A Micro-level study on UPI (unified payments interface) as a payment method in Goa

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DECLARATION BY STUDENT

I at this moment declare that the data presented in this Dissertation report entitled, "A Micro–level study on UPI (Unified Payments Interface) as a payment method in Goa" is based on the results of investigations carried out by me in the Economics Discipline at the Goa Business School, Goa University under the Supervision of Ms. Ankita Chari and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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COMPLETION CERTIFICATE

This is to certify that the dissertation report "A Micro – level study on UPI (Unified Payments Interface) as a payment method in Goa" is a bonafide work carried out by Mr. Atharva Vinayak Bapat under my supervision in partial fulfillment of the requirements for the award of the degree of Masters of Arts in the Economics Discipline at the Goa Business School, Goa University.

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PREFACE

The study explores the intersection of technology and convenience for the people of Goa. The UPI (Unified payments interface) is a technological platform for Indian citizens from which they can seamlessly do their day-to-day transactions. This revolutionary technology came into light after the demonetization in 2016, after which the financial condition of our nation trembled and there was an urgent need for an alternate payment method that would fill the void in the payment system and could also reduce the black money circulating throughout our economy.

This digital platform gives a user the freedom to make contactless payments in seconds at their convenience though it does have its drawbacks still it's the easiest form for making payments. There was a limited review of literature when it comes to any particular state of India so the need was felt to study any one particular state, being a Goan the topic that came into the light was, "**A micro–level Study on UPI (Unified Payments Interface) as a payment method in Goa".**

Here the main focus was to determine how UPI as a payment method has grown over the years, its usability, and the problems faced by the users and to assess whether it will hinder the adoption rate for the people in Goa.

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ABSTRACT

This study at the micro level examines the acceptance and use of the Unified Payments Interface (UPI) as a payment mode in Goa's coastal area in India. The research objectives were to see how UPI services have grown, the usability of the same, and major issues that are related to it as well as to determine if demographic and socio-economic factors influence its usage more often. The findings from this descriptive-analytical study showed significant determinants of the growth of UPI services. This included an increase in the number of banks connected to UPI from 44 in 2017 to 572 by 2024 indicating a tremendous growth in infrastructure. In addition, both volume and value of transactions skyrocketed with transaction volume jumping from 6.37 million to 13,440.00 million while transaction value rose from `2,425.14 crore to `1,978,353.23 crore respectively for the same period. Concerning usability, the adoption rate is almost 98% and people found it easy to use these UPI applications. Server issues and network issues were two of the major problems faced by the respondents. Regression analysis also indicated that satisfaction and convenience were the key variables that affected the frequency of UPI usage patterns thereby giving us insight into future digital payments outlooks and highlighting areas requiring further research and policy actions for addressing emerging challenges while capitalizing on opportunities in GOA's money market.

CHAPTER 1: INTRODUCTION

Following the 2016 demonetization, the financial landscape of India underwent significant upheaval. However, the Central Government swiftly introduced the Unified Payments Interface (UPI) as part of its ambitious digitization initiative. UPI, gaining traction with the influx of private sector participants, has emerged as the preferred mode for conducting monetary transactions. Thus, this study delves into India's monetary digital revolution, focusing on UPI in Goa through the lens of "A Micro-level study on UPI (Unified Payments Interface) as a payment method in Goa". The study aims to assess UPI's usability and address associated challenges, ultimately contributing to enhancing user experience and promoting its adoption for day-to-day transactions.

Goa, famous for its lively culture and flourishing tourism industry, is an interesting case study for examining how UPI has taken root at the bottom of the pyramid. Its economic structure as well as payment behavior might be different from those in other parts of India notwithstanding its popularity as a tourist destination. It is therefore very important to understand how UPI fits into Goan residents' preferences so atoertain its usefulness as a mode of payment in divergent socio-economic backgrounds.

The main objective of undertaking this research is to explore the digital money revolution in Goa focusing on patterns of both the adoption and use of UPI. To discover the differences between various age groups and market segments within the Goan economy regarding UPI's application, we will use micro-level analysis. This will be done through conversations with people, questionnaires, and analysis of transaction records so that we can test whether UPI can be used by customers easily; tell us what difficulties are associated with the uptake or dismissal of this system; and suggest ways for improving user experience.

This paper seeks to untangle the complexities surrounding UPI adoptions in Goa for a wider conversation about e-payments in India. The ultimate goal is to provide policymakers, financial institutions, and technology providers with insights into factors contributing success story behind it.

1.1) BACKGROUND OF THE STUDY

The Unified Payments Interface (UPI) is a smartphone application designed for seamless money transfers between bank accounts. It acts as a platform enabling users to link multiple bank accounts from various banks to a single UPI application, facilitating easy transactions using their registered mobile phone number at any time of day. Operated by the National Payments Corporation of India (NPCI), UPI consolidates various banking functions into one convenient mobile application, including smooth fund routing and merchant payments. UPI eliminates the need for customers to repeatedly provide sensitive bank account information for each transaction, streamlining the payment process. It offers additional features such as in-app payments, cross-screen QR codes, and web-based payments, with services extending to online payments through UnionPay-powered e-wallets. The adoption of "UPI Autopay" by thousands of businesses across diverse industries underscores its significant impact on the digital economy. However, despite its revolutionary potential, UPI transactions also present notable security risks, emphasizing the importance of implementing robust security measures.

Although UPI has experienced substantial growth countrywide, its uptake and use in places like Goa need to be examined closely. Being a famous tourist destination with its unique economic landscape; Goa may present different challenges and opportunities for UPI adoption than other parts of India. The factors that may affect the rate at which UPI is adopted in this region include the composition of the population, local business practices, and infrastructure availability.

We intend to undertake a micro-level study on UPI in Goa, to explore these aspects more deeply thereby providing some insights into the dynamics of digital payments within localized environments. We would like to understand how UPI is perceived by residents in Goa, how it is being used by them, as well as any problems faced while adopting it through conducting surveys and data analysis. This information will help us come up with valuable strategies to increase the use of UPI in Goa and remove any hindrances to its implementation. Ultimately our findings should help us better comprehend digital payment ecosystems across varied socio-economic contexts hence facilitating more inclusive financial services that are easily accessible all over India.

RISE OF UPI:

UPI made its debut in 2016 under the guidance of the National Payments Corporation of India (NPCI) and with the endorsement of 21 member banks, under the leadership of then RBI governor, Raghuram G. Rajan. It caters to a broad audience engaged in digital money transfers. The ascent of UPI transactions in India has become integral to the nation's evolving cashless ecosystem. Reports indicate that in 2018 alone, over 3 billion transactions occurred on UPI platforms, with December witnessing 620 million transactions worth Rs. 1 lakh crore. As per a recent NPCI report, UPI transactions totaled around 1.09 trillion rupees in January this year, underscoring its significance in fostering a cashless economy. The value of online financial transactions in India surged by 10.5 percent between December 2019 and December 2020, according to reports. A joint study by WorldPay reveals that 39.7% of India’s e-commerce payments in 2020 were made through digital wallets, marking a significant shift in online payment preferences. Data from EY indicates a substantial surge in UPI-based digital transactions, with volumes rising by 110% and values by 109% between June 2020 and June 2021. This sustained growth suggests a promising future for UPI, with projections indicating a

substantial contribution to India's digital payments industry. By 2023, it is estimated that UPI transactions will surpass 60 billion, accounting for over 50% of India’s digital payments. The growth trajectory of UPI transactions is evident from the statistics. In March 2019, UPI transactions reached a milestone of 800 million. Comparing the period between April and August 2021 to the same period in 2018, there has been a remarkable 22-fold increase, with 14.79 billion transactions recorded. UPI achieved a billion transactions per month within three years of its launch, a trend expected to continue in the foreseeable future. With its exponential growth, UPI has emerged as a dominant player in the market, competing with platforms like PhonePe, Paytm, and Google Pay. In FY20, UPI transactions totaled 125.1 billion rupees, a 13.2% increase in volume and a 14.3% increase in value compared to FY19. The surge in UPI transactions has spurred consumer interest in various sectors, including bill payments, mobile recharges, and non-essential purchases on e-commerce platforms. Its impact on the Indian market has been substantial, revolutionizing payment methods and consumer behavior. UPI's future potential is vast, offering convenience, speed, and security in transactions. The government's plans to leverage UPI for international transactions and as a robust fraud management system further underscore its significance in the digital economy landscape. UPI represents India's progressive vision toward a digital economy, a sentiment reinforced by the surge in digital transactions during the pandemic. With its dynamic growth rate and potential to contribute significantly to India’s GDP, UPI is poised to play a crucial role in shaping the country’s economic trajectory.

1.2) NEED AND IMPORTANCE OF THE STUDY:

The study is important to evaluate the current rise in significance of UPI because of its distinct and widely recognized characteristics. It is also important to gain insights into the challenges encountered by UPI users, address technical issues to boost interface efficiency for seamless financial transactions, and check how the frequency of use of the UPI brings about a change concerning various personal, social, and economic factors.

Furthermore, understanding broader implications necessitates a consideration of the frequency of UPI usage as well as how it influences economic, social, and personal factors. On personal grounds, regular use of UPI can influence individuals' financial behavior and choices that shape their general financial conduct. At the societal level, massive acceptance of UPI payments has a likelihood of promoting cultural transformation in payment systems thus changing perceptions of cashless transactions.

From an economic viewpoint, the upswing of UPI is a pointer to the digital economy with impacts on various industries such as retailing, e-commerce, and banking. Consequently, this knowledge will provide useful information on the role played by UPI in enhancing entrepreneurship development through access to finance for all.

