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MOBILE WALLETS: AN OVERVIEW OF INDIA'S DIGITAL PAYMENT LANDSCAPE

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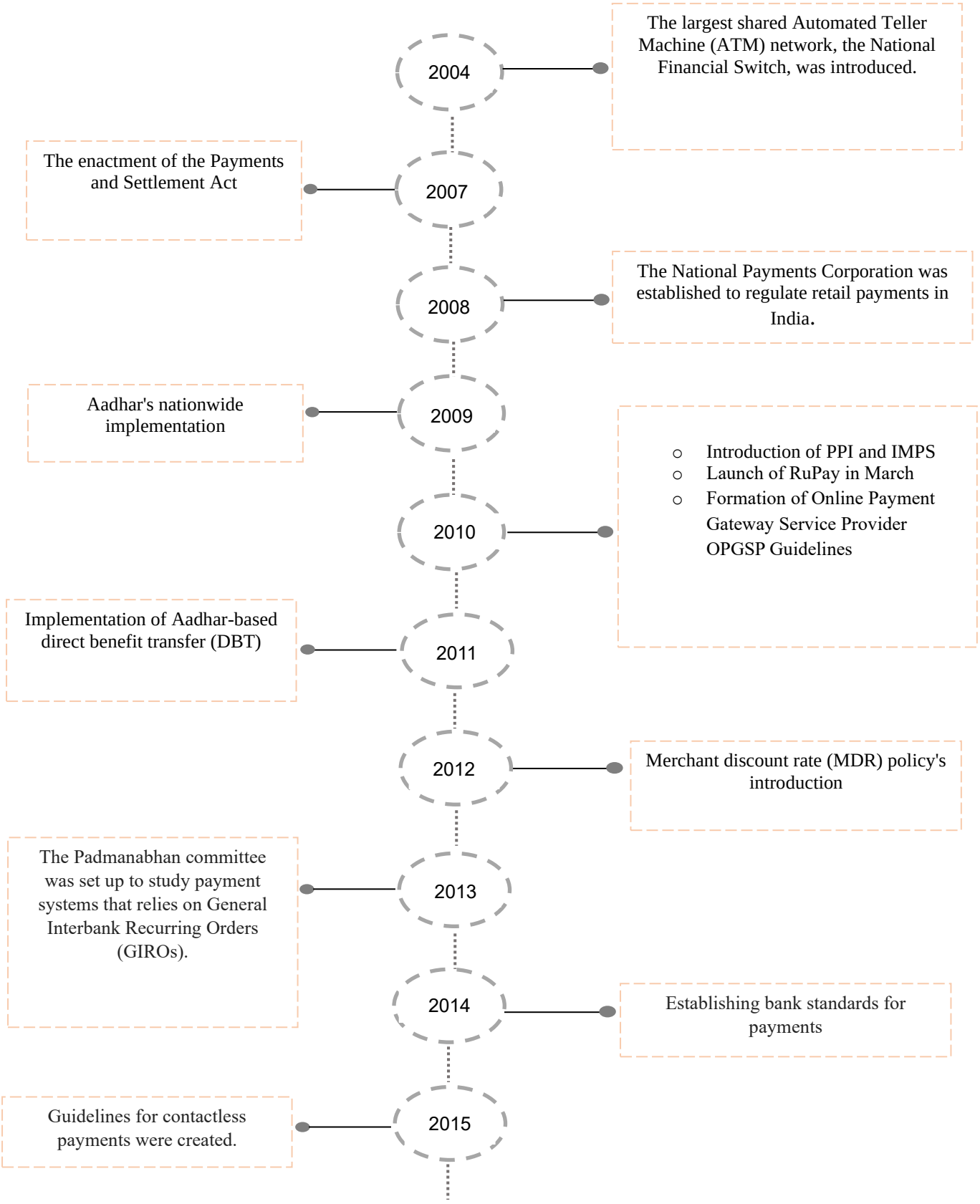
ABSTRACT

India's digital revolution set new goals for the country, and these goals are based on a strong digital payment landscape. One of the ways that the payment environment is changing from cash to cashless is through mobile wallets. Mobile wallets have revolutionized digital transactions, providing a convenient, secure, and efficient method for financial transactions. This paper explores the evolution, functionality, and impact of mobile wallets in modern financial ecosystems. It discusses the technological advancements enabling mobile payments, security concerns, and user adoption trends. The purpose of this research is to give further information regarding the use of mobile wallets for digital payments in India and to address regarding how these payments might change the payment landscape in the future. Additionally, it examines the challenges and prospects of mobile wallets in the context of digital finance. The findings highlight the growing reliance on mobile wallets and their potential to shape the future of cashless economies.

