

A Study of the digital payment adoption in India, current potential and the future ahead

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Abstract:

Digital payments have become an integral part of our lives, providing convenience and speed in transactions. The Government of India has prioritized rapid digitization as a key objective with initiatives like Digital India. This initiative playing a significant role in propelling the country towards a digital economy. This trend is not limited to individuals but also extends to small and medium business communities as well. The demonetization resulted in tremendous growth in digital payments. With the government initiative such as Digital India and increased use of mobile and internet are means to exponential growth in use of digital payment. The primary objective of this study is to investigate the factors responsible for the widespread adoption of digital payments among people, to study potential size, and drivers of India's digital economy of the future; and to determine what needs to be done to ensure progress toward realizing the vision.

Keywords: UPI, Digital Payment, Digitalization, e-payment, Online payment

1. Introduction:

India is one of the fastest growing economies worldwide, and acceptance of Digital Payments in India has been one of the major reasons behind this phenomenal growth. The digital payments ecosystem has witnessed growth spanning over three significant areas. Firstly, there is growth in payment infrastructure. India has strong position in global benchmark for availability of alternate payment systems [2] As all eyes are set on India; the government is leaving no stone unturned to transform the country into a complete digital economy. With the rapid advancement of technology and the increasing prevalence of mobile devices, modern payment methods have become increasingly prevalent. With the widespread availability of smartphones and internet access, technology has become much more convenient for people, leading to a greater emphasis on digitalization. The demonetization that occurred in recent times has further fueled the demand for digital payments, leading to the entry and success of numerous digital wallet companies in India. This progress has not only revolutionized trade and commerce, but also made payment transactions quicker and more efficient

than ever before. The present report comprises a compilation of literature reviews by various articles, blogs and authors delving into the various modes of digital payments, their rate of adoption, frequency of usage, growth and their potential for the future. Additionally, it highlights how the Digital India initiative launched by the government has the potential to make our nation a cashless economy, with the help of digital payment methods.

2. Literature Review

Digital payment systems have revolutionized the way people conduct financial transactions, and research on this topic has been growing rapidly in recent years.

A systematic review of digital payment research by Huang and Benyoucef (2020) highlighted the key themes and trends in the literature, including the adoption and usage of digital payments, security and privacy concerns, and the impact of digital payments on businesses and society.

According to Shri Narendra Modi Hon'ble Prime Minister of India, Over 40 percent of the world's real-time payments took place through UPI in 2021.

Kshetri (2018) examined the potential of blockchain technology to enhance supply chain management, which could facilitate more efficient and secure digital payment systems.

Liébana-Cabanillas (2014) investigated the antecedents of consumer acceptance of mobile payments, while Zhang and Mao (2018) examined the role of trust in the adoption of digital payment systems.

Research by Lee and Kozar (2012) explored the factors influencing the adoption of online payment systems. Together, these studies provide a comprehensive understanding of the challenges and opportunities in the digital payment landscape and can inform future research and practice in this field.

As per view expressed by Shri Ashwini Vaishnaw Minister of Electronics & Information Technology, Railways and Communications, India's digital payments last year were more than the combined digital payments of four big economies- US, UK, Germany, France.

Rakesh H M & Ramya T J (2014) in their research paper titled "A Study on Factors Influencing Consumer Adoption of Internet Banking in India" tried to examine the factors that influence internet banking adoption. It is found that Internet banking services are impacted by the perceived reliability, ease of use, and usefulness of the system. To promote the adoption of these services, experts should focus on highlighting the benefits they offer and increasing awareness among consumers. By doing so, attention and interest in internet banking can be generated.

Kartikeya Bolar (2014) In his research paper "End-user Acceptance of Technology Interface In Transaction Based Environment" stated that to make informed strategic decisions in improving technology interfaces and competing on different quality dimensions, technology creators and investors require knowledge of customers' evaluations of the interface's features and various quality dimensions. This

information enables them to enhance the technology interface and remain competitive in the market.

