# CONTINUANCE AND RECOMMENDATION INTENTIONS FOR UNIFIED PAYMENT INTERFACE: EXTENDING UTAUT WITH SECURITY, TRUST AND PACE OF INNOVATION

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**DOCTOR OF PHILOSOPHY**

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**By**

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**LOVELY PROFESSIONAL UNIVERSITY, PUNJAB**
**2023**

## DECLARATION

I, hereby declared that the presented work in the thesis entitled "Continuance and Recommendation Intentions for Unified Payment Interface: Extending UTAUT with Security, Trust and Pace of Innovation" in fulfilment of degree of **Doctor of Philosophy (Ph.D.)** is outcome of research work carried out by me under the supervision Dr. Rupinder Katoch, working as Associate Professor, in the Mittal school of Business of Lovely Professional University, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.

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# CERTIFICATE

This is to certify that the work reported in the Ph.D. thesis entitled "Continuance and Recommendation Intentions for Unified Payment Interface: Extending UTAUT with Security, Trust and Pace of Innovation" submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the Mittal School of Businessis a research work carried out by Sandeep kaur, (Registration No. 41900048), is bonafide record of his/her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

Rupinder

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## ABSTRACT

This study investigated the cognitive, affective, and conative framework in combination with contextual factors of technology usage that affect users' post-adoption continuation and recommendation intentions. Exclusively, the impact of cognitive factors (i.e. Performance expectancy, effort expectancy, social influences, facilitating conditions, personal innovativeness) and affective factors (such as satisfaction) on conative factors (such as continuation and recommendation intention) in the perspective of UPI applications (apps) was investigated using the UTAUT model. The National Payments Corporation of India (NPCI) has invested a sizable amount of money in the country's massive payment infrastructure in an effort to enhance the user experience. However, in order for investments to be profitable, NPCI must guarantee the ongoing use of technological solutions and post-adoptive behaviors like continuance and recommendation intention. 651 UPI users in India's Northern region provided the study with the data that was used in its analysis. Partial Least-Square Structural Equation Modeling (PLS-SEM) was used to analyze the data after it had been gathered and cleaned. By examining the contribution of individual traits to technology adoption, the study broadens the body of knowledge on post-adoptive behaviour. The inclusion of personal innovativeness advances our theoretical understanding of the variables influencing continuous intention, even though the dominant technological acceptance models offer insights into how continuous intentions are formed. By including recommendation intention as a secondary outcome to continuance intention, the study expands on previous research on post-adoptive behaviour. The study's findings enable UPI's creators to pinpoint the key elements influencing post-adoptive behaviour. The structural model's findings showed that satisfaction had a direct impact on continuation intentions, which in turn had an impact on recommendations intentions. This study investigates how factors such as performance expectations, effort expectations, social influence, facilitating conditions, and individual inventiveness affect consumer satisfaction. It was discovered that all cognitive factors, including performance expectations, effort expectations, and facilitating conditions, and personal innovativeness have an impact on satisfaction. According to the study, adding a significant individual difference variable—personal

innovativeness with regard to information technology—would aid in our understanding of the role that these factors play in the development of continuous intention. It further examines the influence of trust and security, and the pace of innovation on continued intentions. Through the mediating function of user satisfaction, it also looked at the impact of performance expectancy, effort expectancy, social influence, facilitating variable, and personal innovativeness on the continuance intentions of the UPI system. All factors have been shown to be significant. Future researchers will find it extremely helpful that the study used a validated instrument to better understand user adherence and referral intentions. Therefore, this study adds to the limited body of knowledge in the payment industry literature by examining how users perceive UPI apps and post-adoption behaviors.

## ACKNOWLEDGMENTS

A PhD thesis is not, as it may seem on occasion, an isolated academic discussion. It is primarily the sum of the commitments of several other participants in the research project. And the same can be said for this PhD thesis. And it was because of the commitments mentioned below that I was willing to accomplish it.

First of all, I'd like to express my gratitude to "Waheguru ji" for bestowing upon me the intellect and strength to believe in myself. I praise God for seeing me through all this endeavor's highs and lows. You are the one who allowed me to complete my doctorate. I will proceed to have trust in you.

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**(Sandeep Kaur)**

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# CHAPTER 1: INTRODUCTION

## 1. Introduction

Every aspect of the economy is being impacted by digitization, including the way financial transactions are executed and processed. It is not surprising that health (e.g., Neilson & Sahay, 2022), governance (e.g., Upadhayay et al., 2022), and education (e.g., Arkorful & Abaidoo, 2015) are some of the areas where technologically enabled communication processing capabilities have proved to be beneficial. Even the financial services industry is undergoing a major shift at the moment. Given the central role that digitization plays in the financial lives of an increasing proportion of the global population, electronic payments are at the heart of this transformation. To maintain growth in a competitive market and to encourage new entrants, the payments sector has been an early adopter of cutting-edge technologies and is continuously simplifying processes, standardizing overall operations, and employing innovations. It is clear that utilizing appropriate technology will accelerate the growth of digital payments and open up access to financial services for previously underserved and untapped populations.

The instant payment model has replaced the expensive and antiquated legacy payment infrastructure, resulting in a dramatic shift in the way the payment industry functions. The payments industry is becoming increasingly innovative as new platforms, products, and services are introduced. In an era where more and more transactions are conducted electronically, the financial services sector has a critical obligation to advance financial inclusion. Transactions not only support the expansion of digital economies and new forms of creativity, but they also serve as the solid ground upon which our economies are built.

Digital payments are becoming more widespread in contemporary world since users and service providers can use data in more ways than ever, such as images, audio, video, and sensors (Agarwal & Dhar, 2014). The improved digital infrastructure has made it possible for more people to use payment systems by making them easy, quick,

and safe for them to use and by providing a seamless and rich user experience (e.g., networks, processing power, and storage capacity).

As part of their industrial policy, governments are building payment infrastructure to control the flow of money and own digital and data platforms. Due to these modifications, domestic payment systems like Troy in Turkey, Mir in Russia, and the Elo and Pix systems in Brazil have proliferated. According to PwC India's (2021) analysis of statistics from the RBI and NPCI, the Indian electronic payment sector has experienced phenomenal growth in recent years, with the volume of transactions growing at an average CAGR of 23%. The Unified Payments Interface (UPI) and other new, payment products have put the digital payments industry on a clear path to growth. So, as the industry grows, we need to make sure that our current and future payment systems can offer value to all stakeholders while reducing risks. Academia is of the view that UPI can also curb the problem of Black money as economic activity becomes more transparent (Dixit et al., 2018).

## 1.2 Overview of Digital Payments/ Electronic payments

The cashless/digital payment platform gained importance after demonetization in November 2016. There was a huge requirement for paper money, but our government was not able to supply the requisite amount of money. The government wanted to encourage the people to do cashless transactions (Fouillet et al., 2021). The digital payment system is defined as doing transactions or payments for goods or services with the help of a digitalized system, eliminating the usage of cash or cheques (Kumar et al., 2020). It is also known as an online payment system.

### 1.2.1 Different modes of electronic transactions

Through electronic services like NEFT, USSD, RTGS, AEPS, UPI, mobile wallets, etc., technology has enabled faster payment methods. Following are some of the prevalent payment systems used by the general public and corporations.

- **National electronic fund transfer (NEFT)**: It's a mode of money transfer that enables one-to-one payments within India.
- **Real-time gross settlement (RTGS)**: The money transactions between bank accounts in real-time, or immediately.
- **Unstructured Supplementary Service Data (USSD):** It is a mode of transferring funds using the **99# service* code.
- **Aadhaar-enabled payment system (AEPS)**: It is a 12-digit unique *Aadhaar* identification number that allows online interbank transactions at PoS. AEPS allows to do balance inquiries, the deposit and withdrawal of cash, and *Aadhaar-to-Aadhaar* fund transfers.
- **Immediate Payments Service (IMPS):** It is an initiative of NPCI and an immediate payment platform for transferring money between banks with the help of mobiles.
- **Unified Payments Interface (UPI):** It is a sophisticated adaptation of IMPS that enables mobile payment modes, where multiple banking features are provided under one service. There is no need for bank details of another person for money transfer and it is possible only using a single VPA.
- **Mobile wallets**: A secured way of hauling cash, and credit/debit card information. The user can link their debit or credit card details to m-wallet apps or transfer funds to m-wallet. The user has to link his/her account to the digital wallet to transfer the money.

The accessibility of different payment modes provides the user with the option of choosing a suitable payment mode according to their device capabilities (GSM/Smartphone), internet connectivity, restriction of sharing confidential information (like bank details—individual's account number/IFSC code of bank/VPA/mobile number, and MPIN), and details of money transfers including date, transfer amount, and time of transaction (Lakshmi et al., 2019). Table 1 provides details of the comparative features of different payment methods.

**Table 1: Comparison of different modes of electronic/digital transactions**

| Features | IMPS | NEFT | RTGS | UPI | USSD |
|---|---|---|---|---|---|
| *The time needed for the transaction* | Immediate | Done on the same day or hourly basis | Within 30mintues | Instant | Instant |
| *Resource requirement* | With internet | With/without internet | With/without internet | Smartphone with internet | GSM phone with/without internet |
| *Access/Fund transfer days* | 24*7 on all days of the year. | (8am-7pm Monday to Friday), (8am-7pm Saturday excluding holidays) | (9am-4.30 pm Monday to Friday), (9am-2pm Saturday excluding holidays) | 24hours a week | 24*7 on all days of the year. |
| *Fund transfer limit* | The maximum amount through mobile is Rs.10000 and bank account is Rs. 200000. | Maximum is Rs. 10lakh. | The minimum amount is Rs. 2lakh | Rs. One lakh | Rs.5000 |
| *Requirement of information* | Individual's account number and IFSC code/ beneficiary's MMIDcodeand mobile number and Aadhar | Person's name, account number, bank name, IFSC code of the bank | Persons' account number, IFSC code/ beneficiary's MMID code, phone number, and Aadhar card. | Virtual payment address of receiver and MPIN | Persons' account number, IFSC, phone number and aadhar |
| *Charges on amount transaction* | • Upto 1lakh- Rs. 5<br>• 1-2lakh- Rs. 15 | • UptoRs. 10k to Rs. 2.5 lakh;<br>• Rs.10,000-1lakh- Rs. 5<br>• 1-2lakh- Rs. 15<br>• Above Rs.2lakh- Rs. 25 | • 2 – 5 lakhs < 30<br>• Beyond 5 lakhs - <□ 55 | No fee | .50 paise |

*Source: Authors compilation*

### 1.2.2 Description of the Unified Payment Interface

A unified payment interface (UPI) is an immediate fund transfer platform introduced by the National Payments Corporation of India (NPCI) that facilitates bank-to-bank transfers. The system is controlled by RBI and works by instant transfer of money between one bank to some other bank account through a mobile device. The idea of UPI was so unique and revolutionary that within 12 months of its launch, above 20 million customers had downloaded various UPI applications (Gochhwal, 2017). This helped not only the consumers but also multiple startups and financial institutions grow in this newly established market. UPI is known as a revolutionary product in the payment system. Financial transactions are simplified and become more affordable due to the flexibility of the Unified Payments Interface (UPI). But pressure from M-wallets and also failures on part of banks to reduce payment inaccuracies, mainly on the front end, could hurt it (Chaterjee & Thomas, 2017).

UPI enables users to make transactions from different bank accounts, and retain multiple bank features through one service application. It is sometimes referred to as a P2P collect request, and it can be planned and handled as needed (Godambe, 2020). It works using a single identity, i.e., a virtual payment address, QR code, mobile number, or *Aadhar* card number, without the need for bank details. The virtual payment address (VPA) technology seems to be safer and less expensive (Mishra, 2017). UPI has proven to be a revolutionary technology and, hence, has been adopted by a large section of the general and business populations (Gupta et al., 2018). ICICI Pocket, Axis Pay UPI app, Union Bank UPI app, Pnoepe, PNB UPI app, Paytm, BHIM app, GooglePay, and Mobikwik are some examples of UPI apps.

The UPI system needs only the UPI ID and MPIN as two-factor validation for doing business. The two-factor verification makes the UPI-featured transactions safe and secure. Time settlement, cost, ease of use, and increased security are just some of the areas where UPI has stood out and proven effective (Gochhwal, 2017). In the 2017 Union Budget, the GOI decided to promote the adoption of digital technology, especially with a major objective of financial inclusion. With this goal in mind, it was necessary to empower every resident with the awareness to unite with the revolution

and aid India's development along the path to becoming a cashless country. To achieve this, it was necessary to empower every citizen with the ability to join the revolution and advance India's progress toward becoming a cashless society.

### 1.2.3 Working of UPI

UPI is based on the concept of a virtual payment address (VPA).The information about the bank accounts, and cards has been assigned to a certain VPA. The VPA looks like an email address (abc @ hdfc bank), and it is unique to everybody (Lakshmi, Ranjan, & Gupta, 2019). The VPA gateway helps to make payments and transfers through UPI, which allows payments with a mobile phone from a bank account. The user can link multiple bank accounts to the same VPA. There is no need for the bank details of both parties in the transaction, the sender and receiver (TMS, 2021).

QR (quick response) codes: these are unique codes for every transaction and enable flawless payments. Various merchants use this efficiently. Static QR codes are pasted on shop counters and restaurant menus, and by scanning them, users can make payments to the merchant’s bank. The data have been already encoded within them, so the customer is needed to enter the amount only to be paid. A dynamic QR code has to generate every time for making a payment by the merchant. This code includes the amount to be paid and the merchant’s name and bank details. It is becoming popular in-home delivery items, online shopping, or food deliveries. The integration of UPI with PSPs (Payment Service Providers) and other stakeholders is presented in Figure 1.


**Figure 1: Working of the Unified Payment Interface**

*Source: Kedia, 2020*

### 1.2.4 Different Apps used UPI Features in India:

The report given by ASSOCHAM (2017) disclosed that "Due to the current usage of 74 crore debit and credit cards, 50 million users of the internet, 102 crore cellphones, 110 crore Aadhaar, and far above 20 crore Jan Dhan accounts, the whole payment system has been utilising virtual payment methods. The number of financial transactions using UPI and USSD has increased exponentially by 3,574% and 10,603% respectively"

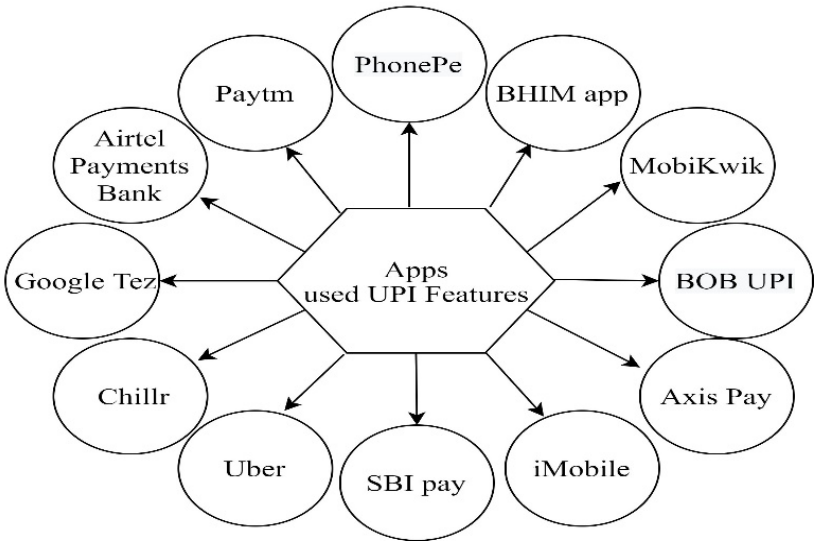


**Figure-2 UPI apps**

- *Phonpe*: It is one of the trendiest payment application that allows consumers to do transactions by the UPI platform. This app was founded in December 2015 and is considered the most preferred app for UPI in India.
- *BHIM app:* It is an Indian mobile payment app introduced by NPCI based on UPI in December 2016. It has a user-friendly interface intended to provide e-payments openly with the help of banks and offers a very secure platform for cashless transactions. The funds can be transferred through a VPA, QR code, or bank account.
- *Mobikwik: The* MobiKwik Indian payments network uses the UPI system, where its users can add money through UPI to their wallets. They also conduct transactions like fund transfers, cash deposits, and cash pickups.
- *BOB UPI:* This app is developed by the Bank of Baroda to provide some supplementary utilities that have not given by other UPI applications.
- *Axis Pay:* This UPI-enabled platform was launched by Axis Bank for customers to make digital payments. It is very user-friendly.
- *Paytm:* The mobile wallet app Paytm Company cooperated with the UPI interface to offer consumers the ability to perform and easily move funds. Users can load funds into their Paytm folders through their UPI identity and other payment alternatives like net banking, and debit/credit cards. Consumers

can do transactions such as collection, and request money through Paytm with UPI.

- *Airtel Payments Bank:* By integrating with the UPI interface, this app offers stress less virtual payments. It offers its customers to generate VPAs and link their bank accounts. This app facilitates online as well as offline payments.
- *Googlepay:* This online payment system is developed by Google to enable users to perform payments with Androids, and tablets.
- *Chillr:* It is also by making use of UPI as an easy mode of payment.
- *Uber:* Users also can pay for their Taxi services using UPI, which Uber has launched as a payment option.
- *SBI Pay:* SBI Pay application is specially built for using UPI features. It provides a fund transfer facility, consequently, anyone can use it to transfer and receive money by a VPA although they are not having an SBI account.
- *iMobile:* launched by ICICI bank to use UPI interface. With iMobile, customers can transfer funds, pay utility bills, recharge, and much more.

UPI apps aren't like electronic wallets. Transactions don't require users to add money. Apps don't accept money. The app is transactional only. UPI helps vendors collect customer funds. UPI lets merchants receive money from bank customers. Keeping customers' financial data secure is low-risk. Customers can make transactions without cash, credit, or debit cards. It solves the "Cash on Delivery" (COD) issue in electronic business.

The UPI ecosystem has three players (Thomas & Chatterjee, 2017).

1. Operators of payment systems serve as a link between both the supplier and the receiver.
2. Banks provide the payer and payee's fundamental accounts.
3. NPCI stands as a central point controlling virtual payments.

### 1.2.5 Benefits of UPI

- For both sender and receiver, UPI is a very transparent, secure, chore, and economical payment service**.**
- UPI offers instantaneous, secure, and universally scalable verifications.
- UPI permits consumers for making instant online via mobile phones for things like utility bills and school fees.
- It promotes the development of e-commerce and the related trading involved in it.
- UPI minimizes the usage of physical tools such as debit and credit cards.
- It is not necessary to use multi-step procedures, such as internet banking, because these are vulnerable to phishing attacks because of unsafe infrastructures.
- There is proof and a record of every transaction that is made on the UPI platform. It helps to keep black money under control.

### 1.2.6 Trends in UPI

India is at the front of digital payments innovation, and UPI, which had a modest start in April 2016, has grown faster than other modes of digital payments across India. India is ahead of the world in terms of digital innovations in the economic sector, with Phonepe, Paytm, and GooglePay dominating the payment sector on the UPI platform. SEBI approved UPI as an additional payment method for retail investors (up to Rs 2 lacs) to invest in initial public offerings (IPOs) in late 2018. NPCI introduced BHIM UPI App in Singapore and in various countries. The government made it compulsory in November2019, for companies that incur an annual turnover of Rs 50 crores or more to accept UPI payments by customers. Oxxy Healthcare Launched A Special Insurance Policy for RuPay Card Holders and UPI Users, Rs 1500. Western Union has launched a service that uses the Unified Payments Interface to enable real-time cross-border transfers to India. A report given by online portal vpnMentor reported more than 7 million users of mobile payment apps, BHIM was revealed in a website violation uncovering private information (June, 2020).

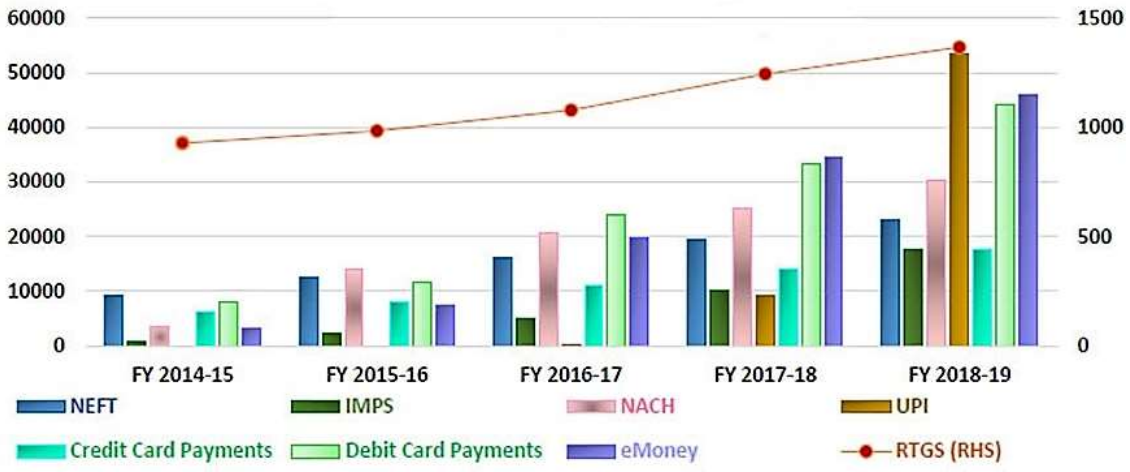


Figure-3 Digital payments systems in India (volume)

*Source: rbi.org.in*

In India, UPI is presently leading among growing digital payments platforms. Rs. 43.45 lakh crore worth of transactions were recorded on the UPI system from 2016 to 2020. Out of this, transactions amounting to Rs. 14.26 lakh crore took place in the months from March to August 2020. The number of transactions on the UPI system also boosted after the epidemic period; 2552 crore transactions were recorded on UPI from August 2016 to August 2020, and approximately 793040 crore transactions were done between March and August 2020. In the month of April 2020 total number of transactions boost to 99.95 crores from 78.17 crores in April 2019.Mr. Mahabaleshwara M.S. (MD and CEO of Karnataka Bank Ltd.) said that the desire of the people to do contactless transactions is one of the main reasons for the growth of UPI in the post-pandemic period. During the pandemic period, many shopkeepers, like grocery shops, milkmen, and medical stores, started accepting payments through UPI (Vinayak, 2021).

According to NPCI, UPI volume increased from 1.14 billion in October 2019 to 2.07 billion in October 2020; transaction value grew by 101%, to 3, 86,106.74 crores from Rs. 1, 91,359.94 crores in the same period. This volume of transactions increased during the lockdown as people avoided doing cash transactions, within eight months, volume increased by 746 million from 1.3 billion in February to 2.07 billion in October. In November 2020 NPCI Putt the market cap of 30% on UPI transactions

done through third parties; so that UPI cannot be monopolistic or duopolistic to reduce overall systematic risk. It also allows fintech companies to come into the market and make innovations.

There has been a rise in the use of digital payment methods across all industries in these areas, including online pharmacies, online games, telecom and media, online grocery stores, recharge, and utility bill payments. Before COVID-19, people were using UPI for different activities, such as utility bill payments, Kirana stores, fuel stations, online shopping, transportation, travel bookings, railway tickets, entertainment, restaurants and hotels, IPO, credit card payments, etc. The volume of UPI transactions doubled in a year, reaching 2.73 billion in March 2021, up from 1.25 billion the previous year. The number of banks implementing UPI in November 2021 was 274 with a transaction volume of 4186.48 million and a value of Rs. 768436.11 crore.

### 1.3 Problem statement

Although there are benefits to information technology (IT) capabilities, these benefits accrue from actual usage. The underutilization (e.g., ineffectual or lacking use) of UPI, which is a major issue in the adoption and continuation of UPI, is unfortunately caused by a number of factors, including privacy and trust issues since UPI is vulnerable to attacks that have devastating implications (Kumar et al., 2020), and a lack of innovativeness on the part of consumers, which is a valuable contributor to the creation of service value (Salim et al., 2020). The growth of digital payments has also led to numerous instances of failed payments due to infrastructure issues, network outages, server downtimes, and other technical issues, which in turn have a negative effect on customer satisfaction, confidence, and usage continuance (PWC, 2021). Moreover, the demand for higher-quality upgraded solutions is raised by the speed of technological advancement (Park and Koh, 2017). Consumers' willingness to use a certain innovation can be affected by their opinions of how slowly it is developing. Information systems studies in the past have oftentimes assumed that customer experience is associated with the pace of technical innovation, but few of

these studies have established empirical support for this assumption (Byrne et al., 2017; Mani & Dhingra, 2012; Shehryar & Hunt, 2005).

Recent academic research and corporate reports have highlighted the prevalent issues in the context of UPI implementation in many countries (Madwanna et al., 2021; Khanra et al., 2020). Recognizing that underutilization of digital payments remains a barrier to realizing its full potential benefits, IT/IS researchers have recognized the need to explore the factors affecting UPI use in order to facilitate better technology implementation. Further, customer satisfaction with UPI is a key-dependent variable for investigation in the context of multiple stakeholders because of its linkage to the continuation intentions of customers (Mubarokah & Hidayanto, 2020). Researchers have been attempting to determine what causes people's continued use of the technology and satisfaction with this IT adoption for many years (Venkatesh et al., 2003). The outcomes of this research are anticipated to offer insights that will be both beneficial and provocative in influencing the payment industry.

The study's research problem might be described as follows:

*"To study the factors which influence the user's satisfaction of UPI-based payment, to examine the impact of perceived security factors on users' trust and their influence on intention to continue using UPI, to study the continuance and recommendation intentions of the UPI system by users through the mediating role of user satisfaction, and finally to measure the impact of the pace of technological innovations and personal innovativeness on continuance intention."*

### 1.4 Rationale of the study:

ICT has changed how the payment industry conducts business and facilitated digital payments for consumers. (Sharma & Sharma, 2019). Digital payment technologies such as UPI have increased payment systems' productivity and efficiency by allowing consumers to make financial payments more conveniently. (Singh & Rana, 2017). Customers are requesting UPI designers come up with new and inventive methods for

making transactions due to the advantages (Xiang, Magnini, & Fesenmaier, 2015). Service providers should develop UPI that is quite dynamic, inventive, and adaptive in response to changing user expectations. (Seethamraju & Diatha, 2019). To suit users' requirements, UPI designers have incorporated new technology. Nevertheless, this will not ensure customer reliance or continued employment (Bhattacherjee, 2001b). The underutilization of UPI-enabled payment solutions is a result of many other behavioural aspects of consumer's satisfaction (Shaikh & Karjaluoto, 2015). As a result, UPI service providers should concentrate on the behavioral properties of customer satisfaction (Oliver, 1980; Bhattacherjee, 2001b), including elements affecting post-adoption behavior of the user, such as intent to continue using the product and make referrals (Choi, Han, & Choi, 2015).

The researchers are of the view that satisfaction is an essential measure of the success of an IT/IS system. In general, satisfaction refers to an ex-post evaluation of aggregate consumption experiences following system implementation (Kim & Han, 2009); it can be used to describe or forecast post-system deployment behaviours in an adoptive setting (Ye et al., 2008). An extended line of argument is that technology acceptance (use) cannot guarantee satisfaction (DeLone & McLean, 1992); therefore, it is a must that future research should scrutinize satisfaction and its explanatory variables along with usage and acceptance of IT/IS systems. In contemporary discussions, researchers and practitioners primarily focus on user satisfaction with IT/IS systems in various usage and organizational settings.

Researchers have pointed out that insufficient information is documented about how customers actually use and assess smartphone apps (Wang et al., 2016). For service providers, this poses a significant challenge, especially when they have exhausted more time, money, and efforts to create mobile services and applications. If UPI service providers want to increase app usage, customers should be encouraged to participate in the service. To accomplish this, service providers need to be aware of the variables influencing users' decisions to keep employing UPI solutions. The current study investigates the cognitive and affective elements that determine users' choices to keep using and suggest a UPI service app. In order to improve customers'

desire to continue using UPI service applications, it will be necessary to identify these elements. This will guide the creation and use of policies.

Prevailing adoption frameworks are incomplete and only describe a portion of the issue being studied. Also, the outcomes of the past research have been varying. Additionally, certain works ignore factors that others deem significant. Furthermore, past research works employed a multiplicity of adoption frameworks (such as TAM, TPB, UTAUT, UTAUT2, etc.) for examining the significant factors. These variations and inconsistencies lead to misperceptions and complexity in understanding post-adoption behavior. To completely comprehend the antecedents of a person's choice to adopt a new IT/IS service, the researchers need a comprehensive research model that takes into account all the contemporary, contextual, and relevant factors. Additionally, according to the findings of previous research, there is a dearth of information regarding how people actually use smartphone apps and how they rate their experiences with them (Wang et al., 2016).

The present research augments novel insights in the mass of information already available on UPI users' post-adoption behaviour. The results can be applied to create novel strategies for refining the user experience and maintaining existing customers. In the context of UPI, there is not a lot of research that looks at things from the consumer's point of view i.e., how consumers use mobile applications (Wang et al., 2016). The generally acknowledged theories and models, such as UTAUT, have been used in previous research that has looked at users' adoption intentions. Kim et al. (2008) claim that popular theories like TAM are incapable of giving accurate information about the perspectives of post-adoption consumers.

On the basis of this, it would appear that there is a gap in the published research on the application of mobile technologies in the payment industry. It is difficult to determine whether or not customers are likely to use and reuse the UPI payment system due to the lack of information on how users of the UPI payment system assess their experiences. Due to the narrow perception regarding usage of smart know-how is used in the payment business, investigation needs to be steered to examine and get a comprehensive perception of consumers UPI applications usage, as well as the factors

that impact users' post-adoption behavior in terms of their intentions to continue using the technology and their propensity to recommend it to others. The proposed study has integrated psychological, behavioral, and technological factors with the UTAUT model to explain the variables that affect the continued intention of using UPI.

The significance of this study can be broken down into three parts. Firstly, a limited amount of research has been conducted in the field of digital payments due to the infancy and newness of this technology, particularly in the context of UPI users. Through the course of this study, the researcher hopes to acquire a deeper grasp of how users of the UPI service apps think about the service and how they use it. The insights from the research will help in the designing and execution of UPI apps that will influence users' post-adoption behaviour (i.e., continuation intention and word of mouth). The study will help the relevant agencies make plans and policies for the growth of UPI for cashless payments.

Second, by grasping an understanding of the factors that contribute to post-adoptive behaviour, app developers will be able to capitalize on those factors, which will ultimately have an effect on an individual's propensity to recommend the UPI application to others, thereby ensuring that the resource investment by businesses will result in a profitable return.

Third, the present study provides a comprehensive framework using IT/IS adoption models and extends the existing models with a cognitive, conative, and affective trilogy of mind (Hilgard, 1980). This study aims to test a model of the relationships between customer satisfaction and the cognitive, affective, and conative phases of customer loyalty. Numerous studies have utilized the cognition-affective-conation framework as a reference theory to explain how people absorb information cognitively and behave when making purchases (e.g., Kidwell et al., 2008). Kim et al. (2013) established the validity of the associations between users' engagement drives (conative), perceived value (cognitive), and satisfaction (affective) in a mobile context using this framework. Davis (1993) updated the fundamental technology adoption framework by describing technology acceptance cognitively, emotionally, and conatively

## 1.5 Outline of the dissertation

The thesis is divided into five chapters, their contents are abridged as follows:

- **Chapter One- Introduction**

The purpose of the study is discussed in this chapter. It starts with a background and motivation section that explains why it is necessary. The research question is then discussed in combination with the research's precise goals. The scope of the study is described by providing information about the UPI background and the relationship between the UTAUT model and other variables. After that, the study's potential importance is stated explicitly. The chapter concludes with a thesis outline.

- **Chapter Two- Review of Literature**

The theoretical background and literature relevant to UPI, UTAUT, and selected variables are reviewed in this chapter. The UTAUT model is modified with additional variables in the development of a comprehensive study framework. Trust, security, the pace of innovation, and personal innovativeness are additional variables selected for the study from past studies. This chapter next goes into the theoretical underpinnings of empirical research. The evolution of the UTAUT model, additional variables, and relevant literature are discussed and refined.

- **Chapter Three- Research methodology**

This chapter explains the study's research design and methods. Several scholars' philosophical opinions are explored, and the author's philosophical viewpoint is acknowledged. This chapter includes the objectives of the study, the hypotheses framed, and the pilot testing results. In addition, this chapter explores the specifics of research methodology, such as sampling and questionnaire preparation.

- **Chapter Four- Data analysis and Interpretation**

The outcomes of the data analysis are presented in this chapter. It starts with a description of how the questionnaire was administered. Internal consistency reliability is used to illustrate the measurement structures' dependability. The

research findings are based on descriptive statistics and Structural Equation modeling among other statistical techniques. Several tables and figures are provided to aid in the understanding of statistical findings.

- **Chapter Five- Conclusion and Recommendation**

This chapter contains an overview of the research methodology as well as an interpretation of the findings in accordance with the project's conceptual perspective. Possible explanations are explored, as are some recommendations. Each decisive aspect that influences the continuation and recommendation decision is thoroughly explained. Furthermore, the theoretical and managerial implications of the results are debated. The chapter concludes with potential exploration directions.

# CHAPTER 2: LITERATURE REVIEW

This chapter addresses the framework and theoretical background for the proposed research. An extensive review of the UTAUT and its many modifications are discussed as well. First, the UTATUT model and its extensions is explored for identifying the constructs used by Information Systems (IS) researchers. Second, the final research framework containing eleven factors as extracted from previous studies in this research domain has been condensed into Cognitive, Affective, and Conative behavioral framework. At the end, the chapter concludes the conceptual model and justification of the proposed constructs to extending the UTAUT.

People and businesses must agree on the “value” when buying and selling goods and services. Bartering was used before money for this purpose. Today, sales and purchases are settled with money, which took the place of gold and silver, which was one of the early forms of “moneys”. Later on, governments issued precious metal coins as money, which were replaced by paper money. People adopted paper money and started carrying and transacting with cash. As the banking system evolved, keeping money in a bank account and using "transfer of money in bank accounts" for economic transactions became common.

Keeping the changing nature of money, in recent times, electronic payment and transfer systems have also evolved under the umbrella of ICT, IOT and IT/IS technology infrastructure. According to the detailed Digital Payments Index and Financial Inclusion Index maintained by the RBI, since UPI's launch in 2017, the country has seen a CAGR of 5 percent or more improvements in financial inclusion, and since 2018, the extent of payment digitization has more than doubled. (Niti Aayog, niti.gov.in).

Consequentially, the research on adoption of currencies and payment services among users have also evolved. The next few sections try to capture the essence of existing research for developing a strong foundation for the present study. This chapter advances knowledge by providing a thorough and in-depth analysis of recent studies on electronic payments. It primarily offers an evaluation to explore landscape in the domain of post-adoption of e-payments, which offers insightful perspectives

and points of development for the theoretical framework of the current consumer behaviour research. Reviewing the body of previous work helps to clarify the state of the field's research at the moment and reveals trends in the growth of the field itself. Reviewing earlier papers prevents researchers from doing the same thing twice and identifies critical gaps in the field. In other words, it highlights areas where there are few studies and draws a line through areas where there are many studies, which could be seen as another contribution of the current literature review.

## 2.1 An overview of adoption research

E-commerce has benefited greatly from mobile technology, particularly with the introduction of new payment options like digital payment. By providing quick, safe, and simple ways to complete financial transactions, digital payment may be advantageous for both businesses and customers. However, M-payment is underused in a number of nations, including Malaysia, Singapore, India, and China, as people prefer to use cash to pay for goods and services. (Sahi et al., 2021)

In recent years, an increasing number of studies have devoted discussion to the complexity of the factors that influence the use and adoption of digital payment methods. The lack of clarity surrounding regulatory requirements for mobile payments raises customer security and financial concerns. Digital payment technology adoption has been largely slow or non-existent, which can be attributed to security and privacy issues as well as usage and value barriers,(Balakrishan & Shuib, 2021; Kim et al., 2010; Lee et al., 2015). Therefore, the security issues with the technology have been one of the main concerns in the adoption of any technology in general and of UPI in particular. For instance, according to the findings of Yang et al., (2015) consumers have a more difficult time exercising their rights due to regulatory gaps in the privacy protection offered by mobile commerce.

