AN EMPIRICAL ANALYSIS OF ELECTRONIC PAYMENT SYSTEM (EPS) AMONG BANKING CUSTOMERS IN KERALA

Thesis
Submitted to the University of Calicut
for the award of the degree of

Doctor of Philosophy in Commerce

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September 2023

Declaration

I, ABDURAHMAN.M, hereby declare that the thesis entitled **An Empirical Analysis of Electronic Payment System (EPS) among Banking Customers in Kerala** is the authentic record of research work carried out by me, for the award of the Degree of Doctor of Philosophy (Ph.D.) in Commerce under the guidance of Dr. Rajeev Thomas, Research Guide Department of Commerce, Mar Thoma College Chungathara, Kerala, and that no part thereof has previously formed the basis for the award of any degree or diploma or any other similar titles or recognition.

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Certificate

I certify that the thesis entitled **An Empirical Analysis of Electronic Payment System (EPS) among Banking Customers in Kerala** submitted for the Degree of Doctor of Philosophy (Ph.D.) in Commerce by Mr. ABDURAHMAN M. is the record of research work carried out by the candidate during the period from December 2017 to September 2023 under my guidance and supervision, and this work is original and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other titles in this University or any other University or institution of higher learning.

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(Research Guide)

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LIST OF ABBREVIATIONS

ACH	:	Alternative Checking Accounts
AEPS	:	Aadhaar-Enabled Payment System
ANOVA	:	Analysis of Variance
ATM	:	Automated Teller Machines
BBNL	:	Bharat Broadband Network
BBPOUs	:	Bharat Bill Payment Operating Units
BBPS	:	Bharat Bill Payment System
BIC	:	Bank Identifier Code
BPSS	:	Board for Regulation and Supervision of Payment and Settlement Systems
BSBD	:	Basic Savings Bank Accounts
CAGR	:	Compound Annual Growth Rate
CBDC	:	Central Bank Digital Currency
CBLO	:	Collateralised Borrowing and Lending Obligation
CCIL	:	Clearing Corporation of India Ltd
CCTNS	:	Crime and Criminal Tracking Network & Systems
CDD	:	Customer Due Diligence
CoD	:	Cash on Delivery
CoE-IT	:	Centre of Excellence for Internet of Things
CPMI	:	Committee on Payments and Market Infrastructure
CPS	:	Centralised Payment Systems
CSC	:	Common Services Centre
CTS	:	Cheque Truncation System
CUG	:	Closed User Group
CVV	:	Card Verification Value
DAMASCPC	:	Demand Assigned Multiple Access-Single Channels Per Carrier
DBT	:	Direct Benefit Transfer
DEA	:	Department of Economic Affairs
DISHA	:	Digital Saksharta Abhiyaan
DLCC	:	Digital Lending Capital Corp
DPI	:	The Digital Payments Index
DTC	:	Direct To Home
ECS	:	Electronic Clearing Service

EMV	:	Euro Pay, Mastercard, and Visa
EPR	:	Electronic Payments and Receipts
EPS	:	Electronic Payment Systems
EPSEM	:	Equal Probability Selection Method
GOI	:	Government of India
GPR	:	General Purpose Reloaded
IAMAI	:	Internet and Mobile Association of India
IBA	:	Indian Banks' Association
ICT	:	Information and Communication Technology
IDRBT	:	Institute for Development and Research in Banking Technology
IFSC	:	Indian Financial System
IMPS	:	Immediate Payment Service
INFINET	:	Indian Financial Network
IVRS	:	Interactive Voice Response System
KCC	:	Kisan Credit Cards
KYC	:	Know Your Customer
LEI	:	Legal Entity Identifier
MANOVA	:	Multivariate Analysis of Variance
MDR	:	Merchant Discount Rate
MeitY	:	Ministry of Electronics and Information Technology
MICR	:	Magnetic Ink Character Recognition
MMID	:	Mobile Money Identifier
MPIN	:	Mobile Banking Personal Identification Number
MoCA	:	Ministry of Consumer Affairs
mPOS	:	Mobile-Point-of-Sale
NACH	:	National Automated Clearing House
NASSCOM	:	National Association of Software and Services Companies
NCFE	:	National Centre for Financial Education
NCH	:	National Consumer Helpline
NCMC	:	National Common Mobility Card
NEFT	:	National Electronic Funds Transfer
NETCS	:	National Electronic Toll Collection System
NFC	:	Near Field Communications
NIPFP	:	National Institute of Public Finance and Policy
NITI	:	National Institution for Transforming India
NMFI	:	National Mission for Financial Inclusion

NPCI	:	National Payments Corporation of India
OGD	:	Open Government Data
OTP	:	One Time Password
PACS	:	Primary Agricultural Cooperative Societies
PIN	:	Personal Identification Number
PKI	:	Public Key Infrastructure
PMJDY	:	Pradhan Mantri Jan- Dhan Yojana
PMKVY	:	Pradhan Mantri Kaushal Vikas Yojana
POS	:	Point of Sale Terminal
PPI	:	Prepaid Payment Instruments
PRICE	:	People Research on India's Consumer Economy & Citizen Environment
PSPs	:	Payment Systems Providers
QR Code	:	Quick Response Code
RBI	:	Reserve Bank of India
RRB	:	Regional Rural Banks
RTGS	:	Real-Time Gross Settlement
SBI	:	State Bank of India
SBLC	:	Standby Letter of Credit
SIPs	:	Systematic Investment Plans
SLBC	:	State-Level Bankers' Committee
SMEs	:	Small and Medium-Sized Enterprises
SMS	:	Short Message Service
SPSS	:	Statistical Package for the Social Sciences
SRO	:	Self-Regulatory Organization
SSL	:	Secure Sockets Layer
SWIFT	:	Society for the Worldwide Interbank Financial Telecommunication
TAM	:	Technology Acceptance Model
TDM	:	Time-Division Multiplexing
TPDS	:	Targeted Public Distribution System
TRA	:	Theory of Reasoned Action
TRAI	:	Telecom Regulatory Authority of India
UIDAI	:	Unique Identification Authority of India
UPI	:	Unified Payments Interface
USSD	:	Unstructured Supplementary Service Data
UTAUT	:	Unified Theory of Acceptance and Use of Technology

UTS	:	Unreserved Ticketing System
VPA	:	Virtual Payment Address
WEF	:	World Economic Forum
WLAOs	:	White-Label ATM Operators
YONO	:	You Only Need One

CHAPTER 1

INTRODUCTION

CONTENT

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1.2 Statement of the Problem
1.3 Research Questions
1.4 Objectives of the Study
1.5 Significance of the Study
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1.1 Introduction

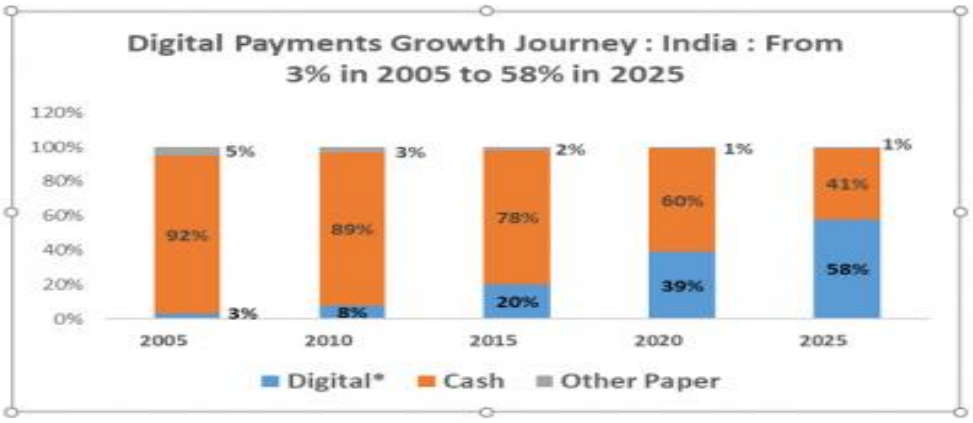
Digitisation has had a dramatic influence on a variety of aspects of our daily life, affecting how we communicate, work, study, enjoy ourselves, and connect with the world around us. The digitisation of the new century has brought in a variety of options in information and communication technologies, which have brought about a revolutionary change in the payment environment. With digitisation, the financial transaction scenario has shifted swiftly from traditional to convenient e-payment methods.

An Electronic Payment System (EPS) is a method of conducting transactions or paying for goods and services on an e-commerce website or in an electronic environment without using traditional cash or cheques. An Electronic Payment, also known as digital payment, is the transfer of funds between two payment accounts using an electronic device, such as a mobile phone, Point of Sale (POS) terminal, or computer and electronic channel communication, like mobile wireless data or Society for the Worldwide Interbank Financial Telecommunication (SWIFT).

Electronic Payments entail the transfer of funds through electronic mediums such as debit/credit cards, mobile wallets, internet banking, e-cash, e-cheque, quick response (QR) code payments, UPI payments, biometric payments, mobile banking, etc. (www.dbs.com).

Figure 1.1

Growth journey of India's Electronic Payments



Source: NASSCOM

The journey of India's Electronic Payments began in the early 2000s. As per National Association of Software and Services Companies (NASSCOM) data, it is reported that E-Payment Systems were recorded at only 3% in 2005, then it increased to 39% in 2020 and is expected to rise to 58% in 2025 out of the total payments in the country.

The Government of India (GOI) has taken a number of measures to promote and strengthen electronic payments in the nation. The GOI aspires to create a "digitally empowered" economy that is "Faceless, Paperless, and Cashless" as part of the "Digital India" Campaign. The Digital India Campaign was launched by the Prime Minister of India, Mr. Narendra Modi on 1st July 2015, with the objective of connecting rural areas to high-speed Internet networks and boosting digital literacy. It consists of three main components: the establishment of safe and stable digital infrastructure, the digital delivery of Government services, and universal digital literacy.

As of December 31, 2018, India has 1.3 billion people possessing 1.23 billion Aadhaar digital biometric identity cards, 1.21 billion mobile phones, 44.6 billion smartphones, 56 crores (560 million) internet users, up from 481 million users (35% of the population overall) in December 2017, and an increase of 51% in e-commerce (www.igi-global.com).

Electronic Payment Methods are often hassle-free, fast, and flexible, allowing for payments to be made anywhere and at any time. This is an age of cashless financial transactions (www.cashlessindia.gov.in).

India is renowned as the fastest-growing digital economy in the world. In India, the core banking system arose in the 1990s, and from 2005, the digitisation of the financial industry was promoted. The digitisation of the financial sector and payment ecosystem gained significance in India, particularly following the demonetisation of the 8th of November 2016. By seizing the circulation of ₹ 500 and ₹ 1000 currency notes, the Indian Prime Minister Mr. Narendra Damodardas

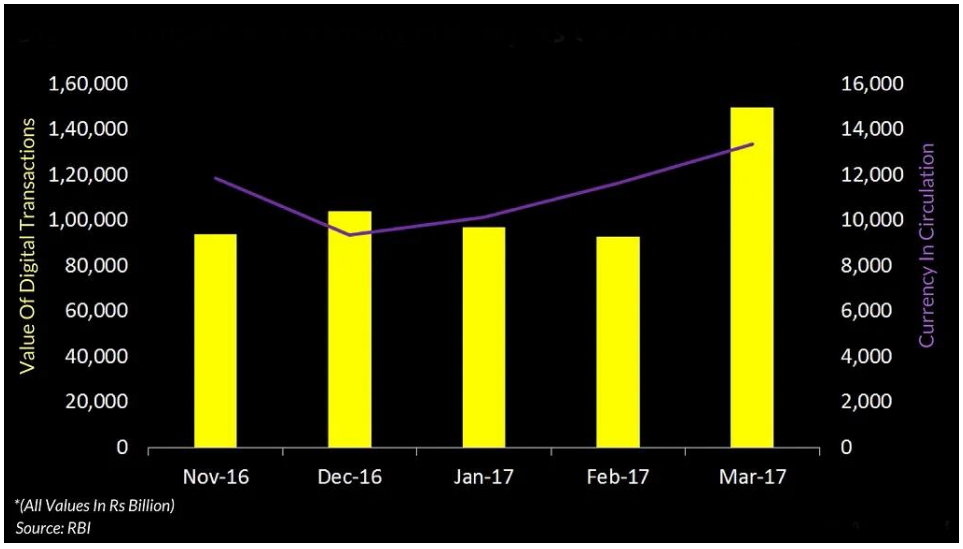
Modi fostered the concept of a cashless society. Demonetisation exerted significant pressure on people to embrace electronic commerce (www.rbi.org.in).

According to Dilip Asbe, Chief Operating Officer of the National Payments Corporation of India (NPCI), the cash crunch that followed the demonetisation of ₹ 500 and ₹ 1,000 notes on November 8, 2016, pushed up to six crore customers to Electronic Payment Systems. This was on top of nearly four crore users prior to the cash ban. After cash restrictions were relaxed, almost 2.5 crore additional customers continued to use Electronic Payment Methods.

According to NPCI data, the number of customers transacting online has increased by 60% after demonetisation. Despite the fact that the figures are not directly comparable, representative statistics released by the Reserve Bank of India (RBI) revealed that the value of Electronic Payment Systems increased by 33% in March 2017 compared to November 2016, when demonetisation was put into effect. The statistics also revealed that electronic payments increased in December 2016, decreased in the next two months, and then grew once again in March 2017, which is illustrated below.

Figure 1.2

Value of electronic transactions and currency in circulation



Source: RBI (2017)

In the modern day, customers want new and simple transactions in addition to safe transfers. The development of digital technology has simplified payment systems. There are various consumer-accessible payment systems that allow rapid and safe transactions. Electronic Payments can be made simply by clicking a button, touching a screen, swiping a card, tapping a point-of-sale machine, or scanning a Quick Response (QR) Code, and the transactions are completed with the appropriate authentication.

This generation will be increasingly reliant on innovative, automated, faster, and more efficient technology and services. Consequently, demand for Electronic Payment Systems will increase significantly in the following years. The digitisation of payments was a significant step toward achieving a simple, convenient, quick, and secure e-payment method. In the last four to five years, Electronic Payment Systems have undergone significant modifications, and we can expect even more changes in the immediate future. According to RBI data, electronic payments increased by 30.19 percent, showing the acceptance and expansion of cashless transactions in the nation by March 2021. As per the recently formed Digital Payments Index (RBI-DPI), the index grew to 270.59 at the end of March 2021, up from 207.84 as of March 2020 (www.rbi.org.in).

Initially, bank accounts were identified by random combinations of unique numbers included on the cards. However, EMV (Euro pay, MasterCard, and Visa) technology progressively gained traction and exposed users to a more automated and secure payment system.

Several companies around the country have begun accepting online payments, and others are prepared to do so. Numerous gadgets, including point-of-sale terminals, QR-based payment methods, mobile wallets, Electronic Money Institution Cards (EMI Cards), Unified Payment Interface (UPI), internet banking, mobile banking, and many such types of payment methods, are aiding in the shift to a digital economy. Electronic Payment Methods, notably Point of sale terminals (POS), make it simpler for merchants and establishments to conduct transactions, generate data, and keep track of accounts (www.mckinsey.com).

Consumers find it convenient to pay electronically for a variety of services, including restaurants, hotels, travel, home delivery of goods, etc. Online retailers

who allow e-payments are preferred by customers over those who do not. The extraordinary scenario caused by Coronavirus has once again pushed electronic payments to the front stage. People throughout the world, not just in India, increasingly prefer electronic payments over cash transactions. Recent advances in financial technology have led to the creation of several digital tools and gadgets that make payment secure and convenient (www.paymentscardsandmobile.com).

The change in payment preference over the last decade is shown by the fact that the volume of paper clearance, which accounted for 60% of all retail payments in fiscal year (FY) 2010-11, decreased to 3% in fiscal year (FY) 2019-20. This remarkable change in payment preferences is a result of the development of sophisticated Electronic Payment Systems, such as Real-Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT), and Electronic Clearing Service (ECS), which have made real-time or near-real-time financial transfers possible. This decade has also witnessed the introduction of innovative payment systems that provide instant credit to the beneficiary, with the launch of fast payment systems such as Immediate Payment Service(IMPS) and UPI that are available to consumers 24*7 for conducting fund transfers, and the introduction of mobile-based payment systems such as Bharat Bill Payment System (BBPS), PPIs to facilitate payment of bills and purchase of goods and services, and National Electronic Toll Collection System (NETCS) (www.rbi.org.in).

The simplicity of these payment methods facilitated their quick adoption since they offered customers an alternative to paying with cash and paper. The inclusion of non-bank FinTech enterprises as Prepaid Payment Instruments (PPI) issuers, Bharat Bill Payment Operating Units (BBPOUs), and third-party application providers on the UPI platform has accelerated the uptake of electronic payments in the nation. During the 2019-20 fiscal year, Electronic Payment Systems reached a volume share of 61% and a value share of 75% of the retail payment market (www.rbi.org.in).

Increased mobile and internet access in the nation has led to a considerable shift toward mobile/internet-based payment methods for the purchase of products and services. The nationwide usage of mobile-based payments has been further helped by the deployment of lightweight acceptance infrastructure (QR codes).

Mobile-point-of-sale (mPOS) is a breakthrough technology since it liberates retailers from storefronts and in-store payments. It enables them to travel to numerous locations, such as concerts, trade exhibitions, food trucks, and others, where they may receive payments from clients without difficulty. In addition, mPOS technology makes a significant impact on the payment process of a business by replacing central checkout areas with sales employees equipped with mPOS devices, therefore making it more efficient and adaptable. Statistics indicate that mobile point-of-sale terminals will be the dominant Electronic Payment technology in the near future. According to Global Market Insights, mPOS will have an approximate Compound Annual Growth Rate (CAGR) of 19% between 2020 and 2026.

India's e-payment transactions in 2022 amounted to $ 1.5 trillion annnualised basis which is more than the combined economies of the US, UK, Germany, and France (Source: Union Minister Ashwini Vaishnaw - World Economic Forum (WEF) 2023 data).

This research investigates the different kinds of Electronic Payment Systems available in India and examines the elements that influence customers' perceptions of Electronic Payment Systems and the degree of satisfaction of banking customers about the use of EPS. It is evident that the Electronic Payment System will thrive in the future, and with good reason, given the current drive for a cashless economy by consumers, companies, and the Government.

Government Guidelines for Electronic Payment & Receipts for Cashless Services

The Government of India's Ministry of Electronics and Information Technology (MeitY) envisages Paperless, Cashless, and Faceless services across the nation, particularly in rural and remote areas. MeitY envisions a standard e-governance infrastructure that will provide an end-to-end transactional experience for citizens, enterprises, and internal Government operations, including accessing different services and making electronic payments and receipts.

The Apex Committee on Digital India has suggested a focused and time-bound strategy for introducing electronic payments for people across all Government e-services. In light of this, MeitY has issued guidelines for Electronic

Payments and Receipts (EPR) to Central Public Sector Undertakings, State Governments, GOI Autonomous Bodies, and Municipalities to rapidly adopt a suitable structure to facilitate Electronic Payments and Receipts. The purpose of this guideline is to provide departments with guidance to:

- Evaluate different services involving receipts and payments by service type and degree of Electronic Payment enablement.
- Provide directives for the general use of Electronic Payment modalities for each kind of service through multiple payment channels.
- Provide recommendations on collaboration with different payment service providers.

Guidelines for Electronic Payments and Receipts (EPR) shall be implemented via an evaluation of the department's overall state of services supplied and the maintenance of a repository of departmental services. This repository will be used to measure and monitor the extent of the adoption of electronic payments throughout India's ministries. In addition, information about departments seeking payment integration will be shared with Government and commercial sector Payment Systems Providers (PSPs) to allow Electronic Payment modalities and channels.

1.2 Statement of the problem

With the introduction of cashless payments, the payment experience has been completely transformed. Numerous anticipated and unanticipated developments, including the digital India campaign in 2015, demonetisation in 2016, the introduction of new EPS methods like UPI Apps in 2016, and the Covid-19 outbreak, have expedited the use of Electronic Payment Methods in the economy. Even though there are numerous factors that are ready to adopt EPS options widely, the statistics show that all citizens are not using EPS methods for all their payments. As per the National Association of Software and Service Companies (NASSCOM) 2021 data, it is reported that e-payments were recorded only 39% in 2020 out of the total payments in the country.

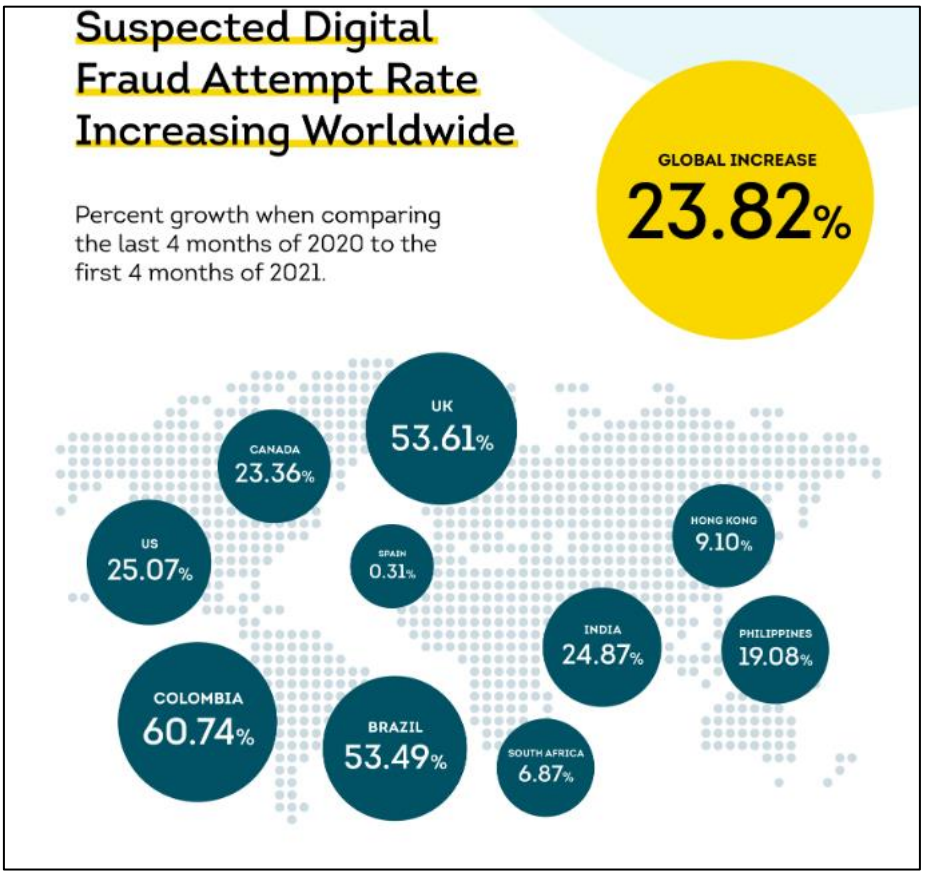
As Kerala banking customers have a traditional attitude, they will not switch payment methods until the Electronic Payment System becomes safer and more

reliable for financial transactions. Customers, company owners, farmers, and even educated Government employees do not adopt E-Payments for their transactions due to a number of factors. Security difficulties, a lack of direct engagement between parties, trust issues, privacy concerns, an insufficient regulatory framework, language difficulty, etc., are the primary obstacles preventing the people of Kerala from engaging in EPS transactions.

One of the primary causes of worry among consumers is the security risks associated with cashless electronic transactions. According to the American Consumer Credit Reporting Agency TransUnion Reporting Organization, suspected digital fraud attempts across industries from India increased by 24.87% when comparing the last four months of 2020 to the first four months of 2021 (www.transunion.in).

Figure 1.3

Suspected Digital Fraud Attempt Rate



Source: www.transunion.in

The literature review analysis also indicated that, to date, no in-depth examination of EPS usage in Kerala has so far attempted to understand the factors which make it difficult for Keralites in this regard. Therefore, the researcher is attempting to analyse the perception and degree of satisfaction of the respondents, and the strategies to be considered for enhancing the utilisation of e-payment methods in Kerala.

1.3 Research questions

- Whether the customers aware of the latest Electronic Payment technologies?
- What are the motivational factors influencing them to use Electronic Payment Systems?
- How the banking customers are satisfied with various Electronic Payment Methods?
- What are the problems associated with the use of Electronic Payment Systems?
- How the Government schemes and policies are helpful for promoting the use of Electronic Payment Systems?
- What committees have been formed to promote EPS?
- What can be done in order to improve the usage of Cashless Electronic Payments?

1.4 Objectives of the study

1. To examine the **awareness and usage** of the Electronic Payment System.
2. To identify the **factors** that could motivate the use of the Electronic Payment System.
3. To study the **satisfaction level** of banking customers towards the usage of the EPS.

4. To analyse the **problems** associated with the use of the Electronic Payment System.

5. To assess the **schemes, and policies** of Govt. for promoting the EPS.

1.5 Significance of the study

The effect of ICT on e-payment users in their day-to-day lives has resulted in a dramatic shift in their way of life due to their adoption of the most advanced and rapid payment method for their daily transactions. Indian citizens started to use EPS methods at the beginning of 2020 and its relevance is magnificently increased recently.

India's electronic payments journey began in the early 2000s. As per NASSCOM 2021 data, it is reported that EPS was recorded at only 3% in 2005, then it increased to 39% in 2020 and is expected to rise to 58% in 2025 out of the total payments in the country. While analysing RBI annual reports, it is also found that India's total e-payments in value increased by 350% in 2022 when compared to 2011.

After demonetisation in 2016, customers adopted electronic mode as an alternative to cash mode for doing their financial transactions. Gradually, customers adapted to EPS due to their convenience and advantages, such as pervasiveness, time savings, seamlessness, and rapid transfer of funds. It may also provide multilingual online payment systems, such as mobile applications in regional languages, to facilitate transactions.

E-payments are much quicker than conventional payment methods such as cash or cheques, and there are no time or geographical restrictions. It facilitates payments at any time and from anywhere in the world. EPS has removed the need to make payments at a bank. No longer must clients spend time waiting in huge queues at banks.

Now mobile phones and the internet have reached every part of India, both urban and rural areas are becoming more familiar with EPS usage. The top five

states in India in terms of internet users per 100 people (Internet Density) are Delhi (186), Kerala (87), Punjab (86), Himachal Pradesh (86), and Maharashtra (79). As many as 87 of every 100 individuals in Kerala have an internet connection. This is against the national average of 60 out of 100 (TRAI 2022).

Kerala has the greatest rate of internet penetration in rural areas. While most other states see an increase in the number of internet connections in urban areas, it is just the opposite in Kerala. Kerala has 149 internet connections per 100 people in rural areas, which is higher than the national average (37 per 100 persons). Kerala has 64 internet connections per 100 people in urban areas, which is lower than the national average (103 per 100 persons).

Individuals have begun avoiding human contact during the COVID-19 pandemic to prevent contracting the coronavirus (TRAI). This has also raised the need for contactless payments. Therefore, the study about EPS usage is very significant & therefore the researcher is made an attempt to analyse the customer satisfaction level, problems faced, and practical solutions to promote EPS usage in Kerala.

1.6 Scope of the study

- This study primarily focuses on the present status of the Electronic Payment System in India, particularly in Kerala.
- The demographic variables affecting the banking customers such as age, gender, monthly income, educational qualification, and employment status are analysed to find any influencing relationship with EPS usage.
- It covers the level of awareness and usage of the EPS among banking customers in Kerala along with the factors influencing them towards EPS usage.
- It also attempts to review the impact of demonetisation & Covid 19 pandemic on EPS usage.
- The research intends to examine various committee recommendations and the schemes and policies of both central and state Governments for promoting the EPS.

- The review of the satisfaction level of banking customers towards EPS usage and the issues encountered by them while using Electronic Payment Methods in Kerala also comes under the purview of the present study.

1.7 Theoretical foundation of the study

1.7.1 Models and theories on innovation in technology adoption

The factors that influence people to adopt innovation in technology-based systems and services are explored by many researchers and models have been formulated by them. Some of the fundamental and most predominant theories and models of innovation adoption are explained in this part. Theories dealt with in this study are - Diffusion of Innovation Theory (DIT), Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Decomposed Theory of Planned Behaviour (DTPB), Technology Acceptance Model (TAM), Unified Theory of Technology Acceptance and Usage Theory (UTAUT). These theories and models are explained below.

1.7.1.1 Diffusion of Innovation Theory (DIT)

In 1962, Everett Rogers developed the diffusion of innovation theory and fine-tuned and expanded this theory in the year 2003. Rogers found that there are 4 major elements that influence the transmission of new innovations or ideas such as the innovation itself, the communication channel, time, and the social system.

1.7.1.2 Theory of Reasoned Action (TRA)

In 1975, Martin Fishbein and Icek Ajen developed the theory of reasoned action. This theory elucidates the relationship between a person's attitude, subjective norms, and behaviour within their actions. The TRA proposed that individuals' behavioural intention depends on the individuals' attitude about the behaviour.

1.7.1.3 Theory of Planned Behaviour (TPB)

In 1985, the theory of planned behaviour was developed by Icek Ajzen and it has been further elaborated in 1991. This is an extension of the theory of reasoned

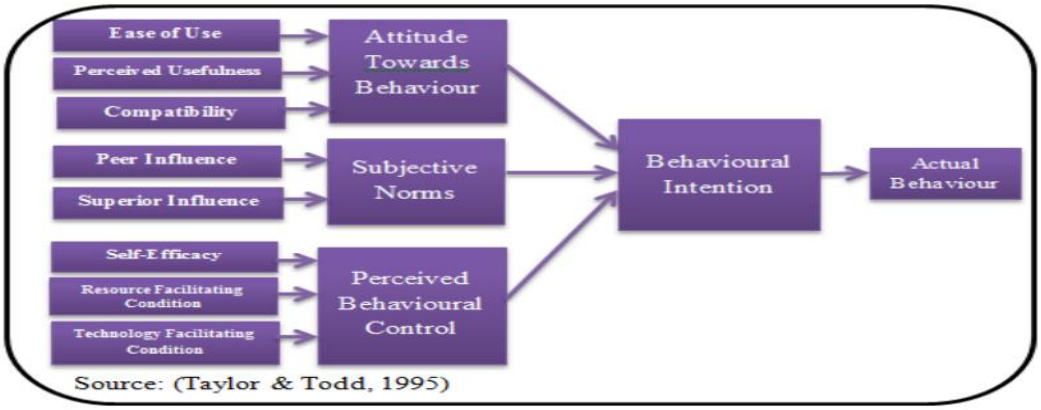
action which has included an element of perceived behavioural control to improve the predictive power of the theory. This theory elucidates that the elements like attitude towards behaviour, subjective norms, and perceived behavioural control jointly influence the persons' behavioural intention and actual behaviour.

1.7.1.4 Decomposed Theory of Planned Behaviour (DTPB)

In 1995, Shirley Taylor and Peter Todd established the decomposed theory of planned behaviour. The researchers indicated that a better understanding of belief and intention needs a breakdown of the attitudinal belief. It has been proved that the Decomposed Theory of Planned Behaviour provides more clarity and has ameliorated and enhanced the explanatory power when compared to the earlier models of pure Theory of Planned Behaviour and Theory of Reasoned Action. This theory with the help of multidimensional constructs; decomposes the attitude, normative, and control beliefs. Modifications in the construct helped to well-define the model with better diagnostic value and intensify the ability to illuminate the actual behaviour.

Figure 1.4

Decomposed Theory of Planned Behaviour Model



1.7.1.5 Technology Acceptance Model (TAM)

In 1989, the Technology Acceptance Model was first formulated by Fred Davis. This theory is an extension to the earlier models of Diffusion of Innovation Theory (DIT), Theory of Reasoned Action (TRA), and Theory of Planned Behaviour (TPB). In all the previous models the consumers' intention to adopt the new technology was portrayed. TAM is an information system theory that shows how consumers behave and accept technology. This Technology Acceptance Model portrays the various factors that influence consumers when a new technology is given to them. Perceived usefulness, perceived ease of use, self-efficacy, job relevance, output quality, image, result demonstration, external variables, etc., are the various factors that influence consumers to accept and adopt new innovations in technology. This Technology Acceptance Model (TAM) was first constituted in 1989 and since then there has been continuous improvement. Expansions and upgradations were made by the researchers.

- ♣ TAM-1 was developed by Fred D. Davis and then the same was proved again with little modification by Fred D.Davis, Richard P.Bagozzi and Paul R.Warshaw in the year 1989.
- ♣ TAM-2 was advanced by Viswanath Venkatesh and Fred D. Davis in the year 2000.
- ♣ TAM-3 was evolved by Viswanath Venkatesh and Hillol Bala in the year 2008.

Figure 1.5

Technology Acceptance Model-1

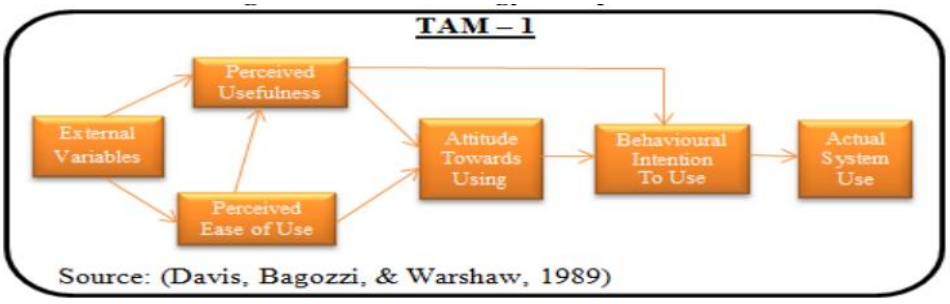


Figure 1.6

Technology Acceptance Model-2

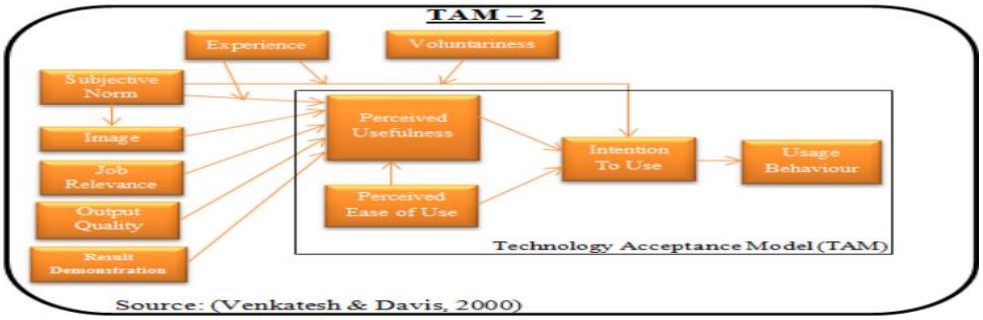
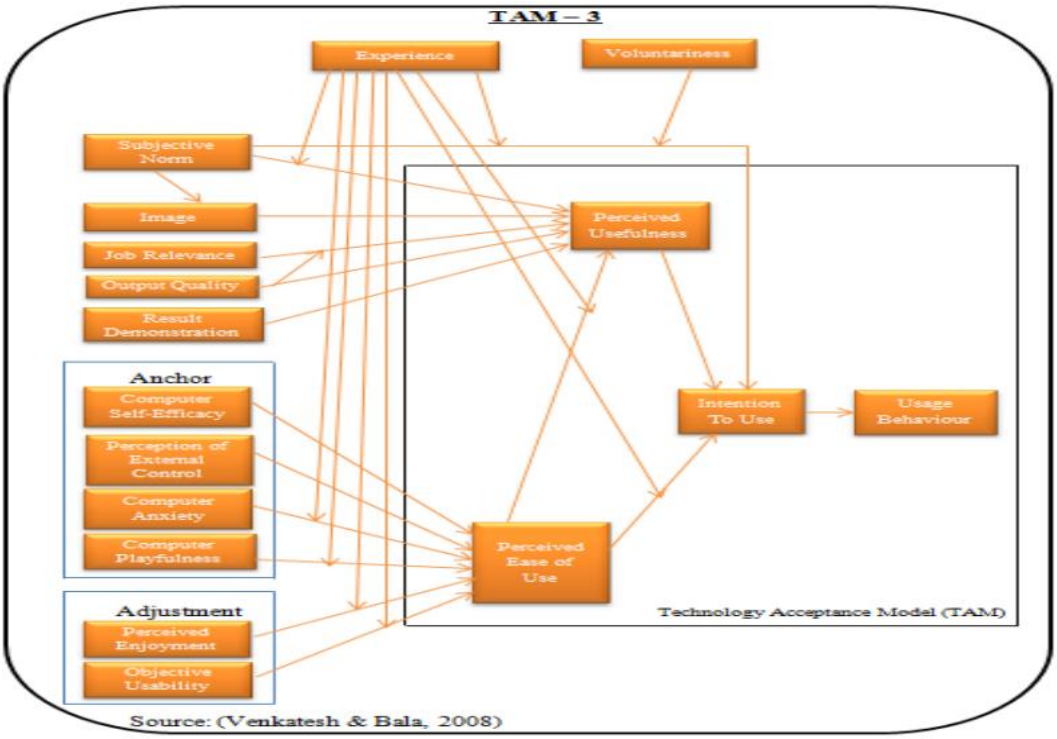


Figure 1.7

Technology Acceptance Model-3



1.7.1.6 Unified Theory of Technology Acceptance and Usage Theory (UTAUT)

In 2003, the Unified Theory of Technology Acceptance and Usage Theory was articulated by Viswanath Venkatesh and other researchers. This model focused on the intention of users to adopt the information system and its acceptance. This theory was developed to explain the usage behaviour of consumers for an information system by assessing and merging the constructs from the previous 8

models such as the Theory of Reasoned Action, Technology Acceptance Model, Motivational Model, Theory of Planned Behaviour, Combined Theory of Planned Behaviour and Technology Acceptance Model, Model of Personal Computer Use, Diffusion of Innovation Theory and Social Cognitive Theory. The four main elements that influence the behaviour of consumers to adopt the information system are performance expectancy, effort expectancy, social influence, and facilitation conditions. The subsequent improvements in the model included the elements such as hedonic motivation, price value, and habit. These elements were moderated by the variables such as gender, age, experience, voluntariness of use, and personal innovations. This model was framed to highlight the most influencing factor influencing the consumers to adopt and accept the usage of modern technology.

- ♣ UTAUT-1 was developed by Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis and Fred D. Davis in the year 2003.
- ♣ UTAUT-2 was advanced by Viswanath Venkatesh, James Y. L. Thong, and Xin Xu in the year 2012.
- ♣ UTAUT-3 was evolved by Muhammad Shoaib Farooq, Maimoona Salam, Norizan Jaafar, Alain Fayolle, Kartinah Ayupp, Mirjana Radovic-Markovic, and Ali Sajidin the year 2017.

Figure 1.8

Unified Theory of Technology Acceptance and Usage Theory Model-1

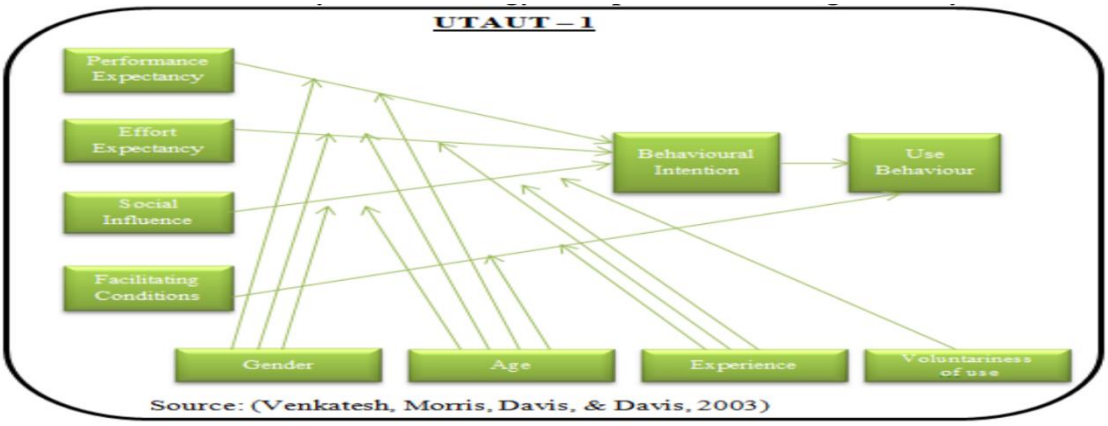


Figure 1.9

Unified Theory of Technology Acceptance and Usage Theory Model-2

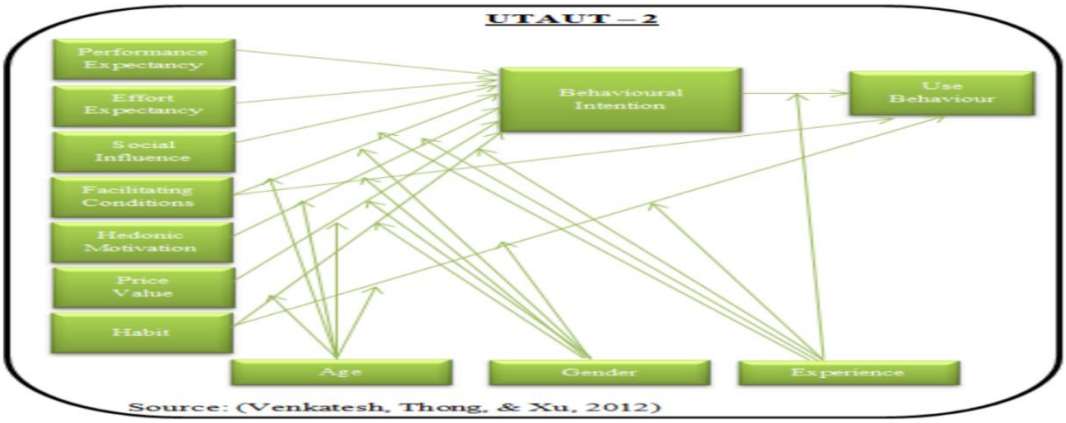
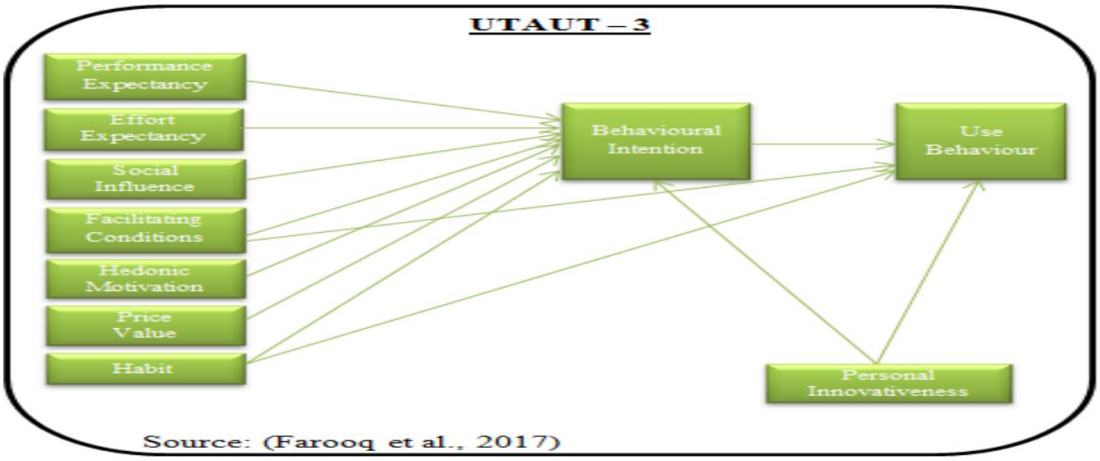


Figure 1.10

Unified Theory of Technology Acceptance and Usage Theory Model-3



Based on the above-mentioned theories of technology innovation adoption, earlier researchers have tested the acceptance, attitude, behavioural intention, and usage behaviour of consumers. These are the factors influencing the adoption of a particular technological innovation by the sample of respondents selected by the researchers in their area of study. All these studies have been formulated and developed by researchers in developed countries like the United States of America, the United Kingdom, Australia, Canada, Germany, Singapore, Denmark, France, Japan, the Netherlands, etc. This is because of the reason that technological advancements are usually invented primarily in these developed nations, so the

citizens of these countries adopt the innovations rapidly. Hence, this study also focused on the various factors that are primarily affecting the customer's awareness and satisfaction with the Electronic Payment Systems in Kerala.

1.7.2 Conceptual model of the present study

The present study considered and integrated factors mainly from modified TAM and UTAUT models to identify the critical factors that influence the adoption of the e-payment system. The important factors identified for the study are as follows:

1. **Ease of use:** It is defined as the degree to which an individual believes that using a particular system would be free from physical and mental effort.

2. **Usefulness:** It is defined as the degree to which a person believes that using a particular technology will enhance his or her job performance.

3. **Social influence**: It is the process by which a customer's attitudes, beliefs, or behaviour are modified by the presence or action of others. Customers have a tendency to change their behaviour according to those around them.

4. **Security:** It is defined as the degree to which a user believes that using a specific online payment channel will be safe.

5. **Trust:** It is defined as the degree to which a customer believes that e-payment transactions will be processed in accordance with their expectations. It occurs when one party has confidence in an exchange partner's reliability and integrity.

6. **Attitude:** It is defined as the positive or negative emotions and feelings of an individual about their behaviour when adopting new technology.

7. **Intention to use:** It is the likelihood of a customer using the same product or services again based on their past experience. It can also be the need for a product or service which is driving the customer towards a use.

8. **User-friendliness:** It is the degree to which something that is easy to learn, use, understand, or deal with.

9. **Supporting system:** Refers to a network of people who provide an individual with practical support.

10. **Time-saving:** It is the degree of reducing the amount of time needed for doing something.

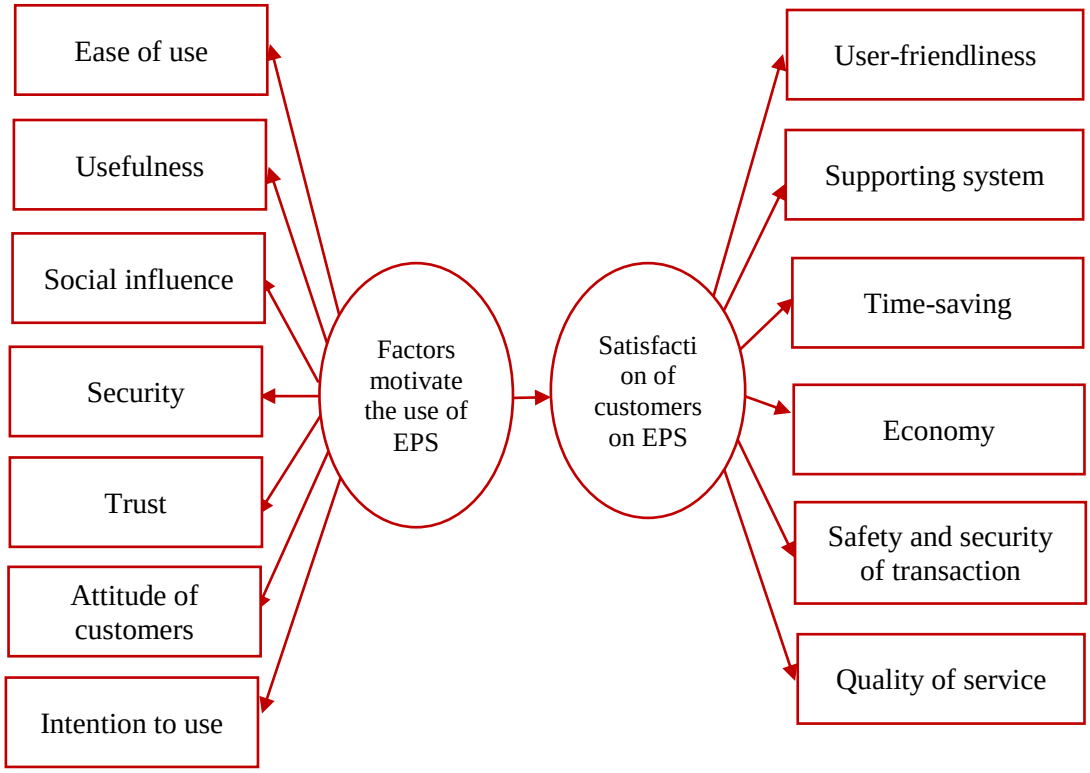
11. **Economy**: The degree of the minimum amount of money, time, and related resources needed to achieve something.

12. **Safety and security of transactions:** The degree of safety of confidential information when multiple entities communicate to complete a transaction.

13. **Quality of service:** It refers to the capability of a network or a system to provide different levels of service to different types of traffic, applications, or users.

Figure 1.11

Conceptual model of the present study



Source: Primary data

1.8 Operational definitions

Customer: The term 'customer of a bank' has not been defined in the **Banking Regulation Act**, **1949**, or any other Act. By the term, it is generally understood or means an account holder of a bank. But this general understanding of the term has been qualified by banking experts and judgments of law courts.

A **customer** is one, who has an account with a banker or for whom a banker habitually undertakes to act as bank. A single transaction is sufficient to constitute a customer. Therefore, to constitute a customer, the following two conditions are to be satisfied, he must open an account with the Bank to have a dealing with the Bank, and the nature of such dealing must be a form of a banking transaction (Dr. Hart**)**.

Electronic Payment: When money is exchanged digitally, it is called an electronic payment, digital payment, or cashless payment. Both the sender and the recipient of an Electronic Payment conduct the transaction electronically. It's also known as "online payment" or "e-payment." In electronic transactions, no physical currency is exchanged. All Electronic Payment transactions take place entirely online (www.quickbooks.intuit.com).

Electronic Payment Systems (EPS): Electronic Payment Systems enable customers to pay electronically for products and services. This is done without using cheques or cash (www.lawinsider.com).

Unified Payments Interface (UPI): A smartphone application that allows users to transfer money across bank accounts is known as a Unified Payments Interface (UPI). The National Payments Corporation of India (NPCI) created this single-window mobile payment system. Every time a customer starts a transaction, there is no longer a need to enter sensitive information like bank account numbers (www.investopedia.com).

Credit Card: A credit card is a thin, rectangular piece of plastic issued by a financial institution that allows cardholders to borrow money to pay for goods and services. Credit cards put the obligation on cardholders to repay the borrowed funds plus interest and any other agreed-upon fees (www.cashlessindia.gov.in).

Debit Card: A debit card is a payment card that deducts funds directly from a customer's checking account in order to make a transaction. Debit cards reduce the need to carry cash or paper cheques when making direct transactions from savings accounts (www.cashlessindia.gov.in).

Point-of-Sale (POS): A Point-of-Sale (POS) transaction occurs between a merchant and a customer when a product or service is bought; a point-of-sale system is often used to complete the transaction (www.cashlessindia.gov.in).

ATM: An Automated Teller Machine (ATM) is an electronic banking outlet that enables customers to do simple transactions without the assistance of teller or branch personnel. Most ATMs are accessible to anybody with a credit or debit card. However, some credit cards may have greater difficulty. ATMs are handy because they enable users to do rapid, self-service financial transactions, such as deposits and withdrawals (www.investopedia.com).

Mobile Banking: Mobile banking refers to systems that enable clients of a financial institution to complete a variety of financial transactions using a mobile device such as a mobile phone or tablet. Mobile banking is distinct from mobile payments, which include paying for products and services using a mobile device (www.cashlessindia.gov.in).

Internet Banking: Internet banking enables users to execute financial transactions online. Internet banking is often referred to as web banking and online banking. Internet banking provides users with almost every function formerly offered at a local branch, such as financial transfers and online bill paying. Virtually every financial institution offers online banking, accessible through desktop versions and smartphone applications (www.cashlessindia.gov.in).

IMPS (Immediate Payment Service): Immediate Payment Service (IMPS) is an interbank electronic immediate mobile money transfer service using mobile phones. Our IMPS service allows customers to rapidly access their bank accounts and transfer cash. When a fund transfer request is submitted using their mobile phone or Internet banking, the beneficiary's account is credited promptly. This service is

accessible 24 hours a day, seven days a week, including Sundays and holidays (www.cashlessindia.gov.in).

NEFT (National Electronic Funds Transfer): National Electronic Funds Transfer (NEFT) is an internet mechanism for transferring payments between financial institutions, often banks, inside India. The least amount that may be transferred by NEFT is 1 rupee, while the highest is 2 lakh rupees (www.cashlessindia.gov.in).

RTGS (Real Time Gross Settlement): RTGS is a mechanism for transferring funds from one bank to another in "real-time" and on a gross basis. When utilising a banking method, RTGS is the quickest way to transfer funds. Real-time signifies that the payment transaction is not susceptible to a delay. The least amount transferable by RTGS is 2 lakhs, while the highest is 10 lakhs (www.cashlessindia. gov.in).

ECS (Electronic Clearing System): The RBI established ECS to facilitate the movement of large sums of money from one bank account to another. This feature allows loan providers to automatically deduct loan EMIs from the borrower's bank account on a predetermined date (www.cashlessindia.gov.in).

AEPS (Aadhaar Enabled Payment System): AEPS is one of the most effective cashless payment techniques. AEPS parallels Micro ATM. For the transaction, a smartphone and fingerprint scanner are used. In order to use this service, the Aadhaar card must be linked to the user's bank account. AEPS enables the customer to do transactions such as Aadhar-to-Aadhar cash transfers, cash withdrawals, cash deposits, etc. The RBI has neither a minimum nor a maximum limit. However banks are allowed to establish their own restrictions (www.cashlessindia.gov.in).

USSD (Unstructured Supplementary Service Data): Customers without a smartphone or internet access may utilise the USSD cashless option. USSD is a service for mobile banking. They may call *99# from any mobile phone to utilise this service. They can accomplish anything that a person with a smartphone and an internet connection can do (www.cashlessindia.gov.in).

Digitalisation: Digitalisation is the use of digital technology to transform a company model and create new revenue and value-generating possibilities; it is the transition to a digital business (www.gartner.com).

1.9 Hypotheses of the study

Objective 1: Awareness, usage and purpose of using EPS

H_0 1: There is no significant association between the region of the customers and other socio-economic variables such as local body, educational qualification, and employment status.

H_0 2: There is no significant difference in the usage of EPS before and after demonetisation.

H_0 3: There is no significant difference in the usage of EPS before and during COVID-19.

H_0 4: There is no significant difference in the money transacted through Electronic Payment Methods based on educational qualification.

H_0 5: There is no significant difference in the money transacted through traditional cash payment based on educational qualification.

H_0 6: There is no significant difference in the experience of the use of electronic modes for payments based on educational qualification.

H_0 7: There is no significant difference in the money transacted through Electronic Payment Methods based on local body.

H_0 8: There is no significant difference in the money transacted through traditional cash payment based on local body.

H_0 9: There is no significant difference in the experience of the use of electronic modes for payments based on local body.

$H_0$10: Employment status and Plastic card used for Electronic Payment System are independent.

H_0 11: There is no significant association between employment status and mode of using EPS.

H_0 12: There is no significant relationship between employment status and devices used for EPS.

$H_0$13: Local bodies and plastic cards used for EPS are independent.

H_0 14: There is no significant association between the local body and the mode of using EPS.

H_0 15: There is no significant relationship between the local body and devices used for EPS.

$H_0$16: There is no significant difference in the usage of EPS before demonetisation and after demonetisation based on gender, employment status, and local body.

H_0 17: There is no significant difference in the usage of EPS before and during the COVID-19 pandemic based on gender, employment status, and local body.

H_0 18: The purpose e-payment system is not significantly different among Corporation, Municipality, and Panchayath.

Objective 2: Factors that motivate the use of EPS

H_0 19: There is no significant difference among the different group of customers on the basis of their demographic profile and the influence of motivational factors to use EPS.

Objective 3: Satisfaction of customers towards EPS

H_0 20: There is no significant difference among the different group of customers on the basis of their demographic profile and the level of satisfaction of customers towards EPS.

H_0 21: There is a goodness of fit in the relationship of factors motivate to use EPS on the satisfaction of customers towards EPS.

H_0 22: The motivational factors to use EPS do not influence the satisfaction of customers towards EPS.

Objective 4: Problems associated with the use of EPS

H_0 23: There is no significant difference among the different groups of customers on the basis of their demographic profile and the problems of the e-payment system.

1.10 Research methodology

Research methodology is a procedure to orderly answer the research problem. To study the research problem, the different steps taken by the researcher will be discussed in this section. This includes sampling area of the study, research design, source of data, sample size, sample design, and tools used for data analysis.

1.10.1 Sampling area of the study

The data collection area for collecting samples was from Kerala state. This is because of the reason that Kerala state is one of the prime states in India with stacks of literate and millennial populations who are tech-savvy, dynamic, energetic, and easily adapt to state-of-the-art technology.

The primary data was collected from respondents of three regions in Kerala state namely, **Southern** (Trivandrum, Kollam, Pathanamthitta & Alappuzha), **Central** (Kottayam, Idukki, Ernakulam & Thrissur), and **Northern** (Palakkad, Malappuram, Calicut, Wayanad, Kannur & Kasaragod). Samples (respondents) were collected from different categories like employees, businessmen, students, homemakers, professionals, and self-employed workers.

1.10.2 Research design

Descriptive research was employed for this study, which means that information was gathered on the study's occurrences and then presented in tabular, graphic, and narrative form. Graphs and charts are common place to help illustrate the facts and provide context for the viewer.

1.10.3. Source of data

The data collected for this study is through primary and secondary sources.

1.10.3.1 Secondary data

National and international journals, research articles, books, working papers, research theses, Government sites, newspapers, websites, reports of RBI, NPCI, various committees appointed for promoting EPS, and the Kerala IT mission.

1.10.3.2 Primary data

A well-structured questionnaire was used as the instrument for the collection of primary data from banking customers in Kerala.

The questionnaire has five parts. The first part had questions relating to the demographic information of banking customers. The second part consists of questions relating to the awareness, usage, and purpose of the EPS. The third part had questions regarding factors that motivate the use of EPS. The fourth part consists of questions relating to satisfaction of customers towards EPS, and the last part had questions relating to the problems associated with the EPS usage.

1.10.3.2.1 Population

The important objectives of the study are to analyse the factors affecting customers' perception of Electronic Payment Systems and the satisfaction level of banking customers towards the EPS usage. Therefore, the banking customers who are using any of the Electronic Payment Methods were considered as the target population. To maintain generalization of the findings, 14 districts of Kerala were selected for sampling.

1.10.3.2.2 Sample size

Kerala has been India's first state to offer digital banking in all enabling accounts, according to December 2022 statistics. As per the State-Level Bankers' Committee (SLBC) report, at least one product is now available digitally in each of the state's 3.76 crore accounts. The state Government, led by Chief Minister Pinarayi

Vijayan, has executed this measure as part of the RBI 'Expanding and Deepening of Digital Payments Ecosystem' scheme (www.slbckerala.com).

95 percent level of confidence was assumed to be the wanted precision. The sample size was computed by using the Cochran w.g (1977) formula.

Sample size (n) = $(ZS/E)^2$

Z= 1.96

S= 0.4915

E=5%

Z= Standard value corresponding to a confidence level of 95%=1.96

S=Standard deviation from pilot study with 45 samples=0.4915

E= Acceptable error=5%=0.05

n= $(1.96*0.4915/0.05)^2$ = 371.21

=371

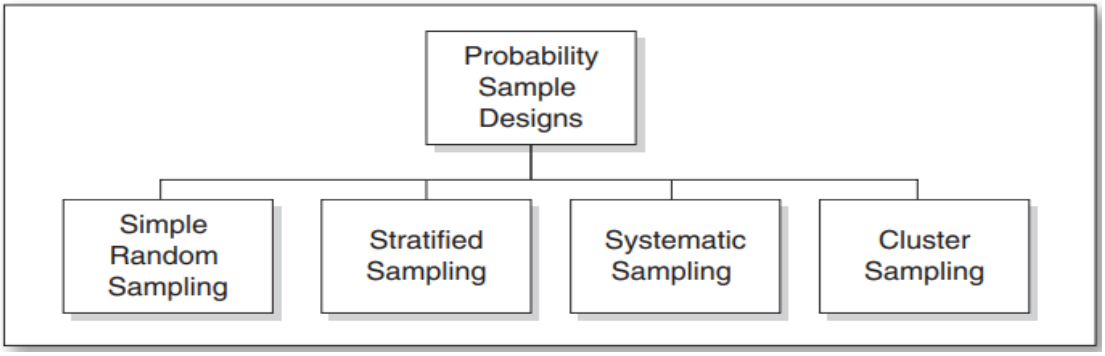
371 banking customers were chosen as samples from 14 districts. The usage of any of the Electronic Payment Systems for payment-related transactions was regarded as a criterion for the selection of samples. Primary data were collected from 371 banking customers in Kerala during the period of 2021 November to 2022 March.

1.10.3.2.3 Sampling technique

The present study followed Disproportionate Stratified Random Sampling for selecting respondents from the state of Kerala.

Figure 1.12

Major types of probability sampling



Source: www.sagepub.com

- **Simple Random Sampling**

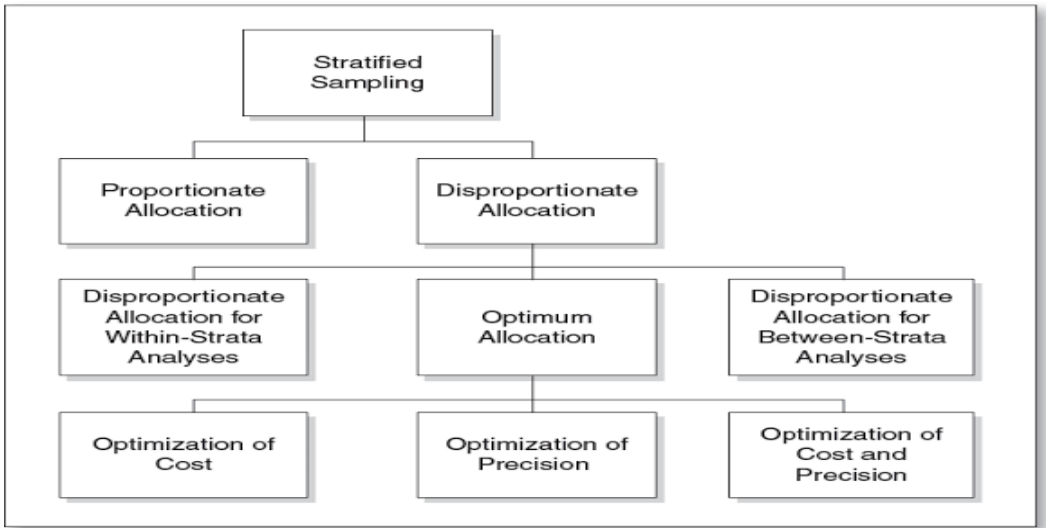
Simple random sampling is a probability sampling technique in which each element of the target population and each potential sample of a given size has an equal chance of being selected. Consequently, this is an Equal Probability Selection Method (EPSEM).

- **Stratified Sampling**

Stratified sampling is a probability sampling process in which the target population is first split into mutually exclusive, homogenous segments (strata), and then a simple random sample is picked from each segment (stratum). The samples collected from the different strata are then merged into a single sample.

Figure 1.13

Subtypes of Stratified Sampling Based on Stratum Allocation



Source: www.sagepub.com

- **Disproportionate Stratified Sampling**

This is a stratified sampling technique in which the **number of items selected from each stratum is not proportional to their overall population** representation. As per the 2011 census data, the proportion of the population from the south region of Kerala is 28%, but the researcher collected sample size from that region is 33% (i.e., not 28%).

Among the three types of disproportionate stratified sampling (i.e., within-strata analysis, between-strata analysis, and optimal allocation), Disproportionate allocation for analysis between strata method is used for the present study. Under this method, the sample size from each stratum should be equal. Equal allocation (also known as "balanced allocation" and "factorial sampling") is a technique employed by the researcher to pick an equal number of sample respondents from each stratum.

In this research, sample responses were selected from the three regions of Kerala i.e., Northern (Palakkad, Malappuram, Calicut, Wayanad, Kannur & Kasaragod), Central (Kottayam, Idukki, Ernakulam & Thrissur), and Southern

(Trivandrum, Kollam, Pathanamthitta & Alappuzha) were equal. Here an equal 33% of samples were selected from each region. The researcher finally used convenience sampling to pick out sample respondents.