Sanghita Roy, Dr. Indrajit Sinha (2014) . stated that Although the E-payment system in India has exhibited significant growth, its adoption rate remains low, with 90% of transactions still being conducted in cash. To address this issue, a study utilizing the Technology Acceptance Model identified four key factors that can enhance the system: innovation, incentives, customer convenience, and a strong legal framework. Further efforts are needed to promote E-payment usage in India.

E-payment systems serve as both a secure and convenient method for individuals and organizations to make payments online, while also providing a gateway to technological progress in the global economy. (Slozko & Pello, 2015).

Shri Rajeev Chandrasekhar Minister of State for Electronics and Information Technology and Skill Development and Entrepreneurship stated that Promotion of digital payments ecosystem is aimed at digitalising the financial sector and economy with consequent benefits of efficiency, transparency and quality. -

As per opinion stated by Shri Alkesh Kumar Sharma Secretary, Ministry of Electronics and Information Technology, Digital India has truly empowered the Indian society and contributed to making knowledge economy. -

As per Neeraj M in his article Digital Payments in India: Mobile Will Be Instrumental in 26.2% CAGR During 2016 – 2020 in India, only one-third of mobile phone users have smartphones, albeit the penetration (population) of a mobile phone has already crossed 80%. With just 450 million smartphone users, India is entering into a smartphone revolution era.

3. Objectives of the Paper:

This research paper initiative has three objectives:

1. To recognise the progress made by India on digital adoption.
2. To articulate the vision, potential size, and drivers of India's digital economy of the future; and
3. To determine what needs to be done to ensure progress toward realising the vision.

4. History of Digital payment

The Digital India programme, launched in July 2015, is a flagship programme of the Government of India with a vision of transforming India into a digitally empowered society and knowledge economy. In line with the Honourable PM Shri Narendra Modi's vision of ensuring that technology is "accessible, affordable, and adds value", the Digital India initiative was aimed at improving the life of the common person. The programme centres on three key vision areas: a) digital infrastructure as a utility to every citizen, b) governance and services on demand, and c) digital empowerment of citizens.

Having built a strong foundation of digital infrastructure and expanded internet access through some 836 million subscriptions, India is poised for the next phase of growth – the creation of tremendous economic value and the empowerment of millions of Indians as new digital applications permeate and transform a multitude of activities and types of work at a national scale. Over the last few years, the government has taken up initiatives across many spheres, including e-governance, skills, and digital infrastructure, that have shown significant impact on the way that the nation lives and works.

The adoption of digital payments in India began even before the internet was born. Back in the 80s, we did not have any internet infrastructure in the country. Yet, there were two products that were being used in place of physical cash by many people. We are talking about credit and debit cards, of course.

Andhra Bank introduced the first credit cards in 1981. This was 30 years after the first bank credit card was introduced in New York. Soon, many other banks in India followed suit and issued their own credit cards. In 1987, HSBC Bank set up the first ATM.

Soon, people started to carry around these little plastic cards instead of a big wad of cash. Cash was still a staple part of the payments industry though - until the internet came knocking. If you really want to put a pin on when the digital payment system in India began, you can trace it back to the mid 90s and early 2000s. In the 90s, the internet started to become wildly popular in India. VSNL Limited was one of the first internet providers, offering internet connections at the speed of 9.6 Kbit per second.

People then began to sell stuff online. In other words, the e-commerce industry was born, although it was in its nascent stages. But selling things online gave way to the need for an online payment system.

BillDesk was founded in 2000, on the cusp of the new decade. It was the first payment aggregator in the country, and it made digital payments easier for e-commerce customers. In 2005, digital transactions like fund transfers got easier, thanks to the introduction of National Electronic Funds Transfer (NEFT).