Previous research has shed light on the pivotal role that trust plays in the adoption of IT/IS; however, very little attention has been paid to investigate the role of post-use trust and its impact on users' continuous-use intention of UPI. The processing of payment settlements is an essential part of economic activity, having a

significant impact not only domestically but internationally, and socially. It is essential for UPI to have visibility and strong confidence from its users in order for the platform to continue to scale up its use. (post-adoption behaviour) (Sahi et al., 2021). The findings a recent study on customer satisfaction, adoption, perception, and behaviour on mobile banking, which reviewed sixty-eight papers, revealed that security is one of the least addressed factors (Kelly & Palaniappan, 2019). It appears adoption of IT/IS systems should be equipped with security features integrated with information technologies to facilitate continued usage, is desirable by individual and businesses

Additionally, the incessant pace of innovations in the information and communications technology sector (ICT) has transformed the scope of payment industries. To enhance adoption there has been a continuum of innovation in the UPI space since 2016. The UPI framework is merely getting started, but the potential for the entire ecosystem is huge. Since the introduction of some new functionalities can boost adoption and have the potential to give end users the next level of digital experiences, UPI has undergone constant innovation. On the one hand, consumers are increasingly able to decide whether or not new technologies are worth adopting. On the other hand, UPI developers, seeking to expand their market shares, encourage the continuing purchase of newer versions of their products regardless of their elapsed technology life cycle. Despite this, a few studies have attempted to define the pace of innovation in order to help in determining how increasing the rate of innovation can increase the likelihood that consumers will adopt new technologies and continue to use them (Hanrahan et. al., 2009).

To determine users' behavioral intentions towards IT, Venkatesh et al. (2003) provided the UTAUT model, or Unified theory of acceptance and use of technology. UTAUT model has been a pillar in technology adoption studies in different domains, including online shopping (Liu & Forsythe, 2011), mobile stocking (Tai & Ku, 2013), technology-based training (Yoo et al., 2012), mobile and online banking (Martins et al., 2014; Oliveira et al., 2014), RFID (Nysveen & Pedersen, 2016), and tablet devices (Magsamen-conrad et al., 2015). It ascertains the ever-growing popularity of the

UTAUT model to assess the behavioral intentions and usage behavior of the users in various fields.

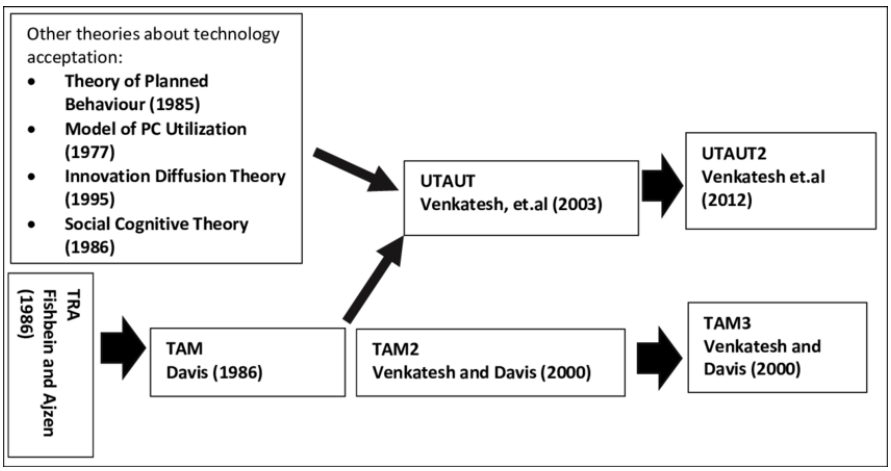


**Figure 2.1** Technological acceptance frameworks

About seven existing theories and models from domains of sociology, psychology and technology, such as TAM (Theory acceptance model), TPB (Technology of planned behavior), TRA (Theory of reasoned action), PC utilization model, SCT (Social Cognition Theory), and IDT (Innovation Diffusion Theory)—were synthesized in to UTAUT (Figure 2.1). UTAUT includes four constructs that are used to determine users' acceptance behaviour with regard to adopting IT:

1. Performance expectancy (PE)
2. Effort expectancy (EE)
3. Social Influence (SI)
4. Facilitating conditions (FC)

Performance expectancy is the belief that using an information system will improve a person's performance at work. Efforts used in an information system are referred to as "effort expectancy." Social influence is characterized as the effect of other people on how a system is used. Infrastructure facilities to use the system are facilitating conditions. It was hypothesized that the four moderators of gender, age, experience, and voluntariness of use would affect behavioral intentions significantly.

Although the UTAUT model has been the main focus of several studies, it is widely acknowledged that the model cannot explain the intricate nature of customer intention on its own. Because of this, the UTAUT model has been extended with a variety of contextual (technology type and geographic regions) variables to account for the various types of digital payments and contextual settings. UTAUT has also been broadly applied in mobile adoption studies but along with additional variables. The model has been extended with satisfaction to examine the acceptance of m-commerce (Min et al., 2008). UTAUT model customized by Khalilzadeh et al.(2017) to analyze the trust issues due to risk and security weaknesses inherent in any technology adoption; the results positively established the significant linkage of trust issues with the customer's intentions of using mobile payment technologies.

Furthermore, the UTAUT model has also been integrated with several other models for identifying the adoption of mobile technologies. Such as, task technology fit model has been combined with the UTAUT model, and the results established that task technology fit, performance expectancy, social influence, and facilitating conditions significantly influenced the adoption of mobile banking in China (Zhou et al., 2010). The task technology fit model and ITM were also combined with UTAUT by Oliveira et al. (2014)and revealed that performance expectancy, trust, technique features, and task technology fit are the main antecedents in identifying users' intentions for the adoption of mobile banking. After that, different researchers used the UTAUT model to figure out intentions of users to keep using mobile technology and to recommend it to others (Chopdar & Sivakumar, 2019; Marinkovic et al., 2020). Given the complexity of the determinants affecting usage and adoption of digital expenditures, there is an urgent need for more theoretical development in this area due to these limitations. In the theoretical foundation of this study, UTAUT is extended by combining it with personal innovativeness, pace of innovation and hence present study is based on the premise that for UPI adoption can be better understood by counting for the effect of added factors.

## 2.2 Theoretical framework for the study

To enhance our awareness of post-adoption behaviours in the UPI context, this study evaluated the key drivers of continue usage and recommending intentions, both are two significant post-adoption behavior's.

## 2.3 Affective Phase Factors

The affective phase is defined as the user behaviours that reflect their individual feelings toward an object and how those feelings influence their behaviour (Pappas et al., 2016). A user's affect can either demonstrate optimistic or pessimistic belief toward the things, give evaluation of the project under consideration, and are regarded as an important component of their attitude toward the product (Wilkkie, 1994). The results of a study by Zang (2013) suggest that an individual's affective states help in explaining significant variance in both their cognition and behaviour. In the same study, the author concluded that affect also has a significant influence on decision-making behaviour as well as the shopping behaviour of consumers. Experts of information system domain have shown a great deal of interest in affective factors like satisfaction, which has also been the factor that has been used in continuance intention research most frequently. Satisfaction is established as a factor that has the greatest impact on continuance intentions in the IT domain (Nabavi et al., 2016).

In addition, the incorporation of affective constructs enables a more in-depth understanding of the factors involved in the application of new information systems in a variety of settings, which is especially important in light of the increased availability of information technology for individual usage. A deeper comprehension of the effective state will lead to practical implications for the development, acceptance, and management of communication and information (Zhang, 2013).The concept of satisfaction, which was included in the ECM in its initial form, is a part of this study

### 2.3.1 User satisfaction

Users' satisfaction is measured by how happy they are with how well they understand a digital payment system (Rai et al., 2002). Customer satisfaction has an

effect on a specific company's direct user experience, which may have a significant impact on the intention to continue adopting technology (Wang et al, 2019; Bhattacherjee & Hikmet, 2008).Customer satisfaction in e-commerce refers to how they felt overall and how they rated the goods and services in general. Any new technology's success is heavily reliant on how well users perceive and are satisfied with the services they receive. Therefore, e-payment adaptation is only feasible when users are happy and have high expectations. The study selected the factors mentioned in the literature in table 2.1in order to better understand the causes of satisfaction with e-payments. Prior research has shown that factors such as performance expectations, effort expectations, facilitating conditions, social influence, and individual creativity are crucial for boosting user satisfaction with a variety of e-commerce services. In the present study, five factors are included that influence the user satisfaction with UPI-based payment practices namely performance expectancy, effort expectancy, facilitating conditions, personal innovativeness, and social influence. The impact of these factors is analyzed on the user satisfaction of UPI-based payment practices.

**Table 2.1: Review of studies on satisfaction in relation to research on IT/IS post-adoption**

| **Authors** | **Year** | **Theoretical Model** | **Context** | **Findings** |
|---|---|---|---|---|
| Chen et al. | 2009 | TR<br>TAM<br>TPB | Self-service technologies (SSTs) | Satisfaction influenced by ease of use, perceived usefulness, subjective norms, behavioural control.<br>Innovativeness has a positive effect on satisfaction |
| Rajeh, et al. | 2021 | ECT<br>TPB | E-learning | Students were satisfied (median = 3.5). Perceived usefulness and confirmation affected student satisfaction |
| Al-Busaidi & Al-Shihi | 2012 | | Learning Management System (LMS) | The findings indicated that personal innovativeness, is a key factor to instructors' satisfaction of LMS in blended learning. |

| | | | | |
|---|---|---|---|---|
| Weng, Tsai &Weng | 2015 | SIT | employees' learning | Peer and supervisor support affects trainees' learning satisfaction, while family support affects their participation. |
| Chen et al. | 2013 | TAM Moderated by relationship quality | E-Appointment systems | Perceived ease of use and perceived usefulness impacts continuance intention through satisfaction and trust. |
| Al-Maroof & Salloum | 2021 | Flow theory, IS expectation confirmation model and DeLone and McLean IS success model | Google Classroom | Perceived usefulness and usability affected satisfaction. |
| Isaac, et al. | 2019 | UTAUT | Internet usage | Performance expectancy, effort expectancy, social influence, and task technology fit indirectly influenced user satisfaction. |
| Rodrigues et al. | 2016 | UTAUT | E-government | Confidentiality, trust, facilitating conditions, attitude toward technology use, performance expectancy, and effort expectancy have increased user satisfaction and adoption of e-government services in UAE. |
| Singh, et al. | 2020 | UTAUT | M-wallets | Innovativeness, stress to use, and social influence moderated mobile wallet users' satisfaction and recommendation. This showed that usefulness, ease of use, attitude, and perceived risk affect user intentions, which affects mobile wallet user satisfaction and recommendation. |
| Venkatesh, et al. | 2010 | UTAUT | E-government technology (smart cards) | Performance expectations, effort expectations, and facilitating conditions had a direct effect on citizens' satisfaction with smart card adoption, but social influence |

| | | | | |
|---|---|---|---|---|
| | | | | had no effect on citizens' satisfaction with mandatory e-government technology adoption. |
| Alshurideh et al. | 2020 | TAM ECM | Mobile Learning System (MLS) | The study found that social influences influence positively satisfaction. |

### 2.3.2 Performance Expectancy-

Performance expectancy (PE) is defined as extent to which people believe that adopting that technology will assist them to complete their tasks. Perceived utility, relative advantage, job fit, extrinsic motivation, and outcome expectation are its five constructs (Venkatesh et al., 2003). It reflects the apparent benefits and utilities that can be expected from the adoption of technologies. Various mobile technologies have used UTAUT in studies to determine users' intentions to adopt innovative technologies and intention to continue using them (Zhou, 2011; Lai & Shi, 2015; Chodar &Sivakumar, 2019). According to Tam et al. (2018), performance expectancy was discovered to be a significant predictor of customer satisfaction and continued intention to use mobile technology (Marinkovic et al., 2020; Chong, 2013). In various studies PE have significant influence on customer satisfaction in mobile apps (Tam et al., 2018), mobile shopping (Shang & Wu, 2017; Agrebi & Jallais, 2015), m-commerce (Chong, 2013; Marinkovic & Kalinic, 2017), mobile insurance (Lee et al., 2015) and mobile services (Rezaei & Valaei, 2017).

### 2.3.3 Effort expectancy-

Prior studies have used effort expenditure (EE) to determine the intentions of users to continue using mobile and information technologies (Venkatesh et al., 2011). (Yuan et al., 2016; Chodar & Sivakumar, 2019). Through PE and customer satisfaction, EE has shown that it has a significant effect on the continued use of technologies. The results of the authors' use of UTAUT in mobile commerce studies showed that effort expectancy significant impact on users continued intentions the

devices (Marinkovic et al., 2020), and these findings were also supported by other studies (Yeh and Li, 2009). Studies established a significant impact of EE on customer satisfaction in the m-commerce domains (Marinkovic & Kalinic, 2017; Marinkovic & Kalinic, 2020), m-insurance, and m-shopping (Shang & Wu, 2017; Agrebi & Jallais, 2015). (Lee, Tsao, Chang, 2015).

### 2.3.4 Social Influence-

Social influence (SI) is the process by which individuals alter their beliefs, perspectives, or behaviour to accommodate the demands of the social environment and interpersonal relationships. According to many experts, social impact can be taken into account as an expected determinant of people's intentions to use technology (Venkatesh et al., 2003). SI influenced user satisfaction and their continuance intentions positively and significantly in mobile technology context (Hsiao et al., 2016; Marinkovic et al., 2020). Most of the time, when people who matter to the user advise them to use a certain technology, they may follow their advice (Agarwal & Prasad, 1997). As a result, the growing popularity of self-service technology encourages users to stick with it because they receive personalized support.

### 2.3.5 Facilitating Conditions

When someone says there are "facilitating conditions," they mean they think there is organisational and technical infrastructure support for using the system. Customer service, mobile devices, and an internet connection are considered to be facilitating conditions for using UPI services in this context. Online services in South Korea were found by FC to have a positive influence on consumer satisfaction (Gholami et al.,2012; Park, 2020). User satisfaction in massive open online courses was significantly impacted by facilitation conditions (Liyong et al., 2020).

### 2.3.6 Personal innovativeness

One of the most significant and determining factors of technological innovation adoption intentions has been considered to be an individual's capacity for innovation. Users can adopt innovation in the world of information technology thanks to a unique feature (Agarwal & Prasad, 1998). A user's attitude toward embracing new technology can be described by the personality trait known as personal innovativeness. It illustrates how inventive a person is when measured against others. It clarifies the criteria for favouring or rejecting novel concepts. A high level of individual innovation ensures that technologies are utilised to their fullest extent (Khan & Qutab, 2016). Users who are highly innovative personally are eager to adopt novel concepts. It exhibits a readiness to apply innovations (Agarwal & Prasad, 1998). According to Khan et al. (2019) there are positive and significant effects of individual creativity, the calibre of digital capital, and the general usability of the digital information on user satisfaction.

We assume that these five variables are zero-order and reflective in nature and that they have an impact on users' satisfaction using UPI services. It is presumable that users' satisfaction using UPI services is an endogenous construct with zero-order reflective characteristics. In order to study how the adoption factors affect user satisfaction with the UPI-based payment practices, a structural model (SEM model) is developed, assuming the five factors to be exogenous constructs. The following hypotheses are put forth to investigate the impact of satisfaction:

*"There selected factors (performance expectancy, effort expectancy, facilitating conditions, personal innovativeness, and social influence) significantly influences the user satisfaction of UPI based payment practices"*

## 2.4 Conative Phase Factors

The likelihood or tendency of an individual to act or exhibit a certain action or behaviour is referred to as conative behaviour (Wilkie, 1994). To put it another way, conative behaviour is an expression of an end user's intention that represents the likelihood of acting in a particular way (Kim et al., 2013). In this particular study, the conative phase factors include both the intention to continue and the intention to

recommend. Bhattacherjee (2001b) explained that the decision to continue using an IS is based on a sequence of events, beginning with the user's initial acceptance of the product and continuing with the user's first experience of using the product. An ex-post decision is one that is made by the user after initial use regarding continued use or a reversal of the decision made initially. In addition to the concept of continued use, this study also incorporates the concept of the intention to recommend (Harrison-Walker, 2001). The term "recommendation intention" refers to a user's willingness to recommend a product or service to other users. Scholars explain the significance of recommendation intention and its impact on consumer behaviour and attitudes, arguing that it is more effective than company recommendations communicated through traditional media (Lee et al., 2012). This is due to the fact that recommendation intention influences consumer behaviour and attitudes. The recommendation intention of a customer serves as a source of information for other customers, is commonly regarded as more reliable, and has a greater influence on the reputation of a company (Kim & Kim, 2010).

### 2.5 Continuance Factors

Maintaining customers and facilitating their continued usage, which is crucial for service providers, has been made easier by the fierce competition between UPI providers and the low switching cost for users. Customers could easily switch from one service to another, which makes it obvious, why it's important to retain them. Therefore, it is vital to know the causes of UPI's ongoing use. Few studies have looked specifically at the ongoing use of mobile payment services after adoption, including constant use of the UPI.

The development of long-term relationships with customers, value proposition, and the assurance of a prolonged life of service, these all play a major role in the maintenance of payment technology. Consumers will probably keep using mobile payment technologies as long as their needs are met as effectively as possible. The majority of researchers have focused on satisfaction as the motivator of continuance behavior (Rajeh et al., 2021), and have found it to be a significant determinant. A few studies have taken other factors like security and trust into

account (*see* Table 2.2). Moreover, Gao et al.,(2015) revealed the effect of effort expectation, performance expectation, and social influence on continuance use of e-payments. Some empirical research studies' findings, however, are not definitive. For instance, mixed findings were reported regarding the impact of perceived trust and satisfaction (Li & Xue, 2021). Despite their importance, the relationship between perceived security, personal influence, and demographic factors and continuance intention to use e-payments has not yet been thoroughly researched. There are existing studies that take into consideration user traits related to continuance intentions in addition to continuous usage intentions, such as personal innovativeness are scarce (Park & Lee, 2010).

A review of studies on factors affecting Continuation Intentions

**Table 2.2: Review of the Factors affecting Continuous intention**

| **Authors** | **Year** | **Theoretical Model** | **Context** | **Findings** |
|---|---|---|---|---|
| Rajehet al. | 2021 | ECT<br>TPB | E-learning | Satisfaction was the strongest predictor of students' continued intention |
| Hsieh et al. | 2015 | Attribution Theory | e-Portfolio | Satisfaction and attribution drive users' e-Portfolio continuous intentions, not PU and attitude. |
| Rho et al. | 2015 | Experimental Design | Telemedicine services | Perceived usefulness and ease of use accelerated continued use. Satisfaction only increased public healthcare users' intention to use. |
| Rouibah& Al-Hassan | 2019 | ECT | MIS | Results show that "Wasta" (a cultural factor) affects continuous intention through satisfaction. |
| Kim-Soon et al. | 2016 | ECT | Mobile Learning ; | Perceived performance influences student satisfaction and continued M-learning use. User satisfaction influences m-learning use. User satisfaction mediates between perceived performance and continued M-learning use. |

| | | | | |
|---|---|---|---|---|
| Hsieh & Hsu | 2015 | Mentoring theory | IS | Through perceived usefulness, satisfaction, and continuous intention, mentoring aids in IS adaptation. |
| Zhu et al. | 2013 | ISSM TAM | traveling websites | An information quality, system quality, service quality, perceived playfulness, perceived ease, perceived usefulness, customer satisfaction, and continuance intention paradigm was proposed in this study. This paradigm could clearly explain the process behind potential customers' ongoing use intentions. |
| Zang et al. | 2019 | TAM | Mobile payment | Perceived security influences continuance intention to use mobile payments. |
| Park & Oh | 2019 | TAM | Cloud services | Fault recovery and compliance impacted trust and continuous use. Only trust is affected by service interruption and personal information leakage risks. The findings show that trust also affects continuous use intentions. |
| Park & Lee | 2010 | | Twitter (SNW) | Twitters' continuance usage affected by perceived enjoyment, social presence, perceived ease of use. |
| Lee et al. | 2019 | UTAUT2 | Food Delivery apps | This study validates the significance of information, habit, quality, performance expectancy, social influence in influencing food delivery app users' continuous use intention |
| Al-Busaidi & Al-Shihi | 2012 | Exploratory Design | LMS-(Learning Management System | Instructors' satisfaction affects intentions of LMS users for distance and blended leaning. |
| Lu et al. | 2017 | ECT | m-Payment | Social influence beliefs drive user continuous intentions. |

| | | | | |
|---|---|---|---|---|
| Koo & Chung | 2014 | SDT | Smart Green IT | Social influence drives user continuous intentions. |
| Wu & Chen | 2015 | IS- success model | Facebook educational usage intention. | This study shows that social influence affects users' intention to use Facebook for learning. |
| Chen et al. | 2013 | TAM-Extended | Hospital e-appointment system | Perceived ease of use (PEOU) and perceived usefulness (PU) influence continuance intention through satisfaction and trust. |
| Kim et al. | 2019 | VAM ECM | Accommodation app services | The influence of satisfaction proved to be important in inducing continuous intention to use accommodation apps. |
| Al-Maroof et al. | 2021 | TAM-Extended | E-learning | PEOU and PU affect the continuous intention to use technology. |
| Al Amin et al. | 2021 | TPB | Mobile food delivery apps | Subjective norms were related to continued use of MFDAs, perceived food safety to behavioural intention, and social isolation to continued use. |

### 2.6 Satisfaction and Continuance Intentions

Theoretically, satisfaction refers to the subjective feeling of happiness or dislike that consumers experience after comparing their assessment of the performance of the product to their expectations (Armstrong et al., 2014). Existing experimental research on social networks has demonstrated that users' intention to continue use intention is primarily influenced by their satisfaction. Similarly, User satisfaction is a crucial precondition for the banking services' continued use during the initial trial. According to Abu-Salim et al. (2017), “customers’ service-usage continuance intentions are associated with a service provider’s ability to attain and retain customer loyalty by ensuring customer satisfaction.” Some of the major issues

in smart city contexts include lower user satisfaction and low usage-continuance intention (Peng et al., 2017).

Customers who are pleased with the service's performance will almost certainly take positive steps to reuse the technologies. The authors discovered that user satisfaction affects users continued intentions making mobile purchases (Gao et al., 2015). Furthermore, satisfaction found as other factor of UTAUT model that influenced consumers continuance intentions of using IT (Alghamdi et al., 2018). Several studies (e.g. Zhou, 2011; Deng et al., 2010; Lee et al., 2007) have found that satisfaction influences how likely people are to continue using IT. Research on other mobile technologies supports similar findings, including mobile apps (Hsaio et al., 2016; Tam et al., 2018), mobile banking (Liebana- Cabanillas et al., 2017; Susanto et al., 2016; Yuan et al., 2016), mobile payments (Dlodlo, 2014; Cao et al., 2014).

Satisfaction also had a positive impact on the intention to continue in enterprise resource planning (Chou & Chen, 2009). User satisfaction has also been identified as a useful variable for researching the intention to continue using MOOCs (Wan et al., 2020). The experience users have when using technology, how well it solves their problem, or how much they feel like they belong in the technology all contribute to their satisfaction with the technology. This increases the likelihood that the user will stick with the technology and continue to use it (Han et al, 2018). In line with previous findings, it is our opinion that satisfaction is a precursor of continuance intentions in technology service context.

## 2.7 Trust, Security, Pace of Innovation and Continuance Intention

### 2.7.1 Trust

Trust can be defined as the state of people's beliefs about their intentions and potential measures that will lead to reliable and capable behaviour (Grazioli&Jarvenpaa, 2000; Gefen, 2000). Customers' mental expectations to believe technology can provide reliable services can be positively shaped by trustworthiness (Cho et al., 2019), that means consumers a privileged growth of reliability from

technology and a higher enthusiasm to continue using that technology (Zhao & Bacao, 2020). Furthermore, Trust has been established as a new UTAUT variable that reflects users' subjective perceptions of security in the face of risk and uncertainty and that significantly impacts their behavioural intentions. (Khalilzadeh et al., 2017; Shao et al., 2018).

Meantime, trust found as an important determinant of users continuance intentions of using mobile technologies (Hung et al., 2012; Gao et al., 2015; Zhou, 2013).Among Chinese consumers, trust was discovered to be the most important determinant of m-commerce continuation intentions (Chong, 2013). Gao et al. (2015) found the factors of continuance intention in m-commerce study and exposed that trust impacts future purchases positively. Further the impact of trust on continued use of m-banking and m-payments studied in literature (Sustano et al., 2016) and (Cao et al., 2018).

### 2.7.2 Security

The quality of security available will influence users' decision to use any digital payment system (Huang, 2012). The security of digital payments influenced their continued use. User intentions toward e-payment systems are influenced by risk perception, trust, and serviceability (Sevgi et al., 2010); high security and privacy concerns lead to a lower proclivity to use m-payment (Chen &Nath,2008). Customers' trust in digital payments is linked to their perception of the system's security because these payments involve greater uncertainty and risk because they operate in a simulated and wireless setting, are infected with viruses, stolen; data leakage, and online frauds.

### 2.7.3 Pace of Innovation

The pace of innovation is the frequency at which new advancements/technological developments take place. Users are more ready to stick

with new features offered by digital payment systems because they are growing at a dramatic rate (Cabanillas et al., 2017, Sandeep & Rupinder, 2022). When compared to other technologies, UPI is moving quickly in India, with advancements happening frequently. Only 10percent of the total of consumer expenditure is currently digital, therefore there is plenty of room for all competitors. UPI will play a role in promoting deployment as a speedy and economical mode for small transactions like medical, daily necessities, grocery, healthcare, health & hygiene, investments, OTT and media. A social media study shows that pace of technological innovation has no impact on intentions to use it (Camilleri, 2019).

### 2.7.4 Personal innovativeness (PI) & Continuance Intention

A negligible research has been conducted on the outcome of personal inventiveness in a post-adoptive contextualisation (Lu,2014). Behaviorists have acknowledged the lasting impact of personality on a wide range of conative responses, including intentions and behaviors (Ajzen, 2005). Innovation research has a long history of examining personal ingenuity as a cause of cognitive style differences (Rogers, 1995; Scott & Bruce, 1994). A person with a high PI is more likely to detect novel situations or inconsistencies and engage in adaptive system use. According to Engestrom et al. (1998), the innovative nature is a reflection of active cognitive thinking.

After a system has been adopted, IS researchers frequently believe that users can continue discovering and adopting new features (Jasperson et al., 2005). This allows users to demonstrate their creativity in post-adoption behaviour. To put it another way, creative people are more willing to accept the risk that comes with modifications and to use them in creative ways. In m-commerce, context-specific innovativeness influences continuation intent positively (Lu June, 2014). Personal innovativeness should therefore play a significant role in influencing post-adoption continuation decisions regarding UPI services. UPI users who are more innovative, tolerant, and confident in their ability to adapt to frequent changes are more likely to maintain usage.

## 2.8 Recommendation Intentions

Until recently, the only success factor considered for an IS system was the intent to continue. Information system success is no longer determined solely by the intention to continue usage. The influence of word-of-mouth (WOM) on the intention to recommend is significant (Keiningham et al., 2007; Morgan & Rego, 2006; Reichheld, 2003). Experts investigated the relationship between continued usage intention and word of mouth in different domain including transportation self- service terminals, mobile banking, and Web2.0 (Chen et al., 2012, choi et al., 2015, sheikh & Karjaluoto, 2016). A study of Chen et al. (2012) established that WOM has a significant effect on continuance intention with Web 2.0.

Satisfaction and social factors also affect the spread of word-of-mouth. The study of Shaikh and Karkaluoto (2016) examined the factors of word of mouth in the mobile banking domain. The authors revealed that

Shaikh and Karjaluoto (2016) investigated the antecedent of WOM in the context of mobile banking. The authors found that WOM has been significantly influenced by continued intentions. According to the authors, this is an expected outcome because user satisfaction and perceived value both affect users' intentions to continuing using the service that in turn affects users' tendency to suggest the system with other. Regarding the effect of continued intentions on WOM, Choi et al. (2015) made a contribution to the debate. Similar to prior studies, they found that users' propensity to recommend has a considerable impact on their continuance intentions. Furthermore, the researchers found that product characteristics, such as wifi, product information, and aesthetics, directly affect WOM.

WOM is essential as users' intentions to recommend have a substantial impact on other people's behavior and attitudes (De Matos & Rossi, 2008). However, there is still debate among academics regarding the impact of continuation research on WOM. This study considers recommendation intent to be the most important aspect of an information system and investigates its factors in the context of the UPI service. Given the continuing interest of scholars and the contradictory findings, the following hypothesis is framed:

*"Continuance intention significantly influences the user intentions to recommend"*

**Table 2.3 Review on Recommendation Intentions**

| Author | Year | Theory | Context | Findings |
|---|---|---|---|---|
| Xu et al. | 2015 | VSL | M-apps | App satisfaction and app retention are direct antecedents of recommendation intent. Non-monetary sacrifices and utilitarian benefits also affect app satisfaction and app continuation. |
| Hartono et al. | 2021 | UTAUT 2 PTS | Telemedicine | This study found that frequent use of mobile telemedicine affects recommendation intentions. |
| Rahi et al. | 2022 | SDT ESM | Internet banking services | this study confirmed the relationship between user continuance intention and intention to recommend. |
| Vishnani et al. | 2022 | | Mobile banking users | Satisfaction and continuance intention play role of mediator between ease of use and recommendation intention and cost and recommendation intention. |

## 2.9 Research Gaps

The review of previous studies has led to the identification of the following research gaps that provide basis for this research:

1. Online payments have changed consumer behaviour in the payment space by transforming traditional payment methods into digital services. In information system literature, Users' continued intentions has not been observed thoroughly, particularly in UPI perspective.
2. Post-adoption and its interplay with trust is one of the least discussed areas. Existing research has not deeply investigated the role of trust in the continuation of digital payments. Most of the research papers were on digital payment adoptions, while those on post-adoption trust are very rare.
3. There is a need to investigate the effect of perceived security on consumers' continued use, particularly with regard to UPI services. Mobile services are more likely to be susceptible to the threat of a security compromise than wired

ones are. This might hinder the adoption of some technologies, such as mobile payment systems.

4. The pace at which innovations are taking place in UPI technology to add value to existing services is notable. The degree to which a user accepts such innovation can impact the user's intention to continue. It is necessary to specify how accelerating innovation boosts consumers' likelihood to embrace new technology.
5. Personal innovativeness is deemed a significant factor of continuation intention as well as an important predictor of customer satisfaction. There is no existing study that highlights PI as a contextual factor in UPI services.
6. An extension of the UTAUT model to measure affective and conative phases in the UPI post-adoption period has been proposed. There is a need to check the relation between user satisfaction and continuance and recommendation intention of using UPI through the extended model.

## 2.10 Summary:

There is need to explore continuance and recommendation intention of this technology in the current scenario. Researchers caution that theories are frequently used incorrectly, which leads to the creation of erroneous relationships (Bhattacherjee&Barfar, 2011). It's important to add constructs in a meaningful way if the theory in the information system field is to be extended appropriately (Nabavi et al., 2016). Context is crucial for the study of information system because it is the "situational opportunities and constraints that affect the occurrence and meaning of behavior". Many IS frameworks and models have incorporated context in their models. This study develops a comprehensive model, which extends the UTAUT model with personal innovativeness, perceived security, trust, satisfaction, and pace of innovation to explain how users' continuous-use intention and referral intention are affected.

# CHAPTER 3: RESEARCH METHODOLOGY

In this section, the methodologies and procedures used to fill the research gaps outlined in the earlier chapters are discussed. The primary goal of the research is to examine the variables that contribute to user satisfaction with UPI services and to examine its impact on a users' decision to continue using the service or to recommend it to others. The details of data collection and methods is also described. The criteria that are used in user surveys are explained using population description and sampling methods, which are then followed by information on data analysis methodology, which summarizes the validity and reliability concerns of the survey.

## 3.1 Conceptual framework

In the literature review, we have discussed antecedents of satisfaction that are drawn from previous studies. The antecedents of satisfaction are PE, EE, SI, FC and PI. In this study, the satisfaction of users is likely to have a positive impact on continuance intentions. The continuance intentions are also affected by other contextual factors such as Trust, Security, Pace of Innovation. Lastly, based on previous literature, CI is likely to have some impact on recommendation intention. The conceptual framework and hypothetical relationships are presented in Fig. 3.1.

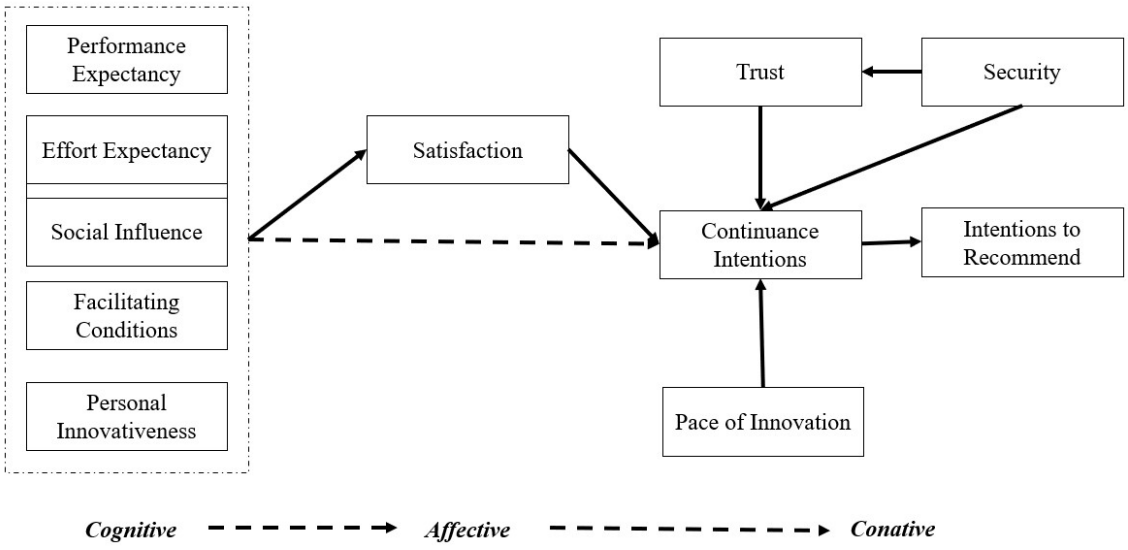


**Figure3.1: Conceptual framework for the study**

### 3.2 Research questions and objectives

Keeping in view on the importance of UPI and from the research gaps identified by the existing literature, it is proposed to study **Continuance and recommendation intentions of users**- An Empirical Study. The following are the research questions:

- ✓ What are the current trends in usage of UPI in India?
- ✓ What is the security and trust factors affecting UPI based transactions in Indian Banking Sector?
- ✓ What is the impact of UPI based transactions on continuance and recommendation intentions of users?
- ✓ How innovativeness of this technology is perceived by users?

The key objectives of this research to study the factors that influences the users' satisfaction of UPI based payment, to examine the impact of perceived security factors on users trust and their influence on intention to continue using UPI, to study the continuance and recommendation intentions of UPI system by users through the mediating role of user's satisfaction and to finally to measure the impact of pace of technology innovations and personal innovativeness on continuance intention. The objectives are listed hereunder:

- **Objective 1:** ***To study the factors affecting the user's satisfaction of UPI based payment practices.***

This objective aims to identify and study the factors which influences the the users' satisfaction of UPI based payment practices. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method.

The alternate hypotheses under this objective are:

- $H_{1a}$: "Performance Expectancy is positively related to UPI payment service satisfaction of users."
- $H_{1b}$: "Effort Expectancy is positively related to UPI payment service satisfaction of users."

- $H_{1c}$: "Social Influence is positively related to UPI payment service satisfaction of users."
- $H_{1d}$: "Facilitating Conditions are positively related to UPI payment service satisfaction of users."
- $H_{1e}$: "Personal innovativeness is positively related to UPI payment service satisfaction of users."

- **Objective 2:** ***To examine the impact of perceived security factors on users trust and its influence on intention to continue using UPI***

This objective aims to identify and study the impact of perceived security factors on users' trust and its influence on intention to continue using UPI. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method. The alternate hypotheses for this objective are:

- **$H_2$**: "Security in UPI is positively associated with users' Trust in UPI."
- **$H_3$**: "Security in UPI is positively associated with continuance intention of using UPI."
- **$H_4$**: "Trust is positively related to continuance intention."

- **Objective 3:** ***To study the mediating role of user's satisfaction on continuance intentions and the effect of continuance intentions on recommendation intentions of users of UPI***

This objective aims to identify the continuance and recommendation intentions of UPI system in users of Northern region of India through the mediating role of user's satisfaction. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method. The hypothesis under this objective are:

- **$H_5$**:"User satisfaction has a positive and significant effect on continuance intentions"
- **$H_6$**:"User satisfaction mediates the relationship between PE, EE, SI, FC, PI and continuance intentions in UPI platforms"

Sub- Hypotheses for the previous main hypothesis are:

- *$H_{6a}$**:** "User Satisfaction from using UPI- based payment system significantly mediates the relationshipbetween performance expectancy and continuance intention to use."*
- *$H_{6b}$: "User Satisfaction from using UPI- based payment system significantly mediates the relationship between effort expectancy and continuance intention to use."*
- *$H_{6c}$**:** "User Satisfaction from using UPI- based payment system significantly mediates the relationshipbetween social influence and continuance intention to use."*
- *$H_{6d}$**:** "User Satisfaction from using UPI- based payment system significantly mediatesthe relationshipbetween facilitating conditions and continuance intention to use."*
- *$H_{6e}$**:** "User Satisfaction from using UPI- based payment system significantly mediates the relationshipbetween personal innovativeness and continuance intention to use."*
- **$H_7$**: "Continuance intentions of using UPI is positively associated with Intention to recommend."*

- **Objective 4: *To measure the impact of pace of technology innovations and personal innovativeness on continuance intentions.***

The objective aims to find how the effect of pace of technology and personal innovativeness affects continuance intentions of UPI users. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method.