Additionally, doing micro-level research within particular areas like Goa has the potential to reveal peculiarities in preferences among consumers concerning using UPI. This regional focus is important because it helps in adjusting interventions and strategies based on specific challenges and opportunities found in different socio-economic contexts thereby increasing the efficiency of UPI as a method of payment.

1.3) OBJECTIVES OF THE STUDY:

The objectives behind carrying out the following study are as follows:

1. To understand the growth of usage of UPI services.

2. To understand the usability of UPI services.

3. To find out the major problems faced by UPI users.

4. To investigate the impact of gender, education qualification, satisfaction, reliability, and convenience on the frequency of use of the Unified Payments Interface (UPI).

1.4) RESEARCH QUESTIONS:

Here are the research questions aligned with the research goals:

1. How has the utilization of UPI services changed over time?

2. What are user's views, on the ease of using UPI services?

3. What challenges do users face when utilizing UPI services?

4. How do factors, like education qualification, gender, satisfaction, reliability, and convenience influence how often users use UPI services?

1.5) SCOPE AND DELIMITATION OF THE STUDY:

The study is based in Goa, where the main focus will be on determining the trends in terms of usage at a national level and see if there is any relationship with the primary data that will be rendered from the respondents of Goa. Further, the study aims at determining if there exists a correlation between the social and economic factors of people in Goa and their usage of UPI; along with the problems that people have faced as users of UPI.

1.6) LIMITATIONS OF THE STUDY:

While performing the study, the following limitations were encountered:

1. Respondents were not ready to disclose their personal information without consent.

2. The adoption rate of UPI services to carry out financial transactions not only depends on demographic, social, and economic factors but also depends on several other factors such as acceptance at the stores, infrastructure for communication, etc. Which was not covered in this study.

3. The study could have been more effective in terms of relevance in transactions that UPI has gained if the opinions and user experiences of business-class individuals, suppliers, traders, retailers, etc were also taken into consideration.

CHAPTER 2: REVIEW OF LITERATURE

2.1) EVOLUTION OF MONEY:

Throughout history, people have engaged in commerce to exchange goods and services for payment**.** The book **(Davies, 2010)** states these financial transactions were not usually accompanied by monetary payments. There was a time when standard money did not exist, and individuals had to rely on various forms of payment to complete transactions. The modes of payment have changed dramatically as technology has advanced. Modern technologies and innovative business solutions enable financial transactions to take place at almost any time and in almost any location.

[Source: Primary] Figure: 2.1 Evolution of Money

BARTER SYSTEM:

Bartering is the exchange of goods and services between two or more parties without the use of money. Many years ago, bartering was an advantageous way for people to exchange products and services since it allowed both sides to acquire what they needed. Livestock was also regarded as a form of wealth that people could collect. The more cows or sheep a person had, the wealthier they were.

LEATHER MONEY:

Leather was another currency material. White deer skin was used for currency in ancient China. The notes were huge in comparison to the ones used today. Leather money could have been as huge as one-foot deerskin squares.

PRECIOUS METAL COINS:

Beads and shells were used as currency in ancient cultures. They eventually started employing precious metals to manufacture coins. People of Lydia's ancient culture were among the first to employ gold and silver coinage. This coinage was precious as well as easily transportable.

PAPER-BASED PAYMENTS:

Paper-based instruments such as cheques, drafts, etc, account for roughly 60% of total non-cash transactions in the country. In terms of value, the share is currently around 11%. This percentage has been continuously declining over time, while the electronic method has gained popularity as a result of the Reserve Bank of India's persistent attempts to popularise electronic payment products over cash and cheques.

ELECTRONIC PAYMENTS:

In the mid-1980s and early 1990s, the Reserve Bank of India (RBI) initiated technology-driven measures to bolster the infrastructure of the payment and settlement system, alongside introducing innovative payment methods leveraging advancements in banking technology. The

surge in cheque volumes during this period strained the existing system, necessitating the adoption of a cost-effective alternative solution. During the 1990s, the RBI introduced the ECS Credit scheme to cater to the bulk and repetitive payment needs of corporations and institutions, such as salary, interest, and dividend disbursements. This scheme facilitates the crediting of client accounts on predetermined dates and is operational in major cities nationwide. In addition to NECS, the RBI launched RECS in 2009, tailored to bank branches within the jurisdiction of RBI Regional offices. Under RECS, sponsor banks upload validated credit/debit instructions to clients of CBS-enabled bank branches within the RBI's Regional office jurisdiction. The RECS center processes this data, facilitates settlement, generates bank-specific reports, and disseminates the data/reports via a secure web server, enabling destination bank branches to credit/debit beneficiaries' accounts leveraging CBS technology. RECS is operational in select cities including Ahmedabad, Bengaluru, Chennai, and Kolkata. The RBI introduced the ECS (Debit) Scheme to expedite the collection of recurring payments for utility companies. This scheme allows utility company customers/subscribers to authorize bank branches to debit their accounts and transfer funds to the companies, streamlining payment processes and enhancing customer satisfaction. There are no constraints on the payment amount, and ECS (Debit) is operational in major cities nationwide. In the late 1990s, a retail money transfer system enabled electronic fund transfers between bank account holders in 15 major cities. However, this system has been phased out in favor of the more advanced National Electronic Funds Transfer (NEFT) system, available nationwide. NEFT offers features such as batch settlements at hourly intervals, near real-time fund transfers, accepting cash for transactions, facilitating one-way transfers to Nepal, and providing confirmation of credit to beneficiaries' accounts. Real Time Gross Settlement (RTGS), launched in 2004, enables real-time and gross settlement of inter-bank payments and high-value client transactions above 2 lakh rupees. RTGS transactions are finalized instantly and are irreversible once processed.

OTHER PAYMENT SYSTEMS:

PRE-PAID PAYMENT SYSTEMS:

Pre-paid instruments are payment instruments that enable the purchase of products and services in exchange for the value stored on the instrument. The value stored on such instruments is the amount paid by the holders in cash, through debit to a bank account, or by credit card. Smart cards, magnetic stripe cards, internet accounts, internet wallets, mobile accounts, mobile wallets, paper vouchers, and other forms of pre-paid payment instruments are available.

MOBILE BANKING SYSTEM:

The popularity of mobile phones as a medium for delivering banking services has surged. In October 2008, the Reserve Bank introduced a set of operational guidelines for banks regarding mobile banking. These guidelines stipulate that only banks licensed and supervised in India, with a physical presence in the country, are authorized to offer mobile banking services upon obtaining approval from the Reserve Bank. Emphasizing security measures and inter-bank transfer protocols utilizing Reserve Bank-approved systems, the guidelines aim to standardize interoperable standards in technology. This standardization facilitates real-time fund transfers between accounts within the same or different banks, irrespective of the mobile network registered by the customer.

NATIONAL PAYMENTS CORPORATION OF INDIA:

The Reserve Bank of India (RBI) advocated for the establishment of the National Payments Corporation of India (NPCI) to oversee various Retail Payment Systems (RPS) across the country. NPCI commenced its operations in early 2009 and has since assumed control of the National Financial Switch (NFS) from the Institute for Development and Research in Banking Technology (IDRBT). NPCI aims to enhance efficiency, consistency, and standardization in retail payments, while also expanding the reach of both existing and innovative payment

solutions to enhance customer convenience. In today's digital age, where convenience is paramount, the internet has revolutionized our lives, making tasks such as ordering food online and paying bills effortlessly. Payment applications like PhonePe, Google Pay, and Paytm have become integral to our daily routines. These transactions are facilitated through the Unified Payment Interface (UPI), a single-interface payment system developed by the National Payments Corporation of India (NPCI).

2.2) LITERATURE ANALYSIS:

In times the Unified Payments Interface (UPI) has emerged as an advancement, in the field of digital payment systems transforming how financial transactions are carried out in India. Known for its easy-to-use features and seamless compatibility UPI has experienced growth in popularity establishing itself as a key player in the fintech industry. Understanding the factors fueling this growth and considering the impact on users and stakeholders is crucial for shaping discussions on finance. In this review of existing literature, we explore research, on UPI services to uncover trends, user experiences, challenges encountered by individuals, and the factors driving its acceptance.

When it comes to UPI adoption and awareness amongst the citizens, one of the preliminary study by **(Gochhwal, 2017)** states that the Unified Payment Interface (UPI), an interbank payment system introduced by the National Payment Corporation of India with a smartphone application approach. UPI is set to revolutionize digital payments in India due to its cost-effectiveness, user-friendly interface, quick settlement times, and tight security measures. By assessing the evolution of payment systems in India, the paper underlines the importance of merchant-centric solutions to see a widespread user adoption rate. Moreover, UPI's role in enhancing financial inclusion and expanding the digital economy in India is highlighted.

The paper **(Edwin, 2022)** highlights the increasing preference for UPI online payment in both urban and rural areas of Kannur district, Kerala. UPI, renowned for its ease of use and robust security, has witnessed a surge in adoption among diverse demographic groups. Research endeavors to discern the preferences of male and female UPI users in these regions, underscoring its role in advancing digital India.

Further, the paper by **(N Bharath, 2023),** showed a comprehensive analysis of consumer preferences regarding the Unified Payment Interface (UPI) within Chennai city. Findings indicated a notable awareness and favourability towards UPI, with a significant majority (over 61%) expressing a preference for it. Noteworthy use cases encompass bill payments, online shopping, and fund transfers. Statistical analysis tools were leveraged to investigate the interplay between variables, providing valuable insights into the dynamics of consumer behavior surrounding UPI adoption.