Table 1.1

Disproportionate stratified sample using equal allocation

Region	Population		Disproportionate stratified sample using equal allocation	
	Frequency	**Percentage**	**Frequency**	**Percentage**
South	9254467	28%	124	33.42%
Central	9477024	29%	124	33.42%
North	14656186	43%	123	33.16%
Total	33387677	100%	371	100

Source: www.kerala.gov.in, 2011 census data and Primary data

1.10.3 Tools used for data analysis

The collected data was analysed with the help of the Statistical Package for the Social Sciences (SPSS) & AMOS.

- **Percentage analysis**: A percentage is a number or ratio expressed as a fraction of 100. It explains the portion of the population satisfying a particular criterion. (www.storyofmathematics.com).
- **Mean:** Mean refers to the average of a data set, which is calculated by adding all of the numbers together and then dividing the total of the numbers by the number of numbers. (Kothari, C.R. (2004)).
- **Standard deviation:** Standard deviation (SD) is a measure that is used to quantify the amount of variation or dispersion of a set of data values. (Kothari, C.R. (2004)).
- **One sample t-test:** The One Sample *t* Test examines whether the mean of a population is statistically different from a known or hypothesized value. (www.libguides.library.kent.edu).

- **Chi-square test:** The objective of this test is to identify whether a disparity between observed and anticipated data is due to chance or to a relationship between the variables under consideration (Kothari, C.R. 2004).

- **Paired t-test:** The Paired Samples *t* Test compares the means of two measurements taken from the same individual, object, or related units. (www.libguides.library.kent.edu).

- **Analysis of variance:** Analysis of variance (ANOVA) is used to analyse the differences among group means. (Kothari, C.R. (2004)).

- **Multivariate analysis of variance (MANOVA):** MANOVA is an extension of the univariate ANOVA. The MANOVA tests whether or not the independent grouping variable simultaneously explains a statistically significant amount of variance in the dependent variable (www.statistics solutions.com).

- **Cluster analysis:** Cluster analysis is a form of exploratory data analysis in which observations are divided into groups that share common characteristics. Those groups are compared and contrasted with other groups to derive information about the observations. The general purpose of cluster analysis is to construct groups, or clusters, while ensuring that within a group, the observations are as similar as possible, while observations belonging to different groups are as different as possible (www.business. adobe.com).

- **Discriminant analysis**: Discriminant Analysis is a classification technique that deals with the data with a response variable and predictor variables. It is mainly used to classify the observation to a class or category based on the independent variables of the data. Discriminant analysis is a technique that is used by the researcher to analyze the research data when the criterion or the dependent variable is categorical and the predictor or the independent variable is interval in nature. (www.statisticssolutions.com).

- **Factor analysis:** Factor analysis is a statistical method used to describe variability among observed, correlated variables regarding a potentially lower number of unobserved variables called factors. It deals with data sets where there are large numbers of observed variables that are thought to reflect a smaller number of underlying/latent variables (www.en.wikipedia. org).

- **Multilayer analysis**: The simplest definition of a multilayer network is a set of nodes, edges, and layers, where the interpretation of the layers depends on the implementation of the model. One of the main problems faced when studying these graphs is the absence of terminology and a nomenclature convention (www.bdataanalytics.biomedcentral.com).

- **Structural Equation Modeling (SEM):** Structural equation modeling is a multivariate statistical analysis technique that is used to analyse structural relationships. This technique is a combination of factor analysis and multiple regression analysis, and it is used to analyze the structural relationship between measured variables and latent constructs. This method is preferred by the researcher because it estimates the multiple and interrelated dependence in a single analysis. In this analysis, two types of variables are used endogenous variables and exogenous variables. Endogenous variables are equivalent to dependent variables and exogenous variables are equal to the independent variable (www.statisticssolutions. com).

Table 1.2

Summary of research methodology

Research approach	Quantitative
Sources of data	Primary and secondary data
Method of data collection	Questionnaire
The population of the study	The banking customers who are using any of the Electronic Payment Methods in Kerala were considered the target population
Research method	Survey method
Type of survey	Sample survey
Sample size	371
Sampling method	Disproportionate Stratified Random Sampling
Tools used for analysis	Percentage, mean, standard deviation, one sample t-test, chi-square test, paired t-test, ANOVA, MANOVA, cluster analysis, discriminant analysis, factor analysis, multilayer analysis, and structural equation modeling.

Source: Primary data

1.11 Pilot study

At the first level, the developed questionnaires were circulated among the e-payment users like employees, businessmen, students, homemakers, professionals, and self-employed workers to complete the pilot study. The aim to conduct the pilot study is to verify the feasibility and the reliability of the questionnaire which is the primary source for collecting the data. The pilot study questionnaire surveyed among 45 e-payment users in Kerala in shopping malls, training institutes, residences, banks, universities, and colleges. The pilot study was conducted in different parts of Kerala from 10th August 2021 to 25th September 2021. The respondents were chosen conveniently for the study.

The survey was done after enquiring the respondents whether they are e-payment users and if they were users of e-payment, then the opinion regarding its usage is asked and a questionnaire was given. The minimum time needed to fill out a

questionnaire was about 20 minutes. This includes the time the researcher has taken for clearing doubts raised by the respondents.

1.11.1 Descriptive statistics

The following table shows the descriptive statistics of all variables in the study.

Table 1.3

Descriptive statistics

		Statistic	**Std. Error**
Mean		**3.895278**	**.0643309**
95% Confidence Interval for Mean	Lower Bound	3.765627	
	Upper Bound	4.024928	
5% Trimmed Mean		3.877238	
Median		3.825000	
Variance		.186	
Standard Deviation		**.4915446**	
Minimum		3.1375	
Maximum		4.9625	
Range		1.8250	
Interquartile Range		.5125	
Skewness		.473	.354
Kurtosis		.247	.695

Source: Primary data

The above table shows that mean of all study variables is 3.895 with a standard error of 0.0643 and a standard deviation of 0.4915. The standard error is an indication of the reliability of the mean. A small standard error (0.0643) indicates that the sample mean (3.895) is a more accurate reflection of the population and it is reliable. Standard deviation is a measure of how dispersed the data is in relation to the sample mean. A low standard deviation (0.4315) means data are clustered around the sample mean.

1.11.2 Normality

Table 1.4

Tests of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
	.090	45	.200*	.968	45	.247
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Source: Primary data

From the above table, significant value of Kolmogorov-Smirnov test is greater than 0.05, i.e., 0.200 and failed to reject null hypothesis and accepted that the data follows normal distribution. The significant value of Shapiro-Wilk test is 0.247 which is higher than 0.05. This test also reveals that data follows normal distribution.

1.11.3 Reliability

Table 1.5

Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.956	.963	90

Source: Primary data

Reliability is the measure of the internal consistency of the constructs in the study. A construct is reliable if the Alpha is greater than 0.7. Construct reliability was assessed using Cronbach's Alpha. The results revealed that Cronbach's Alpha is 0.956 which is higher than 0.7 and it is in the excellent region. Hence the reliability of the question is proved i.e., the questionnaire is reliable for the purpose of data collection.

1.11.4 **Homogeneity of variances**

Table 1.6

Homogeneity of variances

Test of Homogeneity of Variances			
Levene Statistic	df1	df2	Sig.
1.198	5	39	.328

Source: Primary data

Levene's test is used to test the null hypothesis that the variances of the variables are equal. From the analysis, the significant value of Levene statistic is .328 which is greater than 0.05. Therefore, the null hypothesis was accepted, that the sample data are homogeneous.

1.12 Normality, reliability, homogeneity, and non-additivity of sample data

1.12.1 Normality

The normality of research work was studied through Kolmogorov-Smirnov, Shapiro-Wilk, and histogram. The results are shown below.

Table 1.7

Tests of normality

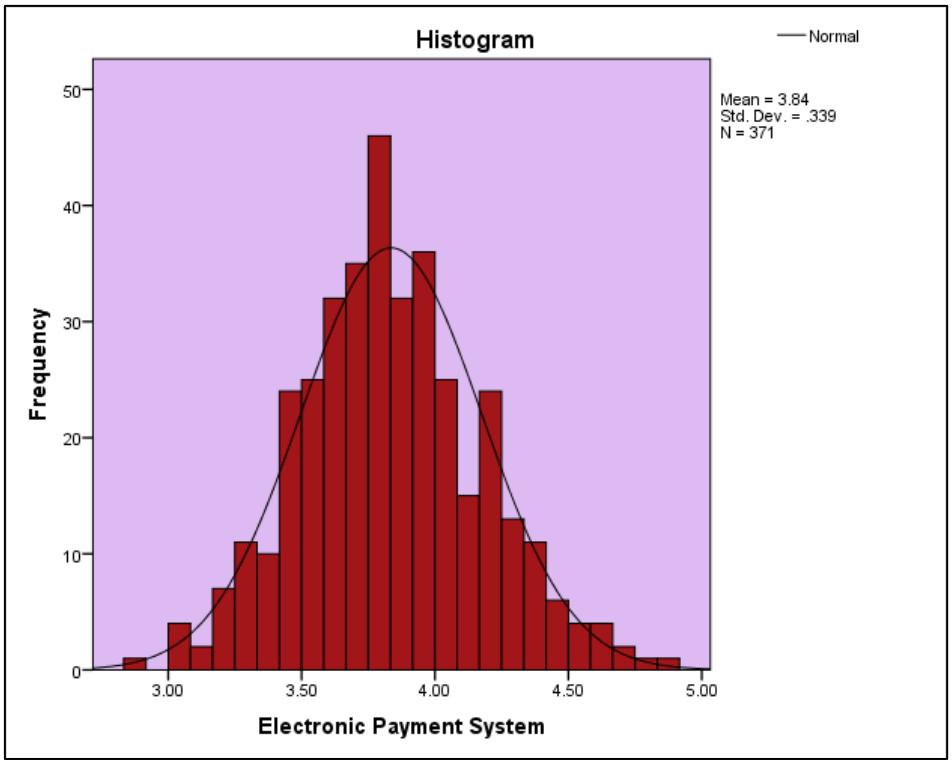
Kolmogorov-Smirnov			**Shapiro-Wilk**		
Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
.038	371	.200	.996	371	.373

Source: Primary data

From the above table, the significant value of the Kolmogorov-Smirnov test is greater than 0.05, i.e., 0.200, and failed to reject the null hypothesis and accepted that the data follows the normal distribution. The significant value of the Shapiro-Wilk test is 0.373 which is higher than 0.05. This test also reveals that data follows the normal distribution. The following figure shows the histogram and which proves the data used in the study follows the normal distribution.

Figure 1.14

Histogram



Source: Primary data

1.12.2 Reliability

Reliability is the measure of the internal consistency of the constructs in the study. The reliability of the research can be referred to as the extent of dependency or consistency of a scale. A construct is reliable if the Alpha is greater than 0.7. Construct reliability was assessed using Cronbach's Alpha. The Statistical Package SPSS is used for the calculation of the Cronbach alpha value for measuring the reliability of the data used in the study.

Table 1.8

Reliability statistics

Variables	Cronbach's Alpha	No of Items
All variables	**.909**	**89**
Purpose of EPS	**.806**	**13**
Ease of use	.764	5
Usefulness	.850	5
Social influence	.818	5
Security	.768	4
Trust	.820	5
Attitude of customers	.854	4
Intention to use EPS	.804	4
Factors motivated to use EPS	**.932**	**32**
User-friendliness	.760	5
Support system	.827	5
Time-saving	.759	4
Economy	.812	5
Safety and Security	.708	3
Quality of services	.767	4
Overall Satisfaction towards EPS	**.923**	**26**
Problems of EPS	**.863**	**18**

Source: Primary data

The results revealed that Cronbach's Alpha of all variables in the study is 0.909 which is higher than 0.7 and it is in an excellent region. Hence the reliability of the data is proven and can be used for further analysis. The above table also shows Cronbach's Alpha of every variable in the study, all the value of alpha is higher than 0.7, so the reliability of all variables is satisfied.

1.12.3 Homogeneity of variances

The homogeneity of variances of variables is studied through Levene's test. The following table shows the result.

Table 1.9

Test of homogeneity of variances

Levene Statistic	df1	df2	Sig.
1.213	3	367	.305

Source: Primary data

Levene's test is used to test the null hypothesis that the variances of the variables are equal. From the analysis, the significant value of Levene statistic is .305 which is greater than 0.05. Therefore, the null hypothesis was accepted, that the sample data are homogeneous.

1.12.4 Non-additivity

The non-additivity of variables was studied through ANOVA with Tukey test. From the analysis, the significant value of the two F statistics is below 0.01, so we can interpret that the variables are non-addictive. The result is shown below.

Table 1.10

ANOVA with Tukey's test for non-additivity

			Sum of Squares	d.f.	Mean Square	F	Sig
Between People			122880331717.749	370	332109004.643		
Within People	Between Items		330039124954.046	94	3511054520.788	11.616	.000
	Residual	Non-additivity	5500123170462.169	1	5500123170462.169	38164.924	.000
		Balance	5012162057528.657	34779	144114611.045		
		Total	10512285227990.826	34780	302250869.120		
	Total		10842324352944.873	34874	310899935.566		
Total			10965204684662.621	35244	311122593.482		
Grand Mean = 452.4864							
a. Tukey's estimate of power to which observations must be raised to achieve additivity = .011.							

Source: Primary data

1.13 Variables used for the study

Table 1.11

Variables used for the study

	Variables	
Demographic Variables	1	Age
	2	Gender
	3	Educational Qualification
	4	Marital Status
	5	Employment Status
	6	Monthly Income
	7	Type of Local Body
	8	Region
Awareness, Usage, & Purpose of EPS	1	Type of Banks
	2	Type of Bank Accounts
	3	Type of EPS
	4	Years of using EPS
	5	Type of Bank Plastic Cards
	6	Utilisation of EPS
	7	Frequency of EPS usage
	8	Purpose of using EPS
	9	Usage of EPS during Demonetisation and Covid-19
Motivational Factors	1	Ease of Use
	2	Usefulness
	3	Social Influence
	4	Security
	5	Trust
	6	Attitude of Customers
	7	Intention to Use
Satisfaction of Customers towards EPS	1	User-Friendliness
	2	Supporting System
	3	Time-Saving
	4	Economy
	5	Safety and Security of transactions
	6	Quality of Service
Problems associated with the use of EPS	1	Slow internet connectivity
	2	The complexity of electronic transactions
	3	Poor response on complaints

	4	Need help from a technical person
	5	Language barriers
	6	Biometric-based authentication
	7	Lengthy procedure
	8	Speed of transactions
	9	Timely confirmation
	10	Leaking out personal information
	11	Online fraudulent activity & risk of hacking
	12	Service charge & additional charge
	13	Customer awareness programmes

Source: Primary data

1.14 Period of the study

The present study is confined to five years from 2018 to 2022. It was during this period that various planned and unplanned initiatives were taken by the Government to accelerate electronic transactions like the digital India programme, demonetisation, the go cashless campaign of the Kerala Govt. etc.

1.15 Limitations of the study

- The respondents are reluctant to share their financial details above a limit
- Answers were given from the recall memory of the respondents, which may affect the accuracy.
- It's crucial to remember that customer perceptions, & attitudes towards the use of Electronic Payment Systems might change with time and location.
- The degree of customer satisfaction is a relative concept and varies from person to person.

1.16 Chapter scheme of the study

Chapter 1: Introduction

This chapter provides the basis of the thesis and provides a general background to the study. This chapter deals with a brief introduction to the concept

of the e-payment system. This chapter also includes the statement of the problem, significance of the study, theoretical aspects of the research, the research design, nature and source of data, validity test, sampling technique, population, sample size, data collection method, pilot study, analysis tools, software packages used for the study, variables used for the study, period of the study, and limitations of the study.

Chapter 2: Review of literature

This chapter comprises the reviews of associated literature relating to the study. The chapter explains the associated studies conducted in the different variables used to study the research gap and formulates the frame for the present research.

Chapter 3: Electronic Payment System- An overview

This chapter mainly includes the theoretical framework and various committees on Electronic Payment Systems. The first part of the chapter deals with the evolution, types, growth, challenges, and opportunities of EPS. The second part includes various committees constituted for promoting EPS such as Ratan P Watal and the high-level committee on deepening electronic payments.

Chapter 4: Policy measures and the growth of EPS

This chapter mainly includes the policies and schemes of the Government for promoting EPS and present scenario of electronic payments. The first part of the chapter deals with the policies & schemes of the GOI, the digital India campaign, projects under Digital India, the union budget for 2022, and other Electronic Payment promotion plans. The second part includes the current position of different sorts of electronic payments from International, National, and Kerala state perspectives.

Chapter 5: Customer's awareness, usage, and purpose of e-payment system

This chapter deals with the results of data analysis & interpretation regarding the research objective of customer awareness, usage, and purpose of the e-payment system.

Chapter 6: Motivational factors and customer satisfaction towards E-Payment System

This chapter comprises the results of data analysis & interpretation regarding the research objective of factors that motivate the use of EPS and customer satisfaction with the E-Payment System.

Chapter 7: Problems associated with the use of the Electronic Payment System

This chapter also deals with the results of data analysis & interpretation regarding the research objective of problems associated with the use of the Electronic Payment System.

Chapter 8: Findings & conclusion of the study

This chapter attempts to summarize the main findings of the research based on the primary and secondary data and it also includes the conclusion of the study.

Chapter 9: Recommendations

This chapter mainly deals with three aspects such as suggestions, implications, and scope for further research.

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CHAPTER 2

REVIEW OF LITERATURE

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2.1 Introduction

It is essential to have a thorough understanding of what has already been done in the field of research before beginning the journey of research. Therefore, the present chapter deals with the literature review of previous studies undertaken by many researchers. This chapter provides an overview of the literature review relating to various Electronic Payment Systems from the state, national, and international contexts by investigating the connection and variations highlighted by existing researchers and their empirical findings to emphasis the concepts explored in this research.

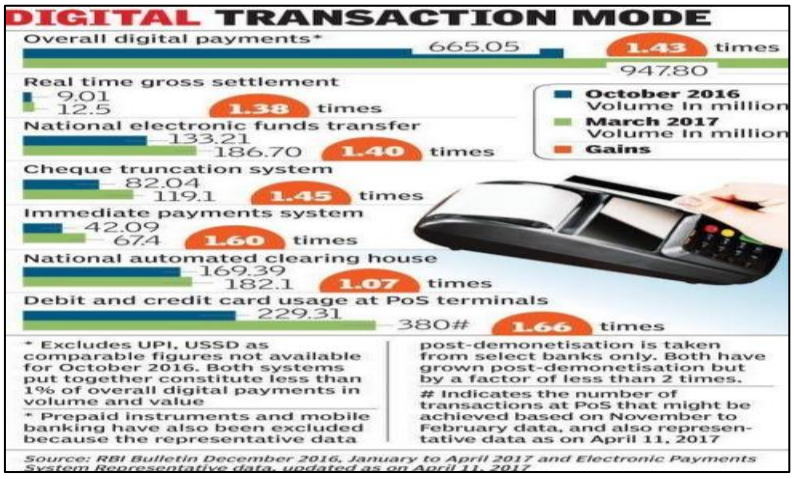
The Electronic Payment System is a growing concept that involves the use of electronic platforms to replace the physical exchange of currency. It is the quickest method to transfer money between individuals. In comparison to previous years, the usage of Electronic Payment Methods and electronic platforms has increased rapidly in recent years.

Electronic Payment Methods are extensively popularised in response to the demonetisation of currency and the Covid-19 outbreak.

An evaluation of RBI data on digital transaction volume and value in March 2017 against October 2016 reveals that the entire volume increased by only 1.43 times (RBI Bulletin December 2016, January to April 2017).

Figure 2.1

Digital transaction mode



According to NITI Aayog, the number of e-payments increased by over 55% in 2016-17. Demonetisation appears to be fueling this expansion.

This strong surge in a single year contrasts sharply with the 28 percent increase over a five-year period ending in 2015-16, said NITI Aayog's Principal Advisor Ratan P. Watal at a FICCI conference on 'Digital Payments - Trends, Issues, and Challenges.'

Watal also said that "Demonetisation benefited in raising the graph of digital mode of transactions." "The essence of the Government's program is that technology will ultimately influence customer behavior in shifting from cash to card," (www.ficci.in).

Since the adoption of demonetisation, all Indian residents have been confronted with money challenges and have been obliged to utilise more Electronic Payment Methods.

In 2016, the Government of India (GOI) headed by Prime Minister Narendra Modi ordered the demonetisation of Rs 500 and Rs 1,000 notes in an effort to curb the flow of black money. This led in an upsurge in digital adoption in the following months due to a severe cash shortage. The GOI and its agencies steadily advocated digital adoption as the key reason for withdrawing the high-denomination currencies. "Digital payments have surged by 56% from 71.27 crore transactions in October 2016 to 111.45 crore transactions at the end of May 2017," the Government said in a press release dated 30 August 2017 (Source: www.npci.org.in).

Table 2.1

Impact of demonetisation on the Electronic Payment System

Year	Volume (in million)	% Change
2014-15	4717	-
2015-16	7047	50%
2016-17	10991	55%

Source: RBI (2017)

The percentage growth change in EPS volume was 50% in the year immediately prior to the demonetisation and grew to 55% in the year following its implementation, i.e., in 2016–17.

Table 2.2

Impact of Covid-19 on the Electronic Payment System

Year	Volume (in million)	% Change
2019-20	34002.6	-
2020-21	43744.5	28
2021-22	71953.1	65

Source: RBI (2022)

From the above table, it can be understood that there is a growth in Electronic Payment Systems due to the Covid-19 pandemic. The growth change in the year 2020-21 was only 28% because of Covid-19 pandemic difficulties faced by people. After getting the Covid-19 pandemic relaxations, the growth rate increased drastically to 65%.

In this study, the researcher has reviewed more than 150 research articles and books in the related area in order to differentiate the present research from the previous research. The reviews are arranged in chronological order starting from the most recent one. It ranges from the year 2000 to 2021. The reviewing of these research works enabled the present researcher to create a robust tool to gather and analyse the data needed for the present research to identify the research gap. These reviews provided the various factors and variables that are relevant in the present area of research and help the researcher to apply them in order to bring out valid research work.

Reviews of currently available works of literature and various reports that are occasionally published show that there is limited awareness of the current state and potential of Electronic Payment Systems from the viewpoints of customers. It is also understood that the studies on Electronic Payment Systems and associated topics in the Kerala context are limited.

A brief literature review of the studies from the state, national and international context on Electronic Payment Systems is considered for the study. In this chapter, reviews are categorised on the basis of various types of Electronic Payment Systems.

2.2 DIGITAL /ELECTRONIC /ONLINE PAYMENT SYSTEM

Digital payments have been defined by the Payment and Settlement Act of 2007. According to this definition, an "electronic funds transfer" is any transfer of funds initiated by a person through an instruction, authorization, or order to a bank to debit or credit an account maintained with that bank through electronic means, and includes point-of-sale transfers, automated teller machine transactions, direct deposits or withdrawal of funds, transfers initiated by telephone, internet, and card payment.

All the transactions in digital payments are completed online. In digital payments, the payer and payee both use digital modes to send and receive money. It is also termed as online/internet/electronic payment. No physical cash is involved in digital payments. It is a prompt and convenient way to make payments.

2.2.1 Digital Payment Systems

Padmakumari & Chandrasekaran (2021) researched digital payment penetration and cashless transactions in Kerala. Most consumers prefer cash transactions, according to the report. The survey suggests security concerns and a lack of IT and physical infrastructure are major key bottlenecks. The report urges adequate infrastructure and awareness initiatives.

Singhal & Gupta (2021) In their study, it is found that during the COVID-19 pandemic, there was a surge in the adoption of digital payment systems in Indian cities and villages. Digital payment systems are popular because they save time, are easy to use, and are safer.

Rajeswari, et al. (2021) evaluated customers' perceptions of digital payment systems and found that they positively affect digital payment uptake. The survey

also assesses consumer knowledge of debit cards and digital payment systems, and the findings reveal that customers are well-informed. More confidence via cyber security framework will speed up public adoption of digital payment systems.

Saravanan & Mariyappan (2021) evaluated the influence of covid-19 on digital payment systems in Chennai and identified the cyber-attack, high transaction cost, and technical challenges. Fear of covid-19, rush banking hours, security concerns, and distance made visiting bank offices cumbersome, which boosted the adoption of digital payment systems.

Malakar (2020) examined the knowledge and obstacles that rural women towards digital payments in Assam. Despite demonetisation and a specific push to encourage digital payments during the previous several years, it was discovered that online financial transactions and e-commerce activities, as well as digital modes of payment, continue to lag in rural regions. Rural women are still unfamiliar with and conflicted about accepting and utilising digital payment methods. It is advised that the Government should use various tactics to teach non-literates about the cashless economy and that training would be required in rural areas of the nation.

Raharja, et al. (2020) identified how digital payment opens up business opportunities. Opportunities come from the characteristics of the industries where business owners are thinking about taking action. Financial inclusion is a key step toward inclusive growth, and Go-Pay can help micro, small, and medium-sized businesses that used to be in the underserved market move into the formal system. New technologies have made it easier to update operating systems and user interfaces and have changed the way payment services work.

Jayaprakasam & Eswari (2020) analysed customer perception of digital payment systems in Tamil Nadu, and the findings show that consumers face a significant issue of technology security when using mobile payment applications; perceived compatibility plays a critical role in the adoption of mobile payment applications. They recommend that service providers go above and above to guarantee that they describe a mobile payment application stage that is devoid of faults and electronic dangers.

Sahil, et al. (2019) carried out research to determine the effect of demonetisation on digital payment transactions. According to the report, demonetisation had a major impact on growing digital payments. The report also suggests that in order to increase the rate of online transactions, the Government, financial intermediaries, and banks should launch awareness campaigns and ensure transaction security.

Makhija (2019). tried to assess the general adoption, degree of convenience, perception, and use frequency of digital payments, as well as the impact of demographic variables on digital payment usage. Customers are drawn to digital payment because it is simple, safe, and straightforward to use, and they feel digital payment modalities save time.

Mayilsamy & Krishnan (2020) had stated the consumers' perceptions of digital payment systems and the influence of demographic characteristics on adoption. People agree with the Government on the usefulness of a cashless economy since it helps combat terrorism, corruption, and money laundering, yet cybercrime and illicit access are major problems in India. The report notes that consumer education affects digital payment uptake. Smartphone and internet access in such areas also aided digital payment acceptance.

Sivathanu (2019) investigated how customers used digital payment systems during India's demonetisation and found that digital payment service providers must reduce privacy and security risks and offer prompt aid and support. They should promote digital literacy and cashless digital payment methods by launching promotional efforts.

According to Kurniawan et al. (2019), digital payments on public expenditure are simpler since they can be made anywhere and anytime. This may result in major changes to economic growth from year to year. The report notes that merchant discount rates, critical mass, point-of-sale interfaces, mass transportation cards, customer behaviour, and Government legislation are vital for cashless or digital payments.

Gadge & Rai (2019) reviewed digital payments in rural regions and found that most consumers are aware of and agree that digital payments would help battle black money, corruption, and the risk of carrying cash, as well as speed up economic progress. Digital payment is vital since it saves people's time, however, the quality of services must improve with digital banking and payment sources.

Dhanya (2019) in her study, regarding customer perception of digital payment found that digital payment tries to support a behavioural shift toward cashless services. Future Indian economic growth would be driven by cashless transactions made feasible by smartphones, online banking, card transactions, etc.

Ganesh & Rahman (2018) reports that most customers felt it was important to use digital payments and that the importance of these e-banking services was linked to the respondents' socio-economic status and demographics. Even though most customers prefer digital payments to e-banking, customers tend to use digital payments instead of e-banking. This is because the number of times bank customers visit the payment centre and the number of transactions, they do each month in the area have a big impact on how many people use digital payment, e-banking, and internet banking.

In their research, **Byakod et al. (2018)** discussed the penetration of digital payment systems in selected rural regions of Karnataka, as well as the present technological infrastructure and adoption status of digital payment systems, as well as the factors influencing digital payments. They found that a lack of training on the use of digital payment systems is the primary reason for the system's low acceptance rate and that the availability of Internet service in remote areas also affects the use of digital payments.

Sivathanu (2018) analysed how customers used digital payment methods during demonetisation. This research focuses on the stickiness of the cash payment system, behavioural intention, and innovation resistance to utilise digital payments. The empirical study found that performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, and habit positively affect behavioural intention to utilise digital payment systems. Innovation resistance

hinders the actual use of digital payment systems owing to use, value, risk, tradition, and image obstacles. The study suggests digital payment service providers make technology user-friendly and free of hurdles and check on security and privacy problems to entice users to utilise digital payment and minimise cash payments.

Sivasubramanian et al., (2017) In their research tried to determine why Gen-X customers favour Digital Payment Systems and their degree of satisfaction. The researchers concluded that Gen- X consumers' use of digital payment systems depends on trustworthiness, ease, security, and privacy. This research found that Trustworthiness, Convenience & Benefits, and Security influence Gen-X customer satisfaction.

In a case study about digitisation by the state of Kerala done by **Paul & Pillai (2017)** reported an internet penetration rate of 37%, with 90% of rural males as the major users and 79% of city dwellers as the sole users. In addition, the study revealed that, according to the New Indian Express, Kerala is well ahead of its peers in terms of internet penetration, with over 30 million connections for a population of 33 million. Regarding the scope of cashless transactions, a 2016 article (Demonetisation: In Kerala, many support the cashless movement, but political resistance remains a worry) indicated that an impressive number of small retailers, transport vendors, etc. had embraced cashless transactions. The research also emphasised the positive contribution of Akshaya centres to the promotion of the cashless campaign. Their awareness campaigns, demonstrations, and training sessions were very useful in enhancing the same, with a particular emphasis on different e-wallet technologies such as UPI, USSD, etc. According to the survey, the proportion of digital transactions in December 2016 was about 30 percent.

In empirical research conducted by **Dominic et al. (2018),** the acceptability of digital payments in the Ernakulam district of Kerala was examined. The majority of respondents prefer cash payments (58%) despite the fact that the majority have bank accounts (92%). The preference for cash is mostly owing to the ease of handling currency, followed by a lack of familiarity with digital payment methods. In addition, the majority of respondents believe that utilising cash saves time and is

readily available. They also contend that cash transactions eliminate bureaucracy. According to the survey, security concerns were the greatest barrier to its widespread dissemination among the populace. The survey also revealed that only large quantities of money are transferred using online payment methods.

Singh & Rana (2017) aimed to comprehend customer perceptions of digital payments and the influence of demographic characteristics. The empirical findings reveal there is no significant variance in the perception of consumers on demographic factors like gender, age, profession, and annual income; but there is a significant variance in the perception of consumers on education. Education influences customers' opinions on digital payment methods. Thus, customers' perceptions affect the uptake of digital payments positively.

Goriparthi & Tiwari (2017) analysed demonetisation's impact on digital payments in India. Researchers say Indians generally use cash. Most are unbanked and just handle cash. Demonetisation aims to eliminate parallel economies, limit illicit money, and digitalize financial transactions to increase transparency. To encourage digital payments, the Government has introduced cash-back policies, discounts, etc. People began adopting digital transactions after demonetisation. Demonetisation led India to a cashless or digital economy.

Shah (2017) examined the varieties, issues, and future possibilities of digital payment systems in India. The researcher asserts that cashless transactions are expanding as a result of the emergence of numerous banks, telecom companies, and mobile wallet companies, all of which have developed numerous apps for digital transactions that are governed and managed by RBI and NPCI, and users are offered incentives to promote cashless transactions. Digital payment systems face obstacles such as cyber fraud, privacy, data theft, and limited internet connection. This research suggests that cash reigns supreme among Indians, thus the transition to digital transactions will be gradual.

Goparaju (2017) studied India's digital payment system theoretically. This study examined several scholars' works and gathered data on digital transactions in different nations. The study evaluated India's digital payment market using Porter's 5

forces model including goods, services, industries, rivals, suppliers, and consumers. This research suggests that a significant number of digital payment users will assist create a digital economy.

Kerala State Planning Board (2016) Under the auspices of the State of Kerala, created a committee to "Study the Impact of Demonetisation on the Kerala State Economy." The committee's findings revealed that the majority of enterprises in the state relied substantially on cash. Therefore, demonetisation had a devastating effect. The informal or unorganised sector comprised more than fifty percent of the State's economic activity and used exclusively a cash-based payment system. This, coupled with more than 2.5 million migrant labourers in Kerala, lacked access to digital ways of payment; hence, the demonetisation had a devastating effect. This also demonstrated that the attempt to eliminate cash had not reached the fundamental heart of the economy. The state was dominated by cooperative banks, with Primary Agricultural Cooperative Societies (PACS) located at the base of the pyramid. The committee said that the Government was also making efforts to increase cashless transactions among cooperative and scheduled commercial bank account holders.

Thomas (2016) conducted a study to understand the various digital payment services offered by banks in Kerala, and the findings reported that 50% of the population still doesn't have bank accounts.

Kazan et al., (2016) studied digital payment systems' structure. The qualitative research shows that a monopolistic platform (Pingit) creates unique service and content layers that are hard to imitate, whereas the federal platform (Paytm) obtains data from financial institutions. In a competitive world of ubiquitous digital payment platforms, it's crucial to focus on privacy and security problems, since they affect user intent to use them.

Polasik & Piotrowski (2016) made an empirical investigation with commercial banks and specialists to find new payment methods since the Poland market is ready for innovative payments. Banks strive to build novel, multidirectional payment technologies. This research agrees that restrictions on

interchange fees and third-party payment providers would boost payment innovations in digital transfers' competitive area.

Moldrich (2015) article targets the report issued by the payment council of Great Britain, in which they revealed that the amount of cash payments represents only less than 50% of all transactions. Though there are many merits & demerits involved in the cash and digital channels, people choose to do digital transactions because of its convenience and the ultimate characteristics of contactless technology. The report further estimates that in the future there will be tremendous growth in digital payments as "people prefer to pay digitally".

Chant (2015) investigated the upgrading of Canada's payment systems. This report asserts that cheques should be abolished largely through shifting the clearing and settlement of transactions to digital technologies. The researcher agrees that modernisation may be accomplished through educating people, customising services to their requirements, and implementing appropriate rules. This research finds that payment activity should be a fluid procedure for both payer and payee, with control over the risk and security component, which will increase Canadians' desire to use a contemporary payment system.

2.2.2 Electronic Payment Systems

Panhwer, et al. (2020) studied the awareness and reason for slow E-payment system adoption. They found that system credibility, facilitating conditions, perceived ease of use, and perceived usefulness are the most important factors affecting customer awareness and slow adoption. The survey found that most individuals know about and like e-payments.

Athanassious (2017) in the study pointed out that e-commerce transactions in Europe have grown rapidly in recent years, leading to digital payments. Fin-techs have agreed to handle and settle retail payments using smart contracts, distributed ledger technology, and virtual currencies. It contains 3 parts: Virtual currencies have a large scope for retail payments; distributed ledger technologies have legal relevance; smart contracts will have a major regulatory influence. An authoritative

server is essential for individuals to participate in smart contracts in the legal environment and create morale to boost digital transactions, which will finally accomplish their contractual aim in the European retail sector.

Menon et.al, (2017) evaluated the Access and Use of Technology-Based Money Transfer Mechanisms among Migrant Workers in Kerala and concluded that the city culture, relatively high wage rate, and type of employment that the migrant workers engaged in contributed to the variation in workers' awareness and use of formal money remittance mechanisms. In addition, they discovered a considerable disparity between urban and rural residents' understanding and use of official systems for money transfer. The access of the poor may be extended via the use of mobile banking and casual banking.

Sujth & Julie (2017) explored e-payment systems in a conceptual study (such as E-wallets, UPI, Plastic money, net banking, AEPS). This research recognised convenience, minimal risk, and promptness as pros, and data theft and digital payment security as difficulties. This research analyses the rise of online payment systems due to e-commerce. More incentives and transaction security will increase digital transaction volume and value, according to the study. According to the survey, digital payments have a bright future as their use increases.

Oney, et al. (2017) verified a structural equation model to evaluate perceived security, trust, and Electronic Payment Systems. Technical protection and personal prior experience are key predictors of both perceived - security and trust; the security statement is a determinant of perceived security only, not trust; transaction method has no relationship with both perceived – security and trust. Perceived security and trust have a beneficial influence on customers' perceptions and are prominent factors for consumers to adopt Electronic Payment Systems.

Roy (2017) examined consumer uptake of electronic payments. People favour Electronic Payment Methods for simplicity and accessibility, according to the report. Perceived utility, simplicity of use, and security are important for Electronic Payment System acceptance, but the perceived danger is minimal. The study said the

GOI and the Reserve Bank of India are trying to develop an Electronic Payment System to suit customer demand, which will drive consumers to embrace and utilise.

Roy & Sinha (2017) studied about the characteristics affecting consumers' acceptance of electronic payments. The report mentions conventional payment concerns such as high printing costs and robbery risk, and Electronic Payment System benefits such as ease, user-friendliness, and time-saving. Perceived utility, simplicity of use, and security are positively correlated with Electronic Payment uptake, but the perceived danger is negatively correlated. This research shows that public education and knowledge about Electronic Payment Systems are needed to develop Electronic Payment services and increase their usage.

Stavins (2017) reported that customers prefer cash, paper cheques, cards, and electronic payments over cash. This research analysed customer payment behaviour and how they pay. The research found that supply-side variables (cost, technology, regulation, price-differentiation, merchant acceptance) and demand-side ones (age, education income, incentives, peer influence, security, speed, convenience, network preference) impact customers' payment choices. The survey also indicated that customers favour security above cost, convenience, and other payment features.

Rysman & Schuh (2016) investigated and discussed payment system developments. They have implemented three kinds of payment system innovations, including the Mobile Payment System, the Faster Payment System (such as ACH and Real-Time Payment System), and Virtual Currencies. In this study, the challenges and potential of each form of payment system are explored. According to this report, banks should invest in new technologies to modernise the system and implement a wider payment system in order to compete with the opposition. They discovered that ease and pervasiveness are the primary motivators for individuals to utilise current payment methods.

Roy & Sahoo (2016) pointed out the need to upgrade the payment system from paper to electronic to increase efficiency and save costs. This research concluded that advanced and sophisticated nations' payment systems face dangers

and challenges that hamper the economy's monetary policy and hurt user trust. The experts say the shift from cash to click will happen faster as e-commerce becomes more prevalent. Central bank authorities should limit risks and promote strong payment systems to attract more users.

Sherferahu & Gezu (2016) analysed the Ethiopian banking industry's E-Payment issues and prospects. Lack of trust & knowledge, frequent power outages, language & network difficulties, and cyber security risks were mentioned as challenges. Government efforts, ICT e-learning programmes, and software application development are e-payments potential. The study concluded that Ethiopian banks are undeveloped and must incorporate new technology to improve e-payments.

Kirillova et al., (2015) explained the issues related to Electronic Payment accounts in Russia. It is found that there is a lack of unified approach and inheritance issues in the case of Electronic Payment accounts. The researchers suggest that Electronic Payment Systems should provide proper verification, and authentication for every transaction, and the details should be stored in the notary's electronic database to identify and implement the inheritance rights to the legal heirs of the owners of the Electronic Payment accounts.

Roy & Sinha (2014) tried to understand how clients accept Electronic Payment Methods. They created a research model incorporating consumer attitude, perceived ease of use, usefulness, credibility, and risk. Perceived simplicity of use is important for the adoption of Electronic Payment Systems, but consumer attitude is not. Innovation, incentives, consumer convenience, and regulatory framework help improve e-payments. This research advises banks to execute awareness programmes on e-payment systems to promote the convenience, safety, and security of online transfers, which will improve the use of Electronic Payment Systems.

Slozko & Pelo (2014) explained about the relationship between electronic payments and economic growth. The empirical investigation demonstrated a favourable correlation and direct connection between the adoption of electronic payments and economic development improvement. This research also demonstrates

that electronic monetary transactions have a significant impact on the entire financial system, as e-payments offer numerous advantages, such as the ability to conduct transactions at any time and from any location, which boosts economic activity and contributes to overall economic growth.

Teoh et al., (2013) studied to identify and explore the elements that influence customers' perceptions of electronic payments. The regression analysis found that elements such as advantages, self-efficacy, and simplicity of use are highly important in customers' perceptions of Electronic Payment Systems, but security and trust are less significant. In the near future, the majority of people will accept and use Electronic Payment Systems due to their simplicity and speed. Therefore, the Government, policymakers, financial institutions, suppliers of online transaction facilities, and software developers must play a crucial role in ensuring the security and reliability of Electronic Payment Systems.

Hayashi (2013) discovered the elements of Electronic Payment Systems that affected unbanked customers. This research indicated that low and uncertain income and hefty bank fees discourage customers from opening bank accounts. The study uncovered three Electronic Payment products: General Purpose Reloaded (GPR) prepaid cards, Alternative Checking Accounts (debit cards and ACH), and transaction accounts (mobile and online accounts). These accounts are better than standard ones. Electronic payment devices reduce transaction costs and time, allowing users to purchase offline and online. Unbanked people will benefit from inexpensive Electronic Payment devices. The study also proposes speedy transactions like instant access to cash and prompt payment would suit unbanked customers' desires. Electronic payments may attract unbanked people.

Ozkan et al., (2010) in their experimental study tried to find out what motivates customers to use e-payments. The research found that security, perceived benefits, and online assurance seals are extremely important variables encouraging customers to embrace Electronic Payment Methods. Internet-facilitated online transactions have inflated Electronic Payment Systems. E-payment systems must

include more explanatory notes on their website for easier investigation and be more trustworthy and user-friendly to attract customers.

Kim et al., (2010) empirically validated customer perceptions of e-payment security and trust. This research shows that technological protection and security statements influence consumer perception and that security and trust are favourably associated with Electronic Payment Systems (EPS). Researchers advise improving security standards to increase consumer confidence and EPS usage.

Sumanjeet (2009) identified 4 major forms of Electronic Payment Systems (1) online credit card payment system (2) online electronic cash system (3) electronic cheque system (4) smart-card-based Electronic Payment System. In e-commerce, business-to-business, business-to-consumer, consumer-to-business, and consumer-to-consumer transactions are completed electronically. Each Electronic Payment method offers pros and downsides for customers and retailers, according to the study. Integrity, non-repudiation, authentication, authorization, dependability, and secrecy boost e-commerce payment systems. Regression research placed credit card Payment systems on top worldwide among Electronic Payment Systems. debit Cards, e-cheques, and e-cash aren't utilised extensively for payments. however, smart cards are popular for online payments. This research found that smart-card e-commerce payment is the best owing to its speed, secrecy, and cheap transaction cost.

Raja & Senthilvelmurgan (2008) in their theoretical study, elucidated the difficulties and potential of e-payments. This research found that security concerns, technological and cultural challenges, privacy, web-based money laundering, online hacking, etc. are the most significant impediments to the Electronic Payment System. Enhancing the security system on a periodic basis, defining the role of issuers and customers, enacting stringent laws to take action against hackers, and significantly reducing the cost of e-payment system charges are among the recommendations made by the researchers to improve electronic payments so that people will shift from traditional cash-based payments to electronic payments. Future B2B, B2C, B2G, and C2G mobile and electronic commerce will develop.

Due to its convenience, promptness, and usability, M-commerce will substitute existing payment methods and play a dominant position in the Electronic Payment System.

Manoharan (2007) in his study focused on e-payments and Indian banking performance. Banks are revamping their operations to compete with fierce competition. The study categorised the Indian payment system as big value, retail, and retail electronic. During this investigation, RTGS was chosen for complete payments, however, most payments are still done using cash. E-payment systems have a lot of room to grow. RBI should enhance the legal framework of electronic banking and promote Electronic Payment Systems.

Ramani (2007) examined the significance of the e-payment system and says e-payments can handle large company payments and transfers. E-payments are paperless, rapid, and hassle-free. RTGS, NEFT, ECS (Debit & Credit), EFT constitute e-payments. The research found that e-payments have increased the usage of core banking, data warehousing, and data mining. E-payment systems have reduced fraud, sped up transaction processing, and enhanced customer service, according to this research.

Theodosios & Georg (2005) conducted a conceptual study to build confidence and security in electronic payments. This report says online transactions need identity, authentication, secrecy, integrity, availability, and non-repudiation. Both sender and recipient must be reliable to deal online, studies say. This research proposes certificate authority and web-trust for electronic payments are needed for appropriate public key infrastructure.

Peffers & Ma (2003) attempted to outline a research agenda on the interplay between payment system features and transaction characteristics in electronic commerce and the influence of this relationship on transaction costs. Convenience, portability, privacy, security, simplicity of use, and network externality impact e-commerce payment systems. New payment systems (C2it, Yahoo! PayDirect, PayPal, etc.) will acquire prominence in the near future and boost online transactions and e-commerce.

Wright (2002) studied about B2B, B2C, and C2C surrogate internet e-payment systems. The author assessed credit cards, e-cheques, and digital cash. This research assessed the pros and demerits of each internet payment method for consumers, retailers, e-payment service providers, and financial institutions. Electronic Payment Systems should eventually outperform encryption to improve security, privacy, and avoid hacking, which is a consumer concern. To overcome this problem, the researcher offered "Off-Net Payments" – Interactive Voice Response System (IVRS), which is more secure than internet-based payments and makes it impossible for hackers to obtain client financial information.

Stavins (2001) evaluated customers' traits on current payment mechanisms. Even as electronic payments expand, paper cheques continue to rise. Young, high-income, white-collar customers prefer electronic payments, according to an empirical study. This report advises enacting regulations to alter cheque use and increase electronic payments.

2.2.3 Online/Internet Payment Systems

Rouibah et al., (2016) in their study, 'online trust' model to determine what characteristics impact consumers' adoption of online payment systems. The research found that fun, familiarity, third-party seals, trust tendency, and personal innovativeness favourably affect trust. Perceived danger reduces trust. Trust and fun are the key reasons people use online payment services, offsetting the risk perception. This research offers several managerial implications that might boost online payment acceptability in Kuwait.

Williams (2013) examined the upcoming US payment system and it concludes that new technical developments will satisfy user expectations such as ubiquity, speed, and convenience, and laws will strengthen the trust, safety, privacy, and security of new payment systems. In this study, the researcher agrees that this development will benefit all parties and modify users' perceptions of new payment forms.

Sahut (2008) investigated the characteristics of the online payment system and its effect on banks by conducting expert interviews. The research of this survey revealed that cost and convenience, in addition to the Internet Payment System's inadequate security, are the primary incentives that motivate people to utilise it. This research demonstrates that the development of the online payment method affects the bank's ability to make decisions and that there is a problem with uncontrolled money in the economy. Enhancing payment security and eradicating cyber fraud would be advantageous for the online payment system, according to the researcher, who proposes that the current system should be modified. This research indicates that in order for an online payment system to be successful, it must be built to fulfil the demands of customers.

He et al., (2007) aimed to experimentally assess online payment adoption determinants. Regression research shows internet business transactions are growing dramatically. Due to paperless operations, online payment systems gained popularity. Web system efficiency and security influence clients' preference for online payment methods.

Lowry et al., (2006) in their work, studied about e-commerce payment gateways. E-credit cards, E-cheques, and E-cash are three forms of online payment solutions. This report says internet payments increase cash flow, efficiency, assured transactions, cost, and data security. Cyber frauds and security concerns are also major difficulties for online transactions. The research concludes that e-commerce will grow, boosting online purchases. For frictionless online transfers, firms should strengthen risk management, fraud prevention, and security (both payments and receipts).

Black (2005) analysed demographic, regional, and economic data in order to predict customers' confidence in online payment. The regression study found that female customers and consumers in rural areas are the least likely to pay online, while consumers with a high level of education and a higher income are more likely to pay online. This study's findings indicate that more Internet exposure and

customer experience have fostered consumer confidence in the security of the online environment, which has led to an increase in online payments.

Novak et al., (2000) created a quantitative methodology to evaluate online consumer experience. The empirical investigation shows that happiness, time spent online, and job-related activities positively link with online customer experience. Researchers say internet information may help customers make better decisions. The research suggests developing commercial websites as a lucrative strategy.

Summary: In recent years, the digital mode of payments is gaining popularity which will replace cash and cheque transactions. This is a cash-to-click transactions era. The previous studies found that portability, ease of use, usefulness, convenience, ubiquitous, and instant transaction are significant factors whereas trust, security, and reliability are insignificant factors for adopting digital payment systems. The researchers suggest that strict legal rules and regulations should be framed to check on cyber-fraud, & data theft, and recommends offering training, creating awareness programmes, and establishing targeted strategies to improve self-efficacy and improve people to access electronic payments.

2.3 MOBILE/DIGITAL WALLET

A mobile wallet is a technique to transfer cash in digital mode, it is a form of virtual wallet service that can be made use of by downloading an app. Users can link their credit card or debit card or bank account information in an encoded format on their mobile device and make payments. Example: Paytm, PayUMoney, Mobikwik, Google Pay, Amazon Pay.

2.3.1 Mobile Wallets

Mate & Kapdi (2021): attempted to examine the significance of digital payments in covid-19 and customer perceptions of digital payment use in covid-19. And the survey indicated that e-wallet use has increased throughout the covid-19 period because it saves time, is simple to use, and is safe and secure while managing currency. In addition, the research revealed that as time passed, several e-wallet applications like Paytm, BHIM UPI, Mobikwik, Gpay, etc. were established.

Singh and Kaur (2020) Analysed the use and degree of satisfaction of Paytm consumers and found that the demonetisation policy and covid-19 had contributed to a rise in public awareness of Paytm. From the comfort of their homes, individuals may make payments and transfer monies to faraway locations with ease. The research indicates that the public should be made more aware of mobile payment applications and associated services. The significant expansion of this sector necessitates the introduction of sales promotion activities such as discounts, reduced service fees, and gifts, etc.

Rao (2020) makes an attempt to explain the e-wallet sector, including its progress and hurdles. The quantity that may be placed in mobile wallets, as well as the dependability and speed of the internet connection, are considered to be hurdles for the development of e-wallets despite their benefits. Mobile wallets contain restrictions on high-value payment transactions. Historically, the banking system including issuers, acquirers, processors, and networks associated to banks operated separately from the payment industry. These systemic actors ought to be heavily involved in creating industry involvement norms and recommendations. Currently, more than 100 mobile money projects are active in emerging economies, with 84% of them starting within the last three years.

Jain, et al. (2020) investigated E-Wallet as an alternative payment tool in the digital world and discovered that increase in the smartphone usage and 3G and 4G internet access are reflected in India's burgeoning payment gateways. It investigates the impact of trust groups on customers' bank selection decisions. This research focused on consumer preferences about payment gateways in relation to fees and hazards and successfully assessed the effect of variety on the use of payment gateways. This survey reveals that young people are primarily considering e-wallets due to their accessibility, transaction simplicity, privacy, and security at the moment of payment.

Vijai (2019) conducted research on mobile wallets and their future in India, and they concluded that security concerns must be improved, which would enhance mobile wallet acceptance and use. Today, everyone has a smartphone, but there is a

need to educate and get acceptability for mobile wallet services that are effortless, extremely private, discreet, safe, and convenient. E-wallet enables customers to conduct electronic commerce transactions in a safe and expedient manner.

Rao (2019) says digital payments have seen remarkable development, innovations, and legislative backing in recent years. Digital wallets are driving digital payment growth. The initiatives done by the GOI to promote digital payments increase cash transparency and limit black money by revealing each person's cash flow. In India, mobile phones are quickly becoming personal electronic devices that provide a variety of functions, including payments.

Crouzet, et al. (2019) examined the 2016 demonetisation of Indian currency and its subsequent impact on the use of electronic wallets, concluded that the demonetisation led to a substantial and sustained rise in the general usage of this technology. And also demonstrates that the cash crisis led to a sustained rise in the adoption rate of electronic wallets by businesses. In situations with complementarities, some of the issues encountered by policymakers were also highlighted by the analysis.

Sujith et al. (2019) investigated youth's perceptions of mobile wallets in Kerala. The study indicated that the respondents had enough knowledge of mobile wallets and mostly used them for bill payments. Educated male respondents used mobile wallets more often than their female counterparts. According to the survey, security concerns, network challenges, and a lack of infrastructure were the primary obstacles to the cashless campaign.

Singh, et al. (2017) studied the consumer preference and satisfaction of M-wallets on North Indian consumers and the result shows a significant association between consumers' perception, preference, usage, and satisfaction. The study also reveals that security, trust, and hedonism are a few of the most influencing factors to adopt M- wallets and demographic variables such as gender and age also influence consumer satisfaction and usage rate of mobile wallets in North India.

Jubair and Yakoob (2017) reviewed the acceptance of digital wallets in Kerala and pointed out that the necessity of proper awareness towards digital wallets among all categories of people to solve the concerns and issues of the present customers. Increased use of smartphones, developments in internet connectivity, and the encouragement of the Government to become cashless etc. have led to the growth of mobile-based electronic payments during the recent period.

Shukla & Bose (2017) stated that the promulgation of demonetisation led to the looming of numerous mobile wallet companies to surge Indians to embrace digital transactions. It is found that corporate, merchants, vendors, Governments, and consumers have started accepting and adopting digital transactions for their various amenities. Multiple banking apps and mobile wallets have been developed to promote digitalization. Digital payment systems include credit/debit cards, e-wallets, UPI, USSD, AEPS, BHIM, and Internet Banking (NEFT, RTGS, ECS, IMPS) all these ensure speedy transactions. This study revealed that apps, e-wallets, and cards will certainly help people to make digital transactions in a simple and convenient manner. It is concluded that digitalization will elevate the banked population in the country, which will eventually lead to the country's economic growth and development.

Yadav (2017) argues that smartphones are an integral element of one's life and it is an expedient device for performing digital payments. This study has found six factors (i.e., perceived –the quality of service, risk, usefulness, cost, ease of use, and trust) from past studies which induce consumers to adopt mobile wallets. The researcher has empirically examined and validated these factors and reported that perceived usefulness has significantly influenced consumers and gained a positive impact on the adoption of mobile wallets.

Yurcan & Bank (2012) noticed that mobile wallets are now available across the board and use contactless payment technologies such as Near Field Communications (NFC), Wi-Fi Network capabilities, Europay MasterCard & Visa (EMV), scanning of Quick Response Code (QR Code) and Bar Code, allowing consumers to pay at Point-of-Sale (POS) terminals. For customers to embrace

mobile wallets, incentives, subsidies, and discounts are desired. Globally, mobile wallet firms are proliferating, and telecom operators are launching wallets to facilitate mobile wallet transactions. The analysis emphasises that mobile wallets will dominate other payment methods in the near future.

2.3.2 Digital Wallets

Bagla & Sancheti (2018) in their innovative work, identified digital wallet consumer satisfaction gaps. Rewards, cash-back incentives, fast transfers, etc. influence digital wallet adoption but trust and security limit it. The findings show a mismatch between client satisfaction and expectations, a key hurdle for digital wallets. Researchers advise improving security standards and giving interest in digital wallet deposits to encourage people to use them.

Brahmbhatt (2018) reported that people are aware and willing about online payments through E-wallets and there is a tremendous increase in growth rate after demonetisation. Word to mouth publicity has a higher impact on information spread compared to other methods such as advertisement on social media, magazines, TV, and Government promotion. So, this study recommended that companies and Governments both should create awareness by organizing seminars about a cashless society.

Capachin (2001) predicted that if wireless shopping becomes popular, digital wallets will be used. Digital wallets include features like auto-filling forms and password recognition for price-conscious Internet shoppers and security-conscious cardholders. This research indicated that form filling is difficult on desktops and tiresome on mobile phones, therefore if mobile commerce succeeds, users would favour digital wallets. The study says there's no indication digital wallets will enhance transaction volume or cardholder loyalty. Digital wallets have increased value for users and profit prospects for financial institutions by enabling inexpensive maintenance and security.

Dhapola (2015) examined the growth of mobile app payments or digital wallets. Smartphones are used for everything nowadays. Digital wallets have

transformed our mainstream payment system, and several applications encourage them. The analyst agrees that digital wallet acceptance has risen and says firms must understand consumer needs to survive in the industry. This research suggests that India's digital wallet is growing with e-commerce and there is room for expansion in the future.

McGarvey (2013) in the research found that the industry is very dynamic and fragmented, and it would take customers some time to adjust to digital wallets. Convenience, safety, trust, dependability, and security all play a significant part in the acceptability of digital wallets. Financial organisations are competing to achieve technological success by assuring users that digital wallets would facilitate easy and secure transactions. It predicts that digital wallets would be adopted at a modest rate and concludes that 'digital wallets will happen' People will make all of their mobile payments using just 5 to 10 applications.

Austin (2013) reported that smartphone development is imminent and that its usage would continue to expand and supplant the necessity for other items. Credit cards, debit cards, loyalty cards, coupons, and cash are all stored in a digital wallet of a smartphone application, which facilitates transactions with a single swipe or tap at the point-of-sale of brick-and-mortar stores as well as with a single click on an online store, according to the researcher. This research demonstrates that a digital wallet is a combination of software and data that stores users' information, which is subsequently used to conduct wireless financial transactions. This research concludes that since digital wallets provide simple, safe, and instantaneous transactions in both online and offline businesses, consumers will eventually use them.

Shrivastav (2013) observed that digital wallets are now assuming a prominent place in the payment business, allowing instantaneous money transfers and receipts. This research demonstrates that a digital wallet is a crucial method that safeguards the saved information and password for both online and offline transactions. It lets buyers do transactions with anybody, from anywhere, and at any time; sellers benefit from assured payments, and it gives businesses a competitive

edge. The study believes that digital wallets should try to facilitate non-financial transactions, such as interoperability, identification, and the provision of value-added services, as well as recognise and reward loyal consumers. The researcher believes, based on the findings of this study, that the future of digital wallets will boost the client base and pleasure them. This research finds that the future generation of wallets will include a complete range of financial transactions, hence enhancing the consumer experience.

Short (2000) identified that new models of digital wallets, web-based payment systems, and online payment services seem to provide customers, content suppliers, and Internet service providers with a win-win situation (ISP). Using online payment services for e-commerce is a handy option for customers, according to this survey. Consumers are more confident in their Internet service provider (ISP) as privacy and security concerns are being addressed. Additionally, this research found that the current models perform well for B2C transactions. To facilitate business-to-business interactions, these models need to be developed and evolved. Conclusion: Internet payment services will be widely accepted by consumers and companies in e-commerce in the near future, according to the author.

Summary: The previous studies regarding digital or mobile wallets highlight that smartphone are an integral part of one's life in this era and especially mobility & usefulness are the two major factors that drive consumers to adopt digital wallets. It also found that there is a gap in the satisfaction and expectation level of customers. Understanding the customers' expectations and providing their requirements will enhance the usage of digital wallets in the near future.

2.4 ELECTRONIC/DIGITAL/PLASTIC (SMART CARDS) MONEY

2.4.1 Banking Cards (Debit/Credit/Cash/ Travel/Others)

Cards are issued by banks to their customers to perform a number of financial transactions for in-store and online store dealings. Example: MasterCard, Visa, Rupay.

Kumari and Pavithra's (2018) in their research demonstrate that users are quite knowledgeable about debit cards, that digital payment systems are widely utilised for utility payments, and that transaction fees are the most influential element in favouring digital payment systems. The research indicates that more work needs to be done to enhance its utilisation. Service available 24 hours a day, seven days a week, convenience, and safety all contribute to the improvement of the digital payment system.

Bama & Gunasundari (2016) looked at the current state of plastic money and its potential for the future in a conceptual study. Plastic money is becoming more popular owing to its many benefits, according to this study. For both in-store and online purchases, these plastic cards are a great option. In order to remain competitive, banks are increasingly turning to technology-intensive delivery channels (such as the internet and mobile banking) to lower operating costs, improve productivity and efficiency, and provide a better client experience. Recently, digital transactions have been steadily increasing in popularity, and this trend is projected to lead to a cashless society in the near future. There must be a simple, smooth, safe payment procedure in order to encourage the use of plastic money and digital transactions among unbanked individuals.

Ooi & Tan (2016) analysed mobile users to determine the prevalence of smartphone credit card use. The empirical investigation found that mobile payment compatibility and use are crucial for mobile payment uptake, however security risk and trust are minimal. The ramifications for the parties engaged in smartphone credit card transactions have been examined by academics. This research forecasts that if customers have faith in bankers, merchants, and technology, smartphone credit card payments would ultimately increase in popularity.

Koivunen & Tuorila (2015) examined the link between customers' faith in banks and payment cards. Until a problem emerges, people have faith in banks and payment cards, according to the research findings. Only in the event of a disaster does customers' confidence convert to mistrust, as banks place the responsibility on them and reject reimbursement. Thus, it can be inferred that customers' carelessness

and technology-related concerns drive them to mistrust banks and payment cards since they are the victims in both instances.

Angel & McCabe (2015) examined the development of payment methods such as barter, coins, cash, cards, ACH, internet transfers, and bitcoins. According to the experts, there are several ways of payment systems, each with its own advantages and disadvantages, as well as varying costs and benefits for both payer and payee. This paper asserts that the modernisation of payment technology should also include ethical considerations in addition to fees, security, and privacy.

Sullivan (2014) studied payment card concerns and presented strategies to limit fraud and dangers. This report says that although payment methods are improving, scams restrict client utilisation. Hackers and fraudsters falsify end-user cards and PINs. The study believes that the payment sector should tighten security systems, regulate risk, and prevent fraud to secure payment information, which would eventually promote card payments.

Bergevin & Zywicki (2012) found that Canadians prefer debit cards and cheques to pay. This research indicated that Canadians lag behind other industrialised nations in cell-based payments. The researchers advised that regulatory frameworks should be explicit and reveal common requirements to enhance digital payment adoption. The Canadian Payment System's technology and infrastructure should be well-developed to meet the needs of an expanding global economy and contemporary global payment systems.

Chandio (2012) analysed debit card usage empirically. People buy using debit cards. according to an evaluation, the result says that They prefer debit over credit cards at the register. The study also notes that debit cards have replaced cheques and credit cards, benefiting users. This survey also revealed that debit card usage is expanding since it's generally accepted by consumers and may be used at ATMs and point-of-sale to make transactions.

Wonglimpiyarat (2007) focused on smart-card e-cash transactions and explored business methods to harmonise banks, customers, and IT. Lack of

coordination among organisations to introduce smart-card e-cash is its biggest impediment, according to the study. Smart-card development should integrate business and technology strategies. The study suggests the Government control smart-card e-cash payment schemes.

Sullivan (2008) examined smart card use in the U.S and it explains how smartcards function, security requirements, and transaction processes. The study advises that enterprises should promote smartcard payments and improve smartcard security to reduce data theft, and fraud, and increase smartcard transaction numbers and quality.

Stoneman (2001) found that MasterCard International is pursuing wireless payments from many angles. They've worked with phone makers, network operators, and financial institutions to make MasterCard Payment wireless. This research discovered three ways to manage wireless payments: (i) mobile phones with card readers, (ii) a chip containing cardholders' account information on mobile phones, and (iii) electronic wallets. In all 3 methods, customers must authenticate payments. MasterCard's wireless efforts include the Global Mobile Commerce Interoperability Group to improve safe wireless payments. This research predicts that wireless payment systems would be pervasive and attract consumers to digital payments.

Summary: These studies state that besides credit and debit cards, smart cards will supersede cash and cheque transactions. The card details can be stored in the mobile phone which is used to make payments for brick-and-mortar stores and also for online stores instantly. The previous studies suggested that the creation of trust, security, low service charge, and interoperability will boost the usage of cards for payments.

2.5 ELECTRONIC/DIGITAL/INTERNET/ONLINE BANKING

Internet banking refers to the process of carrying out banking transactions online. These may include many services such as transferring funds, opening a new fixed or recurring deposit, closing an account, etc. Internet banking is also referred

to as e-banking/online/virtual banking. Internet banking is usually used to make online fund transfers via (NEFT, RTGS, and IMPS)

- National Electronic Fund Transfer – Bank customers can transfer funds to other accounts electronically and are maintained by the Reserve Bank of India.
- Real-Time Gross Settlement – Usually for high-value online transactions this system is being used and is maintained by the Reserve Bank of India.
- Immediate Payment Service - It is a prompt real-time and inter-bank electronic funds transfer system in India and is managed by the National Payments Corporation of India (NPCI).