Simultaneously, the popularity of debit cards also soared in the 2000s, leading to easier digital payments both online and in-store. The gamut of choices available in the digital payment systems in India was clearly on the rise. The National Payments Corporation of India (NPCI) was established in 2008-09. This umbrella organization oversees the retail payment systems in India and has been leading many developments in this area over the past decade.

And by the time 2010 came around, we had several online payment channels such as credit and debit cards, Magnetic ink character recognition (MICR) clearing channels, Electronic Clearing Service (ECS), NEFT and Real Time Gross Settlement (RTGS).

In the years that followed, the NPCI rolled out several other digital payment options to strengthen the payments system in India. Here is a preview of some of these solutions.

RuPay- RuPay is one of the flagship products of the NPCI. It is a global card payment network that is widely accepted at various nodes like ATMs, e-commerce portals, POS machines and more. Over 1,000 banks in India issue RuPay cards today, and this selection includes credit, debit, prepaid and government cards. This innovative system played a tremendous role in the penetration of digital solutions in the tier 2 and tier 3 cities in India.

Aadhaar Payment Bridge System (APBS)- The Aadhaar Payment Bridge System helps the government and governmental agencies make direct transfers to the beneficiaries of the many schemes sponsored by the central and state governments. It uses the beneficiary's Aadhaar number as the primary key.

The Bharat Bill Payment System (BBPS)

The Bharat Bill Payment System (BBPS) is a one-stop solution for all your regular payments. You can pay your electricity, gas, DTH, insurance, telecom, water and even your FASTag dues online via the BBPS route. There are over 200 billers in the system in various categories.

With demonetization being announced in 2016, the digital payment system in India was further strengthened as more people began to turn to these channels for their everyday transactions. Furthermore, the outbreak of the COVID-19 pandemic made it increasingly necessary to initiate contactless payments.

The use of NFC technology in POS terminals made it easier for retail consumers to pay for their purchases in a contactless manner. But in view of the lockdowns enforced over the past years, the need for more robust contactless solutions made Unified Payments Interface (UPI) increasingly popular.

5. Government Initiative:

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. Promotion of digital payments has been accorded the highest priority by the Government of India to extend digital payment services to every segment in the country.

The vision is to provide digital payments facilities to all citizens in a convenient, easy, affordable, quick and secured manner

Ministry of Electronics & Information Technology (MeitY), Digital Economy & Digital Payment Division has been entrusted with the responsibility of leading this initiative on "Promotion of Digital Transactions including Digital Payments". MeitY is coordinating with multiple stakeholders including Banks, Payment Service Providers, Central Ministries/Departments and States/UTs, for promotion of digital payments across the country.

Coordinated efforts of the Government with all stakeholders have led to a significant growth in digital payments, as given below:

Financial Year	2017-18	2018-19	2019-20	2020-21	2021-22
Digital Transaction Volume (in crore)	2,071	3,134	4,572	5,554	8840
Digital Transaction Value (in lakh crore)	1,962	2,482	2,953	3,000	3,021

(Source:RBI, DigiDhan Dashboard)

6. The current situation:

India is among the top three global economies in number of digital consumers. With 634.9 million internet subscriptions in 2022 India is the second-largest internet subscriptions market in the world. Likewise, India has the second-largest number of instant messaging service users worldwide, behind China.

