THE ANALYSIS OF DIGITAL PAYMENTS IN INDIA

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Abstract: *Digital Financial Services (DFS) can be defined as the set of financial services accessed and delivered through certain digital pathways. In another word, DFS are services provided and accessed on the customer's respective mobile phones, computers, Point-of-Sale (POS), ATMs, etc. The merits of DFS can be implemented on payments, credit, savings, remittances, insurance and accessing financial information. The "digital pathways" mentioned earlier refer to the digital infrastructure like the Internet, mobile phones(both Smartphone and digital feature phones), ATMs, POS terminals, NFC-enabled devices, chips, electronically enabled cards, biometric devices, tablets, and any other existing digital communication system. This paper focused on the analysis of Digital Payments in India and road ahead to increase the digital transaction.*

Keywords: *Digital Finance, Demonetisation, Digital Transformation, Digital Payment.*

Introduction

Digital Finance can be defined as the financial services provided through or using digital infrastructures such as mobiles and the Internet. It negates the reliance and usage of cash and other traditional bank branches. Digital Finance allows individuals and business to make seamless transactions across all parties. The times have changed until recently though as newer business models are emerging out summed up expeditious technological innovation and government intervention, the situation has gravely improved. This has enabled banks to reach out to the excluded through third-party agents or network managers like M-PESA. As such due to the rapid technological advances, financial services have also been successful at gaining immense insights into consumer needs and behaviours through mobile service networks. The information gathered from such sources can eventually help in addressing the needs of the customers. Apart from that as the reach of the mobile network, especially in countries like India is vast and spread out, digital financial services can act as "infrastructure rails" for other products and business models to improve along with. At the utmost crux of an economy stand "Financial Services" empowering households and businesses to participate in the day-to-day economic activities like saving, investing and protecting themselves from potential financial risks. Unfortunately, even today, most of the emerging economies like India are struggling hard to eliminate poverty and increase economic growth through increased financial inclusion.

Digital financial services and the digital economy is not a new thing and has been around for over a decade or so. But in the past few years, we have seen accelerated growth in this field as new favouring regulation regarding customers and service providers came to ease out the use of digital financial services and increase the reach to the underserved population. Much of the things have been done but even much more is there on the plate which is needed to be done regarding the digital finance and to popularise it in the common masses. With the government taking an interest, easing down the regulation and new and innovative service providers coming in the field it is safe to say that the future of digital finance is there in India. Next-generation payment structures, such as mobile wallets, payments banks, Bharat QR, and electronic authentication, have created new forms of digital payment channels and servicing capabilities. The payment industry in India is going through gigantic changes. Over the last few years,

the tremendous growth in the digital payment space has elicited a passionate debate across the industry. It is of certainty that the next several years will see a transformation of how consumers, businesses, and the government more money. The trends of digital payments at a broader level can be summarised as a very modest growth despite the major government interventions to spur the growth of digital payments.

However, this is not to say that the trajectory of the trends is stagnating as we witness numerous change in the way business and money transaction is carried in India. Merchant payments are at the epic centre of the disruption that is going on; with payment services for small and medium-sized merchants (SMEs) increasingly integrated with other business software and POS systems. The payments value chain is becoming digitised, and payments are increasingly an integrated part of the 'commerce journey.' Banks understand that digital channels are how customers interact with them, and consequently, digital investment priorities are starting to shift from customer experience to customer engagement. While enhancing customer experience is important, developing digital channels as customer engagement platforms are now seen as critical to the success of banks. Distributed ledger technology (more commonly known as blockchain technology) has started to alter the landscape of digital payments in India, and cross-border payments, securities and digital currency issuance are all being impacted.

Financial institutions in India, much like in the rest of the world, are launching a proof of concepts for blockchain technology, targeting use cases such as cross-border remittances, trade finance and vendor financing. In October 2016, ICICI Bank executed India's first international trade transaction and overseas remittance using blockchain, and Prime chain Technologies, a year-old startup, created a Bank chain for banks. Bankchain gives access to a sandbox, allowing bank developers to discover and develop new blockchain solutions; currently, it has 24 members and is on target to grow to 750 members in 2019. The Reserve Bank of India has also given positive signals to the marketplace, noting that the technology could bring transparency, efficiency and cost savings to the industry, which all together indicates the tectonic shifts that are altering the hitherto payment systems in India albeit in a rather slow pace.

