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Digital Payment Systems – An Overview of Categories and Extant Opportunities and Challenges

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Abstract: ***The payments industry is changing as a result of mobile payments. These services give non-banking actors a way to break into the sector. Banks, who are already involved in the traditional payments sector, must provide mobile payments in order to meet this threat. Right now, we're in a digital era. India is about to see a significant digital revolution.***
The increasing connectivity that the Internet provides in today's society has altered the way that money is exchanged. The use of several technologies, including smartphones, computers, iPads, tablets, and the internet, has advanced dramatically in India.
Smartphones and government initiatives like Digital India are acting as catalysts for the exponential growth in the use of digital payment as a result of the increase in internet users. In India, efforts are being made to switch to electronic payments.
A digital payment system is one that processes payments through digital channels and an electronic network. Every transaction involving digital payments is completed online. It is a speedy and useful way to pay. With the aim of promoting cashless transactions and turning the Indian economy into a digital one, a number of digital payment options are available, including banking cards, USSD, UPI, AEPS, mobile wallets, POS terminals, Micro- ATMs, the internet, mobile banking, and BHIM. Secondary data has been gathered for this conceptual study from a variety of research papers, journals, magazines, and websites.
Keywords: Provider of services, merchant accepting mobile payments, business model.

I. INTRODUCTION

Online or through other digital channels, digital payments are exchanges of money that don't involve a physical exchange of currency. This shows that electronic ways of exchanging money are used by both the payer and the payee.
The Indian government has been putting various initiatives into effect to encourage and promote digital payments. As part of the "Digital India" initiative, the government seeks to create a "digitally empowered" economy that is "Faceless, Paperless, Cashless." Several formats and methods are used for digital payments. Digital transactions can be completed online and in person. If you purchase anything from Amazon and pay using UPI, for example, that counts as a digital payment. A digital payment is also made if you make a purchase at your neighbourhood Kirana store and opt to use UPI rather than cash, similar to the preceding example. There is no single, widely accepted definition for digital payments even though they can be entirely, largely, or partially digital. An example of a partially digital payment is when the payer and payee both use cash through third-party agents, with the providers doing digital bank transfers on the backend. So, the term needs to be accurate when referring to a payment that is predominantly digital. One definition places emphasis on the payer-payee interface as the key element. Digital payments can be categorised in numerous ways, such as by payment type. These definitional choices become crucial when the aim is to estimate the amount or percentage of digital payments in a specific use case, organisation, firm, country, or region. Depending on how they are classified, digital payments are measured differently.

II. REVIEW OF LITERATURE

1) According to Ghosh and Gourab (2022), the development of information and communication technologies paved the ground for contemporary payment options. People's lives were made easier by the proliferation of cell phones and internet connectivity, which led to the beginning of digitalization. Along with enhancing trade and commerce, digitization also facilitated quick and easy financial transactions.
2) Kaur, Puneet, et al. (2022) investigate the sharp rise in the popularity of mobile wallet apps. Although it is effective for transactions and safety payments on behalf of the customer, mobile wallets are still not widely available in markets.

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3) S. Vasantha, K. Vinitha, and K. (2021) People's daily lives have changed as a result of the digital revolution. The ability to connect and make payments at any time, from anywhere thanks to the power of the internet and digital payments is crucial for achievinguser pleasure, which in turn encourages customer loyalty.

4) According to Pillai, Sruthy S., G. Sandhya, and G. Rajkumar (2020), even for minor transactional issues, more consumers prefer using non-cash options when cash shortages are at their peak. It demonstrates that simplicity and interoperability have a large positive influence on the adoption of mobile payments, whereas prompt interactions and security hurt the dependent variable. Consumers are more worried about security issues because they think their financial information is not secure when they conduct online transactions.

III. OBJECTIVES OF THE STUDY

1) To study the various types of digital payment systems.

2) To identify the opportunities and challenges of digital payment systems.

3) To offer suggestions to improve & identify the future of the digital payment system in India.