The study by **(Bose, 2023),** revealed a survey-based study conducted through Google Form, encompassing 62 respondents. The findings underscore a prevailing positive sentiment towards UPI technology within the banking sector, indicating high levels of customer satisfaction. However, the study also unveils significant challenges faced by customers in utilizing the UPI scheme, shedding light on areas warranting further examination and potential avenues for enhancement.

Further, the paper by **(M. N.Prakasha, 2023)** aimed to study UPI awareness, preference, and satisfaction among university students in Madikeri City. Employing a sample size of 120, the study conducted a percentage analysis to derive insights. Results indicate that respondents exhibit notable awareness of UPI, attributed to its perceived ease of use, security features, and enticing cashback offers. Notably, Google Pay emerges as the most utilized application, while Amazon Pay garners relatively lower usage. The findings underscore the potential efficacy of further promotional campaigns to bolster the 'Digital India' initiative, emphasizing the

importance of strategic marketing efforts in enhancing UPI adoption among the student demographic.

Further the study **(Sankararaman & Suresh, 2021),** the literature presents a comprehensive study on UPI transactions, focusing on awareness, satisfaction, problems, and usage duration. Utilizing a questionnaire, researchers gathered responses from 119 participants, revealing a noteworthy 86% awareness of UPI as a digital payment mode, with 31% selecting UPI as their primary choice. Notably, age emerged as a significant determinant of satisfaction with UPI usage, with one-way ANOVA analysis indicating a notable variance in usage frequency across different age cohorts. The findings underscore the importance of regulatory measures to fortify UPI's cyber security infrastructure and foster widespread adoption nationwide, highlighting the imperative role of policymakers in shaping the digital payments landscape.

The research **(Shah, 2021)** aimed to explore the perception of the Indian population regarding the UPI payment method, employing a survey based on the UTAUT model. The survey encompassed various parameters, including ease of use, short and long-term benefits, monetary gains, and social advantages. Analysis of the results, based on the formulated hypotheses, indicated a positive correlation between UPI usage and performance expectancy, effort expectancy, perceived monetary benefits, safety perceptions, social influence, and adoption intention.

The paper by **(Dr. A.Vanitha & Dr. V. Yuvarani, 2023)**, studied that the Consumer awareness of emerging mobile technology innovations is rapidly increasing, with trust emerging as a key factor influencing user satisfaction and adoption of mobile wallet applications in India. The digital era has greatly simplified life, with digital payments playing a pivotal role. The widespread adoption of UPI Autopay by numerous companies has heightened consumer expectations, prompting continuous innovation by service providers. Mobile wallets offer diverse functionalities, including payment transactions, fund transfers,

grocery purchases, and bill settlements. Trust significantly impacts user satisfaction and usage of mobile wallets, according to empirical findings.

The paper by **(Gohil et al., 2023),** revealed that in the last decade, India has experienced a surge in internet and mobile phone usage, leading to a significant increase in digital payments. This growth is fuelled by greater internet accessibility, widespread mobile phone adoption, and government initiatives like Digital India. Electronic payment methods such as online banking, mobile banking, and smartphone card payments are expected to play a crucial role in driving the future economy.

According to the paper **(MC & Shanmugam, 2023),** The Unified Payments Interface (UPI) stands out as India's rapidly expanding payment system, facilitating mobile-based money transfers around the clock. Governed by the National Payments Corporation of India (NPCI) and leveraging IMPS as its foundation, UPI introduces initiatives like UPI123 and "UPI Chalega." This case study offers a detailed overview of UPI's growth, challenges, and NPCI's data analysis, alongside exploring the complexities inherent in UPI payments.

Concerning the UPI’s prospects, the paper by **(Sahu et al., 2023)** delves into the contactless payment landscape in India, with a particular emphasis on the prospects of the Unified Payment Interface (UPI) and a comparative analysis of public and private sector bank performance. The study underscores the significance of a resilient infrastructure, aligned with evolving customer expectations, governmental interventions, and technological advancements, in facilitating UPI's transformative journey. It posits that the future trajectory may witness a reconfiguration of ecosystem stakeholders' roles and a convergence of market participants to enhance financial literacy, thus illuminating the promising outlook for the Indian mobile payments ecosystem to flourish.

Research conducted along the same lines as the aforementioned, on Mobile banking and its evaluation in the era of UPI **(Balasubramanium and Amanullah, 2019)** which focused on the growth of paperless transactions and how UPI payments contributed towards this goal revealed that this method of payments is growing rapidly and has immense potential in contributing towards smooth and efficient transactions for the modern age. However, it also suggests that UPI is ideal for smaller fund transfers and other modes of payment are preferable in case of larger (value) transactions.

The paper by **(Assistant Professor in K L Business School, K L (Deemed to be University) K L E F, Vaddeswaram, et al., 2019),** investigates the impact of India's Digital India initiative, which endeavors to transition the nation into a digitally empowered society, emphasizing the shift towards faceless, paperless, and cashless transactions. By examining the evolution of the payment industry, from traditional coins to paper currency, plastic money, and electronic wallets, the study underscores the potential benefits including enhanced employment opportunities, mitigated risks of theft and corruption, and improved governance.

When it comes to the cause of concerns about UPI's usability the paper by **(Khanra et al., 2020)** probes into the influence of consumer resistance on the intention to persist in using the Unified Payment Interface (UPI) for electronic payments in India. Drawing from cross-sectional data gathered from 714 UPI users aged 16-55 years, the research underscores the pivotal role of privacy concerns and usage barriers in mitigating consumer resistance towards UPI. Additionally, image barriers and visibility emerge as noteworthy factors contributing to consumer reluctance. Moreover, security concerns and word of mouth are identified as partial moderators, shaping the relationships between key variables and UPI's sustained usage. By integrating privacy concerns, visibility, security concerns, and word of mouth, the study expands the innovation resistance theory, offering valuable insights into the dynamics of UPI adoption and persistence among consumers.

The research **(Mallik & Gupta, 2021)** sought to investigate consumers' behavioral inclination toward UPI-based payment applications. Employing an extended UTAUT2 framework, a conceptual model was proposed and tested through a pan-India survey, yielding 224 valid responses. Key factors such as performance expectancy, effort expectancy, social influence, hedonic motivation, price value, and user adoption were scrutinized. Additionally, trust, perceived security, and innovativeness were incorporated into the analysis. The findings revealed significant associations between behavioral intention and performance expectancy, price value, trust, and perceived security.

When it comes to the feasibility of UPI services, the paper **(Durairaj, 2019**) underscores the pivotal role of UPI in everyday life, emphasizing its efficiency in saving time for users. UPI facilitates direct fund transfers from bank accounts, thereby enhancing the utility of digital banking. Operating on a sophisticated payment infrastructure, UPI employs a distinctive VPA address akin to an email address, ensuring security and dependability. The utilization of this unique VPA mitigates the risk of fraudulent activities, rendering UPI a favored option among users.

Several other studies that focus on the efficiency of UPI payments and their use in modern society to make transactions simpler **(Mohapatra, 2017), (Kakade and Veshne, 2017)** and **(Thomas and Chatterjee, 2017)** have similar findings which suggest that UPI is quick, hassle-free, all-time service availability, uniform integration throughout the country and easier modes of security procedures and verifications encourage and promote electronic payments for the most simple transactions that one undertakes as a part of his/ her day to day life activities. However, they too suggested that server errors, failures, or bugs in front-end development can take a toll on the consumer's belief as well as adoption of this mode of transactions which is perceived predominantly as the future of payments.

A study **(Jothi, 2019)** on Chennai Youth's utilization patterns of UPI for making transactions whose sample consisted of over 75 college students in the urban and suburban areas of Chennai revealed that almost one-third of the youngsters use UPI mode of payments to make their transactions.

However certain contrasting study findings such as that done by **(Chawla and Singhal, 2019)** on people's level of awareness about the UPI and the basis on which people choose their modes of payments found that though digital payments are increasing, especially among those aged below the forties, the major chunk of transactions are done through cash and cards revealing the existence of certain hurdles, technological or mental.

UPI's acceptance across the country is supported by a research paper from **(Mahesh and Bhat, 2021)** which focused on the potential of UPI to contribute towards digital transactions when the government was encouraging more participation by the masses of the country to become involved in the digital economy. The findings, unsurprisingly, show remarkable growth in the last couple of years due to customers' shift towards contactless payments over other methods and UPI mode of payments has witnessed the maximum growth rate in terms of adoption as compared to other forms of electronic payment methods.

(Guptal and Kumar, 2020) their study on UPI turned into an innovative step for making digital payment effective and consumer perception of unified payments interface, which revealed that UPI may be a tool with compatible options that will create financial transactions straight forward and reasonable for the customers.

A study investigating the impact of the "Digitization of disbursement scheme" in India **(Vally and Divya, 2018)** which collected data from the sampled individuals from Hyderabad, found the growing progress in digital disbursements at a massive scale ever since the central schemes

like Digital India were launched which "aids in more pellucidity in dealings which endows the country's economy".

2.3) RESEARCH GAP :

Research on UPI's growth at a national level; its usability and problems associated with it in the state of Goa was not conducted before. Moreover, such large-scale research work as a study on UPI users at the state level was never conducted. Most of the studies only look at the age composition, gender differentials, and the benefits associated with UPI by choosing the sample from a particular educational institution or other organizations. Therefore, a study at this scale has been taken up to fill the void in this area of research.