Objectives

1. To study the Growth and Trend of Digital Payment System in India.
2. To know the digital financial services in India.
3. To analyses the Digitization impacts on the industries/services.

Research Methodology

The methodology is used for the paper is secondary data based research paper and its conceptual research paper of Digital payment System.

Review of Literature

Nitsure (2014) in his paper observed that the problem being faced by developing countries like India in the adoption of E-banking initiatives due to low dissemination of Information Technology. The paper highlighted the problems such as security concerns, rules, regulation and management. In India there is a major risk of the emergence of a digital split as the poor are excluded from the internet and so from the financial system.

Balazs Vinnai, general manager, Digital Channels, Misys(April 25, 2016), says that "It is critical for banks to consider new digital channels as part of an integrated strategy and evolve from first to second generation digital banking: switching digital from a supporting role, to the primary sales and communication channel for banks," says Vinnai. "Reengineering processes around the customer is not easy, but banks must embrace digital banking to remain competitive and relevant."

Pushpa S. Abbigeri and Rajeshwari M. Shettar (2018) talked about how the Digital India flagship program attracted large number of people to start using digital wallets , which people started to use as there was lots of cash back offers and coupons. After the digital India flagship program a lot of mobile wallet companies entered India and other methods such as UPI, NEFT to a surge. The initiative taken by the government and RBI was being accepted by the people as they were using such methods.

Shivathanu B. (2019) in his study adoption of digital payment system in the era of demonetization emphasised on how the digital payment system was used by the people or accepted by the people during demonetization. It was based on a conceptual framework where the sample size was 766 .The data analysed suggested that behavioural intentions and innovation resistance had an impact on the actual usage timing, Online Monthly statement, Quick financial decision making, Easy interbank account facility, Internet Connectivity, and Usability.

Growth of Digital Payment System in India:

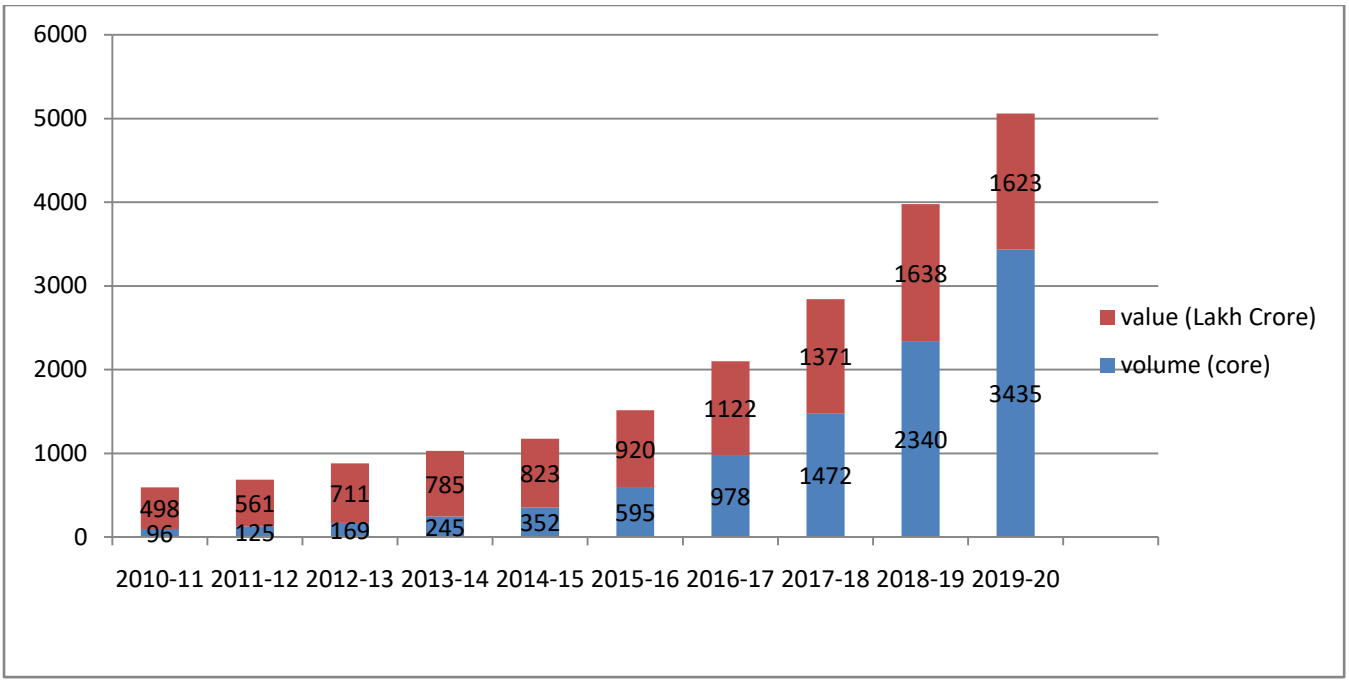
This growth in the digital payment system is mainly credited to the policy and regulation changes, technological advancements, mobile penetration and at an availability price of internet. With people getting more familiar with technological advancement, mobile applications, digital financial services, there is an observed increase in the volume of transaction. With the policies like Demonetization, Digital India and others, usage of M-wallets, mobile banking and other digital platforms for payments and digital financial services were encouraged by the government, which resulted in the steep rise in the volume of transactions done through digital platforms.