- **$H_8$**: The perceived pace of innovation has a positive and significant effect on their intention to use UPI

- **$H_9$**: Perceived personal innovativeness has a positive and significant effect on their intention to use UPI

### 3.3 Population for the study

To realize the objectives of the present study, existing UPI users will be considered from selected cities in Punjab, Haryana, and Himachal Pradesh. Ludhiana, Amritsar, Jalandhar from Punjab; Faridabad, Gurugram, Karnal from Haryana; Shimla, Solan from Himachal Pradesh. These cities are largest and most populated cities, famous for their tourism, commercial, industrial, financial and technology, transportation and other business activities. Therefore, these cities are likely to populate the desired respondents. Respondents will be service-class people, businessmen, professionals, retired people, and students, as this study considers UPI users in general. The researcher does not distinguish among the users based on their personal, demographic, or personal characteristics (except; region and literacy).

### 3.4 Sample size and selection

Since the sampling frame of the respondents is not available, the probability sampling method is difficult to apply. Thus, the proportionate stratified sampling method is used in the study to select the respondents for the study. The respondents for the research study are the citizens performing the digital financial transactions using UPI in the states of Punjab, Haryana, and Himachal Pradesh, which are representative of Northern India. Most of the literate people make use of the digital payments system, so we will focus on people who are using UPI.

According to Krejcie & Morgan's (1970) table for determining sample size, a 384-sample size is deemed sufficient when the population is more than 10,00,000). Additionally, in social science research, Stevens (2012) concluded that the "sample size should exceed fifteen times the number of predictors." Although it can be difficult to identify the ideal sample size for structural equation modelling research, MacCallum and Austin (2000) believe that a sample size of 200 is adequate. DeVellis (2017) asserts that N = 300 might be sufficient for a one-dimensional scale with 20

items. The ratio ranges from 1:4 to 1:10, that is, for every one item measured, four respondents are required to justify the sample size (Hair et al., 2017). In this research, about 60+ items were estimated to be measured on a 7-point Likert scale (60 * 10 = 600). Thus, at least 600 respondents are needed for this research.

Hence, a 651-person sample size is considered more than sufficient for this research. The appropriate sample size of a study was estimated by the number of items measured in the questionnaire. The number of questionnaires will be distributed on a proportionate basis based on the populations of these states. The interviewers began by asking each person who indicated their interest in taking part in the study how frequently they utilize m-commerce services. This was done to make sure that the sample would only include frequent users who used these services once a week or more or regular users who engaged in digital payments many times each week.

The UPI transactions per capita for these states were obtained from *www.digidhan.com* (maintained by the GOI). On the basis of per capita transactions, the sample was decided using the proportionate sampling method. The detailed sampling design to arrive at the final sample size for each selected state is given in Table 3.1.

**Table 3.1: Sample determination using UPI transactions per capita**

| State | UPI Transactions/capita | Proportion | Sample |
|---|---|---|---|
| **Haryana** | 9.18 | 73.10 | 475 |
| **Punjab** | 1.33 | 10.56 | 70 |
| **Himachal Pradesh** | 2.05 | 16.34 | 106 |
| | | **N** | **651** |

### 3.5 The research instrument

The primary data have been gathered with the help of structured and standardized questionnaire adopted from previous research studies. The questionnaire used in this research is divided into two parts, General/ Demographics, and itemized

Likert scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (7) to measure variables under scrutiny. The final questionnaire is attached as Annexure-I.

After a vast literature review, the instrument was prepared for this study. Table 3.2 details the factors and number of items included in the first draft along with sources of scaled items.

**Table 3.2: Sources referred for item identification and scale development**

| Factor | No. of Items (First Draft) | Sources |
|---|---|---|
| Performance Expectancy | 13 | Venkatesh et al. (2003) ; Zhou (2010); Zhou et al., (2010); Im et al., (2011); Martins et al., (2014); Silveira (2012); Rehman et al. (2020); Escobar-Rodríguez et al. (2014), Thomas et al. (2013), Khechine et al. (2014);Javedsarfraz, (2017); Anup Kumar et al. (2018); Bhattacherjee (2001); Wan, (2020) |
| Effort Expectancy | 9 | Agrebi and Jalais, (2015); venkatesh et al. (2003); Venkatesh et al. (2012); Tao Zhou, (2011); Lu June, (2014); Wan (2020) |
| Social Influence | 8 | Attuquayefio&Addo (2014); Venkatesh et al. (2003); Zhou et al. (2010); Escobar-Rodríguez et al. (2014), Thomas et al. (2013), Khechine et al. (2014); Javedsarfraz(2017); Kumar et al, (2018); Bhattacherjee (2001); Wan (2020) |
| Facilitating Conditions | 6 | Venkatesh (2003); Myungsookang et al. (2011); Jalayer et al. (2017); Samuel, (2014); Venkatesh et al, (2012) |
| Personal Innovativeness | 12 | AygulTuran, (2015); Alkawsi, (2021); Goldsmith &Hofacker (1991); Kamboj& Joshi, (2020) |
| Satisfaction | 9 | Gupta et al, (2020); Dayour et al. (2019); Goldsmith and Hofacker (1991); Han et al. (2018) |
| Continuance Intention | 12 | Kim et al. (2007); Guo et al. (2016); Indrawati, (2018); Lin & Wang (2012); B. Wu & Chen (2017) |

| | | |
|---|---|---|
| Trust | 13 | Venkatesh, (2003); Jalayer et al., (2017); Jarvenpaa et al., (1999); Venkatesh, (2011); Zhen et al., (2018); Kim et al., (2010) |
| Security | 8 | Jalayer et al. (2017); Salisbury et al. (2001), Kim et al. (2010); Pal et al., (2019) |
| Pace of Innovation | 6 | Grewal et al., (2004); Camilleri, (2019) |
| Intentions to Recommend | 6 | Gupta et al., (2020); Jung et al., (2015); Self |

*Source: Author compilation*

### 3.5.1 Content validity

The second stage of this study involved the pre-testing of the survey instrument by expert panel to ensure its content validity. All items were given a numerical value from 0 to5 by the panelists, based on their relevance. The scores were recoded as 0 (if relevance score is less than or equal to 3), and 1 (if relevance score greater than 3)

Three members each from teaching faculty, experts, and researchers were consulted in order to verify and validate the structured questionnaire used in this study. For clarity and improved data collection, we made some adjustments to the wording and order of the questions based on their comments and suggestions. Therefore, the experts were requested to judge on face validity of instrument as well. The experts were provided with a recommended rating scale of relevance (Polit, 2007) for scoring individual items. The context as well description of population under study was also enclosed with the format to facilitate the scoring process by the experts.

**Table 3.3: Profile of panel members**

| Category | Expert | Inputs |
|---|---|---|
| Teaching Faculty | Dr. Vishal Soodan | Language correction, relevance of item, |
| | Dr. Arpit Sidhu | Face validity and relevance |
| | Dr. Harvinder Singh | Face validity and |

| | | |
|---|---|---|
| | | relevance |
| Research Faculty | Dr. Ajay Chauhan, Founder & CEO, Research Shiksha | Suggested to modify POI items, Content validity |
| | Prof and Dean Mohinder Singh, Central University, Himachal Pradesh | Content validity |
| | Dr. Ravi Inder, Professor University Business School Punjab University Regional Centre Ludhiana | Face and Content validity, Exclusion of certain statements was suggested |
| Industry Experts | Avinash Thakur, Assistant Vice President, HSBC Global Markets | Suggested to change the questions in PE, and EE item, Content validity |
| | Vishal Prasad, Senior Software Engineer, Paytm | Content validity |
| | Atul Kumar, Software Engineer, Paytm | Modified PI items, Content validity |

*Source: Author compilation*

The suggestions and modifications are presented in Annexure-II. The results of item content validity index (I-CVI) and Scale-CVI is presented in table of Annexure-II. Items with more that a I-CVI score above 0.78 were retained. The Scale-CVI were also above threshold of 0.8 (Shi & Shun, 2012).

**3.5.2 Pilot study**

The responses were collected using the questionnaire that was corrected after content validity using Google-Forms™ from the probable respondents for the research study. The link of the google sheet was forwarded to the respondents at different platforms namely, WhatsApp groups, Facebook, LinkedIn etc. The respondents were requested to provide their response to the questionnaire. The pilot survey was conducted on 79 responses received from the respondents. The sample for pilot was adequate at N=79, as scholar suggest that N for pilot should be more than

number of items used in the survey instrument. The pilot survey is conducted for the following objectives:

- To figure out the possibility of the improvement in the drafted questionnaire such as modifying the language and dropping the duplicate statements.
- Examining the internal consistency reliability of the responses.
- To examine the possibility of addition of the relevant statements.

The modified questionnaire was used for the final data collection. The pilot survey was helpful in improving questionnaire. The final questionnaire is used for the data collection, and ultimately fulfilment of the study objectives. The pilot survey is also helpful in reducing the possibility of communication gap, if any, that may exist due to the inappropriate language used in the statements. The results of pilot survey are shown below:

**Table 3.4: Description of demographics for pilot study (N=79)**

| **Demographics** | **Sub Category** | **Frequency (%)** |
|---|---|---|
| Gender | Male<br>Female | 27 (34.2%)<br>51 (64.6%) |
| Age | 18-30<br>31-45<br>46-60<br>60 & above | 30 (38%)<br>37 (46.8%)<br>9 (11.4%)<br>3 (3.8%) |
| Occupation | Student<br>Employee<br>House maker<br>Self-employed<br>Retired | 15 (19%)<br>36(44.3%)<br>6(7.6%)<br>20 (35.3%)<br>3 (3.8%) |
| Location | Rural<br>Urban | 27 (34.2%)<br>52 (65.8%) |

*Source: Authors' Compilation*

**Table 3.5: Usage of digital modes among respondents of pilot study (N=79)**

| **Usage of digital modes** | **Yes** | **No** |
|---|---|---|
| Banking Cards or banking pre-paid cards | 56 (70.9%) | 23 (29.1%) |
| USSD | 3 (3.8%) | 76 (96.2%) |

| | | |
|---|---|---|
| AEPS | 7 (8.9%) | 71 (89.9%) |
| Internet banking | 39 (49.4%) | 40 (50.6%) |
| Mobile banking | 31 (39.2%) | 48 (60.8%) |
| UPI | 62 (78.5%) | 17 (21.5%) |
| Mobile wallets | 34 (43%) | 45 (57%) |
| Micro ATMs | 5 (6.3%) | 74 (93.7%) |

*Source: Authors' Compilation*

**Table 3.6: UPI applications usage among respondents of pilot study (N=79)**

| **UPI apps** | **Yes** | **No** |
|---|---|---|
| PhonePe | 36 (45.6%) | 43 (54.4%) |
| Paytm | 47 (59.5%) | 32 (40.5%) |
| BHIM App | 16 (20.3%) | 63 (79.7%) |
| Mobikwik | - | 79 (100%) |
| Google Pay | 58 (73.4%) | 21 (26.6%) |
| Uber | 2 (2.5%) | 77 (97.5%) |
| Imobile | 2 (2.5%) | 77 (97.5%) |
| Chillr | 3 (3.8%) | 76 (96.2%) |
| Axis Pay | 3 (3.8%) | 76 (96.2%) |
| BOB UPI | 2 (2.5%) | 77 (97.5%) |
| Paytm payments Bank | 10 (12.7%) | 69 (87.3%) |
| SBI Pay | 12 (15.2%) | 67 (84.8%) |
| Other apps | 9 (11.4%) | 70 (88.6%) |

*Source: Authors' Compilation*

The pilot survey was found helpful in improvement in the language. The Cronbach alpha of different factors was found to be greater than 0.7 indicating the presence of the reliability in the responses. The following statements were dropped due to the presence of duplicity, high disagreement and if found, not relevant with the study, after the pilot survey, for example;

1. UPI usage is ***safe and secure***
2. I would use UPI if it would be ***used by other***

### 3.5.3 Reliability test of research instruments

For establishing reliability Chronbach's Alpha analysis was conduct on every construct under study. Cronbach's Alpha (α) is a widely popular and used measure for establishing construct reliability. The data collected from the sample survey was

exposed to this analysis. The results are presented in table 3.8 below**.** It is evident that all the factors fulfilled the criteria indicating that internal consistency is achieved when reliability estimates are greater than 0.70 (Nunnally, 1978; Barclay et al., 1995).

**Table 3.7: Reliability test**

| S.No. | Construct | Number of Items | Chronbach's Alpha(α)* |
|---|---|---|---|
| 1 | Performance Expectancy | 6 | 0.910 |
| 2 | Effort Expectancy | 5 | 0.899 |
| 3 | Social Influence | 5 | 0.885 |
| 4 | Facilitating Conditions | 5 | 0.894 |
| 5 | Personal Innovativeness | 6 | 0.901 |
| 6 | Trust | 7 | 0.952 |
| 7 | Security | 7 | 0.972 |
| 8 | Pace of Innovation | 6 | 0.915 |
| 9 | Satisfaction | 5 | 0.961 |
| 10 | Intention to recommend | 4 | 0.965 |
| 11 | Continuance Intentions | 6 | 0.959 |

*Source: Authors Compilation*
**Threshold α; >=0.70 is good, >=0.80 is better and, >=0.90 is best.*

### 3.6 Test for normality

PLS-SEM is often criticized for its "flexibility", and researchers have suggested to "drop the 'normality' or 'distribution-free' argument in arguing about the relative merits of PLS and [SEM]" (Dijkstra, 2015). The test of normality is a preliminary condition for any multivariate data analysis. For applying PLS- SEM method the assumption of normality is not very strict, however some researchers argue that for the in PLS-SEM the significance of parameter estimates is assessed by the one-sample T-Test which ironically is a parametric test which necessarily assumes normality of parameter estimates (Peng& Li, 2012), therefore, assessment of normality provides robustness to the path model testing. There are various methods (graphical and statistical) to establish normal, "bell-shaped" distribution. On the recommendation of existing researchers, Kolmogorov-Smirnov (Miot,2017) and Shapiro-Wilk (Ghasemi & Zahediasl, 2012) tests were used to make certain that the

data was normally distributed. The results are presented in the table below, confirming the normal distribution of the variables under study.

**Table 3.8: Test for Normality**

| S No. | Construct | Kolmogorov-Smirnova | | Shapiro-Wilk | |
|---|---|---|---|---|---|
| | | Statistic | Sig. | Statistic | Sig. |
| 1 | Performance Expectancy | 0.128 | 0.00 | 0.918 | 0.00 |
| 2 | Effort Expectancy | 0.121 | 0.00 | 0.932 | 0.00 |
| 3 | Social Influence | 0.101 | 0.00 | 0.947 | 0.00 |
| 4 | Facilitating Conditions | 0.131 | 0.00 | 0.936 | 0.00 |
| 5 | Personal Innovativeness | 0.15 | 0.00 | 0.934 | 0.00 |
| 6 | Trust | 0.11 | 0.00 | 0.945 | 0.00 |
| 7 | Security | 0.136 | 0.00 | 0.926 | 0.00 |
| 8 | Pace of Innovation | 0.111 | 0.00 | 0.944 | 0.00 |
| 9 | Satisfaction | 0.14 | 0.00 | 0.922 | 0.00 |
| 10 | Intention to recommend | 0.185 | 0.00 | 0.905 | 0.00 |
| 11 | Continuance Intentions | 0.185 | 0.00 | 0.911 | 0.00 |

### 3.7 Structural equation modeling

CB-SEM was the dominant method for analyzing complex observed-latent variable relationships for many years. Until 2010, more social science journal articles used CBSEM than partial least squares SEM (Hair et al., 2019). However, PLS-SEM is nowadays widely used in many social science fields, such as supply chain, international management, human resource management, operation management, and management information system (Hair et al., 2019). In the last decade, there has been much discussion on which circumstances are more and less suitable for utilizing PLS-SEM (Goodhue et al., 2012; Marcoulides et al., 2012, Hair et al., 2019). But this debate has died down in recent years (Rigdon et al., 2017b), establishing PLS-SEM as a distinctive method for composite based-SEM.

PLS-SEM should be used to spread a current theory, identify model constructs, or if the model is too complicated and there are too many factors to take into consideration (Hair, Ringle, & Sarstedt, 2011). PLS-SEM is recommended "when the model is complex and many predecessor constructs are linked to endogenous

constructs" (Wu & Chen, 2014) and if there are no sample size assumptions (Ghozali, 2006). PLS-SEM was executed using two step approach; first a measurement model is developed to establish reliability and validity of items and constructs used in the model; second, structural path modeling was done using PLS using bootstrap procedure recommended by the existing researchers (Hair et al., 2013).

### 3.8 Data pre- processing and analytics methods

The data collection process was slow, this allowed the researcher to review the completed questionnaires. Incomplete questionnaires were consistently filtered out during data collection process. Over 157 questionnaires were filtered out due to inconsistencies. Once the sample threshold was achieved (N-651), data collection process was stopped.

Next, the collected data was recoded according to different typologies of variables. The categorical variables (e.g., Demographics) were given numeric proxies where ever necessary. Descriptive statistics such as mean, median, mode, frequencies, percentages were used to describe the population characteristics and app usage statistics.

Following chapters will include the detailed analysis of measurement and structural model to test the hypotheses proposed in this chapter.

# CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

This chapter discusses the data analyses procedures and insights. Once the data collection and pre-processing are over. The next, logical step is to validate the data and use it to accept/ reject the research hypothesis. As discussed in the previous chapter, descriptive statistics, normality and validity tests and advanced path modelling procedures (PLS-SEM) are adequate for testing the proposed conceptual framework. In the upcoming section, descriptive statistics, scale validity and reliability and path modelling results are presented.

## 4.1 Descriptive statistics

The demographic profile of the sample population, digital payment system modes utilized by the respondents, and the UPI apps used by respondents were all investigated using frequency distribution and percentages. The researcher examined the demographic characteristics of respondents viz. gender, age, occupational status, and location of respondents are among the demographic characteristics examined in this study. Additionally, the researcher determined their UPI usage. Table 4.1 describes the demographics and Table 4.2 discusses the payment platform UPI app usage statistics.

**Table 4.1: Demographic characteristics of respondents (N=651)**

| Demographics | Sub Category | Frequency (%) |
|---|---|---|
| **Gender** | **Male** | **373 (57.3%)** |
| | **Female** | **278 (42.7%)** |
| **Age** | **Less than 30 years** | **259 (39.8%)** |
| | **31-45 years** | **277 (42.5%)** |
| | **More than 45 years** | **115 (17.7%)** |
| **Occupation** | **Service class (employees)** | **279 (42.9%)** |
| | **Businessmen** | **110 (16.9%)** |
| | **Professional (CA, DR., Lawyers)** | **58 (8.9%)** |

| | | |
|---|---|---|
| | **Retired people** | **49 (7.5%)** |
| | **Students** | **155 (23.8%)** |
| **Location** | **Rural** | **151 (23.2%)** |
| | **Urban** | **500 (76.8%)** |

(Sandeep, 2022)

There are 651 respondents in the sample, with 373 (57.3%) men and 278 (42.7%) women. Males make up the bulk of those polled in this study.

"An age cohort" is defined as "a group of persons of similar ages whom has shared experiences," (Solomon, 2010).Age was grouped and labeled as “Less than 30 years”, “31-45 years”, and “more than 45 years”. About40 percent of the respondents in this survey are under the age of 30 years, 42.5 percent are between the ages 31-45 years, and 17.7 percent are more than 45 years.

The respondents' occupational level is determined by their employment status. In today's society, occupation is a status symbol. As a result, the responses are divided into the following categories: Service class- (Employees), Businessmen, Professionals (CA, DR., and Lawyers etc.), Retired people, and Student.

This study's sample includes 23.8 percent of UPI payment system users who are students, 42.9 percent of the UPI payment system users who are service class people. 8.9 percent of UPI payment system users who are professionals like CA, DR., Lawyers, 16.9 % of UPI payment system users who are Businessmen, and 7.5 percent of UPI payment system users who are retired people. The majority of the respondents in this study work in service class as employees, which is consistent with prior studies (Singh & Rana, 2017). The data suggests that majority of users are from urban area.

Table 4.2 shows the usage statistics related to payment platforms and UPI apps. There are various modes of digital payment systems available for the fund transfer, payment activity. These modes can be used to pay for purchases made in-store and also online shopping. The various type digital payment systems taken for this study are Banking Cards or banking pre-paid cards, USSD, AEPS, Internet banking, Mobile banking, UPI, Mobile wallets, Micro ATMs. Hence, this statement was treated as a multiple response to assess which mode of digital payment system is most preferred by the customers.

**Table 4.2- Usage of digital payment modes and UPI apps**

| **Usage of digital modes** | **Yes** | **No** |
|---|---|---|
| Banking Cards or banking pre-paid cards | 370 (56.8%) | 281 (43.2%) |
| USSD | 19 (2.9%) | 632 (97.1%) |
| AEPS | 30 (4.6%) | 621 (95.4%) |
| Internet banking | 249 (38.2%) | 402 (61.8%) |
| Mobile banking | 293 (45%) | 358 (55%) |
| UPI | 651 (100%) | - |
| Mobile wallets | 199 (30.6%) | 452 (69.4%) |
| Micro ATMs | 56 (8.6%) | 595 (91.4%) |
| **UPI apps used** | **Yes** | **No** |
| PhonePe | 265 (40.7%) | 386 (59.3%) |
| Paytm | 329 (50.5%) | 322 (49.5%) |
| BHIM App | 138 (21.2%) | 513 (78.8%) |
| Mobikwik | 57(8.8%) | 594 (91.2%) |
| Google Pay | 472 (72.5%) | 179 (27.5%) |
| Uber | 58 (8.9%) | 593 (91.1%) |
| Imobile | 30 (4.6%) | 621 (95.4%) |
| Chillr | 45 (6.9%) | 606 (93.1%) |
| Axis Pay | 30 (4.6%) | 621 (95.4%) |
| BOB UPI | 26 (4%) | 625 (96%) |
| Paytm payments Bank | 80 (12.3%) | 571 (87.7%) |
| SBI Pay | 81 (12.4%) | 570 (87.6%) |
| Other apps | 76(11.7%) | 575(88.3%) |

Table 4.2 shows that, 56.8% of the respondents prefer using Banking Cards or banking pre-paid cards, 38.2% of the respondents prefer using Internet banking, 30.6% of the respondents prefer using Mobile wallets, 45% of the respondents prefer using mobile banking, 8.6% of the respondents prefer using Micro ATMs, 2.9% of the respondents prefer using USSD, and 4.6% of the respondents prefer using AEPS.

Henceforth, this result evidently states that majority of the sample unit prefer to use UPI.

There are various types of UPI featured apps used by users. The following frequency table shows the type of UPI apps used by the respondents. The sample survey revealed that 72.5% of the respondents using Google Pay app for making transactions, most preferred app.

## 4.2 Antecedents of user's satisfaction of UPI based payment practices: Descriptive analysis

This section discusses about the results of descriptive analysis (central tendency, dispersion and distribution analysis) of the different identified factors influencing the user satisfaction of UPI based payment practices. The factors are named *Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Personal Innovativeness.*

- **Performance expectancy**

The users of UPI based payment accept that utilizing the new technology will help them to make the transactions effectively. For this variable, the researcher used performance expectancy as the first construct to find whenever required performance levels appraised by users can be achieved by mobile applications. Here, performance expectancy is defined as "the degree to which the users believe that using UPI would fulfill a certain purpose." The descriptive analysis of the responses received from the users of the UPI payment system is shown below:

**Table 4.3: Descriptive analysis: Performance expectancy**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **PE1**- Payments through UPI would bring me greater convenience | 5.15 | 1.641 | -0.721 | -0.291 |
| **PE2**- UPI helps me to be more efficient in online transactions | 5.01 | 1.558 | -0.547 | -0.407 |
| **PE3**- I found UPI useful and saves my time | 5.04 | 1.620 | -0.509 | -0.647 |
| **PE4**- Using UPI would improve my productivity | 4.85 | 1.583 | -0.547 | -0.538 |

| | | | | |
|---|---|---|---|---|
| **PE5**- UPI enables me to accomplish my tasks more quickly in my daily life | 5.09 | 1.642 | -0.673 | -0.414 |

The results show that the mean score of most of the statements representing the performance expectancy are greater than 5 in the scale of 1 to 7, suggesting that most of the users agree with the PE statements. The UPI payment system provides them the high convenience (mean score = 5.15). The users find the payment using UPI more convenient than traditional cash payment. Also, the UPI payment is perceived to be faster than the cash payment (mean score= of 5.09). There is no need to exchange the balance amount as in the case of cash payments. Thus, the UPI payment system saves time for users (mean score = 5.04). The UPI payment is also found to be efficient in making online payments (mean score = 5.01). The lowest mean score is found in the case of the statements that the UPI payment system increases the productivity of the users (mean score = 4.85). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distribution of the responses is near to the normal.

- **Effort expectancy**

Effort expectancy is defined here as, "the degree of ease associated with users' use of UPI payment technology."The degree to which a user thinks using a UPI system would be effortless is known as perceived ease of use, and it comprises elements like perceived ease of use and complexity. The descriptive analysis of the responses received from the users of the UPI payment system is shown below:

**Table 4.4: Descriptive analysis: Efforts expectancy**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **EE1**-The use of UPI is clear & understandable when doing online transactions | 4.90 | 1.545 | -0.543 | -0.434 |
| **EE2-** I find UPI easy for me to use | 5.02 | 1.550 | -0.631 | -0.126 |
| **EE3-** Learning to operate UPI is much easier | 4.92 | 1.620 | -0.565 | -0.625 |
| **EE4-** It is easy for me to become skillful at | 4.86 | 1.660 | -0.421 | -0.834 |

| | | | | |
|---|---|---|---|---|
| using UPI | | | | |
| **EE5-** Recovering from mistakes is very quick and easy | 4.70 | 1.605 | -0.288 | -0.835 |

The results reported that the mean score of most of the statements representing the effort expectancy is greater than 4 on a scale of 1 to 7, representing that most of the users moderately agree with the included statements. The users find the UPI payment system easy to use (mean score = 5.02). The users find learning UPI much easier than other methods (mean score= 4.92). Thus, the users found that usage of UPI is clear and understandable when doing online transactions (mean score= 4.90). The UPI system also found that users will moderately use UPI payments because of their known people using online transactions with UPI (mean score= 4.86). The lowest mean score is found in the case of the statements that the recovering from mistakes is very quick and easy (mean score= 4.70). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **Social influence**

It refers to how users change their convictions, modifies their perspectives, or adjusts their conduct to satisfy the needs of social climate and social collaborations with others. In this study, it is defined as the degree to which the user feels that the other important person influences him or her to use UPI. In simple terms, the researcher is validating whether by using the UPI payment system a person is getting due importance from his friends, relatives, or colleagues.

**Table 4.5: Descriptive analysis: Social influence**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **SI1 -** Most of the people around me using UPI | 4.67 | 1.670 | -0.254 | -0.959 |
| **SI2 -** The people who influences my behavior think that I should use UPI | 4.57 | 1.640 | -0.176 | -0.955 |
| **SI3 -** People in my social network think that I | 4.67 | 1.655 | -0.524 | -0.598 |

| | | | | |
|---|---|---|---|---|
| should use UPI for online transactions | | | | |
| **SI4 -** I find that using UPI is fashionable & popular way to perform online transactions | 4.98 | 1.657 | -0.478 | -0.793 |
| **SI5 -** I would use UPI if it would be used by others | 4.57 | 1.677 | -0.251 | -0.948 |

The results reported that the mean score of all of the statements representing the social influence is greater than 4 in the scale of 1 to 7, representing that the all of the users moderately agree with the included statements. The users find the UPI payment system a trendy and well-liked method of doing online transactions with UPI (mean score = 4.98). The users used UPI payments because most of the users around them are using UPI and they advised their known to use UPI for online transactions (mean score = 4.67). The statements the user who influence someone's behavior think that others should use UPI and the users will use UPI if it would be used by others have the lowest mean score that is (4.57). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **Facilitating conditions**

The fourth construct is representing the degree toward which users think that a technological and organisational infrastructure has been established to facilitate the use of the system is known as the facilitating condition. It is users' perceptions of the resources and support that they have available to perform a certain behavior. In this context, facilitating conditions for using UPI services include customer support, user-friendly mobile devices, availability of internet connection, cost-effectiveness, and also easy-to-install features of UPI apps**.**

**Table 4.6: Descriptive analysis: Facilitating conditions**

| **Statement** | **Mean** | **SD** | **Skewness** | **Kurtosis** |
|---|---|---|---|---|
| **FC1**- I have necessary resources (like internet connectivity, POS, QR code) to use UPI | 5.33 | 1.513 | -0.810 | -0.049 |
| **FC2-** I have knowledge that is required to use | 5.21 | 1.495 | -0.759 | 0.047 |

| | | | | |
|---|---|---|---|---|
| UPI | | | | |
| **FC3-** A person is available for help if I found any difficulty in using UPI | 5.03 | 1.625 | -0.760 | -0.235 |
| **FC4-** It is convenient for me to perform online transactions at UPI platform | 5.11 | 1.499 | -0.781 | 0.182 |
| **FC5-** Assistance is available when difficulties are facing in using UPI | 5.11 | 1.575 | -0.830 | 0.032 |

The results reported that the mean score of all of the statements representing the facilitating conditions is greater than 5 in the scale of 1 to 7, representing that all of the users agree with the included statements. The users have required resources to use the UPI system like internet connection, POS, and QR codes (mean score = 5.33). Also, they have knowledge that is necessary to use UPI (mean score= 5.21). Thus, the statements the users find it's easy to perform online transactions at the UPI system, and help is available when difficulties are faced in using the UPI platform (mean score = 5.11 each). The lowest mean score is found in the case of the statements that the user is available for help if users found any difficulty in using the UPI payment system (mean score = 5.03). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distribution of the responses is near to the normal.

- **Personal innovativeness**

Personal innovativeness is the acceptance of innovative ideas or products or services by users relative to others in their community (Leavitt & Walton, 1975). Innovativeness has a significant influence in determining how consumers intend to use new digital technology, however users' experiences with new mobile innovations are less than ideal (Kim et al., 2010; Sandeep, 2022). Additionally, it is appropriate to assess innovativeness as an influencing component for the UPI given the relative infancy of digital services.

**Table 4.7: Descriptive analysis: Personal innovativeness**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **PII1-** When I hear about UPI app, I looked ways to try it. | 4.86 | 1.690 | -0.556 | -0.653 |
| **PII2-**Among my all friends and relatives, I am first to try out UPI services. | 4.30 | 1.700 | -0.182 | -0.942 |
| **PII3-**Generally, I would not hesitate to try out new UPI services/ new technology. | 4.73 | 1.675 | -0.521 | -0.618 |
| **PII4-** Being the first to use new high-tech services is very important to me | 4.63 | 1.612 | -0.516 | -0.566 |
| **PII5-** I can usually figure out new high-tech products and services without help from others | 4.73 | 1.592 | -0.531 | -0.581 |
| **PII6-** I love to experiment with UPI | 4.90 | 1.661 | -0.697 | -0.497 |

The results reported that the mean score of all of the statements representing personal innovativeness is greater than 4 in the scale of 1 to 7, representing that all of the users moderately agree with the included statements. The UPI payment system is liked by its users (mean score = 4.90). Also, When the user hears about new UPI features, they looked ways to use them (mean score = 4.86). it finds that UPI users generally figure out new high-tech products and services like UPI without the help of others, and they feel no hesitation using new services provided by UPI service providers (mean score = 4.73 each). The users said that being the first to use the UPI new services was very important for them (mean score = 4.63). The statement among all the users, friends, they are first to use UPI services has the lowest mean score that is (mean score = 4.30). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **User satisfaction**

Satisfaction implies the fulfillment of expectations. User satisfaction is defined as how users are satisfied with the usage of an information system (Rai et al., 2002). During the post-purchase evaluation process, A user's level of satisfaction will increase if they believe the UPI payment system is performing better than expected;

the opposite is also true. Here, in this study satisfaction level of UPI users is examined.

**Table 4.8: Descriptive analysis: User satisfaction**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **SAT1-** I am satisfied with services provided by UPI | 5.13 | 1.498 | -0.832 | 0.140 |
| **SAT2-** I am satisfied with functions provided by UPI | 5.03 | 1.560 | -0.719 | -0.180 |
| **SAT3-** I am extremely contented with use of UPI | 4.96 | 1.519 | -0.595 | -0.409 |
| **SAT4-** I think it is wise to choose to use UPI | 5.13 | 1.519 | -0.674 | -0.354 |
| **SAT5-** I feel satisfied about my overall experience of using UPI | 5.10 | 1.589 | -0.716 | -0.188 |

The results reported that the mean score of most of the statements representing user satisfaction is greater than 5 in the scale of 1 to 7, representing that most of the users agree with the included statements. The UPI payment system provides them the high satisfaction, and they think it's wise to choose to use UPI services (mean score = 5.13 each). Overall, the users are satisfied with the UPI system (mean score= 5.10). Also, the users are satisfied with the functions provided by UPI service providers (mean score = 5.03). The lowest mean score is found in the case of the statements that the users are very contented with the use of the UPI payment system (mean score = 4.96). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distribution of the responses is near to the normal.

- **User trust**

In the UPI payment context, trust is a user's willingness to perform Electronic payment transactions and the expectation that a UPI payment provider will fulfill its obligations. Users' attitude toward the UPI payments system is associated with their perception of the system's security. UPI payments system involves greater uncertainty and risk, as it works in a remote and digital world, is susceptible to virus infection, theft or misuse, database leakage, and online fraud, there is more uncertainty and risk

associated with this system. Therefore trust plays a crucial role in the adoption and continued use of UPI payments, an absence of trust can significantly undermine the desire to continue using UPI payments.

**Table 4.9: Descriptive analysis: User trust**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **TR1-** I trust the UPI's reliability and availability | 5.28 | 1.450 | -0.708 | -0.268 |
| **TR2-** I believe that UPI is trustworthy | 5.01 | 1.477 | -0.587 | -0.376 |
| **TR3-** UPI provides online transaction services in my best interest | 5.17 | 1.465 | -0.512 | -0.695 |
| **TR4-** I believe that transaction data is safe and confidential | 5.08 | 1.519 | -0.656 | -0.171 |
| **TR5-** I believe that immediate confirmation message provided by system, when transaction is completed | 4.98 | 1.558 | -0.547 | -0.466 |
| **TR6-** I believe UPI service providers keep users' interest in mind | 5.03 | 1.446 | -0.544 | -0.383 |
| **TR7-** I believe that UPI service provider will do everything to keep users transaction data secure | 5.20 | 1.479 | -0.635 | -0.367 |

The results reported that the mean score of most of the statements representing the trust construct is greater than 5 in the scale of 1 to 7, representing that most of the users agree with the included statements. The UPI payment system provides them the high reliability and availability (mean score = 5.28). The users believe that UPI service providers would keep their transaction data secured (mean score= 5.20), and UPI provides online transactions in their best interest (mean score = 5.17). The users believe that transaction through the UPI platform is safe and confidential, and there is no leakage of data (mean score = 5.08). The UPI service providers keep their users' interests in their minds (mean score = 5.03). Hence, the UPI users find UPI services are trustworthy (mean score = 5.01). The lowest mean score is found in the case of the statements that the UPI payment system sends an immediate confirmation when the transaction is done (mean score = 4.98). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and

kurtosis of the responses are less than 1 indicating that the distribution of the responses is near to the normal.

- **Security**

The level of security offered will have an impact on users' decision to continue to using the UPI payment system, and improvement in the level of security solutions for UPI payment solutions. UPI service providers can affect users' perceptions of trust in the UPI's continuous use by training and encouraging them about the security of UPI payment options. Security statements on electronic payment system websites are a significant factor impacting users' trust in digital services, according to report by Mukherjee and Nath (2003). With the increase in cyber threats, by increasing online payments through UPI, this construct reflects the level of comfort of the users for continue using the UPI system. On the other hand, carrying cash, UPI methods are considered relatively safe by the respondents. Inconvenience and safety related to carrying cash, cash transactions, visiting ATMs is a high inconvenience and lack safety factors. UPI payments offer many conveniences which increase the trust and reliability factor - enumeration of transaction data in monthly billing, mini-statements, funds transfer, etc.