CHAPTER 3:

RESEARCH METHODOLOGY

3.1) SOURCE OF DATA:

Primary data has been collected with the help of a questionnaire for analysis. Secondary data from the National Payments Corporation of India (NPCI) has been rendered to achieve the first objective whereas for other objectives that eventuated this study.

3.2) POPULATION AND SAMPLE:

For the last three objectives of the study, primary data has been used where the population of Goa is estimated to be 15,70,000 as per **("Goa Population 15.7 Lakh, 75% Concentrated in Urban Areas," 2023)** The Time of India, 2023 estimates, which is unevenly spread across the two districts of the state mainly North Goa, and South Goa. The sample size is **300**, consisting of people from the two districts.

3.3) OPERATIONAL DEFINITION OF THE STUDY

This study looks at UPI services in terms of their "growth" concerning volume and the value of transactions, "usability" where the study focuses on how easily the UPI services can be adopted by the masses to carry out their daily financial transactions and the "problems" that the users have faced. It also intends to look at how complicated or easy it is to use the various applications that facilitate payments through UPI, which are available for people.

3.4) RESEARCH APPROACH

This study makes use of the descriptive and analytical study approach where the data delivered from primary and secondary sources will be utilized to determine the trends of usage of UPI services in our country with an attempt to replicate it in the state of Goa along with determining the usability levels and the problems faced by the users of this service. The questionnaire aims to collect data that are qualitative and categorical and consists of questions that retrieve information on the target population's demographics, economic and social factors, whether or not they use UPI for making payments, whether or not they find the user interface of the service providers friendly and why would people prefer using it over other modes of payment. An OLS model will be used to analyze the relationship between the frequency of use of these UPI services concerning its independent variables.

3.5) DATA COLLECTION TOOLS

For data collection, secondary data from the National Payments Corporation of India (NPCI) was rendered to achieve the first objective and a questionnaire was prepared to collect primary data to achieve the remaining objectives of the study.

3.6) DATA ANALYSIS TECHNIQUES

In the data collected through the questionnaire, one segment will be utilized for analyzing if there exists a correlation between the different social and economic factors against the frequency of use of UPI. For the last objective, the study intends to refer to the data collected in the remaining half of the questionnaire to comprehend the community's opinions on UPI. One segment of the study that deals with the secondary data, the percentage method, is intended to be used to determine the year-on-year trends in the usage of UPI.

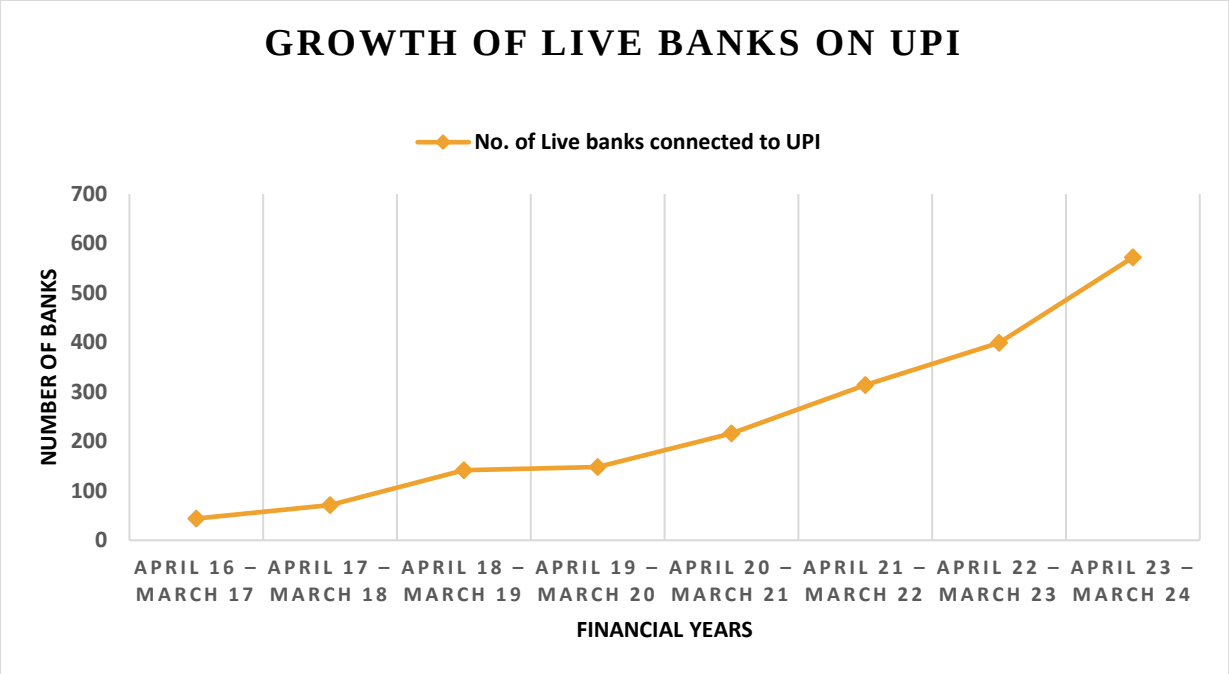
CHAPTER 4

TO UNDERSTAND THE GROWTH OF USAGE OF UPI SERVICES

Under this chapter, the study aims to analyze the growth of usage at a national level in terms of the number of banks linked to UPI, its volume of transactions, and lastly the value of transactions and see if there has been an increasing trend over the years since 2016 the year when the Unified Payments Interface (UPI) was launched.

TABLE NO: 4.1.1 GROWTH OF LIVE BANKS ON UPI

Financial Years	April 16 – March 17	April 17 – March 18	April 18 – March 19	April 19 – March 20	April 20 – March 21	April 21 – March 22	April 22 – March 23	April 23 – March 24
No. of Live banks connected to UPI	44	71	142	148	216	314	399	572



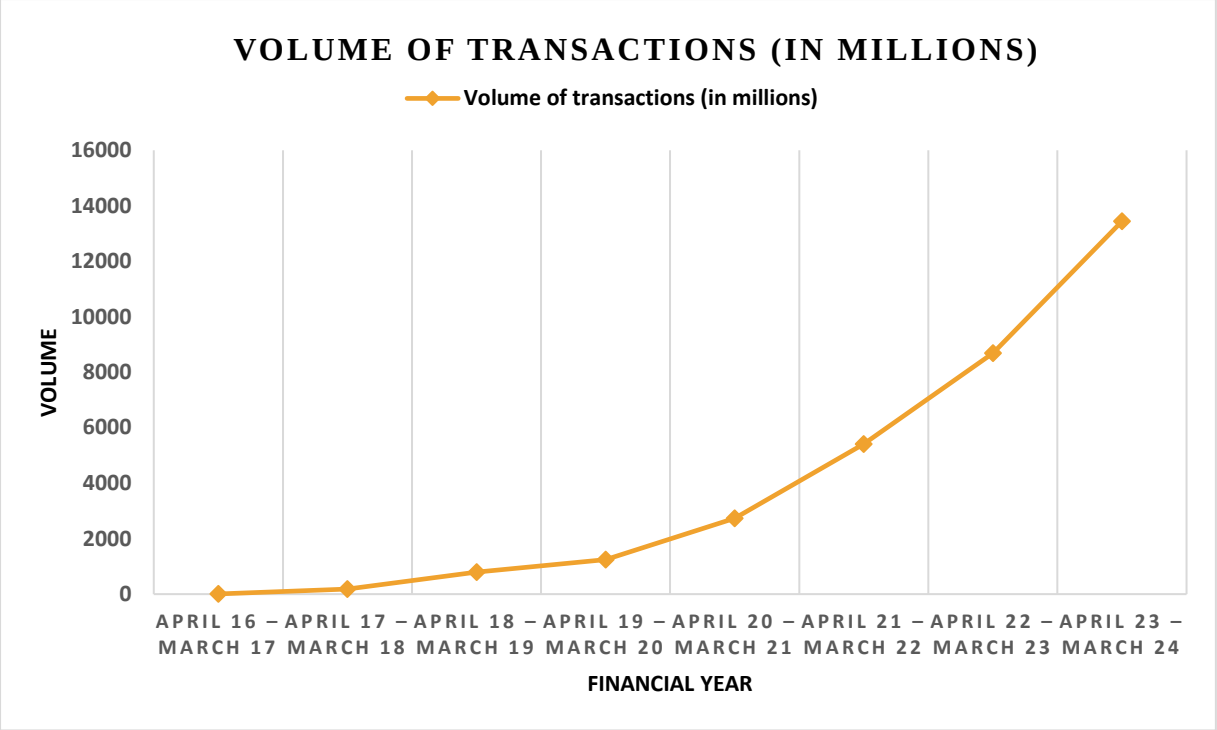
[Source: NPCI]

Figure No: 4.1.1 Growth of live Banks on UPI

The above graph depicts the growth of live banks associated with UPI transactions. The X-axis represents the financial year of April and March of the years 2016 to 2022, and the Y-axis represents the number of live banks linked with UPI. In the financial year April 2016 to March 2017, there were only 44 banks which were linked with UPI. In the following year (2017-18) the number of linked banks rose to 71 which implies a growth of 61.36%. Likewise in the year (2018-19), the number increased to 142 which implies a 100% rate of growth. In the year (2019-20) there was only a slight increase in the number which rose to 148 which implies a growth of 4.22%. Then in (2020-21), the number of banks rose to 216 which implies a growth of 45.94%, and in the year (2021-22) the number increased to 314 which implies a growth of 45.37%. Then in (2022-23) the number of banks rose to 399 which implies a growth of 27.07% and in the previous financial year (2023-24) the number increased to 572 which implies a growth of 43.35%. From the above graph, we can see that there is an increase in the number of live banks that have linked with UPI over the years.