2.5.1 Digital Banking

Gupta (2017) analysed the progress of the Indian Banking System from traditional to convenience (cash to click) mode. This research examines banking system trends using secondary data. This paper explains digital banking kinds, benefits, and drawbacks. The researcher noted digital banking's problems. In this study, the researcher advises educating individuals to utilise digital systems to increase the use of digital banking transactions.

Yeremenko & Rudskaya (2016) explored Russian financial advances in a conceptual study. By using theoretical foundations, they explained digital banking, or developments in banking, payment systems, and mobile banking. The experts said banks should use state-of-the-art technology, offer safe services at affordable costs, and boost consumers' loyalty to online services to encourage them to adopt contemporary banking technology.

Berndt et al., (2010) examined consumer's preparedness for new banking technologies. This survey indicated that optimism and innovation are essential drivers for consumers' technology readiness index, while discomfort and insecurity are barriers. The majority of respondents are accepting and implementing contemporary technology. Therefore, banks should educate their consumers and enhance their services to meet their demands.

2.5.2 Internet/Online Banking

Ingle & Pardeshi (2012) described online banking in India and outlined its pros and cons for banks and clients. For banks, benefits include cost-effectiveness, improved customer service, greater income, and competitive pressure. For consumers, benefits include convenience, rapid transactions, ubiquity, etc. For banks, downsides include complexity and technical problems. For clients, disadvantages include delays in online registration and a lack of confidence. This research proposes that banks should educate clients on the benefits of online banking to encourage them to use it.

Uppal R.K (2011) evaluated Internet banking for consumers and banks. Internet banking is the leading surrogate media for rapid, hassle-free, effective, and efficient service whenever and wherever, according to the report. In the present technological age, thorough automation of banking processes is vital for all banks to capture more consumers; banks must concentrate on dynamic customer service to thrive in the increasingly competitive market. This research found that international banks are more prominent than private sector banks in delivering Internet Banking services to their consumers and have higher profitability than other banks. Training and awareness programmes will increase online banking use among users, particularly in rural and semi-urban areas, says the study.

Hua (2009) investigated Chinese consumers' acceptance of internet banking and reveals that the acceptability of online banking positively affects perceived ease of use and privacy policy, and security is the dominant factor determining online banking adoption. Perceived usage, privacy, and security influence online banking acceptance. This research discovered a link between internet shopping and online banking. The report says e-commerce includes online buying and banking. Once privacy and security concerns are alleviated, internet banking use will rise rapidly, according to this research.

Geetika & Ashwani (2008) researched online banking's ideas, challenges, and prospects and assessed users' and non-users' perceptions. This study found that clients prefer online banking for its convenience, quickness, and rapid transactions.

Safety, security, service prices, trust, and privacy are concerns of non-users. Security concerns impede online banking. The researchers found that superior, cost-effective banking services with sufficient security rules would encourage users to use online banking.

Yiu et al. (2007) aimed to determine online banking's current use rate and adoption variables. Internet banking usage is significantly linked to perceived utility, marginally linked to perceived ease of use and perceived danger, and weakly linked to personal IT innovation. Based on the study's findings, the researcher suggested that banks create services to increase client online banking use.

Sharman & Kirsty (2006) assessed consumers' online banking uptake. In this study, researchers conceptualised and linked consumer-oriented factors influencing online banking uptake. This survey shows that more men than women utilise online banking. This survey found that online banking is convenient for users, while non-users are concerned about security, privacy, technical understanding, and trust. Researchers advocate training and focused interventions to boost women's digital self-efficacy and internet banking. This research implies banks may control user experiences by upgrading online environments and creating internet banking technologies.

Awamleh & Fernandes (2005) wanted to know what factors influence UAE customers' decision to use online banking. The research found that customers' happiness with online banking is influenced by convenience, security, and independence. It says online banking in UAE is in its infancy, thus design, infrastructure, and interface should be improved and people should be incentivized to use it.

Laforet & Li (2005) examined Chinese customers' attitudes regarding online and mobile banking. This survey found that Chinese customers were driven by security rather than convenience, simplicity of use, or anytime-anywhere banking. Lack of computer skills, risk perception, and cash habits hampered internet banking. Lack of awareness and information regarding mobile banking's advantages

hampered adoption. Researchers propose bankers promote online and mobile banking via advertising and other channels.

Suh & Han (2002) studied the variables that influence Internet banking acceptability and the result shows that despite the growth of e-commerce, some consumers remain scared to provide personal information online. They introduced trust in a research model. Trust is one of the most important criteria affecting consumers' adoption of Internet Banking, followed by perceived utility and simplicity of use. Perceived utility, simplicity of use, and trust are substantially connected to online banking behaviour. This survey shows that consumers trust the web with their personal information.

Vichuda & Ekin (2001) investigated Turkish consumers' adoption of online banking. This research studied consumer and organisational variables affecting online banking uptake. Access, dependability, and savings are vital for customer happiness, while marketing and competitiveness are important for businesses. Banks must properly manage customer complaints to avoid customer migration. Internet banking decreases bank operational costs, improves client happiness, and helps keep consumers.

Tan & Teo (2000) assessed variables impacting Singapore's online banking uptake. Attitudinal elements including relative benefit, compatibility, and perceived complexity had a substantial impact on the desire to use online banking. Subjective norms had little effect. Self-efficacy and Government assistance are key for online banking uptake, say consumers.

2.5.3 Electronic Banking

Keivani et al., (2012) made a theoretical analysis of the current and future developments in electronic banking. As per the study, clients may do their financial operations online without visiting the bank. This research indicates that the usage of electronic banking will reduce opportunity costs for banks and that the number of electronic banking users is restricted owing to a lack of technical understanding and confidence. They recommended that the Government and banks educate clients via

campaigns and bolster the security system in order to increase user confidence in electronic banking.

Robbins (2010) investigates consumer attitudes toward the adoption of e-banking and new payment products. The findings reveal that customers have a favourable view of online banking. Users are influenced by four factors: convenience, familiarity, privacy, and security. The study recommends that banks should expand their e-banking strategies and strengthen consumers' attitudes by fostering confidence in security concerns, which would assist to increase the number of customers who use e-banking goods and services.

Cai et al., (2008) in their study aimed to analyse US consumers' attitudes and use of e-banking. Their research found that customers (users) are heavily persuaded to use e-banking owing to its perceived benefit, but the perceived disadvantage is the primary factor preventing consumers (non-users) from adopting e-banking services. The researchers suggested that steps should be taken to reduce security and privacy concerns, as well as various strategies such as educating consumers, raising their awareness, and informing them of the benefits, such as the usefulness and convenience of the new technology of e-banking, in order to increase the adoption of electronic banking services.

Roberta et al., (2008) analysed the evolution of e-banking and payment systems in an idealistic study. This research has investigated the legal and regulatory framework necessary for the delivery of banking services and electronic payments. It has also provided a detailed explanation of the development of technology and market growth. The researchers also determined that new regulations should be drafted for minor transactions, with a special focus on the development of Gift Cards. These alterations will be daunting for attorneys, retailers, and customers. The researchers agree that these improvements to the legal and regulatory environment will facilitate the development of safe electronic financial transactions.

Yousafzai et al., (2003) reported that clients were hesitant to embrace e-commerce owing to trust and risk concerns, the researcher sought to examine the trust and risk components of e-banking. The researchers discovered that customers'

perceptions of security and privacy are the primary determinants of their trust. In addition to honesty, competency, and altruism, the research identifies integrity, competence, and kindness as additional trust characteristics. The conclusion is that the consequence of trust is anticipated to reduce risk, which has a beneficial influence on the adoption of e-banking.

Howcroft et al., (2002) analysed customer attitudes regarding novel financial service delivery channels and discovered characteristics that favour and hinder the adoption of home-based banking. This research suggests that people are eager to acquire financial services through an "arm's length channel," i.e., telephone banking is emphasised more than online banking in the United Kingdom. The findings of this research indicate that cheap cost, service quality, time savings, and round-the-clock services are encouraging elements for the adoption of telephone home-based banking, but security, mistakes, and the absence of face-to-face interaction are discouraging aspects. They suggested that developing error-free services that give value for money, convenience of use, and promptness would encourage customers and grow the consumer base for the adoption and use of home-based banking.

Liao & Tow (2002) investigated the views of customers concerning e-banking. The empirical investigation found that attitudes such as user-friendliness, user participation, ease, correctness, transaction speed, and security motivate customers' perceptions of a product's utility. The regression analysis demonstrates that these variables have a substantial impact on customers' propensity to utilise an electronic banking system. Based on the findings of their study of customers' attitudes about e-banking, the researchers have also provided advice and implications for users and bankers.

Wenninger (2000) discusses the role of banks in the age of e-commerce, which is growing in popularity due to its ease. Since bill payments and receipts are processed electronically, banks play a significant role in the electronic marketplace. Electronically, typical financial services are given with a single click. The study believes that banks face both strategic and operational risks. To remain competitive

and do business in the electronic marketplace, banks must continually monitor the changes, build new information systems, and provide their services in a cost-effective way.

Summary: The prior studies related to online banking points out that it is convenient and easy for making high-value transactions instantly. This reduces the manual errors and workload of bankers. The recommendation is that banks should update to state-of-the-art technology, create awareness and educate the customers to use online banking services. Suggestions are to improve network availability and security systems which will minimize cyber frauds, so this will generate trust among the present and potential users which will certainly help to boost the online banking adoption by the people.

2.6 MOBILE BANKING / MOBILE PAYMENT SYSTEMS (MPS)

Mobile banking or MPS is termed as the process of performing financial/banking transactions with the help of a smartphone. The scope of mobile banking is growing with the launch of many mobile wallets, digital payment apps, and other services like the USSD, and UPI. Most of the banks have their own apps for Android, Windows, and iOS mobile platforms and customers can download the same to perform their banking transactions at the click of a button or by a touch of an icon, or just by scanning the QR/Bar Code, or by tapping.

Jaiswal (2020) examined the future of mobile-based payments for Government services in India and concluded that low levels of literacy pose a challenge for mobile payments. This system must improve transaction usability, cost, efficiency, interoperability (Meaning), and security. The availability of low-priced mobile phones is also a significant concern (m-bank).

Verma & Manrai (2019): investigated the elements that contribute to the acceptability and use of mobile banking services in India, as well as the end users' perceptions of these aspects. The survey indicated that the ease of use of mobile banking services is the most influential element. Time savings, cash backs, and

discounts, as well as security, are other advantages that entice consumers to prefer digital mode transactions.

Dinh et al., (2018) analysed the elements that encourage customers to adopt mobile payments and presented strategic recommendations for promoting mobile payment systems. This survey identifies perceived usefulness, social acceptance, promotional incentives, and convenience as the primary motivators for utilising mobile payment systems. Customers' reluctance to use mobile payment methods is mostly attributed to a lack of confidence, limited usage options, complexity, and habits associated with cash transactions. This research suggests that mobile payment service providers and their partners should engage in integrated marketing communication in order to enhance the customer experience and encourage the adoption of mobile payment systems.

Kerviler & Demoulin (2017) investigated the uptake of mobile payments by consumers for in-store transactions. This research demonstrates that intent to utilise mobile payment has a favourable effect on perceived advantages and a negative effect on perceived hazards. This research proposes that utilitarian, hedonic, and social aspects should be prioritised to make in-store mobile payments joyful and to increase consumers' propensity to use mobile payments for in-store transactions.

Upadhyay & Jahanyan (2016) performed a unified investigation to discover the influencing elements and experimentally validate those aspects. This research discovered that major aspects include perceived utility, usability, system quality, connection, task-technology fit, and structural assurance. In contrast, characteristics such as monetary value, absorption capacity, and individual inventiveness have little effect on mobile payment systems. The service providers must engage with Government agencies to increase institutional authority and patronage in order to increase the acceptance and adoption of mobile transfers. This research found that, in addition to service provider support, the convenience interface with a credible and compelling value proposition is likely to increase mobile money service uptake.

Dastan & Gurler (2016) recommended identifying the variables influencing the adoption of MPS and analysing how these aspects affected customers' desire to utilise Mobile Payment Systems. According to the experts, mobile phones have been widely employed for e-commerce in recent years. The empirical investigation revealed that perceived trust, perceived mobility, and attitude have a favourable impact on the adoption of MPS, but perceived usefulness and perceived ease of use had a negative impact. In addition, this research found that reputation is favourably connected with perceived trust, but the environmental risk is inversely associated with perceived trust. This research concludes that mobility, among other things, has significantly inspired customers' propensity to use MPS.

Bezhovski (2016) tried to identify the elements influencing consumer adoption of mobile payment systems, as well as to analyse the current situation and propose growth strategies for mobile payment systems. It has been shown that e-commerce penetration has encouraged customers to adopt mobile payment methods for their routine online and in-store transactions. The growth of mobile payment systems has been facilitated by the development of Information and Communication Technology (ICT), and customers have developed a habit of using mobile payments for their own advantage and convenience. The results also imply that the use of modern technology, the establishment of appropriate standards for service providers, and the resolution of security, authentication, and privacy concerns might contribute to the expansion of the user base and hasten the acceptance of mobile payments. According to the study, mobile payment systems have a bright future and may even outperform current payment options.

Abrahao et al., (2016) assessed the Brazilian consumer’s desire to embrace mobile payment systems and identified that mobile payments were in their infancy throughout the research, the perceived cost element was removed. The empirical result of their study indicates that perceived risk was negatively associated with the behavioural intention of consumers regarding the adoption and use of technology for mobile payments, whereas performance expectation, effort expectation, and social influence factors were positively associated.

Staykova & Damsgaard (2016) in this case study technique tried to analyse the tactics used by providers of mobile payment services to strengthen their platform and supply continuous services. Despite the growth of smartphones, it was discovered that the mobile payment platform is still in its infancy. In order to increase the use of mobile payment systems, the investigation found that service providers must control the reach and scope of their platforms. This research indicates that mobile payment systems should begin with a single-sided platform and then gradually transition to a two-sided or multi-sided platform. The success of mobile payment systems is dependent on the capacity to increase the number of participants, the features and functions of their platform.

Yang et al., (2015) aimed to examine how uncertainty affects mobile payment acceptance. The empirical research found that financial, privacy, and performance risks reduce the perceived value and acceptance intent of mobile payments. This study found and validated the key elements of perceived risk, including technology uncertainty, information asymmetry, regulatory uncertainty, and service intangibility. The perceived value affects consumers' mobile payment acceptance intentions. The researchers also advised that MPS developers and facilitators educate customers on knowledge and operation skills, inform consumers of connection concerns, and help promote mobile payments. These approaches may lower the risk perception that hinders mobile payment uptake and improve customer sentiments about mobile payment systems.

Dlodlo (2015) analysed the utilisation of mobile payment services in an empirical study. The findings reveal that the association between value, trust, contentment, and desire to continue using mobile payment is favourable and extremely significant. Therefore, it is evident that financial institutions, service providers, and mobile network operators should collaborate to strengthen the mobile payment system, therefore increasing the degree of user satisfaction and, ultimately, the demand for mobile payment services in the future.

Shin et al., (2014) investigated the attitude and preferences of smartphone users in the United States and Korea regarding mobile payments. This research

discovered that U.S. customers engage in mobile purchasing more than Korean consumers engage in mobile banking. The regression analysis demonstrated that all variables (cost, security, and convenience) had a substantial impact on mobile payment use intentions. The researchers emphasise that security is a significant element driving customers in both nations to use mobile payment systems often.

Padashetty and Kishore (2013) studied about the consumer adoption of mobile payments in Bangalore city and found that Perceived Use, Trust, Expressiveness, and Perceived Ease of Use play a crucial role in facilitating the adoption of mobile payment. The customers consider Mobile payment is considered useful because of the time it saves and for a single point of purchase and payment. The study recommended that there is a need to build confidence among people about the safety and security of new inventions.

Zhong et al., (2013) conducted an investigation by expanding the UTAUT model and experimentally validating it by surveying Chinese respondents. The findings reveal that the adoption of mobile payments by Chinese customers is heavily driven by compatibility and connectivity, followed by utility, usability, security, and habits. The researchers also anticipate that MPS's enhanced compatibility and utility will drive customer demand.

Hamdi (2011) examined mobile phone technology and the influence of mobile payment technologies on less developed countries' financial sectors. Mobile phones have progressed from basic communication devices to sophisticated contactless payment gadgets, and are needed by both the rich and the poor. Mobile phones are supposedly the most essential instrument for building a new financial system and narrowing the wealth gap. Mobile phones let customers, businesses, and banks transfer real and virtual money. Even unbanked people have mobile phones; therefore the mobile payment system encourages financial inclusion for the poor. This study suggests that mobile phones will transform the economies of developing countries.

Chandra et al., (2010) analysed the trust-theoretic model of mobile payment system adoption by consumers. Mobile Service Provider and Mobile Technology

Environment are two comprehensive trust criteria presented by the researchers. This research established the predicted trust facilitators, which are perceived repute and perceived opportunism for mobile service providers and perceived environment risk and perceived structural assurance for mobile technology environments. In addition, the empirical analysis of this study demonstrated that among other variables influencing the adoption of technology, customer faith in mobile payment systems has a significant ambient impact.

Schierza et al., (2010) tried to determine the elements affecting customer adoption of mobile payment services. They developed a research model based on the theoretical notions and performed a large-scale survey to experimentally validate the model. This research indicated that perceived compatibility has a significant influence on customers' intentions to utilise mobile payment systems. Mobility and Subjective Norms are the primary factors that influence customer adoption of mobile payment services. In addition, the researchers found a correlation between the adoption of mobile payment systems and perceived danger and security. Therefore, service providers should focus on these aspects when introducing mobile payment services in order to promote and expand their usage. The conclusion of this research is that mobile payment services are projected to grow in importance in the near future due to the widespread use of smartphones and technological advancements.

Nath & Chen (2008) tried to uncover the factors that influence mobile payments. This research found that there are two types of mobile payments, namely cellular and contactless mobile payments. The empirical research found that compatibility is extremely influential, transaction speed and convenience are somewhat influential, and security and privacy concerns are very influential on customers' intentions to embrace m-payments. In addition, the researchers discovered that customers' willingness to embrace m-payments is strongly correlated with their digital lifestyle characteristics, as opposed to their demographic characteristics. This research concurs that cellular and contactless m-payments should be merged into a single device in order to increase m-payment usage. This research suggests that m-payment transaction speed should be increased, the m-

payment procedure should be streamlined, and privacy and security concerns should be emphasised to increase the use of m-payments.

Bossuyt & Hove (2007) in a comparative study about the carrier-centric model and the payment service provider (PSP) model and found that both of these models have a number of advantages and disadvantages, and they, therefore, proposed a hybrid model – a mediated model in which the carrier-centric and payment-service provider models can be collaborated to correlate their advantages and overcome their disadvantages. This mediated model will provide Next-Gen MSPs with natural good fortune toward a more complicated and dynamic relationship. This research reaches the conclusion that the model will meet the requirements of Next-Gen MSPs and give a clear value proposition for their new products in order to attract and retain clients.

Tomi et al., (2003) reported that the technological acceptance model (TAM) with a trust construct to propose a model based on the characteristics that influence consumer adoption of mobile payment systems. The data shows that customer adoption of mobile payments is primarily influenced by two factors: trust and security. The study observed that effective restrictions on mobile wallets and mobile certificates would encourage customers to use MPS and increase the acceptability of mobile payment systems.

Hezerberg (2003) examined the process of mobile payment transactions and analysed the advantages and disadvantages of the mobile payment system. By approving a transaction, mobile devices will be utilised to conduct secure financial transactions, according to this research. The study forecasts that the technology will advance to the point where banking, payment, and all other financial transactions will be conducted through a mobile device, which was before impossible or even unimaginable.

Summary: Previous research determined that Mobile Payment Systems (MPS) are practical, have a favourable influence on usefulness, and have a negative impact on dangers. To attract customers to MPS, it is suggested that the security

aspect and trust factor be strengthened. Compatibility is the driving force behind client adoption of mobile payment.

2.7 OTHER PAYMENT SYSTEMS

2.7.1 Near Field Communication (NFC)

Near Field Communication is a system that supports short-range communication for wireless payments with high frequency. This is a communication between two devices when they are close to each other.

Lee et al., (2015) the model was developed and experimentally verified by the researchers. The statistical research found that the influential element for perceived NFC benefits is utility, whereas the influential component for perceived NFC risks is universality. And subsequent investigation found that the perceived advantage has a favourable impact on the intention to use NFC, but the perceived danger has a negative effect on the acceptability of NFC-based MPS.

Shin & Lee (2014) combining the technology acceptance model and technological readiness model, the researchers performed a study to assess the adoption of NFC payment. The empirical findings indicate that innovativeness, optimism, discomfort, and insecurity are relevant components for perceived ease of use. And the main constructs for perceived usefulness are responsiveness and intelligence. The findings also indicate that perceived usefulness and perceived usability have direct and indirect effects on the acceptability of NFC mobile payments, respectively. This research asserts that the convenience aspect of NFC technology must be improved in order to achieve widespread acceptance of NFC-based payment systems.

Go et al., (2012) identified the problems associated with NFC-based payment systems and provided a remedy. The researchers analysed NFC concerns such as eavesdropping, duplication, counterfeiting, verification, security, and shoulder surfing rigorously and showed their existence. Consequently, this research offered a gyroscope-based approach for validating an NFC-secured transaction using a signature generated by swiping a mobile device. The researchers suggest that

increasing the security and effectiveness of NFC-based mobile payment systems will attract a larger user base.

Summary: The previous studies highlighted that a Near Field Communication (NFC) based payment system is comfortable and user-friendly, and concur that authentication is necessary. The signature-based transaction will enhance security and improve the efficiency of the NFC – mobile-based payment system.

2.7.2 Point of Sale (POS)

Point of Sale (PoS) terminals signified those devices that were mounted in all stores where customers make the payment for their purchases by swiping/scanning/tapping the credit/debit cards. With digitisation, the scope of PoS is enhancing and this service is also offered on mobile platforms and via internet browsers by scanning Bar or QR codes. There are various types of PoS terminals such as:

- Physical PoS terminals are the ones that are available at shops and stores.
- Mobile PoS terminals can work on smartphones. This is advantageous for small-scale business owners as they do not have to invest in expensive electronic registers.
- Virtual PoS systems practice web-based applications to process payments.

Michal et al., (2010) studied the time consumers spend at the point-of-sale for different payment options and offered improvements. The empirical investigation indicated that cash is still the quickest and hassle-free payment option, while other methods take roughly 20 seconds. This research proposes that the for POS payment method to advance, transaction time and costs should be lowered, which would benefit users and encourage cashless payments. Previous research shows it's important to lower POS terminal wait times and transaction costs.

Summary: The studies relating to POS are very limited. The previous article stated that the POS terminal needs to reduce waiting time and transaction costs for improving customer satisfaction.

2.7.3 Aadhaar Enabled Payment System (AEPS)

In the case of AEPS, absolutely there is no need to physically visit a branch, provide debit or credit cards, or even make a signature on a document. Fund transfers are made with biometric authentication, using an Aadhaar number which is linked to the users' bank account. This service can only be availed if a person's Aadhaar number is linked & registered with the bank where they hold an account.

Chiraag (2013) explains the benefits and drawbacks of Aadhaar-based banking and payments. This research shows that attaching Aadhaar cards to bank accounts has promoted financial inclusion by connecting unbanked and underbanked individuals. Biometric authentication prevents fraudulent transactions, according to the study. With Micro-ATMs, AEPS offers interoperable systems and anytime-anywhere banking.

Summary: The studies relating to AEPS are very limited as it is a recent innovation in the payment sector and not that very popular. The previous article stated that AEPS is suitable for the illiterate, unbanked, and underbanked population and this also boosts financial inclusion in the country.

2.7.4 Micro ATMs

Micro ATMs Business Correspondents (BC) use the micro-ATM device to deliver basic banking services which are connected to banks across the country. This platform will enable Business Correspondents to conduct instant transactions and enables banking services at low cost. This device will be based on a mobile phone connection and would be made available at every BC. The micro-ATMs supports basic banking transaction like deposit, withdrawal, fund transfer, and Balance enquiry.

Visionteck (2013) examined the characteristics, advantages, and effects of Micro-ATMs. In the interior of the nation, setting up an ATM counter for low-value transactions has proven to be expensive for banks. Therefore, the Government proposed installing Micro-ATMs in rural areas of the nation. Using aadhaar cards, micro-ATMs let users make payments, withdraw cash, check account balances, etc. This investigation also discloses that micro-ATMs enable contactless cards, that online and offline transactions are possible, and that biometric technology is used for authentication. Micro ATMs are a novel means of payment, hence there has been few research conducted on them.

Summary: There are only few studies conducted on micro-ATMs. The previous studies discloses that micro-ATMs lower the cost of setting ATM counters for low-value transaction and it enables contactless cards, that online and offline transactions are possible, and that biometric technology is used for authentication.

2.7.5 Unified Payments Interface (UPI)

UPI is a form of interoperable payment system through which a customer holding any bank account can send and receive money through a UPI-based app. UPI is a system that controls numerous bank accounts into a single mobile application (of any participating bank), combining several banking features, unified fund routing & merchant payments under one veil.

Chawla, et al., (2019) investigated the awareness and adoption of the Unified Payments Interface (UPI) for digital payments. They discovered that the degree of knowledge is a crucial role and that cash and cards are, on average, the most favoured means of payment. Although the use of digital payments by individuals of all ages has expanded dramatically, more education is required, particularly in the realm of UPI. The frequency of digital payments is greatest for those under 40 and lowest for those over 40.

Tungare (2019) conducted a detailed analysis of customer insight towards UPI (Unified Payment Interface) as a Mobile Payment System and found that it was well-approved by youthful service industry clients. There are considerable

differences between male and female clients in the adoption and usage of UPI, according to the report. The use of smartphones, the availability of an online verifiable identity, universal access to banking, and the introduction of biometric sensors in phones will actively encourage UPI Transactions, and findings indicate that the respondent has a positive attitude toward UPI transactions as a means of ushering in a cashless society in India.

Tiwari and Singh (2019) advocate that firms such as Paytm and BHIM need to understand the elements that influence user satisfaction with cashless payment systems in India. In India, the exponential expansion of cashless payment firms may be attributed to the increased use of the internet, smartphones, and the Government's extensive efforts to promote digital payment. This analysis suggests that BHIM is a far more secure platform than Paytm since it is Government-owned.

Komirisetty & Simha (2018) evaluated Paytm's development in India as a digital payment platform and concluded that Paytm is one of the top technological innovations of the twenty-first century and aids in Time usage. Paytm is the greatest example of a company that has used internet business advertising to create its brand image in the face of fierce competition.

Kakade & Veshne (2017) analysed the characteristics, advantages, problems, and operating processes of UPI. They added that UPI is in its infancy and that NPCI is creating applications for iOS, Android, and Windows users. This research concluded that there are no fees associated with UPI transactions and that it is a convenient, safe, and rapid method for transferring funds. Both the sender and the recipient of money must have UPI accounts. This research suggests that as smartphone use increases, the UPI money transfer will alter the payment landscape.

Thomas & Chatterjee (2017) conducted an exploratory study on the acceptance, usefulness, advantages, prospects, and problems associated with UPI Applications. According to this study, the UPI allows users to immediately interact using their connected bank accounts and Aadhaar cards. This research proposes that the accessibility of internet connections and the assistance of service providers

should be enhanced to facilitate the adoption of UPI. Academics believe that the Aadhaar platform would contribute to the country's financial inclusion.

Goel & Gupta (2017) have examined and evaluated UPI. Comparing UPI with NEFT, IMPS, and e-wallets, the researchers analysed the process, advantages, and disadvantages of each modality. According to this research, UPI App transactions are quick, easy, and hassle-free; the transfer of money needs a Virtual Payment Address. The conclusion is that UPI will bring about a transformation in the payment system, which will assist to develop the Digital or Cashless Economy via a safety mechanism. The research pertaining to the Unified Payments Interface (UPI) indicates that smartphone penetration would increase UPI use and aid to foster a cashless or digital economy with quick, safe, and trustworthy transactions.

Summary: There are numerous studies conducted on UPI. All those previous studies stated that UPI played a major role in the transformation of traditional payment systems to Electronic Payment Systems. The studies also concluded that UPI is the most economical, secure, and trustworthy mode of e-payment system.

2.7.6 Unstructured Supplementary Service Data (USSD)

This is a state-of-the-art payment service. USSD payments can be done on a featured phone as well. Mobile payments and transactions can be made without a mobile data facility and without downloading any app. The basic objective of this type of digital payment service is to build an environment to deliver financial deepening and inclusion among the underserved sections, and under-banked society and integrate all of them into typical banking services.

Soni et al., (2017) investigated the operation of USSD and they reported that Unstructured Supplementary Data is an effort of the National Payment Corporation of India (NPCI) that facilitates the transmission of low-value transactions through the GSM system. The researchers discovered that this service is presently accessible in ten Indian languages. The USSD money transfer does not need a smartphone or an internet connection; it may be performed on a feature mobile phone, and the user's mobile number must be registered with the banks.

Date et al., (2017) in their study describe the USSD functioning mechanism and its benefits. The researchers discovered that the USSD financial transaction works on the featured mobile phone. This system employs the communication technology of GSM- Global Systems for Mobile, which functions similarly to that of SMS- Short Message Service. The novelty of the USSD Payment System is that it facilitates financial transactions and is the quickest and most dependable service accessible at no additional cost and even without an internet connection**.**

Summary: The previous studies relating to Unstructured Supplementary Service Data (USSD) found that it works on a featured phone with GSM communication technology and without mobile data or internet connection, which is the uniqueness of the USSD payment system and this system is beneficial for the rural population and helps in the financial inclusion.

2.8 Research gap

Past studies in Kerala were limited to either one or two aspects of Electronic Payment Systems such as online banking, digital wallets, mobile payment systems, debit cards, credit cards, Paytm, & UPI apps, and there was no attention to overall Electronic Payment Systems till this research work starts.

Even though there are some general studies, this study focuses on the impact of demonetisation & Covid 19 pandemic on the usage of EPS in Kerala.

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Digital /Electronic /Online Payment System

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CHAPTER 3

ELECTRONIC PAYMENT SYSTEM AN OVERVIEW

CONTENT

3.1 Introduction
3.2 Indian Banking System
3.3 Introduction to Electronic Banking
3.4 Electronic Payment System
3.5 Evolution of the Electronic Payment System
3.6 Types of Electronic Payment Systems
3.7 Challenges of the Electronic Payment System
3.8 Opportunities for Electronic Payment System
3.9 Committees on Electronic Payment System
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3.1 Introduction

This chapter explains about the theoretical framework and various committees on Electronic Payment Systems. The first part of the chapter deals with the evolution, types, growth, challenges, and opportunities of EPS. The second part includes various committees constituted for promoting EPS such as Ratan P Watal and the high-level committee on deepening electronic payments.

3.2 Indian Banking System

The banking system of any country is critical to the economic system's financial stability. Banks are responsible for mobilizing deposits and disbursing loans to various sectors of the economy in any country. The existing dynamic banking structure in India has changed over time. Strong and healthy banks are crucial in most emerging countries, including India, for the following reasons:

- Banks contribute to the development of other financial intermediaries and markets based on the needs and requirements of the country.
- Banks assist the corporate sector in meeting its financial demands because the equity and bond markets are underdeveloped,
- Banks assist in mobilising the resources of a large number of depositors who seek guaranteed income, liquidity, and the safety of their investment.
- Banks help to keep the financial stability of the economy.

3.2.1 Origin of Indian Banking

India's financial system dates back to the pre-civilisation eras. Banking is an ancient business in India, with references to it found in the Manu writings. Bankers were also important throughout the Moghul era. However, banking activity did not begin until the first decade of the twentieth century.

The agency houses primarily provided banking services during the early days of the East India Company. Modern banking in India began in the mid-eighteenth

century. The Bank of Hindustan, formed in 1770 and liquidated in 1829-32, was among the first banks, and the General Bank of India, was established in 1786 but failed in 1791.

The State Bank of India (SBI) is the largest and oldest bank still in operation. It was created and began operations as the Bank of Calcutta in mid-June 1806. It was renamed as the Bank of Bengal in 1809. The Bank of Bombay, established in 1840, and the Bank of Madras, established in 1843, were the other two banks established by a presidential Government. The three banks combined in 1921 to become the Imperial Bank of India, which became the State Bank of India in 1955 after India's independence. For many years, the presidency banks and their successors served as quasi-central banks until the Reserve Bank of India was created in 1935, under the Reserve Bank of India Act of 1934.

3.2.2 Meaning of Bank and Banking

A bank is a financial institution that primarily provides banking and allied services to its customers. A bank is an organisation that makes loans and accepts deposits.

Banks are a subset of the field of financial services. Apart from traditional banks, there are various non-banking financial institutions that provide similar banking services but not meeting the definition of a bank.

According to Banking Regulation Act 1949. Sec. 5 (b) “Banking” means the accepting for the purpose of lending or investment, of deposit of money from the public, repayable on demand or otherwise, and withdrawable by cheque, draft, order, or otherwise.

3.2.3 Classification of the Indian Banking System

The Indian banking domain can be classified into organised and unorganised sectors.

The organised sector of the Indian banking system consists of:

1. Reserve Bank of India

2. Indian Scheduled Commercial Bank

- State Bank of India (SBI) and its associate banks
- Twenty nationalized banks
- Regional Rural Banks (RRBs)
- Other scheduled commercial banks

3. Foreign Banks

4. Non-scheduled banks

5. Co-operative banks

The un-organised sector of the banking system consists of indigenous bankers and money lenders.(www.bankgyaan.com)

3.2.4 Functions of Banks in India

Banks have both primary and secondary functions.

Primary functions

Accepting deposits: The most important function of a bank is to mobilize public funds. The bank provides safe custody as well as interest to the depositors. The various types of deposits are saving deposit, fixed deposit, current deposit, and recurring deposit.

Granting loans and advances: The various types of loans and advances are cash credit, bank overdraft, loans, and discounting bills.

Secondary functions

The following can be considered as the secondary functions of commercial banks.

Agency functions are fund transfer, cheque collection, periodic payments/ collection, and portfolio management.

General utility functions are issue of draft & letter of credit, locker facility, underwriting of shares, dealing with foreign exchanges, project reports, and social welfare programs.

3.3 Introduction to Electronic Banking

There is no denying that the world is evolving quickly every day and in all directions. For years, the banking industry has been going through significant changes, especially in technological adoption. Each year, fewer people utilize the full range of traditional banking services. Currently, more people particularly youngsters use internet banking widely. Compared to their parents and grandparents, they frequently use the internet more.

3.4 Electronic Payment System (EPS)

Digital Payment also called Electronic Payment, is the transfer of money from one payment account to another using a digital device like a mobile phone, POS (Point of Sales), or computer, or a digital channel of communication like mobile wireless data or Society for the Worldwide Interbank Financial Telecommunication (SWIFT). These transfers could be made with debit or credit cards, mobile wallets, mobile apps, net banking, Electronic Clearing Service (ECS), National Electronic Fund Transfer (NEFT), Immediate Payment Service (IMPS), pre-paid instruments, and other similar methods.

Electronic Payment is a transaction that takes place through digital or online means, with no actual money changing hands. This means that both the person sending money and the person receiving it use electronic means to do so. Electronic payments can be made both on the Internet and in person. When payments towards goods and services are purchased using electronic means, this is called "digital payment." This method of payment doesn't involve cash or cheques.

Electronic Payment, also known as "Digital Payment," is a way to pay that uses digital means. Both the sender and the receiver of a digital payment use digital methods to send and receive money. In Digital Payments, there is no cash in the form of currency notes. Digital Payments are all done online.

3.4.1 Electronic Payment Transaction

The RBI Ombudsman scheme for digital transactions defines an 'Electronic Payment transaction' means a payment transaction in a seamless system effected without the need for cash at least in one of the two legs, if not in both. This includes transactions made through electronic modes wherein both the originator and the beneficiary use the electronic medium to send or receive money" (www.rbi.org.in).

3.4. 2 Characteristics of Electronic Payment

- **Acceptability:** Not only should the payment infrastructure be strong, but it should also be open and accessible to an increasing number of customers and sellers of products and services. The value held in electronic money should be respected and acknowledged for reconciliation by other banks and financial entities.

- **Convertibility:** Electronic money should be able to be used interchangeably and in combination with other forms of electronic cash, paper money, and bank deposits.

- **Flexibility:** A payment system should be able to accept multiple payment methods rather than only allowing one type of currency per user.

- **Reliability:** The payment method should guarantee and encourage user confidence.

- **Reduced cost:** The cost of overhead associated with the operation of e-payments is very less. The transaction cost should be close to zero.

- **Security:** Digital currency should be maintained in a manner that prevents duplicate spending, replication, and tampering. When sending over the

internet, it should provide protection against outsiders attempting to tap it and utilize it for unlawful purposes.

- **Usability:** The payment mechanism should be as simple to use as traditional cash. It should be seamlessly integrated with existing apps and procedures.
- **Scalability:** Scalable solutions should be provided. Micropayments to business payments should be accepted.

3.4. 3 Benefits of Electronic Payments

- Faster, easier, and more convenient.
- Economical, and less transaction fee.
- Discounts, and cashbacks.
- Digital record of transactions.
- Helps to keep black money under control.
- Increases tax collection.
- Control over the parallel economy.
- Health benefits by way of going digital.
- Environment friendly.

3.5 Evolution of the Electronic Payment System

The Electronic Payment System has been in operation and making tremendous progress since the 1960s. Several monetary systems were used throughout that time period, including barter, commodity money, metallic money, paper money, bank money, and virtual currency.

Recent years have seen rapid development in India's payments framework, particularly the electronic payments system, accelerated by data and communication

technology developments and in accordance with the path envisioned by the Reserve Bank of India (RBI).

- The Internet's widespread availability in the 1990s marked the beginning of the era of online banking. When it comes to banking, everything has changed because of the advent of online banking.

- The RBI has been at the helm of Electronic Payment innovation in India, and the resulting changes have been documented in payment systems in India, first published in 1998.

- Any exchange of funds initiated by an individual by instruction, authorisation, or request to a bank to debit or credit an amount from an account maintained with that bank electronically, including point-of-sale transfers; ATM transactions; direct deposits or withdrawals of funds; transfers initiated via phones or the internet; and card payment; is defined as an "electronic funds transfer" under the Payment and Settlement Act, 2007.

- The introduction of Magnetic Ink Character Recognition Code (MICR) clearing in the early 1980s, Electronic Clearing Service and Electronic Funds Transfer in the 1990s, issuance of credit and debit cards by the banks in the 1990s, the National Financial Switch in 2003 that realised interconnectivity of ATMs across the nation, the RTGS and NEFT in 2004, the Cheque Clearing System in 2005, and the Cheque Clearing System in 2006 are all critical achievements in the development of the payments framework as a whole.

- In 2008, the National Payments Corporation of India (NPCI) was established. In terms of the retail payments infrastructure, it has been at the forefront of development.

- Additionally, non-bank organisations have been shown in the issue of prepaid instruments (PPI), which includes mobile and digital wallets. The NPCI has also taken a number of remarkable initiatives to complement these measures, such as introducing grid-wise operations of CTS, interoperability on NACH

(National Automated Clearing House), IMPS, NFS, RuPay, APBS, and AEPS, and the launch of the National Unified USSD Platform (NUUP), UPI, and the BHIM application.

- These developments reflect the progress of the country's electronic payments infrastructure. This was followed by a significant step by the GOI, which established the Committee of Digital Payments in August 2016 under the Chairmanship of Ratan P. Watal, Principal Adviser, NITI Aayog.

- Electronic Payment use in India was given a significant boost after the demonetisation in November 2016. When the pressure of demonetisation subsided, Indians went back to using cash despite the many hidden expenses associated with moving to cashless ways (www.tokenex.com).

3.6 Types of Electronic Payment Systems

The Reserve Bank of India is in charge of every online transaction. Then, in 2013, the National Payment Corporation of India (NPCI) was formed, and the RBI supported this by making a single-window organisation for making online retail payments. Here are some of the most important types of Electronic Payment Systems.

3.6.1 Banking Cards

A bank card is one of the most popular cashless payment options. It has several characteristics, including convenience, security, etc. A debit or credit card's primary advantage is that it may be used to make various sorts of electronic payments. For example, we may preserve our card information in mobile applications in order to conduct cashless payments. These cards may also be used for online purchases, online transactions, and electronic payments.

In India, financial cards have been recognised as the most convenient method of payment due to their widespread usage. The usage of banking cards for Internet transactions is widespread. Master cards, Visa, and Rupay are the most prevalent

card payment methods. A depositary account may be used to issue banking cards. There are several card kinds, including debit/ATM cards and credit cards.

Banks produce plastic cards with magnetic stripes. The identifying code on this card can be read by a machine. The bank card contains the customer's name, the issuer's name, and the card number. Barclays in London introduced the first bank cards in 1967, followed by Chemical Bank on Long Island, New York, in 1969.

a) Debit Card: Debit cards are plastic cards that banks offer to their clients. Debit cards differ from credit cards in that available cash in the account is debited instantly for transactions, rather than establishing a line of credit that may be repaid later. A debit card may be used instead of cash to make a transaction, with the funds taken from the user's bank account. Debit cards are the most used payment method in the world. (Fontinelle, 2021).

The major advantages of debit cards are more convenience, easy availability to everyone, a debit card holder cannot spend more than what is in his account, etc.

b) Credit Card: It is a plastic card provided by banks and financial institutions to their clients, allowing them to borrow money and make payments at the point of sale (POS) and online. With the use of a credit card, the cardholder is able to buy things and get services on credit and we are often offered 30-55 days of interest-free credit by the bank.

The major benefits are high security, the chance to earn reward points, the opportunity to use a banker's money to make a large purchase, etc.

3.6.2 Unified Payments Interface [UPI]

UPI is an interoperable payment system that allows customers with any bank account to send and receive money using a UPI-based application. UPI is a system that combines several banking services, unified money routing, and merchant payments inside a single mobile application (of any participating bank). The UPI is a payment transaction that any customer with a bank account may utilise with the

assistance of an App that supports the UPI. With the UPI mobile app on our smartphones, we can connect several bank accounts and start financial transfers with ease. This method allows customers with a bank account to receive and transfer money using UPI-based apps. The individual must possess both a registered mobile phone number and a valid bank account number (Cashless India, 2016).

The major benefits of UPI are the cheapest method to transfer money, the most secure since it does not need card information, CVV codes, etc., several accounts may be managed with a single UPI app, UPI replaces digital wallets due to its lower cost, etc. (Mishra C., 2019).

❖ **Types of UPI Apps**

a) Google Pay: Google Pay, commonly referred to as G Pay or Pay with Google, is a digital wallet and online payment system created by Google. In January 2018, the services of Android Pay and Google Wallet amalgamated, the name was changed to Google Pay, and it is presently accessible in India in eight languages. G Pay is operational in 28 nations as of July 2022 statistics (www. androidauthority.com). In September 2017, Google released TEZ in India, a UPI-based app that was eventually renamed as Google Pay. In India, Google Pay has more than 25 million active users of digital wallets every month.

Transactions using Google Pay are safe and secure. Google Pay lets you to send and receive money, securely store your credit/debit card information, and use this information to pay for a variety of goods inside applications. Google Pay is renowned among other Electronic Payment applications for its security. Google stores your credit/debit card information using robust encryption on its secure servers. Customers' cloud storage and data protection are Google's top priorities. Per day, only 15 transactions are authorised (www.startuptalky.com).

b) PhonePe: PhonePe or PhonePe Private Limited is an Indian digital wallet and e-commerce payment service. PhonePe was created by Sameer Nigam and Rahul Chari in 2015, and it was the first payment app in India to be developed on Unified Payments Interface, i.e., UPI. PhonePe is currently offered in eleven

languages. Phone Pe provides a variety of services, including: -i. Users may send and receive money using the Phone Pe app. ii. Users may make a variety of payments, including cell recharges, DTH recharges, and online purchases via numerous applications. iii. Phone Pe also enables users to purchase tickets using applications like Redbus, Goibibo, Ola, etc.

The PhonePe app has more than 5 billion transactions and more than 100 million users (www.blog.phonepe.com). The most recent update to the Phone Pe app enables its users to withdraw cash through its in-app UPI function, popularly known as Phone Pe ATM. This is accomplished by transferring the amount to be withdrawn to a nearby Phone Pe-enabled business or vendor **(**www.startuptalky. com).

c) UPI BHIM App: BHIM is an acronym for the Bharat Interface for Money. The National Payments Corporation of India (NPCI) created the BHIM App, which is based on the Unified Payment Interface (UPI). This app was introduced on 30 December 2016 by our prime minister, Shri Narendra Modi, and is presently accessible in twenty languages (www.npci.org.in). BHIM App accepts all Indian banks that operate on the UPI system and are built on IMPS, i.e., the Immediate Payment System, allowing the user to transfer funds to the bank accounts of any two parties. Using the UPI system, transactions may be completed quickly, easily, and conveniently.

3.6.3 Internet Banking

Banking transactions done online are termed as internet banking. It is also known as e-banking or virtual banking. NEFT, RTGS, IMPS, etc are used for online fund transfers (www.cashlessindia.gov.in). The major advantages of Internet banking are convenient to use, worldwide availability, fast and safe, etc.

❖ **Types of Internet Banking**

a) Electronic Fund Transfer (EFT): EFT is the electronic movement of funds from one bank account to another, either within a single financial institution or across numerous institutions, using computerised systems and without the

participation of bank personnel. There are a lot of names for EFTs. They may be referred to as electronic cheques or e-cheques in the United States (www.cashlessindia.gov.in).

b) National Electronic Funds Transfer (**NEFT**): NEFT is a payment method that enables the transfer of funds via a bank's website. NEFT is a well-known electronic money transfer mechanism in India. With NEFT, bank clients may transfer payments quickly and safely. It is accomplished by electronic messaging. This is not conducted in real-time, unlike RTGS (www. cashlessindia.gov.in).

The major benefits of NEFT are faster and more convenient; no need to physically visit the bank, economical, safe, and secure method, and no need for a cheque or demand draft.

c) Real-Time Gross Settlement (**RTGS**)**:** RTGS is an expert method of money transfer in which the transfer of monies or securities occurs in "real-time" and on a "gross" basis from one bank to another. Settlement in "real-time" implies that transactions are resolved as soon as they are processed and there is no waiting period for payment transactions. The gross settlement indicates that the financial transfer is paid on a matching basis without grouping or offsetting it with another financial transfer. Once completed, "settlement" signifies those payments are final and irreversible. The RTGS system was initiated in 2004 by the RBI. (www.cashlessindia.gov.in)

The benefits of RTGS transactions are real-time online fund transfer, used for high-value transactions, safe and secure, reliable and backed by the RBI, immediate clearing, funds credited on a one-on-one basis, and transactions executed on an individual and gross basis.

d) Society for Worldwide Inter-Bank Financial Telecommunication (SWIFT): SWIFT is an international cooperative communications network. SWIFT provides a network that enables financial institutions to transmit and receive financial data globally for registered organisations and customers. SWIFT is

accessible 24 hours a day, seven days a week, and provides a secure, standardised, and trustworthy environment for the transmission of financial transactions. The term "SWIFT" originated in Brussels in 1973. India became the 74th nation to join the SWIFT network on December 2, 1991 (www.cashlessindia.gov.in).

e) Immediate Payment Service (IMPS): IMPS can be performed by electronic channels such as mobile, internet, Short Message Service (SMS), and Automated Teller Machines (ATM). The major aim is to render transfers as simple and convenient for customers as possible. IMPS developed a comprehensive suite of banking services to assist the RBI goal of electronic retail payments.

The major steps in IMPS usage are registering on the bank's mobile banking service, having the Mobile Money Identifier (MMID) and Mobile Banking Personal Identification Number (MPIN), and downloading a banking mobile application from the bank to use the SMS facility if the customer's bank has an SMS IMPS facility. (www.cashlessindia.gov.in)

3.6.4 Mobile Banking: Mobile banking refers to the use of a mobile phone or smartphone to conduct financial or banking activities. Numerous banks have developed their own apps, which customers may now download and use (www.cashlessindia.gov.in).

Time-saving, convenient, and secure for making payments or accessing bank accounts, and with an increased level of efficiency, fraud can be reduced are the major benefits of using mobile banking.

❖ **Types of Mobile Banking**

a) Paytm: Paytm is an Indian financial technology company and e-commerce firm. Paytm was launched by Mr. Vijay Shekhar Sharma in August 2010. Paytm Wallet, the company's first digital E-wallet, was introduced in 2014. Paytm provides digital wallet payments, mobile payments, online shopping, the Paytm Payments Bank, and more. In 2015, the RBI granted Paytm a license to build Paytm Payments Bank, which was subsequently opened in 2017 by Finance

Minister Mr. Arun Jaitley. Paytm functions in two distinct ways: the Paytm Wallet and the Paytm Payments Bank. Paytm is a well-known Electronic Payment System that enables online banking and debit/credit card money transfers. After registering with Paytm, we may make online bill payments or payments using our Paytm wallet by first adding funds to your wallet. (www.zippia.com)

b) MobiKwik: MobiKwik is another Indian business app that functions as a mobile payment system and digital wallet. MobiKwik is an app established in 2009 by Bipin Singh and Upasana Taku. Initially, MobiKwik was merely a website with a closed wallet feature, but the company eventually began offering mobile applications. MobiKwik developed the MobiKwik Lite app in 2016, which was designed for outdated 2G mobile networks and individuals with low network access. MobiKwik introduced its very first Mobile Wallet solution in 2012. Mobikwik also introduced the ability to transfer and receive money through mobile applications. Mobikwik also offers financial services like loans, different insurances including life, accident, and fire insurance, and mutual funds. In 2017, Paytm was MobiKwik's greatest opponent. According to Forbes India Magazine, MobiKwik's unique features were used by more than 15 million customers in 2015, and the company also claimed a one million user rise every month. MobiKwik's financial transactions increased by 400% after India's Demonetisation in 2016, during which MobiKwik had a 400% rise in financial transactions (www.startuptalky.com).

c) YONO by SBI: The State Bank of India developed this mobile wallet application. This wallet's services are available in thirteen languages. The acronym YONO stands for You only need one. This application gives users access to a variety of financial and other services. It functions as an electronic banking platform that provides a variety of services, including online shopping payments and reserving tickets for trains, buses, taxis, and flights, among others. Additionally, it enables clients to pay medical bills. Mr. Arun Jaitley, India's Minister of Finance, introduced the YONO app in 2017. In addition to making different financial transfers, etc., consumers may use this application to

withdraw cash from ATMs. Using the YONO app, a client may monitor the amount of his or her OD account, create fixed deposits and recurring deposits, and even invest in mutual funds. Customers may monitor their loans using this application. (www.bankingtides.com)

d) Micro ATM: Micro ATM is a mini version of an ATM. Based on e-KYC and service request acceptance, it may execute a variety of operations, including cash deposit, withdrawal, money transfer, balance query, Aadhar seeding, and savings account setup. As it is portable, bank representatives in distant regions carry this gadget, which is incapable of storing currency. Consequently, a bank official transports the cash (www.cashlessindia.gov.in).

e) Point of Sale (PoS) Terminal: A point-of-sale terminal is a portable gadget capable of reading bank cards. It is implemented anywhere. Credit and debit cards are used to make transactions. Physical POS terminals, mobile POS terminals, and virtual POS terminals are distinct kinds of POS terminals (Halton, 2021).

f) Unstructured Supplementary Service Data (USSD): USSD is one of the greatest mobile banking services for clients with modest incomes. This approach to the Electronic Payment System in India does not need the installation of a mobile application or the usage of mobile data. In addition, the user does not require a smartphone to conduct electronic transactions using USSD. This technique is supported by the National Payments Corporation of India (NPCI). This method was designed to establish an atmosphere for underserved segments of society and to incorporate them into the financial system. USSD is available in both English and Hindi, which is a crucial feature. This technique offers services such as wire transfers, bank statements, and balance enquiries (www.cashlessindia.gov.in).

g) Aadhar Enabled Payment System (AEPs): AEPs are often used for banking activities, such as cash withdrawals, balance enquiries, cash deposits, and wire transfers. Verification of Aadhaar accompanies all cashless purchases. In AEPs, neither a physical visit to a bank nor the provision of banking cards is needed,

nor is the signing of any paperwork necessary. Bank-registered Aadhaar cards may be used to access this service. Therefore, we may use this service provided our Aadhaar number is registered with the bank (Cashless India, 2016)

3.7 Challenges of Electronic Payment System

- **Limited access to banks and cards:** Due to a lack of bank branches in more remote areas of India, most residents there must rely on cash for all of their financial transactions.

- **Cash-dependent economy**: The majority of Indians rely on cash-based transactions. They experience better efficiency and security in cash transactions. Due to the fact that nearly 40% of the Indian population lives below the poverty line (Rangarajan Committee, 2014 RBI report), 191 million Indians remain unbanked (Global Findex Report of World Bank).

- **Labour-dominated society**: The majority of people in India work in the agricultural sector or in blue-collar jobs. People in the informal sector (street vendors selling vegetables, fruits, flowers, small provisions, petty shops, and so on) rely heavily on cash for their daily activities. As a result, cashless transactions pose a significant challenge for them.

- **Difficult for senior and illiterate citizens**: For the aged and uneducated, the digital revolution is a complicated prospect. They find it challenging to understand and use cutting-edge technologies. Due to a lack of expertise and a fear of making mistakes, they are hesitant to conduct electronic transactions since even a small error may result in a substantial financial loss.

- **Strenuous for petty sectors**: People who deal with micro, small-scale businesses, etc., need liquid cash, making the cashless transfer a daunting undertaking for them. Those who are employed for daily wages find it challenging to transact using electronic means.

- **Slow internet speed**: The primary factor that prevents or halts the transaction is the absence of legitimate and reliable internet access.

- **Lack of digital literacy among BPL category**: As per the National Digital Literacy Mission- Digital Empowerment Foundation 2022, 40% of the Indian population is coming under below the poverty line, the general illiteracy rate itself is 25 to 30%, and digital illiteracy among them is more than 90% (www.defindia.org).

- **Risk of cyber fraud and privacy**: Cybersecurity issues prevent the widespread deployment of Electronic Payment Methods. Consumers' privacy is being breached, due to Internet Protocol's inadequate regulations.

- **Security issues**: The issues with hacking and other forms of cyberattack have a negative effect that disturbs the people. (KPMG Report on Digital Payments)

- **Trust**: In a nation like India, where formerly the bulk of transactions was conducted in physical currency and more than half of the population is unbanked, it is difficult for people to trust the parties engaged in an electronic transaction and switch to the new form.

3.8 Opportunities for Electronic Payment System

- **Government initiatives:** Initiatives including demonetisation and the Pradhan Mantri Jan Dhan Yojna contributed to economic growth via financial inclusion. Even the unbanked began opening bank accounts. All contributions to the Government, including taxes (both direct and indirect), tariffs, and even penalties, are now collected digitally.

- **Increasing smart phones penetration**: Smartphones are now cheap, and mobile data services are also cheap. This makes it easier for people to use smartphones and makes them more likely to use them. With the help of smartphones and their apps, people are able to make electronic payments. With Near Field Communication (NFC) transactions, debit and credit card information can be stored in mobile wallets and payments can be made for online purchases or by scanning a QR code at a store.

- **Intensifying usage of internet:** In recent years, more and more people are using the internet because telecom companies offer cheap data packages. Banks are also improving their Information and Communication Technology (ICT) infrastructure to keep up with the competition and to offer customers modern and innovative banking services at a reasonable price that will improve their experience and make them happier.

- **Incentivizing consumers**: It was recommended by the Government that incentives and awards be offered to encourage consumers to switch to Electronic Payment Methods.

- **Increasing urbanisation**: Urbanisation resulted in the growth of electronic transactions. The residents of urban societies have solid educational credentials, a high salary, and a contemporary lifestyle. All of these factors will convince people to use electronic payments.

- **Raising trends of E-Commerce**: People like to do their shopping online these days. They are influenced by things about online shopping like being able to shop at any time, making payments easily, having a wide range of products, saving time and energy, and having products delivered right to their door. So, the growth of e-commerce is also making electronic transactions more and more common.

- **Technological innovation in Indian Banking:** Electronic payments are on the rise because more and more people are using online and mobile banking. People can move money from one account to another account at any branch or bank through services like NEFT, RTGS, ECS, and IMPS.

- **Limiting the scope for cash payments:** The central bank has made rules to control high-value cash transactions, especially to encourage electronic transactions and stop the flow of black money and a parallel economy. So that there is a record of every transaction, which makes it easier to check how cash is used.

- **Launch of more Electronic Payment solutions**: The Reserve Bank of India and the GOI are fostering the development of FinTech firms. They are licensing, regulating, and supervising the activities of FinTech businesses to create innovative Electronic Payment solutions for the benefit of the sender (customer) and the recipient (merchants). In addition to smartphones, feature phones can also make electronic payments nowadays (Rachna & Priyanka Singh 'Issues and Challenges of Electronic Payment Systems)**.**

3.9 Committees on Electronic Payment System in India

The important committees on the Electronic Payment System in India are the Committee on Electronic Payments was established on August 23, 2016, by the Ministry of Finance, Department of Economic Affairs, under the chairmanship of Shri. Ratan P. Watal and another committee on deepening electronic payments was constituted in January 2019 by the RBI under the chairmanship of Aadhaar creator Nandan Nilekani.

3.9.1 Ratan P Watal Committee

The Committee on electronic payments was established on August 23, 2016, by the Ministry of Finance, Department of Economic Affairs, under the chairmanship of Shri. Ratan P. Watal, Principal Advisor, NITI Aayog, and former finance secretary to the GOI, submitted its Final Report to Union Finance Minister Shri Arun Jaitley in his office in the national capital. The primary objective of the group was to examine the country's payment systems and suggest steps to promote electronic payments (www.pib.gov.in).

3.9.1.1 The Committee's terms of reference and membership were as follows:

- Examine and provide recommendations about the necessity for fees, if any, in the regulatory structure and any laws pertaining to the development of Electronic Payment forms.

- Examine and suggest methods for using Unique Identification Numbers or any other evidence of identification for the verification of card/electronic transactions and the establishment of a Centralised KYC Registry.
- Examine the establishment of a single-window Payment Gateway system to take all sorts of cards and electronic payments for Government payments.
- Examine the viability of developing a payments history for all Electronic Payments and establish the required connection between the payment's transaction history and credit information.
- To investigate and suggest a variety of strategies to encourage card and electronic transactions.
- To research international payment best practices, including efforts made by other Governments and Government agencies.
- To identify any market failures and suggest appropriate solutions that might be used to encourage card/electronic payment.
- To identify any regulatory obstacles and recommend modifications to encourage card/electronic payment.
- To research any other issue pertaining to the promotion of payments by cards and electronic means and to provide suggestions.

3.9.1.2 Composition of the Committee

Members of this Committee were: Shri H. R. Khan, Former Deputy Governor, Reserve Bank of India; Secretary, Department of Investment and Public Asset Management; President, NASSCOM; Chairman, Indian Banks Association; Chairman, Payments Council of India; President. Internet and Mobile Association of India; Chairman, Central Board of Direct Taxes; Director General, Unique Identification Authority of India; Executive Director, Reserve Bank of India; and Joint Secretary, Department of Economic Affairs, Ministry of Finance.

The Committee was also supported by Shri. B.N. Satpathy, Consultant, Ms. Deepika Srivastava, OSD, and Shri. Suneet Mohan, young professional from NITI Aayog.

The National Institute of Public Finance and Policy (NIPFP) and Department of Economic Affairs (DEA) programme team are headed by Shri. Ashish Aggarwal acted as the secretariat for this Committee. The team also included Shri. Pratik Datta, Shri. Aditya Kumar Rajput & Shri. Indrajeet Sarkar.

On November 21, 2016, the Committee has issued an interim report to the Ministry of Finance. In order to finalize the Report, the Committee conducted comprehensive consultations with all stakeholders and technology groups, such as the Reserve Bank of India, State Governments, Comptroller Auditor General of India, Payment Firms, Technology Companies, and Academia.

In its Report, the Committee recommends a medium-term plan for advancing the development of electronic payments in India with a regulatory system that promotes competition, open access, and interoperability in payments.

The report also recommends the inclusion of financially and socially excluded groups and the incorporation of emerging technologies into the market, while ensuring the security of electronic transactions and ensuring a level playing field for all stakeholders and new entrants to this new transaction space. It has proposed the interoperability of the payments system between banks and non-banks, the modernization of the Electronic Payment infrastructure and institutions, and the establishment of a framework to recognize innovation and pioneering achievements in facilitating electronic payments.

3.9.1.3 Recommendations

- The Committee has proposed a plan for increasing the development of electronic payments in India over the medium term.

- The plan must be supported by a regulatory system that promotes competition, interoperability, and open access to payments and is favorable to bridging the electronic divide.
- It also proposes the incorporation of developing technology and the involvement of financially and socially marginalized people.
- It emphasizes the need of ensuring the security of electronic transactions and ensuring a fair playing field for all stakeholders and new entrants to this new transaction sector.
- It has advocated for the interoperability of payment systems between banks and non-banks, as well as the modernization of Electronic Payment infrastructure and institutions.
- The report also suggests a structure for rewarding innovators for leading efforts in facilitating electronic payments.
- Increased use of Aadhaar and mobile numbers to make electronic payments as simple as cash.
- Requires interoperable payments between banks and non-banks and within non-banks.
- Proposed to decouple regulation of payments from the role of the central bank to provide a boost to all electronic payments.
- Provide the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS) with an autonomous legal position within the larger RBI organization.
- Requested that the Payments and Settlement Systems Act of 2007 be amended to provide BPSS with specific mandates for competition and innovation, consumer protection, open access and interoperability, systemic risk rules, and data protection.

- Following a cost-benefit analysis, payment system operations such as National Electronic Fund Transfer (NEFT) and Real Time Gross Settlement (RTGS) may be outsourced (www.dea.gov.in).

3.9.2 High-Level Committee report on Deepening Digital Payments

In January 2019, the RBI appointed Aadhaar creator Nandan Nilekani to lead a high-level group charged with establishing a viable digital payments ecosystem in the nation. The expert panel presented its recommendations to RBI Governor Shaktikanta Das in response to a request to establish a medium-term plan for expanding electronic payments and steps to enhance safety and security.

The key to advancing electronic payments in the nation is shifting the ecosystem from issuance to acceptance. The committee addressed this pivot from the user's standpoint to achieve the result of ongoing voluntary usage of electronic payments, according to the expert panel's report to the Reserve Bank of India.

During the consultation phase, NASSCOM also made a presentation to the committee and provided specific recommendations on issues such as the creation of a conducive e-KYC framework, the expansion of acceptance points, the promotion of fintech and open banking, the improvement of consumer trust and customer reliability, and the implementation of a robust consultation process for regulation creation.

The other members of the panel are former UIDAI chairman Nilekani, former RBI deputy governor H.R. Khan, former managing director and CEO of Vijaya Bank Kishore Sansi, former secretary in the Ministry of IT Aruna Sharma, and chief innovation officer at the Centre for Innovation, Incubation, and Entrepreneurship at IIM Ahmedabad, Sanjaya Jain.

3.9.2.1 Recommendations of High-Level Committee Report on Deepening Digital Payments

- **Create KYC data-sharing mechanisms with user consent**

The committee has taken notice of the many industry recommendations on the KYC and client onboarding processes. The committee suggests a multi-pronged approach to meeting legal and regulatory standards in order to alleviate the industry's issues. This involves promoting innovation in the process, developing industry-wide tools to exchange data with consumer permission, and opening a new account using a KYC-compliant account.

- **Merchant Discount Rate (MDR) and interchange fee to be revised**

MDR and interchange fees should ideally be set by the market. Nonetheless, this strategy does not seem to be effective, since there are fewer acquirers. The interchange on card payments should be cut by 15 basis points (0.15 %), as proposed by the committee to rectify the problem This would boost the incentive for acquirers to sign up merchants.