**Table 4.10: Descriptive analysis: Security**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **SEC1-** I would feel secure using my personal information through UPI system | 4.86 | 1.744 | -0.436 | -0.927 |
| **SEC2-** UPI system are secure means through which, funds can be send/receive | 5.00 | 1.560 | -0.611 | -0.510 |
| **SEC3-** UPI is secured method of online payments/transactions | 4.82 | 1.574 | -0.513 | -0.361 |
| **SEC4-**UPI maintains privacy of data | 4.88 | 1.596 | -0.536 | -0.529 |
| **SEC5-** UPI platform provides good firewall technology to prevent unauthorized intrusion. | 4.70 | 1.552 | -0.460 | -0.453 |
| **SEC6-** Data stored at UPI system cannot be manipulated or tampered | 4.60 | 1.684 | -0.372 | -0.795 |
| **SEC7-** I have not fear of hack invasion into UPI system | 4.74 | 1.746 | -0.475 | -0.846 |

The results reported that the mean score of all of the statements representing the security is greater than 4 in the scale of 1 to 7, representing that all of the users moderately agree with the included statements. The UPI system provides a secured means of transferring funds (mean score = 5.00). The UPI payment system maintains the privacy of data (mean score = 4.88). It is found that users feel secure using personal information through the UPI payment system (4.86), and it is found as a secured method of online payments (mean score = 4.82). Hence the users have no fear of hack invasion into the UPI system (mean score = 4.74). Also, UPI provides good firewall technology to prevent unauthorized intrusion (mean score = 4.70), so that data stored at the UPI system cannot be manipulated or tempered by hackers (mean score = 4.60). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **Pace of innovation**

It is the speed at which UPI technology innovation or advancement is occurring.Online technologies for digital payments are increasingly advancing at an unprecedented pace of innovation. UPI payments are emerging quickly in comparison to other technologies. In UPI, innovations happen frequently.

**Table 4.11: Descriptive analysis: Pace of innovation**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **POI1-** UPI features changing at fast pace | 4.85 | 1.644 | -0.421 | -0.890 |
| **POI2-** UPI system changing more fast than other techniques of online payments | 4.77 | 1.676 | -0.394 | -0.963 |
| **POI3-** Pace of technological innovation in online payments is high | 4.59 | 1.602 | -0.361 | -0.732 |
| **POI4-** I have consistently seen new features in UPI for some time | 4.74 | 1.669 | -0.387 | -0.854 |
| **POI5-** Technological innovations and UPI don't go hand in hand | 4.66 | 1.668 | -0.306 | -0.972 |
| **POI6-** Innovations in UPI are frequent | 4.68 | 1.636 | -0.380 | -0.777 |

The results reported that the mean score of all of the statements representing the pace of innovation is greater than 4 in the scale of 1 to 7, representing that all of

the users moderately agree with the included statements. It is found that UPI features are changing at a fast speed (mean score = 4.85). The users believe that the UPI payment system changing faster than other means of online payments (mean score = 4.77). It is found that users have consistently seen new features in the UPI system for some time (4.74). The users see frequent innovations in the UPI system (mean score = 4.68) and the technological innovations and UPI don't go hand in hand (mean score = 4.66). The pace of technological innovations in online payments is high and has the lowest mean score (mean score = 4.59). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **Continuance intentions**

Continuance intention is the net benefit of the success of the UPI system. If users observe that UPI technology helps them in different situations with quality, and they are satisfied with their first experience, they will reuse it and also its relationship with the satisfaction of users.

**Table 4.12: Descriptive analysis: Continuance intentions**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **CI1-** If I had access to UPI, I intend to continue use it | 4.91 | 1.612 | -0.457 | -0.628 |
| **CI2-** I plan to continue use of UPI in future | 4.81 | 1.568 | -0.360 | -0.794 |
| **CI3-** I will have continuance intention to use UPI for online transaction | 4.79 | 1.567 | -0.407 | -0.590 |
| **CI4-** I have continuance intentions of using UPI than other alternative means | 4.72 | 1.542 | -0.294 | -0.755 |
| **CI5-** I would like to continue to make suggestions for UPI | 4.73 | 1.496 | -0.386 | -0.600 |
| **CI6-** I will keep using UPI as regularly as I do now | 4.97 | 1.717 | -0.556 | -0.720 |

The results reported that the mean score of all of the statements representing the pace of innovation is greater than 4 in the scale of 1 to 7, representing that all of the users moderately agree with the included statements. It is found that users will

keep using the UPI system as regularly as they are doing now (mean score = 4.97). Also, find that if the user had access to using UPI system, they will continuously use it (mean score = 4.91). The users have continued plans to use UPI in the future for also (4.81). Hence, they have a continuance intention to use the UPI payment system for online transactions (mean score = 4.79). They are ready to make suggestions for UPI continually (mean score = 4.73), and users will keep using UPI more than other alternative means of online transactions (mean score = 4.72). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distributions of the responses are near to the normal.

- **Intention to recommend**

Word of Mouth has a extremely good affect at the aim to suggest UPI payment practices to others. It has high quality impact on the intention to recommend firm performance **(**Reichheld, 2003; Morgan &Rego, 2006; Keiningham et al., 2003**;** sandeep, 2022). It has been shown in literature that CI and intentions to recommend were both affected through satisfaction in mobile applications (Setyawan et al., 2017). Higher satisfaction closer to technology normally has greater continue using intentions to use it and go in for the positive word of mouth(Wang & Liao, 2007; Sandeep, 2022).

**Table 4.13: Descriptive analysis: User's intention to recommend**

| Statement | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| **IR1**- I will recommend UPI to other people. | 5.03 | 1.528 | -0.599 | -0.357 |
| **IR2**- I positively recommends UPI to others by Word-of – Mouth | 4.96 | 1.593 | -0.632 | -0.407 |
| **IR3-** I will encourage my colleagues, friends, relatives to use UPI | 5.07 | 1.529 | -0.645 | -0.338 |
| **IR4-** I am willingly say positive words about UPI | 5.17 | 1.568 | -0.745 | -0.331 |

The results reported that the mean score of most of the statements representing the Intention to recommend is greater than 5 in the scale of 1 to 7, representing that most of the users agree with the included statements. The users are willing to say

positive words about using UPI services for recommending to others (mean score = 5.17). Also, they will encourage their friends, colleagues, and relatives to use UPI payment services (mean score= 5.07). Thus, they will recommend UPI payment services to others (mean score = 5.03). The lowest mean score is found in the case of the statements that they will recommend the UPI payment system to others by word–of–mouth (mean score = 4.96). The standard deviation of the responses is found to be greater than 1 indicating the variation of the responses. The skewness and kurtosis of the responses are less than 1 indicating that the distribution of the responses is near to the normal.

### 4.3 Instrument reliability and validity

#### 4.3.1 Internal consistency approach

The hypotheses tests using structural equation modeling has a precondition whereby the research instrument and collected data is exposed to robust pre-testing. In the previous chapter the Cronbach Alpha measures are reported and this measure establishes reliability of the research instrument. However, Hair et al. (2013) have argued that this measure is sensitive to number of items in the scale and assumes equality of outer loading of the items. Thus, to arrive at a more concrete reliability researchers have come up with CR (Composite Reliability) as a good measure of testing scale reliability. According to Hair et al. (2013), and Nunnally and Bernstein (1994), the accepted range of CR values for items in a construct between 0.60 to 0.70 (depending on research model and context).

The internal consistency reliability of the different factors influencing the user satisfaction of UPI based payment practices are measured with the help of Cronbach's alpha. The estimated value of Cronbach's alpha for each included factor is shown in table 4.14. The table shows that the estimated Cronbach's alpha of *performance expectancy is .891, effort expectancy is 0.908, facilitating conditions is .864, personal innovativeness is .882, social influence is .912, trust is .894, security is .917, pace of innovation is 0.918 , satisfaction is .892, continuance intention is .912, and intention to recommend is .904 ..* Thus, the estimated Cronbach's alpha for each factor is found to be greater than 0.7 indicating the presence of consistency reliability in the responses received from the different users of UPI-based payment practices.

After ensuring the presence of internal consistency reliability in the different factors of the measurement scale measuring the factors which influence *the user's satisfaction and continuance intentions of UPI-based payment practices*, the construct validity of the scale is examined with the help of the CFA method. The construct validity of the scale includes the convergent validity as well as discriminant validity. The convergent validity of the scale examines whether the included statement of each factor is significantly related and also have a significant correlation with their factors. In other words, the convergent validity confirms that the statement used in the study significantly represents their respective factors. The convergent validity of the measurement scale is tested using construct loadings, composite reliability (CR), and average variance extracted (AVE) estimates. In order to ensure the presence of convergent validity in the scale, the following conditions must be fulfilled:

- Construct loadings of each item/statement of the factors affecting the user satisfaction towards UPI based payment practicesis expected to be greater than 0.7.
- CR of each factor is expected to be greater than 0.7, and
- AVE of each factors affecting the user satisfaction by the users should be greater than 0.5.

**Table 4.14 shows the CA, CR and AVE, values; all required values are above the threshold.**

**Table 4.14: Construct validity**

| **Construct** | **Item Code** | **Loadings** | **CA** | **CR** | **AVE** |
|---|---|---|---|---|---|
| Continuance Intention | CI1 | 0.85 | 0.912 | 0.912 | 0.636 |
| | CI2 | 0.758 | | | |
| | CI3 | 0.72 | | | |
| | CI4 | 0.772 | | | |
| | CI5 | 0.762 | | | |
| | CI6 | 0.907 | | | |
| Effort Expectancy | EE1 | 0.797 | 0.908 | 0.908 | 0.664 |
| | EE2 | 0.807 | | | |
| | EE3 | 0.814 | | | |
| | EE4 | 0.83 | | | |
| | EE5 | 0.825 | | | |
| Facilitating Conditions | FC1 | 0.782 | 0.864 | 0.864 | 0.56 |
| | FC2 | 0.799 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | FC3 | 0.709 | | | |
| | FC4 | 0.713 | | | |
| | FC5 | 0.734 | | | |
| Performance Expectancy | PE1 | 0.823 | 0.891 | 0.893 | 0.625 |
| | PE2 | 0.755 | | | |
| | PE3 | 0.722 | | | |
| | PE4 | 0.807 | | | |
| | PE5 | 0.84 | | | |
| Personal Innovativeness | PII1 | 0.79 | 0.882 | 0.881 | 0.554 |
| | PII2 | 0.665 | | | |
| | PII3 | 0.8 | | | |
| | PII4 | 0.695 | | | |
| | PII5 | 0.757 | | | |
| | PII6 | 0.749 | | | |
| Pace of Innovation | POI1 | 0.821 | 0.918 | 0.918 | 0.652 |
| | POI2 | 0.772 | | | |
| | POI3 | 0.786 | | | |
| | POI4 | 0.818 | | | |
| | POI5 | 0.805 | | | |
| | POI6 | 0.841 | | | |
| Intention to Recommend | RI1 | 0.848 | 0.904 | 0.904 | 0.701 |
| | RI2 | 0.826 | | | |
| | RI3 | 0.821 | | | |
| | RI4 | 0.855 | | | |
| Satisfaction | SAT1 | 0.83 | 0.892 | 0.893 | 0.625 |
| | SAT2 | 0.72 | | | |
| | SAT3 | 0.801 | | | |
| | SAT4 | 0.775 | | | |
| | SAT5 | 0.823 | | | |
| Security | SEC1 | 0.829 | 0.917 | 0.918 | 0.615 |
| | SEC2 | 0.747 | | | |
| | SEC3 | 0.786 | | | |
| | SEC4 | 0.777 | | | |
| | SEC5 | 0.751 | | | |
| | SEC6 | 0.776 | | | |
| | SEC7 | 0.818 | | | |
| Social Influence | SI1 | 0.853 | 0.912 | 0.912 | 0.676 |
| | SI2 | 0.805 | | | |
| | SI3 | 0.915 | | | |
| | SI4 | 0.785 | | | |
| | SI5 | 0.742 | | | |
| Trust | TR1 | 0.804 | 0.894 | 0.895 | 0.55 |
| | TR2 | 0.734 | | | |
| | TR3 | 0.737 | | | |
| | TR4 | 0.714 | | | |
| | TR5 | 0.67 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | TR6 | 0.718 | | | |
| | TR7 | 0.805 | | | |

### 4.3.2 Discriminant validity

Discriminant validity "is the degree to which a construct can truly be distinguished from other constructs." (Hair et al 2013). Discriminant validity establishes the uniqueness of a construct. The two popular methods of establishing discriminant validity are a) cross-loading examination and, b) Fornell-Larcker Criterion (Hair et al., 2013). The PLS-SEM procedures generates a table where the diagonal values show the square root of AVE values for each construct and the off-diagonal values shows its correlation with other constructs. (Hair et al., 2013). Table 4.15 shows the discriminant validity of the measurement scale indicating the factors which influence *the user's satisfaction of UPI based payment practice*is examined with the help of Fornell-Larcker criterion. Comparing the AVE of each factor affecting the *user's satisfaction of UPI based payment practice* where the square root of AVE for each construct is compared with its correlation with the remaining constructs in the measurement scale.

In order to ensure the presence of discriminant validity, the AVE of each construct should be greater than its MSV estimate and the square root of AVE should be greater than the correlation of each construct with the remaining construct. Thus, the results satisfy the discriminant validity of the constructs.

**Table 4.15: Discriminant Validity (Fornell-Larckercriterion)**

| | CI | EE | FC | RI | POI | PE | PI | SAT | SEC | SI | TR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CI | **0.797** | | | | | | | | | | |
| EE | 0.624 | **0.815** | | | | | | | | | |
| FC | 0.662 | 0.685 | **0.749** | | | | | | | | |
| RI | 0.761 | 0.569 | 0.567 | **0.837** | | | | | | | |
| POI | 0.75 | 0.802 | 0.657 | 0.66 | **0.807** | | | | | | |
| PE | 0.518 | 0.647 | 0.64 | 0.512 | 0.624 | **0.791** | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI | 0.677 | 0.605 | 0.601 | 0.99 | 0.632 | 0.561 | **0.744** | | | | |
| SAT | 0.696 | 0.638 | 0.644 | 0.594 | 0.66 | 0.643 | 0.578 | **0.791** | | | |
| SEC | 0.74 | 0.566 | 0.62 | 0.64 | 0.61 | 0.522 | 0.653 | 0.628 | **0.784** | | |
| SI | 0.451 | 0.633 | 0.61 | 0.492 | 0.559 | 0.543 | 0.521 | 0.505 | 0.509 | **0.822** | |
| TR | 0.78 | 0.654 | 0.723 | 0.709 | 0.699 | 0.601 | 0.629 | 0.682 | 0.768 | 0.533 | **0.742** |

*Notes: Bold values represent Square Root of AVE*

*Source: Author compilation, (Sandeep, 2022)*

In addition to discriminant validity the model was tested for multicollinearity issues among constructs that can result from common method bias/ common method variance. For collinearity assessment PLS-SEM provides Variance Inflation Factor (VIF) scores, the popular threshold for VIF is 5 or higher, which indicates a potential issue with collinearity problem (Hair, Ringle & Sarstedt, 2011). Table 4.16 shows that the VIF values are above the threshold.

**Table4.16: Variance Inflation Factor (VIF) scores for the constructs**

| | **CI** | **CS** | **RI** | **TR** |
|---|---|---|---|---|
| **CS** | 1.913 | | | |
| **PI** | 1.806 | 1.637 | | |
| **POI** | 2.054 | | | |
| **SEC** | 2.234 | | | 1.00 |
| **TR** | 2.482 | | | |
| **EE** | | 2.11 | | |
| **FC** | | 1.952 | | |
| **PE** | | 1.788 | | |
| **SI** | | 1.715 | | |
| **CI** | | | 1.00 | |

## 4.4 Factors affecting the user's satisfaction of UPI based payment practices: Structural equation modelling approach (objective-1)

This section discusses the different identified factors influencing the user satisfaction of UPI-based payment practices. After establishing the reliability and validity of the collected data and ensuring there are no issues of multicollinearity and common method variance, a bootstrapped path analysis using the consistent PLS method was performed. In addition, f-square ($f^2$) statistics is used to measure the effect size of independent variables on the dependent variable (SI).

The first objective of the study aims to identify and study the factors which influence theuser's satisfaction of UPI-based payment practices. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before the hypothesis testing method. This section discusses the internal consistency, reliability, and construct validity of the responses received against the different factors influencing the user satisfaction of UPI-based payment practices. In this study, the following five factors are included that influences the user satisfaction of UPI based payment practices:

A) Performance Expectancy
B) Effort Expectancy
C) Social Influence
D) Facilitating Conditions
E) Personal Innovativeness

The impact of the above-mentioned factors is analyzed on the user satisfaction of UPI based payment practices. The factors are measured using different statements included in the questionnaire. These five factors influencing the user satisfaction of UPI-based payment practices are assumed to be zero order and reflective in nature. The user satisfaction of UPI-based payment practices is assumed to be an endogenous construct zero-order reflective in nature. The five factors are assumed as exogenous constructs and a structural model (SEM model) is developed in examining the impact of adoption factors on the user satisfaction of the UPI-based payment practices. The SEM analysis is used to examine the following hypothesis:

**Hypothesis:** *"Selected factors (performance expectancy, effort expectancy, facilitating conditions, personal innovativeness, and social influence) significantly influence the user satisfaction of UPI based payment practices"*

The above hypothesis is examined with the help of the following five sub hypotheses.

*$H_{1a}$: "Performance Expectancy is positively related to user satisfaction."*
*$H_{1b}$: "Effort Expectancy is positively related to user satisfaction"*
*$H_{1c}$: "Social Influence is positively related to user satisfaction."*
*$H_{1d}$: "Facilitating Conditions is positively related to user satisfaction."*
*$H_{1e}$: "Personal innovativeness is positively related to user satisfaction."*

The results of hypotheses testing are discussed below:

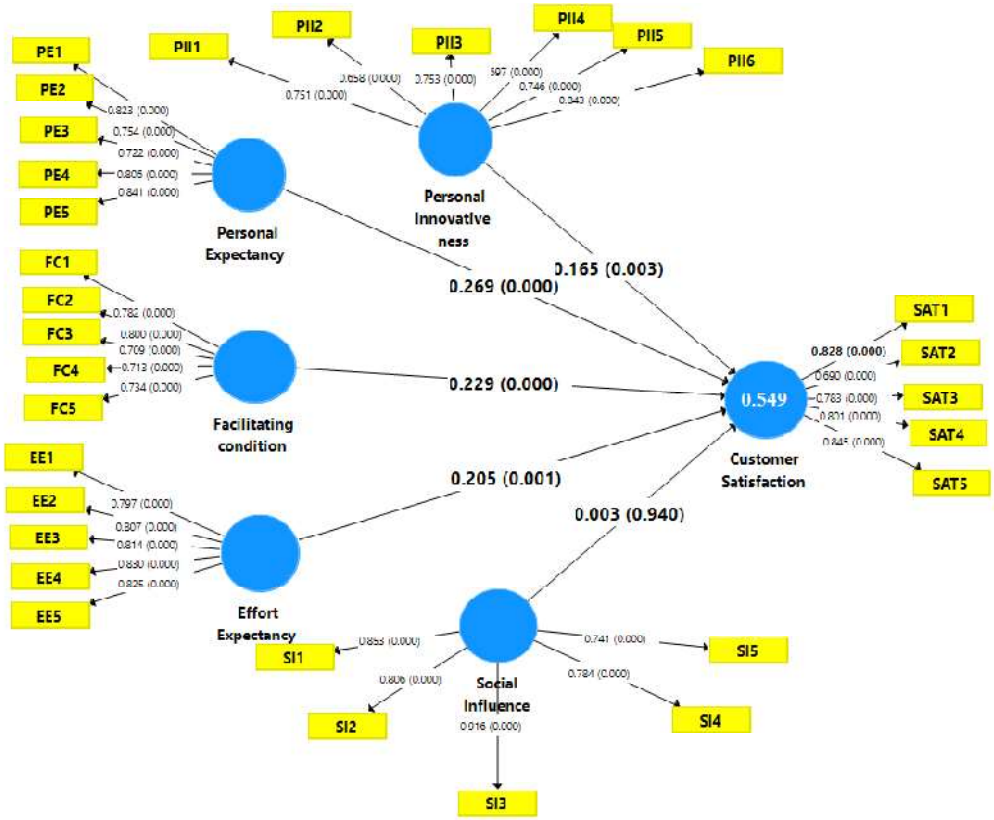


**Figure 4.1: Path analysis for objective-1**

**Table 4.17: Hypotheses test results- PLS-SEM (objective-1)**

| **Hypothesis** | **Endogenous Construct** | **Exogeneous Construct** | **Path Coefficients** | **Standard Deviation** | **T Stats** | **$R^2$** | **Result** |
|---|---|---|---|---|---|---|---|
| "Effort Expectancy is positively related to user satisfaction." | SAT | EE | 0.205 | 0.063 | 3.265*** | 0.549 | Supported |
| "Facilitating Conditions is positively related to user satisfaction" | | FC | 0.229 | 0.058 | 3.968*** | | Supported |
| "Performance Expectancy is positively related to user satisfaction" | | PE | 0.269 | 0.054 | 5.008*** | | Supported |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| "Personal Innovativeness is positively related to user satisfaction" | | PI | 0.165 | 0.053 | 3.125*** | | Supported |
| "Social Influence is positively related to user satisfaction" | | SI | 0.003 | 0.047 | 0.072 | | Not Supported |

- **Conclusion*:***

The results of the SEM analysis supported the hypothesis that *"selected factors (performance expectancy, effort expectancy, facilitating conditions, personal innovativeness, and social influence) significantly influence the user satisfaction of UPI based payment practices*" for the factors performance expectancy, effort expectancy, facilitating conditions, and personal innovativeness. The social influence is found to be insignificant in influencing the user satisfaction of UPI-based payment practices. The table 14.7also reported the path coefficients of the different factors that influences the user satisfaction of UPI based payment practices (*performance expectancy* =0.269, *effort expectancy*= 0.205, *facilitating conditions = 0.229, personal innovativeness = 0.165).* Thus, it can be concluded that these significantly ($p<0.005$) enhance the user satisfaction of UPI-based payment practices. It can be concluded from path analysis that all constructs of the UTAUT model except social influence has emerged as statistically significant variables of satisfaction in the research. The strongest

influence was that of performance expectancy on satisfaction. The benefits offered by the UPI payment system are of significant importance for user satisfaction. The R square of the SEM model indicates the explanatory power of the model. The results indicate that the user satisfaction towards the UPI payments can be explained by around 55 % with the help of this model.

- ***$H_{1a}$: "Performance Expectancy is positively related to user satisfaction."***

**Conclusion:** The t stats (greater than critical value of 1.96) indicates the presence of a significant impact of performance expectancy on the user satisfaction. The higher the performance expectancy, higher the satisfaction level of the users of the UPI payments. So, performance expectancy is directly related to the utilization of UPI payment practices by users for online payments. This is since users rely on UPI for a variety of functions. Users use UPI because of its benefits, such as greater convenience, saving time and money, being efficient in online transactions, improving productivity, and helping to accomplish tasks more quickly in daily life (Alalwan et al., 2016; Wan et al., 2020; Indravati, 2018), which leads to satisfaction for the users. High performance of UPI payment practices in terms of network usage, confirmation, and speed; less risky practices have a direct impact on user satisfaction. If factors such as crashing of the system, and bugs in the UPI applications might harm the use of this system. The results of our study are similar to existing literature, that performance expectancy has a significant influence on user satisfaction (Tam, Santos & Oliveira, 2018; Shang & Wu, 2017; Agrebi & jallais, 2015; Chong, 2013; Marinkovic & Kalinic, 2017; Marinkovic et al., 2020; Lee, Tsao, Chang, 2015; Rezaei & Valaei, 2017; Tam et al., 2018).

- ***$H_{1a}$: "Effort Expectancy is positively related to user satisfaction."***

**Conclusion:** The t stats (greater than critical value of 1.96) indicates the presence of a significant impact of effort expectancy on the user satisfaction. The higher the effort expectancy, the higher the satisfaction level of the users of the UPI payments. Effort expectancy is the level of belief of UPI users that the use of UPI payment practices will not involve any physical and mental hard work. It is dependent on the possibility that there is a link between the amount of effort put into work and the

amount of productivity gained from that effort (Ghalandari, 2012). The use of UPI payment practices for online payments is possibly affected by how the technology is easy or complex for making transactions within the shortest time conceivable. Hence, UPI users realize that it is very easy to use the UPI system for online transactions; they probably won't give up utilizing it (Wan et al., 2020). If UPI payment services are easy to use, then they will eliminate any type of transaction error, and which is an important aspect of digital financial transactions. Literature also shows that ease of use (TAM) is still one of the significant drivers that affect technology usage (Rana et al., 2013). Users' satisfaction with the UPI system can be determined by the ease and simplicity of using them. The results of this study are similar to other studies in the literature that effort expectancy has a significant influence on user satisfaction (Shang and Wu, 2017; Agrebi & Jallais, 2015; Marinkovic & Kalinic, 2017;Marinkovic&Kalinic, 2020; Lee, Tsao, Chang, 2015).

- ***$H_{1c}$: "Social Influence is positively related to user satisfaction."***

**Conclusion:** The t stats (less than critical value of 1.96) indicates that social influence does not have a significant impact on user satisfaction. Lack of support from social groups means users have lower satisfaction with UPI payments. Because social influence helps the users generate a supportive system for trying innovative technologies, especially if they have less confidence in using new technology, For mobile payment practices, social influence has a great role in affecting users' intentions (Slade et al., 2014). According to existing literature, social influence has a positive and significant effect on a user's satisfaction and continued usage intentions for mobile technology (Hsiao et al., 2016; Marinkovic et al., 2020). In this study, we hypothesized that social influence is a critical factor that leads to a user's satisfaction using the UPI system. Because there is sudden intervention like demonetization and COVID 19, that also encourages users to use the UPI payments system for online transactions. Moreover, after the adoption of such services, we presume that it will affect the understanding of using the system if there is support from social groups (Wan et al., 2020). The bigger the support when users use it, the better the service user satisfaction. Hence, the increasing trend of self-service technology adoption leads to continued usage of that system due to individual support. But according to the results of this study, social influence had an insignificant impact on the user's

satisfaction; there might be a lack of support from social groups. For the significant role of social influence, it's very essential to make suitable advertising movements on the UPI platform or social networks. Because social networking has powerful network coverage with target groups, communication with users, a large number of followers, and enhances user satisfaction, So, it is attractive to form an instructive and promotional movement that promotes the benefits of UPI payment practices through it (Marinkovic & Kalinic, 2019).

- ***$H_{1d}$: "Facilitating Conditions is positively related to user satisfaction."***

**Conclusion:** The t stats (greater than critical value of 1.96) indicates the presence of a significant impact of facilitating conditions on user satisfaction. If the organizational and technical infrastructure is good, it will lead to a high level of satisfaction among the users of UPI payments. Thus, facilitating conditions are features of an environment that create the potential for the usage of the UPI payment system by its users. It can be determined by the compatibility of the system and behavioral control. The efficient use of the UPI system for online transactions depends on the technological infrastructure, the availability of organizational resources, and the convenience of users. If UPI users had an adequate level of knowledge and organizational and technical infrastructure when using UPI apps, they might have an easy and convenient familiarity with the UPI system (Wu et al., 2022). Users believe that organizational resources and technical networks exist to maintain the successful usage of the UPI system for online payments (Wan et al., 2020), They will be more satisfied with the system. The results of our study are similar to (Gholami et al., 2012; Park, 2020; Liyong Wan et al., 2020).

- ***$H_{1e}$:"Personal innovativeness is positively related to user satisfaction."***

**Conclusion:** The t stats (greater than critical value of 1.96) indicates the presence of a significant impact of personal innovativeness on user satisfaction. The higher the personal innovativeness, the higher the satisfaction level of the users of UPI payments. Personal innovativeness emerges from the willingness of users to try out new UPI payments apps, features, etc. and their experience with them. People with higher personal innovativeness are likely to have a more optimistic perception of

innovation and a more positive intention to use new UPI apps and features, which may give them more satisfaction. Service providers must concentrate on developing and sharing the beneficial and ineffective benefits of new UPI features in order to boost user satisfaction. They must emphasize how beneficial the new UPI features, apps, etc. are. The more alternatives consumers have to try new things, the more satisfied they will be with UPI services. UPI can do this by promoting or advertising new products(Khan et al., 2019) Because the majority of users are still unfamiliar with new mobile services, innovativeness plays an essential role in users' willingness to try out new digital technologies (Kim et al., 2010).

## 4.5 Impact of perceived security factors on users' trust and its influence on intention to continue using UPI: A structural equation modelling approach (objective-2)

This objective aims to identify and study the factors that influence the *user's continuance intentions of UPI based payment practices.* This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method.

In the digital payments world, security and trust play a vital role in maintaining a link between users and merchants with the UPI payments system. Security is a major issue for UPI users. In digital payments, users have their private keys and secret codes for digital transactions, which developed the perception of security in UPI payments. In this digital era, it is necessary to retain the system of authorization, and authentication between merchants, users, and payment service providers (Shon & Swatman, 1998). The perception of users is frequently recognized as a major issue for users of online services and digital technology products as they retain plenty of information and digital identification methods are occasionally used to provide secured platforms (Stadler, 1999; Mir et al., 2019). Whenever the users have issues nearby how others possibly will use their data that is shared and stored in a remote platform, they have fewer propensities to reuse it. We extend this argument by saying that normally such users may discontinue using it. The user continuance intention of UPI based payment

practices is assumed to be an endogenous construct zero order reflective in nature. The security and trust factors are assumed as exogenous construct and a structural model (SEM model) is developed to examine the impact of perceived security on users' trust, then the impact of security and trust on continuance intention of UPI based payment practices. The SEM analysis is used to examine the following hypothesis:

*$H_2$: Security in UPI is positively associated with users' Trust in UPI.*

*$H_3$: Security in UPI is positively associated with continuance intention of using UPI.*

*$H_4$: Trust is positively related to continuance intention.*

The results of hypothesis testing are discussed below:

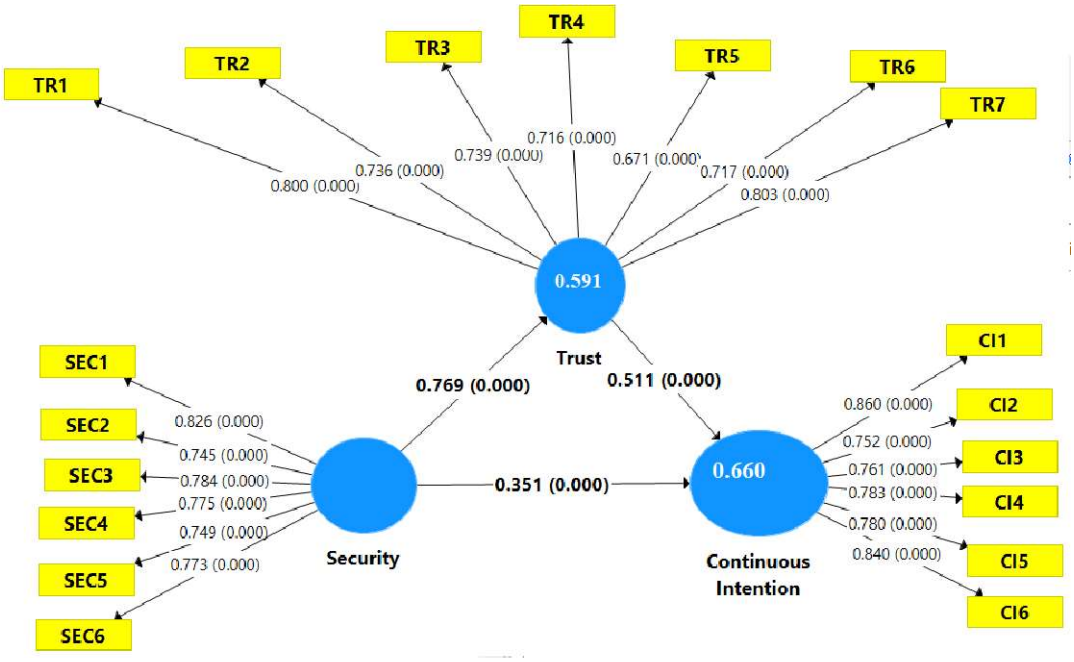


**Figure 4.2: Path model of security and trust on CI**

The results of the SEM analysis supported the hypothesis that *"These selected factors (security and trust)* significantly influences the user continuance intention of using UPI based payment practices. For the security factor that *influences users Trust*

*in UPI*; and *security and trust in UPI is significantly influences continuance intention of using UPI*. The table also reported the path coefficients of the different factors influences the user continuance intention of using UPI based payment practices (*security =.351, trust =.511);* and *path coefficient of security factor that affects trust is .769*.Thus, it can be concluded that the selected factors *security and trust* significantly influenced on intention to continue using UPI and *security also influenced users trust* using UPI significantly. The R square of the SEM model indicates the explanatory power of the model.

The results indicate that the continuance intentions towards the UPI payments can be explained by around 66% (security and trust) and 59.1% (security to trust) with the help of this model.

**Table 4.18: Hypotheses test results- PLS-SEM (objective-2)**

| **Hypothesis** | **Endogenous Construct** | **Exogenous Construct** | **Path coefficient** | **Standard Deviation** | **T Stats** | **R Square** | **Remark** |
|---|---|---|---|---|---|---|---|
| *"Security in UPI is positively associated with continuance intention of using UPI"* | Continuance Intention | Security | 0.351 | 0.066 | 5.324 | 0.660 | Supported |
| *"Trust is positively related to continuance intention"* | | Trust] | 0.511 | 0.065 | 7.912 | | Supported |
| *"Security in UPI is positively* | Trust | Security | 0.769 | 0.028 | 27.538 | 0.591 | Supported |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *associated with users Trust in UPI"* | | | | | | | |

- ***$H_2$: Security in UPI is positively associated with users' Trust in UPI.***

**Conclusion:** The results of SEM analysis support the hypothesis that "*Security in UPI is positively associated with users Trust in UPI" (Path coefficient = 0.697, t stats= 27.538**).* The t stats (greater than critical value of 1.96) indicate the presence of a significant impact of security on the users' trust. The higher the security, the higher the trust in UPI payments.

The report given by Mukherjee &Nath (2003), "consumers' trust in digital services is significantly influenced by security assurances on electronic payment system websites. Security has a positive impact on users' trust (Lim, 2008) in continuance intentions of using UPI payment methods. It is feasible to affect consumers' perceptions of trust in electronic payment systems by educating and assuring them about the security of their payment alternatives (Lim, 2008). Security has a positive impact on users' trust in their intentions to continue using UPI payment methods (similar results to existing studies, Vatanasombut, 2008; Jusob et al., 2016; Hogail, 2018).

***$H_3$: Security in UPI is positively associated with continuance intention of using UPI.***

**Conclusion:** The t stats (greater than critical value of 1.96) indicate the presence of a significant impact of security on the continuance intention to use UPI payments. The higher is the security in the system, higher is the continuance intention to use the UPI payments.

The level of security that is provided to users will have a significant impact on their decision to utilise any digital payment system. (Huang, Encho & Chang, 2012), Security affected continuance intention of using the UPI system positively. our results is similar to studies found that perceived security is an important factor to continue

usage intention: in retail- Liao and Shi (2009), travel services- Li and Liu (2014), web service- Lightner (2004) and Liao and Shi (2017).

- ***$H_4$: Trust is positively related to continuance intention.***

**Conclusion:** The t stats (greater than critical value of 1.96) indicates the presence of a significant impact of user trust on the continuation intention. The higher is the trust in the UPI, the higher the continued intention to use UPI payments. Similar results are found in the literature in the case of trust (in the context of mobile commerce, Chong (2013); mobile shopping, Gao et al. (2015); mobile payment, Zhen Shao et al. (2018); Cao et al. (2018); and mobile banking, Sustano et al. (2016)) as important predictors of continued intentions of using UPI.

So as to enhance perceived security and trust, UPI service providers ought to look up their data protection methods, security of the system, transparent privacy, refund strategies (Marinkovic et al., 2019; Kim et al., 2010; Linck et al., 2006), and confirmation messages after the transaction. UPI service providers should use a safe, secured (Vatansombut et al., 2008) trustworthy system so that unauthorized intervention into the system can be prevented. If UPI service providers offer security and stability, updated and accurate information, and services of high quality that fulfil the user's expectations, they can minimize user's fears and build trust in UPI services (Ryu and KO, 2020). UPI service providers must provide good firewall technology to protect users' interests so that the privacy of their data can be maintained and data cannot be tempered (Marinkovic et al., 2019). Such privacy issues may be associated with contact and use of personal information of users for misusage. To strengthen the security and trust in electronic payments, it's necessary to protect the users of UPI technically (Kim et al., 2010). Technical procedures, security statements, technical protection, and past experience are the factors that affect users' perceptions of security and trust. Transaction procedure has a significant influence on the security and trust of electronic payments (Hwang et al., 2006; Kim et al., 2010). If the information is protected, users should have more intentions to continue using this technology. Even users' security and trust can be enhanced with the help of third-party technology. Further, while UPI transactions are done on a digital platform and

involve the exchange of personal information, it is mandatory to implement sophisticated encrypted methods for data protection (Kim et al., 2010) not only during communication but also when the information is stored at the system. In addition, verification methods on smartphones like fingerprint and face recognition are also helpful in making UPI transactions safe and more reliable in users' minds.