TABLE NO: 4.1.2 VOLUME OF TRANSACTIONS IN MILLIONS.

Financial Years	**April 16 – March 17**	**April 17 – March 18**	**April 18 – March 19**	**April 19 – March 20**	**April 20 – March 21**	**April 21 – March 22**	**April 22 – March 23**	**April 23 – March 24**
The volume of transactions (in millions)	**6.37**	**178.05**	**799.54**	**1,246.84**	**2,731.68**	**5,405.65**	**8,685.30**	**13,440.00**



[SOURCE: NPCI]

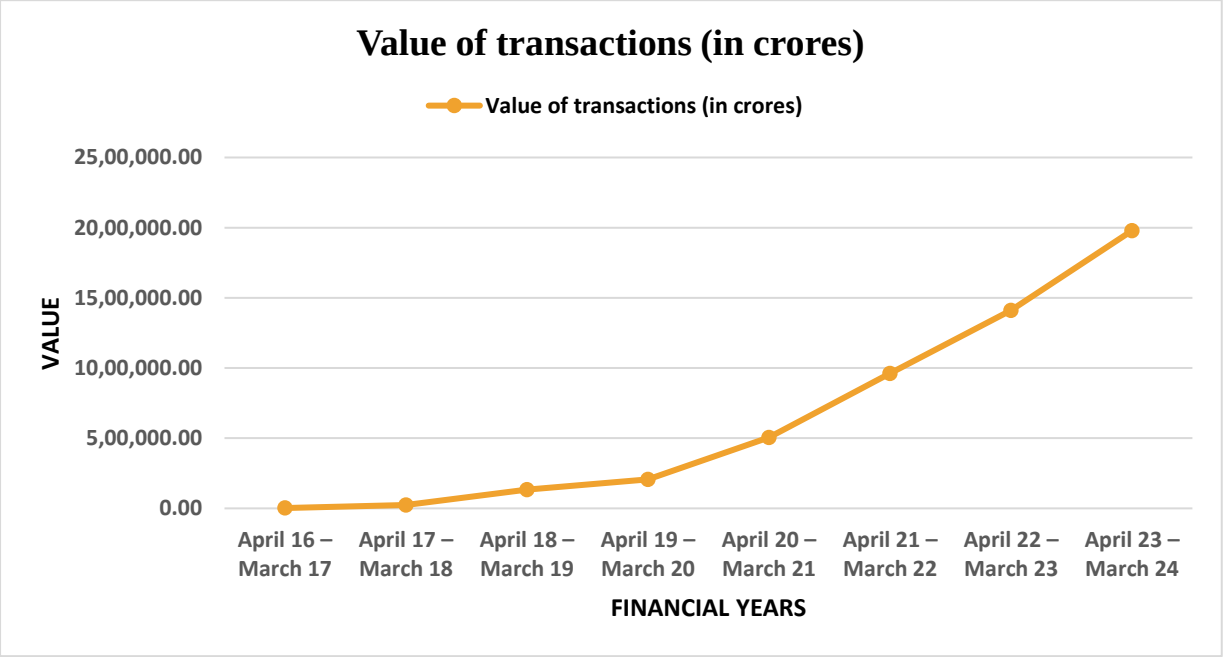
FIGURE NO: 4.1.2 VOLUME OF TRANSACTIONS IN MILLIONS.

The above graph depicts the volume of UPI transactions that took place over the financial years in millions. The X-axis represents the financial years of April and March of the years 2016 to 2022. The Y-axis represents the volume of UPI transactions in millions. In the financial year (2016-17) the volume of UPI transactions was only 6.37 million. In the following year (2017-18) the volume rose to 178.05 million which is almost over 20 times. In the year (2018-19) the volume further increased to 799.54 million which was an increase of over 4 times. The following year (2019-20) the number increased from the previous year to 1246.84 million which is roughly a 60 % increase. In (2020-21) the volume increased to 2731.68 million and for the year (2021-22) the volume of UPI transactions rose to 5405.65 million which indicates almost a 2 times growth. Then in (2022-23) the volume of transactions rose to 8685.30 million which again implies almost a 2 times growth, and in the previous financial year (2023-24) the number increased to 13440.00 million which implies a massive growth over the years.

From the above graph, we can see that there is an increase in the volume of UPI transactions (millions) over the years which depicts that the volume of transactions has shown an upward trend.

TABLE NO: 4.1.3 MONETARY VALUE OF TRANSACTIONS IN CRORES.

Financial Years	April 16 – March 17	April 17 – March 18	April 18 – March 19	April 19 – March 20	April 20 – March 21	April 21 – March 22	April 22 – March 23	April 23 – March 24
Value of transactions (in crores)	2,425.14	24,172.6	133,460.72	206,462.31	5,04,886.44	9,60,581.66	14,10,443.01	19,78,353.23



[SOURCE: NPCI]

FIGURE NO: 4.1.3 MONETARY VALUES OF UPI TRANSACTIONS

The above graph depicts the monetary values of UPI transactions that took place over the financial years in crores. The X-axis represents the financial years of April and March of the years 2016 to 2022. The Y-axis represents the monetary values of UPI transactions in crores. In the financial year (2016-17) the monetary value of UPI transactions was 2,425.14 crore. In the following year (2017-18) the value increased to 24,172.6 crore which was a growth of over

10 times. For the year (2018-19) the value rose to 133,460.72 crore, a growth of over 4 times. For the next year (2019-20) the value rose to 206,462.31 crore, a growth of 55%. In 2020-21the value increased to 5,04,886.44 crore, almost 2 times the growth. In the financial year (2021-22) the Monetary value of UPI was 9,60,581.66 crore a growth of 90%. Then in (2022-23) the value of transactions rose to 14,10,443.01 crores which again implies a 47% growth, and in the previous financial year (2023-24) the number increased to 19,78,353.23 which implies a 40% growth.

From the above graph, we can say that the monetary value of UPI transactions has shown an increasing trend over the years.

ANALYSIS 4.1

From the observations above, the first objective depicts that the Unified Payments Interface (UPI) has been showing positive growth in all of its aspects. Over the years, UPI transactions have rapidly increased, as observed from the above graph of the volume of transactions. It is an encouraging sign for our developing economy. We can also see a spike in UPI transactions as a whole from the year 2020, as after the covid pandemic hit our nation, most of the people transitioned to the mode of contactless payments, an UPI was hugely benefitted by it. As more and more banks will get linked to the UPI servers, more and more people will be able to make use of these UPI services which will increase the volume of transactions thereby also increasing the monetary value of the UPI transactions.

In India, several factors promote the growth of UPI. Primarily, this digital payment mode has been encouraged by policies and initiatives of the government such as demonetization in 2016 and the “Digital India” campaign. Additionally, UPI has helped facilitate financial inclusion

by reaching out to those who lack access to formal financial services. The increased adoption of smartphones and internet connectivity for instance has made it easier for people to use UPI. Moreover, user confidence in UPI's robust security features as well as its ease of use, efficiency, and cross-bank compatibility among others have motivated more users and businesses to embrace it. Apart from that it is also a much cheaper alternative compared to traditional payment instruments when processing financial transactions. Finally, increasing digitization of life results in broader usage of UPI across all sectors; hence these are among the serious factors that make up the ongoing growth and adoption process.

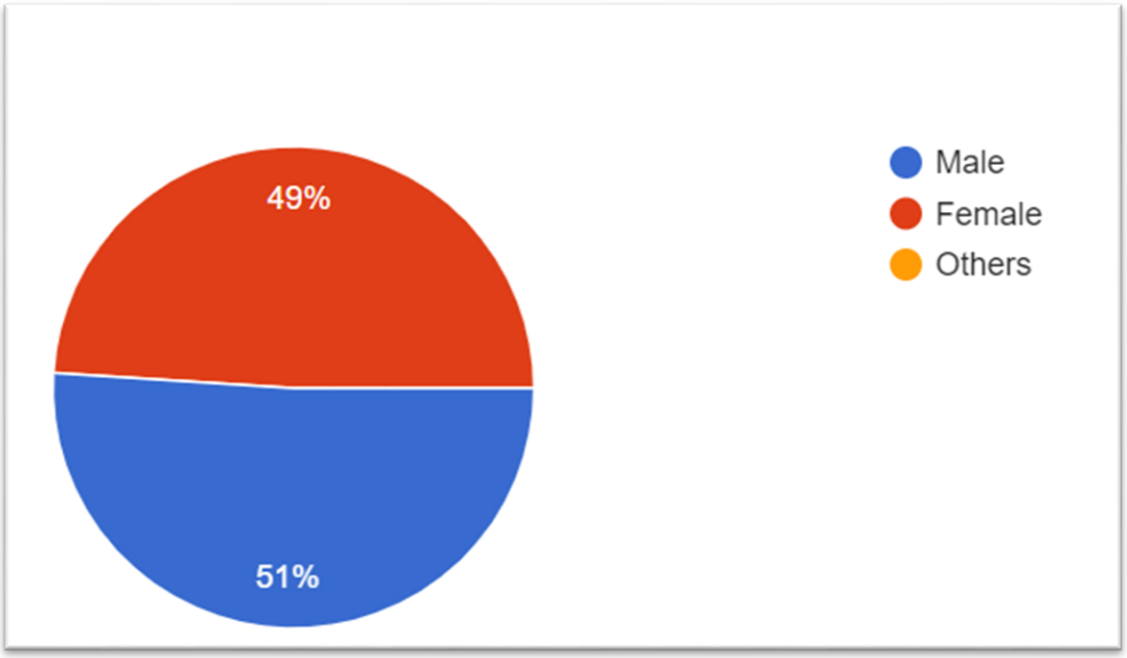
CHAPTER 5

TO UNDERSTAND THE USABILITY OF UPI SERVICES.