The growth and the welcome changes in the regulation for the digital financial services it is safe to say that the growth will be persistent. The deepening of digital financial services has increased the volume of the transaction being done digitally. With the further deepening of DFS in the underserved population, the volume of the transaction will also increase. By looking down the data released by Reserve Bank of India (RBI) on payment system indicators, there is shown a growth trend in the digital payment system. The data has been collected from 2010-11 to 2019-2020.

The acceptance and growth of digital payments has been exponential over the years. From 498 crore transactions with a value of 96 lakh crore handled during FY 2010-11, digital payments have grown to 1623 crore transactions with a value of 3435 lakh crore in the FY 2019-20. This represents a CAGR of 12.54% and 43.01% in terms of volume and value, respectively.

Global Data, a data and analytics company, in its 2017 Consumer Payments Insight Survey, observed that India is one of the top markets globally in terms of digital cash adoption with 55.4% survey respondents indicating usage of digital cash. India is followed by China and Denmark. The adoption level in India is much higher compared to many of the developed markets such as the US and the UK, where consumers predominantly use cards.

Digital payments in India



Within the digital payments, retail electronic payments comprising credit transfers {NEFT, fast payments (IMPS and UPI)} and direct debits (ECS, NACH) have shown a rapid growth over the past ten years at a CAGR of 55% and 43% in terms of volume and value, respectively. E-Money issued in the form of wallets and prepaid cards demonstrated an increased adoption with a CAGR of 91% and 56% in terms of volume and value, respectively in the past 9 years.

Immediate Payment Service (IMPS)

An Immediate Payment Service (IMPS) is a 24*7 'fast payments' system that was introduced in 2010. India was the fourth country after South Korea, UK and South Africa to introduce such a payment system. The system provides for real time transfer of funds between the remitter and beneficiary with a deferred net settlement between banks. The system facilitates push transactions with a per-transaction limit of ` 2 lakh. An IMP is a multi-channel system that can be accessed using mobile, ATM, internet banking, bank branches, BCs, etc. Besides banks, the system allows non-bank entities such as PPI issuers to participate and facilitate remittances from wallets to the recipient bank accounts. Initially, the system required both the remitter and the beneficiary to be registered for mobile banking which was inhibiting the growth. Hence, the system was upgraded to enable remittance of funds by using other parameters such as account number and IFSC (like NEFT) or by using bank account linked Aadhaar number.

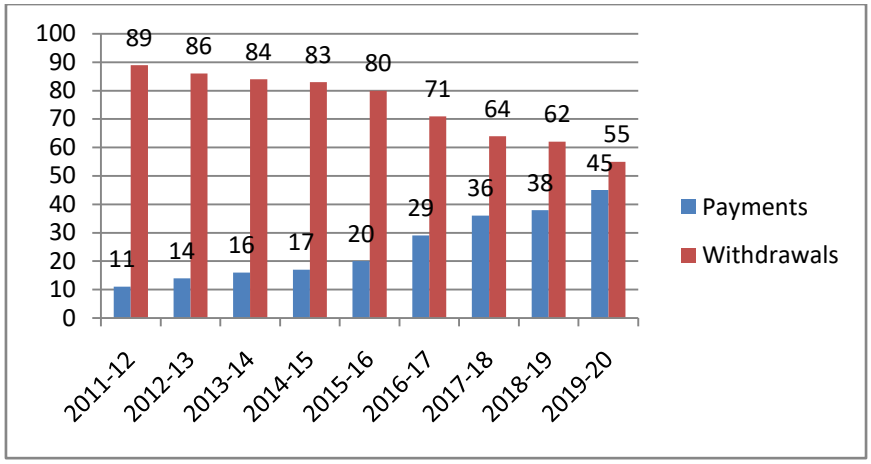
Under retail electronic clearing payment, there is an electronic clearing system, NEFT and Immediate Payment System (IMPS). In the above graph, we see that from the year 2011 the growth has been there, but after 2014 the growth took a big leap, and since then growth in retail electronic clearing has been on accelerating growth. This growth can majorly be credited to the regulation that was implemented and powered the use of services like NEFT and IMPS. Also, people making online purchases and paying to online merchants have also made this growth possible. The major two components of retail electronic clearing are NEFT and IMPS, and from the graph, we can see that they have been growing like ever since. With the welcoming changes in the regulation, it is very safe to predict that the growth in the retail electronic clearing will also persist even in the coming years and as more people coming online and with smart phones doing their transactions shortly we see that the growth will be there.