Keywords: Digital Payment, Mobile Wallets, Financial Inclusion, Digital India, Financial Technology, JEL Code: E42, O33, G21, O38.

1. INTRODUCTION

Technology has changed the way individuals live in the age of technology. This impact can be observed in many fields in India. Technology development has been speeding up processes in numerous industries, including banking, industry, education, and communication. Money and money-related transactions are significantly impacted by technology. India's economy is set to be significantly impacted by the ongoing digital revolution, which is taking place in a country with little media attention (Shah, 2017)[1]. In this climate of fast change, financial institutions have witnessed competitors challenge their market dominance in various important industries. In this case, non-bank entrepreneurs are revolutionising the way customers make and receive (instant) payments for products and services, making the payment industry one of those that is experiencing rapid upheaval. In recent years, technologies have been more extensively used and are multiplying quickly in the payment industry. These developments provide data-driven platforms for customer connection and ever-more-undetectable cashless payments. The Indian government's push towards a cashless economy, exemplified by the "Digital India" initiative, it has accelerated the adoption of digital payment methods, including mobile wallets. With the proliferation of affordable smartphones and internet connectivity, a vast segment of the population now has access to mobile wallet services. The mobile wallet market in India is anticipated to surpass $5 trillion by 2027, reflecting a compound annual growth rate (CAGR) of 23.9% from 2023 to 2027 (GlobalData, 2023)[2]. The mobile wallet ecosystem in India is poised for substantial growth, driven by technological advancements, supportive government policies, and increasing consumer acceptance. As the market evolves, it is expected to offer more diversified services in India. The Indian government's incredible journey in the digital payment sector is depicted here:


2004
The largest shared Automated Teller Machine (ATM) network, the National Financial Switch, was introduced.
2007
The enactment of the Payments and Settlement Act
2008
The National Payments Corporation was established to regulate retail payments in India.
2009
Aadhar's nationwide implementation
2010
Introduction of PPI and IMPS
Launch of RuPay in March
Formation of Online Payment Gateway Service Provider OPGSP Guidelines
2011
Implementation of Aadhar-based direct benefit transfer (DBT)
2012
Merchant discount rate (MDR) policy's introduction
2013
The Padmanabhan committee was set up to study payment systems that relies on General Interbank Recurring Orders (GIROs).
2014
Establishing bank standards for payments
2015
Guidelines for contactless payments were created.