The RBI should establish a standing committee to periodically examine the MDR and interchange to guarantee the fair expansion of the electronic payments system. The group must be comprised of a balance of stakeholders, including issuers, acquirers, merchants, and academics. The committee proposes that consumers should not be charged for electronic transactions and that such transactions should be an integral element of providing customers.

- **Ensure fast dispute resolution**

The committee proposes that online dispute resolution methods be used by payment systems to manage concerns. All payment system operators, including NPCI, must adopt a swift and equitable online dispute resolution mechanism in order to enable the scalability of payment systems and fulfill consumers' increased expectations of a quicker response to complaints.

- **Create a centralized fraud registry for a real-time rating of transaction risk**

The committee advises the establishment of a common fraud registry that will be used to assign a risk rating to each payment transaction. This register should be available in near real-time to all payment system participants, who may use it to assess the fraud risk of all users and transactions dynamically. This risk rating may be used to provide the user with extra precautions.

The committee has previously suggested the Payment Method Operator establish a dispute resolution system. This system may be improved to monitor fraud reports and communicate with the fraud registry and regulatory reporting.

- **Monitor transaction failures**

The committee has suggested that the regulator monitor unsuccessful transactions, in particular the technical decline rates and the business decline rates, in order to maintain continual improvement in the payment systems and to boost consumer trust. In addition, the regulator must ensure that the operators present a plan to reduce these failure rates by 25% annually.

With the goal of minimizing networking issues and enhancing the customer experience, it is suggested that POS machines have built-in features to monitor network issues and prevent transactions from failing due to poor connectivity. The Committee has suggested that the SLBC/DLCC be used to liaise with the state-level DoT representative to resolve these concerns and provide a dependable telecom infrastructure for payments. Bharat Net may be made operational as soon as possible.

- **Enable a robust Cash in Cash Out (CICO) network**

In order to increase electronic transactions and provide a safety net of a robust Cash in Cash Out network, particularly in Tier III, IV, V, and VI (semi-urban to rural) centers, the committee suggests strengthening the infrastructure of business

correspondents and empowering small merchants to provide cash at the point of sale to customers to meet their immediate needs.

- **Ensure no user charges for electronic transactions**

Considering those electronic transactions result in bigger bank balances, the committee believes that consumers should be permitted to start and accept a fair number of Electronic Payment transactions without incurring fees.

- **Incentivize users to make Electronic Payments**

Considering that a huge number of cards and other electronic choices presently accessible to consumers remain inactive, the committee has recommended that issuers implement continuing efforts to encourage users to make Electronic Payments to merchants. A large number of consumers have lately established bank accounts, and debit cards have been issued to provide the ease of ATM banking. These cards may also be used for electronic transactions. Similarly, many client accounts include a mobile phone number. By activating these consumers, banks will be able to retain them and guarantee that they maintain greater bank balances.

- **Promote BHIM Aadhaar Pay to serve customers without phones**

In order to enable consumers without mobile phones to make electronic payments from their Aadhaar-enabled bank accounts, the committee suggests promoting BHIM Aadhaar Pay.

In order to streamline the use of accounts that receive DBT transfers through business correspondents, banks that receive DBT payments may be obliged to facilitate Off Us transactions via AEPS. The interchange may be set at 1%, with a maximum of Rs 15 per transaction, for certain transactions.

- **Encourage innovation for the use of feature phones in Electronic Payments**

In order to include feature phone users in Electronic Payments, the committee has advised that the regulator foster innovation via the regulatory

sandbox in order to create new interoperable enabling solutions for this user to make and receive electronic payments. QR codes, for instance, have become a popular lightweight acceptance infrastructure, and it may be conceivable to allow feature phone users to use this capacity. In instances when the phone may be used by many family members, solutions are also necessary.

- **Promote acceptance of electronic payments**

The committee has advised that each business support at least one digital channel, such as BharatQR, BHIM UPI QR, or Cards, so that an interested client may conduct financial transactions digitally.

- **Review limits on BSBD Accounts and small accounts**

Taking into consideration the difficulties faced by customers who are new to the financial system, the committee has recommended that all limits for Basic Savings Bank Accounts (BSBD) and small accounts be modified so that Government, insurance, and other statutory payments are excluded from these limits. In addition, given the need to encourage electronic payments, the committee suggests allowing a fair number of free Electronic Payment transactions via BSBD accounts.

- **Increase Electronic Payments**

The Government should anticipate a tenfold increase in the number of electronic transactions within three years. This would result in electronic transactions per capita increasing to 220 in three years, from the present level of 22. There should be a threefold rise in the number of users of electronic transactions, from around 100 million to 300 million.

- **RBI to be the single source of Electronic Payments data**

For improved monitoring, the RBI should be the exclusive source of accurate and full data about India's Electronic Payments. The RBI may simplify the definition of "digital payments" to improve monitoring and encompass any information that may be reliably gathered. It is feasible to integrate uncontrolled sources. As these

services are offered by banks to assist payments, the Central Bank should begin providing statistics on mobile and internet banking in addition to the breakdown of interbank and intrabank transactions.

- **Encourage non-banks to participate in payment systems**

In an effort to boost the use of Electronic Payments, the committee has advised that non-banking companies be included as associate members of payment systems and become active participants in upgrading the country's acceptance infrastructure. In order to promote acceptability, the committee has also proposed that payment systems be permitted to admit non-banks as associate members.

- **Setup an Acceptance Development Fund**

It has been suggested that an "Acceptance Development Fund" be established for the purpose of enhancing acquiring infrastructure in tier IV, V, and VI areas, which will ensure optimal utilization of millions of cards issued to customers and lead to an increase in digitalization in these deficit centers. Issuers must deposit interchange fees to this fund, which is matched by the RBI.

- **Build capacity for electronic transformation in the banking industry**

Keeping in mind the need to establish capacity within the banking system to manage the electronic transformation and to guide clients through the digitisation journey, the committee has suggested that the IDRBT lead the development of training programs and financial services sector capacity.

- **Ensure business continuity planning for electronic transactions**

National and state-level disaster strategies should monitor the availability of well-oiled disaster recovery mechanisms, such as the availability of mobile cell phone towers and the sharing of such infrastructures by all service providers during a crisis, to ensure business continuity for Electronic Payment Services, particularly in sensitive/coastal areas. Included in such disaster recovery plans should be preventative actions such as guaranteeing, via an audit and accountability framework, the building of strong and resilient infrastructure in vulnerable locations

and their regular maintenance. As a means of alleviating the pain of the afflicted population, it is necessary to implement similar cash withdrawal backup plans.

- **Activate FIN-CERT**

In an effort to increase the security of the financial system, the committee suggests implementing FIN-CERT to oversee and monitor the security of Electronic Payment Systems. Previously, a Computer Emergency Response Team for finance (FIN-CERT) was planned. The committee recommended an early implementation of this so that it can routinely aid in enhancing the security posture of the financial ecosystem, therefore safeguarding consumers from damage.

To guarantee the continuous security of payment systems, the committee suggests that telecom providers provide a monthly list of inactive telephone numbers that may be assigned to new clients.

- **Make B2B payments more software friendly**

As improved links between accounting systems and payment transactions may result in several advantages, the committee has suggested that banks permit software-driven transactions that contain invoice information so that accounts can be reconciled. The applicable payment metadata schemes may be modified.

- **Revisit Micro ATM and APBS Architecture**

As micro-ATMs have gained popularity and become a vital element of the financial inclusion infrastructure, the committee has advised that the Indian Banks' Association (IBA) reassess the technological architecture of micro-ATMs and enhance it to accommodate banking services other than cash dispensing.

The committee has also suggested that the IDRBT, NPCI, and DBT cells examine the design of the APBS and DBT delivery so that beneficiaries have better visibility and control over the flow of money, and may self-enroll in different programs.

- **Promote electronic transactions at rural farmers' markets**

In order to promote electronic transactions and their advantages to rural clients, the Committee has proposed intensifying efforts to guarantee that suitable electronic infrastructure is provided in a timely manner at all wholesale grain mandis, villages, etc.

- **Bring in RRBs into the Electronic Payment Ecosystem**

In order to include clients in the countryside and semi-urban areas who bank with RRBs, the committee has advised that all RRBs be brought into the purview of UPI as soon as possible. While scheduled commercial banks have allowed electronic payments for their clients, many Regional Rural Banks and cooperative banks have lagged behind. Onboarding customers on mobile banking solutions should be simplified and process-driven. Since RRBs serve rural people, their incorporation into the BHIM UPI network will stimulate Electronic Payment transactions further.

- **Remove barriers to language and accessibility**

The Committee has proposed that electronic infrastructure be accessible to residents of both genders and individuals with special needs, making it a right for all citizens. In addition, the committee has proposed that, if feasible, technology should be made accessible in local languages to facilitate adoption by the country's inhabitants. This should include support for all technological interfaces, including mobile, online, apps, POS, ATM, and so forth.

- **Convert Business Correspondents into Electronic Assistants**

The Committee has observed that bank branches constitute a crucial interface for the effective implementation of financial inclusion in the nation. In consideration of the fact that BCs depend heavily on electronic infrastructure to carry out their duties, the committee has suggested that they be turned into electronic assistants. In addition, their activities must be supervised by IBA through respective Banks and SLBCs to ensure that they fulfill their tasks exactly according to the assigned location, & time and that they satisfy the banking needs of the assigned region.

- **Promote financial literacy through front-line staff and agents**

Recognizing the importance of electronic financial literacy, the committee has suggested that the National Centre for Financial Education (NCFE) develop standardized materials to educate consumers on electronic payments and services.

Keeping in mind the number of new users and their different demands, the committee has suggested that the regulator implement targeted user awareness and education initiatives in the field to assist the SLBC staff's urgent needs. This may be accomplished via the Financial Education Fund.

- **Enable Kisan Credit Cards for Electronic Payments**

In light of the challenges faced by farmers, the committee has recommended that efforts be made to convert KCCs issued by banks into RuPay cards expeditiously (within a year, for example) and that adequate acceptance infrastructure is established so that KCC holders can make electronic purchases for their agriculture procurements using KCC Cards.

- **Ease electronic purchase of train tickets**

To make life easy for the common man and to digitize unreserved train tickets in India, the committee has proposed that the Unreserved Ticketing System (UTS) be made compatible with all other online payment systems, including wallets, BHIM UPI, etc. The amenity must be offered at no extra expense.

- **Recommendations for high-frequency use cases**

- **Enable recurring payments in all Electronic Payment System**

With the rise in popularity of Electronic Payments, the committee has advised that cashless payment solutions become feature-rich and offer recurring payments in addition to other modern capabilities in order to enhance the user experience while ensuring appropriate consumer security. Recurring payments have several applications, including EMIs, Systematic Investment Plans (SIPs), magazine subscriptions, etc. The committee suggests that e-Mandates be added to BHIM UPI

to enable recurring payment use cases. Users must have the ability to revoke a mandate by notifying the other party.

- **Promote interoperable transit payment standards**

The Committee has also recommended the widespread use of common and interoperable mobility cards by the general public across all modes of public transportation, for which it is necessary to adopt common technical standards and a time-bound migration plan for existing systems to migrate to a common new standardised platform, such as the NCMC. In addition, such mobility cards would have a modest stored value and no KYC requirements. Since they are stored-value cards, the RBI must give standards for lost or stolen card liability.

- **Facilitate broader adoption of NCMC**

The Committee has proposed that the National Common Mobility Card (NCMC) acceptance at POS terminals be expanded beyond mobility use cases. A migration plan for POS machines to accept the NCMC card may be established.

➢ **Regulatory Changes**

- **Review all high-volume payment systems every 6 months**

The committee has proposed that the BPSS perform a full examination of all high-volume payment systems every six months, considering market dynamics, consumer complaints, frauds, decline rates, and any other customer-impacting concerns.

- **Aid Initial Regulators / Self-Regulatory Organizations**

The committee has advised that the regulator enable the development of a Self-Regulatory Organization (SRO) for the newly licensed NBFC Account Aggregators, keeping in mind the ongoing evolution of technology and the need to create regulatory capacity to regulate in this environment. This may serve as a model for further SROs that may be established in the future in the field of Electronic Payments. To properly manage the payment ecosystem and increase regulatory

capacity, the RBI must assist in the creation of first-level regulators or SROs. SROs are industry organizations having membership from the industry but a governing board that is independent.

- **Promote regulatory sandbox use**

The committee has lauded the RBI's commitment to establishing a regulatory sandbox in order to encourage innovation and the development of solutions for consumers who may otherwise be difficult to service and has urged that mass market use cases be explored as a top priority.

- **Consider investing in Electronic Payment infrastructure for lending to priority sectors**

In an effort to remove obstacles to the development of Electronic Payments infrastructure, the committee has proposed that priority sector loans be expanded to include financing for capital expenditures related to Electronic Payments Infrastructure.

- **Simplify know-your-customer (KYC) / customer due diligence (CDD) processes**

Noting that there are a variety of use cases in which the sector might comply with PMLA criteria without friction, the committee has urged the industry to innovate for the benefit of the client.

- **Consider re-activating dormant wallets and small accounts**

Keeping in mind that many wallets and small accounts may have become inactive due to KYC compliance deadlines and that these wallets and small accounts may have only been loaded from KYC-compliant accounts, the committee has recommended that these wallets and small accounts be considered for reactivation.

- **International expansion**

The committee has advised that the NPCI develop an internationalization strategy for Indian payment systems such as RuPay and BHIM UPI in order to

facilitate remittances into India and foreign payments by Indian tourists. This will further highlight the superiority of the technique.

- **Create a standing committee on digital payments at the SLBC**

In order to assess the situation on the ground and provide immediate solutions to issues related to financial inclusion, the committee has recommended that each State-Level Bankers' Committee (SLBC) establish a standing committee on electronic payments in order to enhance Digitisation, particularly in semi-urban and rural areas. This standing committee, led by a representative of the RBI, may also study and suggest prompt solutions for Aadhaar seeding in customer accounts.

- **Spread best practices**

To increase client trust and to borrow a useful feature from BHIM UPI, operators of other payment systems may make the appropriate modifications to enable the automatic reversal of unsuccessful transactions (www.rbidocs.rbi.org.in).

3.10 Conclusion

The RBI and the GOI are licensing, regulating, and supervising the activities of FinTech companies, and also constituted various committees to promote innovative Electronic Payment solutions for the benefit of Indian society. The several measures adopted by the Government played a pivotal role in popularizing and making the EPS a common man’s tool for financial services. It also contributes a lot to reduce the cost of banking and reaching the unbanked rural people.

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CHAPTER IV

POLICY MEASURES AND THE GROWTH OF EPS

CONTENT

4.1 Introduction
4.2 Policies and Schemes of the Government of India
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4.1 Introduction

This chapter mainly includes the policies and schemes of the Government for promoting EPS and the present scenario of Electronic Payments. The first part of the chapter deals with the Government of India's schemes, the Digital India campaign, projects under Digital India, the union budget, and other e-payment promotion plans. The second part includes the current position of different sorts of Electronic Payments from International, National, and Kerala state perspectives.

4.2 Policies and schemes of the Government of India

In order to promote cashless transactions and safeguard the interests of those who use e-payment methods, the GOI has launched a number of programmes that accelerated the adoption of Electronic Payment Methods in the country.

Digital literacy and awareness are exceedingly poor in rural regions. On December 9, 2016, Union IT Minister Ravishankar Prasad inaugurated a 24-hour TV channel called DigiShala to educate millions of people about digital payments. This channel is open to people without a subscription charge. He argued that viewership will exceed 2 billion by August 2022. (www.news18.com). The minister claims the channel would promote the use of Digital Payments among the general public. The channel's programme aimed to inform people in rural and suburban areas about available Electronic Payment options.

The Central Government is making significant strides toward the goal of abolishing paper currency. At the Digi Dhan Mela event, Prime Minister Narendra Modi unveiled BHIM (Bharat Interface for Money), a mobile payment software that uses Aadhaar to verify users. There isn't much complexity to this software, and our fingerprint is all that's required. In this case, we won't require access to the web or a mobile device.

NITI Aayog, in collaboration with NASSCOM telecom providers, has developed a dedicated helpline, '14444', for any inquiries about Electronic Payments. Other user advantages of the E-Payment System include cheaper sub-urban train passes, lower toll fees for cashless mode, more PoS terminals, no extra

fees for cashless payments, and cheaper gasoline for cashless mode payments. To get the best from the available benefits, it is necessary to be well-educated about electronic payment. Making Digital Payments not only saves time but also saves money. Apart from this, Digital Payments are going to largely impact the country's economy.

The Union Home Ministry has made the national helpline number 1930 (formerly 155260) and reporting platform available to prevent financial loss due to cyber fraud. The Indian Cyber Crime Coordination Centre (I4C) soft-launched the helpline in April 2021, with active support and collaboration from the Reserve Bank of India (RBI), all major banks, payment banks, wallets, and online merchants. This service is now available throughout the nation and run by the state police.

The major policies and schemes to promote the E-Payment System are as follows.

4.2.1. BHIM Referral and Cash Back Schemes

- **BHIM APP**

In December 2016, the Bharat Interface for Money (BHIM) app was released. The app is available for both Android and iOS. BHIM-Aadhaar is the BHIM App's merchant interface, which allows retailers to accept electronic payments from customers using the Aadhaar platform.

BHIM Aadhaar Pay App users who have designated themselves as merchants and are accepting payments through the BHIM Aadhaar app would be eligible for a 0.5% reward of the transaction value, with a minimum incentive of Rs.2 and a maximum incentive of Rs.50 per transaction. The maximum transaction amount is Rs.10,000. Aadhaar authentication should be performed using any registered device, such as a Micro-ATM/POS, mPOS, Kiosk/Tablet/Mobile phone, as long as the transaction is for the sale of goods and services by a merchant establishment and payment is made using Aadhaar number and biometrics.

4.2.1.1. Schemes to promote BHIM

The GOI has launched the following schemes to reward BHIM users.

- **BHIM Cashback Scheme (For individuals)**

This scheme is intended to expand the adoption of UPI-based transactions and encourage the enrollment of new users on the BHIM app.

- **Incentives for onboarding**

The incentive would be provided to new BHIM app users who successfully download the BHIM app, connect the BHIM app to their bank account/s, and complete 10 successful unique financial transactions of Rs 50 or more using the BHIM app. A cash refund of Rs 150 is given to the consumer. The reward will be provided just once and only to new users. Cashback was given to qualified new BHIM App users who downloaded the app for the first time and completed the required number of transactions between the 4th of July 2018 and the 31st of March 2019.

- **BHIM Aadhaar Merchant Incentive Scheme**

Through Aadhaar Authentication, BHIM Aadhaar Pay allows merchants to accept electronic payments from clients over the counter. It enables any merchant linked with any acquiring bank that is live on BHIM Aadhaar Pay to take payment from any bank's client by validating the customer's biometrics.

BHIM Aadhaar is the business version of the Aadhaar Enabled Payment System (AEPs). BHIM Aadhaar is particularly advantageous for those who lack debit cards, mobile wallets, and mobile phones. This incentive programme was developed to encourage retailers to accept BHIM Aadhaar as a payment method.

- **Waiver of Merchant Discount Rate (MDR)**

When a payment is made at a merchant's point of sale, the merchant is responsible for paying MDR to the bank. Consequently, despite possessing debit cards, many individuals make cash payments. Similarly, MDR is assessed on BHIM UPI platform and AEP payments to merchants. Merchant Discount Rate (MDR) imposed on all debit card/BHIM UPI/ Aadhaar Enabled Payment System (AEPs) transactions up to and including Rs. 2000 would be borne by the Government for a

period of two years with effect from January 1, 2018, by reimbursing the same to banks.

- **BHIM Cashback schemes for Individuals & Merchants**

In accordance with the budget statement for the Fiscal Year 2017-18, it was determined to promote the use of Electronic Payments by people as well as businesses. Individuals and retailers received incentives for making and accepting Electronic Payments using the BHIM App under these incentive programmes.

- **MDR Reimbursement Scheme**

To encourage Digital Payment transactions in the nation, MeitY implemented the following Merchant Discount Rate (MDR) Reimbursement Schemes, in which the Government compensated the MDR claims of acquiring banks:

- MDR Reimbursement Scheme on transactions of value up to Rs.2,000 done through Debit cards/ BHIM Unified Payments Interface (UPI)/ Aadhaar Pay.
- MDR Reimbursement Scheme on Government receipts up to Rs.1 lakh for transactions made through debit cards.

As of December 31, 2019, MDR reimbursement programmes are no longer available. MeitY's MDR plan for low-value transactions is providing the necessary push to advance such dealings throughout the nation.

4.2.2 Digi Dhan Mission

The Digital India Program aims to transform India into a digitally empowered society and knowledge economy by making digital Government and digital services accessible to all citizens. The promotion of the Electronic Payments' ecosystem is a critical component of the Digital India Programme, and it has the potential to alter the Indian economy through expanding inclusive financial services.

In the Union Budget for 2017-18, the GOI announced the establishment of a mission to promote digital payments, with a goal of 2,500 crore digital transactions using UPI, USSD, Aadhaar Pay, IMPS, and Debit cards throughout the fiscal year.

As a result of the distribution of Business Rules as outlined in Cabinet Secretariat Notification No.1/21/1/2017.

MeitY was allocated the role of "promotion of digital transactions, including Digital Payments" on February 15, 2017. As a result, the DIGIDHAN Mission was established at MeitY in June 2017 to promote Digital Payments, with the following **objectives;**

- Promotion of Electronic Payments using all Digital Payment channels, including as UPI, USSD, IMPS, BHIM Aadhaar Pay, and Debit Cards.
- Promoting and monitoring the construction, growth, and maintenance of a national electronic payments ecosystem that is resilient, secure, and inclusive.
- Development of easy Electronic Payment options and Electronic Payment acceptance infrastructure to facilitate smooth Electronic Payments and broader adoption of Electronic Payments by people nationwide.
- Creating awareness of the advantages of Electronic Payments through promotional campaigns, training, and education.
- Evolving and enabling suitable standards for efficient, cost-effective, and secure Electronic Payment services.
- Protecting the Electronic Payments ecosystem.

4.2.2.1 Major initiatives taken by the Digi Dhan Mission

a. Coordination with Banks: Yearly Digital Payment transaction targets, as well as merchant acquisition targets, have been assigned to public and private sector banks for the development of Digital Payments. MeitY has established the Score Card

idea, in which banks are graded according to their performance in several policy aspects.

b. Coordination with Ministries / Departments / States: Coordinated efforts between federal agencies and individual states have been made to expand the use of digital payment methods and build up the infrastructure necessary to accept these new payment types. The NPCI, the banks, and the RBI have all been informed of the problems experienced by ministries, departments, and states so that they might be resolved.

c. Incentive Schemes: Government has introduced a number of programmes to incentivize businesses, consumers, and financial institutions to transition to Digital Payment methods.

d. Internationalization of indigenous Digital Payment solutions (RuPay Cards & UPI): RuPay cards and BHIM-UPI are systems of world-class quality for facilitating Digital Payments. Several nations in Asia, Africa, and the Middle East have shown an interest in building a "real-time payment system" or "domestic card scheme" and would want to use our approach. Government efforts are being made to market these items internationally.

e. Digital Payments Dashboard: DIGIDHAN Dashboard was built to establish a platform for reporting, monitoring, and analysis of Digital Payments transactions happening in the nation, as well as infrastructure enablement via the deployment of physical/mobile/BHIM Aadhaar PoS devices. It integrates data from numerous sources, including banks, the National Payments Corporation of India (NPCI), the Reserve Bank of India (RBI), ministries/departments, states/UTs, and smart cities, and gives a relevant depiction of the status of Digital Payments in the nation.

The Digi Dhan Dashboard offers useful information for prioritising efforts to promote Digital Payments. In the Dashboard, an interactive chat box called 'Digidhan Mitra' has been created that uses artificial intelligence to give on-demand statistics and information from the Digidhan Dashboard. Digidhan Mitrachat bot is intended to converse with the user through text and voice. It mines the Digidhan site

to provide personalised data in graphical, tabular, and textual formats. It can address inquiries in both English and Hindi.

f. Promotion and awareness for Digital Payments: To encourage people to adopt Digital Payments, a promotion and awareness campaign has been launched. Several Digital Payment advertisements have been posted on Digital India and MeitY's social media sites (Facebook, Twitter, Instagram, and LinkedIn) to promote the usage of Digital Payments throughout holiday seasons such as Diwali, Bhai Dooj, Christmas, New Year, Republic Day, and Independence Day.

4.2.3 Electronic Payments and Receipts in Government

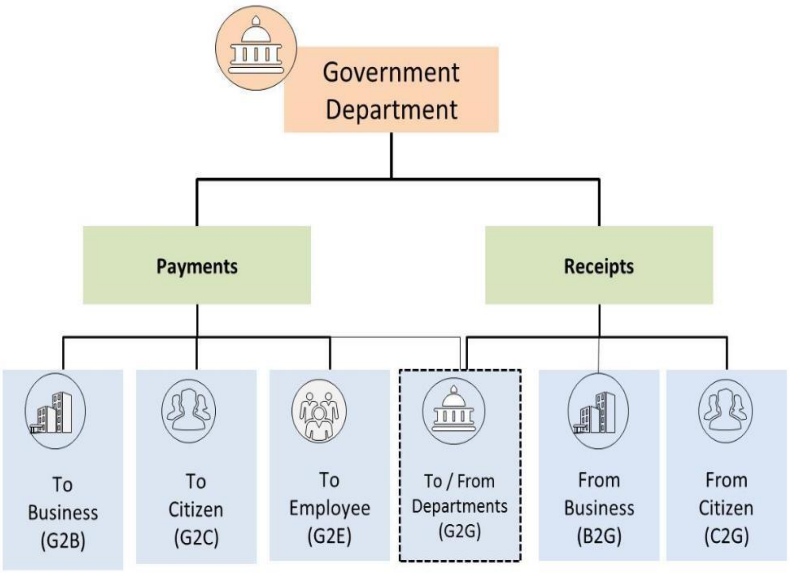
The Government of India's Ministry of Electronics and Information Technology (MeitY) envisions web-enabled/mobile-enabled anytime, everywhere access to information and services throughout the nation, particularly in rural and isolated areas. MeitY also envisions a shared e-governance infrastructure that would provide a seamless transactional experience for citizens, companies, and internal Government activities, including access to different services over the internet and a payment gateway, interface for online payments.

Type of Government Payment and Receipts:

The overall payments and receipts made by departments can be categorized as follows:

Figure 4.1

Type of Government payment and receipts



Source: www.vikaspedia.in

In order to reach its goal of 2500 billion digital transactions in India within the fiscal year 2020-21, the GOI has declared that it would designate some municipalities as "less-cash townships." These townships are anticipated to produce about 1.5 million digital transactions every day, amounting to around 5.5 billion digital transactions per year. NITI Aayog (National Institution for Transforming India) has announced the programme.

Criteria for selection of cashless / less-cash townships:

A less-cash township is one were

- Deployment of payment acceptance infrastructure is complete.
- All the families in the township are covered under training programmes.
- More than 80% of the total number of transactions in the township being done through digital modes.

4.2.5. Lucky Grahak and Digi-Dhan Vyapar Yojana

NITI Aayog announced the launch of the schemes Lucky Grahak Yojana and Digi-Vyapar Yojana, which provide consumers and merchants who use Digital

Payment instruments for personal consumption expenditures with cash rewards.4.2.6. News updates on Digital Payment promotion

According to the Reserve Bank of India's (RBI) weekly data supplement, the Notes in Circulation (NIC) were ₹17, 74,187 crores on November 4, 2016, and ₹27, 80,045 crores on January 29, 2021. Due to ongoing efforts towards digitalization, the overall volume of Digital Payments has grown from ₹1,459.02 crore in FY 2017-18 to ₹4,371.18 crore in FY 2020-21. The amount of banknotes in circulation is mostly determined by the demand for banknotes caused by GDP growth, inflation, the replacement of dirty banknotes, and the expansion of non-cash means of payment.

4.2.6. Ombudsman Scheme for Digital Transactions

The Reserve Bank of India (RBI) launched the Ombudsman Scheme for Digital Transactions, in 2019. This scheme was designed to offer a free and quick procedure for resolving complaints about poor customer service in digital transactions undertaken by non-bank firms authorised by the RBI. The scheme goes into effect on January 31, 2019 under Section 18 of the Payment and Settlement Systems Act of 2007. With effect from November 12, 2021, the programme is absorbed into the Integrated Ombudsman Scheme 2021.

The Reserve Bank of India appoints the Ombudsman for Digital Transactions to address consumer complaints against system participants as defined in the plan for deficiencies in specific services covered under the grounds of complaint indicated in clause 8 of the scheme.

As of now, 21 Ombudsman for Digital Transactions have been appointed, with offices mostly in state capitals to learn more about the Ombudsman for digital transactions' offices.

4.2.7. Payment Systems Vision 2021

The Reserve Bank of India published Payment and Settlement Systems in India: Vision 2019-2021. The Vision document, with its fundamental concept of "Empowering Exceptional E-payment Experience," intends to provide every Indian with access to a bouquet of safe, secure, accessible, rapid, and economical e-payment choices.

The Vision 2021 for payment and settlement systems in India builds on the solid foundation established over the last two decades. While the pursuit of a 'less cash' society continues, as does the desire for a less-card India, the goal is to also ensure increased efficiency, continuous availability of safe, secure, accessible, and affordable payment systems, as well as to serve segments of the population that have previously been unserved by payment systems. The next decade will see a major transformation in how Indian residents utilise Digital Payment choices, as well as

provide them with an e-payment experience that is extraordinarily safe, secure, and really world-class.

4.2.8. Promotion of payments through cards and digital means

The Union Cabinet has approved the implementation of actions to promote card and Digital Payments. The goal is to reduce cash transactions. Several short-term (to be implemented within one year) and medium-term (to be implemented within two years) initiatives have been authorised for implementation by Government ministries/departments/organisations.

Objectives of this scheme are:

- Make it easier for a person to execute card/digital transactions.
- Lower the risks and expenses associated with cash handling at the individual level.
- Lower the costs of handling money in the economy.
- Establish a transaction history in order to increase credit access and financial inclusion.
- Reduce tax avoidance.
- Diminish the effect of counterfeit money.

4.2.9. Scheme of penalty for non-replenishment of ATMs

The RBI developed the Penalty Scheme for ATM Non-Replenishment to guarantee that adequate cash is accessible to the people via ATMs. The scheme will go into effect on October 1, 2021. To minimise cash-outs, banks/WLAOs (White Label ATM Operators) should have a strong system for monitoring the availability of cash in ATMs and ensuring prompt refilling.

The Penalty Scheme will be managed by the Bank's Regional Offices' Issue Departments. The Officer-in-Charge of the Issue Department of the Regional Office

whose authority the ATMs are situated shall be the competent authority to issue penalties. If necessary, banks/WLAOs may appeal the competent authority's decision to the Regional Director/Officer-in-Charge of the Regional Office concerned within one month of the imposition of the penalty. Because the scheme's goal is to guarantee timely replenishment of ATMs, appeals would be entertained only in situations of real causes outside the control of banks/WLAOs, such as imposition of lockdown by state/administrative authorities, strike, and so on.

4.2.10. Person-to-Merchant (P2M)

The Union Cabinet, led by Prime Minister Shri. Narendra Modi, has authorised a strategy to promote RuPay Debit cards and low-value [up to ₹2,000] BHIM-UPI transactions (Person-to-Merchant (P2M)] BHIM-UPI transactions across the nation. Under the programme, acquiring banks would be incentivized by the Government by paying a percentage of the value of transactions (P2M) made using RuPay debit cards and low-value BHIM-UPI means of payment for a one-year period beginning April 1, 2021.

This scheme aided acquiring banks in developing a strong Digital Payment ecosystem and promoting RuPay debit card and BHIM-UPI digital transactions across all industries and population groups, as well as deepening Digital Payments in the nation. It will also assist in making digital forms of payment available to unbanked and underprivileged communities who are not part of the official banking and financial system.

India is now one of the world's most efficient payment markets. These advances are the result of Government efforts and innovation by numerous actors in the Digital Payment ecosystem. The plan will encourage more research, development, and innovation in the fintech area, as well as assist the Government in strengthening Digital Payments in different sections of the country.

4.2.11. The Digital India Campaign

The GOI initiated the Digital India programme in 2015 to guarantee that all people have access to Government services through electronic means. This aim is

accomplished through developing online infrastructure and enhancing internet access, or by empowering India in the technological realm digitally.

The Digital India initiative aims to link rural regions to high-speed internet networks and increase digital literacy. The campaign's objective is inclusive development across all industries.

Objectives

- The establishment of a reliable and secure digital infrastructure.
- Digital delivery of Government services.
- Universal Digital Literacy.

4.2.11.1 Initiatives under Digital India Campaign

The initiatives under Digital India are categorised based on the objectives of the scheme. The initiatives under Digital India are as follows:

4.2.11.1.1 Infrastructure

Under this initiative, the Government provides multiple programmes that facilitate a reliable digital infrastructure. **The following are some of the programmes:**

- **AADHAR:** A fundamental feature of 'Digital India,' each resident of the nation is assigned a unique identification number.
- **Bharat Broadband Network (BBNL):** This is Digital India's custodian. In India, the establishment of the National Optical Fiber Network (NOFN) has been legislated.
- **Centre of Excellence for Internet of Things (CoE-IT):** The center's major goal is to develop domain competency and innovative applications.
- **CERT-IN:** This organisation was founded with the goal of securing Indian cyberspace.

- **Common Services Centres (CSCS**): CSCs serve as entry points for critical public utility services, healthcare, social assistance systems, finance, education, and agricultural services.

- **Cyber Swachhta Kendra:** The goal of this is to create a safe cyberspace in India by identifying botnet infections and notifying, enabling cleaning, and securing end-user computers to prevent new infections.

- **Deen Dayal Upadhyaya Gram Jyoti Yojana:** This is one of the Electricity Ministry's (MoP) main projects, and it aims to provide uninterrupted power supply to rural India.

- **Digi Locker:** A digital wallet for digitally empowering individuals.

- **Digital Saksharta Abhiyaan (DISHA**): This programme intends to teach 52.5 lakh people in information technology.

- **Digitise India Platform:** This platform digitises scanned document images as well as actual documents.

4.2.11.1.2 Services

Under this programme, the Government has implemented a number of online services to allow improved accessibility and reach.

- **Accessible India Campaign and Mobile App:** This nation-wide initiative aims to achieve universal accessibility so that persons with impairments have equal access to opportunities.

- **Agri market App:** This mobile application is designed to keep farmers informed of crop prices and prevent distress sales.

- **Beti Bachao Beti Padhao:** Seeks to offer a female child with equal opportunities, a chance to be born and educated.

- **BHIM (Bharat Interface for Money**): This makes UPI payments simple and fast.
- **Crime and Criminal Tracking Network & Systems (CCTNS):** This initiative intends to establish a statewide networking infrastructure for the development of a state-of-the-art IT-enabled tracking system for 'investigation of crime and identification of criminals.'
- **Crop Insurance Mobile App:** This app computes the insurance premium for notified crops depending on the coverage region, amount, and loan amount for loanee farmers.
- **Digital AIIMS:** A unique health identification number was created on the Aadhar platform for every patient attending AIIMS.
- E-Granthalaya, E-Panchayat, E-Hospital, E-Pathshala, and E-prison digitalise services such as libraries, hospitals, schools, and prisons.

4.2.11.1.3 Empowerment

Under this initiative, the Government provides e-governance, skill development, and infrastructure development initiatives:

- Aadhaar Enabled Payment System (AEPS)
- BPO Scheme
- Digidhan Abhiyaan
- MyGov
- National Mission on Education using ICT
- North East BPO Promotion Scheme (NEBPS)
- NREGA – Soft
- Open Forge

- Pay Gov India
- Smart Cities
- Pradhan Mantri Jan- Dhan Yojana (PMJDY)
- Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- PAHAL (DBTL)
- Targeted Public Distribution System (TPDS)
- Visvesvaraya PhD Scheme for Electronics and IT

The Digital India initiative was introduced in the year 2015 and has achieved a considerable amount of digital literacy by making the internet available to many rural places.(www.meity.gov.in)

4.2.12 Standards and Identifiers

Standardisation is crucial in payment systems since the use of Identifiers, uniform standards and formats assist to remove frictions and inefficiencies in procedures. considering the significance of standards in the payments space, RBI has recommended standards for several payments and has been instrumental in developing a few others. Adoptions of these standards and identifiers have helped to make the payment systems the force they are today.

4.2.12.1 Magnetic Ink Character Recognition (MICR)

MICR is a kind of character recognition technology that is used in the banking sector to speed up the processing and clearing of cheques and other documents. MICR code is a 9-digit number written on cheques that uniquely identifies the bank and branch that participates in an Electronic Clearing System (ECS).

The MICR code consists of:

- The first three digits indicating the city (city code) - they are aligned with the PIN code used for postal addresses.
- The following three digits representing the bank (bank code). and
- The last three numerals denote the branch (branch code).

Cheques having MICR codes are fed through MICR scanner and sorter devices, allowing for speedier processing, sorting, and clearing. MICR clearing was adopted in India in the mid-1980s, and this standardisation benefited in automating and streamlining the cheque clearing process.

4.2.12.2 Indian Financial Network (INFINET)

In order to enhance the country's payment and settlement systems, the RBI took the initiative of providing a communication backbone to the banking and financial sectors in the form of the satellite-based INFINET utilising VSAT technology. IDRBT was tasked with planning and constructing the communication network. The Closed User Group (CUG) Network is a Time Division Multiplexing (TDM) / Time Division Multiple Access (TDMA) network with STAR topology for data and Demand Assigned Multiple Access-Single Channel per Carrier (DAMASCPC) overlay with mesh topology for voice and video traffic.

4.2.12.3 ISO 20022

ISO 20022 is a multi-part International Standard developed by TC68 Financial Services Technical Committee. ISO 20022 is an evolving worldwide and open payment messaging standard. It establishes a universal language and paradigm for payments data. The RTGS of India was the first large-value payment system in the world to utilise the ISO 20022 communications standard.

4.2.12.4 Society for International Interbank Financial Communications (SWIFT)

SWIFT is the largest supplier of secure financial messaging services in the world. The syntax of SWIFT messages has become the industry standard for financial messaging. Messages structured according to SWIFT standards are read and processed by a variety of financial processing systems, regardless of whether the message travelled via the SWIFT network. For local and international financial communications services, SWIFT standards have been adopted globally. In India, the SWIFT messaging standards are used for all international payments.

4.2.12.5 Legal Entity Identifier (LEI)

LEI is a 20-character alphanumeric identifier (based on the ISO 17442 standard) that is used to uniquely identify legally different companies that conduct financial transactions. It provides information on an entity's ownership structure and thereby answers the questions 'who is who?' and 'who owns whom?' by referencing important reference information that allows unambiguous and unique identification of legal entities engaged in financial transactions.

RBI mandated LEI for the first time in India in June 2017 for all participants in OTC derivative markets (rupee interest rate derivatives, foreign currency derivatives and credit derivatives). RBI has required LEIs for non-derivative markets (Government securities markets, money markets, and non-derivative currency markets) and for major corporate borrowers (with total exposure to banks in excess of'50 crore). Implementation has been completed for OTC derivative markets and major corporate borrowers. In the case of non-derivative markets, the regulation was introduced in phases.

Globally, around 16 million LEIs have been issued as of this moment. Any Local Operating Unit (LOU) in the globe, including Legal Entity Identifier Limited, may issue an LEI to an Indian company (the local LOU). LEIs have been given to 47,677 Indian companies as of December 31, 2020.

4.2.13. The Union Budget 2022

India's digital economy was significantly bolstered by Budget 2022. From establishing 75 digital banking units in 75 districts to proposing a "Digital University," the annual financial statement is replete with references to digital technology. In addition, the Government has suggested the digitisation of land records and the DESH-stack e-portal for the youth's skill development.

The GOI's Union Budget for FY 2022–2023 has not only placed an emphasis on digitalizing banking and the financial industry, but has also caught the public by storm. "Digital India" was utilised as a pillar in the budget to promote inclusiveness and establish a sustainable economy over time.

Some of the key highlights that cut into the finance and digital-finance space include:

- **CBDC—Digital Rupee**

The budget proposal mentions that the digital rupee will be introduced by the Reserve Bank of India (RBI) in FY 2022-23.

The introduction of Central Bank Digital Currency (CBDC) will stimulate the digital economy significantly. Additionally, digital money will result in a more economical and efficient currency administration system. It is consequently recommended that the Reserve Bank of India begin issuing digital rupees utilising block chain and other technologies beginning in 2022-23.

- **Post offices on core-banking system**

In the fiscal year 2022-23, all 1.5 lakh post offices in India will be linked to the main banking system. This would facilitate financial inclusion and access to post office accounts through Internet banking, mobile banking, and automated teller machines, as well as the online transfer of money between post office accounts and bank accounts. This proposal has its ideological roots in the National Mission for Financial Inclusion (NMFI) of August 2014, which aims to provide universal banking services to every

unbanked household based on the principles of "banking the unbanked, securing the unsecured, funding the unfunded, and serving un-served and underserved areas."

- **'Digital Banking Units' in 75 districts by SCBs**

To celebrate 75 years of Indian independence, the Scheduled Commercial Banks will establish 75 digital banking centres in 75 districts throughout the nation (SCBs). This would advance financial inclusion, and banks in these regions may gain access to larger pools of liabilities from novel consumer sources. A 2017 RBI Report of the Working Group on Fin Tech and Digital Banking observed that people were fast embracing technology in their everyday lives due to the expansion of internet and mobile penetration, the availability of inexpensive data plans, and the move from offline to online shopping. In this report, it was stated that "Consumers dictate the structure of retail financial services, and as they change, so will retail financial services." Therefore, innovation is no longer a luxury but a need.

4.2.14 RBI-Digital Payments Index

The Reserve Bank of India has constructed a composite Digital Payments Index (DPI) to capture the extent of digitisation of payments across the country.

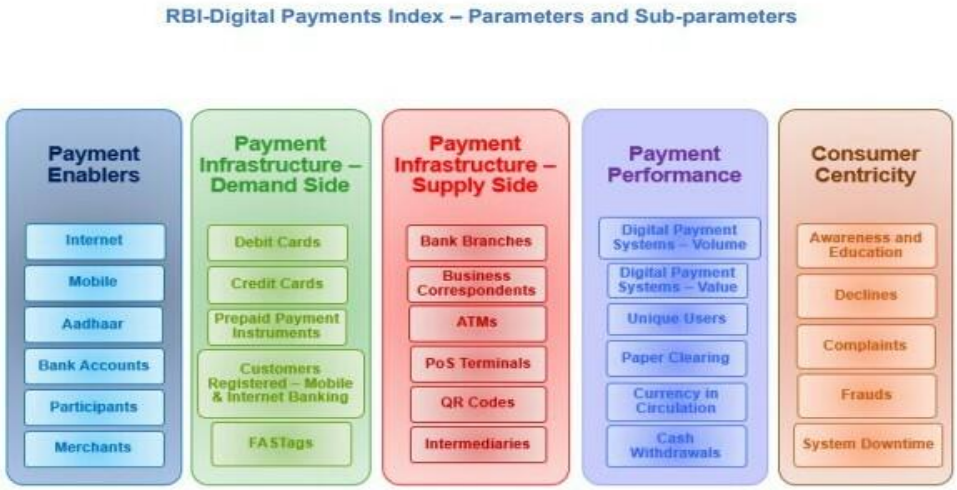
The RBI-DPI comprises of **five broad parameters** that enable measurement of deepening and penetration of Digital Payments in the country over different time periods. These parameters are –

- Payment Enablers (weight 25%)
- Payment Infrastructure – Demand-side factors (10%)
- Payment Infrastructure – Supply-side factors (15%)
- Payment Performance (45%) and
- Consumer Centricity (5%).

Each of these parameters has sub-parameters which, in turn, consist of various measurable indicators. To see the major sub-parameters under each parameter, the following figure is attached.

Figure 4.2

RBI- Digital Payment Index- Parameters and Sub-parameters



Source: www.rbi.org.in

4.2.15. Other promotional schemes for Digital Payment

Following are the important other promotional schemes for boosting Digital Payments

4.2.15.1 Digital Payments Utsav

MeitY is celebrating Digital Payments Utsav to promote Digital Payments around the nation. Azadika Amrit Mahotsav (AKAM) is a festival celebrating the 75th anniversary of India's independence. Ministry of Electronics and Information Technology (MeitY) celebrated "Digital Payments Utsav" from 5 December 2021 to 5 March 2022 as part of its campaign to promote Digital Payments in the nation.

Digital Payments Utsav is a three-month programme intended to speed up the adoption of Digital Payments across the nation. All ecosystem participants, including

Banks, Payment Service Providers, and Central/State/Local Government, are urged to collaborate in order to provide all residents and businesses with user-friendly Digital Payment solutions.

4.2.15.2 Promotion of Digital Payments

The following major steps have been taken for promotion of Digital Payments by Ministry of Electronics & IT (MeitY):

- MeitY has launched an incentive plan to promote RuPay Debit cards and low-value BHIM-UPI transactions (P2M) in order to stimulate digital transactions in the nation.

- BHIM Cash back schemes for Individuals & Merchants, BHIM Aadhaar Merchant Incentive Scheme, and BHIM-UPI Merchant On-boarding Scheme Merchant Discount Rate (MDR) Reimbursement Scheme were some of the other incentive/cash back schemes launched by MeitY to change customer/merchant behaviour for faster adoption of Digital Payments.

- MeitY provided advice to Central Ministries/Departments and States/UTs to strengthen payments acceptance infrastructure, allowing people to pay via a range of channels such as Internet banking, mobile banking, and mobile apps, among others.

- MeitY launched the "Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)" initiative to promote digital literacy in rural India. One of the key Digital India schemes 'Pradhan Mantri Gramin Digital Saksharta Abhiyan' approved in February 2017 to make one person each in six crores rural households' digital literate by March 2019. However, as on 31 December 2019, only 3.19 crore people have enrolled and out of which training has been imparted to only 2.56 crore. Of this, only 1.88 crores have been certified under the scheme. (www.pib.gov.in)

- MeitY encouraged all banks and payment service providers to conduct awareness campaigns to promote safe payment procedures and raise knowledge about information security.

- North East capital cities held awareness efforts to encourage Digital Payments, using the BHIM app. To promote Digital Payments, MeitY also launched newspaper advertisements, digital theatre campaigns, FM radio campaigns, and hoarding promotions.

- Various marketing and awareness programmes have been launched to encourage individuals to embrace Digital Payments, using both classic and emerging media such as social media platforms.

- MeitY commemorated India's Digital Payment Journey with a marquee 'Digital Payment Utsav' as part of the week-long 'AzadiKa Digital Mahotsav'. The event commemorated the journey and emergence of Digital Payments in India, bringing together leaders from the Government, banking industry, fintech businesses, and startups. Top banks were honoured and acknowledged in a variety of categories for their contributions to the development of Digital Payments in fiscal years 2019-20 and 2020-21.

- MeitY has linked Digital Payment Grievances with the Ministry of Consumer Affairs (MoCA) in order to use it with the Department of Consumer Affairs' National Consumer Helpline (NCH) platform (DoCA). The NCH Platform has been adopted by all of the major banks and financial institutions. The portal is now operational and accepting Digital Payment-related complaints.

- The Government and the Reserve Bank of India have taken a number of efforts to guarantee the safety and security of Digital Payments (RBI).

4.2.15.3 MoRTH issues notification for Promotion of Digital and IT based payment of fees through FASTag

Through modifications to the CMVR, 1989, the Union Ministry of Road Transport and Highways has issued a notice making FASTag necessary to be

accessible by January 1, 2021 in old vehicles, i.e., M and N category of motor vehicles (four wheelers) sold before December 1, 2017.

In this respect, the Ministry has issued GSR 690 (E) dated November 6, 2020. According to the Central Motor Vehicles Rules, 1989, the FASTag has been made necessary for all registration of new four-wheeled vehicles starting December 1, 2017, and is issued by the vehicle manufacturer or its dealers. It was also mandatory that the renewal of fitness certificates would take place only once the FASTag for Transport Vehicles was installed. Furthermore, FASTag installation has been compulsory for National Permit Vehicles beginning October 1, 2019.

It has also been compulsory that a valid FASTag be shown when applying for new 3rd party insurance through a modification to FORM 51 (certificate of Insurance), where the information of the FASTag ID must be collected. This will take effect on April 1, 2021.

It may be claimed that this notice would be a significant step toward guaranteeing that toll costs are paid 100% electronically at Toll Plazas and that cars move easily through the Fee Plazas. There would be no wait time at the Plazas, and gasoline would be saved.

Steps are being taken to ensure the availability of FASTags via different channels, including physical sites and online mechanisms, so that residents may have them attached to their cars at their leisure within the next two months.

4.2.15.4 Digi Vaarta launched

Digi Vaarta has been launched with the sole purpose of raising knowledge about Digi Dhan and increasing the adoption of BHIM's barcode-based merchant payment mechanism among merchants and traders in general. This launch consists of two parts.

- An SMS application that works via the NIC's SMS Gateway on a specific short-code service designated by the DoT with the number "14444." Citizens will get pre-approved SMS messages, and the answer messages will be made

accessible for further action, analysis, and study. The Government suggests initially paying for citizen responses in order to encourage citizen involvement and making the awareness initiative fully free for citizens.

- A mobile application version of DigiVaarta that users of smart phones may access and use. This software provides audio-visual lessons, among other features in addition to chat.

The initiative aims to enable citizen Government dialogue and engage citizens in educational and outreach programmes. With the mobile phone as its interface, Digi Vaarta's content and communication style is interactive and adaptive.

4.2.15.5 Digi Shala DD channel launched to promote Digital Payments

Digi Shala, a free Doordarshan DTH channel has been launched to educate and inform the people about the various modes of Digital Payments. The channel helps the people to understand the use of UPI, USSD, AEPs, electronic wallets, debit and credit cards.

Door Darshan (DD) Free Dish reaches to around 2 to 2.5 crore families, mostly in rural areas and people from poor background. The Digi Shala is an education and non-commercial TV channel on DD Free Dish with aim to:

- Provide education on the Digital Payment ecosystem, including its tools, advantages, and procedures.
- Inform and educate folks about cashless, faceless, and paperless India.
- Encourage individuals, particularly those in rural and semi-urban regions, to utilise Digital Payments and other Digital India goods and services.

4.2.15.6 Vittiya Saksharta Abhiyan (VISAKA) of MHRD

The 'Vittiya Saksharta Abhiyan,' an initiative of the Ministry of Human Resource Development, seeks to actively engage the youth/students of Higher Education Institutions in order to encourage and motivate all payers and payees to use a digitally enabled cashless economic system for the transfer of funds.

Through the VISAKA web portal, higher education students and faculty may register as volunteers and occasionally post their accomplishments. Significant accomplishment will be recognised and praised.

4.2.15.7. Seventy-Five Townships declared Less-Cash Townships

In order to reach the goal of 2500 billion digital transactions in India within the financial year 2020-21, the Prime Minister has designated around 75 localities as "cashless towns." A less-cash township is one in which the deployment of payment acceptance infrastructure is complete, and all households in the township are trained.

4.3 Policies and schemes of the Government of Kerala

Digital Literacy in Kerala

The success of e-Government is directly related to closing the digital gap through increasing digital literacy. For the Government programs to be successful, it is crucial that individuals be taught and informed about digital services in 18 orders. The state of Kerala has been labelled "a full digital state" (Kerala to be first digital State, 2015).

As a measure for digital literacy for the citizens, the following initiatives are taken up by the State Government.

4.3.1 E-Jaalakam

The objective of the project was to promote e-Governance literacy among people, and women in particular, so as to improve their ability to live in an e-society. It centered on facilitating citizens' access to e-Government services that may be beneficial to them at different phases of their life cycle. The project, which was initiated in 2012, has progressed in stages and created several public interaction tools to promote e-Government learning (e-Jaalakam, 2014).

4.3.2 Major ICT initiatives in Kerala and their performance: A Review

Over the years, the Electronics and Information Technology Department of the Government of Kerala and the Kerala State IT Mission, a society founded by the

Government and an independent nodal IT implementation agency, were able to effectively execute several ICT programs in Kerala. Currently, IT Policy 2017 provides the general framework for executing the aforementioned projects. In 1972, the establishment of KELTRON (Kerala State Electronics Development Corporation) was a significant step in this direction. KELTRON is India's first state-level company for the advancement of electronics. It is a leader in the manufacturing of communication devices and is actively involved in the production and sale of a vast variety of electronic items. It has the ability to be a partner in promoting the use of ICT in Government and in establishing the State Information Infrastructure.

Kerala's ICT efforts consider ICT as both a manufacturing sector and a driver for socioeconomic development. It is recognized that the E-Governance segment of Kerala's service industry offers the greatest and most immediate development possibility, highlighting the need to boost the market. Information & Communication Technology (ICT) has been promoted as a manufacturing sector consisting of the Information Technology (IT), Information Technology Enabled Services (ITES), and Hardware sectors. The ITES industry has the best capacity to absorb a big number of graduates. However, the greatest obstacle in this respect is their lack of necessary talents (like, for instance, command over English language, and also communication, presentation and other soft skills).

Over the last three decades, ICT investments in Kerala have fallen under the following five categories:(i) Physical and Information Infrastructure, (ii) Training and other services, (iii) Industry (Hardware & Software), (iv) E-Governance, and (v) ICT for Development (ICT4D).

4.3.2.1 Physical and Information Infrastructure Kerala State Wide Area Network (KSWAN):

Kerala has set up Kerala State Wide Area Network (KSWAN). It has got the four major components viz. (i) State Information Infrastructure with Data Centres, (ii) District Level Connectivity, (iii) Block Level Connectivity and (iv) Rural Connectivity Infrastructure.

The above components are briefly discussed in the following paragraphs.

(i) **State Information Infrastructure (SII):** With money from the Union Government, Kerala has already set up a State Information Infrastructure called "DIAMOND." So, a State Information Backbone is set up to connect the three largest cities (Thiruvananthapuram, Kochi, and Kozhikode). The private service providers (Reliance, Bharti, and Asianet) each gave 2 Mbps of free bandwidth in exchange for the "Right-of-Way," which was given to them at the Data/Network centers. These data/network centers are open 24 hours a day, 7 days a week, and are well-equipped with server banks that can meet any IT needs of the Government or other organizations. A 5000 sq. ft. State E-Governance Data Centre has also been set up in Thiruvananthapuram. It has multiple servers, storage/backup, and other necessary facilities, all of which are set up in a very secure area.

Also, the Data Centres in Kochi and Kozhikode make sure that there is enough redundancy and meet the networking needs of different Government departments in the State and other agencies. At the Data Centres, servers can be shared or co-located, and the servers can also be managed remotely. The above facilities save a lot of money on capital investments that would have been needed for each Government department and other agency separately.

(ii) **District Level Connectivity:** The state has already started a project to connect all the District Headquarters to the network centres of the State Backbone. The above infrastructure is supposed to allow for video conferencing between the districts and Kerala's Secretariat, as well as between the districts and other public Government offices in Thiruvananthapuram, such as Vikas Bhavan, the Office of the Advocate General, Kerala House, and so on.

(iii) **Block Level Connectivity:** In addition to District-level connectivity, the State Government is in the process of using the state's KWSAN network to connect all Block Headquarters to the State Information Backbone and the State Data center.

(iv) **Rural Connectivity Infrastructure:** The district of Malappuram has already developed this infrastructure, which is based on wireless technology and covers more than 3,500 square kilometers. This is expected to be the world's biggest IP-based outdoor network. Each police station in each district in the state is connected to this network. Additionally, the Government intends to link all KSEB, revenue, and agriculture departments via this network. In addition, to guarantee that every Panchayat has access to ICT-enabled services, the Government has established the Akshaya e-Kendra project as a trial in Malappuram district. Currently, the state is applying the same policy in more panchayats.

4.3.2.2 Training & other services

- **Technopark, Thiruvananthapuram**

The Kerala Technopark campus was envisioned as an integrated IT setup with all fundamental and sophisticated infrastructure amenities necessary for the business. Government exempted this campus from a variety of approvals, and the only permission necessary from the State Government is the power safety clearance from the Chief Electrical Inspectorate. Technopark functions as a single point of contact for getting almost all permits, approvals, etc. provided by the Indian Government. Technopark was granted ISO 9001: 2000 Certification in 2004 for establishing and maintaining a quality system for the creation and marketing of IT campus infrastructure and support services. Technopark is the first service company to get CMMI level certification (2004) from Carnegie Mellon University in the United States of America.

- **Infopark, Kochi**

Kochi's Infopark, located in central Kerala, is yet another example of the State Government's daring ICT projects. This 92-acre park has a constructed area of 3.5 million square feet. It is home to renowned IT businesses like as Wipro, ACS, TCS, OPI, and IBS, among others. Currently, the total number of firms exceeds 35. It employs more than 1,400 individuals. About Rs. 80.43 crores have been invested

here by different enterprises, and Rs. 32.00 crores' worth of goods have been exported. The GOI granted Infopark SEZ (Special Economic Zone) designation in September 2006, marking yet another significant success in its history.

- **Smart City Project, Kochi**

Smart City Project, Kochi "Smart City" is the State Government's next major IT initiative. The State Government is in advanced discussions with Dubai Internet City (DIC) about the establishment of Smart City in Kakkanad, Kochi. According to the current proposal, the State Government would buy the land necessary for the DIC and transfer the rights to the Infopark in order to promote the IT sector. In exchange, the Infopark will lease the site to the DIC for the development of the Smart City. A significant percentage of the land originally needed for the project is already under Government control, since it is owned by public sector organizations such as the Kerala State Electricity Board and the Kerala Infrastructure Development Corporation.

4.3.2.3 IT Industry (Hardware & Software)

Nearly 40 "Spoken English" trainers were hired on short-term contracts to implement "Spoken English" programs at Industrial Training Institutes (ITIs) across Kerala. Accordingly, over 3000 students from the 31 Government ITIs in Kerala received English communication skills training. Thus, eighty percent of the students who received Call Centre training at the ITES Habitat Centre in Kochi were placed in reputable companies.

4.3.2.4 E-Governance

Regarding ICT activities in E-governance, Kerala has made substantial progress. This is evident from the fact that the state has been ranked as the second best in India for the adoption of e-Government. This award, presented by the Indiatech Foundation, was announced during the Telecom India 2005 Seminar in Mumbai. In addition to the relatively high investments in E-Government among the states of the Indian Union, Kerala has additional reasons to be proud. Among these achievements are the first completely computerized Panchayat in India and a fully

computerized Collectorate, among others. Some of the major initiatives of the State in E-governance front are briefly discussed in the following paragraphs.

- **Fast Reliable Instant Efficient Network for Disbursement Services (FRIENDS)**

FRIENDS is a single-window system through which people may pay all Government-owned taxes and other financial obligations. FRIENDS attempts to give all people with the benefits of the total computerization of different Government agencies, even if the complete computerization of the backend operations of these departments has not yet been achieved. The most notable characteristic of FRIENDS is the efficient integration of IT and logistics in order to supply all citizens with the necessary services. Through the FRIENDS centres, payments may be made to different Government of Kerala and GOI agencies and organizations. The Kerala Government is replicating the FRIENDS Janasevana Kendram as sub-centres at the municipal and district levels. Therefore, the FRIENDS centres in the district headquarters might serve as district coordination centres for each sub centre.

- **E-payment facility (E-pay)**

In August of 2004, the State Government of Kerala launched the 'E-pay' online bill payment service via its Akshaya e-kendras as an upgrade to the FRIENDS project operating in the Malappuram district of Kerala. Currently, payments for electricity bills and telephone bills (both mobile and landline) may be done using this E-pay service. FRIENDS utilize the State Bank of India's (SBI) online banking feature for money transfers. In the second phase of the Akshaya rollout, the e-payment option is being expanded to Akshaya Centres in additional districts of Kerala.

- **Information Kerala Mission (IKM)**

IKM is another innovative State project that was started in 1999. IKM is the single greatest effort for local Government computerization. It entails the use of

software written in an Indian language across the nation. IKM has successfully implemented Jansevana Kendras in all Municipalities, and has also piloted the Panchayat Computerisation projects in two Panchayats (viz. Vellanad and Talikkulam) by making them the first 'Computerised Panchayats in the country. Furthermore, IKM is launching another project called 'Hospital Kiosks,' which connects all hospitals in the state's five cities with the corresponding Corporation offices for online birth and death registration.

- **Secretariat Wide Area Network (Sec. WAN)**

The State Government planned to establish a Secretariat WAN that links the Secretariat, Annex building of the Secretariat, Vikas Bhavan building, and the Public Office Complex, all of which are located in Thiruvananthapuram, the capital city of Kerala. There are now over 1400 computers placed in the Secretariat, of which around 500 operate in the networked setup described above. In the final phase, it is intended to expand this facility to a capacity of 3000. In addition, a tele-printer system for connecting the Secretariat to all District Headquarters, the Advocates General's Office, and the office of the Special Representative in New Delhi has been replaced by a network of computers known as the "Internet-Based Messaging System" at all of these locations.

- **Knowledge Archive System for Secretariat (K-BASE)**

The Government Secretariat is now implementing a Knowledge Archive System (K-BASE) in order to provide an efficient knowledge management solution. K-primary BASE's aims are the creation of knowledge repositories for an effective decision support system, the improvement of the speed, transparency, objectivity, and consistency of decision making, and the provision of public access to significant State Government Acts, Rules, and Orders.

- **AKSHAYA – the Revolutionary Project of Kerala IT Mission**

Akshaya is an innovative, people-focused, grass-roots initiative comparable to the FRIENDS project mentioned above. This was started by the Kerala State IT

Mission in November 2002. In Kerala, the 'Akshaya' initiative was first planned to address the state's digital divide. In addition, it was intended to serve a catalytic role in fostering the socioeconomic growth of Kerala. The centers of Akshaya might be used to gather data on the growing of different crops for the goal of enhancing output. As advised by the IT Mission team and the businesses involved, each Akshaya center has begun involvement in one out of ten e-commerce activities that generate income and jobs. In partnership with the relevant FRIENDS office, it is envisioned that Akshaya centres would provide e-transaction services or those permitting diverse local payments.

4.3.2.5 ICT for Development

The State initiatives in respect of using ICT for developmental purposes have been equally remarkable as are those in respect of information infrastructure, E-governance, training and other services etc. The major initiatives are discussed below.

- **IT @ School**

This initiative of the Government of Kerala aims to equip high school students with computer education in order to enhance the quality of conventional learning methods and to allow instructors to use computers as an efficient instrument for imparting education. It is now being implemented in all Kerala state high schools. In addition, this project includes an efficient supply chain management solution for the administration of textbook inventories, the update of the SSLC database, and the communications systems between 51 offices. Moreover, this initiative utilizes Edusat's capabilities to promote e-learning.

- **E-Krishi**

This initiative aims to create a networked community of farmers across Kerala who have access to information about market demand, pricing, excellent agricultural practices, and quality agricultural inputs, among other things. Key components of this Platform include: (i) a farmer community of approximately 50,000 cultivating priority crops based on market demand; (ii) enrollment of buyers

or exporters in key markets, including manufacturers in processing industries; (iii) enrollment of agricultural input providers, seeds, plants, fertilizers, pesticides, providers/ consultants of technology/methodology; and (v) establishment of a robust IT-enabled platform where the members can seek information, transact & make or receive electronic payments, etc.

- **Collaborative Content Management**

The Akshaya e-Kendras in the community space and the IT @ School project in the schools are anticipated to generate a substantial demand for vast quantities of information. The Collaborative Information Management platform envisions instructors, experts, and individuals with access to educational content uploading instructional resources, illustrative examples, teacher notes, etc. for usage by schools or member student communities. Consequently, this platform provides the necessary tools for collaborative content management.

- **Tele–medicine**

A networked Public Healthcare Program and Tele-medicine system is envisioned for the State as part of the Tele-medicine project. As part of the Akshaya Project, it has been suggested to launch this initiative in the Malappuram district, where intranet connection via wireless is already in existence.