Card Payments in India

Card payment is an important payment instrument which has replaced the use of cash at least at retail outlets and e-commerce sites. Like in other parts of the world, Indian consumers are now frequently using cards for payments, even for smaller transactions. This is driven, in part, by more people holding cards and greater availability of PoS terminals. In comparison to credit cards, debit cards are much more popular in India. Some of the reasons for this exhibited partiality towards debit cards have been identified to be, (a) low demand due to Indian households being traditionally oriented towards savings, rather than credit culture; (b) supply concerns, especially with majority of the labour force occupied in the unorganised sector and card issuers less keen to take higher credit risks; and (c) the Indian ethos to pay for goods and services on purchase instead of running up credit lines. Yet another cultural observation is, people do not wait for the credit period to be over; instead pay ahead of the deadline, and in many cases, even keep a favourable (credit) balance in a credit card account.

Debt and credit card based payments registered a CAGR of 35% and 33% in terms of volume and value, respectively over the last 10 years. To encourage usage of cards, card infrastructure is required to be robust, strong and secure. Mandating the issue and use of only EMV chip and PIN based cards has helped build public confidence as it provides more security than the 'Magstripe only' cards. The adoption of card payments has also been supported by innovations in the form of contactless payments and tokenisation technologies.

Figure: Trends of Card Payments in India.

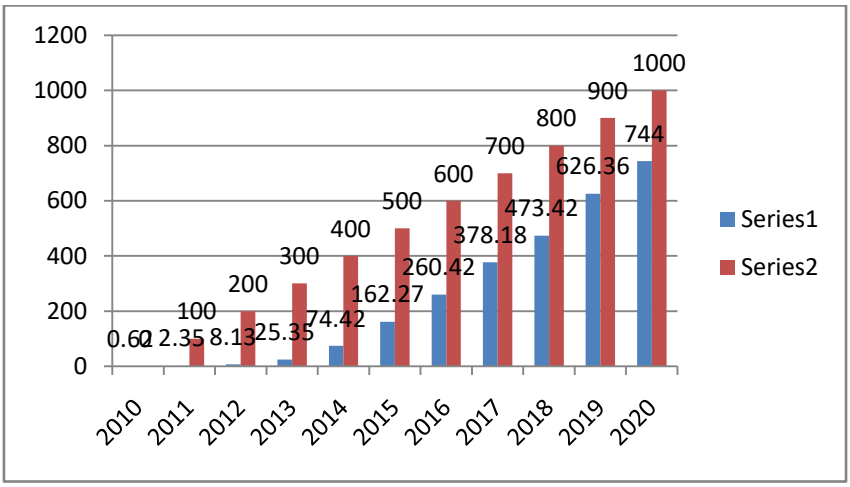


Source: Reserve Bank of India

From the graph above we can make out that there has been a gradual increase in the card payment in both value and volume. We see that payments done on the POS have seen a gradual increase which shows that people are now getting more and more comfortable by making arid payments. This growth in the card payments can be credited to the repay cards, which are now given with all the accounts opened including the 150 million new accounts opened under PMJDY. Also the strengthening the digital infrastructure by increasing the number of ATM which are now even at rural India and encouraging the merchants to have POS at their shops plays a major role in increasing trend of card payments. Also, regulations by the RBI retaining the charges on the payments fine by the credit cards and debit cards have encouraged people to make card payments rather than cash as it is more secure and easy to carry. Also, the incentives from the banks like that of loyalty points encourage people to use cards in place of cash. In future, we see similar trends in the card payments, and with regulations and policy made by the regulation, these trends do nothing but solidity more.