## 4.6 Mediation effect of user satisfaction between UTAUT constructs and continuance intention (objective- 3)

This objective aims to identify the continuance intentions of the UPI system in users of the Northern region of India through the mediating role of user satisfaction. This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method.

### 4.6.1 Mediation effect of user satisfaction between performance expectancy and continuance intention

The mediating role of user satisfaction is examined between performance expectancy and continuance intention to use. The mediation effect of user satisfaction is tested with the help of Baron & Kenny method and Bootstrapping algorithm in SMART-PLS software. The satisfaction of the user of UPI- based payment system is supposed to play a significant mediating role between performance expectancy and continuance intention. The performance expectancy is influencing the intention of using the UPI-based payment systems. The performance expectancy in UPI-based payment systems directly as well as indirectly (through user satisfaction) influences the intention to continue. In the mediation effect, the direct and indirect effect of performance expectancy of UPI-based payment systems is estimated on the continuance intention of the users. The mediating effect of user satisfaction in using the UPI-based payment systems is said to be significant if the indirect effect of performance expectancy of the users on continuance intention is found significant. Further, the mediation effect of user satisfaction may have two possibilities for significant mediation i.e., full mediation and partial mediation. The full mediation of

user satisfaction of the users of UPI-based payment system on continuance intention is said to exist if the direct effect of performance expectancy of users on their continuance intention is found insignificant in the presence of mediating construct i.e., user satisfaction. In case the direct effect of performance expectancy of UPI-based payment users on continuance intention is found to be significant in the presence of mediating construct i.e., user satisfaction, the mediation is known as partial mediation. The following hypothesis is examined for the mediating role of user satisfaction between the performance expectancy and continuance intention.

***Hypothesis $H_{6a}$:*** *"User Satisfaction from using UPI- based payment system significantly mediates between performance expectancy and continuance intention to use."*

The structural model developed for mediating effect is shown below:

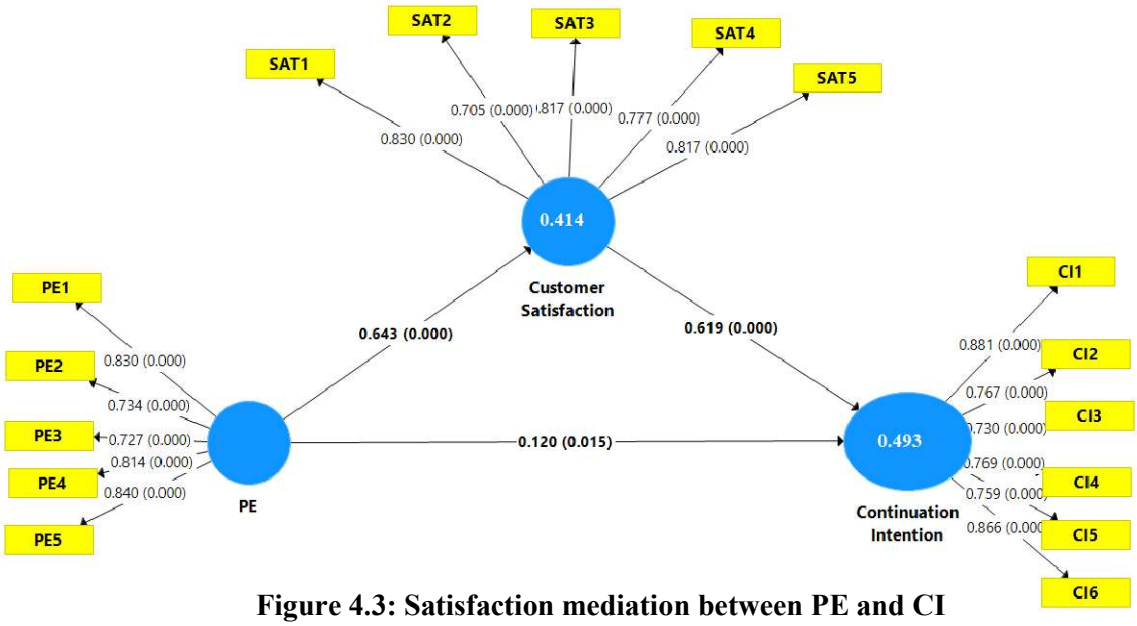


**Figure 4.3: Satisfaction mediation between PE and CI**

**Table 4.19: Hypothesis test of satisfaction mediation between PE and CI**

| **Type of Effect** | **Relationship** | **Standardized Path Coefficient** | **T value** | **Remarks** |
|---|---|---|---|---|
| *Total Effect* | Performance expectancy → Continuance intention (a * b + c) | 0.518 | 12..974*** | Significant total effect |

| | | | | |
|---|---|---|---|---|
| *Indirect Effect* | Performance expectancy →User satisfaction → Continuance intention (a * b) | 0.398 | 10.599*** | Significant indirect effect found |
| *Direct Effect* | Performance→ Continuance intention | 0.120 | 2.632** | Significant direct effect found |
| Strength of Mediation effect (Variance Accounted For) | | =Indirect Effect/Total Effect; = 0.398/0.518 = 0.7683 (76.83%) | | |
| Conclusion | Strong Partial mediation effect of user satisfaction between Performance expectancy and continuance intention is concluded. | | | |

- **Conclusion**

The results supported the hypothesis that ***"****User Satisfaction from using UPI- based payment system significantly mediates between performance expectancy and continuance intention to use."*The result of the mediation test indicates that the total effect of the performance expectancy on continuance intention is 0.518 (t stats = 12.974) significant at 5 % level of significance. Further, the indirect effect of performance expectancy on continuance intention from the mediating construct "user satisfaction" is found to be 0.398 (t stats = 10.599**) significant at 5 % level of significance. Thus, user satisfaction plays a significant mediating role between performance expectancy and continuance intention. To find out the nature of mediation, whether partial or full, the direct effect of effort expectancy on continuance intention is examined. The direct effect of performance expectancy on continuance intention is found to be 0.120 (t stat = 2.632) significant at 5 % level of significance. Thus, the mediation effect of user satisfaction is said to partial in nature. This means that the performance expectancy of a UPI-based payment system not only influences the continuance intention directly, but also influences indirectly from user satisfaction. The variance accounted for (VAF) indicating the strength of the mediation effect of the user satisfaction between the performance expectancy and continuance intention is found to be 76.83 % indicating a partial mediation effect (Hair, Ringle & Sarstedt, 2011). Thus, it can be concluded from the result that the user satisfaction towards UPI- based payment system play a strong positive and partial mediation effect between the performance expectancy on continuance intention.

### 4.6.2 Mediation effect of user satisfaction between effort expectancy and continuance intention

The mediating role of user satisfaction is examined between the between effort expectancy and continuance intention to use. The satisfaction of the user of UPI-based payment system is supposed to play a significant mediating role between effort expectancy and continuance intention. The effort expectancy is influencing the intention of use the UPI- based payment systems. The effort expectancy in UPI- based payment systems directly as well as indirectly (through user satisfaction) influences the intention to continue. In the mediation effect, the direct and indirect effect of effort expectancy of UPI- based payment systems are estimated on continuance intention of the users. The mediating effect of user satisfaction in using the UPI-based payment systems is said to be significant if indirect result of effort expectancy of the users on continuance intention is found significant. Further, the mediation effect of user satisfaction may have two possibilities for significant mediation i.e., full mediation and partial mediation. The full mediation of user satisfaction of the users of UPI- based payment system on continuance intention is said to exist if the direct effect of effort expectancy of users on their continuance intention is found insignificant in the presence of mediating construct i.e., user satisfaction. In case the direct effect of effort expectancy of UPI- based payment users on continuance intention is found to be significant in the presence of mediating construct i.e., user satisfaction, the mediation is known as partial mediation. The following hypothesis is examined for the mediating role of user satisfaction between effort expectancy and continuance intention.

***Hypothesis $H_{6b}$:*** *"User Satisfaction from using UPI- based payment system significantly mediates the relationship between effort expectancy and continuance intention to use.*

The structural model developed for mediating effect is shown below:

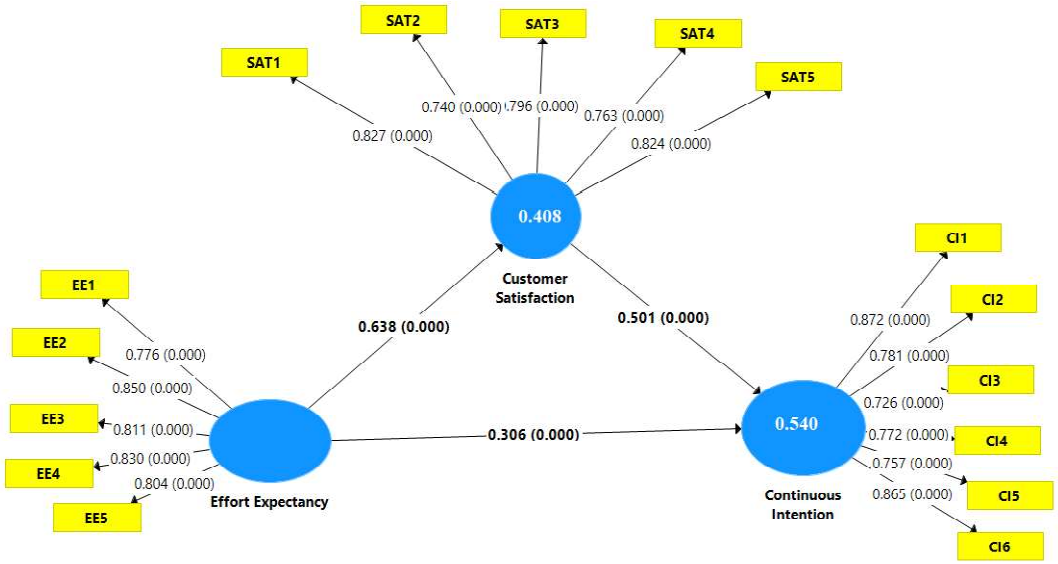


**Figure 4.4**: **Satisfaction mediation between EE and CI**

**Table 4.20: Hypothesis test of satisfaction mediation between EE and CI**

| **Type of Effect** | **Relationship** | **Standardized Path Coefficient** | **T value** | **Remarks** |
|---|---|---|---|---|
| *Total Effect* | Effort expectancy → Continuance intention (a * b + c) | 0.626 | 16.748*** | Significant total effect |
| *Indirect Effect* | Effort expectancy → user satisfaction → Continuance intention (a * b) | 0.320 | 9.142*** | Significant indirect effect found |
| *Direct Effect* | Effort expectancy → Continuance intention | 0.306 | 6.211** | Significant direct effect found |
| Strength of Mediation effect (Variance Accounted For) | | = Indirect effect/ Total Effect = 0.320/0.626= 0.509 (50.9)% | | |
| Conclusion | Moderately strong partial mediation effect of user satisfaction between Effort expectancy and continuance intention is concluded. | | | |

**Conclusion:** The result of the mediation test indicates that the total effect of the effort expectancy on continuance intention is 0.626 (t stats = 16.748) significant at 5 % level of significance. Further, the indirect effect of effort expectancy on continuance intention from the mediating construct "user satisfaction" is found to be

0.320 (t stats = 9.142) significant at 5 % level of significance. Thus, the user satisfaction plays a significant mediating role between effort expectancy and continuance intention. To find out the nature of mediation, whether partial or full, the direct effect of effort expectancy on continuance intention is examined. The direct effect of effort expectancy on continuance intention is found to be 0.306 (t stat = 6.211) significant at 5 % level of significance. Thus, the mediation effect of user satisfaction is said to partial in nature. This means that effort expectancy of UPI-based payment system not only influences the continuance intention directly, but also influences indirectly from user the user satisfaction. The variance accounted for (VAF) indicating the strength of mediation effect of the user satisfaction between the effort expectancy and continuance intention is found to be 50.9 % indicating a partial moderately partial mediation effect. Thus, it can be concluded from the result that the user satisfaction towards UPI- based payment system play a strong positive and partial mediation effect between the effort expectancy on continuance intention.

### 4.6.3 Mediation effect of user satisfaction between social influence and continuance intention

The satisfaction of the user of UPI- based payment system is supposed to play a significant mediating role between social influence and continuance intention. The social influence is influencing the intention of use the UPI- based payment systems. The social influence in UPI- based payment systems directly as well as indirectly (through user satisfaction) influences the intention to continue. In the mediation effect, the direct and indirect effect of social influence of UPI- based payment systems is estimated on continuance intention of the users. The mediating effect of user satisfaction in using the UPI- based payment systems is said to be significant if indirect effect of social influence of the users on continuance intention is found significant. Further, the mediation effect of user satisfaction may have two possibilities for significant mediation i.e. full mediation and partial mediation. The full mediation of user satisfaction of the users of UPI- based payment system on continuance intention is said to exist if the direct effect of social influence of users on their continuance intention is found insignificant in the presence of mediating construct i.e., user satisfaction. In case the direct effect of social influence of UPI-

based payment users on continuance intention is found to significant in the presence of mediating construct i.e., user satisfaction, the mediation is known as partial mediation. The following hypothesis is examined for the mediating role of user satisfaction between the social influence and continuance intention.

***Hypothesis $H_{6c}$:*** *"User Satisfaction from using UPI- based payment system significantly mediates between social influenceand continuance intention to use."*

The structural model developed for mediating effect is shown below:

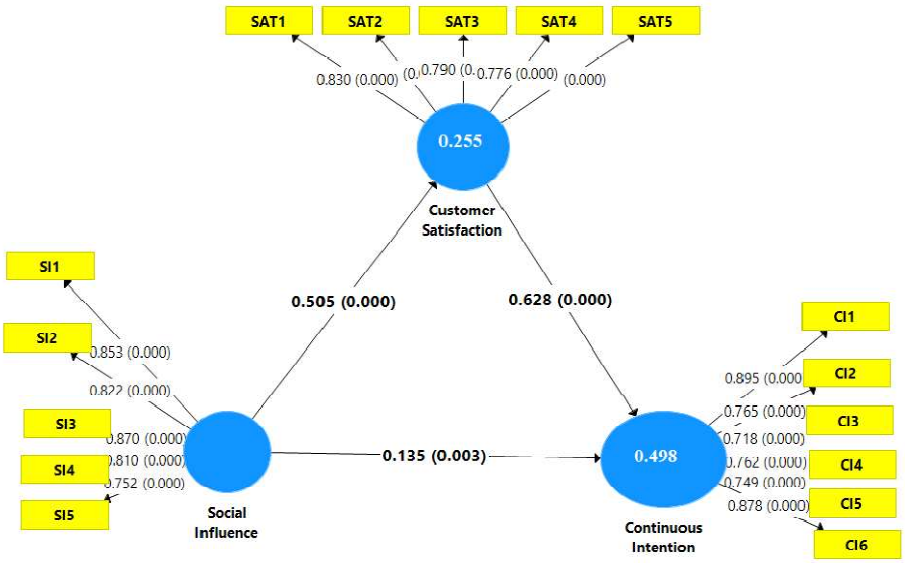


**Figure 4.5: Satisfaction mediation between SI and CI**

**Table 4.21: Hypothesis test of satisfaction mediation between SI and CI**

| **Type of Effect** | **Relationship** | **Standardized Path Coefficient** | **T value** | **Remarks** |
|---|---|---|---|---|
| *Total Effect* | Social influence → Continuance intention (a * b + c) | 0.452 | 11.618*** | Significant total effect |
| *Indirect Effect* | Social influence →User satisfaction → Continuance intention (a * b) | 0.317 | 8.755*** | Significant indirect effect found |
| *Direct Effect* | Social influence → Continuance intention | 0.135 | 3.003** | Significant direct effect found |
| Strength of Mediation effect (Variance Accounted | | = Indirect effect/ Total Effect | | |

| | |
|---|---|
| For) | = 0.317/0.452 = 0.701 (70.10)% |
| Conclusion | Very strong partial mediation effect of user satisfaction between Effort expectancy and continuance intention is concluded. |

**Conclusion:** The results supported the hypothesis that ***"****User Satisfaction from using UPI- based payment system significantly mediates between social influence and continuance intention to use."*.The result of the mediation test indicates that the total effect of the social influence on continuance intention is 0.452 (t stats = 11.618) significant at 5 % level of significance. Further, the indirect effect of social influence on continuance intention from the mediating construct "user satisfaction" is found to be 0.317 (t stats = 8.755) significant at 5 % level of significance. Thus, the user satisfaction plays a significant mediating role between social influence and continuance intention. To find out the nature of mediation, whether partial or full, the direct effect of social influence on continuance intention is examined. The direct effect of social influence on continuance intention is found to be 0.135 (t stat = 3.003) significant at 5 % level of significance. Thus, the mediation effect of user satisfaction is said to partial in nature. This means that social influence of UPI- based payment system not only influences the continuance intention directly, but also influences indirectly from user the user satisfaction. The variance accounted for (VAF) indicating the strength of mediation effect of the user satisfaction between the effort expectancy and continuance intention is found to be 70.10 % indicating a fairly strong partial mediation effect. Thus, it can be concluded from the result that the user satisfaction towards UPI- based payment system play a strong positive and partial mediation effect between the social influences on continuance intention.

**4.6.4 Mediation effect of user satisfaction between facilitating conditions and continuance intention**

The mediating role of user satisfaction is examined between the between facilitating conditions and continuance intention to use. The mediation effect of user satisfaction is tested with the help of Baron & Kenny method and Bootstrapping algorithm in SMART-PLS software. The satisfaction of the user of UPI- based payment system is supposed to play a significant mediating role between facilitating conditions and continuance intention. The facilitating conditions is influencing the intention of use the UPI- based payment systems. The facilitating conditions in UPI-

based payment systems directly as well as indirectly (through user satisfaction) influence the intention to continue. In the mediation effect, the direct and indirect effect of facilitating conditions of UPI- based payment systems is estimated on continuance intention of the users. The mediating effect of user satisfaction in using the UPI- based payment systems is said to be significant if indirect effect of facilitating conditions of the users on continuance intention is found significant. Further, the mediation effect of user satisfaction may have two possibilities for significant mediation i.e. full mediation and partial mediation. The full mediation of user satisfaction of the users of UPI- based payment system on continuance intention is said to exist if the direct effect of facilitating conditions of users on their continuance intention is found insignificant in the presence of mediating construct i.e., user satisfaction. In case the direct effect of facilitating conditions of UPI- based payment users on continuance intention is found to significant in the presence of mediating construct i.e., user satisfaction, the mediation is known as partial mediation. The following hypothesis is examined for the mediating role of user satisfaction between the facilitating conditions and continuance intention.

***Hypothesis $H_{6d}$:*** *"User Satisfaction from using UPI- based payment system significantly mediates between facilitating conditions and continuance intention to use."*

The structural model developed for mediating effect is shown below:

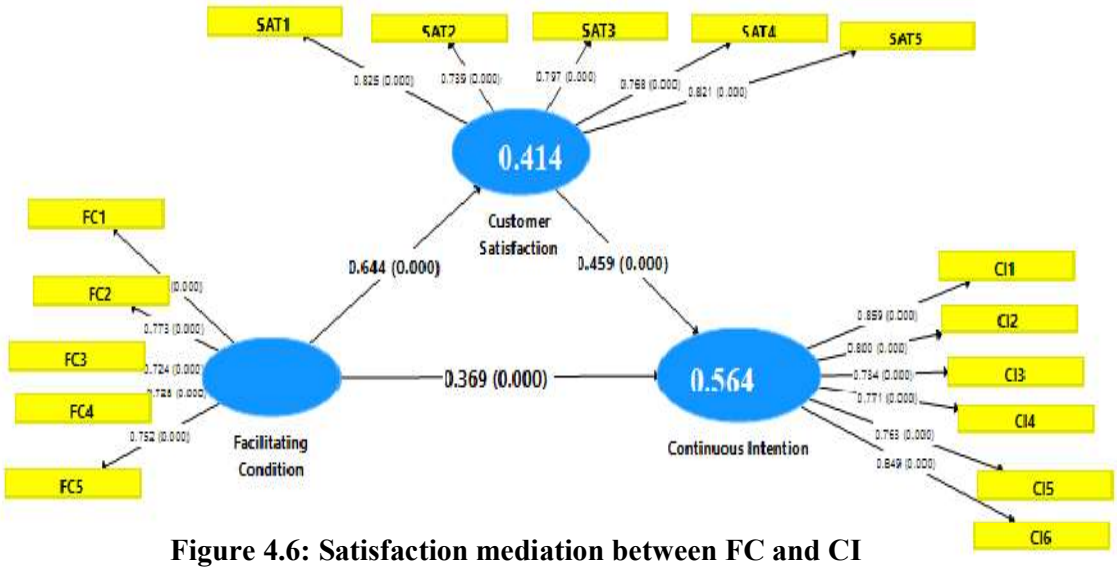


**Figure 4.6: Satisfaction mediation between FC and CI**

**Table 4.21: Hypothesis test of satisfaction mediation between FC and CI**

| Type of Effect | Relationship | Standardized Path Coefficient | T value | Remarks |
|---|---|---|---|---|
| Total Effect | Facilitating Conditions → Continuance intention | 0.664 | 19.844*** | Significant total effect |
| Indirect Effect | Facilitating Conditions → user satisfaction → Continuance intention | 0.295 | 8.321*** | Significant indirect effect found |
| Direct Effect | Facilitating Conditions → Continuance intention | 0.369 | 7.164*** | Significant direct effect found |
| Strength of Mediation effect (Variance Accounted For) | | = Indirect effect/ Total Effect<br>= 0.295/0.664 = 0.444(44.42%) | | |
| Conclusion | Moderately strong partial mediation effect of user satisfaction between facilitating conditions and continuance intention is concluded. | | | |

**Conclusion:** The results supported the hypothesis that **"***User Satisfaction from using UPI- based payment system significantly mediates between facilitating conditions and continuance intention to use".* The result of the mediation test indicates that the total effect of the facilitating conditions on continuance intention is 0.664 (t stats = 19.844) significant at 5 % level of significance. Further, the indirect effect of facilitating conditions on continuance intention from the mediating construct "user satisfaction" is found to be 0.295 (t stats = 8.321) significant at 5 % level of significance. Thus, the user satisfaction plays a significant mediating role between facilitating conditions and continuance intention. To find out the nature of mediation, whether partial or full, the direct effect of facilitating conditions on continuance intention is examined. The direct effect of facilitating conditions on continuance intention is found to be 0.369 (t stat = 7.164) significant at 5 % level of significance. Thus, the mediation effect of user satisfaction is said to partial in nature. This means that facilitating conditions of UPI- based payment system not only influences the continuance intention directly, but also influences indirectly from user the user satisfaction. The variance accounted for (VAF) indicating the strength of mediation effect of the user satisfaction between the facilitating conditions and continuance intention is found to be 44.42 % indicating a partial moderately strong mediation effect. Thus, it can be concluded from the result that the user satisfaction towards UPI- based payment system play a strong positive

and partial mediation effect between the facilitating conditions on continuance intention.

### 4.6.5 Mediation effect of user satisfaction between personal innovativeness and continuance intention

The satisfaction of the user of UPI- based payment system is supposed to play a significant mediating role between personal innovativeness and continuance intention. The personal innovativeness is influencing the intention of use the UPI-based payment systems. The personal innovativeness in UPI- based payment systems directly as well as indirectly (through user satisfaction) influences the intention to continue. In the mediation effect, the direct and indirect effect of personal innovativeness of UPI- based payment systems is estimated on continuance intention of the users. The mediating effect of user satisfaction in using the UPI- based payment systems is said to be significant if indirect effect of the personal innovativeness of the users on continuance intention is found significant. Further, the mediation effect of user satisfaction may have two possibilities for significant mediation i.e. full mediation and partial mediation. The full mediation of user satisfaction of the users of UPI- based payment system on continuance intention is said to exist if the direct effect of personal innovativeness of users on their continuance intention is found insignificant in the presence of mediating construct i.e., user satisfaction. In case the direct effect of personal innovativeness of UPI- based payment users on continuance intention is found to be significant in the presence of mediating construct i.e., user satisfaction, the mediation is known as partial mediation. The below hypothesis is tested to see if user satisfaction plays a mediation role between personal innovativeness and continuance intention.

***Hypothesis $H_{6e}$:*** *"User Satisfaction from using UPI- based payment system significantly mediates between personal innovativeness and continuance intention to use."*

The structural model developed for mediating effect is shown below:

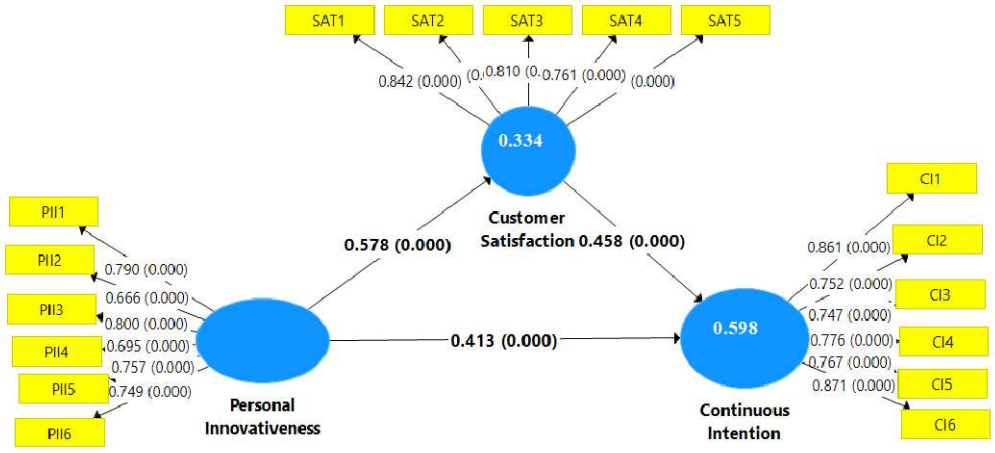


**Figure 4.7: Satisfaction mediation between PI and CI**

**Table 4.22: Hypothesis test of satisfaction mediation between PI and CI**

| **Type of Effect** | **Relationship** | **Standardized Path Coefficient** | **T value** | **Remarks** |
|---|---|---|---|---|
| Total Effect | Personal innovativeness→ Continuance intention | 0.677 | 18.960*** | Significant total effect |
| Indirect Effect | Personal innovativeness→ user satisfaction → Continuance intention | 0.265 | 7.470*** | Significant indirect effect found |
| Direct Effect | Personal innovativeness→ Continuance intention | 0.413 | 7.654*** | Significant direct effect found |
| Strength of Mediation effect (Variance Accounted For) | | = Indirect effect/ Total Effect<br>= 0.265/0.677 = 0.3914 (39.14%) | | |
| Conclusion | Moderate partial mediation effect of user satisfaction between Personal innovativeness and continuance intention is concluded. | | | |

**Conclusion:** The results supported the hypothesis that ***"****User Satisfaction from using UPI- based payment system significantly mediates between personal innovativeness and continuance intention to use".* The result of the mediation test indicates that the total effect of the personal innovativeness on continuance intention is 0.677 (t stats = 18.960) significant at 5 % level of significance. Further, the indirect effect of personal innovativeness on continuance intention from the mediating construct "user satisfaction" is found to be 0.265 (t stats = 7.470) significant at 5 % level of significance. Thus, the user satisfaction plays a significant mediating role between

personal innovativeness and continuance intention. To find out the nature of mediation, whether partial or full, the direct effect of personal innovativeness on continuance intention is examined. The direct effect of personal innovativeness on continuance intention is found to be 0.413 (t stat = 7.654) significant at 5 % level of significance. Thus, the mediation effect of user satisfaction is said to partial in nature. This means that personal innovativeness of UPI- based payment system not only influences the continuance intention directly, but also influences indirectly from user the user satisfaction. The variance accounted for (VAF) indicating the strength of mediation effect of the user satisfaction between the personal innovativeness and continuance intention is found to be 39.14% indicating a partial moderate mediation effect. Thus, it can be concluded from the result that the user satisfaction towards UPI- based payment system play a strong positive and partial mediation effect between the personal innovativeness on continuance intention.

According to the results of path analysis, performance expectancy, effort expectancy, and social influence (in the context of mHealth-Wu et al.,2022; e-learning- El-Masri & tahini, 2017, Tan, 2013; MOOC- Wan et al., 2020, Mulik et al., 2018, and Nordin et al., 2015), facilitating conditions (mHealth- Wu et al.,2022; MOOC- Wan et al., 2020; Oh & Yoon, 2014; T. Zhou et al., 2010), and personal innovativeness (Luqman et al., 2016; Lu, 2014), Among all the factors influencing continuance intention, the impact of performance expectancy has relatively greater than effort expectancy, social influence, facilitating conditions, and personal innovativeness. It implies that as much as UPI users recognize the value of UPI services in terms of completing tasks efficiently, improving performance, and saving their time and money, they will continue to use UPI services. Users' internal demand for UPI is performance expectancy, whereas external demand and perception of UPI is social influence (Wan et al., 2020). The acquaintances such as family members, professors, classmates, and friends will impact users' future usage intentions. Their continuous intention to use UPI is influenced by their peers' continued usage patterns, friends and relative's suggestion and support, a feeling of individual appreciation and a sense of community to the group learning after enrolling and participation (Wan et al., 2020).

The effect of effort expectancy on continuance intention is less than performance expectancy but more than other factors. The explanation for this could be that the current UPI platform appears to be quite good. Its user interface is becoming more and more inviting, and it is becoming a lot easier to use. It does not require a lot of work on the part of the users to grasp it. Respondents are classified as "digital natives" or "digital generation" from the standpoint of learners. They are often well-versed in information literacy and adept at using the internet. In other words, adopting UPI to conduct transactions poses no technical challenges for UPI users (Wan et al., 2020). Facilitating conditions defines the hardware's and software that facilitate users to use of UPI services. For example, the internet's speed can ensure that UPI users can transfer funds without interruption; users can connect to the banking facilities at any time and utilize portable terminal devices to access the UPI platform from anywhere at any time. When problems arise in technology, they may rely on the platform for effective support and remedies (Wan et al., 2020). Under good facilitating conditions, users will feel more satisfied when using UPI. As previously stated, UPI users with high personal innovativeness have more positive opinions about UPI and are more likely to be satisfied with it (Bhattacherjee & Premkumar, 2004; Choi et al., 2007). A key motive for engaging in an activity is to have a favorable subjective experience (Lin et al., 2005). An individual is more inclined to participate in an activity if he or she is at ease with it. Positive effects and usage intentions are also linked, according to studies (Bhattacherjee, 2001; Davis et al., 1989). In other words, UPI users' innovativeness is more likely to result in favorable sensations; therefore, they have a higher level of intention to continue it (Chou & Chen, 2009).

### 4.7 Impact of pace of technology innovations and personal innovativeness on continuance intention using UPI (objective-4)

The objective aims to find out: Does the pace of technology and personal innovativeness affect the continuation intentions of UPI users? This objective is fulfilled with the help of hypothesis testing using SEM analysis using Smart-PLS software. All the assumptions are examined before hypothesis testing method.

The pace of technology is the speed at which technological innovation or advancement is occurring. Online technologies for digital payments are increasingly advancing at an unprecedented pace of innovation. Compared to other technologies, UPI payments are changing fast. In UPI, innovations are prevalent.

Personal innovativeness is the adoption of new ideas or products by an individual relative to others in their group (Leavvitt & Walton, 1975; Sandeep, 2022). Innovations play a significant role in determining users' intentions to adopt new digital devices, but consumers and users don't have a lot of exposure to new mobile innovations (Kim et al., 2010; Sandeep, 2022). Personal innovativeness was defined in this study as the willingness of users to try out new UPI payment apps, features, etc. and their experience with them. People with higher levels of personal innovation are likely to have a more positive outlook about the new innovation and have a more positive intention to use new UPI apps, which may lead them to continue using UPI payment practices.

These factors influencing the user continuance intention of UPI based payment practices are assumed to be zero order and reflective in nature. The user continuance intention of UPI based payment practices is assumed to be an endogenous construct zero order reflective in nature. Pace of innovations and personal innovativeness are assumed as exogenous construct and a structural model (SEM model) is developed in examine the impact of pace of innovations and personal innovativeness on continuance intention of UPI based payment practices. The SEM analysis is used to examine the following hypothesis:

**Hypotheses:**

$H_8$**:** *"The perceived pace of innovation has a positive and significant effect on their intention to use UPI"*

$H_9$: *"Perceived personal innovativeness has a positive and significant effect on their intention to use UPI"*

The results of hypothesis testing are discussed below:

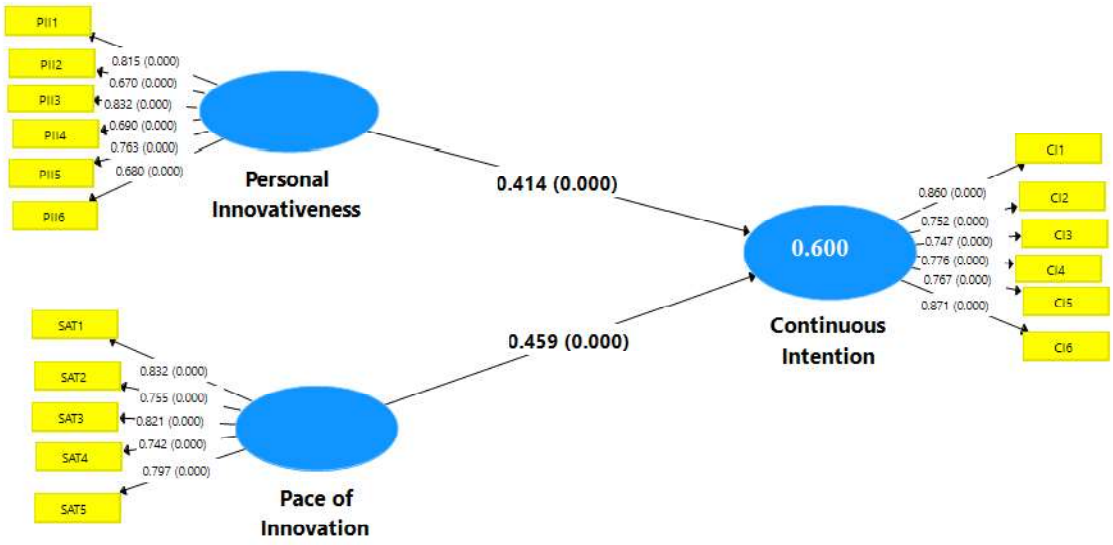


**Figure 4.8: Path model showing PI and POI as antecedents of CI**

**Table 23: Hypotheses test results of PI and POI relationship with CI**

| **Hypothesis** | **Endogenous Construct** | **Exogenous Construct** | **Path coefficient** | **SD** | **T Stats** | **R Square** | **Remark** |
|---|---|---|---|---|---|---|---|
| "The individuals' pace of innovation has a positive and significant effect on their intention to use UPI" | Continuance Intention | Pace of Innovation | 0.459 | 0.050 | 9.167*** | 60% | Supported |
| "Personal innovativeness is positively related to continuance intention." | | Personal Innovativeness | 0.414 | 0.053 | 7.849*** | | Supported |

***Conclusion:*** The table also reported the path coefficients of the different factors that affect the user's intentions of using UPI-based payment practices (*pace of innovation =.459 and personal innovativeness =.414).* Thus, it can be concluded that the selected factors *pace of innovation and personal innovativeness* significantly influenced the user's continued intention of using UPI based payment practices.

In this study, the pace of innovation has an impact on UPI users' intentions to continue it. The pace of innovation is repetitious, because it is continually committed to fast-developing innovations. Therefore, the UPI providers must set up cutting-edge infrastructure and technologies on the UPI platform. "Frequent innovations in the UPI system and UPI apps influenced the continued intentions of Unified Payments Interface users" (Sandeep, 2022). Continuous professional growth and progressing instructions are crucial for a booming and well-ordered use of the ICT environment, including digital and mobile learning resources (Camilleri & Camilleri, 2016; Prensky, 2005).

Personal innovativeness is an individual personal trait that is significant in determining whether someone will continue to use the UPI payment system. The persons with higher personal innovativeness are probably to grow more optimistic perception about the new innovation and having more positive intention to use new UPI apps, features which may give them more satisfaction and they will have definitely continuance intentions of using UPI. In order to increase the continuance intention towards using UPI, Service providers must focus on creating and communicating the useful and redundant benefits of new UPI features in order to increase users' intentions to continue using UPI. They must promote how beneficial the new UPI features, apps, etc. are. By developing or advertising new UPI services, users will have more opportunity to explore new things, which will strengthen their intention to continue using UPI (Sandeep, 2022).

### 4.8 Relationship between satisfaction, continuance intentions and intentions to recommend

The conceptual framework of the study brings out the effect of user satisfaction, on continuance intentions (H5), and effect to continuance intentions on recommendation intentions (H7). For testing these hypotheses path analysis was run on the full model where all IVs and DVs were included. The detailed figure of the full path analysis is included in Annexure II.