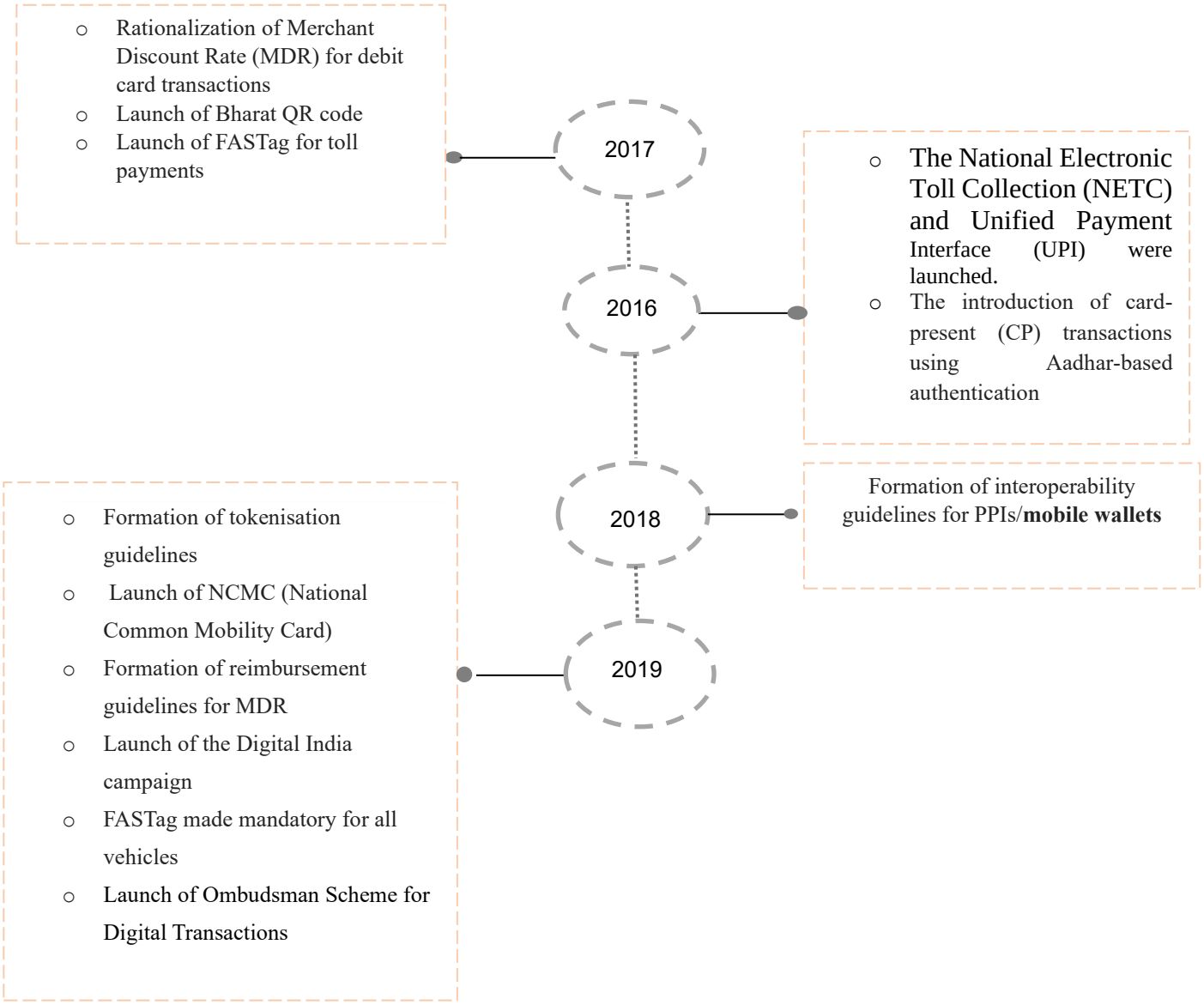


Figure 1: The Path of Electronic Payment

Source: By Author's Contribution

In India, 40% of all transactions are digital, according to the National Payments Corporation of India. The digital payment system is used by millions of people and businesses to conduct small to very tiny transactions. Mobile wallets are successfully occupying a PPI (prepaid payment instrument) position in the digital payment system. The precise goals of the mobile wallet payment system can be attained with the help of smartphones. Using mobile devices, a wide range of services are useful, including social networking, payments, communication, entertainment, and education. In 2022, Statista estimates that India will be the second-largest smartphone market in the world, with 659 million users (Smartphone Users by Country 2022 | Statista, 2024)[3]. Smartphone adoption and use might shift. However, it consistently holds a prominent position among top countries in terms of smartphone usage and holds a sizeable market share. On top of the government-installed "rail tracks" that make up the digital infrastructure, innovation is thought to be possible at a minimal cost. One of the best tools for achieving these objectives is a smartphone. The government laid the "digital public infrastructure" framework, and a strong public-private partnership was built on it. With the aid of the public-private model, India can create fresh concepts that can help the world's poorest countries, and India can set a new standard among all nations. Jan Dhan Accounts, Aadhar, and Mobile, the three foundations that transformed India's whole economic ecology, are at the centre of this programme. The purpose of this research is to give further information regarding the use of mobile wallets for digital payments in India and to address regarding how these payments might change the payment landscape in the future.