IV. TYPES OF DIGITAL PAYMENT SYSTEMS

Every internet transaction is monitored, managed, and under the jurisdiction of the Reserve Bank of India, the nation's central bank (RBI). The RBI later approved the creation of the National Payment Corporation of India (NPCI), a single-window organization for handling online retail payments. rupay, IMPS, USSD, UPI, Bharat QR code, BHIM, AEPS, and BBPS are the various digital payment methods managed by NPCI, whereas the various digital payment methods under the control of RBI are banking cards, internet banking, mobile banking, mobile wallets, point of sale terminals, banks prepaid cards, and prepaid instruments.

A. E- Payment Options in India

The Government of India's main initiative, the Digital India program, aims to make India into a knowledge-based society and economy. ―Faceless, Paperless, Cashless‖ is one of Digital India. A variety of digital payment methods are offered to encourage cashless transactions and make India a society that uses less cash.

- Unified Payments Interface (UPI) apps
- such as Paytm and Free charge;
- Debit/Credit Cards
- Online Financial Transfer
- Net Banking and Aadhar Cards are all examples of plastic money.

1) E-Wallets

You can store money for quick payments using digital instruments called mobile wallets. You can replenish your bank account by utilizing credit/debit cards or online banking. The majority of wallets are semi-closed, allowing you to send money to those with whom you share a wallet or use it to pay for goods and services at establishments that permit that particular payment method. App stores like Google Play also offer a wide variety of additional electronic wallets. Download any of them to easily make digital payments. Among these are Jio Money, Vodafone paisa, and Airtel Money. Even banks have launched their digital wallet applications, such as State bank buddy and Yes Pay.

Payments through E-Wallets

Requirements	Transaction Process	Limitation/Risk
1. Internet wallet with an account. For instance, some of the more well-known e-wallets include Pay money, Paytm, Pockets, Oxygen wallet, and Mobi Kwik.	1. Create an account with your mobile number after downloading the wallet app. Wallet account numbers are treated like mobile numbers.	1. Consumer Wallet Limits: Rs. 20,000 per person, per month. 1,000,000 per month with KYC
2. an Android device with a wallet app installed. Moreover, desktop PCs with bank wallet software are used.	2. Use a debit/credit card or net banking to add money.	2. Limitations for the merchant wallet are Rs. 50,000 per month with self-declaration. 1,000,000 per month with KYC
3. access to the internet.	3. To send money in advance to your digital wallet, connect your bank account.	3. Money can be moved to the wallet of the same business.
	4. Move money with a mobile number from one wallet to another.	

2) Unified Payments Interface (UPI)

The Unified Payments Interface (UPI), a payment system that permits quick fund transfers between two bank accounts on mobile platforms, is managed by the Central Bank of India on behalf of the National Payments Corporation of India (NPCI).

With the Unified Payment Interface, anyone with a bank account can send and receive money from their phone without having to enter their bank account information or net banking user id/password. This only requires the recipient's mobile number or Virtual Payment Address (VPA).

UPI, which has been added to the Immediate Payment Service (IMPS) platform, enables users to send money using one of the following: Virtual Payment Address (a special ID provided by the bank); Account Number + IFSC; Mobile Number + MMID (Mobile Money Identifier); Aadhaar Number; or Collect/Pull money based on Virtual ID. An MPIN (Mobile Banking Personal Identification number, which must be provided while authenticating a money transfer) is given to a banking customer after they register for UPI. The Google Play store and the Apple App Store now both feature UPI-compatible apps that are published by banks that accept UPI payments. To facilitate UPI transactions utilizing Aadhaar IDs, the National Payments Corporation of India has launched the BHIM and NUUP payment apps and services.

Payments through UPI (Unified Payment Interface)

Requirements	Transaction Process	Limitation/Risk
1. a checking account reserved for registration alone	1. For mobile banking, download the UPI app from the bank.	1. Rs. 100,000 is the maximum transaction amount.
2. any smartphone with internet connectivity over 3G, 4G, 5G, or wifi.	2. To register, make a virtual payment address (VPA), such as Julieebi@s Bi or Sujith@icici.	2. Both the sender and the recipient must have a VPA for fund transfers (Virtual Payment Address).
3. UPI apps for banks S (28 banks have enabled UPI)	3. To send money, you only need the payee's VPA.	3. You must have a smartphone.
	4. You will be asked to confirm the payment before it is finished after entering the amount and the payee's VPA.	
	5. You will be asked to confirm the payment before it is finished after entering the amount and the payee's VPA.	