This chapter focuses solely on the usability of these UPI services. Usability in the context of this study is the degree of ease with which people can use the services and tend to adopt them for carrying out daily transactions.

TABLE NO: 5.1.1 GENDER COMPOSITION OF THE RESPONDENTS

GENDER	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
MALE	154	51%
FEMALE	148	49%
OTHERS	0	0%
TOTAL	302	100%



[Source: Primary] Figure No: 5.1.1 Gender composition of the respondents

The above pie chart consists of the gender composition which reveals that 51% were males and 49% were females.

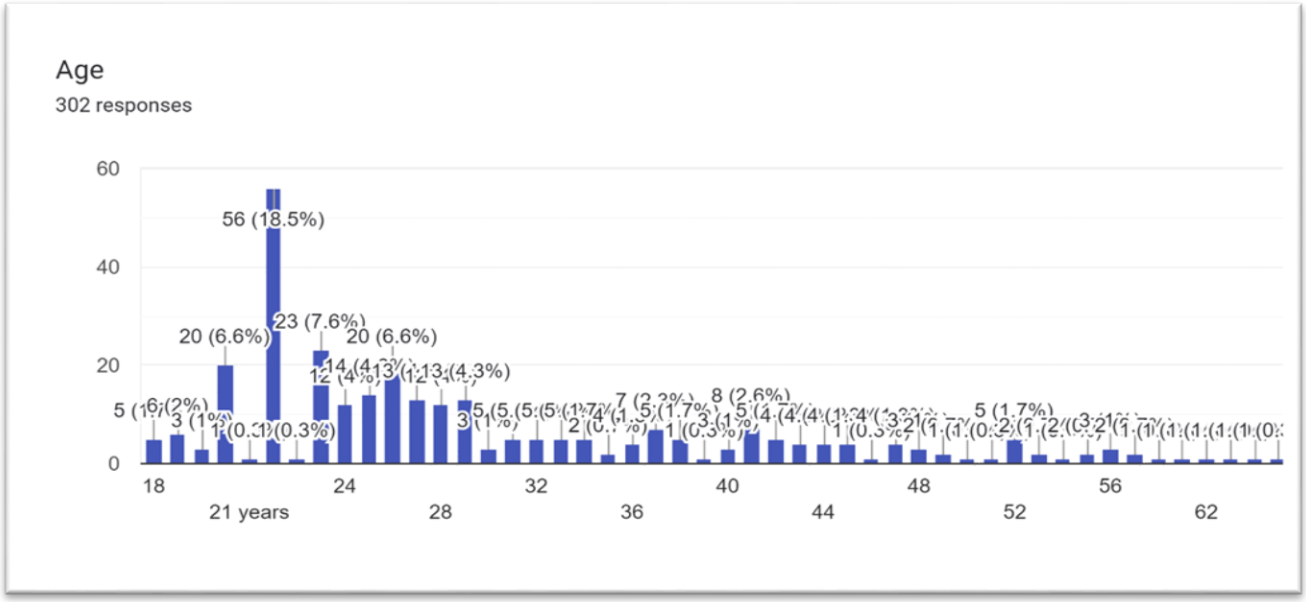


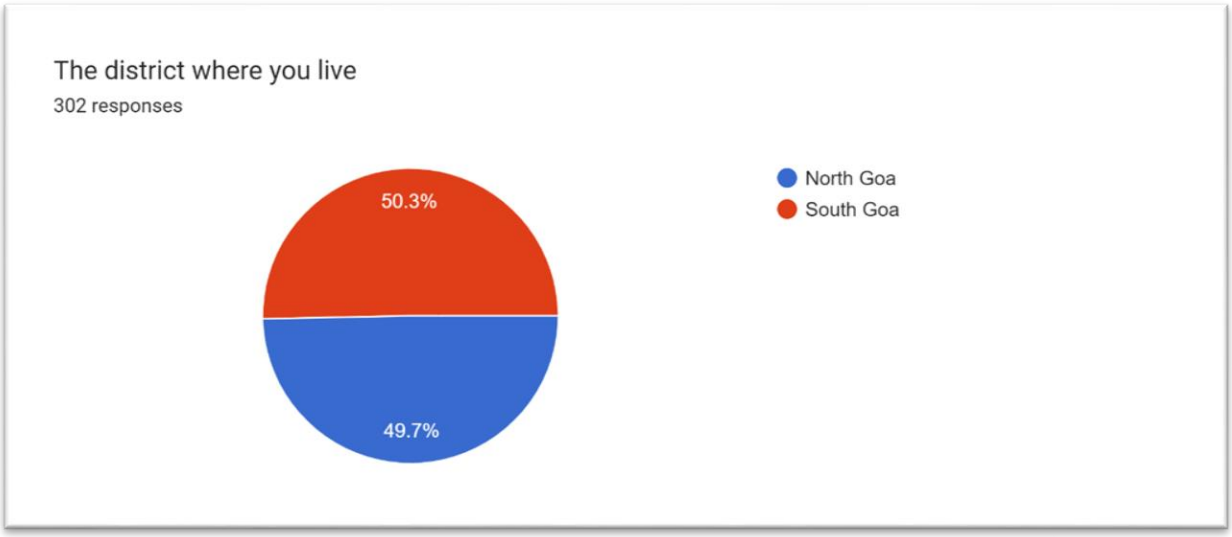
Figure No: 5.1.2 Age group composition

[Source: Primary]

The respondents were asked to enter their age while filling up the questionnaire. The average age of the sample was 30.14 years.

TABLE NO: 5.1.2 RESPONSES FROM EACH DISTRICT

DISTRICT	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
NORTH GOA	150	49.7%
SOUTH GOA	152	50.3%
TOTAL	302	100%

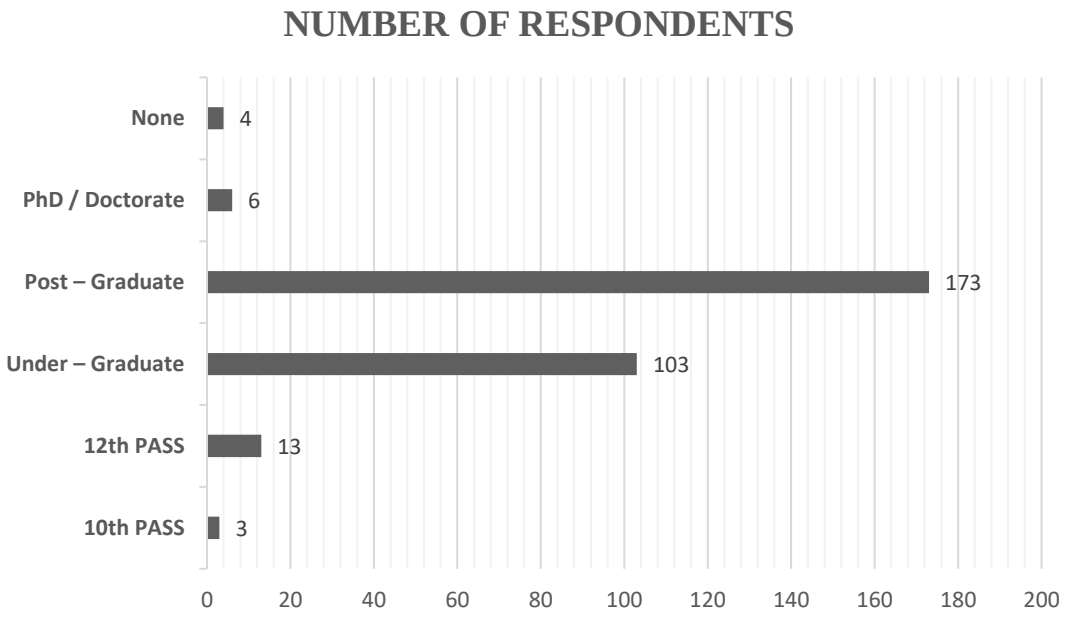


[Source: Primary] Figure No: 5.1.3 Responses from each district

The above pie chart represents the district in which the people live. The state of Goa has two districts, namely the North Goa and the South Goa. As per the sample, 49.7% of people belong to North Goa and the remaining 50.3% of people belong to South Goa.