- **Education Grid**

This initiative aims to connect 30 Kerala institutions and, as a result, provide both students and instructors with the capacity to create, develop, and share limited educational materials. As a result, it works to improve educational teaching standards.

- **Indian Institute of Information Technology and Management–Kerala (IIITM-K)**

This Kerala Government institution is outfitted with cutting-edge technologies, networks, and servers, as well as high-speed Internet access. It

provides IT courses at the postgraduate level. This institute has come a long way over the years, with a number of new and important programs and projects for the future of the State and India as a whole. It is now known throughout the State and the rest of the country as one of the best postgraduate IT schools. Three groups have already graduated, and all of the students have found good jobs at top IT companies. The main goals of teaching at IIITM-K are to give students experience in the real world and in the workplace and to provide a high-tech learning environment.

4.4 E-banking and its Scope in Kerala

The recent demonetisation has impacted e-banking. More and more people want to do digital transactions, which has led to an increase in e-banking activities like using credit or debit cards at merchants' Point of Sale (POS) and using m-wallets to pay for small things like taxi rides, small shop purchases, or donations to temples. E-transactions and online transfers are being used more and more to replace cash transactions. More people who used to prefer cash to electronic payments are now thinking about going digital. With the Government's focus on digital transactions, it is becoming easier to do business online. With e-transactions being so easy, the conditions are right for e-banking. Banks and payment players must now be "e-ready" to take advantage of the growing use of online banking.

E-banking has led to an increase in POS machines in stores, unified payment interfaces (UPI) by banks for their customers, and mobile payment platforms for digital users like Paytm, freecharge, etc. The GOI created BHIM (Bharat Interface for Money), which is a UPI-based mobile app for making instant bank-to-bank payments and can be used to send and receive money using just a mobile number or a "virtual payment address."

According to the report (Demonetisation: In Kerala, many back Cashless Drive, but political opposition remains concern, 2016), small traders and vendors in the retail sector and local transport service providers have started to switch to a cashless system. The report puts a lot of focus on the role that Akshaya centers play in this with the "Go Cashless" campaign to get merchants and the general public to use Digital Payment platforms. By staging live demonstrations, the centers

attempted to acquaint individuals with Digital Payment platforms. During the training sessions, attendees were also given ideas for improving online banking security.

Initial emphasis was placed on bank-issued debit/credit/prepaid cards, USSD (Unstructured Supplementary Service Data), Aadhaar-enabled payment system (AEPS), UPI (Unified Payments Interface), and e-wallets. The e-wallet method was the most preferred among the people.

As of December 2016, almost 30 percent of all transactions in the state were digital. As per the SLBC 2014 report, all households in Kerala have a bank account. In comparison to the national average of 11,000, the state presently has one bank branch for every 5,900 residents. As of December 2016, the increase of Digital Payments for the sale of gasoline and fuel in Kerala was around 20%. On Independence Day celebration in 2015, Kerala chief minister Oommen Chandy declared that Kerala became India's first fully digital state after achieving 100 percent mobile density, 75 percent e-literacy, the highest digital banking rate, and Panchayat-level broadband connectivity. The state has developed e-district programs in each district and connected Aadhaar cards to bank accounts. Even at Kerala's Sabarimala, the temple management has adopted the use of a swipe machine for donations. The facility has been launched by Dhanlaxmi Bank (www.slbckerala. com).

4.5 Electronic payments in the world scenario

4.5.1 Major landmarks of electronic payments in various countries

- Right now, not only does our Prime Minister want to make India a digital country, but other developed countries are also moving in that direction.
- Since 1997, people in Hong Kong have paid for public transportation with smart cards. In 2004, a cashless system was put in place. (John, 2018).
- Starting in 2010, the Canadian Government stopped accepting cash for taxes and passports.
- The countries that use credit cards the most are Canada and the United States. Both of these countries have credit card usage higher than 80%. Others among

the top five countries for credit card usage include: Israel (75%), Norway (70.5%), Luxembourg (69.8%), and Japan (68.4%). In total, at least 143 out of the world's 195 countries use credit cards.

- In 2012, the Spanish law prohibits cash payments of more than 2500 Euros. In 2014, bushes were made cashless.
- In the Netherlands, fixed assets and movable properties could not be paid for in cash after 2014. The Netherlands was the first country to use fingerprints or facial recognition to pay online in 2015.
- The first country to use a digital currency will be Ecuador in 2016. It was run by the central bank of the country.
- The goal of Denmark's Government is for there to be no cash purchases in the retail market by 2030.

4.5.2 Global Comparison - Transaction Value

The way digital transactions work in different countries depends on how much information and communication technology and infrastructure each country has. The values of digital transactions in 2019 for each country are shown in the table and graph below.

Table 4.1

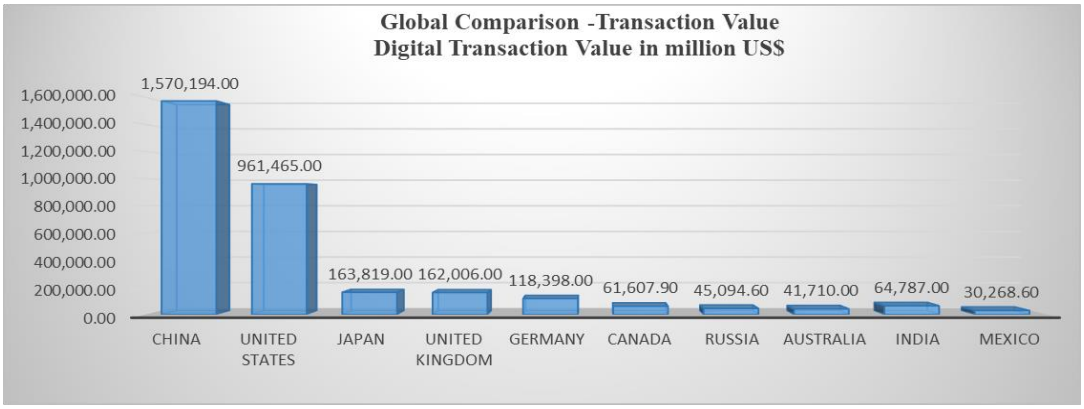
Global Comparison of Digital Transaction Value

Countries	**Digital Transaction Value in million US$**
China	US$1,570,194.00m
United States	US$961,465.00m
Japan	US$163,819.00m
United Kingdom	US$162,006.00m
Germany	US$118,398.00m
Canada	US$61,607.90m
Russia	US$45,094.60m
Australia	US$41,710.00m
India	US$64,787.00m
Mexico	US$30,268.60m

Source: www.paymentscardsandmobile.com

Figure 4.3

Global Comparison - Electronic Transaction Value in million



Source: www.paymentscardsandmobile.com

When looking at the total value of digital transactions by country, China comes out on top with US$1,570,194.00 million. This is followed by other developed countries. In 2019, the total value of all digital transactions in India is US$ 64,787.00 million, and India possesses 6th position out of the top 10 countries based on the value of digital transactions.

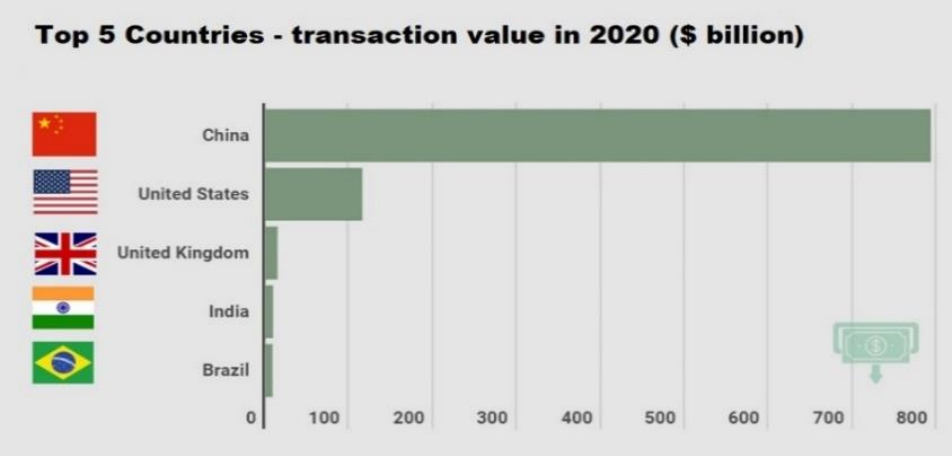
4.5.3 Global mobile wallet market value in 2020

According to recent estimates, the global market for mobile wallets will reach $1 trillion in value by 2020, rising by a massive 36.5% annually. In the next years, it is anticipated that the market will reach a total value of $2.1 trillion value, continuing its robust upward trend.

In 2017, the worldwide market for mobile wallets was worth $368 billion. During the following two years, the value surpassed $745,7 billion. In terms of compound annual growth rate, the unified market is predicted to double by 2023, increasing by 28.1% to a value of $2.1 trillion.

Figure 4.4

Global mobile wallet market value in 2020



Source: www.paymentscardsandmobile.com

In recent years, the number of customers using mobile wallets to handle their payments has increased dramatically. In 2017, 824 million individuals worldwide used this payment option.

According to Statista, the number of users has increased by 13.5% annually over the last three years, reaching 1.3 billion. Millennials (individuals between the ages of 23 and 38) and Generation Z (individuals between the ages of 7 and 22) account for 37% and 25% of the user base, respectively. By 2023, it is anticipated that there will be 1.6 billion users using mobile wallets globally.

In 2020, the average transaction value per mobile POS payments user will reach $791,2; this represents a 75% increase compared to the 2017 number. In the following three years, it is anticipated that this price will almost double, reaching $1,289

In general, Asian nations dominate the mobile wallet business, with China serving as the worldwide leader. Over 70% of Chinese customers frequently use mobile wallets, and the nation is projected to earn nearly 80% of the worldwide mobile wallet income in 2020.

China's market environment had a significant effect in the widespread adoption of mobile wallets. The infrastructure was already in place for mobile

payments. In addition, credit cards never achieved the same level of popularity as they have elsewhere in the globe. Today, mobile payments are widespread, QR codes are everywhere, and they are used to pay taxi drivers and street entertainers.

The majority of individuals in Western nations still prefer cash, credit cards, and debit cards. The United States is the second-largest market in the world, with $116 billion in transactions, or about seven times less than China. The United Kingdom is the third-largest mobile wallet market, with transactions estimated to exceed $14.9 billion this year.

ApplePay is the most popular brand in the US and UK business mobile payments markets, with over 55% of businesses adopting this service, according to an analysis conducted by the suppliers. Android Pay scored as the second-most popular service in these nations, with a market share of around 44%.

4.5.4 Global Scenario of mobile wallets usage

In a number of nations, the use of mobile phones and smartphones varies drastically. The affordability of mobile handsets, network coverage, vendors, service providers, and operators are the primary drivers of smartphone adoption. Utilizing a mobile wallet requires mobile data; network coverage should be extensive and cost-effective. The table below displays the eleven countries with the highest mobile wallet penetration rates.

Table 4.2

Global Scenario of Mobile Wallet Usage for the period 2018-2019

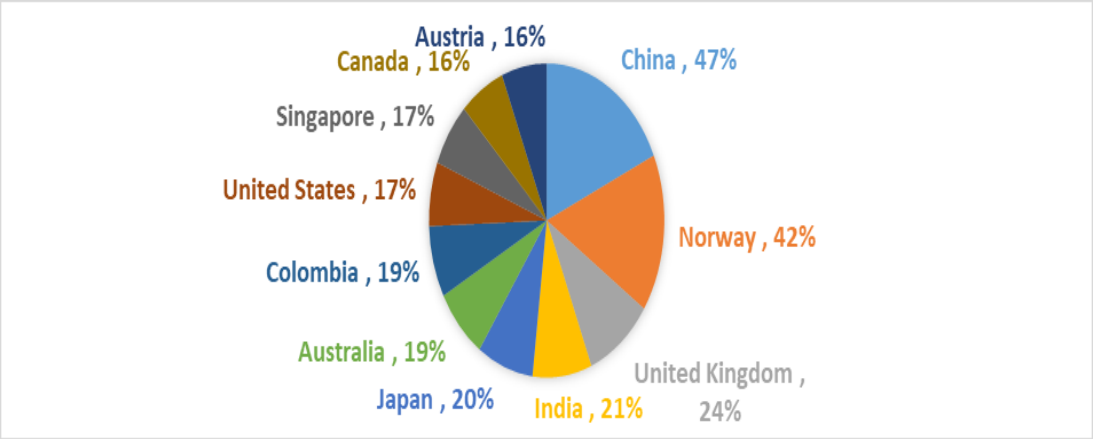
Countries	**Percentage of Mobile Wallet Usage**
China	47%
Norway	42%
United Kingdom	24%
India	21%
Japan	20%
Australia	19%
Colombia	19%
United States	17%
Singapore	17%
Canada	16%
Austria	16%

Source: www.paymentscardsandmobile.com

The data of mobile wallet users worldwide during the year 2019 depicts that, China has 47% of mobile wallet users globally in 2019, followed by Norway with 42% of users, and then other countries. In India, barely 21% of the population uses a mobile wallet.

Figure 4.5

Percentage of Mobile Wallet Usage Worldwide for the period 2018-2019



Source: Data from mobile-wallet-global-usage-statistic

From the above pie diagram, it is understood that people in China & Norway are using mobile wallets comparatively more than in the other 9 countries.

4.6 Electronic Payments in India

As Electronic Payment may save national funds, boost yield, enhance tax collection, etc. India has the most affordable data usage in the world. Digital Payment will aid in the fight against numerous financial crimes. Diverse facts from the "Fintech Festival in Singapore in November 2018" indicate that it is time to use technology in finance. For financial inclusion, Aadhaar has been established for 1.3 million people, and more than 330 million new bank accounts have been opened under the Jandhan Yojana. Presently, students may get scholarships directly into their bank accounts. Approximately 4,000 micro-ATMs are accessible in rural areas. Farmers have digital access to land records, prices, financing, insurance, and markets, among other things.

The BHIM UPI app is the most advanced and simplest payment system in the world. In India, over 128 banks serve as a bridge to UPI, UPI settlement has grown by a factor of 1,500 over the last 24 months, and the value of transactions has risen by over 30%. Countries such as Canada – 82.6%, Israel – 75%, Norway – 70.5%, Luxembourg – 69.8%, Japan – 68.4%, United States – 65.6%, Switzerland – 65.5%, Hong Kong – 65.4%, United Kingdom – 65.4%, and South Korea – 63.7% utilise credit cards for the majority of their electronic payments, but in India, almost everyone uses debit cards for electronic transfers (www.findly.in).

4.6.1 Electronic Payment Transaction Scenario in India

There has been a remarkable increase in the volume of electronic payments. The following table shows the increase in the use of Electronic Payment Systems in India from the Year 2012-2013 to 2021-2022.

Table 4.3

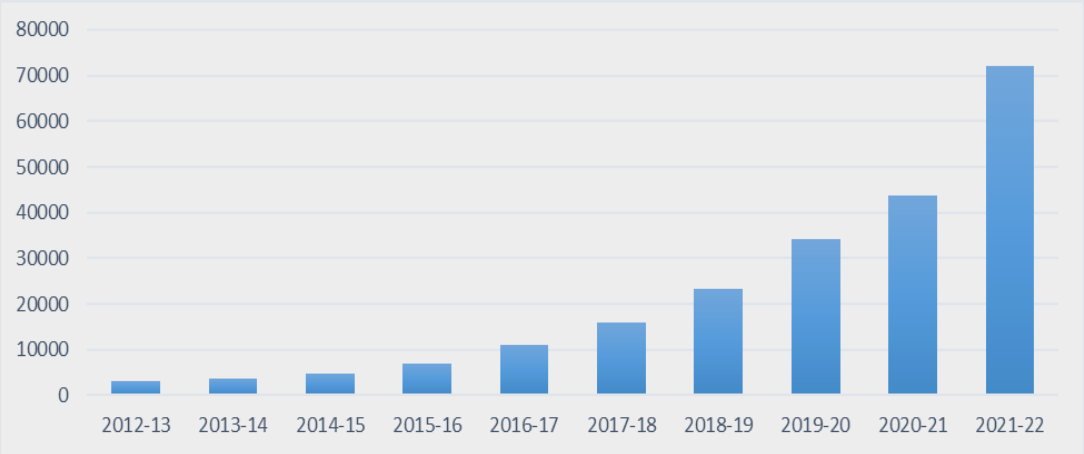
Growth Rate of Total E-payments in India over the last 10 years

Year	Volume (in million)	% of Growth
2012-13	3011	0
2013-14	3711	23
2014-15	4717	27
2015-16	7047	49
2016-17	10991	56
2017-18	15889	45
2018-19	23260	46
2019-20	34124	47
2020-21	43712	28
2021-22	71953	65

Source: RBI (2022)

Figure 4.6

Growth rate of total e-payments in India over the last 10 years



Source: RBI (2022)

Acceptance and expansion of electronic payments have increased exponentially over time. While analysing RBI annual reports of the last 10 years, it is found that India's total e-payments in volume increased by 2390 % in 2022 when compared to 2012.

Table 4.4

Growth of various types of EPS for the period of

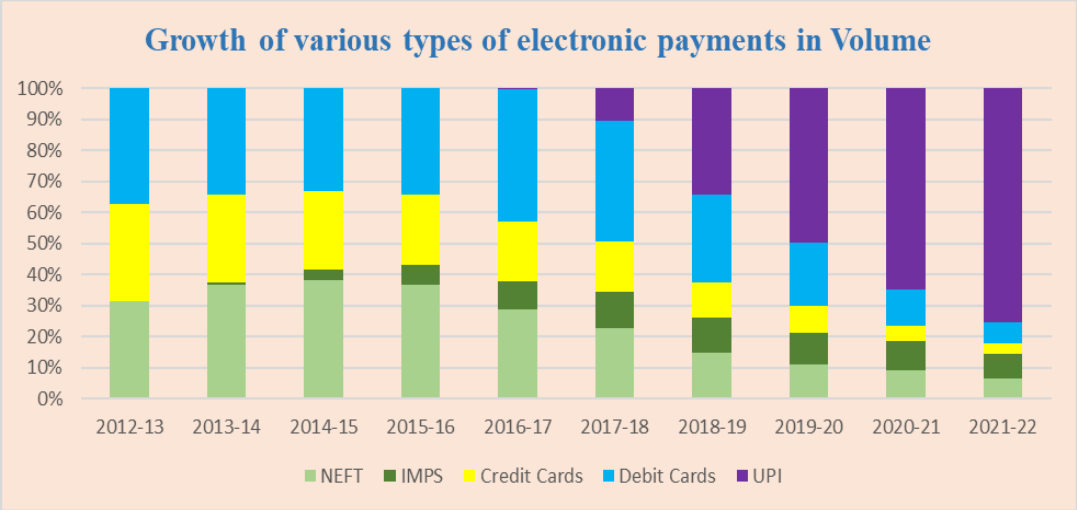
10 years from 2012-13 to 2021-22(Volume in lakhs)

	2012-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	2021-22
NEFT	3,941	6,610	9,276	12,529	16,221	19,464	23,189	27,445	30,928	40,407
IMPS	12	154	784	2,208	5,067	10,098	17,529	25,792	32,783	46,625
Credit Cards	3,966	5,091	6,151	7,857	10,871	14,052	17,626	21,773	17,641	22,399
Debit Cards	4,691	6,191	8,081	11,736	23,993	33,434	44,143	50,611	40,146	39,387
UPI	0	0	0	0	179	9,152	53,534	1,25,186	2,23,307	4,59,561

Source: RBI (2022)

Figure 4.7

Growth of types of EPS in Volume for the period of 10 years from 2012-13 to 2021-22



Source: RBI (2022)

While analyzing the growth of various types of EPS over the last ten years from 2012 to 2022, it is clear that the use of UPI apps has increased steadily in recent years when compared to other EPS methods. According to RBI data, NEFT, credit cards, and debit cards were the most common e-payment methods prior to the introduction of UPI apps in 2016.

4.6.2 Growth of various types of EPS- during the period of pre and post demonetisation

The following table shows how different kinds of Electronic Payment Systems have grown in India over the past 3 years, from the Financial Year 2015-2016 to the Financial Year 2017-2018, both in terms of the number of customer transactions and the amount of money those transactions were worth.

Table 4.5

Growth of various types of EPS during the period of pre and post demonetisation

Types of EPS	Year	Volume (In million)	Growth in Volume	Value (In billion)	Growth in Value
Credit card	FY 2015-2016	786	79 %	2407	91 %
	FY 2017-2018	1405		4590	
Debit card	FY 2015-2016	1174	185 %	1589	190 %
	FY 2017-2018	3343		4601	
NEFT	FY 2015-2016	1253	55 %	83273	107 %
	FY 2017-2018	1946		172229	
RTGS	FY 2015-2016	98	28 %	824578	42 %
	FY 2017-2018	125		1167125	
IMPS	FY 2015-2016	221	**357 %**	1622	**450 %**
	FY 2017-2018	1010		8925	
Wallets	FY 2015-2016	604	**401 %**	206	**428 %**
	FY 2017-2018	3026		1087	

Source**:** RBI (2018)

From the year 2015-2016 (just prior to demonetisation) to the year 2017-18 (just after demonetisation), both the value and the number of electronic transactions that customers made, grew by a huge amount. It can also be seen that IMPS and mobile wallets are growing much faster than other kinds of EPS.

4.6.3 Growth of various types of EPS- during the period of pre and post Covid-19 pandemic.

The following table shows the changes of various kinds of EPS during the period of pre and post Covid-19 pandemic.

Table 4.6

Growth of various types of EPS- during the period of pre and post Covid-19 pandemic.

Types of EPS	Year	Volume (In million)	Growth in Volume	Value (In billion)	Growth in Value
Credit card	FY 2019-2020	2177	3%	7308	33%
	FY 2021-2022	2239		9720	
Debit card	FY 2019-2020	5061	-22%	7039	4%
	FY 2021-2022	3939		7301	
NEFT	FY 2019-2020	2745	47%	229455	25%
	FY 2021-2022	4041		287251	
RTGS	FY 2019-2020	150	38%	1311564	-1%
	FY 2021-2022	207		1286581	
IMPS	FY 2019-2020	2579	81%	23375	78%
	FY 2021-2022	4663		41711	
BHIM UPI	FY 2019-2020	12518	**267%**	21317	**295%**
	FY 2021-2022	45956		84162	

Source**:** RBI (2022)

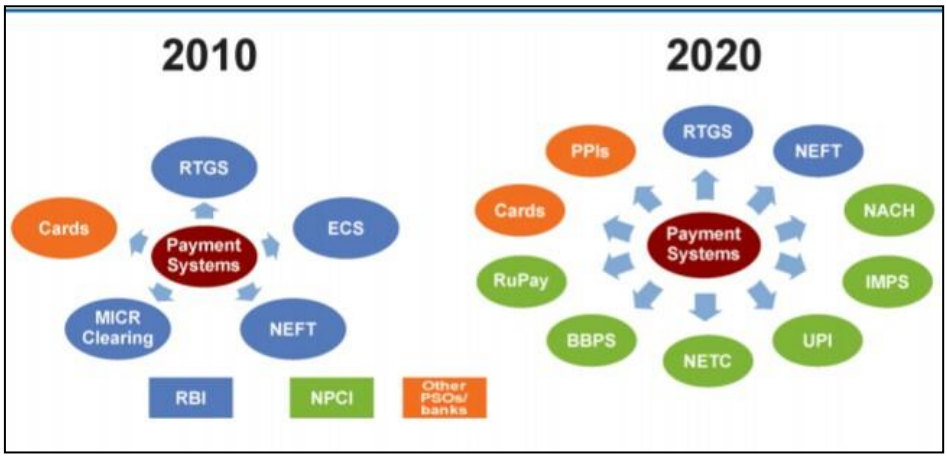
From the year 2019- 20 (just prior to Covid ’19) to year 2021- 22 (just after Covid ’19 complexities), both the value and the number of electronic transactions that customers made, showed an increasing trend except in debit cards and RTGS. It can also be seen that BHIM UPI apps are growing much faster than other kinds of Electronic Payment Systems in volume (267%) and value (295%).

4.6.5 India’s E-Payment System 2010 and 2020

The various Electronic Payment Methods in 2010 are RTGS, ECS, NEFT, MICR Clearing, and Cards. The recent Electronic Payment Methods used in 2020 are NACH, IMPS, UPI, NETC, BBPS, RuPay, and PPIs in addition to those which were mentioned above in 2010.

Figure 4.8

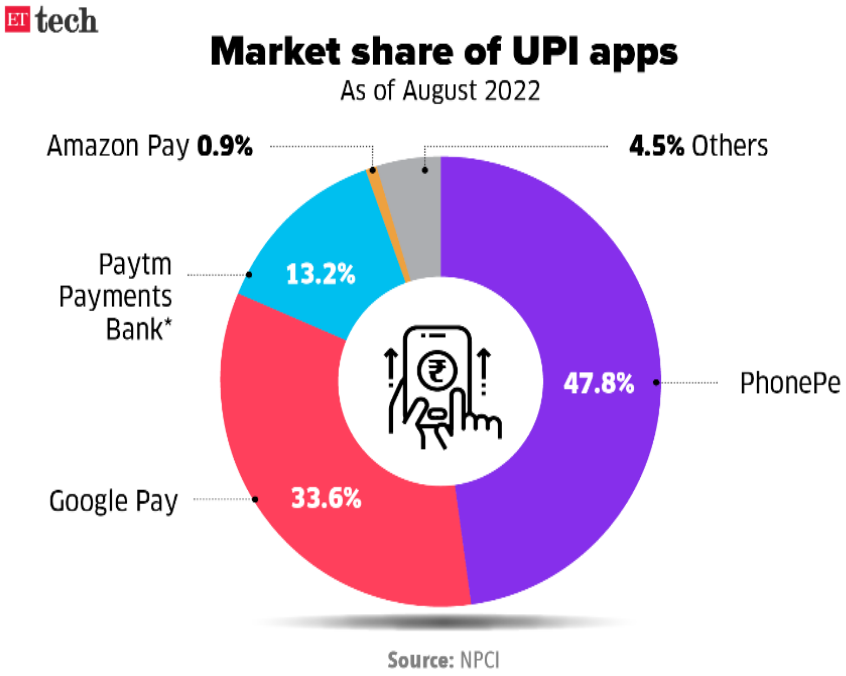
India's E-Payment System 2010 and 2020



Source: RBI (2020)

Figure 4.9

Market share of UPI apps in India 2022



As of August 2022, PhonePe (47.8%) and Google Pay (33.6%) accounted for the majority of the total market share of UPI apps.

4.6.7 NPCI Report on Digital Payments Adoption in India-2020

COVID-19 has made people's lives much harder in many ways. The way people in India pay have changed because of the lockdown period, which will last until a few months of 2020. While most people in the top and middle segments of households were at home, those in the bottom segment had a hard time meeting their needs. People were finding ways to live, work, and do business, and they were learning how to use electronic transactions.

Digital India, Jan Dhan Yojna, PM SVANidhi scheme for street vendors, DBT release, mandating NETC FASTag for tolling, etc. are all Government programmes that have a digital core. This has brought problem-solving to the grassroots. The Government's big spending on benefits also had to go to the right people.

RBI made things easier by putting out rules about V-KYC, contactless payments, offline payments, recurring payments on cards and UPI, standardising QR codes, and adding new categories to BBPS. Banks, Fintech companies, Payment providers, and Business Correspondents all played a big part by speeding up their digital projects and coming up with new ideas quickly to fill in the gaps for customers and merchants.

With this backdrop, PRICE (People Research on India's Consumer Economy & Citizen Environment), an independent, not-for-profit research centre in partnership with NPCI conducted research on Tracking Digital Payments Awareness, Adoption and Use Behaviour of Households.

NPCI

With a primary aim to be the best payments network in the world and a mission to provide at least one payment service to every Indian, NPCI, which is in charge of India's payment systems, is working hard to make digital India work for everyone in India. NPCI was founded in 2008 with the support of the Reserve Bank of India and the Indian Banks Association. Its objective is to reach every Indian with its many Digital Payment products, such as UPI, BHIM, RuPay, NETC, AEPS, BHIM Aadhaar, Bharat Bill Pay, NFS, NACH, CTS, and IMPS, and to make Digital Payments safe and secure. These items help with:

- Person to Person money transfers.
- Person to Business, such as Kirana stores, petrol stations, recharges, e-commerce, retail.
- Business to Business, such as Retailer to Supplier or Distributor.
- Business to Person as salaries, reimbursements, refunds, claims.
- Person to Government, such as tax, public transit, public distribution services utility.
- Government to Person, in the form of direct benefit transfer payments of various central and state Government social security schemes.

PRICE
(People Research on India's Consumer Economy & Citizen Environment)

PRICE is an independent, not-for-profit research centre, also called a "think tank" and a "facts tank." Its main goal is to build and share important knowledge and insights about India's Macro Consumer Economy and Citizen's Environment, which can be used to frame public policy and business strategy. The main authors of PRICE are Rama Bijapurkar (Management Consultant and Professor of Management Practice, IIM Ahmedabad), Praveena Rai (Chief Operating Officer, NPCI), Dr. Rajesh Shukla (Managing Director & CEO, PRICE), and Vikas Sachdeva (Sr. Lead-Marketing, NPCI).

Objective of the Study

To understand the Digital Payments awareness, adoption, and use behaviour of households.

Target Group of the study

- Based on Government data and samples from each state, 5314 households in 25 states are split into three groups: those with the lowest, middle, and highest incomes.

- With a person who "mostly does banking and payment-related work for the household," which includes both rural and urban households' main wage earners.

- The sample was carefully put together using a proprietary sample frame of 35,000 households from a 2016 survey of one million households.

The households are divided into three groups, the Bottom (40%), Middle (40%) and Top (20%)

Table 4.7

Subdivision of Households

Sample households	Rural/Urban Split (%age of households living in respective areas)		Average Income* of household/yr (₹)
	Rural	Urban	
Bottom (40%)	80%	20%	₹1,10,000
Middle (40%)	60%	40%	₹1,80,000
Top (20%)	45%	55%	₹3,60,000

Source: NPCI Report

Respondents were members of households who were responsible for handling all financial concerns and banking on behalf of the household. In most cases, but not always, this individual was also the primary salary earner in the family.

Table 4.8

Status of Digital Payment adoption among Indian households

% of households in each income group who have...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
Never used it	72%	52%	39%	59%
Used in the past but stopped	4%	13%	12%	9%
Use now	**24%**	**34%**	**49%**	**32%**
Never used but would like to use	16%	14%	9%	14%

Source: NPCI Report

The use of Electronic Payment Methods has become deeply ingrained in India at this point. In all, one-third of households throughout India are making use of it in some form or other. 30% of households in the lowest and intermediate income classes are interested in adopting Digital Payment methods. (Table 4.8)

Table 4.9

Digital Payment methods - User share of households

% of households who do digital payments in each income group using...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
Paytm, PhonePe type apps	80%	79%	78%	79%
UPI	56%	45%	56%	52%
Online shopping using credit or debit card	27%	42%	44%	38%
Use Bank App	18%	41%	43%	34%

Source: NPCI Report

User share among households who use electronic payments is in above table 4.9. The data collected clearly shows that Paytm and PhonePe-type apps (79%) are the stars of electronic payments when compared to other Electronic Payment Methods such as UPI (52%), debit/credit cards (38%), and bank apps (34%).

Table 4.10
Status of Online Banking

% of household in each income group who have...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
Have smart phone	57%	72%	90%	68%
Do digital payments	24%	34%	49%	32%
Have mobile app for bank	14%	37%	59%	31%
Use phone for banking related matters	5%	17%	30%	14%

Source: NPCI Report

Online banking is less developed than online payments, although it has potential. Currently, mobile phone use for banking is modest (14%), lower than the availability of mobile banking apps (31%). Also discovered that forty-nine percent of the top segment use Digital Payments and have mobile banking apps. Smartphone ownership is 68% more prevalent than Digital Payment use. Education as a means of bridging the gap between app downloads and use is an immediate and accessible potential (Table 4.10)

Table 4.11

Banking System Reach by Income Group

% of households who have...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
Bank account	100%	100%	100%	100%
Get SMS from Bank	**82%**	**89%**	**94%**	**87%**
Showed Aadhaar Card at Bank	69%	62%	77%	68%
PSU Bank accounts	86%	73%	66%	78%
Private Bank accounts	7%	12%	13%	10%
Both	7%	15%	22%	13%
Bank Branch < 2 kms from home	53%	54%	53%	53%
ATM < 2 kms from home	58%	59%	67%	60%
Reached by Bank Mitra	54%	56%	62%	56%
Has Debit Card	68%	79%	94%	77%
Uses Debit Card for Cash withdrawal	95%	87%	100%	94%

Source: NPCI Report

Even for people with lower incomes, the banking system is very well connected to them digitally through Aadhaar links and SMS. Over 80% of households get SMS updates from banks about what's going on with their bank accounts. This means they can use the AEPS (Aadhaar-enabled Payment System) to do things like withdrawing cash, etc. Also, very high is having an account with PSUs. Both the physical and digital infrastructures are ready for the next big push for online banking, which can help people with less money get better service. (Table 4.11)

Table 4.12: DBT delivery to eligible households (Base: All households who say they are eligible for DBT*)

% of households eligible for DBT who say...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
They received pre lockdown **	79%	86%	93%	84%
They received post lockdown	91%	83%	77%	85%
*Are you or is any member of your household entitled to DBT cash support which the government is giving to supplement your income?				
** Did you or any member of your household receive DBT cash support BEFORE/ AFTER Lockdown?				

Source: NPCI Report

Finally, the Direct Benefit Transfer (DBT) delivery system has worked exceedingly well and got even better during lockdown (Table 4.12)

Conclusion to NPCI Report

A very well-developed ecosystem is driving a lot of customer interest in electronic payments and online banking. Customers can also see the pros and cons of the different Electronic Payment products on the market, which is another sign of a well-developed customer environment.

With specific "how to use" information, helplines for learning and problem-solving, and safety features that help the user "stay safe," India can race towards being a less-cash society. It has moved past the early adopter stage and is now being used by most people. Even better news is that people with less money are also taking part in this move to digitalisation.

4.7 E-Payments in Kerala

Kerala was declared the nation's first digital state by the President of India in February 2016, and its Malappuram district was declared the nation's first e-literate district. The state has attained 100 percent mobile density, 75 percent e-literacy, and the highest rate of digital banking, Aadhaar-linked bank accounts, and e-governance in India (India Today, 2016). According to the 2016 TRAI data, the state has the greatest internet penetration at 40.79 internet subscriptions per 100 inhabitants and

the highest mobile density at 95.85 percent, and a significant share of internet users reside in rural regions.

4.7.1 Digital Empowerment Campaign

According to a report published by Open Government Data (OGD), As of January 2016, the number of internet users in rural Kerala was 5.97 million, or 5.29 percent of the overall number of internet users in India. To achieve digital inclusion via e-literacy, e-services, and information security, the Government of Kerala state carried out the "Digital Empowerment Campaign" initiative July 2015. The primary purpose of the campaign was to provide state residents with e-literacy in support of the Akshaya and IT@ school programmes.

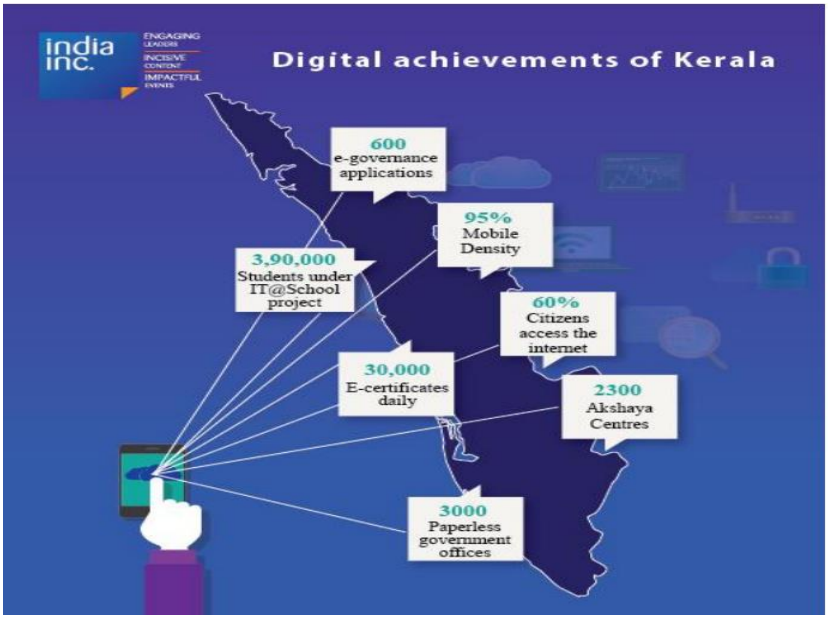
The Akshaya project, which sought to provide e-literacy to at least one member of every household, was effective in educating 33 lakh of the state's 75 lakh households.

The IT@ school programme was effective in providing a high level of computer literacy to 39 lakh kids in 12600 schools throughout the state (Digital Kerala Report, Govt of Kerala, 2016).

The Department of Electronics and Information Technology of the Kerala state Government intends to provide internet access with a restricted capacity to individual houses through an optical fibre network that will be developed in conjunction with the KSEB distribution network (Kerala State Electricity Board). (The India Times).

Figure 4.10

Digital achievements of Kerala

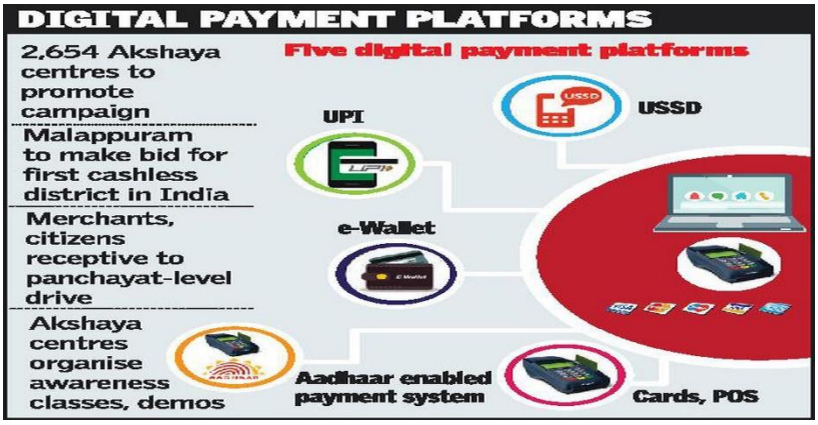


Source: www. indiaincgroup.com

In Kerala, there are 2650 Akshaya centers, 3,000 paperless Government offices, 30,000 e-certificates daily, 41 lakhs students under the IT@school initiative, 60% citizens access the internet, and 600 e-governance applications (indiaincgroup 2019).

Figure 4.11

Digital Payment platforms in Kerala



Source: The Hindu 2016

In the midst of the controversy surrounding demonetisation, Kerala is preparing to join the cashless economy train. The network of 2,654 Akshaya citizen service centers throughout the state has launched an aggressive 15-day campaign to promote Digital Payment systems among businesses and the general public.

4.7.2 Go Cashless Campaign

Efforts are being made to incorporate all panchayats into the paperless economy during the December 15, 2016-begun campaign. During the campaign, each Akshaya center must reach the greatest number of merchants and residents possible. The Union Ministry of Electronics and Information Technology have chosen Akshaya as the lead agency for the "Go Cashless Campaign" in Kerala.

In all panchayats, awareness workshops and live demonstrations are being held with the goal of allowing merchants and the general public, particularly in rural and semi-urban regions, to access and use the Electronic Payment System. P.P. Jayakumar, Manager of e-Government and Networking at Akshaya, Kerala, states that the public's reaction has been gratifying.

The objective of the campaign is to promote five Digital Payment systems, including debit/credit/prepaid cards, USSD (Unstructured Supplementary Service Data), Aadhaar-enabled payment system (AEPS), UPI (Unified Payments Interface), and e-wallet.

The district of Malappuram, which served as a trial for the Akshaya and e-literacy initiatives, has taken an early lead in the "Go Cashless Campaign". 100 awareness sessions were held in the first five days of the campaign, and 2,500 new businesses in the area have accepted Digital Payment methods.

Other districts, including Thrissur, Kottayam, Kozhikode, Palakkad, and Pathanamthitta, have also responded well to the "Go Cashless Campaign."

During the training sessions, participants are also given ideas for improving online banking security. Based on the early feedback, the e-wallet system is favoured above alternative Digital Payment methods. Officials predict that tax

compliance will increase as more businesses and individuals use digital platforms. (The Hindu 2016, 2017).

4.7.3 Kerala e-Statistics 2022

According to Telecom Regulatory Authority of India (TRAI) 2022 Statistics, the top five states in India in terms of internet users per 100 people (Internet Density) are Delhi (186), Kerala (87), Punjab (86), Himachal Pradesh (86), and Maharashtra (79).

- As many as 87 of every 100 individuals in Kerala have an internet connection. This is against the national average of 60 out of 100.
- Kerala has the greatest rate of internet penetration in rural areas. While most other states see an increase in the number of internet connections in urban areas, it is just the opposite in Kerala.
- Kerala has 64 internet connections per 100 people in urban areas, which is lower than the national average (103 per 100 persons).
- Kerala has 149 internet connections per 100 people in rural areas, which is higher than the national average (37 per 100 persons).

4.8 Conclusion

The implementation of numerous programmes and policies by the Government has had a significant influence on the growth of our country. The consequences might be classified as economic, environmental, or societal. It is projected that a programme like Digital India may boost India's GDP by one trillion dollars, and the Government is currently aiming to convert it into a five trillion-dollar economy. India's digital literacy has also risen.

The GOI has different programs and policies, the Government of Kerala has also put in place different programs to encourage digitalization and e-payments. The "Go Cashless" campaign was started by the Kerala Government in 2016 to help merchants and the general public in the state use Digital Payment platforms. In

2015, it was also declared that Kerala was a "completely digital state." In the Malappuram district of Kerala State, one of the world's biggest IP-based outdoor networks was set up. The State Government also did a number of things to help people learn how to use technology.

Therefore, we can conclude that awareness level and usage of Electronic Payment Systems are increased due to the various policies and schemes of RBI, the GOI, and the Government of Kerala.

It can also be concluded that digital transactions will be the future transaction system. The majority of clients and families have bank accounts and prefer electronic payments over conventional cash transactions. People over the globe are driven to adopt Electronic Payment Systems due to its accuracy, ease, simple accessibility, and speed, among other advantages.

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CHAPTER 5

CUSTOMER'S AWARENESS, USAGE, AND PURPOSE TOWARDS E-PAYMENT SYSTEM

CONTENT

5.1 Introduction

5.2 Socio-Economic Profile of Respondents

5.3 Awareness, Usage, and Purpose of Using EPS

5.4 Conclusion

5.1 Introduction

This chapter deals with the results of data analysis & interpretation regarding the research objective of customer awareness, usage, and purpose of the e-payment system.

5. 2 Socio-Economic Profile of Respondents

The socio-economic profile explains the demographic characteristics of samples taken for the study. This profile is used as the basis for studying awareness, usage, problems faced, and satisfaction level of customers. Table 5.1 shows the socio-economic background of the samples.

Table 5.1

Socio-Economic Profile of Respondents

Socio-economic factors	Group	Frequency	Percent
Gender	Male	**210**	**56.6**
	Female	161	43.4
TOTAL		**371**	**100**
Age	Up to 20 Years	19	5.1
	21 Years -35 Years	**246**	**66.3**
	36 Years-50 Years	77	20.8
	Above 50 Years	29	7.8
TOTAL		**371**	**100**
Educational Qualification	Below Graduation	47	12.7
	Graduation	**179**	**48.2**
	Post-Graduation	106	28.6
	Above PG	39	10.5
TOTAL		**371**	**100**
Marital Status	Single	173	46.6
	Married	**198**	**53.4**
TOTAL		**371**	**100**
Employment Status	Employee	**112**	**30.2**
	Businessman	66	17.70
	Professional	44	11.9
	Student	63	16.98
	Homemaker	55	14.82
	Self-employed	31	8.4

TOTAL		**371**	**100**
Local Body	Panchayath	**247**	**66.6**
	Municipality	84	22.6
	Corporation	40	10.8
TOTAL		**371**	**100**
Region	Southern	124	33.4
	Central	124	33.4
	Northern	123	33.2
TOTAL		**371**	**100**
Monthly Income (in ₹)	Below 15,000	104	28
	15,000 – 30,000	**155**	**41.8**
	30,000 – 50,000	80	21.6
	Above 50,000	32	8.6
TOTAL		**371**	**100**

Source: Primary data

Table 5.1 portrays the percentage analysis of the socio-economic factors of banking customers. It reveals that the sample consists of 56.6 percent male and 43.4 percent female. It is implied that the majority of the customers are male. With regards to age, 66.3 percent belong to the age group 21-35 followed by the age group 36-50 which constitutes 20.8 percent. The age group above 50 constitutes 7.8 percent and the age group up to 20 consists of 5.1 percent. It displays younger age group has a keen interest to use Electronic Payment modes.

The education-wise classification shows that 48.2 percent of customers are graduates, 28.6 percent are postgraduates, 12.7 percent possess a below graduation level, and the remaining 10.5 percent of customers possess above post-graduation qualifications. When we examine the marital status of the customers, it is seen that 53.4 percent are married and 46.6 percent are unmarried. From this, it can be understood that the majority of sample respondents are married.

It is evident from the table that employees constitute the core groups of customers (30.2 percent), 17.70 percent are businessmen, 16.98 percent constitute students, 14.82 percent of customers are homemakers, 11.9 percent of customers are professionals, and the remaining 8.4 percent are self-employed customers. Hence, it

is concluded that employees are more interested in dealing with Electronic Payment Systems.

The local body of the sample depicts that 66.6 percent are from Panchayath, 22.6 percent from Municipality and the remaining 10.8 percent are from Corporation. It is clear that the majority of the customers are from Panchayath.

On the basis of region, 33.4 percent of customers are from the southern & central regions, and 33.2 percent are from the northern region. The distribution is an equal allocation between the groups.

Based on the monthly income of customers, 41.8 percent of the customers have income between ₹15,000- ₹30,000, 28 percent of the customers have income below ₹15,000, 21.6 percent have income between ₹30,000- ₹50,000 and only 8.6 percent have income above ₹50,000.

5.2.1 Association between the region with the local body, educational qualification, and employment status

To test the association of region with other demographic factors such as local body, educational qualification, and employment status, the chi-square test is used.

Table 5.2

Association between Region and Local body with test significance

Region	**Local Body**			**Total**	**Chi-square**	**Sig.**
	Panchayath	Municipality	Corporation			
Southern	**76 (61.3)**	25 (20.2)	23 (18.5)	124 (100)	**34.769**	**0.000****
Central	**70 (56.5)**	45 (36.3)	9 (7.3)	124 (100)		
Northern	**101 (82.1)**	14 (11.4)	8 (6.5)	123 (100)		
Total	247 (66.6)	84 (22.6)	40 (10.8)	371 (100)		

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Table 5.2 shows that 61.3 percent of customers in the southern region are from the panchayath, and only 18.5 percent are from corporations. And also, while analysing central and northern regions, most of the respondents are from panchayath (56.5% and 82.1% respectively) and the least of the customers are from the corporation (7.3% and 6.5%). So, it is clear from the table that 66.6 percent of customers are from panchayath and only 10.8 percent of customers are from corporations.

The above table explains that southern, central, and northern regions are significantly related to the local body of customers at a one percent level as the significant value of the chi-square is less than 0.01. So, there is an association between the region and the local body.

Table 5.3

Association between Region and Educational Qualification with test significance

Region	**Educational Qualification**				**Total**	**Chi-square**	**Sig.**
	Below Graduation	Graduation	Post-Graduation	Above PG			
Southern	25 (20.2)	**50 (40.3)**	36 (29.0)	13 (10.5)	124 (100)	**13.820**	**0.032***
Central	15 (12.1)	**60 (48.4)**	37 (29.8)	12 (9.7)	124 (100)		
Northern	7 (5.7)	**69 (56.1)**	33 (26.8)	14 (11.4)	123 (100)		
Total	47 (12.7)	179 (48.2)	106 (28.6)	39 (10.5)	371 (100)		

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Table 5.3 shows that 40.3 percent of customers in the southern region are graduates, and only 10.5 percent of customers have qualifications above PG. And also, while analysing the central region, 48.4 percent of customers are graduates and only 9.7 percent have the qualification of above PG. In the northern region, 56.1 percent of customers are graduates and only 5.7 percent have the qualification below

graduation level. So, it is clear from the table that 48.2 percent of customers are graduates and only 10.5 percent of customers have an educational qualification above PG.

The above table explains that southern, central, and northern regions are significantly related to the educational qualification of the customers at a five percent level as the significant value of the chi-square is less than 0.05. So, there is an association between the region and the educational qualification.

Table 5.4

Association between Region and Employment Status with test significance

Region	**Employment Status**						**Total**	**Chi-square**	**Sig.**
	Employee	Businessman	Professional	Student	Home Maker	Self Employed			
Southern	**37 (29.8)**	27 (21.8)	14 (11.3)	12 (9.7)	21 (16.9)	13 (10.5)	124 (100)	**21.051**	**0.021***
Central	**45 (36.3)**	17 (13.7)	15 (12.1)	24 (19.4)	20 (16.1)	3 (2.4)	124 (100)		
Northern	**30 (24.4)**	22 (17.9)	15 (12.2)	27 (21.9)	14 (11.4)	15 (12.2)	123 (100)		
Total	112 (30.2)	66 (17.8)	44 (11.9)	63 (16.9)	55 (14.8)	31 (8.4)	371 (100)		

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Table 5.4 shows that 29.8 percent of customers in the southern region are employees, and only 9.7 percent of customers are students. And also, while analysing central and northern regions, the majority of the respondents are employees (36.3% and 24.4% respectively) So, it is clear from the table that 30.2 percent of customers are employees, 17.8 percent of customers are businessmen and only 8.4 percent of customers are self-employed.

The above table explains that southern, central, and northern regions are significantly related to the employment status of the customers at a five percent level as the significant value of the chi-square is less than 0.05. So, there is an association between the region and employment status.

Testing of hypothesis:

H_0 1: ***There is no significant association between the region of the customers and other socio-economic variables such as local body, educational qualification, and employment status.***

H_a 1: ***There is a significant association between the region of the customers and other socio-economic variables such as local body, educational qualification, and employment status.***

Based on the chi-square result, it failed to accept the null hypothesis, and we can interpret that region is significantly related to the local body, educational qualification, and employment status.

5.3 Awareness, usage, and purpose of EPS

The awareness and usage level of EPS help the customer to take the right decision and select the right choice. The awareness and usage will give the customers an insight into the beliefs of EPS and allows them to understand EPS from multiple perspectives. Purpose can guide decisions, influence behavior, shape goals, and offer a sense of direction. Under this head, the awareness, usage, and purpose of using EPS are discussed.

5.3.1 Awareness and usage of EPS

To understand awareness and usage of EPS, the type of bank, type of account, method of e-payment, experience in EPS, type of plastic cards, mode of online banking, devices used for electronic payments, utilization of EPS, and usage of Electronic Payment Methods are discussed under this head.

5.3.1.1 Type of banks

Type of banks categories used here are public sector banks (SBI, Canara Bank, etc.), old generation private sector banks (Federal Bank, CSB, SIB, etc.), new generation private sector banks (ICICI, HDFC, IDBI, etc.), and co-operative bank (KSCB, KSCARDB, etc.).

Table 5.5

Type of Banks

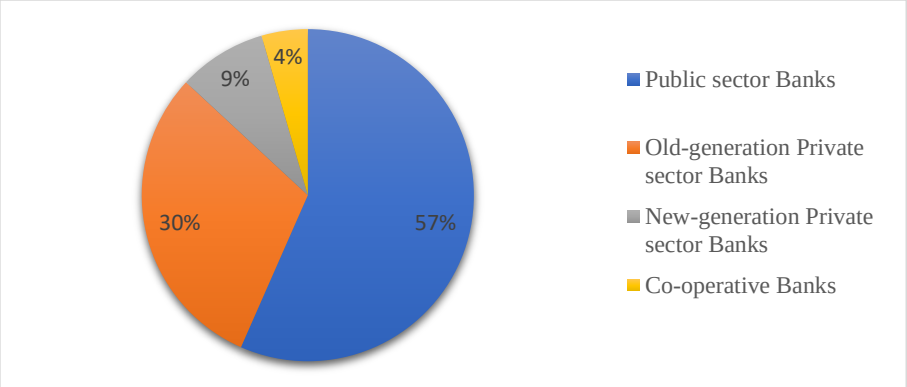
Type of Banks	Percent
Public sector Banks (SBI, Canara Bank, etc.)	**56.6**
Old-generation Private sector Banks (Federal Bank, CSB, SIB, etc.)	30.3
New-generation Private sector Banks (ICICI, HDFC, IDBI, etc.)	8.6
Co-operative Banks (KSCB, KSCARDB, etc.)	4.5

Source: Primary data

Table 5.5 shows that 56.6 percent of customers have bank accounts in the public sector banks such as SBI, Canara, etc. 30.3 percent of customers have bank accounts in old-generation private sector banks, and 8.6 percent are in new-generation private sector banks.

Figure 5.1

Type of Banks



Source: Primary data

5.3.1.2 Type of bank accounts

Under the study, the types of bank accounts used are savings accounts, current accounts, fixed deposit accounts, and recurring deposit accounts.

Table 5.6

Type of Bank Accounts

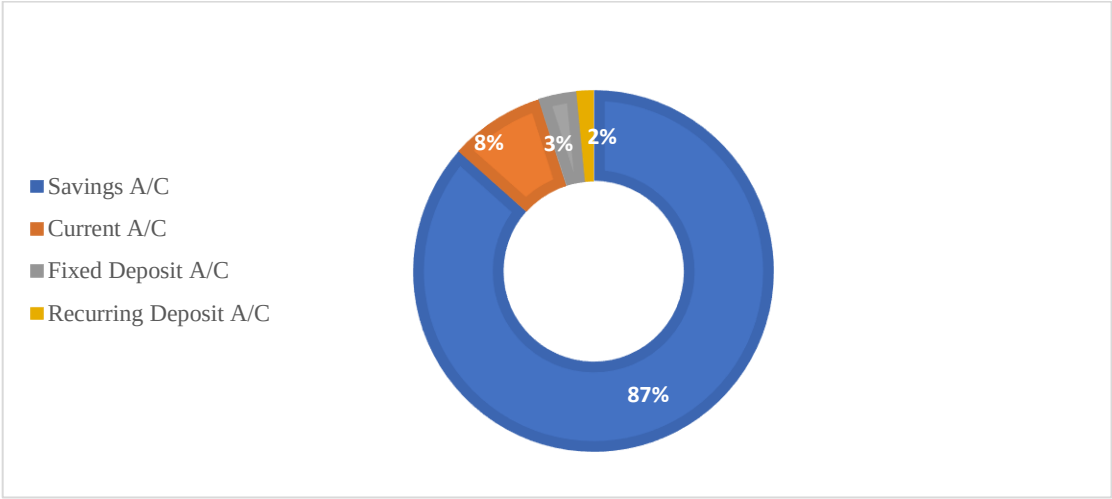
Type of Bank Account	Percent
Savings A/C	**86.7**
Current A/C	8.5
Fixed Deposit A/C	3.4
Recurring Deposit A/C	**1.5**

Source: Primary data

Table 5.6 shows that 86.7 percent of customers have savings A/c. 8.5 percent of customers have current A/c. 3.4 percent having fixed deposit A/c and only 1.5 percent having recurring deposit A/c.

Figure 5.2

Type of Bank Accounts



Source: Primary data

5.3.1.3 Type of Electronic Payment System

The types of Electronic Payment categories in this study are Banking Cards (Debit Card, Credit Card, etc.), Unified Payment Interfaces (UPI) Apps (Google Pay, PhonePe, BHIM App, etc.), Internet Banking (NEFT/ RTGS/ IMPS, etc.), and Mobile Wallets (Paytm, Yono, Mobikwik, etc.)

Table 5.7

Type of Electronic Payment System

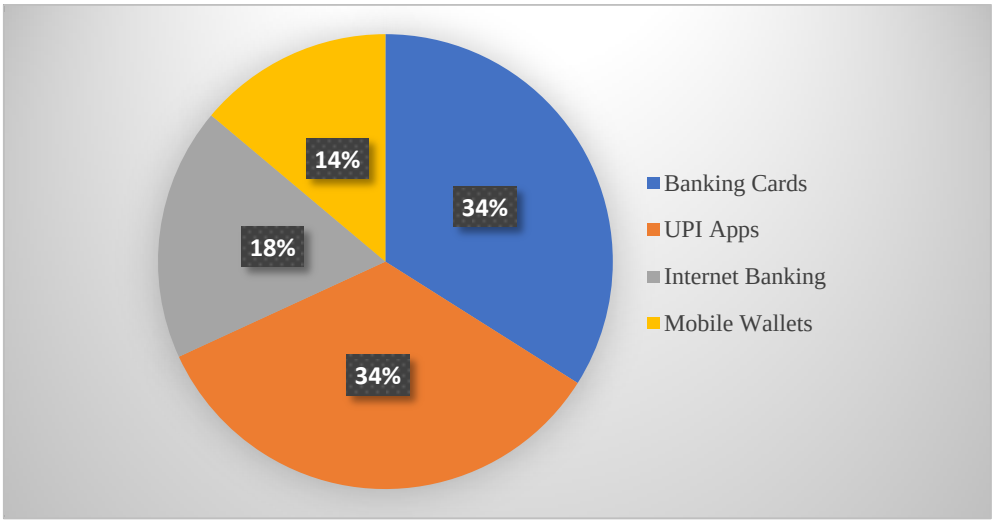
Electronic Payment Method	**Percent**
Banking Cards (Debit Card, Credit Card, etc.)	34.0
Unified Payment Interfaces (UPI) Apps (Google Pay, PhonePe, BHIM App, etc.)	**34.2**
Internet Banking (NEFT/ RTGS/ IMPS etc.)	18.0
Mobile Wallets (Paytm, Yono, Mobikwik, etc.)	13.9

Source: Primary data

Table 5.7 shows that 34.2 percent of customers are using UPI apps for e-payment, 34 percent of customers are using banking cards, 18 percent are using internet banking and only 13.9 percent of customers prefer mobile wallets.

Figure 5.3

Type of Electronic Payment System



Source: Primary data

5.3.1.4 Experience in the usage of Electronic Payment System

Experience in the usage of Electronic Payment Systems is classified as up to one year, one year to five years, five years to ten years, and above ten years. The below table shows the distribution of customers based on experience with electronic payments.

Table 5.8

Experience in Electronic Payment Systems

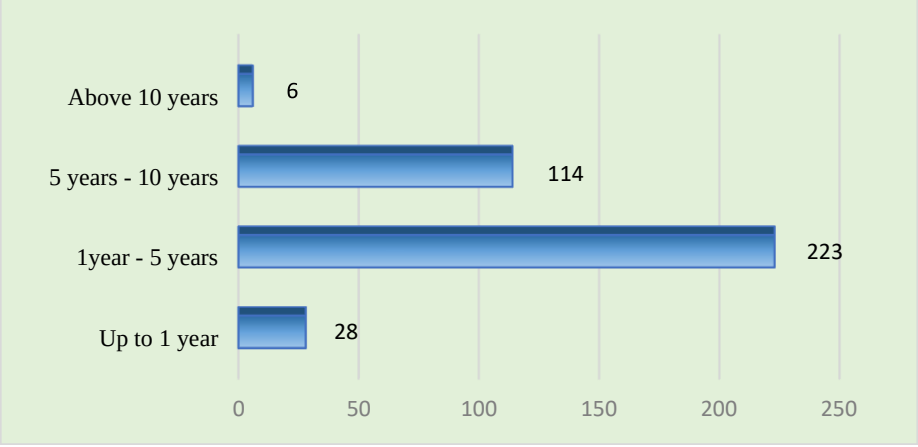
Experience	Frequency	Percent
Up to 1 year	28	7.5
1 year - 5 years	**223**	**60.1**
5 years - 10 years	114	30.7
Above 10 years	6	1.6
Total	**371**	**100.0**

Source: Primary data

Table 5.8 shows the experience of using the Electronic Payment System. 60.1 percent of customers are using Electronic Payment Systems for 1 to 5 years. 30.7 percent are using from 5 to 10 years. 7.5 percent of customers are using Electronic Payment Systems for up to 1 year and only 1.6 percent of customers are using EPS above 10 years.

Figure 5.4

Experience in Electronic Payment Systems



Source: Primary data

5.3.1.5 Type of plastic cards for Electronic Payment

Under this study, the types of plastic cards used are classified as debit cards, credit cards, and both debit & credit cards. The below table shows the details of plastic cards used for electronic payments.

Table 5.9

Type of Plastic Cards for Electronic Payment

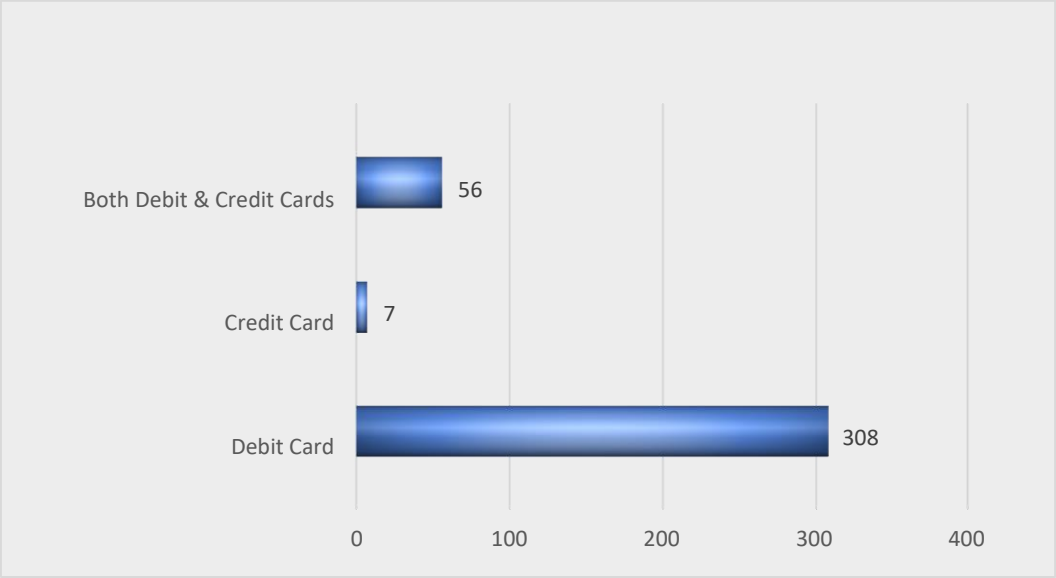
Type of Plastic Cards	Frequency	Percent
Debit Card	**308**	**83.0**
Credit Card	7	1.9
Both Debit & Credit Cards	56	15.1
Total	371	100.0

Source: Primary data

Table 5.9 shows that 83 percent of customers are using debit cards for their electronic payments. 15.1 percent of customers are using both debit and credit cards and only 1.9 percent of customers are using credit cards for their e-payment.

Figure 5.5

Type of Plastic Cards for Electronic Payment



Source: Primary data

5.3.1.6 Mode preferred for EPS

Under the study, modes of online banking preferred by the customers are the bank's website and the bank's app.