3) Plastic Money

Plastic money refers to debit and credit cards that are used to make purchases and withdraw cash from ATMs. You are relieved of the burden of carrying cash if you have a debit or credit card. Due to the requirement of a PIN to complete transactions, the possibility of theft is also eliminated. There's no need for you to carry a lot of cash. Simply swipe to leave. Paying using a debit card requires a bank account. While paying with a debit card, the bank account is deducted. But, with a credit card, a postpaid monthly bill payment scheme is used.

Payments through Debit/ATM Cards

Requirements	Transaction Process	Limitation/Risk
1. Banks issue debit cards. For OTP (One Time Password) verification, use a mobile device or a card pin/password.	1. An ATM card with a PIN is issued by a bank.	1. An ATM card with a PIN is issued by a bank.
2. banking ATMs	2. used to withdraw cash from any ATM with a PIN code.	2. Card cloning poses a security risk.
3. At the retailer, use a swipe machine or POS (Point of Sale) device.	3. used for shopping at any POS. for online purchasing as well	
4. platform for online payments	4. Mobile users receive SMS notifications for every transaction.	

Payments through Credit Cards

Requirements	Transaction Process	Limitation/Risk
1. Banks issue credit cards. For OTP (One Time Password) verification, use a mobile device or a card pin/password.	1. Only qualified customers receive credit cards with a PIN from the bank.	1. Every card has a credit limit, beyond that, you cannot shop.
2. Swipe machine or POS (Point of Sale) machine at a merchant.	2. There is a credit limit for issued cards the, variety varies from person to person depending upon income.	2. Cash withdrawal is possible but at a huge interest rate.
3. Online payment portal	3. Used at any POS for shopping. also, for online shopping or transaction.	3. POS of the Swipe machine at a merchant is a must.
	4. Every month Bill is generated, and the total dares is to be paid before the due date, otherwise interest is charged.	4. Cloning of cards is a security threat.
	5. SMS notifications come in mobile for every transaction.	

4) Net Banking

Another method of conducting transactions online is through net banking. All you need is a bank account with an enabled e-banking feature. From the convenience of your house, you can transfer money to another person's account. You don't need to visit your bank to make transfers. You are responsible for any transfers and payments. Also, this is a highly practical method for going cashless in India.

Online Transaction through Net Banking

Requirements	Transaction Process	Limitation/Risk
1. Internet banking facility activation 2. Mobile or Laptop Internet access.	1. Add the payee's bank account first on your bank portal's fund transfer page.	1. Payee addiction takes time.
2. Mobile or Laptop Internet access.	2. The time required to add a payee varies from bank to bank.	2. For interbank transfers, there is a delay.
	3. The NEFT, RTGS, and IMPS modes are used for fund transfers.	

5) Aadhaar-Enabled Payment System

Use the Aadhaar Enabled Payment System to withdraw funds from a bank account. This method of receiving payment does not require a debit card or your signature. The Aadhar Enabled Payment System allows you to receive money without ever having to set foot inside a bank branch. Instead, it authenticates using Aadhaar data. This is another NPCI effort, like UPI and USSD.

Payments Using Aadhaar Card (Aadhar Enabled Payment System, AEPS)

Requirements	Transaction Process	Limitation/Risk
1. ID Card, Aadhaar	1. Visit a banking correspondent or Micro ATM.	1. Micro ATMs must be used.
2. Post (Micro ATM)	2. Identify your bank and Aadhaar.	2. A restriction on banks is known as the Net Debit Cap (NDC) which is the sum of all outgoing and incoming payments for the day.
	3. Choose the transaction to complete	
	4. Put your finger on the scanner.	
	5. when a transaction is successful, keep the printout.	
	6. The procedure is done	

B. Importance of Digital Payments

1) Accountability and transparency, as each transaction is documented.
2) The price of making coins and printing currency notes is moderated by digital transactions.
3) There is a record of all digital transactions, which leads to fraud and bureaucracy.
4) There is no risk of unexplained money or tax avoidance because cash is being placed in the banks. This results in proper taxation.
5) Since there is less access to hard currency, it has reduced the performance of illicit financial transactions.
6) By keeping track of spending, it is simple to determine how much was spent and where.