2. LITERATURE REVIEW

Mobile wallets provide an in-depth exploration of the technological, economic, and behavioural dimensions of this rapidly evolving sector. Mobile wallets have transformed the payments landscape by offering convenient, secure, and efficient alternatives to traditional payment methods. The growing adoption of mobile wallets (M-wallets) in urban areas, including Rajasthan, reflects the rapid shift towards digital financial transactions. This literature review examines the structure of mobile wallets in India and describes the development system.
The increasing use of mobile phones leads to the rapid growth of the economy in various sectors. Among the various sectors, the use of mobile phones in financial services has increased in recent years. This study explored the key factors that affect the consumer's acceptance and use of mobile money transfers in Ghana. Analyzing consumers' perceptions towards mobile payment, services are mainly based on trust and risk. These determinants directly impact financial services (Tobbin, 2010). In contemporary ideas, customers do not need to go to the banks for their transactions and other services. All the commercial banks provide services on mobile. These kinds of services are quite easy and convenient for the customers. Customers are using mobile banking services without any assistance from bank employees. This study focuses on the impact of mobile banking technology in Jordan and examines the E-satisfaction of the customers (Asfour & Haddad, 2014). Mobile payment is a new opportunity for commerce convenience. This study was all about the factors affecting the intentions to accept mobile money payment (MMP) by MSMEs (Micro and Small Enterprises) within Kisumu City, Kenya. A survey method was used to collect information from a group of people to describe some aspects (Omol et al., 2016). The growth in the mobile wallet payment system represents an opportunity for financial inclusion. The government of India also initiated this new digitalized payment system and made the e-wallet system more user-friendly. This study has observed that perceived usefulness positively influences the intention to adopt a mobile wallet (Yadav, 2017). In India, post-Demonetization resulted in a drastic increase in the customers of e-wallet companies. People have become aware of the electronic payment system. This system of payment has become more popular now. This study synthesized the operational procedure of e-wallets and provided awareness regarding the security of digital payment systems. The study was based on descriptive analysis (Kanimozhi & Kamatchi, 2017). The Mobile Wallet industry has a tremendous growth in the past five years. According to the study, consumers' preferences, adoption, and threats are the main determinants for mobile payment systems (Singh & Rustagi, 2018). Based on the demographic and psychological traits of the designated adopted group, the study establishes a sociological model that characterizes the consumers' intention and adoption of new innovations (Chakraborty & Mitra, 2018). In India, financial services are promoted through financial inclusion for poor people. Mobile banking facilitates financial inclusion and focuses on economic growth (Priya D, 2018). In India, various mobile wallet service providers are expanding their services in the mobile wallet systems, and these services directly affect them. These service providers focus on security, service quality, usefulness, and consumers' intentions to use mobile wallet systems. According to this literature, consumers' intention to use this technology is based on certain factors that maintain trust between consumers and the service provider's company (Susmi et al., 2019). Due to the demonetization process, the number of transactions increased rapidly in every digital payment platform. The mobile wallets are most preferred, followed by IMPS. People use various digital payment platforms at their convenience. As a result, though achieving a state with an absolute cashless economy may still be a faraway dream, India is already striding strong on that path (Sarkar & Chatterjee, 2019).

However, challenges like inconsistent connectivity, inadequate technical support, and limited understanding of advanced features remain. This review underscores that M-wallet adoption is driven by a complex interplay of factors, provides a solid basis for empirical research into digital finance trends in the country.

3. MOBILE WALLET: AN OVERVIEW

M-wallet stands for mobile wallet. The m-wallet payment system is expanding in the financial market. It is a kind of Digi wallet where transactions are made online. M-wallet market includes money transfer, services which is related to banking transactions, recharging, and various bill payments. In this process bank account is mandatory. An "M-wallet" needs to be linked with a bank account to make virtual payments. In India, there are some major M-wallet players like Paytm, Google Pay, PhonePe, MobiKwik, Amazon Pay, etc. Customers are using M-wallet apps for their financial transactions. M-wallet system is a secure and prepaid payment system. A cashless payment system is an integral part of the financial inclusion drive in the long run as well to boost the Indian economy, which has recently been hit by innovation and experiments. India has immense potential for expanding new financial services through improved technology (Singh & Rustagi, 2018). M-wallets are working as prepaid payment instruments (PPIs) that facilitate the purchase of goods and services. M-wallet system is a significant source of money transfer and an alternative source of payment, which is based on the new era's customers' needs (Ramli & Hamzah, 2021). Internet connectivity is a major part of cashless payments by M-wallet. The Digital and Transform India drive of the government initiated this system, and internet penetration has increased.

3.1 Types of Mobile Wallets in India:

Based on functionality, the Reserve Bank of India (RBI) classifies three types of payment wallets in India: open system, closed system, and semi-closed system

i. **Open Mobile Wallet:** Banks and other independent financial organizations may offer. Banks and other independent financial organizations may provide them. It may be used more widely since it functions similarly to a digital version of your physical bank account. This wallet allows you to transfer money and withdraw cash from ATMs (Chauhan & Shingari, 2017). End users can benefit from this wallet. Open wallets allow users to send and withdraw money from ATMs and banks and perform any other transaction permitted by a semi-closed wallet. PayPal is a prime example of an open mobile wallet; it enables customers to pay for goods both online and in-store while keeping the ability to withdraw cash. Wallets such as Google Pay and PhonePe, are open platforms that focus on bank transfers and transactions.