The outcomes shows that satisfaction in UPI context influenced continuance intention significantly ($\beta = 0.144, p= 0.000$). Similarly, a favorable and significant

effect of continuance intentions on recommendation intentions is also confirmed ($\beta$ *=0.693. p = 0.000).* The results suggest that UPI user satisfaction is important for the continued use of payment platform, making it clear that service providers will have to work on customer satisfaction continuously. If service failures and other hindrances are there, users might switch to other alternatives. Similarly, to get recommendations from existing users it is vital to keep them using the payment platforms. It is quite natural because people usually recommend the product and services with they are currently using and are satisfied with.

### 4.9 Importance-performance analysis (IPMA)

In addition to measurement model assessment and path modeling, SmartPLS provided extended features such as IPMA (Importance Performance analysis) that takes the performance of each construct into account. It provides a very informative two-dimensional analysis of "importance" and "performance" of each construct used in structural model, which is particularly important for prioritizing managerial actions (Ringle & Sarstedt, 2016). Since continuous intentions are at the helm of the present study it is selected as a variable of interest (target construct). Figure 4.9 provides a visual map of latent constructs along four quadrants (each quadrants represents a relative degree of performance and importance. Along with that, table 4.24 provides the scores for both dimensions. It is clear from the analysis that Trust has emerged as a significant factor on both dimensions (Imp- 0.268; Perf- 68.571), followed by Security (Imp- 0.372, Perf- 63.536).This means that a one-unit increase in the performance oftrust in the UPI platform increases the intention to continue the total effect's value, which is 0.372, assuming ceteris paribus Another significant construct that is important to induce continuance intentions among customers is pace of innovation (Imp- 0.25; Perf- 61.912). These are the factors which the managers should continue to develop and improve.

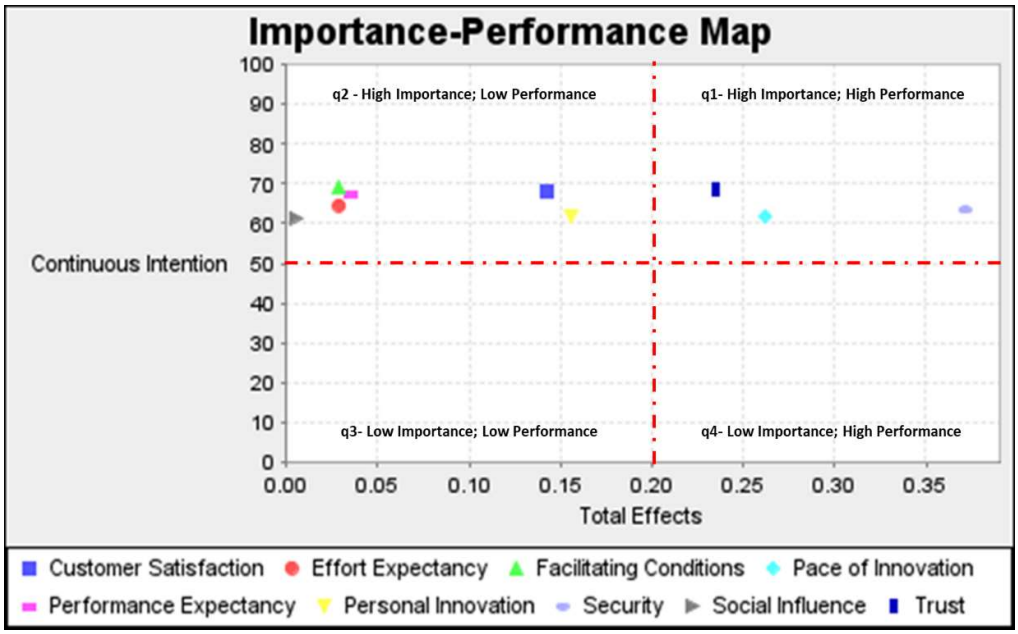


**Figure 4.9: Importance performance map**

**Table 4.24: IPMA results for CI**

| Latent Variable | Continuous intentions | |
|---|---|---|
| | Total Effects (Importance) | Index Value (Performance) |
| Customer Satisfaction | 0.147 | 67.870 |
| Effort Expectancy | 0.028 | 64.649 |
| Facilitating Conditions | 0.031 | 69.392 |
| Pace of Innovation | 0.250 | 61.912 |
| Performance Expectancy | 0.035 | 67.126 |
| Personal Innovation | 0.157 | 61.718 |
| Security | 0.372 | 63.536 |
| Social Influence | 0.005 | 61.530 |
| Trust | 0.268 | 68.571 |

# CHAPTER 5
# CONCLUSIONS, IMPLICATIONS, AND FURTHER RESEARCH

This chapter concludes the research endeavor by drawing insights from the outcomes of data analysis in previous chapters. It also contains an overview of the research methodology as well as an interpretation of the findings in accordance with the conceptual foundations of the study. Possible explanations of the analysis results have been explored, and are used as a basis for recommendations for all the concerned stakeholders. Every significant aspect that influences the continuation and recommendation decision (of UPI services) is thoroughly explained using the results of descriptive analysis and hypotheses tests. Furthermore, the conceptual and managerial ramifications are also examined and deliberated. The chapter concludes by potential research direction intended for forthcoming research projects.

## 5.1 Summary of Study Methods

Collis and Hussey (2013) laid down the positivist paradigm and the phenomenological paradigm, where the positivist paradigm originates from the philosophy of positivism. The positivism philosophy assumes the existing understanding of the phenomenon and tries to draw benefit for people and society at large. The positivist approach typically uses a deductive method of research to test and confirm existing hypotheses in a new research setting. And, for study results to be generalized, statistical probability and a large sample size are needed. The phenomenon being explored should be measurable and quantifiable. Thus, survey research is the best option because it lets researchers get a lot of information from a large group of people in a short amount of time.

The study examines numerous philosophical viewpoints that have been challenged in the literature and affirms the applicability of a positivist research approach to the study context. Additionally, a deductive research approach was used because, despite substantial research into a number of technology acceptance models, relatively few research studies have looked at continuation and recommendation intentions in the context of UPI. Thus, deductive research is found to have more applicability than inductive research in the present context.

To have a greater understanding of the research problem and concentrate on the contemporary academic discussion, the study conducts an exhaustive assessment of the literature on users' behavioral intentions toward digital technology. Based on existing gaps and suggestions from noteworthy researchers, we developed the founding framework, and the study's scope is narrowed to UPI technology, resulting in a specific research area. Considering similar investigations and existing technology acceptance models, a number of hypotheses are developed. Following that, the hypotheses are investigated, and the sample characteristics are explained using descriptive research. The goal of the descriptive research is to describe UPI users' continued usage and recommendation intentions.

According to the proposed conceptual model, the affective phase of consumer behaviour is driven by the cognitive phase and further affects the user's conative behavior. This idea is consistent with consumer behaviour and technology adoption literature. The author specifically suggested that users' rational perceptions and judgments are part of the cognitive phase. Performance expectancy, effort expectancy, social influence, facilitating conditions, and personal innovation were all incorporated in the suggested model to capture the contextual aspects unique to the study. Satisfaction was a component of the affective factors, and it stands for the emotions that result from the service evaluation. The conceptual framework includes the post-adoption behaviour factors of continuation and recommendation intention for the conative phase.

The data collection instrument (questionnaire) is created in three stages. Initially, in conformance with the hypothesised relationships formulated in Chapter 2, a set of questions is constructed based on similar previous studies and related literature. Second, a pilot study is carried out to evaluate the reliability and consistency of the replies. Finally, the questions' reliability and validity are examined. The questions are revised on the basis of users' opinions and statistics. A representative sample of 651 UPI users was selected from three states in northern India, *viz.,* Punjab, Haryana, and Himachal. A proportional representation of each state was given based on the per capita UPI transaction in each state. After completion of data collection and preprocessing, descriptive and path modeling procedures were applied for testing research hypotheses.

Following the completion of data collection, the data were entered into SPSS v 22.0, where they were checked for disinterested respondents, missing data, and other errors like skewness and kurtosis. The sample summary has been created using descriptive statistics, and PLS-SEM was utilised in quantitative analysis to examine the measurement model and structural model. SmartPLS3TM was used to analyse the data and test the hypotheses that had been put forth. In order to assess the validity and reliability of the construct measures, a two-step procedure was used, starting with a test of the measurement model. It is essential to evaluate the measuring model because it enables the researcher to practically assess the links between the constructs and indicators. The researcher was able to analyse the structural model, which looks at the relationships between constructs, because it indicated no problems with validity or reliability. The structural model is discussed in relation to the suggested conceptual perspective in the following section.

### 5.2 Discussion of Results

According to a literature review, a growing body of academic research suggests that customer satisfaction has a critical role in determining the acceptance or rejection of technology (Al-Maroof & Salloum, 2021; Al-Busaidi & Al-Shihi, 2012; Weng et al., 2015). Although much research has been conducted on pre-adoption behaviour intentions in a variety of technology contexts, little research has been conducted on post-adoption behavior, particularly how the technology is used continuously and how it is shared with other users. The contemporary literature also indicates that the prevailing acceptance frameworks are fragmented and largely limited by technology typology and geographical locales (Arbain et al., 2018; Llewellyn & Brown, 2020). Moreover, the findings from existing studies are not easy to generalize, as some research studies include only a few variables and completely disregard others. As a result, an extensive research framework that encompasses all potential facets is required to properly understand post-adoption behaviors.

The technological revolution preferred for this research is UPI application because it is still in its early phases of growth. This research is required to comprehend and preserve user experiences, as well as to effectively facilitate implementation in the

context of UPI. Pre-adoption behavioural tendencies are becoming more widely studied, but little attention has been paid to the framework of post-adoption behavior. The study fills this gap by investigating the cognitive and affective variables that influence consumers' decisions to continue using and recommending a UPI payment platform. In order to accomplish this objective, the variables that play a role in post-adoptive behaviour were researched, and a theoretical model was put to the test.

PLS-SEM was used to test the postulated conceptual model. Since the study's focus is on the explanation and prediction of selected variables, PLS-SEM is the appropriate approach for this (Hair et al., 2014). PLS-SEM is a two-step procedure that involves evaluating the theoretical model by looking at the measurement model, then evaluating the structural model. Study findings revealed no validity or reliability difficulties, indicating that the theory has been empirically confirmed. Evaluation of the theoretical model enabled the investigator to ascertain how effectively the data supported the theory. A review of the structural model revealed no problems with collinearity and significant, pertinent correlations with predictive accuracy.

Suggesting that users first need to be satisfied with the application in order to continue using and recommending the UPI app. The results indicate that satisfaction has the impact on the intention to continue. Customers who are unsatisfied with the application are more likely to utilise it once only before discarding it. Companies developing smartphone apps for the payments sector must make user satisfaction their top priority. Managers who do not prioritise user satisfaction risk having an app that is downloaded just once before being deleted, as well as a capital investment that has not resulted in the enhanced user experience they had hoped for. A thorough discussion of all proposed hypotheses is necessary because this model suggests that cognitive and affective variables impact the conative process (continuance intention) of user behaviour. On the other side, continuing intentions accounted for 74.1% of intentions to recommend.

### 5.2.1. Factors influencing user satisfaction:

Five factors influencing user satisfaction of UPI-based payment practices have been included in this study, namely "performance expectations," "effort expectancy," "social influence," "facilitating conditions," and "personal innovativeness." The impact of the aforementioned factors on user satisfaction with UPI payment services is discussed.

The study supported the theoretical link, which states that users' perceived performance expectations of a UPI application will positively increase users' satisfaction (H1a). According to researchers' prior studies, performance expectancy is a crucial precursor to satisfaction because a system's usefulness will result in user happiness (Al-Maroof & Salloum, 2021; Chen et al., 2009; Weng et al., 2015). The study confirms that performance expectancy influences the consumption of UPI payment platforms for online payments. Users of UPI-based payments revealed that the UPI payment system is likely to process transactions more efficiently. This is due to the fact that consumers rely on UPI for a variety of functions. UPI is used by users because it eventually provides benefits, such as increased convenience, the ability to save time and money, increased efficiency in online transactions, increased productivity, and the facilitation of the completion of tasks in daily life at a faster rate, all of which contribute to the users' sense of satisfaction. Additionally, the UPI payment system provides users with a high degree of convenience, and they find it more convenient than traditional cash payments. Also, the UPI payment is perceived as being faster than the cash payment, and there is no need to reciprocate, return, or exchange the balance amount as in the case of conventional cash payments. Thus, the UPI payment system saves users’ time.

Further, the association between effort expectancy and user satisfaction was also supported (H1b), and a significant impact of effort expectancy on user satisfaction is confirmed. Effort expectancy is the level of belief among UPI users that the use of UPI payment practises will not involve any physical or cognitive stress, which ultimately enhances the satisfaction level of the users of UPI payments. Similarly, effort expectancy is dependent on the possibility that there is a link between the

amount of effort put into technology consumption and the amount of productivity gained from that effort. The results showed that most users conceded the UPI payment system's ease of use and the minimality of steps required to perform a financial transaction. Users also point out the ease of learning as a virtue of the UPI system. Thus, it can be concluded that users can easily adapt to and learn the payment process because it is easy and comprehensible. Recovering from mistakes (during usage) is also found to be very swift. Hence, if UPI users perceive a strong ease of use concerning the UPI system for conducting online transactions, they probably won't give it up and will likely recommend the same to other potential users. The results lead to confirmation that emphasizing on the effort-related aspects of the UPI platforms influences the users' satisfaction, which, in turn, could influence post-adoptive behaviour (continuance intention and recommendation intention). Managers of UPI apps should consider the roles of effort expectation and keep the system and its application simple to use.

The research also revealed that users' perceptions of social influence (SI) do not impact their satisfaction with a UPI platform (H1c). In line with the results of the earlier investigations, the theoretical model proposed that the user's perceived social influence (SI) would have a favourable affect on their satisfaction, but the present study was unable to provide evidence to support this theory. The results are contrary to some studies in similar as well as contrasting IT/IS-related situations that have discovered that satisfaction is impacted by perceived social influence (Bhattacherjee, 2001; Limayem & Cheung, 2011; Barnes & Vidgen, 2014; Oghuma et al., 2016). The popular argument is that most people are not completely familiar with newer technologies at first and are mainly influenced by others' opinions and attitudes, such as those of friends, relatives, and colleagues. According to researchers, SI is a crucial precursor of satisfaction since, when judging users' satisfaction with UPI apps, it is important to point out that they are susceptible to the effect of other users' opinions about the technology and its adoption. Another line of argument is that people may also gain social recognition from others, which will increase their social value and their satisfaction while using technology.

UPI is used for payments by the users because it is used by the majority of users in their immediate vicinity, and the users also encourage others to use UPI for online transactions. The outcomes of this study, though, contradict earlier conclusions. Apparently, there is no significant effect of SI on user satisfaction; however sudden interventions like demonetization and the COVID-19 pandemic might have encouraged users to use the UPI payments system for online transactions. In addition, after the implementation of such services, end users are able to comprehend the system without the assistance of social groups. The continued use of such systems is a direct result of the growing movement toward the deployment of self-service technologies (SSTs).

The analysis of the facilitating conditions factor indicates that the users perceive that the infrastructural resources are adequate for UPI payment systems. The results also indicate that the users have enough resources to use the UPI system, such as an internet connection, PoS, or QR code applications. They also have the necessary knowledge to use UPI. Thus, users find it easy to perform online transactions on the UPI system, and help is also available when difficulties or failures are encountered in using the UPI platform. Additionally, the technical assistance within the apps is generally also available if users face any difficulty using the UPI payment system. The results support the hypothesis (H1d), and it is concluded that the facilitating conditions have a significant impact on user satisfaction. Therefore, confirming that the organisational and technical infrastructure is adequate and efficient, it will result in a high level of satisfaction among UPI payment users. The facilitating conditions create the potential for the usage of the UPI payment system by its users. The efficient use of the UPI system for online transactions depends on the technological infrastructure, the availability of organisational resources, and the convenience of users. If UPI users are continually updated on the features of the UPI system and associated applications, they will be able to enhance their overall experience, leading to increased satisfaction and recommendation intentions.

The current model discovered that users' perceptions of their personal innovation influenced their satisfaction with a UPI app (H1e).The findings revealed that when

consumers learn about new UPI features, they look for ways to put them to use. UPI customers typically comprehend modern digital products and services like UPI on their own, and they have no reservations about using new services provided by UPI service providers. To be the first to use the new UPI services is, according to the users, extremely significant to them.

Additionally, personal innovativeness is a personality attribute that describes a person's attitude toward technology adoption. It can be concluded that the greater the personal innovation, the greater the satisfaction of the users of UPI payments. Suppliers of services must make efforts to create and market the relevant advantages of new UPI functionalities in order to raise user satisfaction levels. The more opportunities consumers have to try new things, the happier they will be with UPI offerings. UPI can do this by pushing or advertising novel products.

### 5.2.2. User Satisfaction and continuance intention:

The study discovered evidence in support of the connection between users' satisfaction with UPI services and their continued intentions to use them (H5). Moreover, it has constantly been acknowledged in earlier research on the connection between satisfaction and intention to continue (e.g., Bhattacherjee, 2001; Benlian et al., 2011; Zhao & Lu, 2012; Lin et al., 2013; Alraimi et al., 2015). Based on the conclusion, researchers came to the conclusion that post-adoptive behaviour studies frequently take satisfaction into account. However, some earlier investigations have produced contradictory findings about the proposed association (e.g., Chea & Luo, 2008; Chen et al., 2013; Li & Liu, 2014). In this setting, further research is necessary to determine how satisfaction affects CI. While the outcomes indicate that it should be maintained to affect users' potential behaviour, practitioners would be advised to concentrate on user satisfaction. In the end, a well-implemented service will not only enhance customer satisfaction and experience, but it will also enable the service provider to keep current customers who might recommend the apps to other intended consumers. User satisfaction will be higher if they perceive the UPI payment mechanism to be more efficient than promised during the post-purchase review process. The study results reveal that users are content with the use of the UPI

payment system. It is noteworthy that the study's findings establish the importance of satisfaction in determining whether or not to continue the use of UPI.

### 5.2.3 Factors affecting continuance intentions:

The theoretical model also found support for hypotheses based on personal innovativeness, the rate of technological innovation, trust, and security factors influencing the intention to use UPI-based payment practices in the future. As it has already been shown, PE, EE, and FC have an impact on how satisfied users are with a UPI payment system and if they plan to continue using it in the future. The results of the data analysis demonstrate that personal innovativeness, pace of technological innovation, trust, and security factors are predictors of continued intention toward UPI. Research on information systems frequently makes the assumption that consumer behaviour and the rate of technical innovation are related, although very few of these studies provide evidence for or address this association. Due to ongoing advancements in hardware, software, and business models, prior studies have shown that post-adoption utilisation of IT/IS systems is very dynamic.

In comparison to other digital payment methods, UPI is subject to more frequent technological and commercial changes due to its novelty. by demonstrating how consumers' perceptions of the rate of technological change are transformed into continuous and repetitive use. The study establishes a strong correlation between consumers' views of rapid technological progress and their decision to continue using UPI products. As a result, rapid technological advancements enclose the effect on a user's continued use of innovative items. Therefore, this study's pace of innovation has a major impact on UPI customers' plans to continue using the service. Frequent innovations in UPI systems and UPI apps affect the continued intentions of UPI users. Furthermore, users that have a significant amount of personal innovation are more ready to continue with UPI since they are more accepting of regular alterations. Creative users typically find items and services with creative features to be more appealing (Zolfagharian & Paswan, 2010). To keep people using online payment services, service providers should pay enough attention to behavioural data on how

likely people are to change their behaviour with innovation implementations. This is anticipated to improve the accuracy of service demand estimations.

Consistent with prior studies, trust and security factors remain major determinants of continuation intention. Lack of secrecy and trust are two of the most significant barriers to user post-adoption. As UPI service providers' security policies make UPI customers feel safer, they are more likely to use it again. Stringent regulations are likely to make it easier for people to trust UPI services. Similarly, individual users gain trust when private and sensitive information is protected by UPI service providers. If continued use of UPI services is to be encouraged, it is necessary to build public trust. Furthermore, it was discovered that people's continued intention to use UPI payments was significantly influenced by their perception of security. As a result, it appears necessary to design a service equipped with secure information technologies to facilitate company continuity.

### 5.2.4. Continuance intention and intention to recommend:

It has been demonstrated that users' motivation to stick around influences their likelihood to recommend UPI payment systems. This result is in line with earlier research showing that continuing intention influences users' recommendation behaviour in a favourable way (Shaik & Karjaluoto, 2016; Li & Liu, 2014). The findings demonstrate the significance of continuation behaviour since it has an impact on other post-adoption behaviours. Accordingly, practitioners should capitalise on suggesting a UPI app to relatives, families, and connections. The findings are an attempt to improve understanding of post-adoptive behaviours in a technological context and permit the investigator to contribute to the increasing body of evidence of UTAUT and continued behaviour in literary works. The study of recommendation intention as a component of ongoing research is limited. The research of recommendation intention as component of continuance investigation is constricted.

## 5.3 Implications of the study:

### 5.3.1 Practical implications of the study

In all business and commercial domains, technology plays a critical role. It is argued in this study that the application of appropriate technology is likely to aid in the development of digital payment services, thereby making financial services available to neglected and ignored segments of the population. The study has revealed various factors that should be considered not only in academic research but also in the development of UPI services by service providers. The study's findings are essential for UPI service providers and financial institutions to offer their users efficient services. Since a bad user experience leads to an absence of desirable post-adoptive behaviour, UPI service providers must concentrate on performance and effort expectations, creating environments that boost user satisfaction.

So as to enhance perceived security and trust, UPI service providers ought to look up their data protection methods, security of the system, transparent privacy, refund strategies, and confirmation messages after the transaction. UPI service providers should use a safe, secure, and trustworthy system so that unstudied intervention into the system can be prevented. If UPI service providers offer security and stability, updated and accurate information, and services of high quality that fulfil the user's expectations, they can minimise the user's uncertainties and build trust in UPI services. UPI service providers must provide good firewall technology to protect users' interests so that the privacy of their data can be maintained and data cannot be tempered. Such privacy issues may be associated with the collection and use of personal information about users. To strengthen the security and trust in electronic payments, it's necessary to protect the users of UPI technically.

Further, while UPI transactions are done on a digital platform, they involve the exchange of personal information, so UPI service providers must implement sophisticated encrypted methods for data protection not only during the transaction but also when the data is stored on the system. In addition, verification methods on smartphones like fingerprint and face recognition are also helpful in making UPI

transactions safe and more reliable in users' perceptions. In the UPI ecosystem, the UPI service providers should offer advanced technologies and facilities. The effective and well-organized usage of UPI services is contingent on both ongoing professional development and progressive implementation on a continuous basis.

### 5.3.2 Theoretical implications of the study

The important theoretical contributions of this study are captured hereafter. Theoretically, the adoption of technology in both marketing and technology has been extensively studied. The literature has established a series of adoption frameworks, but the Technology Acceptance Model, UTAUT, Social Cognitive Theory, and Diffusion of Innovation are four of the most widely used. However, it appears that these models only describe a portion of the adoption decision phenomenon. What's missing is a comprehensive model that can explain all aspects of the phenomenon. The proposed model tries to cover all probable dimensions. This serves as the foundation for the investigation's conceptual involvement. Personal innovativeness, the pace of innovation, trust, security, continuing intentions, and the intention to recommend are new factors introduced to the UTAUT model. All the variables are described and classified into three components depending on the contextual setting: affective (satisfaction), cognitive (PE, SI, EE, FC, PI), and conative factors (continuance intention and intention to recommend). First, this study expands technology adoption theory by incorporating not only system-specific factors (PE, EE, FC) focusing on systems' features but also on potential determinant factors under individual contexts such as personal innovativeness which might also influence the affective constructs such as satisfaction which the information science (IS) researchers have been particularly interested in.

The UPI post-adoption research framework is further augmented by the cognitive component of disposition—trust, a psychological element that proved to be an important and distinct construct in explaining user behavior. In general, cognitive trust is individual beliefs about reliability, dependability, and competence in absence

of which a person does not feel driven toward that behavior (Perkins et. al., 1993). Furthermore, the model attempts to capture conative behavior which can be best described as the likeliness or propensity of a person to act or demonstrate certain actions (Wilkie, 1994). Conative behaviour, in other words, is an outward manifestation of a user's expressed intent that symbolizes the likeliness of acting in a special manner (Kim et al., 2013). As conative stage factors, the current study includes continuous intention and intention to recommend. This study incorporates the component of intention to recommend in addition to continuing use. The intention to recommend acts as a means of knowledge for several other customers, and it is frequently regarded as more reliable and has a bigger influence on a company's standing (Kim & Kim, 2010). As a result, a thorough research framework connecting user satisfaction, continuance intention, and recommendation intention has been developed.

The study suggests six potential determinants that supposed to be considered when examining the recommendation intentions. From the perspective of UPI, the envisaged extensive research framework is empirically examined. The results provide support for the framework's validity and reliability. As a result, it is possible to argue that this comprehensive empirical structure could be used as a tool for investigating key variables in the decision to continue and recommend UPI and its related innovations. The study has extended the UTAUT framework with additional variables from an UPI perspective. Whereas the UTAUT emphasises user IT acceptance in an enterprise context, the researchers have used the validated constructs from this model and extended the same to the UPI scenario. This study investigates how factors like performance expectancy, effort expectations, social influence, facilitating variable, and personal innovativeness affect consumer satisfaction. It looks at how trust and security, personal inventiveness, and the pace of innovation affect continuing intentions. Through the mediating function of user satisfaction, it also examined the impact of performance expectancy, effort expectancy, social influence, facilitating conditions, and personal innovativeness on the continuation intentions of the UPI technology. All factors have been shown to be significant. Future studies will find it

highly helpful as the research used a validated questionnaire to better assess user retention and recommendation intents.

### 5.4. Limitations and Future scope for research

The use of predefined scales restricts the interpretation of the results and does not allow for an in-depth exploration of the issue. It is possible that future research will be able to resolve all of these problems by employing a qualitative methodology for the investigation and by favouring open-ended interrogations on UPI usage preferences.

It is possible to use several affective, cognitive, and conative factors that are specific to UPI applications by asking questions about the reasons for satisfaction or dissatisfaction, continuation or discontinuation, recommendation or no recommendation. These factors can then be incorporated into future post-adoption models. Future research questions may embrace: "Why would you continue the use?" "Why would you discontinue use?" and "What factors would cause you to continue or discontinue use?"

Additionally, this research considered general users of the UPI payment system. In future research, the user behaviour can be studied in more targeted user groups such as: a) commercial and non-commercial users; b) frequent and infrequent users; c) young adult users and senior citizens; d) users and non-users. Similarly, comparative studies can be done between diverse locales (such as rural and urban). This would not only validate the existing model but also give insight into usage, penetration, and cultural influences.

As present research uses a cross-sectional research design, it is limited by data collected at a single point of time. However, in future research, longitudinal research designs can be implemented to better understand, examine, and evaluate user behaviour over a longer time period. Future research can also examine the proposed model. This study was planned during the pre-pandemic (COVID-19) period and therefore could not incorporate it as an influencing factor. Future research can look at

payment adoption and usage in light of sudden changes in the business and social environment.

## REFERENCES


[1]. Abu-Salim, T., Onyia, O. P., Harrison, T., & Lindsay, V. (2017). Effects of perceived cost, service quality, and customer satisfaction on health insurance service continuance. *Journal of Financial Services Marketing*, *22*(4), 173-186.

[2]. Agarwal, R., &Dhar, V. (2014). **Editorial** —Big Data, Data Science, and Analytics: The Opportunity and Challenge for IS Research. *Information Systems Research*, *25*(3), 443–448. https://doi.org/10.1287/isre.2014.0546

[3]. Agarwal, R., and Prasad, J. (1997)."A Conceptual and Operational Definition of Personal Innovative-ness in the Domain of Information Technology," Information Systems Research, 9(2).

[4]. Agrebi, S., & Jallais, J. (2015). Explain the intention to use smartphones for mobile shopping. *Journal of Retailing and Consumer Services*, *22*, 16–23. https://doi.org/10.1016/j.jretconser.2014.09.003

[5]. Ahn KH, Kim MS, Kim BI (2008) The study of the effect of container terminal service quality on customer satisfaction and loyalty: the moderating effect of the company Size and port location. Korean Manag Rev 37(3):417–442

[6]. Ajzen, I. (2005). *EBOOK: Attitudes, Personality and Behaviour*. McGraw-hill education (UK).

[7]. Al Amin, M., Arefin, M. S., Alam, M. R., Ahammad, T., &Hoque, M. R. (2021). Using Mobile Food Delivery Applications during COVID-19 Pandemic: An Extended Model of Planned Behavior. *Journal of Food Products Marketing*, *27*(2), 105–126. https://doi.org/10.1080/10454446.2021.1906817

[8]. Alalwan, A. A., Dwivedi, Y. K., &Rana, N. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. International Journal of Information Management, 37(3), 99–110.

[9]. Alalwan, A. A., Rana, N. P., Algharabat, R., &Tarhini, A. (2016, September). A systematic review of extant literature in social media in the marketing perspective. In *Conference on e-Business, e-Services and e-Society* (pp. 79-89). Springer, Cham.

[10]. Al-Busaidi, K. A. (2013). An empirical investigation linking learners' adoption of blended learning to their intention of full e-learning. *Behaviour& Information Technology*, *32*(11), 1168-1176.

[11]. Al-Busaidi, K. A., & Al-Shihi, H. (2012). Key factors to instructors' satisfaction of learning management systems in blended learning. *Journal of Computing in Higher Education*, *24*(1), 18–39. https://doi.org/10.1007/s12528-011-9051-x

[12]. Alghamdi, Ahmed, Ibrahim Elbeltagi, Ahmed Elsetouhi, and Mohamed YacineHaddoud. (2018). Antecedents of continuance intention of using Internet banking in Saudi Arabia: A new integrated model. *Strategic Change* 27(3), 231-243.

[13]. AlHogail, A. (2018). Improving IoT technology adoption through improving consumer trust. *Technologies*, *6*(3), 64.

[14]. Al-Maroof, R. S., Alshurideh, M. T., Salloum, S. A., AlHamad, A. Q. M., &Gaber, T. (2021, March). Acceptance of Google Meet during the spread of Coronavirus by Arab university students. In *Informatics* (Vol. 8, No. 2, p. 24). MDPI.

[15]. Al-Maroof, S., Rana, Alhumaid, K., &Salloum, S. (2020). The Continuous Intention to Use E-Learning, from Two Different Perspectives. *Education Sciences*, *11*(1), 6. https://doi.org/10.3390/educsci11010006

[16]. Al-Momani, A. M., Mahmoud, M. A., & Ahmad, M. S. (2016). Modeling the adoption of internet of things services: A conceptual framework. *International Journal of Applied Research*, *2*(5), 361-367.

[17]. Alraimi, K. M., Zo, H., &Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education*, *80*, 28-38.

[18]. Alshare, K. A., & Lane, P. L. (2011).Predicting Student-Perceived Learning Outcomes and Satisfaction in ERP Courses: An Empirical Investigation. Communications of the Association for Information Systems, 28, pp-pp. https://doi.org/10.17705/1CAIS.02834

[19]. AniketChandrakantGodambe.(2020). Unified Payments Interface (UPI)-Advantages and challenges, International research journal of engineering and technology (IRJET), 7(12).

[20]. Arbain, S. H., Ali, N. A., &Mustaffa, N. H. (2019, August). Adoption of Machine Learning Techniques in Software Effort Estimation: An Overview. In *IOP Conference Series: Materials Science and Engineering* (Vol. 551, No. 1, p. 012074). IOP Publishing.

[21]. Arkorful, V., &Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International journal of instructional technology and distance learning*, *12*(1), 29-42.

[22]. Armstrong, G., Adam, S., Denize, S., & Kotler, P. (2014). *Principles of marketing*. Pearson Australia.

[23]. Ashraf, R. U., Hou, F., & Ahmad, W. (2019).Understanding continuance intention to use social media in China: The roles of personality drivers, hedonic value, and utilitarian value. *International Journal of Human–Computer Interaction*, *35*(13), 1216-1228.

[24]. ASSOCHAM, (2017), financial inclusion landscape in India. https://www.assocham.org/uploads/files/Financial%20Inclusion%20Report.pdf

[25]. Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly*, *36*(3), 421. https://doi.org/10.2307/2393203

[26]. Balakrishnan, V., &Shuib, N. L. M. (2021). Drivers and inhibitors for digital payment adoption using the Cashless Society Readiness-Adoption model in Malaysia. *Technology in Society*, *65*, 101554.

[27]. Barclay D., Higgins, C. and Thompson, R. (1995), *The partial least squares (PLS) approach to causal modeling*, Technology Studies, *2*(2).pp

[28]. Barnes, S. J., &Vidgen, R. T. (2014). Technology socialness and Web site satisfaction. *Technological Forecasting and Social Change*, *89*, 12-25.

[29]. Benlian, A., Hilkert, D., & Hess, T. (2015). How open is this platform? The meaning and measurement of platform openness from the complementers' perspective. *Journal of information Technology*, *30*(3), 209-228.

[30]. Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, *25*(3), 351. https://doi.org/10.2307/3250921

[31]. Bhattacherjee, A., &Hikmet, N. (2008). Reconceptualizing organizational support and its effect on information technology usage: Evidence from the health care sector. *Journal of Computer Information Systems*, *48*(4), 69-76.

[32]. Bhattacherjee, A., Perols, J., & Sanford, C. (2008). Information technology continuance: A theoretic extension and empirical test. *Journal of Computer Information Systems*, *49*(1), 17-26.

[33]. Bhattacherjee, A., Limayem, M., & Cheung, C. M. (2012).User switching of information technology: A theoretical synthesis and empirical test. *Information & Management*, *49*(7-8), 327-333

[34]. Bhattarai, S., & Wang, Y. (2018). End-to-end trust and security for Internet of Things applications. *Computer*, *51*(4), 20-27.

[35]. Boke, S., Harkare, O. (2018). Review on unified payment interface advancement towards digitalization and challenges faced. *Episteme: an online interdisciplinary, multidisciplinary & multi-cultural journal Bharat*, 7(3), pp57-62.

[36]. Byrne, D., Oliner, S. D., &Sichel, D. E. (2017). Prices of high-tech products, mismeasurement, and the pace of innovation. *Business Economics*, *52*(2), 103–113. https://doi.org/10.1057/s11369-017-0034-4

[37]. Camilleri, M. A. (2019, September). Measuring the hoteliers' interactive engagement through social media. In *14th European Conference on Innovation and Entrepreneurship (ECIE2019), University of Peloponnese, Kalamata, Greece*.

[38]. Camilleri, M. A., &Camilleri, A. C. (2017). Digital learning resources and ubiquitous technologies in education. *Technology, Knowledge and Learning*, *22*(1), 65-82.

[39]. Camilleri, M.A. (2017) "The Promotion of Responsible Tourism Management Through Digital Media", Tourism Planning & Development, Vol. 15, No. 6, pp. 653-671.

[40]. Camilleri, M.A. (2018) "The SMEs' Technology Acceptance of Digital Media for Stakeholder Engagement", Journal of Small Business and Enterprise Development, https://www.emeraldinsight.com/doi/abs/10.1108/JSBED-02-2018-0042

[41]. Cao, Q., Niu, X., 2019. 'Integrating context-awareness and UTAUT to explain Alipay user adoption'.Int. J. Industrial Ergonomics. Elsevier 69, 9–13 (March 2018).

[42]. Cao, X., Yu, L., Liu, Z., Gong, M., Adeel, L., 2018. 'Understanding mobile payment users' continuance intention: a trust transfer perspective'. Internet Res. 28 (2), 456–476.

[43]. Chan, F. K., Thong, J. Y., Venkatesh, V., Brown, S. A., Hu, P. J., & Tam, K. Y. (2010). Modeling citizen satisfaction with mandatory adoption of an e-government technology. *Journal of the association for information systems*, *11*(10), 519-549.

[44]. Chang, S. E., Liu, A. Y., &Shen, W. C. (2017).User trust in social networking services: A comparison of Facebook and LinkedIn. *Computers in Human Behavior*, *69*, 207-217

[45]. Chao, C. M. (2019).Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in psychology*, *10*, 1652.

[46]. Chaterji, D., & Thomas, R. (2017). Unified payment interface (upi) a catalyst tool supporting digitalization–utility, prospects & Issues. *International Journal of Innovative Research and Advanced Studies (IJIRAS)*, *4*(2).