TABLE NO: 5.1.3 EDUCATION QUALIFICATION

EDUCATION QUALIFICATION	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
10th PASS	**3**	**0.99%**
12th PASS	**13**	**4.30%**
Under – Graduate	**103**	**34.12%**
Post – Graduate	**173**	**57.28%**
PhD / Doctorate	**6**	**1.99%**
None	**4**	**1.32%**
TOTAL	**302**	**100%**

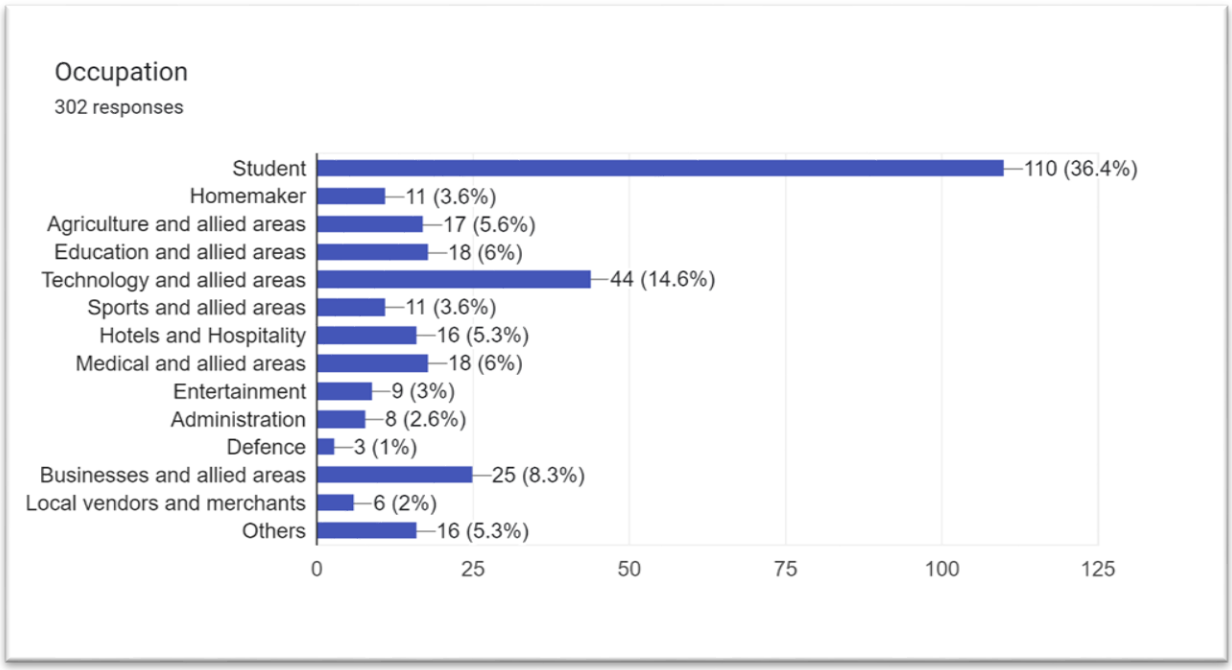


[Source: Primary] Figure No: 5.1.4 Education Qualification

The above chart represents the highest educational qualification of the respondents, where 0.99% have completed their SSC, 4.30% have completed their HSSC, 34.12% of them were undergraduates, 57.28% of them completed their Post graduation, 1.99% of them were PhD holders and the number of respondents who belonged to none of the listed categories comprised of 1.32% of the total responses.

TABLE NO: 5.1.4 OCCUPATION

OCCUPATION	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
STUDENT	110	36.4%
HOMEMAKER	11	3.6%
Agriculture and allied areas	17	5.6%
Education and allied areas	18	6%
Technology and allied areas	44	14.6%
Sports and allied areas	11	3.6%
Hotels and Hospitality	16	5.3%
Medical and allied areas	18	6%
Entertainment	9	3%
Administration	8	2.6%
Defense	3	1%
Businesses and allied areas	25	8.3%
Local vendors and merchants	6	2%
Others	16	5.3%



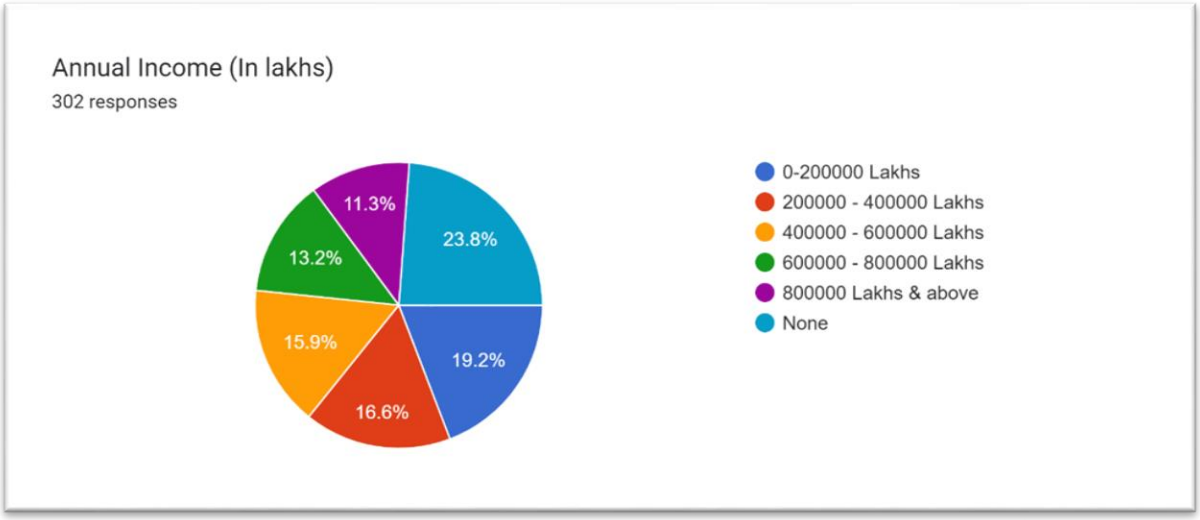
[Source: Primary] Figure No:5.1.5 Occupation

(NOTE: RESPONDENTS WERE ALLOWED TO SELECT MULTIPLE OPTIONS)

The above bar diagram shows the various occupations pursued by the respondents, where 36.4% of the respondents belong to the students category, 3.6% belong to the Homemaker category, 5.6% belong to the Agriculture and allied areas, 6% belong to the Education and allied areas, 14.6% belong to the Technology and allied areas, 3.6% of the respondents belong to Sports and allied areas, 5.3% belong to the Hotels and hospitality, 6% of them belong to the medical and allied areas, 3% of the respondents belong to the Entertainment category, 2.6% of the respondents belong to the Administration category, 1% belong to Defence, Businesses and allied areas comprised of 8.3%, other 2% were Local vendors and merchants, and remaining 5.3% opted other occupations.

TABLE NO: 5.1.5 ANNUAL INCOME

ANNUAL INCOME	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
0 – 200000 Lakhs	**58**	**19.2%**
200000 – 400000 Lakhs	**50**	**16.6%**
400000 – 600000 Lakhs	**48**	**15.9%**
600000 – 800000 Lakhs	**40**	**13.2%**
800000 Lakhs & above	**34**	**11.3%**
None	**72**	**23.8%**
TOTAL	**302**	**100%**

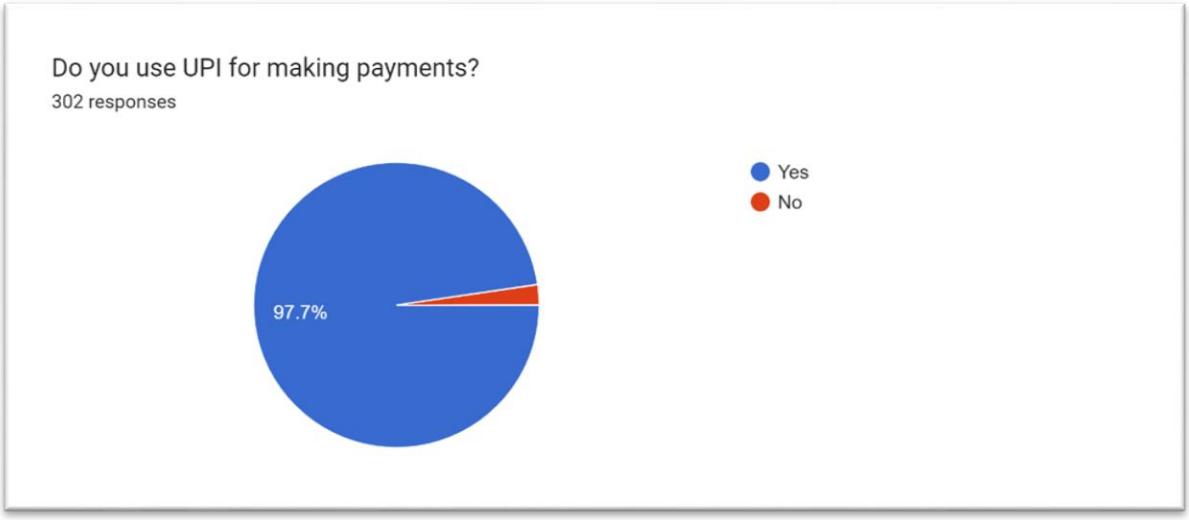


[Source: Primary] Figure No: 5.1.6 Respondent's Annual Income

The above pie chart represents income slabs to which the respondents belong where 19.2% of them fall under the income slab of 0 to 2 lakh, 16.6% fall under the annual income slab of 2 to 4 lakh, 15.9% fall under the annual income slab of 4 to 6 lakh, 13.2% of the total respondents belong to the annual income slab of 6 to 8 lakh, 11.3% of respondent earn more than 8 lacks per annum, and 19.2% of the total respondents didn't have any annual income source.