Mobile Banking in India:

Figure: Trend of Mobile Banking in India



Source: www.statista.com

Above chart no. 3 showssome mobile phone internet users in India from 2010 to 2020 in million.

The year 2010 to 2020 is the year of the digital era. Mobile internet is increased were internet and mobile phone charge and price is lowest in India. Chart trends are increasing in the 10 years. In the highest number of users are 744.06 million years of 2020. India also has the highest number of internet users in the world.

Above chart no. 3 shows some mobile phone internet users in India from 2010 to 2020 in million.

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The above graph shows us how in past years payments through mobile banking have grown many folds. These new regulations of RBI regarding mobile banking and also to the fact that during this period mainly from 2014 onwards the number of people owning smart phones has grown tremendously This should be seen as now more people are opening up to checking their financial things and rendering services over their smart phone than going all the way to visit the branches. Also, this growth has to be credited to the business correspondents and agents who literate people/customer about the services in mobile banking and how to use them. Also, we see that the upward trend or growth in mobile banking will persist with the time as now more and more people are landing their hands on smart phones and with the cheap instrument provided by the network operators people tend to be more time online and use the digital gateway rather than going to the physical branches. Also, the banks are giving more and more service on mobile banking starting from transferring money, top-ups and recharges, paying bills, credit and insurance over the mobile banking app so that customers don't need to visit the branches. Mobile phone internet users are in India from 2010 to 2020 in million. The year 2010 to 2020 is the year of digital era. Mobile internet is increased were internet and mobile phone charge and price is lowest in India. Chart trends are increasing in the 10 years. In the highest number of users are 744.06 million year of 2020. India also has highest number of internet users in the world.

Digital Financial Services in India: Post Demonetisation

Since November 2016, the government has been undertaking a mountainous task to alienate customers' long tradition of 'cash is king' and embrace digital alternatives. While the momentum gathered pace in demonetisation and subsequent digitalisation programmes in the initial period, there has been a dampened environment in terms of volume and value of electronic transactions after its heyday.

According to data available with the National Payments Corporation of India (NPCI) and the Reserve Bank of India (RBI), the total value of electronic transactions in November 2016 stood at Rs 94 lakh crore. By March 2017, this value shot up towards Rs 149.58 lakh crore.growth in digital transactions slowed significantly during the. It was however in the later periods that recorded low development in digital transactions. In April 2017, the total value of electronic transactions fell to Rs 109.60 lakh crore, and then to Rs 107.38 lakh crore in July 2017.

This value fell to a lower rate of Rs 99.28 lakh crore towards the end of October 2017. While not as evident as the slowdown in value growth, digital transaction volumes to have reduced from the post-demonetisation highs: from 957.5 million in December 2016 to 877 million in September 2017. Supply interventions with incentives like the provision of discounts on digital transactions and like practices; the demand side of digital payments is well established. Hence it is the supply side that requires immediate interventions to catalyze the numbers related to electronic transactions. A significant roadblock to the growth of digital payments in urban areas is the recurring cost incurred through maintenance of the technology infrastructure to the merchants. The major component to these increasing costs for the merchants is, ironically at a juncture of falling data charges, the telephone bills which have more than trebled. Similarly, in the countryside, traditional fear for the unknown technologies is hindering

people in attuning to the digital payment technologies.

Aadhaar and Digital Financial Services

Aadhaar is a 12-digit, unique identification number underpinned by biometric authentication which provides a secure, safe and unique proof of identity for India's citizens, with no criteria for eligibility. This means that a thumbprint or iris scan at the point of service delivery can act as ID, for example when opening a bank account, or as a digital signature for a paperless cash transaction. Today, over 1 billion people in India have signed up to the programme, and there are roughly 13 million authentications via Aadhaar every day.

Table. 1. Digitization impacts the following industries/services in three major ways.