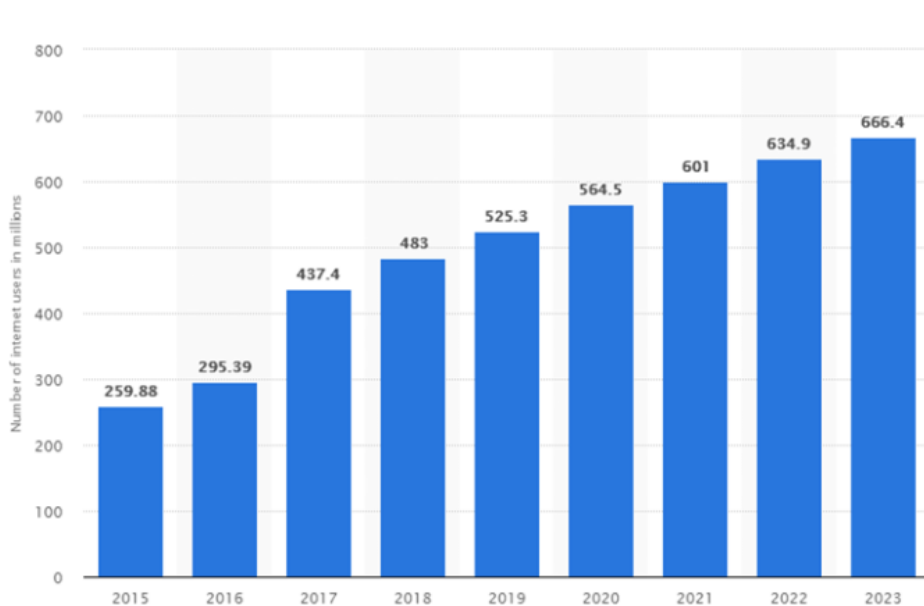


Figure 1 : Number of internet subscribers in India as of June 2022

Source: <https://www.researchgate.net/>

As mentioned by Shri Rajeev Chandrasekhar, Minister of State for Electronics and Information in his address to the upper house- India achieved a total number 8,193 crore digital payment transactions till March 20 2022, across payment modes like Bharat Interface for Money- Unified Payments Interface (BHIM-UPI), Immediate Payment Service (IMPS), National Automated Clearing House (NACH) set up by the National Payments Corporation of India (NPCI), debit cards, credit cards, NEFT, RTGS, PPI and others.

“Over the year, digital payments transactions have grown multifold from 2,071 crore in FY2017-18 to 5,554 crore in FY2020-21. During current financial year i.e. FY2021-22, the total number of 8,193 crore digital payment transactions have been reported till 20th March 2022,” Chandrasekhar also mentioned that BHIM-UPI emerged as a preferred mode of payment among citizens, with record 452.75 crore digital payment transactions with a value of Rs 8.27 lakh crore till February 28. Total value of UPI-based digital transactions in India is Rs 81 lakh crore (FY2021-22); Rs 41 lakh crore (FY2020-21); Rs 21 lakh crore (2019-20); and Rs 9 lakh crore (FY2018-19), as per the NPCI data cited by the minister.

He also apprised the parliamentarians of the measures taken by the Ministry of Electronics and Information Technology (MeitY) to promote digital payments across the country. These include incentive scheme for promoting RuPay debit cards and low-value BHIM-UPI transactions (P2M). This incentive scheme facilitates banks to build robust digital payment ecosystem, promote RuPay debit cards and BHIM-UPI digital transactions across sectors and segments.

7. India’s Digital Payments Landscape:

India has witnessed a tremendous growth in the digital payments sector in recent years. According to reports, there has been a staggering 44% compound annual growth rate (CAGR) increase in digital payments by volume from 2017-18 to 2021-22.

Unified Payments Interface (UPI)- With over 60 billion digital transactions till date, the Unified Payments Interface (UPI) has emerged as a popular platform for inter-bank transactions, with a transaction volume of 7829.49 million as of December 2022.

RuPay card - The indigenously-developed RuPay card, launched in March 2012, has also been a success, with over 714 million total RuPay cards in circulation as of December 2022. In December 2022, the platform recorded a total of 78.80 million point of sale (PoS) transactions, worth INR 12,82,005.01 crore in transaction value.

The National Electronic Toll Collection (NETC)- (Fast Tag) launched in December 2016, has also seen tremendous growth, with a total of 53,54,312.76 million transactions, worth INR 4,939.75 crore in December 2022 alone.