[47]. Chea, S., &Luo, M. M. (2008). Post-Adoption Behaviors of E-Service Customers: The Interplay of Cognition and Emotion. *International Journal of Electronic Commerce*, *12*(3), 29–56. https://doi.org/10.2753/JEC1086-4415120303

[48]. Chen, S.-C., Liu, S.-C., Li, S.-H., & Yen, D. C. (2013). Understanding the Mediating Effects of Relationship Quality on Technology Acceptance: An Empirical Study of E-Appointment System. *Journal of Medical Systems*, *37*(6), 9981. https://doi.org/10.1007/s10916-013-9981-0

[49]. Chen, S.-C., Yen, D. C., & Hwang, M. I. (2012). Factors influencing the continuance intention to the usage of Web 2.0: An empirical study. Computers in Human Behavior, 28(3), 933- 941

[50]. Chen, X., & Li, S. (2017). Understanding continuance intention of mobile payment services: an empirical study. *Journal of Computer Information Systems*, *57*(4), 287-298.

[51]. Cheung S., Kwok L., Yang H., Fong J., Kwan R. (eds) Hybrid Learning: Innovation in Educational Practices. ICHL 2015. Lecture Notes in Computer Science, vol 9167. Springer, Cham.https://doi.org/10.1007/978-3-319-20621-9_27

[52]. Cho, M., Bonn, M. A., & Li, J. J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, *77*, 108-116.

[53]. Chong, A. Y. L. (2013). Understanding mobile commerce continuance intentions: an empirical analysis of Chinese consumers. *Journal of Computer Information Systems*, *53*(4), 22-30.
[54]. Chohan, U. W. (2017). A History of Bitcoin. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3047875
[55]. Choi, M., Han, K., & Choi, J. (2015). The effects of product attributes and service quality of transportation card solutions on service user's continuance and word-of-mouth intention. *Service Business*, *9*(3), 463–490. https://doi.org/10.1007/s11628-014-0235-0
[56]. Chopdar, P. K., &Sivakumar, V. J. (2019). Understanding continuance usage of mobile shopping applications in India: the role of espoused cultural values and perceived risk. *Behaviour& Information Technology*, *38*(1), 42-64.
[57]. Chou, S. W., & Chen, P. Y. (2009).The influence of individual differences on continuance intentions of enterprise resource planning (ERP). *International Journal of Human-Computer Studies*, *67*(6), 484-496.
[58]. Chu, S., & Kim, Y. (2011). The Review of Marketing Communications Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites. *Int. J. Advertis*.
[59]. Churchill, G. A., &Iacobucci, D. (2006). Marketing research: methodological foundations. New York: Dryden Press.
[60]. Culnan, M. J., & Armstrong, P. K. (1999). Information privacy concerns, procedural fairness, and impersonal trust: An empirical investigation. *Organization science*, *10*(1), 104-115.
[61]. Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*(3), 475–487. https://doi.org/10.1006/imms.1993.1022
[62]. De Matos, C. A., & Rossi, C. A. V. (2008). Word-of-mouth communications in marketing: a meta-analytic review of the antecedents and moderators. *Journal of the Academy of marketing science*, *36*(4), 578-596.
[63]. DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information systems research*, *3*(1), 60-95.
[64]. DeVellis, R. F., & Thorpe, C. T. (2021*). Scale development: Theory and applications*. Sage publications.
[65]. Dijkstra, T. (1983). Some comments on maximum likelihood and partial least squares methods. *Journal of Econometrics*, *22*(1–2), 67–90. https://doi.org/10.1016/0304-4076(83)90094-5
[66]. Dijkstra, T. (1983). Some comments on maximum likelihood and partial least squares methods. *Journal of Econometrics*, *22*(1–2), 67–90. https://doi.org/10.1016/0304-4076(83)90094-5
[67]. Dixit, S., Maurya, M., Sharma, N., & Zaidi, N. (2022). Payments Process Privilege: Leveraging Fintech with TAM. *2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS)*, 1668–1673. https://doi.org/10.1109/ICACCS54159.2022.9785136
[68]. Dixit, S., Maurya, M., Sharma, N., & Zaidi, N. (2022). Payments Process Privilege: Leveraging Fintech with TAM. 2022 8th International Conference on

Advanced Computing and Communication Systems (ICACCS), 1668–1673. https://doi.org/10.1109/ICACCS54159.2022.9785136

[69]. Dlodlo, N. (2014). The relationships among service quality, Trust, User satisfaction and post-adoption intentions in M-payment services. *Mediterranean Journal of Social Sciences*, *5*(23), 165-165.

[70]. Drucker, P. (2001, November 3). The next society. Economist, 361(8246), 3-5.

[71]. Edvardsson, B., Gustafsson, A. and Roos, I. (2005), "Service portraits in service research: a critical review", International Journal of Service Industry Management, Vol. 16 No. 1, pp. 107-121.

[72]. Edvardsson, B., Haglund, L. and Mattsson, J. (1995), "Analysis, planning, improvisation and control in the development of new services", International Journal of Service Industry Management, Vol. 6 No. 2, pp. 24-35

[73]. F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

[74]. Falcone, R., &Sapienza, A. (2018). On the users' acceptance of IoT systems: A theoretical approach. *Information*, *9*(3), 53.

[75]. Fauzi, A. A., & Sheng, M. L. (2020).Ride-hailing apps' continuance intention among different consumer groups in Indonesia: the role of personal innovativeness and perceived utilitarian and hedonic value. *Asia Pacific Journal of Marketing and Logistics*.

[76]. Feng, L., Kong, X., Zhu, S., & Yang, H. H. (2015, July). An investigation of factors influencing college students' mobile learning behavior. In *International Conference on Hybrid Learning and Continuing Education* (pp. 323-333). Springer, Cham.

[77]. Fife, E., &Orjuela, J. (2012). The privacy calculus: Mobile apps and user perceptions of privacy and security. *International Journal of Engineering Business Management*, *4*(Godište 2012), 4-11.

[78]. Flavián, C., &Guinalíu, M. (2006). Consumer trust, perceived security and privacy policy: three basic elements of loyalty to a web site. *Industrial management & data Systems*.

[79]. Fouillet, C., Guérin, I., &Servet, J.-M. (2021). Demonetization and digitalization: The Indian government's hidden agenda. *Telecommunications Policy*, *45*(2), 102079. https://doi.org/10.1016/j.telpol.2020.102079

[80]. Gao, L., Waechter, K. A., &Bai, X. (2015). Understanding consumers' continuance intention towards mobile purchase: A theoretical framework and empirical study–A case of China. *Computers in Human Behavior*, *53*, 249-262.

[81]. Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega*, *28*(6), 725-737.

[82]. Ghalandari, K. (2012). The effect of performance expectancy, effort expectancy, social influence and facilitating conditions on acceptance of e-

banking services in Iran: The moderating role of age and gender. Middle East Journal of Scientific Research, 12(6), 801-807.

[83]. Ghasemi, A. &Zahediasl, S. (2012). Normality tests for statistical analysis: a guide for non-statisticians. International journal of endocrinology and metabolism, pp. 10(2), 486.

[84]. Gholami, R., Ogun, A., Koh, E., & Lim, J. (2010).Factors affecting e-payment adoption in Nigeria. *Journal of Electronic Commerce in Organizations (JECO)*, *8*(4), 51-67.

[85]. Ghozali, Imam (2006). Structural Equation Modeling Alternative Method with Partial Least Square. Semarang: Diponegoro University.

[86]. Gochhwal, R. (2017). Unified Payment Interface—An Advancement in Payment Systems. *American Journal of Industrial and Business Management*, *07*(10), 1174–1191. https://doi.org/10.4236/ajibm.2017.710084

[87]. Goodhue, D. L., Lewis, W., & Thompson, R. (2012). Does PLS have advantages for small sample size or non-normal data?. *MIS quarterly*, 981-1001.

[88]. Grazioli, S., &Jarvenpaa, S. L. (2000). Perils of Internet fraud: An empirical investigation of deception and trust with experienced Internet consumers. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans*, *30*(4), 395-410.

[89]. Grifantini, K. (2014). How's my sleep?: Personal sleep trackers are gaining in popularity, but their accuracy is still open to debate. *IEEE pulse*, *5*(5), 14-18.

[90]. Gu, Z., Wei, J., &Xu, F. (2016). An empirical study on factors influencing consumers' initial trust in wearable commerce. *Journal of Computer Information Systems*, *56*(1), 79-85.

[91]. Gupta, A., Bansal,A., Agarwal, A., Garg, B., Sharma, U. (2018). UPI-Redefining Digital Payments - A Critical Review. *International Journal for Research in Engineering Application & Management (IJREAM),* 04(7), Pp 352-356. DOI :10.18231/2454-9150.2018.0969

[92]. Gupta, A., Dhiman, N., Yousaf, A., & Arora, N. (2021). Social comparison and continuance intention of smart fitness wearables: An extended expectation confirmation theory perspective. *Behaviour& Information Technology*, *40*(13), 1341-1354

[93]. Gwebu, K. L., Wang, J., &Guo, L. (2014). Continued usage intention of multifunctional friend networking services: A test of a dual-process model using Facebook. *Decision Support Systems*, *67*, 66-77.

[94]. Hair Jr, J. F., Sarstedt, M., Ringle, C. M., &Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. Sage publications.

[95]. Hair, J. F., Ringle, C. M., &Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long range planning, 46*(1-2), 1-12

[96]. Hair, J. F., Risher, J. J., Sarstedt, M., &Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

[97]. Han, H., & Kim, W. (2009). Outcomes of relational benefits: Restaurant customers' perspective. *Journal of Travel & Tourism Marketing*, *26*(8), 820–835. https://doi.org/10.1080/10548400903356236

[98]. Han, J., Kang, H. J., & Kwon, G. H. (2020).Impact of intelligent healthscape quality on nurse job outcomes and job satisfaction: A test of the moderating effect of innovativeness. *Journal of nursing management*, *28*(1), 43-53.

[99]. Hanrahan, S., De Pietro, P., Brown, L. H., Haw, A., Malins, J., Milojevic, M., &Weckman, J. K. (2009). Interface: Virtual Environments in Art, Design and Education' A report on a conference exploring VLEs in art and design education. *Arts and humanities in higher education*, *8*(1), 99-128.

[100]. Harrison-Walker LJ (2001) E-complaining: a content analysis of an Internet complaint forum. J Serv Mark 15(5):397–412

[101]. Hartono, I. K., Della, T. K., Kawi, Y. A., &Yuniarty. (2021). Determinants factor affecting user continuance usage and intention to recommend of mobile telemedicine. *IOP Conference Series: Earth and Environmental Science*, *794*(1), 012079. https://doi.org/10.1088/1755-1315/794/1/012079

[102]. Hilgard, E. R. (1980). The trilogy of mind: Cognition, affection, and conation. *Journal of the History of the Behavioral Sciences*, *16*(2), 107-117.

[103]. Hong, W., Thong, J. Y., Chasalow, L. C., &Dhillon, G. (2011).User acceptance of agile information systems: A model and empirical test. *Journal of management information systems*, *28*(1), 235-272.

[104]. Hsiao, C. H., Chang, J. J., & Tang, K. Y. (2016). Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives. *Telematics and Informatics*, *33*(2), 342-355.

[105]. Hsieh, T.-C., Chen, S.-L., & Hung, M.-C. (2015). Longitudinal test of ePortfolio continuous use: An empirical study on the change of students' beliefs. *Behaviour& Information Technology*, *34*(8), 838–853. https://doi.org/10.1080/0144929X.2014.907344

[106]. http://digidhan.mygov.in/pages/pdf/sbi/NPCI%20Unified%20Payment%20Interface.pdf

[107]. http://upipayments.co.in/upi-payment-system

[108]. https://bfsi.economictimes.indiatimes.com/news/editors-view/not-just-google-the-world-is-watching-indias-upi/72810296

[109]. https://images.app.goo.gl/1imKUuW754qaDQc8 or https://razorpay.com/blog/upi-preferred-payment-mode-september-2019-data/

[110]. https://m.economictimes.com/tech/technology/whatsapp-gets-npci-green-signal-to-launch-upi-payment/videoshow/79074662.cms

[111]. https://www.americanbanker.com/payments/news/western-union-harnesses-indias-upi-for-real-time-remittances

[112]. https://www.financialexpress.com/opinion/telemedicines-upi-moment/2054476/
[113]. https://www.forbes.com/advisor/in/personal-finance/what-is-upi-and-how-does-it-work/
[114]. https://www.nelito.com/blog/npci-set-to-take-upi-success-to-the-rest-of-asia.html
[115]. https://www.niti.gov.in/protecting-upi-jewel-among-indian-fintech-innovations
[116]. https://www.npci.org.in/npci-in-news
[117]. https://www.npci.org.in/statistics
[118]. https://www.rbi.org.in/
[119]. https://www.sebi.gov.in/sebi_data/commondocs/mar2019/useofunifiedpaymentinterfacefaq_p.pdf
[120]. https://www.theweek.in/news/biz-tech/2020/06/01/bhim-data-leak-exposes-7-million-users-data-report.html
[121]. Iranmanesh, M., Zailani, S., Moeinzadeh, S., &Nikbin, D. (2017).Effect of green innovation on job satisfaction of electronic and electrical manufacturers' employees through job intensity: personal innovativeness as moderator. *Review of managerial science*, *11*(2), 299-313.
[122]. Isaac, O., Abdullah, Z., Aldholay, A. H., &Ameen, A. A. (2019).Antecedents and outcomes of internet usage within organisations in Yemen: An extension of the Unified Theory of Acceptance and Use of Technology (UTAUT) model. *Asia Pacific Management Review*, *24*(4), 335-354.
[123]. Jasperson, J., Carter, P. E., &Zmud, R. W. (2005). A comprehensive conceptualization of post-adoptive behaviors associated with information technology enabled work systems. *MIS quarterly*, 525-557.
[124]. Jianlin, W., & Qi, D. (2010, May).Moderating effect of personal innovativeness in the model for e-store loyalty.In *2010 International Conference on E-Business and E-Government* (pp. 2065-2068).IEEE.
[125]. Junadi[a], S. (2015).A model of factors influencing consumer's intention to use e-payment system in Indonesia. *Procedia Computer Science*, *59*, 214-220.
[126]. Jung, T., Chung, N., &Leue, M. C. (2015).The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism management*, *49*, 75-86.
[127]. Jusob, F. R., George, C., &Mapp, G. (2016, September). Enforcing trust as a means to improve adoption of connected wearable technologies. In *2016 12th International Conference on Intelligent Environments (IE)* (pp. 254-257). IEEE
[128]. *Karnataka Bank will focus on cost-light liability portfolio, says MD - The Hindu BusinessLine*. (n.d.). Retrieved July 9, 2022, from https://www.thehindubusinessline.com/money-and-banking/karnataka-bank-will-focus-on-cost-light-liability-portfolio-says-md/article34505945.ece

[129]. Kedia, A. (2020, August 10). The Enabling Power of UPI Payments. *DICE India*. https://medium.com/dice-india/the-enabling-power-of-upi-payments-4060826c2a16

[130]. Keiningham, T. L., Cooil, B., Aksoy, L., Andreassen, T. W., & Weiner, J. (2007). The value of different customer satisfaction and loyalty metrics in predicting customer retention, recommendation, and share-of-wallet. *Managing Service Quality: An International Journal*, *17*(4), 361–384. https://doi.org/10.1108/09604520710760526

[131]. Keller E (2007) Unleashing the power of word-of-mouth: creating brand advocacy to drive growth. J Advert Res 47(4):448–452

[132]. Kelly, A. E., &Palaniappan, S. (2019). Survey on customer satisfaction, adoption, perception, behaviour, and security on mobile banking. *Journal of Information Technology & Software Engineering*, *9*(2), 1-15.

[133]. Khalilzadeh, J., Ozturk, A. B., &Bilgihan, A. (2017). Security-related factors in extended UTAUT model for NFC based mobile payment in the restaurant industry. *Computers in Human Behavior*, *70*, 460-474.

[134]. Khanra, S., Joseph, R. P., Dhir, A., & Kaur, P. (2020). Antecedents of the Barriers Toward the Adoption of Unified Payment Interface. In S. K. Sharma, Y. K. Dwivedi, B. Metri, & N. P. Rana (Eds.), *Re-imagining Diffusion and Adoption of Information Technology and Systems: A Continuing Conversation* (Vol. 618, pp. 608–625). Springer International Publishing. https://doi.org/10.1007/978-3-030-64861-9_53

[135]. Kidwell, B., Hardesty, D. M., & Childers, T. L. (2008). Consumer Emotional Intelligence: Conceptualization, Measurement, and the Prediction of Consumer Decision Making. *Journal of Consumer Research*, *35*(1), 154–166. https://doi.org/10.1086/524417

[136]. Kim DJ, Kim GJ (2010) A comparative study between product and service for process to form intent of repeat-visit and word-of-mouth: case of family restaurants in Daegu region. Korean J Hotel Adm 19(3):131–146

[137]. Kim, C., Tao, W., Shin, N., & Kim, K. S. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic commerce research and applications*, *9*(1), 84-95.

[138]. Kim, D.-J., & Kim, G.-J. (2010). A comparative study between product and service for process to form intent of repeat-visit and word-of-mouth: case of family restaurants in Daegu region. Korean Journal Hospitality Administration, 19(3), 127-147.

[139]. Kim, S., Bae, J., &Jeon, H. (2019). Continuous Intention on Accommodation Apps: Integrated Value-Based Adoption and Expectation–Confirmation Model Analysis. *Sustainability*, *11*(6), 1578. https://doi.org/10.3390/su11061578

[140]. Kim, W.G., Lim, H. and Brymer, R.A. (2015) "The Effectiveness of Managing Social Media on Hotel Performance", International Journal of Hospitality Management, Vol. 44, pp. 165- 171.

[141]. Kim, Y. H., Kim, D. J., &Wachter, K. (2013). A study of mobile user engagement (MoEN): Engagement motivations, perceived value, satisfaction, and

continued engagement intention. *Decision Support Systems*, *56*, 361–370. https://doi.org/10.1016/j.dss.2013.07.002

[142]. Kim-Soon, N., Ibrahim, M. A., Ahmad, A. R., &Sirisa, N. M. X. (2016). Continuous Intention to Use M-Learning Among Students of Malaysian Technical University Network Universities. *Advanced Science Letters*, *22*(12), 4116–4119. https://doi.org/10.1166/asl.2016.8188

[143]. Kokolakis, S. (2017). Privacy attitudes and privacy behaviour: A review of current research on the privacy paradox phenomenon. *Computers & security*, *64*, 122-134.

[144]. Koo, C., & Chung, N. (2014). Examining the eco-technological knowledge of Smart Green IT adoption behavior: A self-determination perspective. *Technological Forecasting and Social Change*, *88*, 140–155. https://doi.org/10.1016/j.techfore.2014.06.025

[145]. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, *30*(3), 607-610.

[146]. Kumar, A., Upadhyay, P., Sharma, S. K., & Gupta, P. (2020). Role of Intrinsic and Extrinsic Factors Affecting Continuance Intentions of Digital Payment Services. In S. K. Sharma, Y. K. Dwivedi, B. Metri, & N. P. Rana (Eds.), *Re-imagining Diffusion and Adoption of Information Technology and Systems: A Continuing Conversation* (Vol. 618, pp. 544–555). Springer International Publishing. https://doi.org/10.1007/978-3-030-64861-9_48

[147]. Kumar, K. A., & Natarajan, S. (2019). Role of Trust and Privacy Concerns towards Usage of E-Health Services—An Extension of Expectation-Confirmation Model. *Indian Journal of Public Health Research & Development*, *10*(7).

[148]. Kusuma, T. A. H., Sandhyaduhita, P., &Shihab, M. R. (2017, November).Factors influencing continuance intention of travel agency information system use: A case study of Powersuite. In *2017 Second International Conference on Informatics and Computing (ICIC)* (pp. 1-6).IEEE.

[149]. Lai, I. K. W., & Shi, G. (2015). The impact of privacy concerns on the intention for continued use of an integrated mobile instant messaging and social network platform. *International Journal of Mobile Communications*, *13*(6), 641-669.

[150]. Lakshmi, K. K., Gupta, H., &Ranjan, J. (2019). UPI Based Mobile Banking Applications – Security Analysis and Enhancements. *2019 Amity International Conference on Artificial Intelligence (AICAI)*, 1–6. https://doi.org/10.1109/AICAI.2019.8701396

[151]. Miltgen, C. L., Popovič, A., & Oliveira, T. (2013). Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context. *Decision support systems*, *56*, 103-114.

[152]. Lee SG, Park B, Kim SH, Lee HH (2012) Innovation and imitation effects in the mobile telecommunication service market. Serv Bus 6(3):265–278

[153]. Lee, C. Y., Tsao, C. H., & Chang, W. C. (2015). The relationship between attitude toward using and customer satisfaction with mobile application services: An empirical study from the life insurance industry. *Journal of Enterprise Information Management*

[154]. Lee, J., & Moray, N. (1992). Trust, control strategies and allocation of function in human-machine systems. *Ergonomics*, *35*(10), 1243-1270.

[155]. Lee, J. M., Lee, B., &Rha, J. Y. (2019). Determinants of mobile payment usage and the moderating effect of gender: Extending the UTAUT model with privacy risk. *International Journal of Electronic Commerce Studies*, *10*(1), 43-64.

[156]. Lee, S. W., Sung, H. J., &Jeon, H. M. (2019). Determinants of Continuous Intention on Food Delivery Apps: Extending UTAUT2 with Information Quality. *Sustainability*, *11*(11), 3141. https://doi.org/10.3390/su11113141

[157]. Lee, S., & Kim, B. G. (2020).The impact of individual motivations and social capital on the continuous usage intention of mobile social apps. *Sustainability*, *12*(20), 8364.

[158]. Lee, Y. K., Park, J. H., Chung, N., &Blakeney, A. (2012).A unified perspective on the factors influencing usage intention toward mobile financial services. *Journal of Business Research*, *65*(11), 1590-1599.

[159]. Li, H., & Liu, Y. (2014). Understanding post-adoption behaviors of e-service users in the context of online travel services. *Information & Management*, *51*(8), 1043-1052.

[160]. Li, W., &Xue, L. (2021). Analyzing the Critical Factors Influencing Post-Use Trust and Its Impact on Citizens' Continuous-Use Intention of E-Government: Evidence from Chinese Municipalities. *Sustainability*, *13*(14), 7698. https://doi.org/10.3390/su13147698

[161]. Liébana-Cabanillas, F. M. D. S. F. P., Alonso-Dos-Santos, M., Soto-Fuentes, Y., &Valderrama-Palma, V. A. (2017). Unobserved heterogeneity and the importance of customer loyalty in mobile banking. *Technology Analysis & Strategic Management*, *29*(9), 1015-1032.

[162]. Liao, Z., & Shi, X. (2009). Consumer perceptions of internet-based e-retailing: an empirical research in Hong Kong. *Journal of Services Marketing*.

[163]. Liao, Z., & Shi, X. (2017). Web functionality, web content, information security, and online tourism service continuance. *Journal of Retailing and Consumer Services*, *39*, 258-263.

[164]. Lightner, N. J. (2004). Evaluating e-commerce functionality with a focus on customer service. *Communications of the ACM*, *47*(10), 88-92.

[165]. Limayem, M., & Cheung, C. M. K. (2011). Predicting the continued use of Internet-based learning technologies: The role of habit. *Behaviour& Information Technology*, *30*(1), 91–99. https://doi.org/10.1080/0144929X.2010.490956

[166]. Lin, T.-C., Wu, S., Hsu, J. S.-C., & Chou, Y.-C. (2012). The integration of value-based adoption and expectation–confirmation models: An example of IPTV continuance intention. *Decision Support Systems*, *54*(1), 63–75. https://doi.org/10.1016/j.dss.2012.04.004

[167]. Lin, Z., &Filieri, R. (2015).Airline passengers' continuance intention towards online check-in services: The role of personal innovativeness and subjective knowledge. *Transportation Research Part E: Logistics and Transportation Review*, *81*, 158-168.

[168]. Litvin, S.W., Goldsmith, R.E. and Pan, B. (2018) "A Retrospective View of Electronic Wordof-Mouth in Hospitality and Tourism Management", International Journal of Contemporary Hospitality Management, Vol. 30, No. 1, pp. 313-325.

[169]. Liu, C., & Forsythe, S. (2011). Examining drivers of online purchase intensity: Moderating role of adoption duration in sustaining post-adoption online shopping. *Journal of retailing and consumer services*, *18*(1), 101-109.

[170]. Llewellyn, R. S., & Brown, B. (2020). Predicting adoption of innovations by farmers: What is different in smallholder agriculture?. *Applied Economic Perspectives and Policy*, *42*(1), 100-112.

[171]. Loureiro, S. M. C., Kaufmann, H. R., &Rabino, S. (2014). Intentions to use and recommend to others: An empirical study of online banking practices in Portugal and Austria. *Online Information Review*

[172]. Lu, J. (2014). Are personal innovativeness and social influence critical to continue with mobile commerce?. *Internet Research*.

[173]. Lu, J., Wei, J., Yu, C., & Liu, C. (2017). How do post-usage factors and espoused cultural values impact mobile payment continuation? *Behaviour& Information Technology*, *36*(2), 140–164. https://doi.org/10.1080/0144929X.2016.1208773

[174]. MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. Annual review of psychology, 51(1), 201-226.

[175]. Madwanna, Y., Khadse, M., &Chandavarkar, B. R. (2021). Security Issues of Unified Payments Interface and Challenges: Case Study. *2021 2nd International Conference on Secure Cyber Computing and Communications (ICSCCC)*, 150–154. https://doi.org/10.1109/ICSCCC51823.2021.9478078

[176]. Magsamen-Conrad, K., Upadhyaya, S., Joa, C. Y., & Dowd, J. (2015). Bridging the divide: Using UTAUT to predict multigenerational tablet adoption practices. *Computers in human behavior*, *50*, 186-196.

[177]. Mahmoud, M. A., & Hinson, R. E. (2012). Market orientation, innovation and corporate social responsibility practices in Ghana's telecommunication sector. *Social Responsibility Journal*.

[178]. Maillet, É., Mathieu, L., &Sicotte, C. (2015). Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an Electronic Patient Record in acute care settings: An extension of the UTAUT. *International journal of medical informatics*, *84*(1), 36-47.

[179]. Malik, A., Suresh, S., & Sharma, S. (2017).Factors influencing consumers' attitude towards adoption and continuous use of mobile applications: a conceptual model. *Procedia computer science*, *122*, 106-113Arenas-Gaitani, B. Peral-Peral, and M. A. Ramon-Jeronimo, "Elderly and Internet Banking: An Application of UTAUT2," Journal ofInternet Banking and Commerce, vol. 20(1), pp. 1-24, 2015.

[180]. Mani, S., &Dhingra, T. (2012). Diffusion of innovation model of consumer behaviour – Ideas to accelerate adoption of renewable energy sources by

consumer communities in India. *Renewable Energy*, *39*(1), 162–165. https://doi.org/10.1016/j.renene.2011.07.036

[181]. Maqableh, M. (2015). Perceived trust and payment methods: An empirical study of MarkaVIPcompany. *International Journal of Communications, Network and System Sciences*, *8*(11), 409.

[182]. Marcoulides, G. A., Chin, W. W., & Saunders, C. (2012). When imprecise statistical statements become problematic: a response to Goodhue, Lewis, and Thompson. *Mis Quarterly*, *36*(3), 717-728.

[183]. Marinković, V., Đorđević, A., &Kalinić, Z. (2020).The moderating effects of gender on customer satisfaction and continuance intention in mobile commerce: a UTAUT-based perspective. *Technology Analysis & Strategic Management*, *32*(3), 306-318.

[184]. Martins, C., Oliveira, T., &Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International journal of information management*, *34*(1), 1-13.

[185]. Meyer, J., Fortmann, J., Wasmann, M., &Heuten, W. (2015, January). Making lifelogging usable: Design guidelines for activity trackers. In *International Conference on Multimedia Modeling* (pp. 323-334). Springer, Cham.

[186]. Miltgen, C. L., Popovič, A., & Oliveira, T. (2013). Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context. *Decision support systems*, *56*, 103-114.

[187]. Miot, H. A. (2017). Assessing normality of data in clinical and experimental trials. J Vasc Bras, pp. 16(2), 88-91.

[188]. Mir, U. B., Kar, A. K., Dwivedi, Y. K., Gupta, M. P., & Sharma, R. S. (2019). Realizing digital identity in government: Prioritizing design and implementation objectives for Aadhaar in India. Government Information Quarterly, 37(2), 101442

[189]. Mishra, K. D.(2017). A Review on Unified Payment Interface [UPI]", *International Research Journal of Engineering and Technology (IRJET)*, 04(06), pp 5620-5623. www.irjet.net

[190]. Morgan, N. A., &Rego, L. L. (2006). The value of different customer satisfaction and loyalty metrics in predicting business performance. *Marketing science*, *25*(5), 426-439.

[191]. Mubarokah, I., &Hidayanto, A. N. (2020, November).Analysis of Continuance Use Intention and Satisfaction on Implementation of ALKI (Internal Activity Report Application) in Ministry of Industry. In *2020 International Conference on Informatics, Multimedia, Cyber and Information System (ICIMCIS)* (pp. 307-312).IEEE.

[192]. Mun, Y. P., Khalid, H., &Nadarajah, D. (2017). Millennials' perception on mobile payment services in Malaysia. *Procedia Computer Science*, *124*, 397-404.

[193]. Nabavi, A., Taghavi-Fard, M. T., Hanafizadeh, P., &Taghva, M. R. (2016). Information Technology Continuance Intention: A Systematic Literature Review.

*International Journal of E-Business Research*, *12*(1), 58–95. https://doi.org/10.4018/IJEBR.2016010104

[194]. Náñez Alonso, S. L., Jorge-Vazquez, J., &ReierForradellas, R. F. (2021). Central Banks Digital Currency: Detection of Optimal Countries for the Implementation of a CBDC and the Implication for Payment Industry Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 72. https://doi.org/10.3390/joitmc7010072

[195]. Nazione, S., Perrault, E. K., & Keating, D. M. (2019). Finding common ground: Can provider-patient race concordance and self-disclosure bolster patient trust, perceptions, and intentions?. *Journal of racial and ethnic health disparities*, *6*(5), 962-972.

[196]. Neema, K., Neema, A.(2016). UPI (Unified Payment Interface) –A new technique of Digital Payment: An Explorative study. *International Journal of Current Research in Multidisciplinary (IJCRM),* 3(10), pp. 01-10.

[197]. Neuhofer, B., Buhalis, D. and Ladkin, A. (2015) "Smart Technologies for Personalized Experiences: A Case Study in the Hospitality Domain", Electronic Markets, Vol. 25, No. 3, pp. 243-254.

[198]. Nielsen, P., &Sahay, S. (2022). A critical review of the role of technology and context in digital health research. *DIGITAL HEALTH*, *8*, 205520762211095. https://doi.org/10.1177/20552076221109554

[199]. Nunnally, J. C., & Bernstein, I. H. (1967). McGraw-Hill series in psychology. *Psychometric theory*. New York, NY, US: McGraw-Hill.

[200]. Nunnally, J.C. (1978). *Psychometric Theory*. McGraw-Hill, New York.

[201]. Nysveen, H., & Pedersen, P. E. (2016). Consumer adoption of RFID-enabled services. Applying an extended UTAUT model. *Information Systems Frontiers*, *18*(2), 293-314.

[202]. Ogbanufe, O., &Gerhart, N. (2018). Watch it! Factors driving continued feature use of the smartwatch. *International Journal of Human–Computer Interaction*, *34*(11), 999-1014.

[203]. Ogbanufe, O., &Gerhart, N. (2018). Watch it! Factors driving continued feature use of the smartwatch. *International Journal of Human–Computer Interaction*, *34*(11), 999-1014.

[204]. Oghuma, A. P., Libaque-Saenz, C. F., Wong, S. F., & Chang, Y. (2016). An expectation-confirmation model of continuance intention to use mobile instant messaging. *Telematics and Informatics*, *33*(1), 34-47.

[205]. Oh, J., & Yoon, S. (2014). Predicting the use of online information services based on a modified UTAUT model. Behavior & Information Technology, 33(7), 716–729.

[206]. Oliveira, T., Faria, M., Thomas, M. A., &Popovič, A. (2014). Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM. *International journal of information management*, *34*(5), 689-703.

[207]. Oliveira, T., M. Thomas, G. Baptista, and F. Campos. (2016). Mobile Payment: Understanding the Determinants of Customer Adoption and Intention

to Recommend the Technology. *Computers in Human Behavior*, 61, pp404–414. doi:10.1016/j.chb.2016.03.030

[208]. Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, *17*(4), 460–469. https://doi.org/10.1177/002224378001700405

[209]. Pal, D., Funilkul, S., &Papasratorn, B. (2019). Antecedents of trust and the continuance intention in IoT-based smart products: The case of consumer wearables. *IEEE Access*, *7*, 184160-184171.

[210]. Pappas, I. O., Kourouthanassis, P. E., Giannakos, M. N., &Chrissikopoulos, V. (2016). Explaining online shopping behavior with fsQCA: The role of cognitive and affective perceptions. *Journal of Business Research*, *69*(2), 794–803. https://doi.org/10.1016/j.jbusres.2015.07.010

[211]. Park, K., &Koh, J. (2017). Exploring the relationship between perceived pace of technology change and adoption resistance to convergence products. *Computers in Human Behavior*, *69*, 142-150.

[212]. Park, S. C., &Ryoo, S. Y. (2013). An empirical investigation of end-users' switching toward cloud computing: A two factor theory perspective. *Computers in Human Behavior*, *29*(1), 160-170.

[213]. Park, S.-T., & Oh, M.-R. (2019). An empirical study on the influential factors affecting continuous usage of mobile cloud service. *Cluster Computing*, *22*(S1), 1873–1887. https://doi.org/10.1007/s10586-017-1518-8

[214]. Peng, D. X., & Lai, F. (2012). Using partial least squares in operations management research: A practical guideline and summary of past research. Journal of Operations Management, 30(6), 467–480. https://doi.org/10.1016/j.jom.2012.06.002

[215]. Peng, G. C. A., Nunes, M. B., &Zheng, L. (2017). Impacts of low citizen awareness and usage in smart city services: the case of London's smart parking system. *Information Systems and e-Business Management*, *15*(4), 845-876.

[216]. Perkins, D. N., Jay, E., &Tishman, S. (1993). Beyond Abilities: A Dispositional Theory of Thinking. *Merrill-Palmer Quarterly*, *39*(1), 1–21. http://www.jstor.org/stable/23087298

[217]. Phalawang, T. (2018).Study of Factors Affecting Continuance Usage Intention of M-Banking: Perspectives of Corporate Image & Application Quality.Journal of Information System Business (JISB), Vol.04, No.04, Oct-Dec, pp.64

[218]. Philip, B. (2019). Unified Payment Interface–Impact of UPI in Customer Satisfaction. *2019) Research Guru: Online Journal of Multidisciplinary Subjects*, *12*.

[219]. Piwek, L., Ellis, D. A., Andrews, S., &Joinson, A. (2016). The rise of consumer health wearables: promises and barriers. *PLoS medicine*, *13*(2), e1001953.

[220]. Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, *30*(4), 459–467. https://doi.org/10.1002/nur.20199

[221]. Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. Hardvard Business Review, 63(4), 149-160.

[222]. Prensky, M. (2005). Computer games and learning: Digital game-based learning. Handbook of computer game studies, 18, 97-122

[223]. Putri, D. A. (2018, May). Analyzing factors influencing continuance intention of e-payment adoption using modified UTAUT 2 model. In *2018 6th International Conference on Information and Communication Technology (ICoICT)* (pp. 167-173). IEEE.

[224]. PwC (2021), Report, *The Indian payments handbook – 2021–2026*. (n.d.). 34.https://www.pwc.in/assets/pdfs/consulting/financial-services/fintech/payments-transformation/the-indian-payments-handbook-2021-2026.pdf

[225]. Rahi, S., Alghizzawi, M., &Ngah, A. H. (2022). Factors influence user's intention to continue use of e-banking during COVID-19 pandemic: The nexus between self-determination and expectation confirmation model. *EuroMed Journal of Business*. https://doi.org/10.1108/EMJB-12-2021-0194

[226]. Rai, A., Lang, S. S., & Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information systems research*, *13*(1), 50-69

[227]. Rajeh, M. T., Abduljabbar, F. H., Alqahtani, S. M., Waly, F. J., Alnaami, I., Aljurayyan, A., &Alzaman, N. (2021). Students' satisfaction and continued intention toward e-learning: a theory-based study. *Medical education online*, *26*(1), 1961348.

[228]. Rana, N. P., Dwivedi, Y. K., & Williams, M. D. (2013). Evaluating alternative theoretical models for examining citizen centric adoption of e-government. Transforming Government: People, Process and Policy, 7(1), 27–49

[229]. Ratten, V. (2015). International consumer attitudes toward cloud computing: A social cognitive theory and technology acceptance model perspective. *Thunderbird International Business Review*, *57*(3), 217-228.

[230]. Ratten, V. (2016). Continuance use intention of cloud computing: Innovativeness and creativity perspectives. *Journal of Business Research*, *69*(5), 1737-1740.

[231]. Reichheld, F. F. (2003). The one number you need to grow. *Harvard Business Review*, *81*(12), 46–54, 124.