ii. **Closed Mobile Wallet:** Compared to open or semi-closed wallets, closed mobile wallets provide a limited range of features. Within a certain ecosystem or merchant network, they give priority to limited use. Subject to the issuer's policies, funds in a locked wallet may not be readily transferred or convertible into cash **(**Hidayat-Ur-Rehman et al., 2022). These are payment cards that are often issued by businesses and are solely intended for use within certain businesses. Examples of closed wallets include Starbucks locations, McDonald's restaurants, Domino's orders, cinema ticket reservations made on the relevant platforms, FreeCharge credit, and Ola money.

iii. **Semi-Closed Mobile Wallet:** Users can transact at specified merchants using a semi-closed wallet. These wallets may be used for both online and physical purchases. Cash cannot be taken out of users' wallets. It provides a compromise between functionality and limited use by being in the centre ground between open and locked wallets. Usually, a network of retailers that have teamed up with the wallet provider accepts them (Ly et al., 2022). It could be a wise choice for those who often use businesses or services that collaborate with a semi-closed wallet, and you find their loyalty program appealing. The greatest illustration of this wallet is Mobikwik and Paytm.

4. DEVELOPMENT OF M-WALLET SYSTEM IN INDIA

M-wallet is a virtual system for money transfer through a financial application. It is more convenient than the earlier system. In addition to these, mobile payments differ from traditional payment methods in terms of transparency and security. The first mobile wallet in India was ‘Oxygen’, which was launched in July 2004. Oxygen is the first virtual wallet useful for making payments on selected merchants, but it cannot withdraw loaded cash in its mobile wallet (Why Oxygen Wallet, Features of Oxygen Wallet Account | Oxygen Wallet, n.d.). It enables individuals to transfer money from a wallet to a bank account, even if they don't have a bank account. In May 2013, it became the first non-banked wallet to be integrated with NPCI (National Payments Corporation of India), allowing for Instant Money Transfers anytime, anywhere using IMPS. Oxygen works on Financial Inclusion and is a Business Correspondent to India’s premier banks. The company works closely with banks and regulatory bodies to enable various microfinance initiatives of the Government of India, to promote services like BC (business correspondence) or Kiosk Banking, UID (Unique Identification numbers) related Aadhaar, NPCI/IMPS based Money Transfer services, Electronic Benefit Transfers, and more. Vince Talent, Chairman & CEO of Fastacash, said, “With Oxygen Wallet, we are able to bring our innovative solution to the Indian consumer, who will now, for the first time, be able to securely share money and airtime with friends and family, across any social network and messaging platform”. But the use of mobile wallets effectively worked after the launch of Mobikwik in 2009. In addition, Paytm, Google Pay, PhonePe, Amazon Pay, and Airtel Money are mobile wallets that enhance their services in various areas.

5. TECHNOLOGY BEHIND MOBILE WALLET

The technology behind mobile wallets integrates various advanced systems and platforms to enable secure, seamless, and fast digital transactions. In India, various technologies work for different kinds of applications. It depends on the services of the application (Shree et al., 2021). These technologies ensure functionality, usability, and security while supporting diverse payment methods.

3.1 Near Field Communication (NFC) -Enabled Mobile Wallets:

NFC mobile payments are associated with contactless digital payments made using certain card readers and mobile wallets or credit cards with NFC technology. Using this technology, contactless payments might be performed at a store by connecting your phone to an NFC reader at the terminal. The encrypted payment

information is securely transferred for authorization and transaction processing when you hold your phone close to the reader (Hopalı et al., 2022).

i. Secured apps for Mobile Banking to Manage Finances:

Employing mobile banking applications, one can manage their money securely and conveniently whenever they are anywhere, doing away with the need to stop by an ATM or bank branch. Financial organizations provide applications that go beyond traditional banking services by including payment methods for mobile devices that allow customers to handle account balances, cash transfers, and payments right from their phones. They demonstrate the way the financial industry's access to mobile application development has improved user ease and the effectiveness of financial management. Payment services carried out on a mobile device are governed by financial regulations and are referred to as payment apps or mobile wallets.

ii. Encryption technique:

Mobile wallets utilize robust encryption techniques to safeguard your financial data. Encryption ensures that threat actors and unauthorized third parties cannot decode the data, even in the remotest case that they might manage to gain access to it. For example, the Credit Card Industry Data Security Standard requires firms to encrypt customer credit card data while it is being transported over public networks and while the card is at rest.

iii. Cloud-Based Integration:

Cloud-based services are frequently used by mobile wallets to store, scale, and provide accessibility to data. Wherever you're correctly logged in, cloud storage enables you to view your transaction history and mobile wallet from any device connected to the internet. Digital wallets hosted in the cloud are not dependent on a single device. A centralized virtual repository securely stores payment information, and any device capable of running an app could serve as a medium for the digital wallet. Tablets, cell phones, and smartwatches are a few examples.

iv. Payment mechanisms:

Depending on the area and service provider, mobile wallets must connect with payment networks like Visa, Mastercard, RuPay, or UPI (in India) for transactions to be managed efficiently. Such networks serve as facilitators, safely enabling authorization and communication between your mobile wallet, the bank of the merchant, and other parties to the transaction.

v. Quick Response Codes, or QR Codes:

Quick response, or QR, codes are a kind of barcode offering that can be scanned with an app and your smartphone or tablet's camera. The payment amount and merchant details are among the data included in these square-shaped barcodes. One well-known piece of technology in India is the QR code, which businesses utilize to accept payments conveniently (PREMA, 2023).

vi. Tokenization system

Tokenization is commonly utilized by mobile wallets to improve security. The program uses distinct digital tokens to substitute your real credit or debit card information instead of retaining it. Although these tokens are used for transactions, there is a far lower chance that your actual credit card information will be compromised in the event of a data breach. Card tokenization is the process of encrypting sensitive card information by substituting a distinct, algorithmically generated number, known as a token, for sensitive information such as the Primary Account Number (PAN), expiration date, and security code. It is a fundamental technique for processing mobile payments securely.

6. CHALLENGES FOR MOBILE WALLET

Although mobile wallets are highly helpful, many Indian customers have several issues with them. Every technology has an impact, sometimes positive and sometimes negative. Mobile wallet technology has the following drawbacks:

i. **Security issue:** Mobile device threats, unauthorized access, device loss, or theft are among the security issues with mobile wallets. The way you utilize your mobile phone might still compromise its security. Scammers might use the website on your phone to make purchases and payments (Mehraj et al., 2024). Mobile payments using Google Pay and Apple Pay are popular on Android and Apple phones, but they become quite risky if the encryption is compromised.

ii. **Digital literacy:** Digital literacy is essential for customers in the digital payment industry in the current digital era. A wide range of abilities is needed by the fintech workforce to successfully traverse the intricate world of financial tools and technology. The necessity of digital literacy skills will only increase as technology develops (Dave, 2019). In India, people in rural areas are still not using digital payment systems, and most of the population of India lives in rural areas, so this is the main reason for digital illiteracy, which does not boost the economy in financial literacy.

iii. **Internet-dependent behaviour:** The use of mobile wallets requires internet access. Both a smartphone and a strong data connection are necessary. Transaction failures can occasionally be caused by bad connections.

iv. **Transaction amount limit:** All banks allow a maximum transfer sum of ₹1 lakh from apps. However, first-time users may only be able to send ₹5,000 in 24 hours. Nevertheless, the amount permitted could change based on the bank, type of account, KYC standing, and past transactions. For instance, instead of setting daily limitations, certain banks could establish weekly or monthly limits, and PhonePe limits might change depending on the kind of account and KYC status.

v. **Overspending:** Mobile wallets transform the way consumers spend their money. Unwanted costs have the potential to make a person's finances unstable. Credit card consumers in developed countries are overpaying on necessities, which influences the economy going forward.

vi. **Transaction cost:** Regarding services and prices, there are several agreements. Some digital wallets come with extra fees or complex terms. Certain mobile payment providers charge for some transactions, especially when money is transferred between users. Although they are currently low, transaction costs might increase accordingly.

vii. **Password threat:** Malicious malware, including viruses, Trojan horses, and adware, can now compromise wallet accounts and passwords on your devices. The first layer of protection for your digital wallet is a strong, unique password. Avoid using clichés or easily figured-out sequences (Dupont, 2013).

7. CONCLUSION

Mobile wallets, which provide efficiency, security, and convenience, have completely changed how people handle their money. Technological developments, rising smartphone adoption, and consumers' increasing preference for cashless transactions are all contributing factors to the quick adoption of digital payment solutions. Mobile wallets have advantages, but they also have drawbacks, including security threats, legal issues, and the requirement for broad merchant acceptance. Financial institutions, technology companies, and legislators must work together to improve security protocols, build consumer confidence, and guarantee smooth interoperability as the digital payment ecosystem develops. With advancements like blockchain technology, biometric authentication, and artificial intelligence positioned to further improve user experience and security, the future of mobile wallets seems bright.

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