C. Merits of Digital payment

1) With only a click, convenient & hassle-free payments can be made.
2) You can send, receive, or pay money from anywhere at any time.
3) •By offering consumers discounts, rewards, and cash offers, digital payments entice users.
4) Bill-paying service for retailers in one place.
5) All digital transactions are supported by documentation and records.
6) Aids in maintaining control over dark money because every transaction is documented.
7) Less expensive and with lower transaction fees.
8) If utilized more carefully, low danger.

D. Demerits of Digital Payment

1) It becomes simple for hackers to trace our personal information from the bank server or mobile wallet that we are using, increasing the risk of data theft and decreasing reliability.
2) Why Challenging for a non-technical individual because the majority of digital payment methods rely on cards, the internet, and mobile devices. Without these tools, payments cannot be made.
3) As we do not carry tangible currency, we are unable to manage our expenditure, which results in overspending.

In India, the use of digital payments is growing steadily, and some new apps are constantly being released. It is a method of payment. as they become simple and safe The same is true of digital payments; they have two sides. Digital payments have numerous benefits, but they also have certain drawbacks. It is up to the user to make the most of the resources at their disposal without encountering any problems.

V. OPPORTUNITIES FOR DIGITAL PAYMENTS IN INDIA

The following are some of the main opportunities that support digital payment systems in India:

1) *Intensifying Internet Usage that Permeates:* The recent increase in internet usage is a result of telecom companies' low-cost data packages. Also, banks are enhancing their information and communication technology infrastructure to keep up with the competition and offer cutting-edge banking services at competitive rates that will improve consumer satisfaction.
2) *Motivating Customers:* The government suggested incentives and awards to entice consumers to use digital payment methods. By lowering transaction costs, the central bank is also promoting digital transactions. For using digital payments, customers receive cashback incentives, awards, and discounts, which encouraged and motivated them.
3) *Government Initiatives:* Programs like the Pradhan Mantri Jan Dhan Yojna and demonetization helped the economy grow by promoting financial inclusion. Even those who had never opened a bank account began doing so. All payments made to the government, including taxes (direct and indirect), tariffs, and even fines, are processed digitally.
4) *Rising Smart Phone Use:* Over the past few years, cell phones have taken on increasing importance in people's lives. People are more likely to utilize smartphones because they are now reasonably priced, particularly when it comes to mobile data services. People can make digital payments with the aid of cell phones and associated apps. Smartphones can be used to complete Near Field Communication (NFC) transactions, save debit/credit card information in mobile wallets, and process payments for online purchases as well as force QR codes. Mobile payment volume and value are both rapidly increasing. In addition to websites, even banks have built their applications to promote quick and easy transactions.
5) *Urbanization is Growing:* Which leads to an increase in digital transactions. Urban society's residents have high-income levels, and solid educational backgrounds, and they are pressured to use digital payments.

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6) *E-commerce Trends are Growing:* Adopt a Modern Lifestyle. These will all Nowadays, people enjoy shopping online. People are affected by aspects of online shopping such as the availability of products anytime, anywhere, ease of payment, variety of options, time and energy savings, and doorstep delivery.
7) *Technological Innovation in Indian Banking:* Using cutting-edge techniques, the banking industry is constantly seeking to expand and improve its services. Digital payments are expanding because more people are using online and mobile banking. People can transfer money from one account to another account at any branch or bank thanks to services like NEFT, RTGS, ECS, and IMPS. The banking industry benefits greatly from services being available 365 days a year.
8) *Limiting the Reach of Cash Payments:* Rules to Regulate High-Value Cash Payments A record of each transaction will be kept by the central bank, allowing for easier inspection of dealings. This is why the central bank has framed sh dealings specifically to favor digital transactions.
9) *Launch of More Digital Payment Solutions:* The Reserve Bank of India and the growth of FinTech businesses are being supported by the Indian government. To provide innovative digital payment solutions that will benefit both the sender (customer) and recipient, FinTech companies must be licensed, licensed, and governed (merchants). Today, feature phones can also be used to make digital payments in addition to smartphones.