Industry Type	**Customer Insight / Reach**	**Productivity**	**New Value Pools/ Business Models**
Financial Services (including banks & insurance)	Multichannel (including M-payments). Individualized insurance.	Virtual branch/self-service. End-to-end process digitization. (trading, claims management, offer/order processing)	High-speed trading. Analytics-driven forecasting. Digital wallets/savings/credit.
Public Sector & Healthcare	Health card & National Patients Health records. E-polling/E-voting.	(Hospital) asset management, chronic medication assurance. E-government.	Peer-to-peer services, online health services. Digital identity.
Business Services/ Professional Services	Digital commerce/ marketing, digital ticketing, digital maps.	Congestion charging, self-guided cars.	Digital cloud-based design/prototyping. Digitization consulting.
Media/Entertainment	Personalized content. Digital distribution. Long-tail monetization.	Automated news. Digital production. Content management.	User-generated content. Digital aggregation (e.g. Hulu).
Trade / Retail	Store optimization/ segmentation. Augmented reality. Social shopping.	Automatic stock deployment. Trace and trace.	Virtual goods (e.g. in-game). Virtual stores (e.g. pret-a-porter). Made-to-order.

Source: The Ministry of Finance, GoI

Digital technologies used in financial services

The ongoing advances in telecommunications and computing technology have been an important force in the transformation of finance. Technological advances have greatly improved quality and processing speed and helped to lower information costs and other costs of transacting. These developments have had implications for both providers and users of financial products and services.

The discussion that follows provides a brief overview of new and emerging technologies that are being applied to financial services. These include Big Data, the Internet of Things (IoT), cloud computing, artificial intelligence, and biometric technologies. While these technologies are discussed separately it should be noted that there are interdependencies among many of them. For example, AI is enabled by Big Data, cloud computing and increasingly the IoT[1]

Internet of things

The Internet of Things (IoT) refers to the numerous connected devices that capture information regarding movement and other sensing data of objects in the physical world, and is expected to represent an increasing source of Big Data. The IoT can provide rich information regarding individuals' behaviours; thereby, the resulting data can be used for increased tailoring of products, risk profiling and pricing.

Artificial intelligence

The sub-fields of this science can focus on a range of different aspects of human intelligence, including recognition, understanding, learning, problem solving, reasoning and decision making[2]. Artificial Intelligence (AI) is often used in reference to machine learning, whereby machines are trained with historical data to recognise patterns and classify new data. Through advanced algorithms a machine can learn patterns with new experiences to improve its performance. However, the machine is not learning entirely on its own; rather, the learning process requires a significant level of human input to make sure the data is interpreted correctly[3].

Biometric Technologies

Biometric technologies represent a great improvement in security over verification by passwords, and could be used to increase the security of financial transactions, thereby reducing the risk of fraud or data theft. Nevertheless, these technologies are still in development and security is being improved to reduce the risk that biometric information is compromised.

Applications of digital technologies in financial services

The framework presented here classifies the applications covered into eight distinct categories: payments, planning, lending and funding, trading and investment, insurance, cyber security, operations, and communications.

Table 2 provides a mapping of the selected digital technologies to the categories of financial activities and services being affected. As shown, some digital technologies have wide ranging applications while others remain more limited, but all have the potential to significantly impact financial services/markets. These categories and the effects of Fintech developments on financial contracting in these activities and services are discussed in the following sub-sections.

[1] For a more complete discussion, see Chapter 2 on digitalisation in OECD (2017), The Next Production Revolution: Implications for Governments and Business, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264271036-en.

[2] Rao (2016), "Five Myths and Facts about Artificial Intelligence", Predictive Analytics and Futurism, Issue 14.

[3] This is the case for now at least; in AI circles there is futuristic talk of a (so far hypothetical) moment called "singularity' when AI in combination with the web, IoT, and Big Data will be independent of and escape human control and understanding.

Table 2. Applications of new technologies to financial services

FINANCIAL ACTIVITIES AND SERVICES								
DIGITAL TECHNOLOGY	Payment services	Advisory & agency services Planning	Investment & trading	Lending & funding	Insurance	security	Operations	Communications
Distributed ledger technology	X	X	X	X	X	X	X	X
Big Data		X	X	X	X	X	X	X
Internet of things					X			X
Cloud computing				X			X	
Artificial intelligence		X	X		X			X
Biometric technology					X	X		
Augmented / Virtual reality	X	X						X

Payments

Payments represent the most basic application of digital technology to financial services, one which, while not new, is evolving with emerging technologies. Although digital payments began with physical instruments (e.g. credit cards), payments have been moving more and more into the virtual domain. These innovative payment services can broadly be classified into online payments and mobile payments, although the increased use of mobile broadband connections for mobile communications is admittedly lessening the importance of the distinction. Online payments are defined as payment orders which are placed using devices connected to the Internet, and mobile payments as those which rely upon devices connected to a mobile communication network[4]. Therefore online payments encompass online banking, electronic commerce (e.g. Amazon) and payment services (e.g. PayPal).