Bharat Bill Payment System (BBPS)- Another significant addition to the digital payments sector is the Bharat Bill Payment System (BBPS), which was launched in 2014. As of December 2022, BBPS has over 20,600 billers live on its platform, and recorded a total transaction value of INR 1,39,022 crores from April - December 2022. BBPS aims to provide a seamless and accessible platform for customers to pay recurring bills.

Aadhar Enabled Payment System (AePS) - It was launched in November 2010. AePS is a bank-led model that uses Aadhaar-based authentication to enable online interoperable transactions. The system has gained significant popularity, with INR 1,88,421 crores worth of transactions done through AePS from April-December 2022, and 69.7 crore transactions done between April-December 2022.

e-RUPI- Another payment system, e-RUPI, was launched in August 2021. e-RUPI is a person and purpose-specific cashless e-voucher designed to ensure that the stored money value reaches its intended beneficiary. In December 2022, 27,652 vouchers were created through the system.

UPI Lite- It is a new payment solution that can be used to process low-value transactions below ₹200, was launched on 20th September 2022. The system has already recorded 6.62 lakh transactions until 12th December 2022.

IMPS, an instant payment inter-bank electronic funds transfer system, was launched in November 2010 and is the second-largest payment method in India after BHIM-UPI. The system has witnessed a 47% CAGR growth in the volume of transactions through the last five years, with INR 40,93,673 crores worth of IMPS transactions between April-December 2022, and 423 crore transactions done between April-December 2022.

The National Automated Clearing House (NACH) service, launched in 2016 by the NPCI, facilitates electronic automation of inter-bank high volume, low-value debit and credit transactions. The system has recorded a 13% CAGR growth in the volume of transactions since 2018, with 384 crores of transactions in FY 2021-22, and a 22% CAGR growth in the value of transactions from 2017-18.

The National Electronic Funds Transfer (NEFT) was launched in November 2005 by the Reserve Bank of India (RBI) and is a nationwide centralised payment system. NEFT has recorded a 30.6% CAGR growth in volume since 2018, with 404 crores of transactions in FY 2021-22 and a 14.3% CAGR growth in value from FY 2017-18 to FY 2021-22.

The Real-Time Gross Settlement (RTGS) system has witnessed 20.8 crores transactions in FY 2021-22, with INR 1092 lakh crores worth of transactions between April-December 2022

8. The way forward:

Making India a world leader in the digital economy will require a multifaceted approach that involves a combination of government policies, private sector initiatives, and individual efforts. Here are some steps that could be taken:

Expand digital infrastructure: India needs to invest in the expansion of digital infrastructure, such as high-speed internet connectivity, data centers, and cloud services. This will require significant investment in both urban and rural areas to ensure that everyone has access to digital services.

Encourage entrepreneurship: The Indian government should create policies that encourage entrepreneurship in the digital space, such as tax incentives and easier access to funding. This will help create a vibrant startup ecosystem that can develop innovative digital solutions and products.

Embrace emerging technologies: India should focus on embracing emerging technologies such as artificial intelligence, blockchain, and the Internet of Things. This

will help to create new industries and drive economic growth.

Increase digital literacy: India should invest in increasing digital literacy among its population, especially in rural areas. This will help to ensure that everyone can participate in the digital economy.

Develop digital talent: India should invest in developing digital talent by improving the quality of education in science, technology, engineering, and math (STEM) fields. This will help create a pool of skilled workers who can drive innovation in the digital economy.

Foster international partnerships: India should foster international partnerships to exchange knowledge, resources, and ideas with other countries. This will help to create a more robust and global digital ecosystem that can drive innovation and economic growth.

The 360-degree Approach: There is need for a 360 degree robust approach

Digital Foundation

The foundation of a strong digital infrastructure for a should rest on four key pillars.

The first pillar is universal coverage of digital identity, authentication, and consent framework. This ensures that every citizen has a unique digital identity, which they can use to authenticate themselves across various digital platforms.

The second pillar is a world-class environment for cybersecurity and data protection, which safeguards against cyber threats and protects sensitive data.