VI. CHALLENGES OF DIGITAL PAYMENTS IN INDIA

The following are some of the main issues that prevent India's digital payment systems from being successful.

1) *Cash-Dependent Economy:* Most Indians rely on cash-based transactions due to their cash-based economy. People find conducting cash transactions to be safer and more convenient. because there is an unounorganizedonomy and more than 50% of people live in poverty. People in rural or remote areas of India are accustomed to and familiar with cash transactions. They lack current infrastructure and are unaware of digital mode. Some customers are hesitant to engage in digital transactions because of security and privacy concerns.
2) *Lack of Digital Literacy:* In India, the literacy rate is essentially low, and among those who are literate, digital literacy is rare. A cash-based economy cannot be transformed into a cashless one without digital literacy.
3) *Restricted Access to Banks and Cards:* Due to limited bank branch availability in some areas of the nation, most interior areas of India lack access to banks and cards, forcing residents to conduct all financial transactions in cash.
4) *Risks Involved Data Privacy and Online Fraud:* The main issue preventing digital transactions is cyber security. The adoption of digital payment methods is hampered by cybersecurity concerns. The leakage of sensitive data, including financial and personal information, is the main worry in a digital transaction. Internet Protocol rules on user privacy.
5) *Poor Internet Speed:* For the transfer of digital funds, international networking access and speed are crucial. Lack of reliable and trustworthy internet access is the main factor that slows down or halts the transaction.

VII. SUGGESTIONS

The following list includes some ideas for enhancing the services and increasing the use and adoption of digital payment systems:

1) Internet connectivity should be widely available, have sufficient bandwidth, and be reasonably priced.
2) To prevent fraud and increase security, the government should tighten cyber security legislation and improve information and communication technology.
3) Quick action is required to prevent hackers and online fraud.
4) The mobile network should be made accessible, even in rural and distant locations.
5) The government must foster trust and confidence in the minds of the populace by providing awareness initiatives relating to the use of digital media and apps.
6) It's important to have a basic understanding of digital transactions.
7) Individuals should be informed about advancements in modern technology so they can use digital methods to access their bank accounts.

VIII. FUTURE OF DIGITAL PAYMENT

The widespread acceptance of digital payments depends critically on technology. The ideal product must satisfy all of the customer's needs. The payment options must be easy, quick, effective, dependable, and secure. In contrast to the widely held idea that discounts and cash are the main drivers of the adoption of digital payment systems, prior research has shown that ease is the primary driver. Despite the tremendous activity in the past, the digital payment system in India is still in its infancy.

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A tremendous opportunity exists. The Google paper noted that future digital payment options "ought to combine the simplicity and universality of cash with the security and convenience afforded by digital payments."
Digital payments are expanding significantly in India. A simple path to follow for digital payments has been established by BC G Digital Transformation. Both the quantity and the quality of digital transactions will undoubtedly grow as a result.