[232]. Rezaei, S., &Valaei, N. (2017). Branding in a multichannel retail environment: Online stores vs app stores and the effect of product type. *Information Technology & People*, *30*(4), 853–886. https://doi.org/10.1108/ITP-12-2015-0308

[233]. Rho, M. J., Yoon, K. H., Kim, H.-S., & Choi, I. Y. (2015). Users' perception on telemedicine service: A comparative study of public healthcare and private healthcare. *Multimedia Tools and Applications*, *74*(7), 2483–2497. https://doi.org/10.1007/s11042-014-1966-6

[234]. Rigdon, E. E., Sarstedt, M., &Ringle, C. M. (2017). On comparing results from CB-SEM and PLS-SEM: Five perspectives and five

recommendations. *Marketing: ZFP–Journal of Research and Management*, *39*(3), 4-16.

[235]. Robson, C. (2002). Real world research: *A resource for social scientists and practitioner researchers*. Wiley-Blackwell.

[236]. Rodrigues, G., Sarabdeen, J., &Balasubramanian, S. (2016). Factors that influence consumer adoption of e-government services in the UAE: A UTAUT model perspective. *Journal of Internet Commerce*, *15*(1), 18-39.

[237]. Rodríguez-Ardura, I., &Meseguer-Artola, A. (2020). Editorial: How to Prevent, Detect and Control Common Method Variance in Electronic Commerce Research. Journal of Theoretical and Applied Electronic Commerce Research, 15(2), 0–0. https://doi.org/10.4067/S0718-18762020000200101

[238]. Roh, M., Park, K., 2019. 'Adoption of O2O food delivery services in South Korea: the moderating role of moral obligation in meal preparation'. Int. J. Inf. Manag. Elsevier 47, 262–273 (September 2018).

[239]. Rouibah, K., & Al-Hassan, A. A. (2019). Continuous Intention of Entry-Level MIS Professionals to Stay Working in the MIS Field: The Effect of Wasta and Skill-Job Fit. *Journal of Global Information Management*, *27*(2), 136–158. https://doi.org/10.4018/JGIM.2019040108

[240]. Ryu, H. S., &Ko, K. S. (2020). Sustainable development of Fintech: Focused on uncertainty and perceived quality issues. *Sustainability*, *12*(18), 7669.

[241]. Kim, S. C., Yoon, D., & Han, E. K. (2016). Antecedents of mobile app usage among smartphone users. *Journal of marketing communications*, *22*(6), 653-670.

[242]. Salim, T. A., El Barachi, M., Onyia, O. P., & Mathew, S. S. (2020). Effects of smart city service channel-and user-characteristics on user satisfaction and continuance intention. *Information Technology & People*.

[243]. Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of management journal*, *37*(3), 580-607.

[244]. Seannery, G., &Gui, A. (2021, February). Mobile Payment Continuance Usage Intention in Indonesia. In *2021 25th International Conference on Information Technology (IT)* (pp. 1-4). IEEE.

[245]. Seethamraju, R., &Diatha, K. S. (2019, January). Digitalization of Small Retail Stores-Challenges in Digital Payments. In *Proceedings of the 52nd Hawaii International Conference on System Sciences*.

[246]. Shaikh, A. A., &Karjaluoto, H. (2015). Making the most of information technology & systems usage: A literature review, framework and future research agenda. Computers in Human Behavior, 49, 541-566.

[247]. Shaikh, A. A., &Karjaluoto, H. (2015). Mobile banking adoption: A literature review. *Telematics and Informatics*, *32*(1), 129–142. https://doi.org/10.1016/j.tele.2014.05.003

[248]. Shaikh, A. A., &Karjaluoto, H. (2016). On some misconceptions concerning digital banking and alternative delivery channels. *International Journal of E-Business Research (IJEBR)*, *12*(3), 1-16.

[249]. Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*.

[250]. Sharma, S. K., & Sharma, M. (2019). Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. *International Journal of Information Management*, *44*, 65–75. https://doi.org/10.1016/j.ijinfomgt.2018.09.013

[251]. Shehryar, O., & Hunt, D. M. (2005). Buyer behavior and procedural fairness in pricing: Exploring the moderating role of product familiarity. *Journal of Product & Brand Management*, *14*(4), 271–276. https://doi.org/10.1108/10610420510609294

[252]. Shi, J., Mo, X., & Sun, Z. (2012). [Content validity index in scale development]. *Zhong Nan Da XueXueBao. Yi Xue Ban = Journal of Central South University. Medical Sciences*, *37*(2), 152–155. https://doi.org/10.3969/j.issn.1672-7347.2012.02.007

[253]. Shin, D. H. (2009).Towards an understanding of the consumer acceptance of mobile wallet. *Computers in Human Behavior*, *25*(6), 1343-1354.

[254]. Shin, D. H., Lee, S., & Hwang, Y. (2017). How do credibility and utility play in the user experience of health informatics services?. *Computers in Human Behavior*, *67*, 292-302.

[255]. Shon, T. H., &Swatman, P. M. (1998). Identifying effectiveness criteria for Internet payment systems. Internet Research, 8(3), 202–218

[256]. Shu-Chuan Chu &Yoojung Kim (2011) Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites, International Journal of Advertising, 30:1, 47-75, DOI: 10.2501/IJA-30-1-047-075

[257]. Singh, N., Sinha, N., &Liébana-Cabanillas, F. J. (2020).Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence. *International Journal of Information Management*, *50*, 191-205. https://doi.org/10.1016/j.ijinfomgt.2019.05.022

[258]. Singh, S., &Rana, R. (2017). Study of consumer perception of digital payment mode. *Journal of Internet Banking and Commerce*, *22*(3), 1-14.

[259]. Slade, E. L., Dwivedi, Y. K., Piercy, N. C., & Williams, M. D. (2015).Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: extending UTAUT with innovativeness, risk, and trust. *Psychology & Marketing*, *32*(8), 860-873.

[260]. Slade, E. L., Williams, M. D., &Dwivedi, Y. K. (2014). Devising a research model to examine adoption of mobile payments: An extension of UTAUT2. *The marketing review*, *14*(3), 310-335.

[261]. Srite, M., Galvin, J. E., Ahuja, M. K., &Karahanna, E. (2007).Effects of individuals' psychological states on their satisfaction with the GSS process. *Information & Management*, *44*(6), 535-546.

[262]. Stackpool, C. M. (2013). *Accuracy of various activity trackers in estimating steps taken and energy expenditure* (Doctoral dissertation).

[263]. Steelman, Z. R., &Soror, A. A. (2017). Why do you keep doing that? The biasing effects of mental states on IT continued usage intentions. *Computers in Human Behavior*, *73*, 209-223.doi:10.1016/j.chb.2017.03.027

[264]. Stevens, J. P. (2012). Applied multivariate statistics for the social sciences. Routledge.

[265]. Sun, Y., Liu, L., Peng, X., Dong, Y., & Barnes, S. J. (2014).Understanding Chinese users' continuance intention toward online social networks: an integrative theoretical model. *Electronic Markets*, *24*(1), 57-66.

[266]. Sun, Y., Zhang, X., & Zhang, J. (2011, August). Critical influence factors for e-learning education system continuance intention. In *2011 International Conference on Mechatronic Science, Electric Engineering and Computer (MEC)* (pp. 1884-1887).IEEE.

[267]. Susanto, A., Chang, Y., & Ha, Y. (2016). Determinants of continuance intention to use the smartphone banking services: An extension to the expectation-confirmation model. *Industrial Management & Data Systems*. 116 (3), 508–525.

[268]. Susanto, A., Chang, Y., Zo, H., & Park, M. C. (2012, October).The role of trust and security in Smartphone banking continuance.In *2012 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (pp. 2133-2138).IEEE.

[269]. Tai, Y. M., & Ku, Y. C. (2013). Will stock investors use mobile stock trading? A benefit-risk assessment based on a modified UTAUT model. *Journal of Electronic Commerce Research*, *14*(1), 67.

[270]. Talukder, M. S., Chiong, R., Bao, Y., & Malik, B. H. (2018). Acceptance and use predictors of fitness wearable technology and intention to recommend: An empirical study. *Industrial Management & Data Systems*, 119 (1) pp170–188. doi:10.1108/IMDS-01-2018-0009.

[271]. *The Indian payments handbook – 2021–2026*. (n.d.). 34.

[272]. Chaterji, D., & Thomas, R. (2017). Unified Payment Interface (Upi) a Catalyst Tool Supporting Digitalization–Utility, Prospects &Amp; Issues. *International Journal of Innovative Research and Advanced Studies (IJIRAS)*, *4*(2).

[273]. TMS, T. (2021, September 20). Decoded: What is UPI and how does it work? *Business Standard India*. https://www.business-standard.com/podcast/current-affairs/decoded-what-is-upi-and-how-does-it-work-121092001052_1.html

[274]. Unified Payments interface-UPI (2016). Retrieved from www.cashlessindia.gov.in/ upi.html.

[275]. Upadhyay, P., Kumar, A., Dwivedi, Y. K., &Adlakha, A. (2022). Continual usage intention of platform-based governance services: A study from an emerging economy. *Government Information Quarterly*, *39*(1), 101651. https://doi.org/10.1016/j.giq.2021.101651

[276]. Vatanasombut, B., Igbaria, M., Stylianou, A. C., & Rodgers, W. (2008).Information systems continuance intention of web-based applications

customers: The case of online banking. *Information & management*, *45*(7), 419-428.

[277]. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003).User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

[278]. Venkatesh, V., Thong, J. Y., Chan, F. K., Hu, P. J. H., & Brown, S. A. (2011). Extending the two-stage information systems continuance model: Incorporating UTAUT predictors and the role of context. *Information Systems Journal*, *21*(6), 527-555.

[279]. Vinayak A.J. (2021), *Karnataka Bank will focus on cost-light liability portfolio, says MD - The Hindu BusinessLine*. (n.d.). Retrieved July 9, 2021, from https://www.thehindubusinessline.com/money-and-banking/karnataka-bank-will-focus-on-cost-light-liability-portfolio-says-md/article34505945.ece

[280]. Vishnani, S., Tripathi, S. N., & Srivastava, S. (2022). Achieving Recommendation Intention in Mobile Banking: A Serial Mediation Approach. *International Journal of E-Services and Mobile Applications*, *14*(1), 1–21. https://doi.org/10.4018/IJESMA.296580

[281]. Wan, L., Xie, S., &Shu, A. (2020). Toward an understanding of university students' continued intention to use MOOCs: When UTAUT model meets TTF model. *Sage Open*, *10*(3), 2158244020941858

[282]. Wang, D., Xiang, Z., Law, R., & Ki, T. P. (2016). Assessing hotel-related smartphone apps using online reviews. *Journal of Hospitality Marketing & Management*, *25*(3), 291-313.

[283]. Wang, W. T., Ou, W. M., & Chen, W. Y. (2019). The impact of inertia and user satisfaction on the continuance intentions to use mobile communication applications: A mobile service quality perspective. *International Journal of Information Management*, *44*, 178-193.

[284]. Wang, Y. S., Wu, M. C., & Wang, H. Y. (2009).Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British journal of educational technology*, *40*(1), 92-118.

[285]. Warrington, T. B., & Caldwell, H. M. (2000). Building trust to develop competitive advantage in e-business relationships. *Competitiveness Review: An International Business Journal*.

[286]. Weng, C., Tsai, C. C., &Weng, A. (2015). Social support as a neglected e-learning motivator affecting trainee's decisions of continuous intentions of usage. *Australasian Journal of Educational Technology*, *31*(2).

[287]. Westbrook, R. A., & Oliver, R. L. (1991). The dimensionality of consumption emotion patterns and consumer satisfaction. *Journal of consumer research*, *18*(1), 84-91.

[288]. What is UPI? - https://www.npci.org.in/what-upi

[289]. Wilkie, W. L. (1994). Consumer behavior. Wiley.

[290]. Wilkie, W.L. (1994), *Consumer Behavior*, Wiley, New York, NY

[291]. World Bank Report, (2015), DIGITAL INDIA - A mission to transform India into a digitally empowered society and knowledge economy

[292]. Wu, C. G., & Wu, P. Y. (2019).Investigating user continuance intention toward library self-service technology: The case of self-issue and return systems in the public context. *Library Hi Tech*.

[293]. Wu, C.-H., & Chen, S.-C. (2015). Understanding the relationships of critical factors to Facebook educational usage intention. *Internet Research*, *25*(2), 262–278. https://doi.org/10.1108/IntR-11-2013-0232

[294]. Wu, I.-L., & Chen, J.-L. (2014). Knowledge management driven firm performance: The roles of business process capabilities and organizational learning. *Journal of Knowledge Management*, *18*(6), 1141–1164. https://doi.org/10.1108/JKM-05-2014-0192

[295]. www.trai.gov.in

[296]. Xiang, Z., Magnini, V. P., &Fesenmaier, D. R. (2015). Information technology and consumer behavior in travel and tourism: Insights from travel planning using the internet. *Journal of Retailing and Consumer Services*, *22*, 244–249. https://doi.org/10.1016/j.jretconser.2014.08.005

[297]. Xu, C., Peak, D., &Prybutok, V. (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations. *Decision Support Systems*, *79*, 171–183. https://doi.org/10.1016/j.dss.2015.08.008

[298]. Xu, F., & Du, J. T. (2018).Factors influencing users' perceived satisfaction and loyalty to digital libraries in Chinese universities. Computers in Human Behavior, 83, 64–72.

[299]. Yang, Y., Liu, Y., Li, H., & Yu, B. (2015). Understanding perceived risks in mobile payment acceptance. *Industrial Management & Data Systems*.

[300]. Ye, C., Seo, D., Desouza, K. C., Sangareddy, S. P., &Jha, S. (2008). Influences of IT substitutes and user experience on post-adoption user switching: An empirical investigation. *Journal of the American Society for Information Science and Technology*, *59*(13), 2115–2132. https://doi.org/10.1002/asi.20921

[301]. Yeh, Y. S., & Li, Y. M. (2009). Building trust in m-commerce: contributions from quality and satisfaction. *Online Information Review*.

[302]. Yeo, V.C.S., Goh, S.K., Rezaei, S., 2017. Consumer experiences, attitude and behavioral intention toward online food delivery (OFD) services. J. Retailing Consumer Services. Elsevier 35, 150–162 (December 2016).

[303]. Yin, C., & Shi, L. (2015, October).An empirical study on users' online payment behavior of tourism website.In *2015 IEEE 12th International Conference on e-Business Engineering* (pp. 214-219).IEEE.

[304]. Yoo, S. J., Han, S. H., & Huang, W. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: A case from South Korea. *Computers in Human Behavior*, *28*(3), 942-950.

[305]. Yuan, S., Liu, Y., Yao, R., & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, *32*(1), 20-34.

[306]. Yuan, S., Ma, W., Kanthawala, S., &Peng, W. (2015). Keep using my health apps: Discover users' perception of health and fitness apps with the UTAUT2 model. *Telemedicine and e-Health*, *21*(9), 735-741.

[307]. Yuan, S., Liu, Y., Yao, R., & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, *32*(1), 20-34.

[308]. Zhang, J., Luximon, Y., & Song, Y. (2019). The Role of Consumers' Perceived Security, Perceived Control, Interface Design Features, and Conscientiousness in Continuous Use of Mobile Payment Services. *Sustainability*, *11*(23), 6843. https://doi.org/10.3390/su11236843

[309]. Zhang, P. (2013). The Affective Response Model: A Theoretical Framework of Affective Concepts and Their Relationships in the ICT Context. *MIS Quarterly*, *37*(1), 247–274. https://doi.org/10.25300/MISQ/2013/37.1.11

[310]. Zhang, X., Han, X., Dang, Y., Meng, F., Guo, X., & Lin, J. (2017). User acceptance of mobile health services from users' perspectives: The role of self-efficacy and response-efficacy in technology acceptance. *Informatics for Health and Social Care*, *42*(2), 194-206.

[311]. Zhao, L., & Lu, Y. (2012). Enhancing perceived interactivity through network externalities: An empirical study on micro-blogging service satisfaction and continuance intention. *Decision Support Systems*, *53*(4), 825–834. https://doi.org/10.1016/j.dss.2012.05.019

[312]. Zhao, Y., &Bacao, F. (2020). What factors determining customer continuingly using food delivery apps during 2019 novel coronavirus pandemic period?. *International journal of hospitality management*, *91*, 102683. https://doi.org/10.1016/j.ijhm.2020.102683

[313]. Zhou, T. (2011). Examining the critical success factors of mobile website adoption. *Online information review*.

[314]. Zhou, T. (2011). Understanding mobile Internet continuance usage from the perspectives of UTAUT and flow. *Information Development*, *27*(3), 207-218.

[315]. Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services'. *Decision Support Systems. Elsevier B.V.* 54 (2), 1085–1091.

[316]. Zhou, T., & Li, H. (2014). Understanding mobile SNS continuance usage in China from the perspectives of social influence and privacy concern. *Computers in Human Behavior*, *37*, 283-289.

[317]. Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. Computers in Human Behavior, 26, 760–767

[318]. Zhu, D. H., Lan, L. Y., & Chang, Y. P. (2017). Understanding the Intention to Continue Use of a Mobile Payment Provider: An Examination of Alipay Wallet in China. *International Journal of Business & Information*, *12*(4).

[319]. Zolfagharian, M. A., &Paswan, A. (2009). Consumer Perceptions of Service Innovativeness and Personal Control. *Services Marketing Quarterly*, *31*(1), 89–105. https://doi.org/10.1080/15332960903408526

[320]. Sandeep kaur. Factors Influencing Continuance Intentions of Unified Payment Interface (UPI) users, 19 August 2022, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-1966920/v1]

**APPENDIX**

Annexure-I

1. **Questionnaire**

# A study on satisfaction towards UPI usage

Dear Respondents, the purpose of the survey is to examine the continue usage and recommendation intentions of using UPI among Indian users. participation in the survey is on purely volunteer basis. your response to this survey will contribute in the smooth conduct of survey. Data collected from you will be used for academic purpose and will be kept strictly confidential.

Thank you for your precious time.
Sandeep kaur
Research Scholar
LPU, Phagwara
please feel free to contact me for any possible query
EMAIL- sksandeepmomi@gmail.com

* Required

**Email Id**

Your answer

| **Gender** | |
|---|---|
| **Male** | |
| **Female** | |
| **prefer not to say** | |

| **Age** | |
|---|---|
| **Less than 30 years** | |
| **31-45 years** | |
| **more than 45 years** | |

| | |
|---|---|
| **Occupation** | |
| **Service class-(Employees)** | |
| **Businessmen** | |
| **Professional-(CA, DR., Lawyers etc.)** | |
| **Retired people** | |
| **Student** | |

| | |
|---|---|
| **Location** | |
| **Rural** | |
| **Urban** | |

**City, State you belong to**: *

1. Jalandhar, Ludhiana, Amritsar from Punjab;
2. Faridabad, Karnal, Gurugram from Haryana;
3. Shimla, Solan from Himachal Pradesh

**Are you using Digital payment modes, if using select which mode you are using:** *

1. Banking Cards or Banks Pre-paid Cards.
2. Unstructured Supplementary Service Data (USSD)
3. Aadhaar Enabled Payment System (AEPS)
4. Internet banking
5. Mobile banking
6. Unified Payments Interface (UPI)
7. Mobile Wallets
8. Micro ATMs

**UPI APP you are using: (you can select more than one app)** *

1. PhonePe
2. Paytm
3. BHIM app
4. MobiKwik
5. Google Pay
6. Uber
7. iMobile
8. Chillr

9. Axis Pay
10. BOB UPI
11. Paytm Payments Bank
12. SBI Pay
13. Other apps

**Why are you using the above mentioned apps** *

Your answer

| | |
|---|---|
| Strongly Disagree | 1 |
| Disagree | 2 |
| Somewhat Disagree | 3 |
| Neither Agree nor Disagree | 4 |
| Somewhat agree | 5 |
| Agree | 6 |
| Strongly Agree | 7 |

| **Statements (Performance Expectancy)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|---|---|---|---|---|---|---|---|
| Payments through UPI would brings me greater convenience | | | | | | | |
| UPI helps me to be more efficient in online transactions | | | | | | | |
| I found UPI useful and saves my time | | | | | | | |
| Using UPI would improve my productivity | | | | | | | |
| UPI enables me to accomplish my tasks more quickly in my daily life | | | | | | | |
| **Statements(Effort Expectancy)** | | | | | | | |
| The use of UPI is clear & understandable when doing online transactions | | | | | | | |
| I find UPI easy for me to use | | | | | | | |
| Learning to operate UPI is much easier | | | | | | | |
| It is easy for me to **become skillful** at using UPI | | | | | | | |
| Recovering from mistakes is very quick and easy | | | | | | | |
| **Social Influence** | | | | | | | |
| Most of the people around me using UPI | | | | | | | |
| The people who influences my behavior think that I should use UPI | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| People in my social network think that I should use UPI for online transactions | | | | | | | |
| I find that using UPI is fashionable & popular way to perform online transactions | | | | | | | |
| I would use UPI if it would be used by others | | | | | | | |
| **Facilitating Conditions** | | | | | | | |
| I have necessary resources(like internet connectivity, POS, QR code) to use UPI | | | | | | | |
| I have knowledge that is required to use UPI | | | | | | | |
| A person is available for help if I found any difficulty in using UPI | | | | | | | |
| It is convenient for me to perform online transactions at UPI platform | | | | | | | |
| Assistance is available when difficulties are facing in using UPI | | | | | | | |
| **Personal Innovativeness** | | | | | | | |
| When I hear about UPI app, I looked **ways to try** it. | | | | | | | |
| Among my all friends and relatives, I am **first to try out** UPI services. | | | | | | | |
| Generally, I would **not hesitate to try out new** UPI services/ new technology. | | | | | | | |
| Being the first to use **new high-tech services is very important** to me | | | | | | | |
| I can usually figure out new high-tech products and services **without help** from others | | | | | | | |
| I **love to experiment** with UPI | | | | | | | |
| **Satisfaction** | | | | | | | |
| I am satisfied with **services provided** by UPI | | | | | | | |
| I am **satisfied with functions** provided by UPI | | | | | | | |
| I am extremely **contented** with use of UPI | | | | | | | |
| I think it is wise to choose to use UPI | | | | | | | |
| I feel satisfied about my **overall experience** of using UPI | | | | | | | |
| **Continuance Intention** | | | | | | | |
| If I had access to UPI, I **intend to continue** use it | | | | | | | |
| I **plan to continue use** of UPI in future | | | | | | | |
| I will have **continuance intention to use UPI for online transaction** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| I have continuance intentions of using UPI **than other alternative means** | | | | | | | |
| I would like to continue to **make suggestions** for UPI | | | | | | | |
| I will keep using UPI as **regularly** as I do now | | | | | | | |
| **Trust** | | | | | | | |
| I trust the UPI's reliability and availability | | | | | | | |
| I believe that UPI is trustworthy | | | | | | | |
| UPI provides online transaction services in my best interest | | | | | | | |
| I believe that transaction data is safe and confidential | | | | | | | |
| I believe that immediate confirmation message provided by system, when transaction is completed | | | | | | | |
| I believe UPI service providers keep users interest in mind | | | | | | | |
| I believe that UPI service provider will do everything to keep users transaction data secure | | | | | | | |
| **Security** | | | | | | | |
| I would feel secure using my personal information through UPI system | | | | | | | |
| UPI system are secure means through which, funds can be send/receive | | | | | | | |
| UPI is secured method of online payments/transactions | | | | | | | |
| UPI maintains privacy of data | | | | | | | |
| UPI platform provides good firewall technology to prevent unauthorized intrusion. | | | | | | | |
| Data stored at UPI system cannot be manipulated or tampered | | | | | | | |
| I have not fear of hack invasion into UPI system | | | | | | | |
| **Pace of Innovation** | | | | | | | |
| UPI features **changing at fast pace** | | | | | | | |
| UPI system changing **more fast than other techniques** of online payments | | | | | | | |
| Pace of technological innovation in online payments is **high** | | | | | | | |
| I have **consistently seen new features** in UPI for some time | | | | | | | |
| Technological innovations and UPI **don't go hand in hand** | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Innovations in UPI are **frequent** | | | | | | | | |
| **Intention to Recommend** | | | | | | | | |
| I **will recommend** UPI to other people. | | | | | | | | |
| I positively recommend UPI to others by **Word-of – Mouth** | | | | | | | | |
| I will **encourage my colleagues, friends, relatives** to use UPI | | | | | | | | |
| I am willingly **say positive words** about UPI | | | | | | | | |

## Annexure-II

### 2. Responses from experts

| **Construct** | **Ques. Item** | **Expert 1** | **Expert 2** | **Expert 3** | **Expert 4** | **Expert 5** | **Expert 6** | **Expert 7** | **Expert 8** | **Expert 9** | **Ne** | **I-CVI** | **S-CVI** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Performance Expectancy | Item 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 6 | 0.67 | 0.80 |
| | Item 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 3 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 5 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 5 | 0.56 | |
| | Item 6 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 5 | 0.56 | |
| | Item 7 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 6 | 0.56 | |
| | Item 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 10 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Item 13 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 6 | 0.67 | |
| Effort Expectancy | Item 14 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 0.89 | 0.81 |
| | Item 15 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 16 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 0.89 | |
| | Item 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 18 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 19 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.56 | |
| | Item 20 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 0.56 | |
| | Item 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| Social Influence | Item 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.82 |
| | Item 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 27 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 28 | | | | | | | | | | | | |
| | Item 29 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0.33 | |
| | Item 30 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 5 | 0.56 | |
| Facilitation Conditions | Item 31 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 | 0.44 | 0.91 |
| | Item 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 34 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 35 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 36 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| Personal Innovativeness | Item 37 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.81 |
| | Item 38 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 39 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 40 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 41 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 42 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 43 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Ite | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 0. | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m 44 | | | | | | | | | | | 56 | |
| | Item 45 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 46 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 0.56 | |
| | Item 47 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 48 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| Satisfaction | Item 49 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 | 0.44 | 0.74 |
| | Item 50 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 0.33 | |
| | Item 51 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 52 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 0.33 | |
| | Item 53 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 54 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 55 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 5 | 0.56 | |
| | Item 56 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 57 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 9 | **1.00** | |
| Contin | Item 58 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.80 |
| | Item 59 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| uance Intentions | Item 60 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 61 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item 62 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 | 0.67 | |
| | Item 63 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 0.89 | |
| | Item 64 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 0.33 | |
| | Item 65 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 66 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item 67 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 0.56 | |
| | Item 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 69 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 6 | 0.67 | |
| Trust | Item 70 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.82 |
| | Item 71 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item 72 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 73 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 74 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 6 | 0.67 | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 75 | | | | | | | | | | | | |
| | Item 76 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 77 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 78 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 79 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 6 | 0.67 | |
| | Item 80 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 81 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 0.33 | |
| | Item 82 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| Security | Item 83 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.89 |
| | Item 84 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 8 | 0.89 | |
| | Item 85 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 8 | 0.89 | |
| | Item 86 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 87 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 8 | 0.89 | |
| | Item 88 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 | 0.89 | |
| | Item 89 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 6 | 0.67 | |
| | Item 90 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 0.89 | |
| Pace | Ite | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.** | 0.9 |

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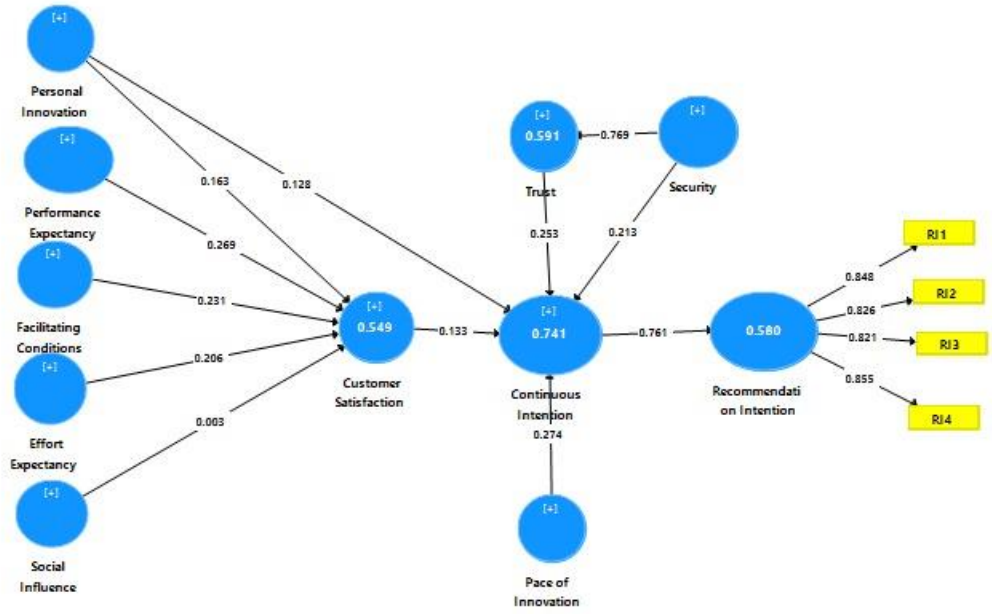
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| of Innovation | m 91 | | | | | | | | | | | **00** | 6 |
| | Item 92 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 7 | **0.78** | |
| | Item 93 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 94 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 95 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 96 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| Intention to recommended | Item 97 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | 0.94 |
| | Item 98 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 99 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 100 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 0.67 | |
| | Item 101 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |
| | Item 102 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | **1.00** | |

## 3. Path analysis of conceptual model



# CERTIFICATE OF PUBLICATION OF PAPERS FOR PH.D.

This is to certify that Ms. Sandeep Kaur pursuing Ph.D. (**Part Time**) programme in Department of Commerce with Registration Number 41900048 under the Guidance of Dr. Rupinder Katoch has the following Publications / Letter of Acceptance in the Referred Journals / Conferences mentioned thereby fulfilling the minimum programme requirements as per the UGC.

| **Sno.** | **Title of paper with author names** | **Name of journal / conference** | **Published date** | **Issn no/ vol no, issue no** | **Indexing in Scopus/ Web of Science/UGC-CARE list (*please mention*)** |
|---|---|---|---|---|---|
| 1. | BIBLIOMETRIC ANALYSIS ON THE UTAUT MODEL<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper-International Journal of Early Childhood Special Education (INT-JECSE) | 2022 | Vol 14, Issue 02 2022 | UGC, ESCI |

| | | | | | |
|---|---|---|---|---|---|
| 2. | Predicting continuation intention of Unified Payment Interface (UPI) users with trust and security :A SEM approach<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper- International Journal of Early Childhood Special Education (INT-JECSE) | 2022 | Vol 14, Issue 02 2022 | UGC, ESCI |
| 3. | A CRITICAL REVIEW OF LITERATURE ON EFFECT OF TECHNOLOGICAL INNOVATIONS ON PERFORMANCE OF BANKS AND CUSTOMER SATISFACTION<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper-<br>Shodh Sanchar Bulletin | 26-12-2020 | Volume 10, Issue 40,October to December 2020 | UGC |
| 4. | Pre and Post covid-19 situation in Unified Payment Interface in India<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper- Shodh Sanchar Bulletin | January-March, 2021 | Vol.11, Iss, 41 | UGC |
| 5. | UNIFIED PAYMENT INTERFACE (UPI): A REVIEW<br>Sandeep Kaur | Journal paper-<br>Modern Thamizh Research | 27-Mar-21 | Special Issue | UGC |

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|---|---|---|---|---|---|
| | Dr. Rupinder Katoch | | | | |
| 6. | BENEFITS AND CHALLENGES OF BLOCKCHAIN TECHNOLOGY<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Book chapter-<br>"World Economy, Trade and Employment – Navigating the Future" | 2021 | | - |
| 7. | BENEFITS AND CHALLENGES OF UNIFIED PAYMENT INTERFACE (UPI)<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper | January-March 2022 | Vol. 16, No.1, | UGC |
| 8. | Literature Survey on Customer Satisfaction, Behavioral Intention, Trust and Security in Electronic payments system.<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Presented in Conference | December,2020 | | |
| 9. | Exploring Post-Adoption Behavior of the UPI Users with Cognitive and Affective Factors<br>Sandeep Kaur<br>Dr. Rupinder Katoch | Journal paper-International Journal on Recent and Innovation Trends in Computing and Communication | December, 2022 | Vol.- 10<br>No.- 12 | Scopus |

| | | | | | |
|---|---|---|---|---|---|
| 10. | Bibliometric analysis on electronic payments and UTAUT | Journal Name- Electronic Commerce Research and Applications | October-November 2022 | Volume 55 | Scopus |

**Signature of Candidate with Date, Registration No, Email ID**

Sandeep Kaur

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Rupinder

**Signature of Guide with Date**

**& UID**- 24805

**A List of Conferences:-**

| Sno. | Title of paper with author names | Name of conference/ Seminar | Conference/ Seminar conducted by | Conference date/year |
|---|---|---|---|---|
| 1. | Sandeep kaur | National Seminar on business ethics and corporate social responsibility (2018) | Bebe nanki university college Mithra & IQAC | 2018 |
| 2. | Sandeep Kaur | Ensuring quality in Higher Education- A Progressive way to National Development (2019) | DAv Jalandhar & IQAC | 2019 |
| 3. | A Critical review of literature survey of technological innovations on performance of banks and customer satisfaction<br>Sandeep Kaur<br>Dr. Rupinder katoch | International Conference On Rethinking Business; Designing Strategies In The Age Of Disruptions . | LPU | 19th December 2020 |
| 4. | Benefits and challenges of blockchain technology | 2 days International commerce & Management virtual conference on world economy, trade & employment navigating the future | University of Mumbai<br>Department of commerce | 12th & 13th March, 2021 |

| | | | | |
|---|---|---|---|---|
| 5. | Pre and post covid-19 situation in UPI in India Sandeep Kaur | One-day International e-conference on covid-19: A holistic approach towards sustainability | Bharat College of arts & commerce<br>Department of commerce & IQAC | 9th April, 2021. |
| 6. | Bibliometric analysis on UTAUT model Sandeep Kaur Dr. Rupinder katoch | "E3: EMPOWER, ELEVATE AND EXCEL" | IQAC, Department of Commerce, Department of Computer Science and Department of Information Technology. | 27th November, 2021 |
| 7. | Literature survey on Customer satisfaction, Behavioral intention, Trust and Security in Electronic payment system. Sandeep Kaur Dr. Rupinder Katoch | International conference on Industry 5.0- Human Touch, Innovation and Efficiency | LPU. | January 28, 2022 |
| 8. | Unified Payments Interface: benefits and challenges Sandeep kaur | AGAMYA 2021: National level seminar for post graduation students | ST. Joseph's college of commerce | 2021 |

| | | | | |
|---|---|---|---|---|
| 9. | Sandeep Kaur | Participated in Online conference on Innovation and Entrepreneurship Development | TIIC | February 27-28, 2021 |
| 10. | Bibliometric analysis on Electronic payments and UTAUT | 7th International management conference | FIIB, New Delhi | January 7th -8th, 2022 |

**A List of Workshops attended:**

1. Panel Data Analysis Using STATA (July 2020), organized by Research Shiksha
2. Meta Analysis & Multiple Correspondence Analysis (1-8 Aug, 2020) organized by Research Shiksha.
3. Two Day National Open Workshop on getting Aligned to the Publishing Process-Author Workship (Sept, 2020)
4. Refresher Course on Research Methodology and Data Analysis w.e.f. May 24, 2021 to June 12, 2021 by LPU, Phagwara.
5. Five days Virtual FDP on Research paper publication in ABDC/Scopus with AMOS, June 21-25, 2021 Organised by Pillai College of Arts, Commerce & Science.
6. 5 days workshop on Application of Tools & Techniques in Research, June 22-26, 2021
7. International training program on AMOS: SEM and CFA, designed and executed by DR. R. Ravanan, 14-16 may, 2021
8. Five day national level workshop on Crafting Literature with Synthesis Tools, organized by Consortium for Human Resource Development faculty chapter, 10-14 August, 2020.
9. Two days online national workshop on Meta analysis, 29-30April, 2021 organized by MD University Rohtak.

10. workshop on “Writing Impactful Research” on “How to identify fake/predatory/cloned journals in academics” on 05th August 2021, organised by the Sabaragamuwa University of Sri Lanka in association with Emerald Publishing and Gulf Medical University
11. one day workshop on how to frame model and identify the research
12. A workshop on EFA, CFA, CCA held on September, 26-27, 2020 oragized by Kahan
13. A workshop on Data Analysis using ‘R’ organized by doctoral research centre, Chitkara business school, Chitkara University, 3-7 May, 2021
14. SEM using SMART PLS-3, from 17-22 May, 2021 organized by Research Shiksha
15. One week online national certificate program organized by Guru Angad Dev Training Centre (PMMMNMTT), SGTB Khalsa College, University of Delhi, 4-10 March, 2021.
16. E-workshop on Questionnaire Designing, 15-16 May, 2021, organized by Research Smiths