The third pillar is digitised data assimilated from an open API framework with utilities developed using deep analytics and real-time visualisation. This will enable the government to leverage data insights to make informed decisions and deliver efficient public services.

Finally, the fourth pillar is requirement of skilled workforce in new digital and emerging technologies, which is crucial for driving innovation and economic growth. With these four pillars in place, a nation can build a strong national digital foundation that can propel it towards digital transformation and success in the digital economy.

Digital Reach

In today's digital age, it is crucial to connect unserved and underserved people with affordable, high-speed internet. This can be achieved by providing fibre and 5G connections to every household, enabling two-way data speeds of up to 20 Mbps. With more than 1 billion internet users globally, it is imperative that we also provide strong local-language content and universal digital literacy to ensure everyone can take advantage of the benefits of the internet.

To maximize the potential of the internet, new digital platforms and delivery models are emerging in areas such as agriculture, education, transportation, and other services. By embracing these technologies, we can create a more inclusive society where everyone has access to the same opportunities and services.

Digital Value

The goal of creating a \$1 trillion digital economy is achievable by leveraging digital and data-backed innovation to boost productivity in key sectors such as manufacturing, agriculture, and services. This can be achieved by nurturing vibrant IT-BPM, telecom, e-commerce, and electronics sectors, which will encourage an explosion of new digital startups. Additionally, more workers will be absorbed into the formalised, digitised sector through tech platforms and value chains, driving further growth. To support this growth, our nation aims to become a global leader in digital identity and public digital platforms, as well as data utilities. We also strive to become a hub of innovation in fintech, edutech, healthtech, agritech, and other areas of technology innovation. To support these efforts, we will build a powerful data analytics engine that will enable us to offer valuable insights and services to the world.

The Indian government has taken several measures to support and promote the growth of digital businesses in the country. One of their main goals is to significantly improve the ease and reduce the cost of operations for digital businesses. The government has set a target to make India one of the 50 easiest countries to do business in, and their efforts are beginning to bear fruit.

Another key initiative is to unlock the flow of domestic capital into digital businesses. While India has attracted large amounts of foreign investment in its technology sector, the government recognises the importance of domestic savings as a strong complement. Encouraging the flow of domestic capital into digital businesses will help retain the assets and wealth created by these businesses in the country, contributing to the growth of the digital economy.

To ensure that India's workforce is equipped with the necessary skills for the digital economy of the future, the government should put more efforts to unshackle centres of higher education and innovation. They must recognise that competitive advantage will lie in developing skills in design, creativity, and innovation. Finally, the government should have supportive policies and regulations that will enable the growth of the digital economy. By implementing these policies and initiatives, the Indian government hopes to create a thriving digital economy that benefits all citizens.

9. Conclusion:

In conclusion, digital payments have become an integral part of our lives, and the Government of India has prioritized rapid digitization through initiatives such as Digital India. This focus on digitization has played a significant role in propelling India towards a digital economy, with benefits that extend to individuals as well as small and medium-sized businesses. The demonetization in recent times has further fueled the demand for digital payments, leading to the entry and success of numerous digital wallet companies in India.

India's digital payments ecosystem has witnessed growth in payment infrastructure, the introduction of various payment systems, and a significant increase in the digital payments sector. With the widespread availability of smartphones and internet access,

technology has become much more convenient for people, leading to a greater emphasis on digitalization.

To ensure progress towards realizing the vision of a complete digital economy in India, a multifaceted approach is required that involves a combination of government policies, private sector initiatives, and individual efforts. This approach should focus on increasing digital literacy, extending digital reach to the people, improving infrastructure, and data protection.

India has the potential to become a world leader in the digital economy, and the government is leaving no stone unturned to make this vision a reality. With the rapid advancement of technology, the increasing prevalence of mobile devices, and the growing acceptance of digital payments, India is poised to lead the way in the digital revolution.

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