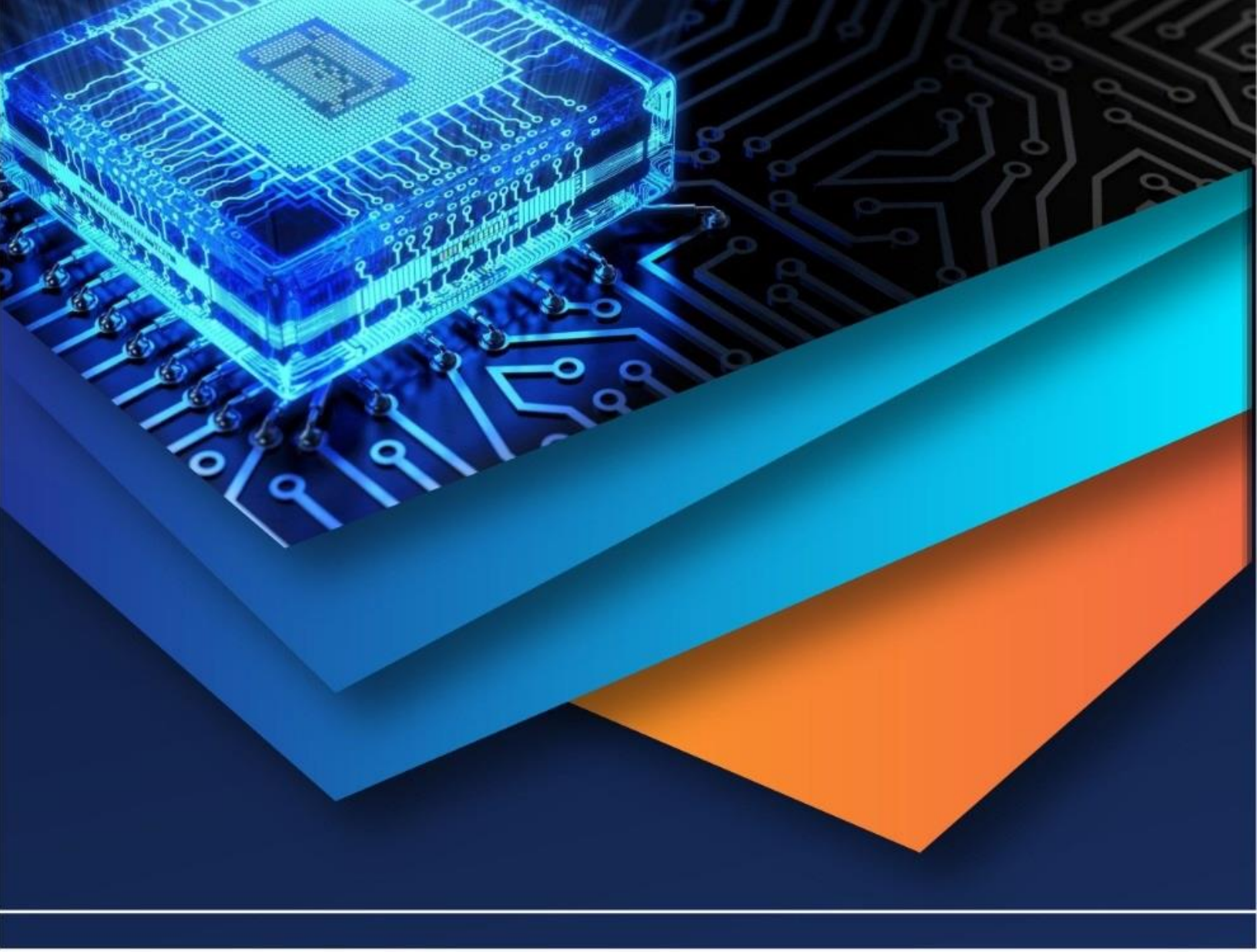
IX. CONCLUSION

India has undergone a remarkable change from traditional to convenient transactions in recent years as a result of innovation in information and communication technology and the digital landscape.
Due to its influencing aspects, such as flexibility, convenience, efficiency, effectiveness, user-friendliness, transparency, and overall customer happiness, digital payment systems are on the rise and showing good growth.
Digital payments are more convenient than cash payments. Having cash on hand is not always necessary. Digital payments can be made instantaneously with only one click. There is no issue with the balance when we can pay the precise amount online. By doing transactions digitally, we can monitor and protect a record of them.
Everyone enjoys comfort and simplicity. We can therefore draw the conclusion that digital payments will dominate the Indian payment environment and represent the future of financial transfers. The rapid expansion of the digital payment system was prompted by the. According to a report by Credit Suisse, "Digital payments in India will reach $1 trillion by 2023,"
In the foreseeable future, this will accelerate at a noticeable rate. Several digital payment organizations have been founded as a result of technological advancement to extend, improve, and enable safe digital payment transactions. In India, the future of digital payments seems promising.

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