Mobile payments include mobile money transactions using mobile network operators (e.g. payments by SMS) and pre-paid cards linked to mobile phones. Payments are not restricted to the banking sector either; mobile payment applications also exist for insurance, where registration and insurance payments can be performed using a mobile device[5].

Investment and trading

Digital technologies have also been used to create new and/or more efficient ways to access and optimise trading and investment. For example, direct trading and investment platforms are facilitating access to markets for both institutional investors and retail consumers. For institutional investors, these platforms are reducing reliance on market makers for trading purposes. For retail investors, trading and investing can be done at a much lower price than going through an intermediary, and some platforms even offer ready-made professionally designed portfolios[6]. Social trading platforms are another example. They can allow investors to automatically copy the trading strategies of traders that they choose to follow.

Insurance[7]

Applications of digital platforms and new technologies are also transforming insurance. First,

[4] FinCoNet (2016), "Online and mobile payments: Supervisory challenges to mitigate security risks".

[5] https://www.oecd.org/finance/Technology-and-innovation-in-the-insurance-sector.pdf

[6] https://www.oecd.org/finance/Robo-Advice-for-Pensions-2017.pdf

[7] See the discussion in www.oecd.org/finance/Technology-and-innovation-in-the-insurancesector. pdf

they are changing the way insurance is accessed and distributed. Providers are now offering access to insurance through mobile devices, for example. Peer-to-peer insurance platforms are also emerging, whereby individuals can form their own group of individuals with whom to pool risk[8]. The biggest impact to insurance, however, may be the uses of technology to improve underwriting and the pricing of risk. Big Data and improved data analytics, including AI, are increasing the number of variables which can be taken into account for the pricing of a policy. However, while this may increase precision, it also may push the boundaries of the goal of insurance to pool risks and lead to exclusion from insurance for risks deemed to be "bad risks".

Cyber security[9]

While the increased reliance on digital technology may increase the risk of cyber security being compromised, digital technology also presents numerous opportunities to improve the security of digital financial services. Data encryption to protect digitally stored data is improving with technology. Biometric technology can be used to improve identity verification and authentication to reduce the risk of stolen passwords or falsified transactions. Data analytics can be used to detect irregular patterns and pinpoint if fraud has occurred. DLT could increase the transparency of transactions, making them easier to track and control, and also reduce the risk of falsified transactions.

Communications

The New technologies are also changing the way financial services providers communicate with their clients. They are changing the way financial products are marketed. Online ads are often targeted to the profile of their viewers, which is inferred from their online behaviour and browsing habits. Once consumers are engaged with a product or service, regular communications can be tailored to them individually, for example, via text message reminders to contribute to a savings plan or pension fund or to pay bills. Consumer support functions can also be transformed with technology, such as the use of *chat bots* or virtual reality sessions with an advisor.

Conclusion:

The result put together gives us an important policy direction towards what can enable the country to increase cashless payments .The results indicate that the deployment of technology for digital payments have improved the performance of banking sector and able to achieve the motive cash less country. The study gives emphasis to the percentage of awareness on maximum utilization of technology. Banks should take effective measures in creating awareness towards the effective usage of technology and security Normally customer's confidence and trust in traditional banking system will make customers less likely to adopt new technologies. New technologies will not be successful until customers are satisfied with privacy and security aspects. It also requires some time to earn confidence among the customers even it is easier and cheaper than the traditional methods.

India has witnessed significant growth in payments over the past decade with the introduction of numerous payment systems. The challenge now is to sustain the growth in payments and ensure a shift in customer behaviour from cash to digital payments. Efforts such as introduction of AFA, limiting customer liability, digital ombudsman and switch-on / switch off cards for online and international use are few milestones in the domain of customer protection. RBI has worked diligently towards creation of a payment landscape where banks and non-banks coexist and thrive together which augurs well for further growth and development of digital payments in the country.

[8] See OECD (2017), Enhancing the Role of Insurance in Cyber Risk Management, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264282148-en.

[9] See "Supporting an effective cyber insurance market" OECD Report for the G7 presidency