Table 5.10

Mode Preferred for EPS

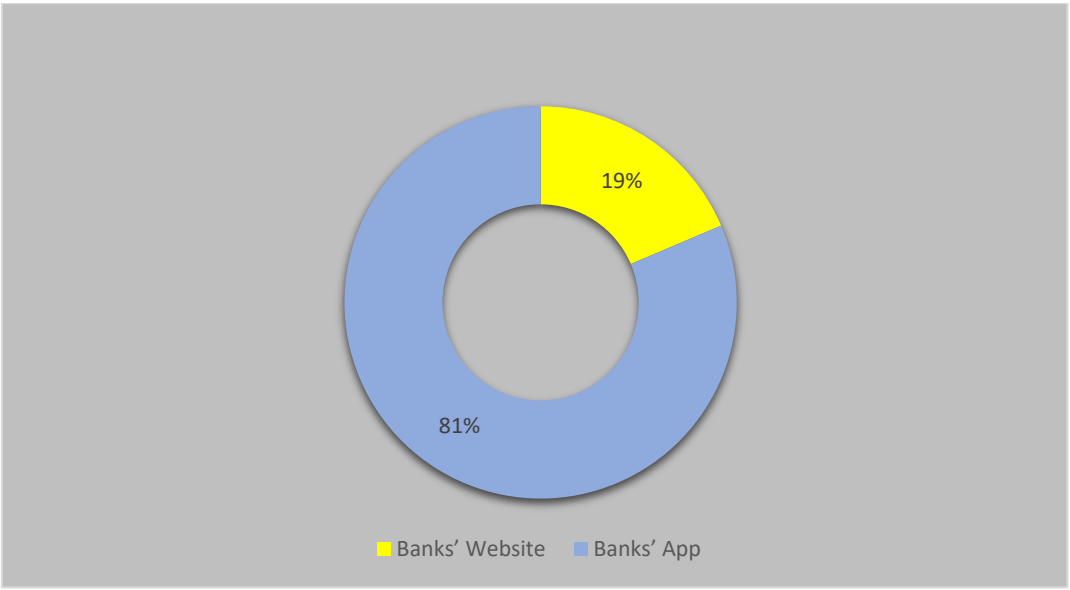
Mode	Frequency	Percent
Banks' Website	69	18.6
Banks' App	**302**	**81.4**
Total	371	100.0

Source: Primary data

Table 5.10 shows the mode preferred for EPS. Out of 371 respondents, 81.4 percent of respondents prefer Bank's app for online banking, and 18.6 percent of customers prefer Bank's website.

Figure 5.6

Mode Preferred for Online Banking



Source: Primary data

5.3.1.7 Devices used for Electronic Payment

Devices used by customers for electronic payments are classified as Personal Computers / Laptops, iPads / Tablets, and Mobile Phones.

Table 5.11

Devices used for Electronic Payment

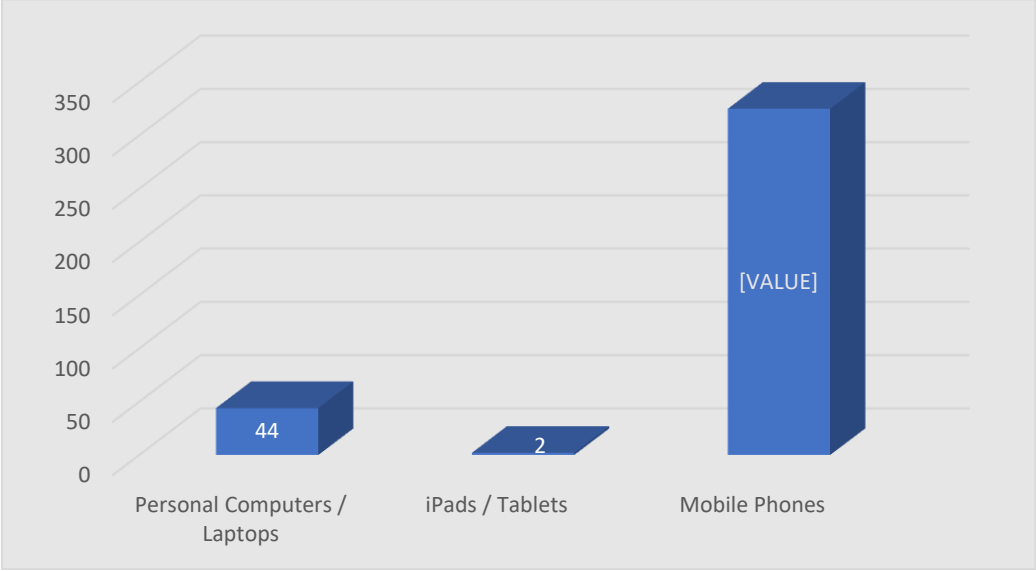
Device	Frequency	Percent
Personal Computers / Laptops	44	11.9
iPads / Tablets	2	**0.5**
Mobile Phones	**325**	**87.6**
Total	371	100.0

Source: Primary data

Table 5.11 shows the devices used for Electronic Payment. Out of 371 customers, 87.6 percent of respondents prefer mobile phones for Electronic Payment and 11.9 percent of customers prefer personal computers/ laptops, and only 0.5 percent use iPads / Tablets for their e-payment.

Figure 5.7

Devices used for Electronic Payment



Source: Primary data

5.3.1.8 Utilization of EPS

The utilization of EPS is categorized under this study as Departmental Stores/Supermarkets, Malls, Petrol Bunks, Hotels/Restaurants, Hospitals, Schools/ Colleges, and Bus/Railway/Film/Air Ticket Booking Counters.

Table 5.12

Utilization of EPS

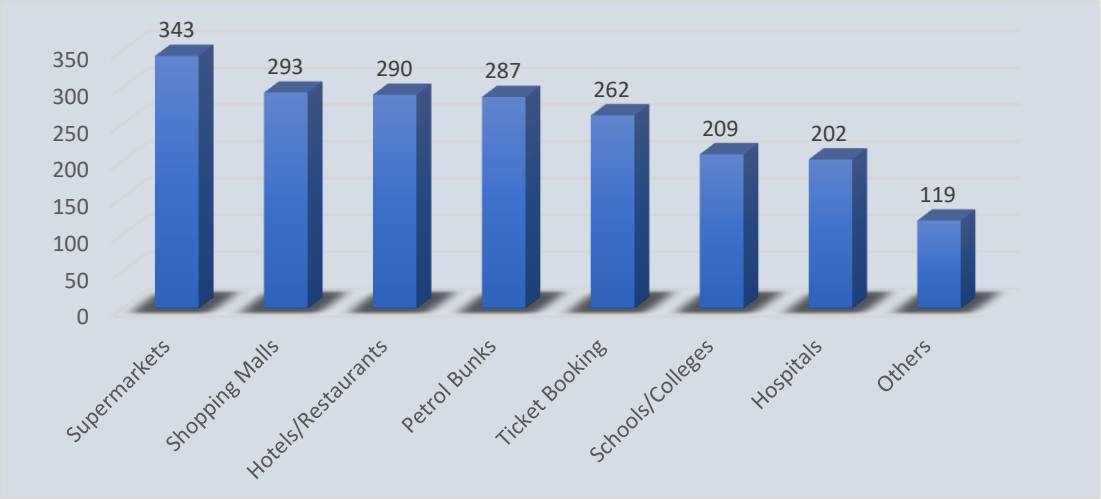
Sl. No	Utilization of EPS	Yes	No
1	Supermarkets	**343 (92.5)**	28 (7.5)
2	Shopping Malls	293 (79)	78 (21)
3	Hotels/Restaurants	290 (78.2)	81 (21.8)
4	Petrol Bunks	287 (77.4)	84 (22.6)
5	Ticket Booking	262 (70.6)	109 (29.4)
6	Schools/Colleges	209 (56.3)	162 (43.7)
7	Hospitals	202 (54.4)	**169 (45.6)**
8	Others (Airports, tourist places, etc.)	119 (32.1)	**252 (67.9)**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Table 5.12 shows the utilization of EPS services. 92.5 percent of respondents used EPS services in supermarkets, 79 percent of customers used it in shopping malls, and 78.2 percent of respondents used EPS in hotels/ restaurants. The table also reveals that 45.6 percent and 67.9 percent of respondents were not utilised EPS services in hospitals, and airports, tourist places, etc. respectively.

Figure 5.8

Utilization of EPS



Source: Primary data

5.3.1.9. Frequency of use of e-payment methods

The frequency of usage of e-payment methods is classified as daily, weekly, monthly, occasionally, and nil. The below table shows the frequency distribution, mean, and standard deviation of usage of EPS.

Table 5.13

Frequency of usage of e-payment methods with test significance

Sl. No	Electronic Payment Method	Daily	Weekly	Monthly	Occasionally	Nil	Mean	SD	t	Sig.
1.	Banking Cards (Debit Card, Credit Card, etc.)	92 (24.8)	113 (30.5)	56 (15.1)	102 (27.5)	8 (2.2)	3.482	1.1953	7.775	.000**
2.	Unified Payment Interfaces (UPI) Apps (Google Pay, PhonePe, BHIM App, etc.)	**123 (33.2)**	**129 (34.8)**	48 (12.9)	65 (17.5)	6 (1.6)	**3.803**	1.1278	13.718	.000**
3.	Internet Banking (NEFT/ RTGS/ IMPS etc.)	15 (4.0)	38 (10.2)	80 (21.6)	91 (24.5)	**147 (39.6)**	2.146	1.1696	14.071	.000**
4.	Mobile Wallets (Paytm, Yono, Mobikwik, etc.)	98 (26.4)	84 (22.6)	78 (21.0)	64 (17.2)	47 (12.8)	2.005	1.3774	13.908	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of the frequency of use of e-payment methods shows that 34.8 percent of customers are using UPI apps on a weekly basis and 33.2 percent of customers are using daily basis, and the mean score is found to be 3.803 which is significantly higher than the mean of the response scale (mean of the response scale-3) and the significance level of the one-sample t-test is less than 0.01. 30.5 percent of customers are using banking cards on a weekly basis, 24.8 percent are using them on a daily basis, which follows the mean score of 3.482 which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01.

While analysing Internet banking, only 10.2% of customers are using it on weekly basis. And 4% of customers are using it on a daily basis. So, it is also evident from the table that 39.6 percent of customers are not using Internet banking. As per the table, the mean scores regarding the frequency of use of Internet banking is less than the mean response score and the significance level of one sample t-test is less than 0.01.

5.3.1.10 Average transaction amount in the last month

The data regarding the amount of monthly transactions through cash payment and Electronic Payment are collected from customers. The below table shows the average money transacted through Electronic Payment and the average cash payment in the last month.

Table 5.14

Money transacted through cash payment and Electronic Payment in the last month

Mode of transaction	N	Minimum	Maximum	Mean	Std. Deviation
Average money transacted through Electronic Payment in the last month	371	100.0	5,00,000.0	**21,782.426**	35,539.0354
Average money transacted through traditional cash payment in the last month	371	100.0	3,00,000.0	**20,847.655**	16,577.7703

Source: Primary data

Table 5.14 reveals that there is an average amount of ₹21,782.426 is transacted through electronic payment, and an average amount of ₹20,847.655 is transacted through traditional cash payment in the last month.

5.3.1.11 Usage of EPS in terms of Demonetisation and Covid-19 Pandemic

The below table shows the level of usage of EPS at the time of demonetisation and the Covid-19 pandemic.

Table 5.15

Frequency of usage of e-payment based on demonetisation and COVID-19 with test significance

Sl. No	Situation	Very High	High	Medium	Low	Very Low	Mean	SD	Paired t-test	Sig.
1.	Before demonetisation	14 (3.8)	41 (11.1)	141 (38)	**114 (30.7)**	**61 (16.4)**	2.550	.6132	27.005	.000**
	After demonetisation	**114 (30.7)**	**178 (48)**	72 (19.4)	6 (1.6)	1 (0.3)	4.073	.7659		
2.	Before Covid 19 pandemic	25 (6.7)	84 (22.6)	169 (45.6)	**70 (18.9)**	**23 (6.2)**	3.049	.965 8	27.041	.000**
	During Covid 19 pandemic	**206 (55.5)**	**129 (34.8)**	31 (8.4)	4 (1.1)	1 (0.3)	4.442	.7157		

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Table 5.15 shows the usage of EPS during the period of demonetisation and the covid-19 pandemic. The usage of EPS before demonetisation was comparatively low (47.1%), and the usage increased to 78.7 percent after demonetisation. The mean score of EPS usage before demonetisation is 2.550 which is increased after demonetisation to 4.073 with a standard deviation of 0.6132 and 0.7659 respectively. The significant value of paired t-test is less than 0.01which indicates, there is a significant difference in the usage of EPS before and after demonetisation at a one percent level of significance.

The usage of EPS before the Covid-19 pandemic was comparatively low (25.1%), and the usage increased to 90.3 percentage during the Covid-19 pandemic. There is a significant difference in the usage of EPS before and during the Covid-19 pandemic situation because the significant value of paired t-test is less than 0.01 at a one percent level of significance.

Testing of hypothesis:

H_0 2: ***There is no significant difference in the usage of EPS before and after demonetisation.***

H_a 2: ***There is a significant difference in the usage of EPS before and after demonetisation.***

H_0 3: ***There is no significant difference in the usage of EPS before and during Covid-19.***

H_a 3: ***There is a significant difference in the usage of EPS before and during Covid-19.***

On the basis of paired t-test, there is a significant difference in the usage of Electronic Payment Systems before and after demonetisation. And there is a significant difference in the usage of Electronic Payment Systems before and during the Covid-19 pandemic. It can be concluded that both the demonetisation and the Covid-19 pandemic have compelled banking customers the usage Electronic Payment Systems.

5.3.1.12 Experience of EPS usage and amount of money transacted based on educational qualification

One Way ANOVA is used to analyze the influence of educational qualification on the amount of money transacted, and the experience in the use of EPS.

Table 5.16

Descriptive statistics of experience of EPS, and amount of money transacted based on educational qualification with the test significance

Sl. No.	Variables		Educational Qualification					F	Sig.
			Below Graduation	Graduation	Post-Graduation	Above PG	Total		
1.	Average money transacted through Electronic Payment in the last month	Mean	19244.68	18079.21	21996.23	41256.41	21782.42	4.774	.003**
		SD	15258.23	19162.71	26485.55	88857.88	35539.04		
		N	47	179	106	39	371		
2.	Average money transacted through traditional cash payment in the last month	Mean	8276.59	24917.77	8419.81	51082.05	20846.31	0.756	.520
		SD	5344.45	223967.98	11698.62	174791.06	165772.94		
		N	47	179	106	39	371		
3.	Experience in the use of electronic modes for payments over years	Mean	6.57	4.94	4.30	5.94	5.07	6.966	.000**
		SD	3.16	3.03	2.97	3.69	3.18		
		N	47	179	106	39	371		

Source: Primary data

Table 5.16 reveals that the average money transacted through EPS in the last month significantly varies with respect to educational qualification at a one percent level as the significant value of ANOVA is less than 0.01.

Same time, there is no significant difference between the average money transacted through traditional cash payment in the last month and educational qualification as the significant value is greater than 0.05.

Similarly, there is a significant difference in the experience in the use of electronic modes for payments with respect to educational qualification at a one percent level of significance as the significant value is less than 0.01.

Testing of hypothesis:

H_0* 4: *There is no significant difference in the money transacted through Electronic Payment Methods based on educational qualification.

H_a 4*: There is a significant difference in the money transacted through Electronic Payment Methods based on educational qualification.*

H_0 5: There is no significant difference in the money transacted through traditional cash payment based on educational qualification.

H_a 5*: There is a significant difference in the money transacted through traditional cash payment based on educational qualification.*

H_0 6: There is no significant difference in the experience of the use of electronic modes for payments based on educational qualification.

H_a* 6*: There is a significant difference in the experience of the use of electronic modes for payments based on educational qualification.

On the basis of One-Way ANOVA, the significant value is less than 0.01 and failed to accept the null hypothesis. Therefore, we can interpret that educational qualification influences the money transacted through electronic payments and experience in the usage of electronic mode for payments.

Since the significant value is greater than 0.05, accept the null hypothesis and conclude that educational qualification does not influence the money transacted through traditional cash payments.

5.3.1.13 The experience of EPS usage and the amount of money transacted based on local body

To study the influence of local bodies on the amount of money transacted, and the experience in the use of electronic modes for payments, One Way ANOVA is used

Table 5.17

Experience of EPS usage and the amount of money transacted based on local body

Sl. No.	Variables		Local body				F	Sig.
			Panchayath	Municipality	Corporation	Total		
1.	Average money transacted through Electronic Payment in the last month	Mean	22249.72	18727.38	25312.52	21782.43	.528	.590
		SD	40286.29	14644.98	35419.23	35539.04		
		N	247	84	40	371		
2.	Average money transacted through traditional cash payment in the last month	Mean	24079.27	15473.62	12167.50	20846.31	.145	.865
		SD	200669.55	54031.16	17190.76	165772.94		
		N	247	84	40	371		
3.	Experience in the use of electronic modes for payment in years.	Mean	5.02	5.19	5.17	5.07	.117	.890
		SD	3.12	3.42	3.15	3.18		
		N	247	84	40	371		

Source: Primary data

The above table shows that all the significant values of ANOVA are greater than 0.05 and we can interpret that there is no significant difference in the transaction of money through Electronic Payment and traditional cash payment based on the local body. Similarly, the local body does not influence the experience in the use of electronic modes for payments as the significant value is greater than 0.05.

Similarly, there is no significant difference in the experience in the use of electronic modes for payments with respect to local body as the significant value is greater than 0.05.

Testing of hypothesis:

H_0 7: There is no significant difference in the money transacted through Electronic Payment Methods based on local body.

H_a 7*: There is a significant difference in the money transacted through Electronic Payment Methods based on local body.*

H_0 8: There is no significant difference in the money transacted through traditional cash payment based on local body.

H_a 8*: There is a significant difference in the money transacted through traditional cash payment based on local body.*

H_0 9: There is no significant difference in the experience of the use of electronic modes for payments based on local body.

H_a 9: There is a significant difference in the experience of the use of electronic modes for payments based on local body.

On the basis of ANOVA, all significant values are greater than 0.05 and accept the null hypothesis. So, we can conclude that Panchayath, Municipality, and Corporation do not influence the amount of money transacted through e-payment, and traditional cash payment. The experiences in the use of electronic modes for payments are identical in Panchayath, Municipality, and Corporation.

5.3.1.14 The employment status with the plastic cards used for EPS, modes of using EPS, and devices used for EPS

In this study, the chi-square test is used to test the association between employment status with the plastic cards used, the modes used, and the devices used for electronic payments.

Table 5.18

Association between employment status with plastic cards used, modes of using EPS, and devices used for EPS with the test significance

Variables		Employment Status						Total	Chi-square	Sig.
		Employee	Businessman	Professional	Student	Home Maker	Self Employed			
Plastic cards used for EPS	Debit card	90 (80.4)	33 (50.0)	36 (81.8)	47 (74.6)	36 (65.5)	28 (90.3)	265 (71.5)	**11.291**	**.335**
	Credit card	0 (0)	14 (21.2)	1 (2.8)	0 (0.00)	5 (9.0)	0 (0)	25 (6.7)		
	Both debit & credit card	22 (19.6)	19 (28.8)	7 (15.9)	16 (25.4)	14 (25.5)	3 (9.7)	81 (21.8)		
	Total	112 (100)	66 (100)	44 (100)	63 (100)	55 (100)	31 (100)	371 (100)		
Mode of using EPS	Banks' Website	25 (22.3)	10 (15.2)	8 (18.2)	8 (12.7)	12 (21.8)	6 (19.4)	69 (18.6)	**1.805**	**.875**
	Banks' App	87 (77.7)	56 (84.8)	36 (81.8)	55 (87.3)	43 (78.2)	25 (80.6)	302 (81.4)		
	Total	112 (100)	66 (100)	44 (100)	63 (100)	55 (100)	31 (100)	371 (100)		
Devices used for EPS	Personal Computer / Laptops	20 (17.9)	18 (27.3)	6 (13.6)	6 (9.5)	9 (16.4)	2 (6.5)	61 (16.4)	**12.003**	**.285**
	iPads / Tablets	1 (0.9)	10 (15.2)	1 (2.3)	2 (3.2)	0 (0)	0 (0)	14 (3.8)		
	Mobile Phones	91 (81.3)	38 (57.5)	37 (84.1)	55 (87.3)	46 (83.6)	29 (93.5)	296 (79.8)		
	total	112 (100)	66 (100)	44 (100)	63 (100)	55 (100)	31 (100)	371 (100)		

Source: Primary data
Note: Figures in parentheses represent percentages of the column total

Table 5.18 shows that all significant values of chi-square are greater than 0.05, and the test failed to create a significant association between employment status with other variables such as plastic cards used, modes of using EPS, and devices used for EPS. Hence there is no significant relationship between employment status with the plastic cards used, modes of using EPS, and devices used for EPS because the significant value of chi-square is greater than 0.05.

Testing of hypothesis:

H_0 10: Employment status, and plastic cards used for EPS are independent.

H_a 10: Employment status, and plastic cards used for EPS are dependent.

H_0 11: There is no significant association between employment status and the modes of using EPS.

H_a 11: There is a significant association between employment status and the modes of using EPS.

H_0 12: There is no significant relationship between employment status, & devices used for EPS.

H_a 12: There is a significant relationship between employment status, & devices used for EPS.

Since the significant value of the Chi-square test is greater than 0.05, accept the null hypothesis and conclude that the usage of plastic cards, devices used, and modes of Electronic Payment are not related to the employment status of the customers.

5.3.1.15 Association between local body with the plastic cards used, mode of using EPS, and devices used for EPS

In this study, to test the relationship between local body with the plastic cards used for electronic payments, the modes of using electronic payments, and the devices used for electronic payments, the chi-square test is used.

Table 5.19

Association between local body with the plastic card used, mode of using EPS, and devices used for EPS with test significance

Variables		Local Body			Total	Chi-square	Sig.
		Panchayath	Municipality	Corporation			
Plastic cards used for EPS	Debit card	202 (81.8)	72 (85.7)	34 (85)	308 (83)	**2.482**	**.648**
	Credit card	6 (2.4)	0 (0)	1 (2.5)	7 (1.9)		
	Both debit & credit card	39 (15.8)	12 (14.3)	5 (12.5)	56 (15.1)		
	Total	247 (100)	84 (100)	40 (100)	371 (100)		
Mode of using EPS	Banks' Website	44 (17.8)	21 (25)	4 (10)	69 (18.6)	**4.328**	**.115**
	Banks' App	203 (82.2)	63 (75)	36 (90)	302 (81.4)		
	Total	247 (100)	84 (100)	40 (100)	371 (100)		
Devices used for EPS	Personal Computer / Laptops	27 (10.9)	16 (19)	1 (2.5)	44 (11.9)	**8.821**	**.066**
	iPads / Tablets	1 (0.4)	1 (1.2)	0 (0)	2 (0.5)		
	Mobile Phones	219 (88.7)	67 (79.8)	39 (97.5)	325 (87.6)		
	Total	247 (100)	84 (100)	40 (100)	371 (100)		

Source: Primary data
Note: Figures in parentheses represent percentages of the column total

From the above Table 5.19, all significant values of chi-square are greater than 0.05, and the test failed to create a significant association between the local body with other variables such as plastic cards used, modes of using EPS, and devices used for EPS. Hence there is no significant relationship between the local

body with plastic cards used, the modes of using EPS, and the devices used for EPS because the significant value of chi-square is greater than 0.05.

Testing of hypothesis:

H_0 13: Local body and plastic cards used for EPS are independent.

H_a 13: Local body and plastic cards used for EPS are dependent.

H_0 14: There is no significant association between the local body and the modes of using EPS.

H_a 14: There is a significant association between the local body and the mode of using EPS.

H_0 15: There is no significant relationship between the local body and the devices used for EPS.

H_a 15: There is a significant relationship between the local body and the devices used for EPS.

Since the significant value of the Chi-square test is greater than 0.05, accept the null hypothesis and interpret that the usage of plastic cards, devices used, and modes of Electronic Payment are independent of the local body of the customers, i.e., there is no association with the place of residence of customers like Panchayath, Municipality, and Corporation with the usage of plastic cards, devices used, and modes of electronic payment.

5.3.1.16. Usage of EPS services before and after demonetisation based on gender, employment status, and local body

To know the variation among different gender, employment status, and local body groups of customers about the usage of EPS services before and after demonetisation, statistical tests ANOVA and MANOVA were used. The results are shown in table 5.20.

Table 5.20

The usage of EPS services before and after demonetisation based on gender, employment status, and local body with the test of significance

Characteristics			Demonetisation		MANOVA	
			Before	**After**	**F**	**Sig.**
Gender	Male		2.767	4.076	6.358	**.002****
	Female		2.267	4.068		
	ANOVA	F	9.724	6.432		
		Sig	**.002****	**.012***		
Employment Status	Employee		2.788	4.187	5.334	**.003****
	Businessman		2.538	4.038		
	Professional		2.779	4.172		
	Student		2.420	4.002		
	Homemaker		2.382	4.033		
	Self-employed		2.290	4.071		
	ANOVA	F	8.895	5.647		
		Sig	**.003****	**.011***		
Local Body	Panchayath		2.479	4.069	5.042	**.003****
	Municipality		2.571	4.107		
	Corporation		2.625	4.125		
	ANOVA	F	9.541	6.443		
		Sig	**.004****	**.015***		

Source: Primary data

Table 5.20 reveals that customers' usage of EPS services before and after demonetisation significantly varies with respect to gender, employment status, and local body at a one percent level as the significant value of MANOVA is less than 0.01.

An analysis of gender and usage of EPS reveals that there is a significant difference in the usage of EPS services before and after demonetisation among male and female. Male customers highly used the EPS services before demonetisation (mean score-2.767) and after demonetisation (mean score-4.076) as compared to female customers. The mean score of female customers is 2.267 (before demonetisation) and 4.068 (after demonetisation).

While analysing the employment status and usage of EPS services, it is found that there is a significant difference in the usage of EPS before and after demonetisation among different categories of employment status. Employees are

highly used to the EPS services before demonetisation (mean score-2.788) and after demonetisation (mean score-4.187) when compared to others.

An analysis of the local body and the usage of EPS reveals that there is a significant difference in the usage of EPS services before and after demonetisation among the local body of customers. Customers from the corporation highly used the EPS services before demonetisation (mean score-2.625) and after demonetisation (mean score-4.125) as compared to municipality and panchayath.

Testing of hypothesis:

H_0 16: There is no significant difference in the usage of EPS before demonetisation and after demonetisation based on gender, employment status, and local body.

H_a 16: There is a significant difference in the usage of EPS before demonetisation and after demonetisation based on gender, employment status, and local body.

As per the result of MANOVA, the usage of EPS services before and after demonetisation varies significantly with gender, employment status, and local body. Here it failed to accept the null hypothesis and it can be concluded that there is significant variation in the usage of EPS services before and after demonetisation among gender, employment status, and local body.

5.3.1.17. Usage of EPS services before and during Covid 19 based on gender, employment status, and local body

To know the variation among different gender, employment status, and local body groups of customers about the usage of EPS before and during Covid- 19 pandemic, statistical tests ANOVA and MANOVA were used.

Table 5.21

The usage of EPS services before and during Covid-19 based on gender, employment status, and local body with the test of significance

Characteristics			Covid 19		MANOVA	
			Before	**During**	**F**	**Sig.**
Gender	Male		2.924	4.652	6.501	**.004****
	Female		2.720	4.459		
	ANOVA	F	8.195	5.324		
		Sig	**.003****	**.022***		
Employment Status	Employee		3.134	4.268	5.556	**.006****
	Businessman		3.392	4.577		
	Professional		3.118	4.561		
	Student		2.902	4.410		
	Homemaker		2.733	4.267		
	Self-employed		3.077	4.316		
	ANOVA	F	6.762	4.092		
		Sig	**.005****	**.015***		
Local Body	Panchayath		3.045	4.509	7.605	**.003***
	Municipality		3.012	4.540		
	Corporation		3.150	4.660		
	ANOVA	F	7.178	5.144		
		Sig	**.002****	**.014***		

Source: Primary data

Table 5.21 exhibits that usage of EPS services before and during the Covid-19 pandemic significantly varies with respect to gender, employment status, and local body as the significant value of MANOVA is less than 0.01.

An analysis of gender and usage of EPS services reveals that there is a significant difference in the usage of Electronic Payment Systems before and during the Covid-19 pandemic among male and female. Male customers highly used the EPS services before Covid-19 (mean score-2.924) and during Covid-19 (mean score-4.652) as compared to female customers. The mean score of female customers is 2.720 (before Covid-19) and 4.459 (after Covid-19).

While analysing the employment status and the usage of EPS services, it is found that there is a significant difference in the usage of EPS services before and during the Covid-19 pandemic among different categories of employment status.

Businessmen highly used the EPS services before Covid-19 (mean score-3.392) and during Covid-19 (mean score-4.577) as compared to others.

An analysis of the local body and usage of EPS services reveals that there is a significant difference in the usage of EPS services before and during the Covid-19 pandemic among the local body of customers. Customers from the corporations highly used the EPS services before Covid-19 (mean score-3.150) and during Covid-19 (mean score-4.660) as compared to municipalities and panchayaths.

Testing of hypothesis:

H_0 17: There is no significant difference in the usage of EPS services before and during the Covid-19 pandemic based on gender, employment status, and local body.

H_a 17: There is a significant difference in the usage of EPS services before and during the Covid-19 pandemic based on gender, employment status, and local body.

As per the result of MANOVA, the usage of EPS services before and during the Covid-19 pandemic varies significantly with gender, employment status, and local body. Hence it failed to accept the null hypothesis and it can be concluded that there is significant variation in the usage of EPS services before and during the Covid-19 pandemic based on gender, employment status, and local body.

5.3.2 Purpose of using the Electronic Payment System

The purpose is the meaningful intention that can help the customer to stay focused on the Electronic Payment System that matters most. It helps to prioritize the customers' needs, attract and retain customers, and helps to engage the customers in both hearts and minds. To check the priorities of the purpose of the e-payment system, one sample t-test is used.

Table 5.22

Descriptive statistics of the purpose of the e-payment system with test significance

Sl. No	Purpose of using EPS	Always	Frequently	Occasionally	Rarely	Never	Mean	SD	t	Sig.
1	Fund transfer	**180 (48.5)**	82 (22.1)	82 (22.1)	18 (4.9)	9 (2.4)	**4.094**	1.0548	19.983	.000**
2	Cash withdrawal	**126 (34)**	95 (25.6)	124 (33.4)	13 (3.5)	13 (3.5)	**3.830**	1.0505	15.222	.000**
3	Shopping	110 (29.6)	98 (26.4)	131 (35.3)	25 (6.7)	7 (1.9)	3.752	1.0150	14.271	.000**
4	Food Ordering Payments	80 (21.6)	57 (15.4)	101 (27.2)	89 (24)	44 (11.9)	3.108	1.3128	1.582	.115
5	Payment of bills (E.g., Utility Bills)	86 (23.2)	95 (25.6)	111 (29.9)	30 (8.1)	49 (13.2)	3.375	1.2871	5.607	.000**
6	Hotel, Fuel, Taxi, etc.	81 (21.8)	86 (23.2)	108 (29.1)	39 (10.5)	57 (15.4)	3.256	1.3282	3.714	.000**
7	Donating Funds	36 (9.7)	45 (12.1)	104 (28)	78 (21)	108 (29.1)	2.523	1.2888	7.130	.000**
8	Mobile Recharge	**184 (49.6)**	80 (21.6)	33 (8.9)	20 (5.4)	54 (14.6)	**3.863**	1.4482	11.472	.000**
9	Loan repayment (EMI)	38 (10.2)	46 (12.4)	58 (15.6)	29 (7.8)	**200 (53.9)**	2.173	1.4454	11.027	.000**
10	Insurance premium	21 (5.7)	27 (7.3)	57 (15.4)	45 (12.1)	**221 (59.6)**	1.873	1.2401	17.499	.000**
11.	Ticket booking	76 (20.5)	57 (15.4)	114 (30.7)	47 (12.7)	77 (20.8)	3.022	1.3909	.299	.765
12.	Balance enquiry	**120 (32.3)**	95 (25.6)	84 (22.6)	26 (7.0)	46 (12.4)	**3.585**	1.3336	8.448	.000**
13.	Mini statement	74 (19.9)	105 (28.3)	82 (22.1)	42 (11.3)	68 (18.3)	3.202	1.3753	2.831	.005**

Source: Primary data

Note: Figures in parentheses represent percentages of the row total

The above table shows that customers mainly used EPS services for fund transfer with a mean of 4.094 followed by mobile recharge with a mean score of 3.863. The third important purpose is cash withdrawal with a mean of 3.830, and the fourth one is balance enquiry, with a mean of 3.585 and the significant value of one sample t-test is less than 0.01 except for food ordering payments and ticket booking.

49.6 percent of customers are always using EPS services for mobile recharge. 48.5 percent of customers are using EPS for fund transfer, 34 percent are always using it for cash withdrawal, and 32.3 percent of customers are always using it for balance enquiry.

It is also found that 53.9 percent and 59.6 percent of customers never used EPS services for loan repayment and insurance premium payment respectively.

5.3.2.1. Purpose of using an e-payment system based on local body

k- Mean cluster analysis is used to categorize the purpose of the e-payment system into three groups or clusters (i.e., Panchayath, Municipality, and Corporation) based on the local body. To know the extent of usage of purpose in three clusters, quartiles are used. Less than or equal to the first quartile (Q1-3.6) indicate that a low level of usage, more than or equal to the third quartile (Q1-4.1) indicates that a high level of usage, and between 3.6 and 4.1 indicate that the medium level of the purpose of using the e-payment system. The final cluster centers are computed as the mean for each purpose within each cluster.

Table 5.23

Final Cluster Centers based on the local body with test significance

Final Cluster Centers (Based on Locality)				F	Sig.
Purpose of using EPS	Cluster				
	Corporation	Municipality	Panchayath		
Fund transfer	4.5 High	4.1 High	3.8 Medium	14.597	.000**
Cash withdrawal	4.4 High	4.2 High	3.8 Medium	16.327	.000**
Shopping	4.4 High	4.2 High	3.1 Low	110.771	.000**
Food Ordering Payments	3.9 Medium	3.8 Medium	2.2 Low	125.178	.000**
Payment of bills (E.g., Utility Bills)	4.2 High	3.7 Medium	2.6 Low	83.111	.000**
Hotel, Fuel, Taxi, etc.	4.2 High	3.8 Medium	2.3 Low	123.799	.000**
Donating Funds	3.4 Low	2.6 Low	1.9 Low	62.330	.000**
Mobile Recharge	4.7 High	4.5 High	3.0 Low	83.693	.000**
Loan repayment (EMI)	3.3 Low	1.6 Low	1.7 Low	74.070	.000**
Insurance premium	2.9 Low	1.5 Low	1.4 Low	79.940	.000**
Ticket booking	4.1 High	2.8 Low	2.4 Low	75.634	.000**
Balance enquiry	4.5 High	2.8 Low	3.4 Low	52.712	.000**
Mini statement	4.1 High	2.4 Low	3.0 Low	47.913	.000**

Source: Primary data

The above table exhibit that the extent of using an e-payment system for different purposes is high in Corporation and low in Panchayath. The highly used purposes of the EPS in **corporations** are mobile recharge (mean score-4.7), fund transfer (mean score-4.5), balance enquiry (4.5), shopping (mean score-4.4), cash withdrawal (mean score-4.4), payment of bills (mean score-4.2), payment towards hotels, fuel, taxi, etc (mean score -4.2), ticket booking (mean score-4.1), and mini statement (mean score-4.1). The e-payment system is moderately used for food ordering payments (mean score-3.9) in Corporations. The usage of e-payments for

donating funds (mean score-3.4), loan repayment (mean score-3.3), and insurance premium (mean score-2.9) are low levels in Corporations.

The highly used purposes of the e-payment system in the **Municipality** are mobile recharge (mean score-4.5), cash withdrawal (mean score-4.2), shopping (mean score-4.2), and fund transfer (mean score-4.1). The e-payment system is moderately used for food ordering payments (mean score-3.8), payment towards hotels, fuel, taxi, etc (mean score -3.8), and payment of bills (mean score-3.7) in Municipality. The usage of e-payments for insurance premiums (mean score-1.5), loan repayment (mean score-1.6), mini statement (mean score-2.4), donating funds (mean score-2.6), balance enquiry (2.8), and ticket booking (mean score-2.8) are low level in Municipality.

In **Panchayath,** the e-payment system is moderately used for fund transfers (mean score-3.8) and cash withdrawals (mean score-3.8). The usage of e-payments for insurance premiums (mean score-1.4), loan repayment (mean score-1.7), donating funds (mean score-1.9), food ordering payments (mean score-2.2), payment towards hotels, fuel, taxi, etc (mean score -2.3), ticket booking (mean score-2.4), payment of bills (mean score-2.6), mini statement (mean score-3.0), mobile recharge (mean score-3.0), shopping (mean score-3.1), and balance enquiry (3.4) are low level in Panchayath.

Testing of hypothesis:

H_0 18: The purpose of the e-payment system is not significantly different among Corporations, Municipalities, and Panchayath.

H_a 18: The purpose of the e-payment system is significantly different among Corporations, Municipalities, and Panchayath.

On the basis of ANOVA, all the significant values are less than 0.05. Hence it failed to accept the null hypothesis. The result of ANOVA indicates that the purpose of the e-payment system is significantly different across the three clusters at a one percent significant level as all the significant value of ANOVA is less than 0.01.

The purpose of E-Payment with large F-values provides greater separation between clusters. The usage of e-payment for the purpose of food ordering payments (F value-125.178), payment towards the hotel, fuel, taxi, etc. (F value-123.799), and shopping (F value-110.771) are greater differences among the Corporation, Municipality, and Panchayath.

Table 5.24

Distances between Final Cluster Centers

Cluster	Corporation	Municipality	Panchayath
Corporation		3.737	5.133
Municipality	3.737		3.335
Panchayath	5.133	3.335	

Source: Primary data

The above table shows the Euclidean distances between the final cluster centers. The result shows that cluster 1- Corporation and cluster-3 Panchayath are most different with a high value of 5.133, i.e., the cluster Corporation and Panchayath are most dissimilar. The cluster-2 Municipality and cluster-3 Panchayath are most similar with a low value of 3.335. The difference between Corporation and Municipality shows more or less similar in nature with a value of 3.737. The usages of e-payment for different purposes are highly dissimilar among Corporations and Panchayath. On the basis of the purpose of the e-payment system, Municipality is approximately similar to Corporations and Panchayaths.

5.4 Conclusion

The results and analysis point out that there is a notable transformation in the progress of Electronic Payment Systems. The influence of the COVID-19 pandemic and demonetisation had a significant impact on this transformation in terms of both awareness and usage. The UPI apps have gained greater popularity among banking customers in Kerala. Among the EPS users, mobile recharge and fund transfer stands out as primary purpose at the same time there is a diverse utilisation pattern among corporations, municipalities, and panchayaths.

CHAPTER 6

MOTIVATIONAL FACTORS AND CUSTOMER SATISFACTION TOWARDS E-PAYMENT SYSTEM

CONTENT

6.1 Introduction

6.2 Motivational Factors of EPS Usage

6.3 Satisfaction of Customers towards Electronic Payment System

6.4 Satisfaction on the Usage of EPS based on Local Body, Education Qualification & Gender

6.5 Motivational Factors of EPS on the Satisfaction of Customer

6.6 Conclusion

6.1 Introduction

The factor determinants of the e-payment system are considered an important part of adopting EPS. Therefore, e-payment providers need to pay special attention to understand the perception of the customers towards motivational factors of e-payments. This section of the chapter aims to identify the motivational factors of EPS. The study focused on seven factors namely ease of use, usefulness, social influence, security, trust, attitude of customers, and intention to use e-payment. Opinions of thirty-two statements related to these factors are analyzed to find out important factors that motivate the use of e-payment systems.

6.2 Motivational factors of EPS usage

6.2.1 Ease of use

Ease of use is a basic concept that describes how easily users can use a product. Ease of use is defined as the extent to which a person believes that using a particular system will be free from effort. The following table shows the perception of ease of use of e-payments.

Table 6.1
Descriptive statistics of ease of use with the test of significance

Ease of use	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I believe learning to use EPS is easy.	164 (44.2)	167 (45)	38 (10.2)	2 (0.5)	0 (0)	4.437	.6135	45.105	.000**
The EPS methods are more user-friendly, convenient, and save time.	**205 (55.3)**	**134 (36.1)**	27 (7.3)	5 (1.3)	0 (0)	4.453	.6895	40.583	.000**
The use of EPS does not create any mental stress.	135 (36.4)	139 (37.5)	69 (18.6)	25 (6.7)	3 (0.8)	4.019	.9456	20.753	.000**
I like the fact that payments done through EPS require minimum effort.	120 (32.3)	184 (49.6)	51 (13.7)	13 (3.5)	3 (0.8)	4.092	.8169	25.741	.000**
My interaction with the payment procedure would be clear and understandable.	145 (39.1)	180 (48.5)	41 (11.1)	2 (0.5)	3 (0.8)	4.245	.7328	32.733	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor i.e., **ease of use** shows that 91.4 percent of customers are agree that, the EPS methods are more user-friendly, convenient, and save time. The mean score is found to be 4.453 which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. The mean score regarding learning to use EPS is easy, is found to be 4.437, it is 4.245 in interaction with the payment procedure would be clear and understandable, payments done through EPS require minimum effort with a mean score of 4.092, the mean score is 4.019 in the use of EPS does not create any mental stress.

As per the table, all the mean scores regarding the motivational factor **ease of use** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because, EPS methods are more user-friendly, convenient, and save time, customers believe learning EPS is very easy, clear and understandable payment procedures, minimum effort is required for payment, and use of EPS does not create mental stress.

6.2.2 Usefulness

Usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. Usefulness can enhance the quality of having utility and especially practical worth or applicability of e-payments. The following table shows the perception of the usefulness of the e-payment system.

Table 6.2

Descriptive statistics of Usefulness with the test of significance

Usefulness	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I think using EPS would enable me to accomplish transactions more quickly.	**212 (57.1)**	**140 (37.7)**	16 (4.3)	3 (0.8)	0 (0)	4.512	.6210	46.900	.000**
I believe using EPS would improve my efficiency of transactions.	161 (43.4)	171 (46.1)	31 (8.4)	8 (2.2)	0 (0)	4.307	.7147	35.234	.000**
I believe EPS would be useful for conducting transactions.	162 (43.7)	172 (46.4)	34 (9.2)	3 (0.8)	0 (0)	4.329	.6736	37.998	.000**
I believe EPS improves the quality of payments.	177 (47.7)	125 (33.7)	62 (16.7)	7 (1.9)	0 (0)	4.272	.8046	30.458	.000**
I think using EPS would improve my performance.	147 (39.6)	157 (42.3)	60 (16.2)	6 (1.6)	1 (0.3)	4.194	.7816	29.426	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor **usefulness** shows that 94.8 percent of customers agree that, EPS would enable them to accomplish transactions more quickly. The mean score is found to be 4.512 which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 90.1 customers agree that EPS would be useful for conducting transactions with a mean score of 4.329, and the significance level of one sample t-test is less than 0.01. The mean score regarding using EPS would improve my efficiency of transactions is found to be 4.307, it is 4.272 in EPS improve the quality of payments. The mean score of EPS would improve customer performance is found to be 4.194.

As per the table, all the mean scores regarding motivational factor **usefulness** are higher than the mean response score and the significance level of one-sample t-test is less than 0.01. Hence it can be concluded that customers are highly motivated

to use EPS because, EPS would enable them to accomplish transactions more quickly, EPS would be useful for conducting transactions, EPS would improve the efficiency of transactions, and EPS would improve the quality of payments.

6.2.3 Social influence

Social influence comprises the ways in which customers adjust their behavior to meet the demands of a social environment. Social influence is the process by which a customer's attitudes, beliefs, or behavior are modified by the presence or action of others. Customers have a tendency to change their behavior according to those around them. The following table shows the perception of motivation from social influence to use the e-payment system.

Table 6.3
Descriptive statistics of Social Influence with the test of significance

Social influence	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
The opinions of my friends and relatives have an impact on me to do the Electronic Payment (following the trend).	95 (25.6)	182 (49.1)	83 (22.4)	9 (2.4)	2 (0.5)	4.075	.7882	26.280	.000**
Reviews and reputations from the people I know influenced me to do the electronic payment.	90 (24.3)	195 (52.6)	62 (16.7)	21 (5.7)	3 (0.8)	3.938	.8408	21.488	.000**
Recent changes in the payment options compelled me to use EPS. (E.g., To get service from Akshaya Centre, we are forced to use EPS).	106 (28.6)	158 (42.6)	63 (17)	27 (7.3)	17 (4.6)	3.833	1.065	15.064	.000**
Demonetisation motivated me to use EPS.	105 (28.3)	135 (36.4)	80 (21.6)	31 (8.4)	20 (5.4)	3.739	1.119	12.708	.000**
Covid 19 situation influenced me to use EPS.	**170 (45.8)**	**118 (31.8)**	51 (13.7)	15 (4)	17 (4.6)	4.102	1.078	19.695	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor **social influence** shows that 77.6 percent of customers agree that, the Covid-19 pandemic situation influenced them to use EPS. The mean score is found to be 4.102 which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 74.7 percent of customers agree that friends and relatives have an impact on them to do the Electronic Payment with a mean score of 4.075, and the significance level of the one-sample t-test is less than 0.01. The mean score regarding reviews and reputation from the people who influenced the customers to do the Electronic Payment is found to be 3.938, it is 3.833 in recent changes in the payment options compelled them to use EPS. The mean score of Demonetisation motivated the customers to use EPS is found to be 3.739.

As per the table, all the mean scores regarding the motivational factor of **social influence** are higher than the mean response score and the significance level of one-sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because of covid-19 pandemic situation, the impact from friends and relatives, reviews and reputation, recent changes in the payment system, and demonetisation.

6.2.4 Security

Customers have fear in doing e-payment transactions, as they are concerned with the security and privacy aspects of such systems. It is noted that although customers' confidence in their bank was strong, their confidence in the technology was weak. It is very much important to know the customers' perception about the security of the e-payment systems to boost the confidence in the minds of the customer to use e-payment transactions. The following table shows the perception of security of the e-payment system.

Table 6.4

Descriptive statistics of Security with the test of significance

Security	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I am very confident that my transactions are protected with three-layer security systems such as Username, Password, and OTP.	**169 (45.6)**	**134 (36.1)**	59 (15.9)	7 (1.9)	2 (0.5)	4.243	.8255	28.991	.000**
EPS do not allow others to access my details.	88 (23.7)	160 (43.1)	92 (24.8)	28 (7.5)	3 (0.8)	3.814	.9097	17.236	.000**
EPS service providers send alerts regarding fraudulent activities & scams through SMS or e-mails.	96 (25.9)	169 (45.5)	96 (25.9)	9 (2.4)	1 (0.3)	4.159	.7843	28.463	.000**
EPS are found to be more secure and safe from fraudulent activities and hacking.	85 (22.9)	124 (33.4)	117 (31.5)	29 (7.8)	16 (4.3)	3.628	1.054	11.482	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor **security** shows that 81.7 percent of customers agree that, they are very confident that their transactions are protected with three-layer security systems such as Username, Password, and OTP. The mean score is found to be 4.243, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 71.4 percent of customers agree that EPS service providers send alerts regarding fraudulent activities & scams through SMS or e-mails with a mean score of 4.159, and the significance level of the one-sample t-test is less than 0.01. The mean score regarding EPS does not allow others to access details is found to be 3.814, it is 3.628 in EPS are found to be more secure and safe from fraudulent activities and hacking.

As per the table, all the mean scores regarding the motivational factor **security** are higher than the mean response score and the significance level of the one-sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because transactions are protected with the three-layer security system, EPS service providers send alerts regarding fraudulent activities & scams through SMS or e-mails, do not allow others to access details, and EPS are found to be more secure and safe from fraudulent activities and hacking.

6.2.5 Trust

Trust is defined as the extent that a user using the system should carry out a transaction securely and maintain the privacy of personal information against unauthorized access. The creation of trust in the minds of customers about e-payment can lead the intention of customers to use e-payment systems. The following table shows the perception of trust in the e-payment system by the customers.

Table 6.5

Descriptive statistics of Trust with test of significance

Trust	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
It is found that EPS are working in order.	90 (24.3)	206 (55.5)	67 (18.1)	8 (2.2)	0 (0)	4.019	.7145	27.468	.000**
The EPS have a reputable track record.	110 (29.6)	172 (46.4)	76 (20.5)	12 (3.2)	1 (0.3)	4.019	.8102	24.223	.000**
The EPS are reliable and dependable.	104 (28)	177 (47.7)	75 (20.2)	14 (3.8)	1 (0.3)	3.995	.8121	23.591	.000**
I trust the system and processes backing my transactions.	82 (22.1)	198 (53.4)	82 (22.1)	8 (2.2)	1 (0.3)	3.949	.7426	24.610	.000**
I believe EPS use will increase in the future.	**224 (60.4)**	**117 (31.5)**	26 (7)	3 (0.8)	1 (0.3)	4.509	.6872	42.309	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor **trust** shows that 91.9 percent of customers agree that they believe EPS use will increase in the near future. The mean score is found to be 4.509, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 79.8 percent of customers agree that EPS are working in order with a mean score of 4.019, and the significance level of the one-sample t-test is less than 0.01. The mean score regarding EPS has a reputable track record is found to be 4.019, it is 3.995 in EPS are reliable and dependable.

As per the table, all the mean scores regarding the motivational factor **trust** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because, EPS use will increase in the near future, EPS are working in order, EPS have a reputable track record, and EPS are reliable and dependable.

6.2.6 Attitude of customers

Customer attitudes are considered an important part of using e-payments. Therefore, e-payment providers need to pay special attention to understand the attitude of the customers. A clear understanding of customer attitude formation leads to the success of the e-payment system. The following table shows the attitude of customers towards the e-payment system.

Table 6.6

Descriptive statistics of the Attitude of customers with the test of significance

Attitude of customers	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I feel using EPS is a good idea.	**208 (56.1)**	**140 (37.7)**	21 (5.7)	2 (0.5)	0 (0)	4.493	.6297	45.673	.000**
I feel pleasant about using EPS.	170 (45.6)	160 (43.1)	36 (9.7)	4 (1.1)	1 (0.3)	4.332	.7170	35.769	.000**
I think using EPS is enjoyable.	151 (40.7)	150 (40.4)	62 (16.7)	5 (1.3)	3 (0.8)	4.189	.8167	28.034	.000**
I value the benefits of EPS.	129 (34.8)	190 (51.2)	46 (12.4)	4 (1.1)	2 (0.5)	4.186	.7281	31.373	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of the motivational factor **attitude of customers** shows that 93.8 percent of customers agree that they feel using EPS is a good idea. The mean score is found to be 4.493, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 88.7 percent of customers agree that they feel pleasant about using EPS with a mean score of 4.332, and the significance level of one-sample t-test is less than 0.01. The mean score regarding using EPS is enjoyable, is found to be 4.189, it is 4.186 in customers value the benefits of EPS.

As per the table, all the mean scores regarding the motivational factor **attitude of customers** are higher than the mean response score and the significance level of one-sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because, using EPS is a good idea, feeling pleasant, enjoyable, and value the benefits.

6.2.7 Intention to use

Intention to use is the likelihood of a customer using the same product or services again based on their past experience. It can also be the need for a product or service which is driving the customer towards a use. The following table shows the perception of intention to use the e-payments system.

Table 6.7
Descriptive statistics of Intention to Use with the test of significance

Intention to use	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I intend to use e-payment frequently in the future.	**197 (53.1)**	**138 (37.2)**	33 (8.9)	3 (0.8)	0 (0)	4.426	.6872	39.968	.000**
I will be open to explore more ways to use e-payments.	148 (39.9)	163 (43.9)	49 (13.2)	9 (2.4)	2 (0.5)	4.202	.7984	29.003	.000**
I will recommend online payment platforms to my friends.	166 (44.7)	160 (43.1)	39 (10.5)	5 (1.3)	1 (0.3)	4.307	.7333	34.337	.000**
I am satisfied with the effectiveness of the current Electronic Payment System.	107 (28.8)	203 (54.7)	48 (12.9)	11 (3)	2 (0.5)	4.084	.7612	27.417	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of motivational factor **intention to use** shows that 90.3 percent of customers agree that they intend to use e-payment frequently in the future. The mean score is found to be 4.462, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 87.8 percent of customers agree that they will recommend Electronic Payment platforms to their friends with a mean score of 4.332, and the significance level of the one-sample t-test is less than 0.01. The mean score regarding exploring more ways to use electronic payments is found to be 4.202, it is 4.084 in satisfaction with the effectiveness of the current Electronic Payment System.

As per the table, all the mean scores regarding the motivational factor **intention to use** are higher than the mean response score, and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are strongly motivated to use EPS because, they intend to use e-payment frequently in the future, they will recommend Electronic Payment platforms to their friends, explore more ways to use electronic payments, and satisfaction with the effectiveness of the current Electronic Payment System.

6.2.8 Descriptive statistics of all factors that motivate the use of the e-payment system

The following table shows the mean score of all factors that motivate the use of the e-payment system.

Table 6.8

Descriptive Statistics of all motivational factors

Motivational factors	N	Minimum	Maximum	Mean	Std. Deviation
Ease of use	371	2.00	5.00	4.2491	.55084
Usefulness	371	2.00	5.00	**4.3229**	.57081
Social influence	371	1.40	5.00	3.9375	.75134
Security	371	1.75	5.00	3.9609	.69054
Trust	371	1.80	5.00	4.0981	.57579
Attitude of customers	371	1.25	5.00	4.2999	.60505
Intention to use	371	1.50	5.00	4.2774	.59168

Source: Primary data

From the analysis, customers have a highly positive perception about the usefulness of the e-payment system with a mean of 4.3229 followed by the attitude of customers with a mean of 4.2999. The third important factor is the intention to use with a mean score of 4.2774 and the fourth one is the ease of use with a mean score of 4.2191. All the standard deviations are less than 1/3rd of the mean. So, most of the customers have the same opinion about the factors such as usefulness, attitude, intention, ease of use, trust, security, and social influence to use the e-payment system.

6.2.9 Variation in motivational factors based on the demographic profile of customers

To know the variation among different socio-economic groups of customers about the motivational factors of the e-payment system, statistical tests ANOVA and MANOVA were used. The results are shown in table 8.9.

Table 6.9

The motivational factors of the e-payment system on the basis of the demographic profile of customers with the test of significance

Characteristics			MOTIVATIONAL FACTORS							MANOVA	
			Ease of Use	Usefulness	Social Influence	Security	Trust	Attitude of Customers	Intention to Use	F	Sig
Gender	Male		4.28	4.35	3.99	4.08	4.14	4.32	4.31	2.086	.044*
	Female		4.22	4.30	3.89	3.87	4.07	4.27	4.25		
	ANOVA	F	1.095	.541	1.601	8.063	1.445	.486	.797		
		Sig	.296	.462	.207	.005**	.230	.486	.372		
Age	Up to 20		3.98	4.00	3.93	3.75	3.94	4.17	4.13	1.843	.012*
	21 -35		4.38	4.48	4.03	4.25	4.29	4.60	4.58		
	36 -50		4.42	4.54	4.01	4.05	4.23	4.49	4.41		
	Above 50		4.20	4.26	3.91	3.92	4.05	4.22	4.21		
	ANOVA	F	5.267	8.018	.534	3.104	3.757	7.108	5.307		
		Sig	.001**	.000**	.659	.027*	.011*	.000**	.001**		
Local body	Panchayath		4.17	4.27	3.93	3.90	4.03	4.25	4.23	1.969	.018*
	Municipality		4.38	4.42	3.95	4.10	4.25	4.35	4.31		
	Corporation		4.46	4.46	3.97	4.08	4.21	4.49	4.50		
	ANOVA	F	8.341	3.511	.063	3.348	5.515	3.270	3.815		
		Sig	.000**	.031*	.939	.038*	.004**	.039*	.023*		
Marital status	Single		4.17	4.23	3.84	3.88	4.02	4.15	4.17	3.042	.004**
	Married		4.32	4.41	4.02	4.03	4.17	4.43	4.37		
	ANOVA	F	7.202	9.210	5.207	4.013	6.286	20.451	10.138		
		Sig	.008**	.003**	.023*	.046*	.013*	.000**	.002**		
Educational qualification	Below Graduation		4.40	4.21	4.06	4.06	4.05	4.15	4.18	1.703	.007**
	Graduation		4.20	4.30	3.92	3.85	4.13	4.27	4.27		
	PG		4.19	4.22	3.92	4.03	4.15	4.35	4.32		

	Above PG		4.43	4.53	3.92	4.14	4.28	4.44	4.46		
	ANOVA	F	3.655	7.210	.507	3.191	3.354	3.845	3.455		
		Sig	.013*	.007**	.678	.024*	.039*	.022*	.004**		
Employment status	Employee		4.32	4.60	4.01	4.05	4.15	4.48	4.34	1.951	.001**
	Businessman		4.31	4.48	4.10	3.89	4.20	4.49	4.32		
	Professional		4.23	4.28	3.67	3.74	3.98	4.17	4.25		
	Student		4.16	4.18	3.92	3.92	4.02	4.10	4.15		
	Homemaker		4.47	4.41	3.81	4.13	4.23	4.47	4.53		
	Self-employed		4.25	4.44	4.05	4.13	4.31	4.52	4.54		
	ANOVA	F	1.649	3.747	1.836	2.019	2.255	7.581	3.400		
		Sig	.146	.003**	.105	.075	.049*	.000**	.005**		
Monthly income (in ₹)	Below 15,000		4.18	4.20	3.92	3.95	4.12	4.17	4.18	2.012	.004**
	15,000 – 30,000		4.19	4.29	3.92	3.95	4.02	4.29	4.27		
	30,000- 50,000		4.41	4.50	3.98	4.06	4.22	4.48	4.36		
	Above 50,000		4.38	4.48	3.99	3.80	4.11	4.36	4.41		
	ANOVA	F	4.039	5.347	.221	1.151	2.066	4.107	2.030		
		Sig	.008**	.001**	.882	.328	.104	.007**	.109		
Region	Southern		4.35	4.46	4.01	4.12	4.16	4.41	4.40	2.528	.002**
	Central		4.20	4.22	3.80	3.95	4.10	4.19	4.18		
	Northern		4.20	4.29	4.00	3.82	4.03	4.30	4.25		
	ANOVA	F	3.062	5.750	3.080	6.015	1.549	4.166	4.768		
		Sig	.048*	.003**	.047*	.003**	.214	.016*	.009**		
Experience in EPS	Up to 1 year		4.06	4.08	3.73	3.86	3.94	3.84	3.98	4.158	.000**
	1 - 5 years		4.16	4.21	3.90	3.93	4.04	4.21	4.19		
	5 - 10 years		4.47	4.62	4.09	4.06	4.25	4.61	4.53		
	Above 10 yrs.		4.40	4.13	3.47	3.67	4.10	3.96	4.05		
	ANOVA	F	9.921	17.237	3.418	1.577	3.968	20.254	12.103		
		Sig	.000**	.000**	.018*	.195	.008**	.000**	.000**		

Source: Primary data

Table 6.9 reveals that motivational factors to use the e-payment system significantly vary with respect to marital status, educational qualification, employment status, monthly income, region, and experience in the E-payment system at one percent level as the significant value of MANOVA is less than 0.01. Similarly, since the significant value is less than 0.05, there is a significant difference in the motivational factors to use the e-payment system in terms of gender, age, and local body.

Based on the gender influence of motivational factors, security is high in male (4.08) compared to female (3.87) customers to use e-payments. There is no significant difference in the influence to use e-payments in remaining motivational factors on the basis of gender.

The analysis also reveals significant differences in the influence of motivational factors to use e-payments among customers based on age. The influence of ease of use and usefulness is high in the age group 36-50 with mean of 4.42 and 4.54 respectively. The influence of security, trust, attitude of the customer, and intention to use is high in the age group 21-35 compares to other age groups with mean 4.25, 4.29, 4.60, and 4.58 respectively. There is no significant difference

in the influence of social influence to use of e-payment systems among different age groups.

The influence of ease of use, usefulness, security, trust, attitude of customer, and intention to use is significantly varied among Corporation, Municipality, and Panchayath to use the e-payment system. The influence of social influence is identical in all local body groups. The influence of ease of use (4.46), usefulness (4.46), attitude of customer (4.49), and intention to use (4.50) are high in Corporation. The motivational factor of security (4.10) and trust (4.25) to use EPS are high in Municipality.

The influences of all motivational factors are significantly varied among married and unmarried customers and the influence of motivational factors to use e-payment system is high in married customers compared to unmarried customers. The mean score of ease of use, usefulness, social influence, security, trust, attitude of customer, and intention to use of married customers are 4.32, 4.41, 4.02, 4.03, 4.17, 4.43, and 4.37 respectively.

The influences of motivational factors are significantly varied among the educational qualifications of customers except for social influence. The mean score of ease of use (4.43), usefulness (4.53), security (4.14), trust (4.28), attitude of customer (4.44), and intention to use (4.46) are high in the educational qualification above PG category when compared others.

The analysis also exhibits that the influence of motivational factors such as usefulness, trust, attitude of customer, and intention to use EPS among the employment group significantly vary to use the e-payment system. The motivational factor of usefulness to use EPS is high in employees (4.60) compared to the remaining groups. The influence of trust (4.31), attitude of customer (4.52), and intention to use (4.54) are high in self-employed customers. The influence of other factors such as ease of use, social influence, and security are the same in all employment groups.

Based on monthly income, the motivational factors of ease of use, usefulness, and attitude of customers are significantly different, and the influence is high in the monthly income between ₹30,000- ₹50,000 groups with mean 4.41, 4.50,

and 4.48 respectively. The influence of social influence, security, trust, and intention to use EPS is the same in all monthly income groups.

On the basis of region, the analysis reveals that all motivational factors except trust are influenced the use of e-payments differently among southern, central, and northern regions. The influences of motivational factors are high in the southern region with the mean ease of use (4.35), usefulness (4.46), social influence (4.01), security (4.12), the attitude of the customer (4.41), and intention to use (4.40).

The analysis of experience in the e-payment system reveals that there is a significant difference in the influence of motivational factors to use the e-payment system except for the motivational factor security. The influences of motivational factors to use e-payment are high in the customers having an experience between 5 years to 10 years compared to other groups. The high mean scores are ease of use (4.47), usefulness (4.62), social influence (4.09), trust (4.25), attitude of customer (4.61), and intention to use (4.53).

Testing of hypothesis:

H_0 19: There is no significant difference among the different groups of customers on the basis of their demographic profile and the influence of motivational factors to use EPS.

H_a 19: There is a significant difference among the different groups of customers on the basis of their demographic profile and the influence of motivational factors to use EPS.

As per the result of MANOVA, the influence of motivational factors to use the e-payment system varies significantly with respect to demographic variables such as gender, age, local body, marital status, employment status, monthly income, region, and experience in the e-payment system. Hence it failed to accept the null hypothesis, and it can be concluded that there is a significant difference among the different groups of customers on the basis of their demographic characteristics and the influence of motivational factors to use the e-payment system.

6.3 Satisfaction of customers towards Electronic Payment Systems

Customer satisfaction is post-experience feedback compared to customer expectations. Customer satisfaction helps to retain existing customers and attract new ones. Satisfied customers are loyal and they spread positive word of mouth among their peer group. Customer satisfaction towards the e-payment system is studied under six heads namely user-friendliness, supporting system, time-saving, economy, safety & security of transactions, and quality of services.

6.3.1 User-friendliness

The following table shows the satisfaction of customers with the user-friendliness of the e-payment system.

Table 6.10

Customer satisfaction towards user-friendliness with the test of significance

User-friendliness	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
All options are easily accessible in EPS.	126 (34)	188 (50.7)	49 (13.2)	8 (2.2)	0 (0)	4.164	.7296	30.740	.000**
I'm comfortable with the language options provided in EPS.	**133 (35.8)**	**197 (53.1)**	33 (8.9)	7 (1.9)	1 (0.3)	**4.224**	.7060	33.385	.000**
EPS services are available in all operating systems.	119 (32.1)	174 (46.9)	61 (16.4)	15 (4)	2 (0.5)	4.059	.8329	24.496	.000**
I'm comfortable with ICT infrastructure & internet connectivity in India.	66 (17.8)	131 (35.3)	104 (28)	59 (15.9)	11 (3)	3.491	1.0510	8.990	.000**
Options and steps in the transaction are not complicated.	82 (22.1)	206 (55.5)	69 (18.6)	7 (1.9)	7 (1.9)	3.941	.8066	22.465	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of satisfaction factor **user friendliness** shows that 88.9 percent of customers agree that they are comfortable with the language options provided in EPS with a mean score of 4.224, 84.7 percent of customers agree that all options are easily accessible in EPS, and 77.6 percent of customers agree that options and steps in the transaction are not complicated.

As per the table, all the mean scores regarding the satisfaction factor **user-friendliness** are higher than the mean response score, and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because, they are comfortable with the language options, easy accessibility of EPS options, EPS services are available in all operating systems, comfortability with ICT infrastructure & internet connectivity, and options & steps in the transaction are not complicated.

6.3.2 Supporting system

The following table presents the satisfaction of customers towards e-payments based on the supporting system.

Table 6.11

Customer satisfaction towards supporting system with the test of significance

Supporting system	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
EPS providers give useful demonstrations & proper user instructions.	**91 (24.5)**	**198 (53.4)**	70 (18.9)	10 (2.7)	2 (0.5)	3.987	.7692	24.702	.000**
There is a good system to give awareness & training programmes to educate customers about the use of EPS.	72 (19.4)	148 (39.9)	121 (32.6)	25 (6.7)	5 (1.3)	3.693	.9049	14.745	.000**
There is a good staff support system to educate ignorant customers.	57 (15.4)	134 (36.1)	127 (34.2)	43 (11.6)	10 (2.7)	3.499	.9764	9.837	.000**
Existing cyber laws and legal guidelines & formalities to protect customers are effective.	59 (15.9)	141 (38)	100 (27)	62 (16.7)	9 (2.4)	3.482	1.0249	9.068	.000**
There is a call center facility or grievance redressal mechanism to deal with customer queries.	72 (19.4)	124 (33.4)	110 (29.6)	51 (13.7)	14 (3.8)	3.509	1.0689	9.180	.000**

Source: Primary data

Note: Figures in parentheses represent percentages of the row total

Analysis of the satisfaction factor **supporting system** shows that 77.9 percent of customers agree that, EPS providers give useful demonstrations & proper user instructions. The mean score is found to be 3.987, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 59.3 percent of customers agree that there is a good system to give awareness & training programmes to educate customers about the use of EPS with a mean score of 3.693, and the significance level of one sample t-test is less than 0.01. The mean score regarding call center facility or grievance redressal mechanism to deal with customer queries is found to be 3.509, and it is 3.499 in customers' opinion that there is a good staff supporting system to educate ignorant customers. The mean score of existing cyber laws and legal guidelines & formalities to protect customers are effective is 3.482.

As per the table, all the mean scores regarding the satisfaction factor **supporting system** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because EPS providers give useful demonstrations & proper user instructions, there is a good system to give awareness & training programmes to educate customers about the use of EPS, call center facilities, or grievance redressal mechanism to deal with customer queries, good staff supporting system.

6.3.3 Time-saving

The satisfaction with the time-saving aspects of the e-payment system is shown in the following table.

Table 6.12

Customer satisfaction towards time-saving with the test of significance

Time-saving	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
I feel I'm saving a lot of time in EPS usage compared to visiting the branch for transactions.	**222 (59.8)**	**104 (28)**	37 (10)	7 (1.9)	1 (0.3)	4.453	.7710	36.297	.000**
Transaction processing time is reasonable.	158 (42.6)	151 (40.7)	55 (14.8)	7 (1.9)	0 (0)	4.402	.6997	38.582	.000**
There are no frequent hangs in transactions.	93 (25.1)	140 (37.7)	86 (23.2)	39 (10.5)	13 (3.5)	3.704	1.0646	12.728	.000**
EPS devices & app updation time are convenient.	103 (27.8)	179 (48.2)	61 (16.4)	23 (6.2)	5 (1.3)	3.949	.9005	20.294	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of satisfaction factor **time-saving** shows that 87.8 percent of customers agree that, they are saving a lot of time in EPS usage compared to visiting the branch for transactions. The mean score is found to be 4.453, which is significantly higher than the mean of the response scale (mean of the response scale-3) and the significance level of the one-sample t-test is less than 0.01. 83.3 percent of customers agree that transaction processing time is reasonable with a mean score of 4.402, and the significance level of one sample t-test is less than 0.01. 76 percent of customers agree that EPS devices & app updation time are convenient, and the mean score is 3.949. It is also found that 62.8 percent of customers agree that there are no hangs in transactions.

As per the table, all the mean scores regarding the satisfaction factor **time saving** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because, EPS saves time compared to visiting branches, reasonable transaction processing time, convenient updation of EPS apps, and a good staff support system with no frequent hangs in transaction.

6.3.4 Economy

The satisfaction of customers with the economy of the e-payment system is shown in the following table.

Table 6.13

Customer satisfaction towards economy with the test of significance

Economy	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
The service charges levied by service providers are affordable.	104 (28)	134 (36.1)	75 (20.2)	36 (9.7)	22 (5.9)	3.706	1.1496	11.832	.000**
Transaction limits set by service providers are reasonable.	93 (25.1)	136 (36.7)	77 (20.8)	45 (12.1)	20 (5.4)	3.639	1.1409	10.785	.000**
Scratch cards, redeemable points, shopping vouchers, rewards, discounts & special offers are very useful.	**115 (31)**	**132 (35.6)**	76 (20.5)	30 (8.1)	18 (4.9)	**3.798**	1.1124	13.815	.000**
There is a sound refund mechanism if there is any payment-related issue.	98 (26.4)	143 (38.5)	91 (24.5)	25 (6.7)	14 (3.8)	3.771	1.0339	14.361	.000**
There are no extra service charges for EPS services.	85 (22.9)	140 (37.7)	96 (25.9)	31 (8.4)	19 (5.1)	3.650	1.0786	11.600	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of the satisfaction factor **economy** shows that the customers say that scratch cards, redeemable points, shopping vouchers, rewards, discounts & special offers are very useful with a mean score of 3.798, and the mean score of there is a sound refund mechanism if there are any payment-related issues is found to be 3.771. It is 3.706 in service charges levied by service providers are affordable. The significant value of one sample t-test of all the economic factors is less than

0.01, and all the mean scores are higher than the mean of the response scale (mean of the response scale- 3).

66.6 percent of customers agree that promotional methods are extremely beneficial, 64.9 percent of customers agree that there is a sound refund mechanism if there is any payment-related issue, and 64.1 percent of customers agree that service charges levied by service providers are affordable.

As per the table, all the mean scores regarding the satisfaction factor **economy** are higher than the mean response score, and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because the promotional methods are very useful, there is a sound refund mechanism if there are any payment-related issues, service charges levied by service providers are affordable, there are no extra service charges for EPS services, and transaction limits set by service providers are reasonable.

6.3.5 Safety and security of transactions

The below table shows the customers' satisfaction with the e-payments system based on the safety and security of transactions.

Table 6.14

Customer satisfaction towards safety and security of transactions with the test of significance

Safety and security of transaction	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	T	Sig.
I'm very confident that my transactions & details are Password/PIN protected.	144 (38.8)	156 (42)	55 (14.8)	7 (1.9)	9 (2.4)	4.129	.9031	24.087	.000**
I feel OTP access/verification is very effective.	**149 (40.2)**	**165 (44.5)**	49 (13.2)	4 (1.1)	4 (1.1)	4.216	.7931	29.522	.000**
I'm receiving SMS/e-mails immediately after every transaction.	153 (41.2)	157 (42.3)	41 (11.1)	16 (4.3)	4 (1.1)	4.183	.8723	26.128	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of satisfaction factor **safety and security of transactions** shows that 84.7 percent of customers agree that, they feel OTP access/verification is very effective. The mean score is found to be 4.216, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 83.5 percent of customers agree that they receive SMS/e-mails immediately after every transaction. The transaction processing & response time is reasonable with a mean score of 4.183, and the significance level of one sample t-test is less than 0.01. 80.8 percent agree that they are very confident that transactions & details are password/PIN protected, and the mean score is 4.129.

As per the table, all the mean scores regarding the satisfaction factor **safety and security of transaction** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because of effective OTP access/verification, SMS alert after every transaction, and password-protected transactions.

6.3.6 Quality of services

The following table shows the satisfaction of customers towards the quality of services of the e- payment system.

Table 6.15
Customer satisfaction towards the quality of services with the test of significance

Quality of services	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	T	Sig.
The performance of EPS-based transactions is always better than traditional cash transactions.	154 (41.5)	167 (45)	40 (10.8)	5 (1.3)	5 (1.3)	4.240	.8014	29.799	.000**
EPS offers faster payment options in the digitalized system with the internet.	**174 (46.9)**	**149 (40.2)**	42 (11.3)	6 (1.6)	0 (0)	4.323	.7374	34.570	.000**
It provides updated technology in Electronic Payment services.	153 (41.2)	169 (45.6)	37 (10)	11 (3)	1 (0.3)	4.245	.7723	31.058	.000**
It provides unrestricted access to all banking activities.	117 (31.5)	142 (38.3)	73 (19.7)	39 (10.5)	0 (0)	3.908	.9627	18.175	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of satisfaction factor **quality of service** shows that 87.1 percent of customers agree that, EPS offers faster payment options in the digitalized system with the internet. The mean score is found to be 4.323, which is significantly higher than the mean of the response scale (mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. 86.8 percent of customers agree that EPS provides updated technology in Electronic Payment services with a mean score of 4.245, and the significance level of one sample t-test is less than 0.01. 86.5 percent agree that the performance of EPS-based transactions is always better than traditional cash transactions, and the mean score is 4.240. 69.8 percent of customers agree that EPS provides unrestricted access to all banking activities.

As per the table, all the mean scores regarding the satisfaction factor **quality of service** are higher than the mean response score and the significance level of one sample t-test is less than 0.01. Hence it can be concluded that customers are satisfied to use EPS because, EPS offers faster payment options in the digitalized system, EPS provides updated technology, higher performance, and it provides unrestricted access for all banking activities.

6.3.7. Overall satisfaction of customers towards the Electronic Payment System

The following table shows the mean score of all factors that motivate the use of EPS.

Table 6.16

Descriptive Statistics on satisfaction of customers towards e-payment system

Satisfaction Variables	N	Minimum	Maximum	Mean	Std. Deviation
User-Friendliness	371	2.00	5.00	3.9757	.59562
Supporting System	371	1.20	5.00	3.6340	.73391
Time-Saving	371	1.75	5.00	4.1267	.61192
Economy	371	1.00	5.00	3.7127	.83383
Safety and Security of transactions	371	1.30	5.00	4.1782	.68602
Quality of Service	371	2.00	5.00	**4.1792**	.63129

Source: Primary data

From the analysis, customers are highly satisfied with the quality of services of the e-payment system with a mean of 4.1792, and safety and security of transactions with a mean of 4.1782 followed by time-saving with a mean of 4.1267. All the standard deviations are less than 1/3rd of the mean. So, most of the customers have the same opinion about the satisfaction of the e-payment system.

6.3.8. Variation in the level of satisfaction of customers towards Electronic Payment System based on demographic factors

To know the variation among different demographic groups of customers about the level of satisfaction with the e-payment system, the statistical tests ANOVA and MANOVA were used. The results are shown in table 6.17.

Table 6.17

Level of satisfaction of EPS on the basis of the demographic profile of customers

Characteristics			FACTORS OF SATISFACTION						MANOVA	
			User-Friendliness	Supporting System	Time -Saving	Economy	Safety and Security of Transactions	Quality of Service	F	Sig.
Gender	Male		4.03	3.62	4.15	3.86	4.15	4.24	5.429	.000**
	Female		3.90	3.66	4.09	3.60	4.21	4.10		
	ANOVA	F	4.121	.283	.776	9.664	.815	4.597		
		Sig	.043*	.595	.379	.002**	.367	.033*		
Age	Up to 20		3.68	3.17	3.87	3.65	3.89	3.70	3.159	.000**
	21 -35		4.25	3.84	4.40	4.05	4.59	4.56		
	36 -50		3.98	3.64	4.19	3.78	4.34	4.09		
	Above 50		3.97	3.64	4.09	3.66	4.10	4.20		
	ANOVA	F	3.645	3.401	3.598	2.173	7.398	8.256		
		Sig	.013*	.018*	.014*	.091	.000**	.000**		
Local Body	Panchayath		3.92	3.59	4.04	3.65	4.09	4.11	1.826	.041*
	Municipality		4.08	3.70	4.31	3.81	4.32	4.30		
	Corporation		4.11	3.75	4.28	3.91	4.39	4.33		
	ANOVA	F	3.232	1.314	8.008	2.474	5.724	4.125		
		Sig	.041*	.270	.000**	.086	.004**	.017*		
Marital Status	Single		3.90	3.58	4.04	3.65	4.00	4.11	4.743	.000**
	Married		4.04	3.68	4.20	3.77	4.34	4.24		
	ANOVA	F	5.059	1.966	6.986	1.852	23.819	3.786		
		Sig	.025*	.162	.009**	.174	.000**	.052		

Educational Qualification	Below Graduation		4.02	3.66	4.20	3.99	4.08	4.23	1.738	.028*
	Graduation		3.98	3.63	4.08	3.69	4.51	4.15		
	PG		3.99	3.68	4.20	3.63	4.22	4.23		
	Above PG		3.88	3.50	4.04	3.71	4.11	4.09		
	ANOVA	F	.459	.571	1.338	2.098	5.342	.715		
		Sig	.711	.634	.262	.100	.001**	.544		
Employment Status	Employee		4.04	3.71	4.25	3.59	4.51	4.19	2.229	.000**
	Businessman		3.98	3.48	4.06	3.62	4.46	4.36		
	Professional		3.99	3.57	4.11	3.83	4.06	4.14		
	Student		3.87	3.59	4.02	3.74	4.03	4.10		
	Homemaker		4.04	3.67	4.13	3.95	4.23	4.23		
	Self-employed		4.19	3.75	4.24	3.86	4.41	4.39		
	ANOVA	F	2.146	.809	2.084	1.213	4.150	1.582		
		Sig	.060	.544	.067	.303	.001**	.164		
Monthly income (in ₹)	Below 15,000		4.00	3.62	4.05	3.73	4.11	4.13	1.992	.008**
	15,000 -30,000		3.97	3.65	4.15	3.72	4.15	4.26		
	30,000- 50,000		3.92	3.62	4.19	3.64	4.34	4.13		
	Above 50,000		4.06	3.66	4.10	3.83	4.15	4.09		
	ANOVA	F	.551	.042	.904	.427	1.875	1.377		
		Sig	.648	.989	.439	.734	.033*	.025*		
Region	Southern		3.94	3.58	4.13	3.83	4.30	4.17	2.436	.004**
	Central		3.94	3.66	4.13	3.59	4.16	4.15		
	Northern		4.05	3.66	4.12	3.72	4.08	4.22		
	ANOVA	F	1.265	.434	.012	2.709	3.204	.484		
		Sig	.283	.648	.989	.068	.042*	.617		
Experience in EPS	Up to 1 year		3.85	3.59	3.96	3.54	3.93	4.13	1.866	.015*
	1 - 5 years		3.97	3.64	4.12	3.67	4.11	4.15		
	5 - 10 years		4.04	3.67	4.18	3.87	4.37	4.28		
	Above 10 years		3.70	2.97	3.92	3.17	4.12	3.54		
	ANOVA	F	1.315	1.775	1.233	2.880	4.944	3.175		
		Sig	.269	.152	2.97	.036*	.002**	.024*		

Source: Primary data

Table 6.17 reveals that the level of satisfaction with the e-payment system significantly varies with respect to gender, age, marital status, employment status, monthly income, and the region at one percent level as the significant value of MANOVA is less than 0.01. Similarly, since the significant value is less than 0.05, there is a significant difference in the level of satisfaction with the e-payment system in terms of the local body, educational qualification, and experience in the e-payment system.

Based on gender, the level of satisfaction towards user-friendliness is high in male (4.03) compare to female (3.90) customers of e-payments. Satisfaction with the economy is high in male (3.86) compared to female (3.60). The satisfaction of quality of service is high (4.24) in male and low in female (4.10). There is no significant difference in the level of satisfaction towards e-payments in remaining satisfaction factors on the basis of gender.

The analysis also reveals significant difference in the level of satisfaction of e-payments among customers based on age. The level of satisfaction is high in the age group 21-35 with mean user-friendliness (4.25), supporting system (3.84), time-saving (4.4), safety and security of transactions (4.59), and quality of services (4.56). There is no significant difference in satisfaction with the economy of the e-payment system among different age groups.

The level of satisfaction with user-friendliness, time-saving, safety and security of transactions, and quality of services are significantly varied among Corporation, Municipality, and Panchayath. The satisfaction of the supporting system and economy is identical in all local body groups. The satisfaction of user-friendliness (4.11), safety and security of transactions (4.39), and quality of services (4.33) are high in Corporations. The satisfaction of time-saving (4.31) is high in Municipality.

The satisfaction of user-friendliness, time-saving, and safety & security of transactions are significantly varied among married and unmarried customers and the level of satisfaction with the e-payment system is high in married customers compared to unmarried customers. The mean score of user-friendliness, time-saving, and safety & security of transactions of married customers are 4.04, 4.20, and 4.34 respectively. There is no significant difference in the level of satisfaction with the supporting system, economy, and quality of service of the e-payment system among married and unmarried customers.

There is a significant difference in the level of satisfaction with the safety and security of transactions based on educational qualification. Satisfaction is high in customers having graduation qualifications with a mean of 4.51. The other factors of satisfaction are identical among different groups based on education qualification.

The analysis also exhibits that the level of satisfaction with the safety and security of transaction among the employment group are significantly varied. The satisfaction of safety and security of transactions is high among employees (4.51) compare to the remaining groups. The satisfaction of other factors such as user-

friendliness, supporting system, time-saving, economy, and quality of services are the same in all employment groups.

Based on monthly income, the satisfaction of safety and security of transactions and quality of services are significantly different among the group. The satisfaction of the e-payment system with the safety and security of the transaction is high in the monthly income between ₹30,000-₹50,000 groups with a mean of 4.34. The satisfaction of quality of services is high in the monthly income between ₹15,000- ₹30,000 groups with a mean of 4.26. The satisfaction of e-payments about user-friendliness, supporting system, time-saving, and economy are the same in all monthly income groups.

On the basis of region, the analysis reveals that the satisfaction of safety and security of e-payment transactions are varied differently among southern, central, and northern regions. The level of satisfaction with the safety and security of e-payment transactions is high in the southern region with a mean of 4.30. The remaining factors of satisfaction are the same among southern, central, and northern regions.

The analysis of experience in the e-payment system reveals that there is a significant difference in the level of satisfaction with the economy, safety, and security of transactions, and quality of services except the factors of satisfaction such as user-friendliness, supporting system, and time-saving. The level of satisfaction is high in the customers having experience between 5 years to 10 years compared to other groups.

Testing of hypothesis:

H_0 20: There is no significant difference among the different groups of customers on the basis of their demographic profile and the level of satisfaction of customers towards the EPS.

H_a 20: There is a significant difference among the different groups of customers on the basis of their demographic profile and the level of satisfaction of customers towards the EPS.

As per the result of MANOVA, the level of satisfaction of customers towards the e-payment system varies significantly with respect to demographic variables such as gender, age, local body, marital status, education qualification, employment status, monthly income, region, and experience in the e-payment system. Hence it failed to accept the null hypothesis, and it can be concluded that there is a significant difference among the different groups of customers on the basis of their demographic profile and the level of satisfaction of customers towards the e-payment system.

6.4 Influence of satisfaction on the usage of e-payment methods based on local body, education qualification, and gender

The Multilayer Perception Model is used to understand the effect of satisfaction variables on the usage of e-payment methods based on local body, education qualification, and gender.

Table 6.18

Network Information

to check the Influence of satisfaction variables on the usage of EPS based on local body, education qualification, & gender.

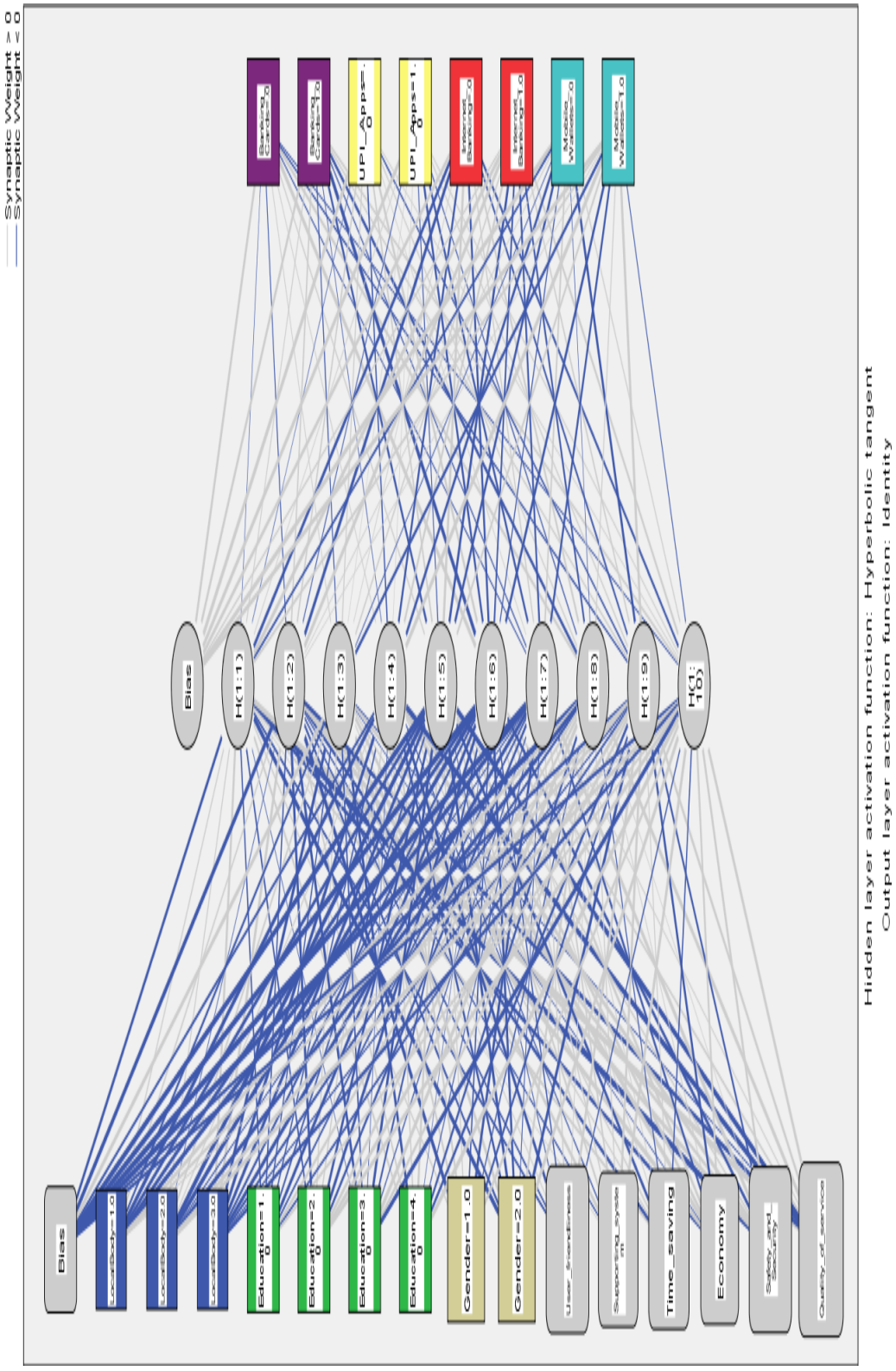
Input Layer	Factors	1	Local Body
		2	Educational Qualification
		3	Gender
	Covariates	1	User-Friendliness
		2	Supporting System
		3	Time-Saving
		4	Economy
		5	Safety and Security of Transactions
		6	Quality of Service
	Number of Units [a]		15
	Rescaling Method for Covariates		Standardized
Hidden Layer(s)	Number of Hidden Layers		1

	Number of Units in Hidden Layer 1[a]		10
	Activation Function		Hyperbolic tangent
Output Layer	Dependent Variables	1	Banking Cards (Debit Card, Credit Card, etc.)
		2	UPI Apps (Google Pay, PhonePe, BHIM App, etc.)
		3	Internet Banking (NEFT/ RTGS/ IMPS etc.)
		4	Mobile Wallets (Paytm, Yono, Mobikwik, etc.)
	Number of Units		8
	Activation Function		Identity
	Error Function		Sum of Squares
a. Excluding the bias unit			

Source: Primary data

Table 6.18 provides details of the neural network's architecture. Six input variables are used as Covariates or independent variables in analysis such as user-friendliness, supporting system, time-saving, economy, safety, and security of transactions. The independent variables are the variables of satisfaction. In the analysis, three input variables are used as factors such as local body, education qualification, and gender. **The standardized rescaling method** is used to adjust the independent variables. A single hidden layer had ten hidden nodes. The output layer had four dependent variables such as banking cards, UPI apps, internet banking, and mobile wallets with eight nodes. A **hyperbolic tangent activation function** is used in the hidden layer, taking the real-valued arguments and then transforming them into a range (-1 to 1). The sum of the square error is reported because the dependent variables are scaled. The identity activation function is used in the outer layer. The following figure shows the network relationship.

Figure 6.1
Artificial Neural Network Diagram of Multilayer Perception Model



Source: Primary data

The above figure shows the relationship between the usage of e-payment methods and the satisfaction of customers towards e-payment on the basis of the local body, educational qualification, and gender.

Table 6.19
Multilayer Perception Model Summary

Training	The sum of Squares Error		131.270
	Average Percent Incorrect Predictions		18.4%
	Percent Incorrect Predictions for Categorical Dependents	Banking Cards (Debit Card, Credit Card, etc.)	7.6%
		UPI Apps (Google Pay, PhonePe, BHIM App, etc.)	4.4%
		Internet Banking (NEFT/ RTGS/ IMPS etc.)	34.0%
		Mobile Wallets (Paytm, Yono, Mobikwik, etc.)	27.6%
	Stopping Rule Used		1 consecutive step(s) with no decrease in error [a]
	Training Time		0:00:00.13
Testing	The sum of Squares Error		67.520
	Average Percent Incorrect Predictions		20.2%
	Percent Incorrect Predictions for Categorical Dependents	Banking Cards (Debit Card, Credit Card, etc.)	3.3%
		UPI Apps (Google Pay, PhonePe, BHIM App, etc.)	8.3%
		Internet Banking (NEFT/ RTGS/ IMPS etc.)	34.7%
		Mobile Wallets (Paytm, Yono, Mobikwik, etc.)	34.7%
a. Error computations are based on the testing sample.			

Source: Primary data

The above table displays information about the result of training and applying the model to the testing data set. The sum of the square error in training is 131.270. Training time is very small (0:00:00.13). The sum of the square error in

testing is 67.520. During the training period, the coefficient of Banking Cards varies by 7.6 percent, the coefficient of UPI Apps varies by 4.4 percent, the coefficient of Internet Banking varies by 34 percent, and the coefficient of Mobile Wallets varies by 27.6 percent. During the testing period, the coefficient of Banking Cards varies by 3.3 percent, the coefficient of UPI Apps varies by 8.3 percent, the coefficient of Internet Banking varies by 34.7 percent, and the coefficient of Mobile Wallets varies by 34.7 percent.

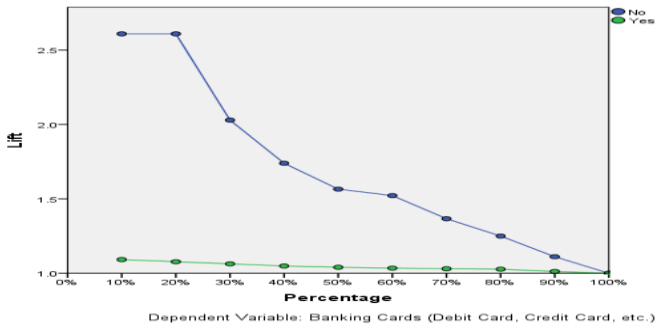
Table 6.20
Classification of Banking Cards
using training and testing

Sample	Observed	Predicted		
		No	Yes	Percent Correct
Training	No	0	19	0.0%
	Yes	0	231	100.0%
	Overall Percent	0.0%	100.0%	**92.4%**
Testing	No	0	4	0.0%
	Yes	0	117	100.0%
	Overall Percent	0.0%	100.0%	**96.7%**

Source: Primary data

The above classification table shows the dependent variable banking cards in two phases i.e., the training phase, and the testing phase. The overall percent in the testing phase is 96.7 percent and the training phase is 92.4 percent. The difference in the accuracy of usage of banking cards is 4.3 percent. **Therefore**, **there is a 4.3 percent improvement in the usage of banking cards from the training phase to the testing phase**. So, the banking card is a popular and important method of e-payment. The following figure shows the lift chart of banking cards.

Figure 6.2
Lift chart of Banking Cards



Source: Primary data

Table 6.21
Classification of UPI Apps using training and testing

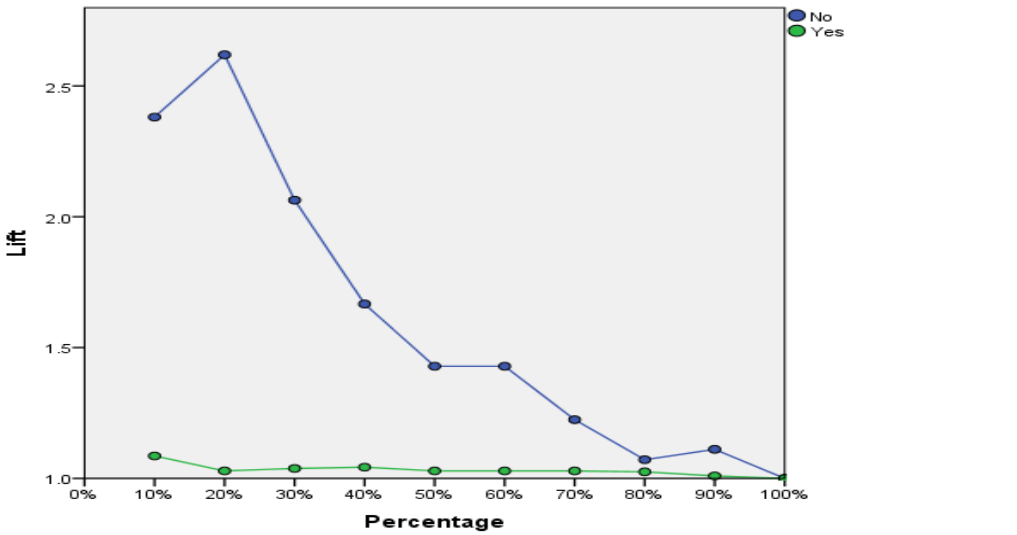
Sample	Observed	Predicted		
		No	Yes	Percent Correct
Training	No	0	21	0.0%
	Yes	0	229	100.0%
	Overall Percent	0.0%	100.0%	**91.7%**
Testing	No	0	5	0.0%
	Yes	0	116	100.0%
	Overall Percent	0.0%	100.0%	**95.6%**

Source: Primary data

The above classification table shows the dependent variable UPI Apps in two phases i.e., the training phase, and the testing phase. The overall percent in the training phase is 91.7 percent. The overall percent in the testing phase is 95.6 percent. **Therefore, there is an increase in the accuracy of 3.9 percent in the usage of UPI Apps from the training phase to the testing phase.**

Figure 6.3

Lift chart of Unified Payment Interfaces



Source: Primary data

Table 6.22
Classification of Internet Banking using training and testing

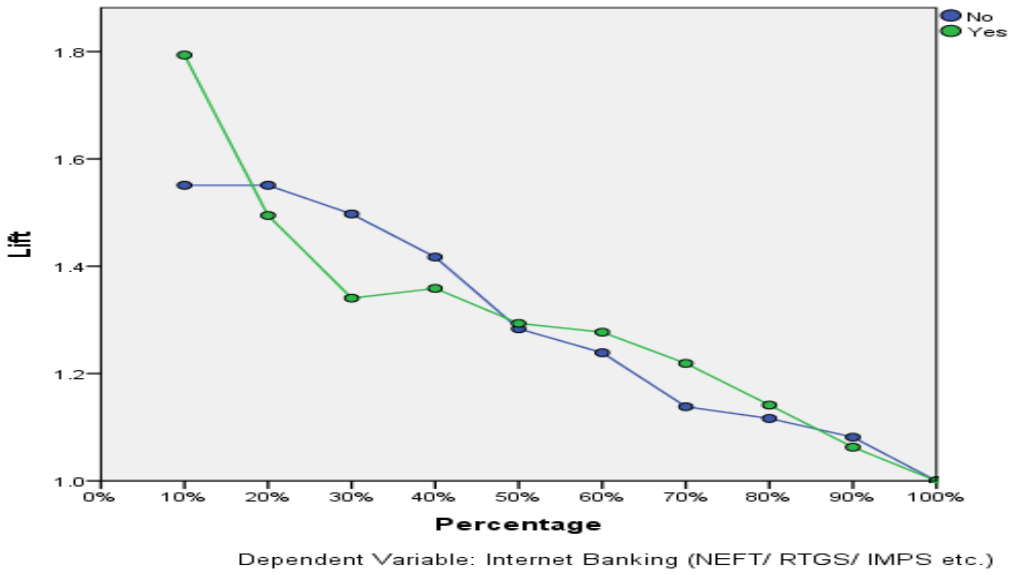
Sample	Observed	Predicted		
		No	Yes	Percent Correct
Training	No	70	51	57.9%
	Yes	36	93	73.6%
	Overall Percent	42.4%	57.6%	**65.2%**
Testing	No	37	30	54.5%
	Yes	11	43	78.2%
	Overall Percent	39.7%	60.3%	**66.1%**

Source: Primary data

The above classification table shows the dependent variable Internet banking in two phases i.e., the training phase and the testing phase. The overall percent in the training phase is 65.2 percent. The overall percent in the testing phase is 66.1 percent. **Therefore, there is an increase in the accuracy of 0.9 percent in the usage of Internet banking from the training phase to the testing phase.**

Figure 6.4

Lift chart of Internet Banking



Source: Primary data

Table 6.23
Classification of Mobile Wallets
using training and testing

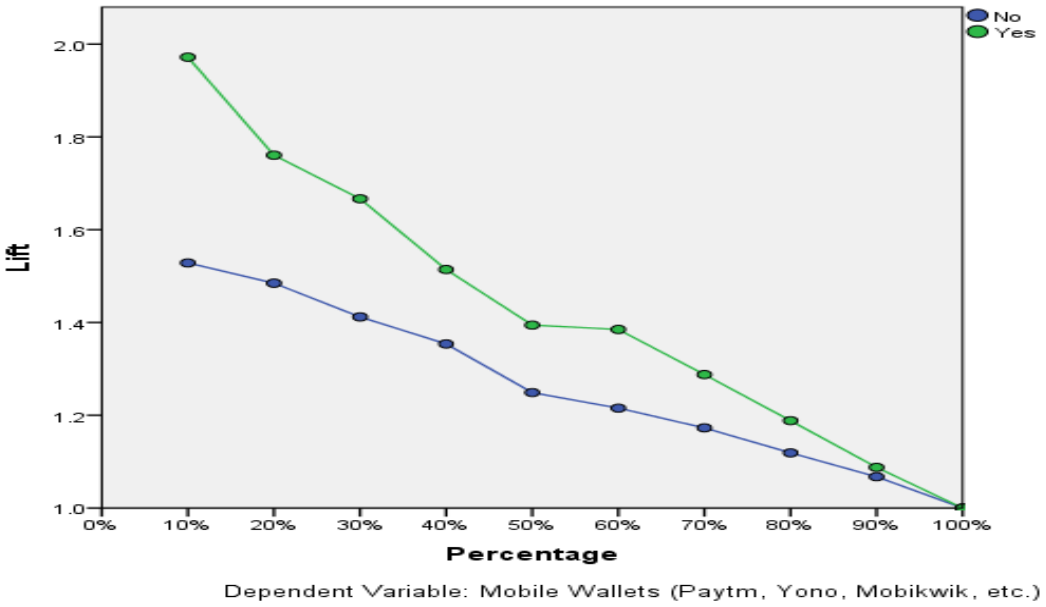
Sample	Observed	Predicted		
		No	Yes	Percent Correct
Training	No	110	39	79.5%
	Yes	48	53	61.6%
	Overall Percent	63.2%	36.8%	**65.2%**
Testing	No	59	18	70.5%
	Yes	15	29	55.8%
	Overall Percent	61.2%	38.8%	**72.7%**

Source: Primary data

The above classification table shows the dependent variable mobile wallets in two phases i.e., the training phase, and the testing phase. The overall percent in the training phase is 65.2 percent. The overall percent in the testing phase is 72.7 percent. **Therefore, there is a increase in the accuracy of 7.5 percent in the usage of mobile wallets from the training phase to the testing phase.**

Figure 6.5

Lift chart of Mobile Wallet



Source: Primary data

Table 6.24

Independent Variable Importance

Variables	Importance	Contribution of the independent variable	Normalized Importance
Time-Saving	.054	**37.0%**	37.0%
Educational Qualification	.063	6.8%	43.8%
Economy	.108	**30.6%**	**74.4%**
Gender	.117	6.6%	81.0%
Quality of Service	.119	1.1%	82.1%
Supporting System	.127	5.9%	88.0%
Local Body	.129	0.9%	88.9%
Safety and Security of transactions	.139	7.4%	96.3%
User-Friendliness	.145	3.7%	100.0%

Source: Primary data

The above table shows the contribution of the independent variables to influence the usage of e-payment methods. The probability value is less in Time-Saving (.054) and contributes 37 percent to influence the usage of e-payment methods.

The probability of education qualification is 0.063 and contributes 6.8 percent to influence the usage of e-payment methods. Time-saving and education qualifications all together contribute 43.8 percent to influence the usage of e-payment methods.

The probability of the economy is 0.108 and the contribution of the economy to influence the usage of e-payment methods is 30.6 percent. Time-saving, education qualifications, and the economy together contribute 74.4 percent.

The probability value of gender is 0.117 and the contribution of gender to influence the usage of e-payment methods is 6.6 percent. Time-saving, education qualification, economy, and gender together contribute 81 percent.

The probability value of quality of service is 0.119 and the contribution of quality of service to influence the usage of e-payment methods is 1.1 percent. Time-saving, education qualification, economy, gender, and quality of service together contribute 82.1 percent.

The probability value of the supporting system is 0.127 and the contribution of the supporting system to influence the usage of e-payment methods is 5.9 percent. Time-saving, education qualification, economy, gender, quality of service, and supporting system together contribute 88 percent.

The probability value of the local body is 0.129 and the contribution of the local body to influence the usage of e-payment methods is 0.9 percent. Time-saving, education qualification, economy, gender, quality of service, supporting system, and local body together contribute 88.9 percent.

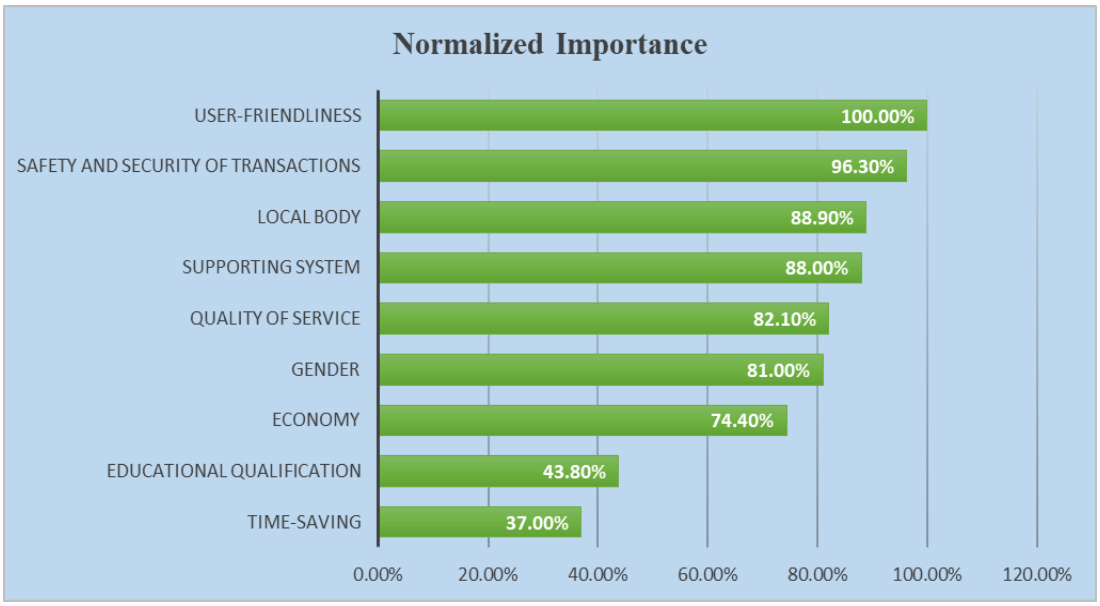
The probability value of safety and security of transaction is 0.139 and the contribution of safety and security of transaction to influence the usage of e-payment methods is 7.4 percent. Time-saving, education qualification, economy, gender, quality of service, supporting system, local body, and safety and security of the transaction, and time-saving together contribute 96.3 percent.

The probability value of user-friendliness is 0.145 and the contribution of user-friendliness to influence the usage of e-payment methods is 3.7 percent. Time-saving, education qualification, economy, gender, quality of service, supporting system, local body, safety and security of the transaction, and user-friendliness together contribute 100 percent.

The influence of the **Time-Saving (37 percent)** and the **Economy (30.6 percent)** are high in the usage of e-payment methods such as banking cards, UPI apps, internet banking, and mobile wallets. The local body (0.9 percent) have less influence on the usage of e-payment methods. Based on the output of this model, we can conclude that to make e-payment methods popular among the general public, more focus will be placed on the quality of service, user-friendliness, supporting system, safety and security of transactions etc.

Figure 6.6

Bar chart of importance table



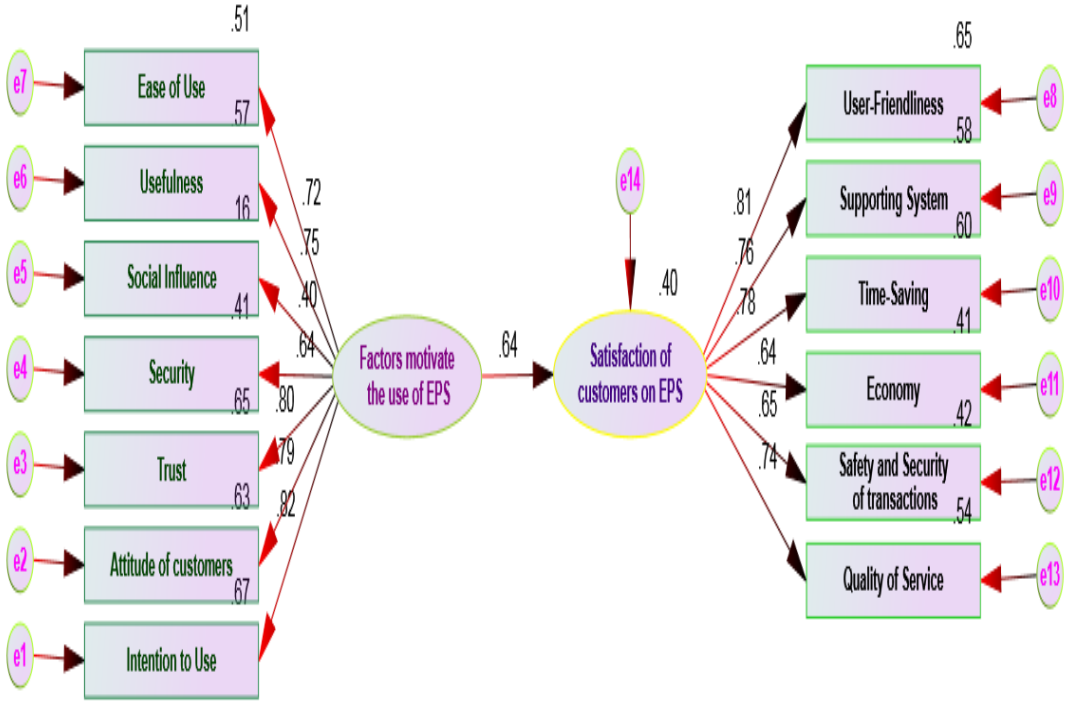
Source: Primary data

6.5 Influence of motivational factors of E-payment Methods on the Satisfaction of customers towards EPS

To know the influence of motivational factors on the satisfaction of customers, **Structural Equation Modeling (SEM)** is used. The total number of variables used in the model is 29. The total number of observed variables is 13. The total number of unobserved variables is 13. The total number of exogenous variables is 15. The total number of endogenous variables is 16. Observed dependent variables are ease of use, usefulness, social influence, security, trust, the attitude of the customer, intention to use, user-friendliness, support system, time-saving, economy, safety and security of the transaction, and quality of services. The unobserved exogenous (independent) variable is the factor motivating the use of EPS. Unobserved endogenous (dependent) variables are the satisfaction of customers on EPS. The circles denote the error variable.

Figure 6.7

Path diagram of the model with standardized regression weights



Source: Primary data

The following table shows the goodness of fit of the model. The table shows absolute and relative tests to identify the adequacy of the model. The recommended approach to judge the adequacy of a model is to use several fit indices. A model can be considered to have an adequate fit if most or all the fit indices are acceptable. The adequacy of the model is accessed by the following indices: chi-square, CIMIN/df, GFI, RMR, AGFI, NFI, CFI, RFI, and IFI. The P- value of the chi-square should be greater than 0.05 to express the good fit of the model. The value of CIMIN/df less than 5 in the model represents a better fit of the data. RMSEA value of 0.08 or less is indicative of a good fit. Traditionally an omnibus cut-off point of 0.09 has been recommended for the GFI, AGFI, NFI, CFI, RFI, and IFI. The threshold for RMR is 0.08 or less.

Table 6.25

The goodness of fit summary based on SEM Model

The goodness of fit test (indicator)	Value	Recommended value
Chi-square (CIMIN)	307.785	
Df	64	
P- value	.057	> 0.05
CIMIN/ df	4.809	< 5
Root Mean Square Error of Approximation (RMSEA)	0.078	≤ 0.08
The Goodness of Fit Index (GFI)	0.950	≥ 0.9
Root Mean Square Residual (RMR)	0.038	≤ 0.08
Adjusted Goodness of Fit Index (AGFI)	0.926	≥ 0.9
Normed Fit Index (NFI)	0.926	≥ 0.9
Comparative Fit Index (CFI)	0.967	≥ 0.9
Relative Fit Index (RFI)	0.913	≥ 0.9
Incremental Fit Index (IFI)	0.907	≥ 0.9

Source: Primary data

From the above table, it can be observed that all the indicators are within the limit and show a perfect model fit and adequacy of the model. The p-value of the chi-square is .057, which is above 0.05 and shows the goodness of fit in the relationship of factors motivating to use of EPS on the satisfaction of customers towards EPS. The value of CIMIN/ df is 4.809, which is below 5 and fell within the desired limit. The analysis also shows that RMSEA = 0.078 and RMR = 0.038, these values are below the prescribed limit of 0.08 and evidence the goodness of fit in the relationship. It could be observed that the value of GFI is 0.950 and fell within the desired limit (≥ 0.9) of SEM analysis. The other indicators, AGFI= 0.926, NFI=0.926, CFI =0967, RFI= 0.913, and IFI= 0.907, these values are within the acceptable limit (≥ 0.9) and show good model fitness.

Testing of hypothesis:

H_0 21: There is a goodness of fit in the relationship of factors motivating to use EPS on the satisfaction of customers towards EPS.

H_a 21: There is no goodness of fit in the relationship of factors motivating to use EPS on the satisfaction of customers towards EPS.

On the basis of chi-square, the p-value of test static is greater than 0.05 and accepts the null hypothesis, i.e., there is a goodness of fit in the relationship of factors motivating to use of EPS on the satisfaction of customers towards EPS. **Therefore, we can conclude that the model is perfect and have better adequacy in the relationship of factors.**

Under **Structured Equation Modelling**, the relationship between the theoretical construct is represented by regression or path coefficients between the constructs. The single-headed arrows show the causal relationship presented in the model, with the variable at the tall of the arrow being the cause of the variable at the point. Statistically, single-headed arrows represent the regression coefficients. The following table shows the unstandardized and standardized regression weights between paths.

Table 6.26

Unstandardised and standardised regression weights between proposed paths

Relationship between exogenous and endogenous			Unstandardized Regression Weights	S.E	C.R.	P	Standardized Regression Weights
Satisfaction of customers towards EPS	<---	Factors motivate to use EPS	.633	.058	10.914	***	.636
Intention to use	<---	Factors motivate to use EPS	1.000				.816
Attitude of customer	<---	Factors motivate to use EPS	.991	.059	16.931	***	.791

Relationship between exogenous and endogenous			Unstandardized Regression Weights	S.E	C.R.	P	Standardized Regression Weights
Trust	<---	Factors motivate to use EPS	.959	.055	17.307	***	.804
Security	<---	Factors motivate to use EPS	.918	.071	12.971	***	.642
Social Influence	<---	Factors motivate to use EPS	.629	.082	7.684	***	.405
Usefulness	<---	Factors motivate to use EPS	.892	.056	15.915	***	.755
Ease of use	<---	Factors motivate to use EPS	.818	.055	14.890	***	.717
User-friendliness	<---	Satisfaction of customers towards EPS	1.000				.807
Supporting system	<---	Satisfaction of customers towards EPS	1.158	.075	15.507	***	.759
Time-saving	<---	Satisfaction of customers towards EPS	.989	.062	15.972	***	.777
Economy	<---	Satisfaction of customers towards EPS	1.112	.088	12.661	***	.641
Safety and Security	<---	Satisfaction of customers towards EPS	.924	.072	12.803	***	.648
Quality of service	<---	Satisfaction of customers towards EPS	.966	.065	14.944	***	.736

Source: Primary data

From the above table, the relationships between different variables are measured through the unstandardized regression coefficient and standardized regression coefficient. The coefficient shows that when the exogenous variable (independent variable) goes up by the unit, the endogenous variable (dependent

variable) goes up by the unit of its respective estimate. A further explanation is given below.

As per the result, when there is a one-degree standard deviation change in the factors motivating the use of EPS, the corresponding standard deviation change on the satisfaction of customers towards EPS varies 0.633 times, the standard coefficient is 0.636, standard error (S.E) is .058 and critical ratio (C.R) is 10.194, which is significant at one percent level of significance.

On the basis of analysis, when there is a one-degree standard deviation change in the factors motivating the use of an e-payment system, the corresponding standard deviation change on intention to use varies 0.816 times and is significant.

The result shows that the critical ratio, unstandardized regression coefficient, standardized regression coefficient, and p-value of the path from factors motivating to use EPS to the attitude of customers to use EPS is 16.931, 0.991, 0.791, 0.059, and .000, and it is significant as P value is less than 0.01. When factors motivating to use EPS go up by 1, the attitude of customers to use EPS goes up by 0.991.

Based on the study, when there is a one-degree standard deviation change in the factors motivating the use of the e-payment system, the corresponding standard deviation change on the trust of EPS varies 0.959 times, the standard coefficient is 0.804, the standard error is .055 and the critical ratio is 17.307, which is significant at one percent level of significance.

Similarly, when there is a one-degree standard deviation change in the factors motivating the use of the e-payment system, the corresponding standard deviation change on the security of EPS varies 0.918 times, the standard coefficient is 0.642, the standard error is .071 and the critical ratio is 12.971, which is significant at one percent level of significance.

Based on the analysis, the critical ratio, unstandardized regression coefficient, standardized regression coefficient, and p-value of the path from factors motivate to use the social influence of EPS is 7.684, 0.629, 0.405, 0.052, and .000,

and it is significant as P value is less than 0.01. When factors motivating to use EPS go up by 1, the social influence of EPS goes up by 0.629.

The research shows that when there is a one-degree standard deviation change in the factors motivating the use of an e-payment system, the corresponding standard deviation change on the usefulness of EPS varies 0.892 times, the standard coefficient is 0.755, the standard error is .055 and the critical ratio is 15.915, which is significant at one percent level of significance.

Similarly, the critical ratio, unstandardized regression coefficient, standardized regression coefficient, and p-value of the path from the factors motivate to use EPS to ease of use are 14.890, 0.818, 0.717, 0.055, and .000, and it is significant as P value is less than 0.01. Hence, the factors motivating to use EPS goes up by 1, ease of use goes up by 0.818 and we can conclude that there is a significant positive influence between factors motivating to use EPS and ease of use.

On the basis of analysis, when there is a one-degree standard deviation change in the satisfaction of customers towards the e-payment system, the corresponding standard deviation change on user-friendliness varies 0.807 times and is significant.

As per the result, when there is a one-degree standard deviation change in the satisfaction of customers towards the e-payment system, the corresponding standard deviation change on the supporting system of EPS varies 1.158 times, the standard coefficient is 0.759, the standard error is .075 and critical ratio is 15.507, which is significant at one percent level of significance.

Similarly, when there is a one-degree standard deviation change in the satisfaction of customers towards the e-payment system, the corresponding standard deviation change on time-saving of EPS varies 0.989 times, the standard coefficient is 0.777, the standard error is .062 and the critical ratio is 15.972, which is significant at one percent level of significance.

Based on the results, the critical ratio, unstandardized regression coefficient, standardized regression coefficient, and p-value of the path from the satisfaction of

customers towards the e-payment system to the economy of EPS is 12.661, 1.112, 0.641, 0.088, and .000, and it is significant as P value is less than 0.01. Hence, the satisfaction of customers towards the e-payment system goes up by 1, the economy of EPS goes up by 1.112 and we can conclude that there is a significant positive influence between the satisfaction of customers towards the e-payment system and the economy of EPS.

On the basis of analysis, when there is a one-degree standard deviation change in the satisfaction of customers towards the e-payment system, the corresponding standard deviation change on safety and security of transaction of EPS varies 0.924 times, the standard coefficient is 0.648, the standard error is .072 and the critical ratio is 12.803, which is significant at one percent level of significance.

Similarly, when there is a one-degree standard deviation change in the satisfaction of customers towards the e-payment system, the corresponding standard deviation change in the quality of services varies 0.966 times, the standard coefficient is 0.736, the standard error is .065 and the critical ratio is 14.944, which is significant at one percent level of significance.

Testing of hypothesis:

H0 22: The motivational factors to use EPS do not influence the satisfaction of customers towards EPS.

H_a 22: The motivational factors to use EPS positively influence the satisfaction of customers towards EPS.

The p-value of the regression coefficient of the relationship between motivational factors and the satisfaction of EPS is less than 0.01. So, it failed to accept the null hypothesis. **Hence, we can conclude that factors motivating the use of EPS has a significant positive influence on the satisfaction of customers towards EPS usage.**

Table 6.27

Variances of variables

Variables	Estimate	S.E.	C.R.	P
Factors motivate to use EPS	.233	.025	9.256	***
e14	.137	.017	8.265	***
e1	.116	.011	10.632	***
e2	.137	.012	11.120	***
e3	.117	.011	10.880	***
e4	.280	.022	12.573	***
e5	.471	.035	13.316	***
e6	.140	.012	11.643	***
e7	.147	.012	12.042	***
e8	.123	.012	10.321	***
e9	.228	.020	11.230	***
e10	.148	.014	10.930	***
e11	.408	.033	12.391	***
e12	.273	.022	12.351	***
e13	.182	.016	11.538	***

Source: Primary data

From the above table, we can interpret that all variances are significant at a one percent level of significance. For example, the coefficient value of factors motivating to use of EPS is 0.233, and the corresponding standard error is 0.25 which has a critical ratio of 9.256 which is significant at a one percent level of significance. Similarly, all the error variables have significant variance.

Table 6.28

Squared Multiple Correlations of variables

Variables	Estimate
Satisfaction of customers towards EPS	.405
Quality of service	.542
Safety and Security of transaction	.419
Economy	.411
Time-saving	.604
Supporting system	.576
User-friendliness	.652
Ease of use	.514
Usefulness	.570
Social Influence	.164
Security	.412
Trust	.647
Attitude of customer	.626
Intention to use	.667

Source: Primary data

The above table shows the coefficient of determination (R^2) of variables. Based on the R^2, the influencing capacity of the predictors to influence the satisfaction of customers towards EPS is 40.5 percent. Squared multiple correlations are estimated that the predictors of quality of services explain 54.2 percent of its variance. In other words, the error variance of the quality of services is approximately 54.2 percent of the variance of the quality of services itself.

Similarly, Squared multiple correlations show that the influencing capacity of the predictors to influence the safety and security of transactions, economy, time-saving, supporting system, user-friendliness, ease of use, usefulness, social influence, security, trust, attitude of customers, and intension to use is 41.9 percent, 41.1 percent, 60.4 percent, 57.6 percent, 65.2 percent, 51.4 percent, 57 percent, 16.4 percent, 41.2 percent, 64.7 percent, 62.6 percent, and 66.7 percent respectively.

6.6 Conclusion

After a thorough analysis of motivational factors and customer satisfaction with the e-payment systems, it is evident that there are a number of factors that contribute to the adoption of EPS such as ease of use, usefulness, social influence, security, trust, attitude of customers, and intention to use. The satisfaction of customers towards EPS is influenced by different aspects including user-friendliness, supporting system, time-saving, economy, safety & security of transactions, and quality of service. The results of the Multilayer Perception Model show that the most influencing factors of e-payment methods are time-saving and the economy.

CHAPTER 7

PROBLEMS ASSOCIATED WITH THE USE OF ELECTRONIC PAYMENT SYSTEM

CONTENT

7.1 Introduction

7.2 Classification of Customers on the basis of the Effect of Problems while using EPS

7.3 Factors related to Problems of Electronic Payment System

7.4 Variation in the Problems of Electronic Payment System based on Demographic Factors

7.5 Conclusion

7.1 Introduction

Customers may face various problems while using an e-payment system. The Likert scale is used to gather information about various issues faced by customers. The various problems associated with the use the of e-payment system are given in table 7.1.

Table 7.1

Problems of customers towards the e-payment system with the test significance

Problems	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	t	Sig.
Slow internet connectivity is an important issue in EPS.	65 (17.5)	43 (11.6)	22 (5.9)	143 (38.6)	98 (26.4)	2.55	1.437	-5.999	.000**
Digital transactions are complex in nature.	15 (4.0)	13 (3.5)	47 (12.7)	158 (42.6)	138 (37.2)	1.95	1.001	-20.274	.000**
Poor response from EPS providers on complaints.	13 (3.5)	53 (14.3)	125 (33.7)	110 (29.7)	70 (18.8)	2.54	1.061	-8.371	.000**
Fear of loss of money is an important reason that forced me to reduce the volume of digital transactions.	**133 (35.9)**	**68 (18.3)**	88 (23.7)	66 (17.8)	16 (4.3)	**3.64**	1.252	9.787	.000**
For using the EPS, need help from a technical person.	16 (4.3)	66 (17.8)	61 (16.4)	129 (34.8)	99 (26.7)	2.38	1.178	-10.091	.000**
There are language barriers when using EPS.	3 (0.8)	11 (3.0)	25 (6.7)	145 (39.1)	187 (50.4)	1.65	.800	-32.582	.000**
Lack of biometric-based authentication & identification of customers are important barriers in EPS.	27 (7.3)	67 (18.1)	105 (28.3)	143 (38.5)	29 (7.8)	2.79	1.066	-3.849	.000**
The ability of Indian financial institutions to provide safety & security for online	34 (9.2)	73 (19.7)	115 (31.0)	135 (36.3)	14 (3.8)	2.94	1.038	-1.100	0.272

transactions and database is not good.									
EPS require a lengthy procedure.	13 (3.5)	38 (10.2)	79 (21.3)	55 (14.8)	186 (50.2)	2.02	1.201	-15.690	.000**
The speed of transactions in EPS is very slow.	17 (4.7)	26 (7.0)	101 (27.2)	84 (22.6)	143 (38.5)	2.16	1.152	-13.972	.000**
The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.	12 (3.2)	5 (1.3)	51 (13.8)	146 (39.4)	157 (42.3)	1.84	.939	-23.828	.000**
There is a chance of leaking out personal information.	**54 (14.7)**	**92 (24.8)**	113 (30.4)	61 (16.4)	51 (13.7)	3.20	1.186	9.345	.000**
There is a chance of online fraudulent activity & risk of hacking.	**103 (27.8)**	**85 (22.9)**	73 (19.7)	61 (16.4)	49 (13.2)	**3.35**	1.380	4.928	.000**
There is an experience with accounts temporarily locked by EPS providers.	32 (8.6)	43 (11.6)	81 (21.9)	133 (35.8)	82 (22.1)	2.49	1.202	-8.206	.000**
There is an experience of failed transactions but with a deduction of amount while using EPS.	**102 (27.5)**	**56 (15.1)**	138 (37.2)	33 (8.9)	42 (11.3)	**3.32**	1.284	5.783	.000**
Service charges & additional charges of EPS are very high.	22 (5.9)	37 (10.0)	69 (18.6)	82 (22.1)	161 (43.4)	2.13	1.241	-13.513	.000**
EPS providers are not famous and there is a lack of information available about them.	34 (9.2)	53 (14.3)	83 (22.4)	114 (30.7)	87 (23.4)	2.55	1.248	-6.950	.000**
Lack of customer awareness programmes.	13 (3.5)	17 (4.6)	125 (33.7)	143 (38.5)	73 (19.7)	2.34	.960	-13.306	.000**

Source: Primary data
Note: Figures in parentheses represent percentages of the row total

Analysis of problems of customers towards e-payment systems shows that 54.2 percent of customers agree that, fear of loss of money is an important problem which forced them to reduce the volume of digital transactions. The mean score is found to be 3.64, which is significantly higher than the mean of the response scale

(mean of the response scale- 3) and the significance level of the one-sample t-test is less than 0.01. The result also shows that 50.7 percent of respondents agree that there is a chance of online fraudulent activity & risk of hacking and the mean score is 3.35. 42.6 percent of customers agree that an experience of failed transactions but with a deduction of money while using EPS with a mean score of 3.32, and the significance level of one sample t-test is less than 0.01. It also found that 40 percent of customers agree that there is a chance of leaking out of personal information.

Among the various problems of EPS usage, the least affected two problems are language barriers (89.5%) and EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc. (81.7%).

As per the table, P-values related to all the problems of customers towards e-payment systems are significant except for the 'ability of Indian financial institutions to provide safety & security for online transactions and database are not good'**.**

7.2 Classification of customers on the basis of the effect of problems while using the e-payment system

Multiple Discriminant Analysis is used to classify the customers into three groups i.e., low effect, moderate effect, and high effect group on the basis of problems faced by them while using e-payments. The different variables related to the problems of e-payments are taken as predictors. Discriminant analysis is used to assess the relationship between problems of e-payments among low-effect, moderate-effect, and high-effect groups.

Table 7.2

Prior Probabilities for Groups

Effects of Problems of EPS	Prior	Cases Used in Analysis	
		Un-weighted	Weighted
Low effect	.333	322	322.000
Moderate effect	.333	18	18.000
High effect	.333	31	31.000
Total	1.000	371	371.000

Source: Primary data

The above table shows the prior probabilities of low-effect, moderate-effect, and high-effect groups. It shows the distribution of customers into different groups of e-payment problems. The responses of customers are equally allocated into the groups. i.e., the prior probability of each group is 0.333. 86.79 percent of customers are included in the low-effect group, 4.85 percent of customers are included in the moderate-effect group, and 8.36 percent of customers are included in the high-effect group. **Therefore, most of the customers feel a low level of problems while using the e-payment system.**

Table 7.3

Tests of Equality of Group Means

Problems with using EPS	Wilks' Lambda	F	df1	df2	Sig.
Slow internet connectivity is an important issue in EPS.	.995	1.001	2	368	**.369**
Digital transactions are complex in nature.	.867	28.104	2	368	.000**
Poor response from EPS providers on complaints.	.888	23.223	2	368	.000**
Fear of loss of money is an important reason that forced me to reduce the volume of digital transactions.	.915	17.059	2	368	.000**
For using the EPS, need help from a technical person.	.688	83.597	2	368	.000**
There are language barriers when using EPS.	.730	67.921	2	368	.000**
The lack of biometric-based authentication & identification of customers is important barriers in EPS.	.802	45.526	2	368	.000**
The ability of Indian financial institutions to provide safety & security for online transactions and database are not good.	.872	27.034	2	368	.000**
EPS require lengthy procedure.	.732	67.368	2	368	.000**
The speed of transactions in EPS is very slow.	.711	74.856	2	368	.000**
The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.	.803	45.263	2	368	.000**
There is a chance of leaking out personal information.	.943	11.048	2	368	.000**

There is a chance of online fraudulent activity & risk of hacking.	.935	12.806	2	368	.000**
There is an experience with accounts temporarily locked by EPS providers.	.862	29.376	2	368	.000**
There is an experience of failed transactions but with a deduction of amount while using EPS.	.865	28.675	2	368	.000**
Service charges & additional charges of EPS are very high.	.831	37.335	2	368	.000**
EPS providers are not famous and there is a lack of information available about them.	.810	43.052	2	368	.000**
Lack of customer awareness programmes.	.923	15.440	2	368	.000**

Source: Primary data

From the above ANOVA table, **there is no variance in the problem of 'slow internet connectivity'** among the low-effect, moderate-effect, and high-effect groups because the significant value is greater than 0.05. But all other significant values are less than 0.01 which shows a significant variance among the low effect, moderate effect, and high effect groups based on the remaining problems. The table also shows all Wilks' Lambda values are high.

There is a significant variance among the low-effect, moderate-effect and high-effect problems in EPS usage except for the problem of 'slow internet connectivity'.

Table 7.4

Test Results of Box's M and Eigenvalue

	Box's M	Eigenvalue	Canonical Correlation
	647.180	1.269	.748
Sig	.000		

Source: Primary data

The above table shows the result of Box's M test and it is significant as the significant value is less than 0.01 which shows that the co-variances of variables are not equal among the groups. The Eigenvalue (1.269) is greater than one and it describes the strong discriminant function. The last column of the table shows the canonical correlation, it is 0.748. **So, there is a strong correlation between the variables of problems of the e-payment system.**

Table 7.5

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.413	317.913	36	.000
2	.937	23.382	17	.137

Source: Primary data

The above table shows that Wilks' Lambda is 0.413 in the case of two groups i.e., 41.3 percent accuracy in comparison between two groups and it is significant at a one percent level of significance (sig <0.01). So, there is a 41.3 percent coefficient of determination and it also shows a significant association between the two groups. In the case of three groups, Wilks' Lambda is 0.937 which shows that the comparison accuracy is 93.7 percent and it is not significant (sig > 0.05) which means the factors of problems are independent of each other. We can conclude that there is a good fit in the comparison with regard to problems of e-payment based on low effect, moderate effect, and high effect groups.

Table 7.6

Functions at Group Centroids

Effect of Problems of EPS	Function	
	1	2
Low effect	-.432	.017
Moderate effect	2.165	-1.029
High effect	3.226	.424
Unstandardized canonical discriminant functions evaluated at group means		

Source: Primary data

The above table shows the functions at group centroids and indicates the average discriminant score of each group for each function calculated. In the first function, the mean of the low-effect group is -0.432, the mean of the moderate-effect group is 2.165, and the mean of the high-effect group is 3.226. In the second function, the mean of the low-effect group is .017, the mean of the moderate-effect group is -1.029, and the mean of the high-effect group is 0.424. From the above table, we can classify all the variables of problems into three groups based on the sign of the coefficient. If the sign of the first coefficient is negative (-0.432) and the second coefficient is positive (0.017), the variable is treated as a low-effect problem. Similarly, the sign of the first coefficient is positive (2.165) and the second coefficient is negative (-1.029), the variable is treated as a moderate effect problem. Same way, if the sign of the first coefficient and second coefficient of the variable is positive (3.226 and 0.424), the variable is treated as a high-effect problem. The following table shows the classification of problems.

Table 7.7

Standardized Canonical Discriminant Function Coefficients

Effect of Problems of EPS	**Problems with using EPS**	Function		Rank
		1	2	
Low effect	There are language barriers when using EPS.	-.279	.660	I
	The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.	-.100	.385	II
	Digital transactions are complex in nature.	-.022	.237	III
	Slow internet connectivity is an important issue in EPS.	-.020	.182	IV
	EPS requires a lengthy procedure.	-.067	.152	V
	For using the EPS, need help from a technical person.	-.015	.027	VI
Moderate effect	There is a chance of leaking out personal information.	.021	-.233	I
	The speed of transactions in EPS is very slow.	.042	-.231	II
	There is an experience with accounts temporarily locked by EPS providers.	.224	-.384	III
	Service charges & additional charges of EPS are very high.	.152	-.234	IV
	Lack of customer awareness programmes.	.254	-.305	V

	Poor response from EPS providers on complaints.	.006	-.002	VI
	EPS providers are not famous and there is a lack of information available about them.	.104	-.101	VII
	Lack of biometric-based authentication & identification of customers are important barriers in EPS.	.163	-.161	VIII
	The ability of Indian financial institutions to provide safety & security for online transactions and database is not good.	.140	-.232	IX
High effect	Fear of loss of money is an important reason that forced me to reduce the volume of digital transactions.	.103	.658	I
	There is an experience of failed transactions but with a deduction of amount while using EPS.	.029	.538	II
	There is a chance of online fraudulent activity & risk of hacking.	.420	.002	III

Source: Primary data

The above table shows the classification of problems into three groups based on the sign of the coefficient and ranks are given based on the variation of the coefficients. The first rank is given to larger variations showing variables.

The low-effect problem includes six variables. The first important variable is there are language barriers while using EPS & which varies the effect between 66 percent to 27.9 percent. The second problem in the low-effect group is the EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc. and varies the effect between 38.5 percent to 10 percent. The third variable is digital transactions are complex in nature and vary the effect between 23.7 percent to 2.2 percent. The fourth variable is slow internet connectivity and varies the effect between 18.2 percent to 2 percent. The fifth problem in the low-effect group is EPS requires a lengthy procedure and varies the effect between 15.2 percent to 6.7 percent. The sixth problem is needing help from a technical person and varies the effect in between 2.7 percent to 1.5 percent.

The moderate effect problem includes nine variables. The first important variable is there is a chance of leaking out personal information and which varies the effect in between 23.3 percent to 2.1 percent. The second variable in the moderate effect is the speed of transactions in EPS is very slow and varies the effect in

between 23.1 percent to 4.2 percent. The third important variable is there is an experience with accounts temporarily locked by EPS providers which varies between 38.4 percent to 22.4 percent. The fourth variable is service charges & additional charges of EPS are very high and the effect varies between 23.4 percent to 15.2 percent. The fifth problem in the moderate effect group is the lack of customer awareness programmes and the contribution varies between 30.5 percent to 25.4 percent. The sixth problem in the moderate effect group is a poor response from EPS providers on complaints and varies the effect between 0.6 percent to 0.2 percent. The seventh problem in the group of moderate effect is EPS providers are not famous and there is a lack of information available about them and the contribution varies from 10.4 percent to 10.1 percent. The eighth problem in the moderate group is the lack of biometric-based authentication & identification of customers are important barriers in EPS and varies the effect in between 16.3 percent to 16.1 percent. The ninth problem in the moderate group is the ability of Indian financial institutions to provide safety & security for online transactions is not good and varies the effect in between 23.2 percent to 14 percent.

The high-effect problem includes three variables. The first important problem is the fear of loss of money is an important reason which forced to reduce the volume of digital transactions and the contribution varies between 65.8 percent to 10.3 percent. The second problem is there is an experience of failed transactions but with a deduction of amount while using EPS and varies the effect between 53.8 percent to 2.9 percent. The third problem in the high-effect group is there is a chance of online fraudulent activity & risk of hacking and varies the effect between 42 percent to 0.2 percent.

Table 7.8
Classification Results [a,c]

		Effects of Problems of EPS	Predicted Group Membership			Total
			Low effect	Moderate effect	High effect	
Original	Count	Low effect	292	26	4	322
		Moderate effect	1	13	4	18
		High effect	0	3	28	31
	%	Low effect	90.7	8.1	1.2	100.0
		Moderate effect	5.6	72.2	22.2	100.0
		High effect	.0	9.7	90.3	100.0
89.8% of original grouped cases are correctly classified.						

Source: Primary data

The above table shows the summary of the final classification with the number of customers and percent. In the low effect group of 322 customers, the opinion of 292 (90.7 percent) customers remains in the group of low effect group, 26 (8.1 percent) customers' opinion leads to the moderate effect group, and the opinion of 4 (1.2 percent) customers is directed to the high effect group.

In the moderate effect group of 18 customers, the opinion of 13 (72.2 percent) customers remains in the group of moderate effect group, 4 (22.2 percent) customers' opinion leads to the high effect group, and the opinion of 1 (5.6 percent) customer is directed to the low effect group.

In the high effect group of 31 customers, the opinion of 28 (90.3 percent) customers remains in the group of high effect group, and 3 (9.7 percent) customers' opinion leads to the moderate effect group.

The above table reflects the model classified correctly and the hit ratio is 89.8 percent, which shows 89.8 percent of accuracy in the classification of e-payment problems based on their effect of them. We can conclude that the current model is a perfect one for discriminating the problems of e-payments based on its effect.

7.3. Factors related to problems of Electronic Payment System

To know the significant factors of problems associated with the e-payment system, **Factor Analysis** is used. The following table shows the result of Kaiser-Meyer-Olkin (KMO) and Barlett's test.

Table 7.9

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.849
Bartlett's Test of Sphericity	Approx. Chi-Square	2117.655
	df	120
	Sig.	.000**

Source: Primary data

The KMO value is 0.849, which is greater than 0.5, so it can be considered valid for data reduction using factor analysis. Since the significant value of Bartlett's Test is less than 0.01, the test is highly significant at a one percent level of significance and which indicates that the variables have a high level of correlation between them and are satisfactory to apply factor analysis for identifying significant factors of problems associated with e-payment usage.

Table 7.10

Communalities

Problems with using EPS	Initial	Extraction
Digital transactions are complex in nature.	1.000	.438
Poor response from EPS providers on complaints.	1.000	.562
Fear of loss of money is an important reason that forces customers to reduce the volume of digital transactions.	1.000	.512
For using the EPS, need help from a technical person.	1.000	.729
There are language barriers when using EPS.	1.000	.659
The ability of Indian financial institutions to provide safety & security for online transactions and database is not good.	1.000	.607
EPS require a lengthy procedure.	1.000	.688
The speed of transactions in EPS is very slow.	1.000	.652

The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.	1.000	.561
There is a chance of leaking out personal information.	1.000	.738
There is a chance of online fraudulent activity & risk of hacking.	1.000	.667
There is an experience with accounts temporarily locked by EPS providers.	1.000	.586
There is an experience of failed transactions but with a deduction of amount while using EPS.	1.000	.642
Service charges & additional charges of EPS are very high.	1.000	.659
EPS providers are not famous and there is a lack of information available about them.	1.000	.616
Lack of customer awareness programmes.	1.000	.481
Extraction Method: Principal Component Analysis.		

Source: Primary data

Every variable in the communality initial is expected to share 100% variance. Hence initially every item is having a value of 1.00 which means 100% variance shared by each item. The extraction value is ranging from 0.438 to 0.738 which shows that the minimum variance share of the item after extraction is 43.80% and the maximum variance share of the item is 73.80%. The factors having extraction values below 0.4 are excluded from the factor analysis. They are slow internet connectivity (.370) and lack of biometric-based authentication & identification of customers (.384).

Below table 7.11 displays the variance that can be contributed to the factors related to the problems of the e-payment system. The variables having Eigenvalue greater than one contribute more variation and that can be used for data extraction.

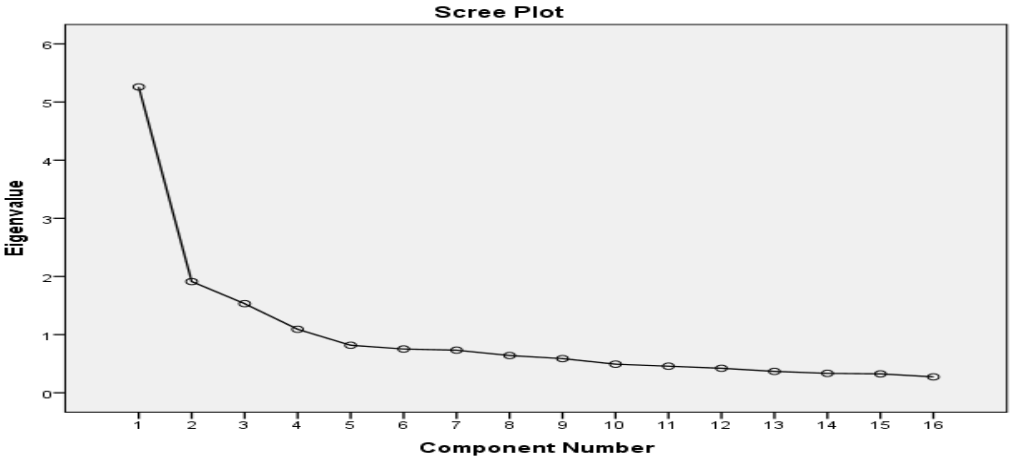
Table 7.11

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.260	32.873	32.873	5.260	32.873	32.873	2.897	18.109	18.109
2	1.913	11.955	44.828	1.913	11.955	44.828	2.489	15.558	33.667
3	1.533	9.581	54.409	1.533	9.581	54.409	2.385	14.907	48.574
4	1.092	6.825	61.234	1.092	6.825	61.234	2.026	12.661	61.234
5	.817	5.105	66.340						
6	.753	4.704	71.044						
7	.733	4.578	75.622						
8	.640	4.003	79.625						
9	.588	3.674	83.299						
10	.492	3.075	86.374						
11	.457	2.858	89.232						
12	.422	2.635	91.867						
13	.368	2.299	94.166						
14	.334	2.090	96.256						
15	.326	2.035	98.291						
16	.273	1.709	100.00						
Note: Extraction Method: Principal Component Analysis									

Source: Primary data

From table 7.11, the Eigenvalues of four variables are greater than one. 32.873 percent of the variance is contributed by the first factor in problems associated with the use of e-payment systems followed by the second factor is 11.955. The third factor explains the 9.581 percent variance in the total. The fourth contributes 6.825 percent to problems associated with the use of the e-payment system. Based on the Eigenvalue, the four factors which have an Eigenvalue greater than one are used for extraction and they all together contribute 61.234 percent of the total variance in problems associated with the use of the e-payment system. The eigenvalue of factor 1 is 5.260, factor 2 is 1.913, factor 3 is 1.533 and factor 4 is 1.092.

Figure 7.1



Source: Primary data

The screen plot shows the components as the X-axis and the corresponding Eigenvalue as the Y-axis. The first four components are considered whose Eigenvalues are 5.260, 1.913, 1.533, and 1.092. Hence 5.260 is the maximum Eigenvalue, so this factor is the most significant one followed by other factors. Since all these four factors are having Eigenvalue greater than one and share maximum variance. Hence, they are essential in the study.

Table 7.12 shows the summarization of factor analysis which shows the exact variance in each variable.

Table 7.12

Summary of Exploratory Factor Analysis

Factor	Item description	Rotated loading	% of variance	Eigenvalue
Factor I Procedural issues	Poor response from EPS providers on complaints.	.762	32.873	5.260
	The speed of transactions in EPS is very slow	.714		
	EPS require a lengthy procedure.	.703		
	The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.	.630		
Factor II	Fear of loss of money is an	.760	11.955	1.913

Personal barriers	important reason which forced to reduce the volume of digital transactions			
	The ability of Indian financial institutions to provide safety & security for online transactions and database is not good.	.726		
	For using the EPS, need help from a technical person.	.626		
	Digital transactions are complex in nature.	.615		
	There are language barriers when using EPS.	.450		
Factor III Disappointed experience	There is an experience of failed transactions but with a deduction of amount while using EPS.	.762	9.581	1.533
	There is an experience with accounts temporarily locked by EPS providers.	.692		
	EPS providers are not famous and there is a lack of information available about them.	.654		
	Service charges & additional charges of EPS are very high.	.650		
Factor I V Security issues	There is a chance of online fraudulent activity & risk of hacking.	.802	6.825	1.092
	There is a chance of leaking out personal information.	.777		
	Lack of customer awareness programmes.	.565		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 10 iterations.				

Source: Primary data

The table exhibits that the first-factor **procedural issues** are loaded with four variables. Five variables are included in the second **personal barrier** factor. **The disappointed experience** factor consists of four variables which is the third factor. Three variables are loaded into the fourth factor i.e., **security issue**.

On the basis of factor analysis, the **procedural issue is** the most prominent factor which influences the problems of e-payments with Eigenvalue 5.260 and 32.873% variance. Poor response from EPS providers on complaints (Factor loading- 0.762) contributes to a high level of problems towards the use of the e-payment system. The other significant contributing factors are the speed of transactions in EPS is very slow (Factor loading- 0.714) and the e-payment system requiring lengthy procedures (Factor loading- 0.703). The EPS service providers fail to provide timely confirmation through receipt, SMS, e-mail, etc. (Factor loading- 0.630) is the least contributing variable in the **procedural issue** factor.

The personal barrier factor is the second major influencing factor for problems associated with e-payment system usage with an Eigenvalue of 1.913 and 11.955% variance. The high contributing factor to the **personal barrier** is the fear of loss of money (Factor loading- 0.760) followed by the ability of Indian financial institutions to provide safety & security for online transactions is not good (Factor loading- 0.726). And other factors such as needing help from a technical person to use an e-payment system (Factor loading- 0.626) and the complex nature of digital transactions (Factor loading- 0.615) are moderately contributing to the problems of the e-payment system. The last factor is the language barrier of customers (Factor loading- 0.450).

The third significant factor in problems associated with e-payments is **disappointed experience** with Eigenvalue 1.533 and 9.581% variance. Experience of failed transactions but with a deduction of money while using EPS (Factor loading- 0.762), experience with accounts temporarily locked by EPS providers (Factor loading- 0.692), EPS providers are not famous and there is a lack of information available about them (Factor loading- 0.654), and service charges & additional charges of EPS are very high (Factor loading- 0.650) are the major contributing variables.

As per analysis, the fourth factor is **security issue** with Eigenvalue 1.092 and 6.825% variance. In this factor, there is a chance of online fraudulent activity & risk of hacking (Factor loading- 0.802) influences more in the problems associated with

e-payment usage followed by there is a chance of leaking out personal information (Factor loading- 0.777) and lack of customer awareness programmes (Factor loading- 0.565).

7.4. Variation in the problems of Electronic Payment System based on demographic factors

To know the variation among different demographic groups of customers about the problems of the e-payment system, statistical tests ANOVA and MANOVA were used. The results are shown in table 7.13.

Table 7.13

Variation in the problems of EPS services on the basis of the demographic profile of customers

Characteristics			Problems				MANOVA	
			Procedural issues	Personal barriers	Disappointed experience	Security issues	F	Sig.
Gender	Male		3.52	3.49	2.80	2.47	6.685	.000**
	Female		3.54	3.53	2.98	2.85		
	ANOVA	F	19.177	5.364	.027	.027		
		Sig	.000**	.021*	.870	.870		
Age	Up to 20		3.37	3.33	2.60	2.75	7.831	.000**
	21 -35		3.40	3.41	2.95	2.83		
	36 -50		3.48	3.43	2.77	2.48		
	Above 50		3.71	3.75	3.01	1.93		
	ANOVA	F	13.072	2.330	1.837	1.837		
		Sig	.000**	.074	.140	.140		
Local Body	Panchayath		3.65	3.63	2.98	2.81	4.668	.000**
	Municipality		3.48	3.45	2.60	2.36		
	Corporation		3.61	3.60	3.04	2.57		
	ANOVA	F	9.925	8.691	.613	.613		
		Sig	.000**	.000**	.542	.542		
Marital	Single		3.43	3.46	2.93	2.83	5.948	.001**

Status	Married		3.60	3.58	2.88	2.55		
	ANOVA	F	10.860	.407	2.543	2.543		
		Sig	.001**	.524	.112	.112		
Educational Qualification	Below Graduation		3.61	3.58	3.08	2.77	1.707	.083
	Graduation		3.52	3.53	2.88	2.52		
	PG		3.51	3.49	2.89	2.62		
	Above PG		3.46	3.43	2.80	2.65		
	ANOVA	F	1.024	1.153	.159	.159		
		Sig	.220	.328	.924	.924		
Employment Status	Employee		3.56	3.53	2.96	2.83	3.279	.000**
	Businessman		3.57	3.55	2.74	2.51		
	Professional		3.48	3.49	2.94	2.61		
	Student		3.44	3.46	2.87	2.79		
	Homemaker		4.09	4.07	2.92	2.08		
	Self-employed		3.62	3.64	2.91	2.22		
	ANOVA	F	5.207	.464	1.697	1.697		
		Sig	.000**	.803	.134	.134		
Monthly Income (in ₹)	Below 15,000		3.43	3.44	2.94	2.84	2.554	.007**
	15,000 -30,000		3.55	3.51	2.93	2.67		
	30,000- 50,000		3.64	3.63	2.86	2.46		
	Above 50,000		3.69	3.67	2.74	2.86		
	ANOVA	F	3.607	.677	1.116	1.116		
		Sig	.014*	.567	.342	.342		
Region	Southern		3.64	3.63	2.84	2.45	5.629	.000**
	Central		3.38	3.36	2.80	2.71		
	Northern		3.58	3.61	3.07	2.90		
	ANOVA	F	9.345	4.722	4.214	4.214		
		Sig	.000**	.009**	.016*	.016*		
Experience in EPS	Up to 1 year		3.61	3.63	2.87	2.88	4.742	.000**
	1 - 5 years		3.51	3.52	2.99	2.83		
	5 -10 years		3.48	3.46	2.76	2.34		
	Above 10 years		3.43	3.44	2.50	3.00		
	ANOVA	F	10.408	3.018	.454	.454		
		Sig	.000**	.030*	.714	.714		

Source: Primary data

Table 7.13. reveals that problems of the e-payment system significantly vary with respect to gender, age, local body, marital status, employment status, monthly income, region, and experience in EPS at a one percent level as the significant value of MANOVA is less than 0.01. But the test failed to establish a significant difference in the case of educational qualification as the significant value is greater than 0.05.

Based on gender, the problem towards the procedural issue is high in female (3.54) compared to male (3.52) customers of e-payments. The personal barriers are high in females (3.53) compare to males (3.49). There is no significant difference in the problems of disappointed experience and security issues on the basis of gender.

The analysis also reveals significant differences in the procedural issue problems of e-payments among customers based on age. The procedural issue problem is high in the age group above 50 years with a mean of 3.71 followed by the age group 36-50 with a mean of 3.48. There is no significant difference in the personal barriers, disappointed experiences, and security issues among different age groups.

Based on the local body, the test shows a significant difference in the problems of procedural issues and personal barriers. The procedural issues and personal barriers are high in panchayath with a mean score of 3.65, and 3.63 respectively. The other problems are identical in different local body groups.

The procedural issue problems are significantly varied among the married and unmarried customers and the procedural issue problems are high in married customers (3.60) compared to unmarried customers (3.43). There is no significant difference in the personal barriers, disappointed experiences and security issues among married and unmarried customers.

The analysis also exhibits that the procedural issue problems significantly vary among the employment group. The procedural issue problems are high in homemakers (4.09) compare to the remaining groups. The other problems such as

personal barriers, disappointed experiences, and security issues are the same in all employment groups.

Based on monthly income, the procedural issue problems are significantly different among the different monthly income groups. The procedural issue problem is high in the monthly income above ₹50,000 groups with a mean of 3.69. The personal barrier, disappointed experience, and security issues are the same in all monthly income groups.

On the basis of region, the analysis reveals that procedural issues, personal barriers, disappointed experiences, and security issues are varied differently among southern, central and northern regions. The procedural issues and personal barriers are high in the southern region with a mean of 3.64 and 3.63. The disappointed experience and security issues are high in the northern region with a mean of 3.07 and 2.90 respectively.

The analysis of experience in the e-payment system reveals that there is a significant difference in the problems of procedural issues and personal barriers except for the problems such as disappointed experience and security issues. The problems of procedural issues and personal barriers are high in the customers having experience of up to 1 year compared to other groups with a mean of 3.61 and 3.63.

Testing of hypothesis:

H_0 23: There is no significant difference among the different groups of customers on the basis of their demographic profile and the problems of the e-payment system.

H_a 23: There is a significant difference among the different groups of customers on the basis of their demographic profile and the problems of the e-payment system.

As per the result of MANOVA, the problems of customers towards the e-payment system varies significantly with respect to demographic variables such as gender, age, local body, marital status, employment status, monthly income, region,

and experience in the e-payment system. Hence it failed to accept the null hypothesis and it can be concluded that there is a significant difference among the different groups of customers on the basis of their demographic profile and the problems of customers towards the EPS.

7.5 Conclusion

Despite the above explained benefits of the e-payment system, there are still challenges faced by users. The important problems are fear of loss of money, chance of online fraudulent activity & risk of hacking, experience of failed transactions but with a deduction of money while using EPS, and chance of leaking out of personal information. These problems vary significantly with respect to demographic variables and it was found that these issues were high among females, respondents from panchayath, and customers having less experience.

CHAPTER 8

FINDINGS & CONCLUSION OF THE STUDY

8.1 Introduction
8.2 Progress Status of EPS Usage
8.3 Socio-Economic Profile of Respondents
8.4 Awareness, Usage, and Purpose of Using EPS.
8.5 Factors that Motivate the Use of Electronic Payment System
8.6 Customer Satisfaction towards E-payment System.
8.7 Problems related to EPS Usage
8.8 Conclusion of the study

8.1 Introduction

The beginning of the twenty-first century witnessed significant changes in company strategy and management towards cashless and Electronic Payment Methods in India. The digitalization of India's payment system is a growing topic of interest for any company, notably the retail sector. Governments, financial institutions, and financial technology (Fin-Tech) groups are already beginning to develop worldwide rules to implement and improve Electronic Payment Systems. In order to get a competitive advantage, businesses are now incorporating EPS into their business strategies. Through the advancement of digital commerce and banking, Electronic Payment technology benefits enterprises. In developing nations like India, many forms of EPS, particularly prepaid methods, are proving to be quite beneficial. It is vital to note that internet connectivity in India is helpful, banking opportunities are many, and smartphone accessibility is great (Dinesh Kumar Khara, 2023)

Demonetisation in India in 2016 brought a boost to Digital Payments and encouraged customers to go cashless and use more Electronic Payment options. Customers now have a wide range of payment alternatives because of the advancement of financial technology, including debit cards, credit cards, mobile banking, and electronic banking. Therefore, the awareness and usage, the factors that could motivate the usage, the satisfaction level, and the problems associated with the use of the Electronic Payment System have been studied in detail in this study. This chapter attempts to summarize the main findings of the research based on the primary and secondary data and it also includes the conclusion of the study.

8.2 Progress Status of EPS Usage

8.2.1 Progress Status of EPS Usage in India

1. When looking at the **total value of electronic transactions by country**, China comes out on top with US$15,70,194.00 million. This is followed by other developed countries. In 2019, the total value of all electronic transactions in India is US$ 64,787.00 million, and India possesses 6th position out of the top 10

countries based on the value of electronic transactions (www.payment scardsandmobile. com).

2. The use of Electronic Payment Methods has become deeply ingrained in India. In all, one-third of households throughout India are making use of it in some form or other. 15% of households in the lowest and intermediate income classes are interested in adopting Electronic Payment Methods.

   The data collected clearly shows that Paytm and PhonePe-type apps (79%) are the stars of electronic payments when compared to other Electronic Payment Methods such as debit/credit cards (38%), and bank apps (34%) (NPCI 2020 Report on Digital Payments Adoption in India).

3. India's Electronic Payment transactions in 2022 amounted to $ 1.5 trillion annnualised basis which is more than the combined economies of the US, UK, Germany, and France (Union Minister Ashwini Vaishnaw at World Economic Forum (WEF) on December 2022).

4. The countries such as Canada – 82.6%, Israel – 75%, Norway – 70.5%, Luxembourg – 69.8%, Japan – 68.4%, United States – 65.6%, Switzerland – 65.5%, Hong Kong – 65.4%, United Kingdom – 65.4%, and South Korea – 63.7% utilise credit cards for the majority of their electronic payments, but in India, almost everyone uses debit cards for electronic payments (www.creditcard.com).

5. The value of customer electronic transactions increased from 2014-2015 to 2021- 2022. It was in its infant stages during the fiscal year 2014-2015. Then, beginning with the fiscal year 2015-2016, it was moving at a slow pace. After the announcement of demonetisation, the value of electronic transactions has gone up quickly (High-Level Committee on Deepening Digital Payments Report)

   From the year 2015-2016 (just prior to demonetisation) to the year 2017-2018 (just after demonetisation), both the value and the number of electronic transactions that customers made, grew by a huge amount. It can also be seen

that IMPS and mobile wallets are growing much faster than other kinds of EPS. From the year 2019- 2020 (just prior to Covid ’19) to the year 2021- 2022 (just after Covid ’19 difficulties), both the value & the number of electronic transactions that customers made, showed an increasing trend except in debit cards and RTGS. It can also be seen that UPI apps are growing much faster than other kinds of EPS in volume (267%) and value (295 %) (RBI annual reports).

8.2.2 Progress Status of EPS Usage in Kerala

6. Kerala was declared the nation's first digital state by the President of India Mr. Pranab Mukherjee in February 2016, and its Malappuram district was declared the nation's first e-literate district. The Kerala state has attained 100 percent mobile density, 75 percent e-literacy, and the highest rate of electronic banking, Aadhaar-linked bank accounts, and e-governance. (www.indiatoday.in).

7. The number of internet users in rural Kerala was 5.97 million, or 5.29 percent of the overall number of internet users in India. To achieve digital inclusion via e-literacy, e-services, and information security, the Government of Kerala state carried out the "Digital Empowerment Campaign" initiative in July 2015. The primary purpose of the campaign was to provide state residents with e-literacy in support of the Akshaya and IT@ school programmes (Open Government Data (OGD) 2016 January report).

8. The top five states in India in terms of internet users per 100 people (Internet Density) are Delhi (186), Kerala (87), Punjab (86), Himachal Pradesh (86), and Maharashtra (79).

   As many as 87 of every 100 individuals in Kerala have an internet connection. This is against the national average of 60 out of 100.

   Kerala has the greatest rate of internet penetration in rural areas. Kerala has 149 internet connections per 100 people in rural areas, which is higher than the national average (37 per 100 persons).

While most other states see an increase in the number of internet connections in urban areas, it is just the opposite in Kerala. Kerala has 64 internet connections per 100 people in urban areas, which is lower than the national average (103 per 100 persons) (Telecom Regulatory Authority of India (TRAI) 2022).

9. In Kerala, there were 2,650 Akshaya centers, 3,000 paperless Government offices, 30,000 e-certificates daily, 41 lakh students under the IT @ School initiative, 60% citizens access the internet, and 600 e-governance applications (indiaincgroup 2019).

8.3 Socio-Economic Profile of Respondents

10. From the profile of the banking customers, it is found that the majority of the customers using Electronic Payment System are male (56.6%), and 66.3 percent belongs to the age group 21-35 years. Among the 371 banking customers, 48.2 percent have graduation qualifications, 30.2 percent are employees, and 53.4 percent are married. The study shows that banking customers are selected equally from southern, central, and northern regions (33% each). The study also exhibits that the majority of the customers in the southern (61.3%), central (56.5%), and northern (82.1%) regions are from panchayath. 41.8 percent of banking customers fall within the monthly income group of ₹15,000- ₹30,000.

8.4 Awareness, Usage, and Purpose of EPS

11. It is found that 56.6 percent of customers have bank accounts in public sector banks, and 86.7 percent of the customers have savings bank accounts.

12. UPI apps (34.2%), and banking cards (34%) are the common type of Electronic Payment Systems preferred by customers in Kerala because of their user-friendly surface.

13. While checking the experience of EPS usage, 60.1 percent of customers belong to 1-5 years and only 1.6 percent of respondents are having an experience of above 10 years.

14. As far as types of cards are concerned, 83 percent of customers prefer to use debit cards over credit cards for electronic payment. Because debit cards can be accessed very easily. Only 1.9 percent of customers are using credit cards for Electronic Payment because of procedural complications.

15. A high proportion of customers (81.4%) prefer to use the bank's app for electronic payments instead of the bank's website. That is because bank apps are more easily accessible than the bank's website.

16. 87.6 percent of banking customers prefer mobile phones for Electronic Payment and only 0.5 percent use iPads / Tablets for their E-payment.

17. EPS services are mainly used in supermarkets (92.5%), shopping malls (79%), and hotels/restaurants (78.2%).

18. The frequency of use of Electronic Payment Methods shows that the majority of banking customers use UPI apps on a daily and weekly basis (68%).

19. 39.6% of customers claimed that they have never used Internet banking for electronic payment, and 55% of customers revealed that they have never utilized mobile wallets.

20. Based on the customer transactions in the last month, it is found that there is an average amount of ₹21,782 is transacted through electronic payment, and an average amount of ₹20,848 is transacted through traditional cash payment.

21. The usage of EPS before demonetisation was comparatively low (47.1%), and the usage increased to 78.7 percent after demonetisation. The mean score of EPS usage before demonetisation is 2.550 which increased after demonetisation to 4.073. Therefore, there is a significant difference in the usage of EPS before and after demonetisation.

22. The usage of EPS before the Covid-19 pandemic was comparatively low (25.1%), and the usage increased to 90.3 percentage during the Covid-19 pandemic. Therefore, there is a significant difference in the usage of EPS before and during the Covid-19 pandemic situation.

23. It is observed that there is a significant difference in the experience in the use of electronic modes for payments with respect to educational qualification.

24. There is no significant difference in the transaction of money through Electronic Payment and traditional cash payment based on the local body.

25. It is also found that the usage of plastic cards, devices used, and various modes of Electronic Payment are not related to the employment status of the customers.

26. It is revealed that there is no significant relationship between the local body with the plastic cards used, the mode of using EPS, and the devices used for EPS.

27. The usage of EPS before and after demonetisation varies significantly with gender, employment status, and local body. Male customers highly used EPS services before, & after demonetisation as compared to female customers. Based on their employment status, employees highly used EPS services before, & after demonetisation. Customers from the corporations highly used the EPS services before, & after demonetisation as compared to municipalities and panchayats.

28. The usage of EPS services before and during the Covid-19 pandemic varies significantly with gender, employment status, and local body. Male customers highly used the EPS services before, and during Covid-19 as compared to female customers. Businessmen highly used EPS services before, and during Covid-19 as compared to others. Customers from the corporations highly used the EPS services before and during the Covid-19 pandemic as compared to municipalities and panchayats.

29. With regard to EPS usage, 49.6 percent of customers always use it to recharge their mobile phones. Customers also used the EPS for fund transfers at a rate of 48.5 percent, cash withdrawals at a proportion of 34 percent, and balance enquiry at a rate of 32.3 percent consistently. 53.9 percent and 59.6 percent of respondents never used EPS services for loan repayment and insurance premium payments respectively.

30. It is found that e-payment utilization was high in corporations but low in panchayaths. The highly used purposes of e-payment systems in corporations include mobile recharging, fund transfer, cash withdrawal, balance enquiry, shopping, bill payment, payment towards hotels, petrol, taxi, ticket booking, and mini statement. The highly used purposes of e-payment systems in municipalities are mobile recharge, shopping, cash withdrawal, and fund transfer. In Panchayath, the e-payment system is moderately used for fund transfers and cash withdrawals. The usages of e-payment for different purposes are highly dissimilar among Corporations and Panchayats. On the basis of the purpose of the EPS, the Municipality is approximately similar to Corporations and Panchayath.

8.5 Factors that Motivate the Use of Electronic Payment System

31. According to the **ease-of-use** dimension, the most significant factor motivating to use of EPS is EPS methods are more user-friendly, convenient, and save time. The other factors which motivated the customers to use EPS are customers believing learning EPS is very easy, clear, and understandable payment procedures, the minimum effort required for payment, and the use of EPS does not create mental stress.

32. According to the **usefulness** dimension, the most significant factor motivating the use of EPS is EPS would enable customers to complete transactions more quickly. The other factors are EPS would be useful for conducting transactions, EPS would improve the efficiency of transactions, and EPS would improve the quality of payments.

33. According to the **social influence** dimension, the most significant factor motivating the use of EPS is the Covid-19 pandemic situation. The other factors are the impact of friends and relatives, reviews and reputation, recent changes in the payment system, and demonetisation.

34. According to the **security** dimension, the most significant factor which motivates the use of EPS is transactions are protected with three-layer security

systems such as Username, Password, and OTP. The other factors are EPS service providers send alerts regarding fraudulent activities & scams through SMS or e-mails, do not allow others to access details, and EPS are found to be more secure and safe from fraudulent activities and hacking.

35. According to the **trust** dimension, the most significant factor motivating the use of EPS is customers' belief that EPS use will increase in the near future. The other factors which motivated the customers are EPS are working in order, EPS have a reputable track record, and EPS are reliable and dependable.

36. According to the **attitude of customers** dimension, the most significant factor which motivates the use of EPS is customers feel using EPS is a good idea. The other factors are feeling pleasant, enjoyable, and valuing the benefits.

37. According to the **intention to use** dimension, the most significant factor which motivates the use of EPS is customers who intend to use e-payment frequently in the future. The other factors are they will recommend Electronic Payment platforms to their friends, explore more ways to use electronic payments, and satisfaction with the effectiveness of the current e-payment system.

38. By considering the mean score of all the seven dimensions of motivational factors affecting EPS usage, it is found that customers have a highly positive perception of the **usefulness dimension** (4.3229)**.**

8.6 Customer Satisfaction towards Electronic Payment System

39. According to the **user-friendliness** dimension, the most significant factor which satisfied the customers to use EPS is the comfort of language options. The other factors are easy accessibility of EPS options, EPS services being available in all operating systems, comfortability with ICT infrastructure & internet connectivity, and options and steps in the transaction are not complicated.

40. As per the **supporting system** dimension**,** the most significant factor which satisfied the customers to use EPS is useful demonstrations & proper user instructions given by EPS providers. The other factors are there is a good system

to give awareness & training programmes to educate customers about the use of EPS, call center facility or grievance redressal mechanism to deal with customer queries, good staff support system.

41. According to the **time-saving** dimension**,** the most significant factor which satisfied the customers to use EPS is saving a lot of time in EPS usage compared to visiting the branch for transactions. The other factors are reasonable transaction processing time, convenient updation of EPS apps, and a good staff supporting system with no frequent hangs in transactions.

42. Based on the **economic** dimension**,** the most significant factor which satisfied the customers to use EPS is promotional methods are extremely beneficial. The other factors are there is a sound refund mechanism if there are any payment-related issues, service charges levied by service providers are affordable, there are no extra service charges for EPS services, and transaction limits set by service providers are reasonable.

43. In accordance with the descriptive statistics of the **safety and security of transaction** dimension**,** the most significant factor which satisfied the customers to use EPS is effective OTP access/verification.

44. Based on the **quality-of-service** dimension, the most significant factor which satisfied the customers to use EPS is EPS offers faster payment options in the digitalized system. The other factors are EPS provides updated technology, higher performance, and it provides unrestricted access to all banking activities.

45. As per the mean score of all the above six dimensions of satisfaction of customers towards the EPS, they are highly satisfied with the **quality of services dimension**.

46. The level of satisfaction towards user-friendliness is high in male (with a mean value of 4.03) compared to female (3.90) customers of e-payments. Satisfaction with the economy is high in male (3.86) compared to female (3.60). The level of satisfaction regarding user-friendliness (4.25), supporting system (3.84), time-saving (4.4), safety and security of transactions (4.59), and quality of services

(4.56) are high in the age group 21-35. The satisfaction of the supporting system and economy is identical in all local body groups. The satisfaction of user-friendliness (4.11), safety and security of transactions (4.39), and quality of services (4.33) are high in corporations. The satisfaction of time-saving (4.31) is high in Municipality.

The level of satisfaction towards user-friendliness, time-saving, and safety & security of transactions is high in married customers compared to unmarried customers. The level of satisfaction towards the safety and security of transactions is high in customers having graduation qualifications. The satisfaction of safety and security of transactions is high among employees compared to the remaining groups. The satisfaction of e-payment systems about safety and security of the transaction is high in the monthly income between ₹30,000- ₹50,000 groups. Satisfaction with the quality of services is high in the monthly income between ₹15,000- ₹30,000 groups. The level of satisfaction with the safety and security of e-payment transactions is high in the southern region. The level of satisfaction with the economy, safety, and security of the transaction, and quality of services are high in the customers having experience between 5 years to 10 years.

47. The results of the Multilayer Perception Model show that the most influencing factors of e-payment methods are time-saving and the economy. To make e-payment methods popular among the general public, more focus will be placed on the quality of service, user-friendliness, supporting system, safety and security of transactions, etc.

48. It is also revealed that there is a goodness of fit in the relationship of factors motivating to use of EPS on the satisfaction of customers towards EPS.

8.7 Problems related to EPS Usage

49. Fear of loss of money (54.2%), the chance of online fraudulent activity (50.7%), the experience of failed transactions with a deduction of money while using EPS (42.6%), and a chance of leaking out of personal information (40%) are the

important problems faced by banking customers while using EPS. Among the various problems of customers towards EPS usage, the least affected two problems are language barriers (89.5%) and EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc. (81.7%).

50. The responses of customers in relation to EPS usage are equally allocated into the groups. 86.79 percent of customers are included in the low-effect group, 4.85 percent of customers are included in the moderate-effect group, and 8.36 percent of customers are included in the high-effect group. Therefore, most customers feel a low level of problems while using the e-payment system. It is also found that there is a significant variance among the low-effect, moderate-effect, and high-effect problems except for slow internet connectivity.

51. The low effect problem includes six variables and the most important three variables are there are language barriers when using EPS, the EPS fails to provide timely confirmation through receipt, SMS, e-mail, etc., and digital transactions are complex in nature.

52. The moderate effect group includes nine variables and the most important three variables are there is a chance of leaking out personal information, the speed of transactions in EPS is very slow, and there is an experience with accounts temporarily locked by EPS providers

53. The high effect group includes only three variables and they are fear of loss of money is an important reason that forced to reduce the volume of digital transactions, there is an experience of failed transactions but with a deduction of the money while using EPS, and there is a chance of online fraudulent activity & risk of hacking.

54. According to factor analysis, the total problems associated with EPS usage are mainly categorized into four. They are procedural issues, personal barriers, disappointed experiences, and security issues.

55. **The procedural issue is** the most prominent factor which influences the problems of e-payments. Poor response from EPS providers on complaints

contributes to the high level of problems with the use of the EPS. The other significant contributing factors are the speed of transactions in EPS is very slow, the e-payment system requiring lengthy procedures, and the EPS failing to provide timely confirmation through receipt, SMS, e-mail, etc.

56. **Personal barrier** factor is the second major influencing factor for problems associated with EPS usage. The high contributing factor to the **personal barrier** is the fear of loss of money followed by the ability of Indian financial institutions to provide safety & security for online transactions is not good. And other factors such as needing help from a technical person to use an EPS, the complex nature of digital transactions, and the least contributing factor is the language barrier of customers.

57. The third significant factor in problems associated with e-payments is the **disappointed experience**. Experience of failed transactions but with a deduction of money while using EPS, experience with accounts temporarily locked by EPS providers, EPS providers are not famous and there is a lack of information available about them, and service charges of EPS are very high are the major contributing variables.

58. As per analysis, the fourth factor is the **security issue**. In this factor, there is a chance of online fraudulent activity & risk of hacking influences more in the problems associated with e-payment usage followed by there is a chance of leaking out personal information and a lack of customer awareness programmes.

59. The problems of customers towards the EPS vary significantly with respect to demographic variables such as gender, age, local body, marital status, employment status, monthly income, region, and experience in the e-payment system. Hence it failed to accept the null hypothesis and it can be concluded that there is a significant difference among the different groups of customers on the basis of their demographic profile and the problems of customers towards the EPS.

60. It is found that the problem with personal barriers and procedural issues is high in females, respondents from panchayath, and customers having experience of up to 1 year compared to other groups. It is also found that procedural issue problems are high among homemakers, respondents from the age group of above 50 years, married customers, and people having a monthly income above ₹50, 000 rupees.

8.8 Conclusion of the Study

The digitisation of the new century has contributed a variety of options in information and communication technologies, that have brought about a revolutionary change in financial services. With digitisation, the financial flow has shifted swiftly from traditional to convenient E-Payment Methods, particularly after demonetisation and the COVID-19 pandemic situations.

The initiatives of GOI, RBI, banks, and service providers helped to increase e-payment usage in the country to a larger extent over the last decade. Many innovative measures were recommended by various committees on EPS to promote the e-payment system and to solve the issues related to Digital Payments. The measures adopted by the Government, and service providers have played a pivotal role in popularising and making the EPS a common man's tool for financial services. In addition to this, EPS has played a vital role in the reduction of the cost of banking and in reaching out to the unbanked rural people.

Both the Central and the State Governments have introduced various schemes and programmes to encourage digitalisation and e-payments. The GOI aspires to create a "digitally empowered" economy that is "Faceless, Paperless, and Cashless" as part of the "Digital India" Campaign. The Digital India Campaign was launched in 2015 with the objective of connecting rural areas to high-speed Internet networks and boosting digital literacy. The promotion of the Electronic Payments Ecosystem is a critical component of the Digital India Programme, and it has the potential to alter the Indian economy by expanding inclusive financial services. It was also declared that Kerala was a completely digital state in 2015. The "Go Cashless" campaign started by the Government of Kerala in 2016 aimed to help

merchants and the general public in the state to use e-payment platforms. After the declaration and the campaign, the habit of banking customers using EPS increased largely in the state, and this model can be extended to other states of India as well.

Progress in EPS usage can be confirmed with its growth in value, and volume during the past ten years. Acceptance and expansion of electronic payments have increased exponentially over time.

Despite of the benefits of the e-payment system, there are several challenges faced by e-payment users as well. Fear of loss of money, chance of online fraudulent activity and risk of hacking, experience of failed transactions but with a deduction of money while using EPS and chance of leaking out of personal information are a few among them. These issues vary significantly with respect to demographic variables with women and people with less experience being more vulnerable. It is hoped that GOI, RBI, banks, and service providers will try collectively to solve these issues.

This study also witnessed that increasing the use of EPS with high-security features will subsequently stop the flow of unlawful transactions, black money, and parallel economies, which enhances accountability, promotes financial inclusion, and improves the country's economic standing. It can also be realised that digital transactions will be the future transaction system. Majority of the customers today prefer e-payments over conventional cash transactions. People all over the globe are driven to adopt EPS due to its accuracy, ease, simple accessibility, and speed. In aggregate, it can be concluded that electronic payment will be the future of fund transfer and it will dominate the arena of payment systems in India.

CHAPTER 9

RECOMMENDATIONS, IMPLICATIONS & SCOPE FOR FURTHER RESEARCH

CONTENT

9.1 Introduction
9.2 Recommendations based on the Findings of the Study
9.3 Implication of the Study
9.4 Scope for Further Research
9.5 Conclusion

9.1 Introduction

This chapter mainly deals with three aspects such as recommendations, implications, and scope for further research.

The study's results provide thorough information on EPS awareness, usage, and purpose as well as on the motivational factors affecting EPS usage and customer satisfaction with EPS services. The study also reveals the problems that the customers encountered. Some of the suggestions to improve the services and enhance the usage and adoption of Electronic Payment Systems are listed below separately for each stakeholder.

9.2 Recommendations based on the Findings of the Study

Based on the findings of the study, suggestions to various parties involved in Electronic Payment Systems such as customers, bankers, service providers, Governments, and RBI are explained below.

9.2.1 Recommendations to the Customers

- Customers should be aware of the recent rules, regulations, and the various changes happening in the digital economy.
- Customers should be vigilant while performing digital transfers or payments because a minor error may lead to a major financial loss.
- Customers should be cautious when submitting the account number and transfer amount and double-check the details before confirming or authorizing a transaction.
- Customers should not disclose their e-payment details to anyone, including bankers, such as their login id, login password, transaction password, and One-Time Password (OTP).
- Customers must create a strong password in order to successfully complete digital fund transfers and payments.

9.2.2 Recommendations to the Banks

- The banks should take efforts to create awareness of their e-payment services like EFT, RTGS, IMPS, etc. through various promotional strategies.
- Banks should organise free workshops, conferences, and seminars for rural people to assist and inform them about using electronic transactions.
- Banks should take steps to promote net banking and mobile wallets in addition to the usage of banking cards and UPI apps.
- The online banking websites of the banks should be simple to use. If the software is upgraded, do not change the standard access method because this may confuse customers and cause errors.
- Online fraudulent activity & risk of hacking are the important obstacles that pulled back the banking customers to transact more through EPS. So, the banks should cooperate with the Government to handle these problems by taking appropriate security measures
- Some of the customers have experienced a failed transaction with a deduction of money while using EPS. Therefore, the banker should ensure that there is a speedy mechanism for re-depositing the cash within 24 hours.
- Chance of leaking out of personal information is one of the security issues that limit electronic transactions. Therefore, banks must ensure that personal and financial information about their customers is kept secure and confidential.
- Customers must be provided with digital literacy training, and bank employees should provide training sessions on the features of e-banking services to assist customers (particularly the elderly and those with weak digital literacy) in becoming comfortable with how to use them.
- The number of customers using EPS is magnificently increasing day by day, especially after demonetisation and during the period of the Covid-19

pandemic. The banks must concentrate to satisfy first-time users thereby converting them to repeat use of the Electronic Payment and clearing system.

- Majority of the customers are using EPS services only for mobile recharge, fund transfer, and cash withdrawal. The banks need to motivate the customers to use other facilities such as insurance premium payment, loan repayment, etc.

9.2.3 Recommendations to the Service Providers

- The research has indicated that UPI apps and banking cards are the most used Electronic Payment options for banking customers. Therefore, the mobile wallet companies like MobiKwik, Paytm, Freecharge, Amazone Pay, Airtel Money, etc. should motivate customers to use their wallets by providing incentives such as cashback offers, referral earnings, and reducing transaction costs.

- Customers should be able to communicate with customer care in their native language while their complaints are being handled.

- To make e-payment methods popular among the general public, more focus will be placed on the safety and security of transactions, quality of service, user-friendliness, etc.

- Service providers must ensure that there are no mechanical problems when conducting online transactions. If there is a technical problem, the money deducted must be refunded within 24 hours so that customers are not adversely affected.

- Some customers have reported that EPS providers have temporarily locked their accounts. If the causes are not connected to any complicated financial fraudulent activities, a joint effort from the banks, service providers, and the Government is required to identify the causes and guarantee the unlocking facilities within 24 hours.

9.2.4 Recommendations to the Government

- Government should develop an initiative to promote cyber security through Government-owned companies, especially for monitoring online fraudulent transactions and also facilitate separate funds in the central Government budget.
- The Government should take additional measures to provide IT infrastructure facilities, and strong, secure, and free Wi-Fi availability in panchayaths when compared to corporations and municipalities.

9.2.5 Recommendations to the RBI

- The research reveals that there is a chance of leaking out personal information, and online fraudulent activity & risk of hacking. Therefore, RBI should improve rules and regulations to tackle these kinds of issues.
- The research indicates that the ability of Indian financial institutions to provide safety & security for online transactions and database is not good. Hence, the RBI should provide suitable guidance and issue valuable guidelines for managing the security issues associated with the use of EPS.
- The RBI should provide suitable guidance and issue valuable guidelines for managing the security issues associated with the use of EPS.
- The RBI should ensure that digital financial services are offered at a reasonable cost with high-security features and that electronic transactions are safe, secure, and consistent.
- More support to start-ups based on financial services for meeting future challenges.

9.3 Implications of the Study

The Government, the Reserve Bank of India, banks, financial institutions, service providers, and software developers should work to meet the demands of current and potential customers. Offering services at a low cost and offering quick,

dependable, and secure transactions will change customers' perceptions of Electronic Payment Systems. The findings of this study will be useful for policymakers and economists in framing strategies to achieve the goal of converting India from a cash-based payment system to an Electronic Payment System.

9.4 Scope for further study

The researcher systematically studied the implications of Electronic Payment Systems in Kerala. This opens the door for the next generation of dynamic researchers to explore the next set of challenging topics.

- There is a scope for conducting a study on specific methods of EPS, especially in recent techniques.
- Comparative study of customers' perception of traditional payments and electronic payments.
- Hopefully, in-depth research at the national level, or a comparison of India with other countries, as well as a comparison of different states or districts within India, would be useful.
- Similar studies can be conducted for a certain community group, such as businessmen, retailers, bankers, financial institutions, service providers, the rural population, senior citizens, women, and teachers.
- A detailed study of fraudulent practices in the e-payment system.

9.5 Conclusion

This study revealed that widespread usage of e-payment methods has made a revolutionary change in the banking habits, especially in fund transfer among the people both in urban, and rural areas of the state of Kerala. The progress of Electronic Payment Systems is dependent on ICT innovation and the modernisation of the electronic landscape. The transition from traditional cash payment to modern EPS is remarkable. The digital revolution has made e-payments a simple process.

The demonetisation, and the Covid'19 pandemic situations also assisted in increasing the volume and value of e-payment transactions.

At the same time, the study has also identified several difficulties that banking customers are dealing with that limit the growth of EPS usage in Kerala. Therefore, this study may be an eye opener to the policymakers such as RBI, Governments, service providers, and banks. They have to play a major role to resolve all e-payment-related issues and develop regulations, and policies that will increase the use of electronic transactions in the coming future.

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APPENDIX

AN EMPIRICAL ANALYSIS OF ELECTRONIC PAYMENT SYSTEM (EPS) AMONG BANKING CUSTOMERS IN KERALA

QUESTIONNAIRE

PERSONAL PROFILE

1. Gender

a) Male ☐ b) Female ☐

2. Age (Please write your age in years) …….

3. Educational Qualification

a) Below Graduation ☐ b) Graduation ☐

c) Post Graduation ☐ d) Above PG ☐

4. Marital Status

a) Single ☐ b) Married ☐

5. Employment Status

a) Employee ☐ b) Businessman ☐

c) Professional ☐ d) Student ☐

e) Homemaker ☐ f) Self-employed ☐

6. Monthly Income (Rs…….)

7. Type of Local Body

a) Panchayath ☐ b) Municipality ☐ c) Corporation ☐

8. Region

a) **Southern** (Trivandrum, Kollam, Pathanamthitta & Alappuzha) ☐

b) **Central** (Kottayam, Idukki, Ernakulam & Thrissur) ☐

c) **Northern** (Palakkad, Malappuram, Calicut, Wayanad, Kannur & Kasaragod) ☐

AWARENESS, USAGE, AND PURPOSE OF EPS

9. In which banks do you have an account for payments?

Type of Bank	**Yes**	**No**
Public sector Bank (SBI, Canara Bank, etc.)		
Old generation Private sector Bank (Federal Bank, CSB, SIB, etc.)		
New generation Private sector Bank (ICICI, HDFC, IDBI, etc.)		
Co-operative Bank (KSCB, KSCARDB, etc.)		

10. Which type of account do you have?

Type of account	**Yes**	**No**
Savings A/C		
Current A/C		
Fixed Deposit A/C		
Recurring Deposit A/C		

11. Which type of Electronic Payment System is used?

Electronic Payment Method	**Yes**	**No**
Banking Cards (Debit Card, Credit Card, etc.)		
Unified Payment Interfaces (UPI) Apps (Google Pay, PhonePe, BHIM App, etc.)		
Internet Banking (NEFT/ RTGS/ IMPS etc.)		
Mobile Wallets (Paytm, Yono, Mobikwik, etc.)		

12. How many years you have been using electronic modes for payments?

……... (Write your answer in years)

13. Which type of bank plastic card do you have for electronic payments?

Type of bank plastic card	**Please tick**
Debit Card	
Credit Card	
Both Debit & Credit Cards	

14. Which mode do you mostly prefer to do e-payment?

Mode	**Please tick**
Banks' Website	
Banks' App	

15. Through which device do you mostly perform electronic payments?

Device	**Please tick**
Personal Computers / Laptops	
iPads / Tablets	
Mobile Phones	

16. Where do you have used EPS for payments?

Sl. No.	**Utilisation of EPS**	**Yes**	**No**
1	Departmental Store / Supermarket		
2	Malls		
3	Petrol Bunks		
4	Hotels/ Restaurants		
5	Hospitals		
6	Schools/ Colleges		
7	Bus/ Railway / Film Ticket Booking Counters		
8	Others (Airports, tourist places, etc.)		

17. How frequently do you use the following e-payment method?

(Please tick in the suitable column)

Sl. No	**Electronic Payment Method**	**Daily**	**Weekly**	**Monthly**	**Occasionally**	**Nil**
1.	Banking Cards (Debit Card, Credit Card, etc.)					
2.	Unified Payment Interfaces (UPI) Apps (Google Pay, PhonePe, BHIM App, etc.)					

3.	Internet Banking (NEFT/ RTGS/ IMPS etc.)					
4.	Mobile Wallets (Paytm, Yono, Mobikwik, etc.)					

18. Rate the purpose of using Electronic Payment Methods

(Please tick in the appropriate column)

Sl. No	**Purpose of using EPS**	**Always**	**Frequently**	**Occasionally**	**Rarely**	**Never**
1	Fund transfer					
2	Cash withdrawal					
3	Shopping					
4	Food Ordering Payments					
5	Payment of bills (E.g., Utility Bills)					
6	Hotel, Fuel, Taxi, etc.					
7	Donating Funds					
8	Mobile recharge					
9	Loan repayment (EMI)					
10	Insurance premium					
11.	Ticket booking					
12.	Balance enquiry					
13.	Mini statement					

19. On average, how much money did you were transacted through Electronic Payment in the last month?

Rs…….

20. On average, how much money did you were transacted through traditional cash payments in the last month?

Rs…….

21. Rate the usage of EPS according to your experience (Please tick)

Situation	**Very High**	**High**	**Medium**	**Low**	**Very Low**
Before demonetization					
After demonetization					

22. Rate the usage of EPS according to your experience (Please tick)

Situation	**Very High**	**High**	**Medium**	**Low**	**Very Low**
Before Covid 19 pandemic					
During Covid 19 pandemic					

FACTORS THAT MOTIVATE THE USE OF EPS

23. Please tick your extent of agreeing or disagreeing in the following statements related to factors that motivate the use of EPS.

(SA -Strongly Agree, A- Agree, N-Neutral, DA- Disagree, SD- Strongly Disagree)

a. Ease of Use

	SA	**A**	**N**	**DA**	**SD**
I believe learning to use EPS is easy.					
The EPS methods are more user-friendly, convenient and save time.					
The use of EPS does not create any mental stress.					
I like the fact that payments done through EPS require minimum effort.					
My interaction with the payment procedure would be clear and understandable.					

b. Usefulness

	SA	**A**	**N**	**DA**	**SD**
I think using EPS would enable me to accomplish transactions more quickly.					
I believe using EPS would improve my efficiency of transactions.					
I believe EPS would be useful for conducting transactions.					
I believe EPS improve the quality of payments.					
I think using EPS would improve my performance.					

c. Social Influence

	SA	**A**	**N**	**DA**	**SD**
The opinions of my friends and relatives have an impact on me to do the Electronic Payment (following the trend).					
Reviews and reputation from the people I know influenced me to do the electronic payment.					
Recent changes in the payment options compelled me to use EPS. (E.g., To get service from Akshaya Centre, we are forced to use EPS).					
Demonetisation motivated me to use EPS.					
Covid 19 situation influenced me to use EPS.					

d. Security

	SA	**A**	**N**	**DA**	**SD**
I am very confident that my transactions are protected with three-layer security systems such as Username, Password and OTP.					
EPS do not allow others to access my details.					
EPS service providers send alerts regarding fraudulent activities & scams through SMS or e-mails.					
EPS are found to be more secure and safe from fraudulent activities and hacking.					

e. Trust

	SA	A	N	DA	SD
It is found that EPS are working in order.					
The EPS have a reputable track record.					
The EPS are reliable and dependable.					
I trust the system and processes backing my transactions.					
I believe EPS use will increase in the future.					

f. Attitude of customers

	SA	A	N	DA	SD
I feel using EPS is a good idea.					
I feel pleasant about using EPS.					
I think using EPS is enjoyable.					
I value the benefits of EPS.					

g. Intention to Use

	SA	A	N	DA	SD
I intend to use e payment frequently in the future.					
I will be open to exploring more ways to use electronic payments.					
I will recommend Electronic Payment platforms to my friends.					
I am satisfied with the effectiveness of the current Electronic Payment System.					

SATISFACTION OF CUSTOMERS TOWARDS EPS

24. Please tick your extent of agreeing or disagreeing in the following statements related to the satisfaction of customers towards EPS.

(SA -Strongly Agree, A- Agree, N-Neutral, DA- Disagree, SD- Strongly Disagree)

Statement indicators of satisfaction	**SA**	**A**	**N**	**DA**	**SD**
User-Friendliness					
All options are easily accessible in EPS.					
I'm comfortable with the language options provided in EPS.					
EPS services are available in all operating systems.					
I'm comfortable with ICT infrastructure & internet connectivity in India.					
Options and steps in the transaction are not complicated.					
Supporting System					
EPS providers give useful demonstrations & proper user instructions.					
There is a good system to give awareness & training programmes to educate customers about the use of EPS.					
There is a good staff supporting system to educate ignorant customers.					
Existing cyber laws and legal guidelines & formalities to protect customers are effective.					
There is a call center facility or grievance redressal mechanism to deal with customer queries.					
Time-Saving					
I feel I'm saving a lot of time in EPS usage, compared to visiting the branch for transactions.					
Transaction processing time is reasonable.					
There are no frequent hangs in transactions.					
EPS devices & app updation time are convenient.					
Economy					
The service charges levied by service providers are affordable.					

Transaction limits set by service providers are reasonable.					
Scratch cards, redeemable points, shopping vouchers, rewards, discounts & special offers are very useful.					
There is a sound refund mechanism if there is any payment-related issue.					
There are no extra service charges for EPS services.					
Safety and Security of transactions					
I'm very confident that my transactions & details are Password/PIN protected.					
I feel OTP access/verification is very effective.					
I'm receiving SMS/e-mails immediately after every transaction.					
Quality of Service					
The performance of EPS-based transactions is always better than traditional cash transactions.					
EPS offer faster payment options in the digitalized system with the internet.					
It provides updated technology in Electronic Payment services.					
It provides unrestricted access for all banking activities.					

PROBLEMS ASSOCIATED WITH THE USE OF EPS

25. The problems associated with the use of EPS**.** Please indicate the extent to which you agree or disagree with each of the following statements by putting tick marks.

(Strongly Agree-SA, Agree-A, Neutral-N, Disagree-D and Strongly Disagree-SD)

Problems associated with the use of EPS	**SA**	**A**	**N**	**DA**	**SD**
Slow internet connectivity is an important issue in EPS.					
Digital transactions are complex in nature.					
Poor response from EPS providers on complaints.					
Fear of loss of money is an important reason which forced me to reduce the volume of digital transactions.					

For using the EPS, I need help from a technical person.					
I have language barriers when using EPS.					
The lack of biometric-based authentication & identification of customers is an important barrier in EPS.					
The ability of Indian financial institutions to provide safety & security for online transactions and database is not good.					
EPS require a lengthy procedure.					
The speed of transactions in EPS is very slow.					
The EPS fail to provide timely confirmation through receipt, SMS, e-mail, etc.					
There is a chance of leaking personal information.					
There is a chance of online fraudulent activity & risk of hacking.					
I have experience with accounts temporarily locked by EPS providers.					
I have experience with failed transactions but with a deduction of amount while using EPS.					
The service charge & additional charge of EPS are very high.					
EPS providers are not famous and there is a lack of information available about them.					
Lack of customer awareness programmes.					

26. Any other suggestions?

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Thank You