TABLE NO: 5.1.6 PROPORTION OF UPI USERS

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
YES	**295**	**97.7%**
NO	**7**	**2.3%**
TOTAL	**302**	**100%**

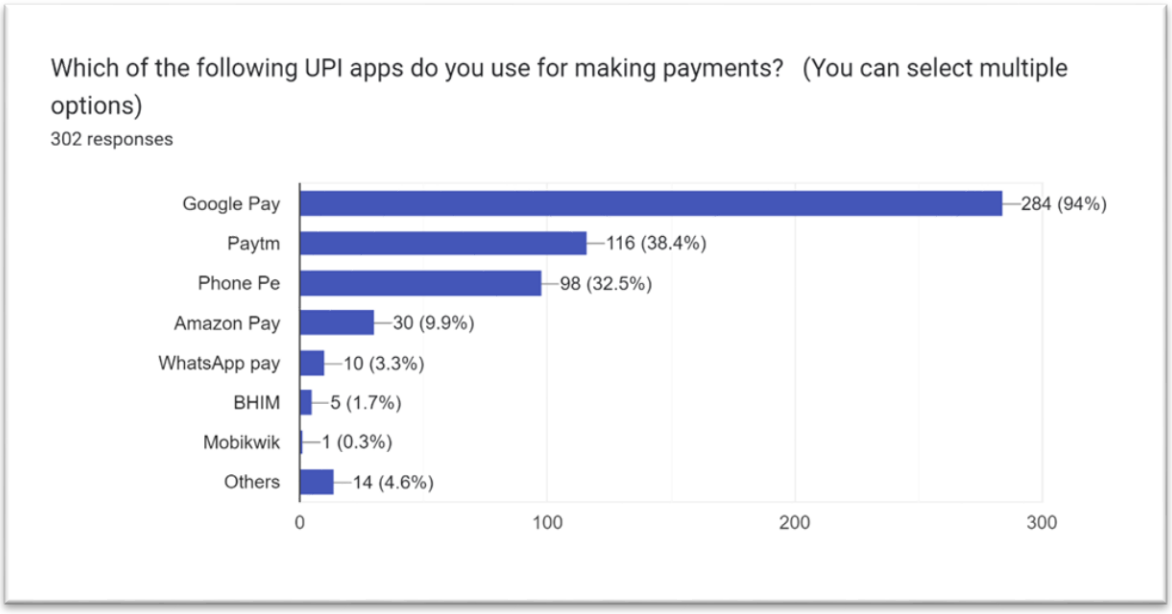


[Source: Primary] Figure No: 5.1.7 Proportion of UPI users

The above pie chart depicts the proportion of UPI users, where 97.7% of the respondents use UPI for making payments, while merely 2.3% of the respondents don't use UPI for making payments.

TABLE NO: 5.1.7 PREFERENCE TOWARDS UPI APPLICATION

UPI APPLICATIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
Google Pay	**284**	**94%**
Paytm	**116**	**38.4%**
Phone Pe	**98**	**32.5%**
Amazon Pay	**30**	**9.9%**
WhatsApp pay	**10**	**3.3%**
BHIM	**5**	**1.7%**
Mobikwik	**1**	**0.3%**
Others	**14**	**4.6%**



[Source: Primary] Figure No: 5.1.8 Preference towards UPI Application

(NOTE: RESPONDENTS WERE ALLOWED TO SELECT MULTIPLE OPTIONS)

The above figure represents the number of different service providers of UPI out of 100% for each option in the form of a bar graph, 94% of the respondents use Google Pay, 38.4% of the respondents are Paytm users, 32.5% of them use Phone Pe, 9.9% of the respondents use Amazon pay, 3.3% of the respondents use WhatsApp pay, 1.7% of the respondents are BHIM users, 0.3% of the respondents are Mobikwik users and 4.6% of the respondents are others.

ANALYSIS 5.1

The main purpose of this study was to evaluate the ease of usage of the Unified Payments Interface (UPI) among Goa residents. The objective revolved around the extent Goan people utilize UPI to pay. This led to nearly 97.7% of respondents agreeing that their payment preference is UPI as a means of transaction in a survey done recently in this region with particular concern on age, gender, education status, occupation, and income details which showed that our of 100% respondents nearly 97.7% were using UPI as their most used mode of payment. The high adoption rate points to UPI's acceptance and usability at large by Goa inhabitants. These findings highlight how deeply ingrained UPI has become within Goan society, providing them with an easy way to make payments for their everyday needs. The fact that they use it more frequently implies positive attitudes towards its acceptability as a payment system for carrying out various transactions. About the preferred application for UPI services, Google Pay was ranked highest among users with 94% indicating Google Pay is their go-to app when making such transactions over many other apps available. This trend demonstrates how effective UPI can be in meeting consumer demands while affording them a seamless and convenient mode of payment experience."

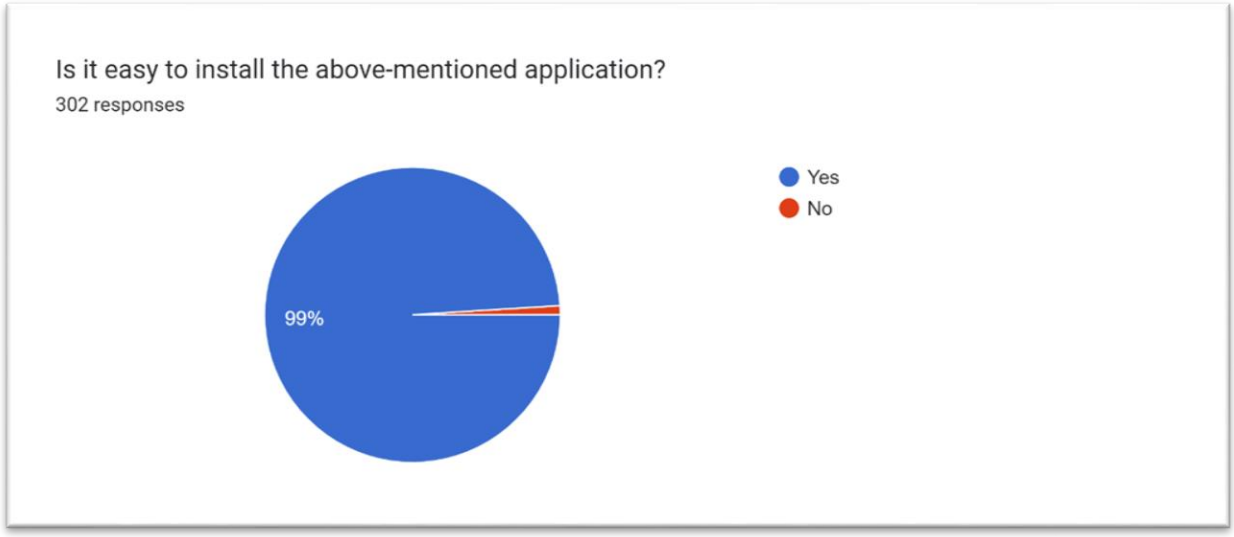
CHAPTER 6

TO FIND OUT THE MAJOR PROBLEMS FACED BY THE UPI USERS.

The study under this chapter aims to determine the problems faced by the users of UPI under several circumstances like installation, account linkage, and payment processing, and analyze the ease with which payments can be made using UPI. The following questions of the questionnaire focus on achieving this objective.

TABLE NO: 6.1.1 EASE OF INSTALLATION OF UPI APPLICATIONS

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
YES	299	99%
NO	3	1%
TOTAL	302	100%

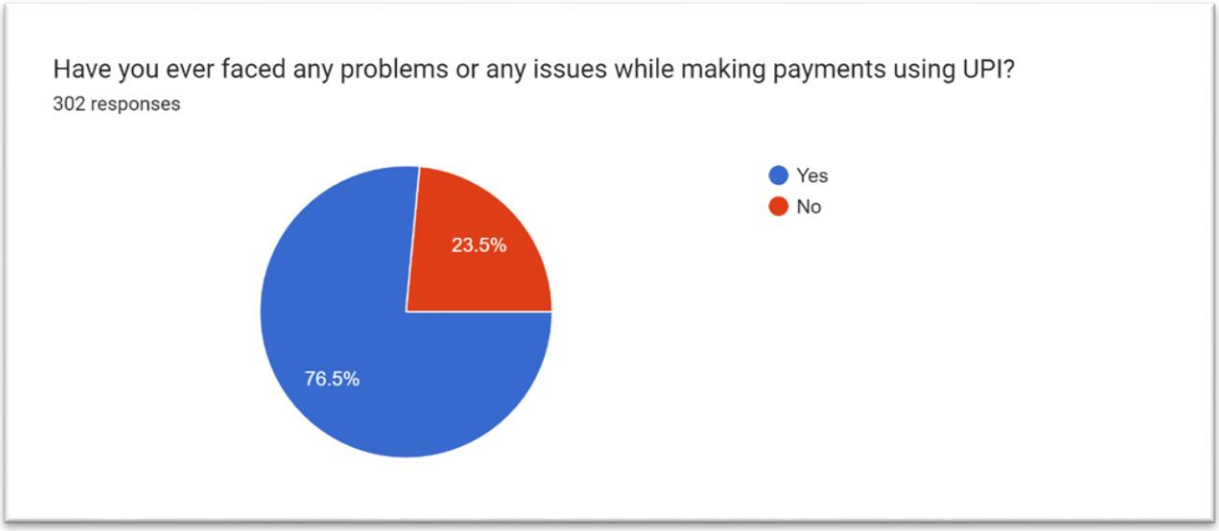


[Source: Primary] Figure No: 6.1.1 Ease of installation towards UPI Application

The above pie chart shows the ease of installation of UPI applications for the respondents. The question was whether it was easy to install the UPI applications. 99% of the respondents found it easy to install the UPI applications, and the rest 1% of the respondents think otherwise.

TABLE NO: 6.1.2 PROBLEMS FACED WHILE USING UPI

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
YES	**231**	**76.5%**
NO	**71**	**23.5%**
TOTAL	**302**	**100%**

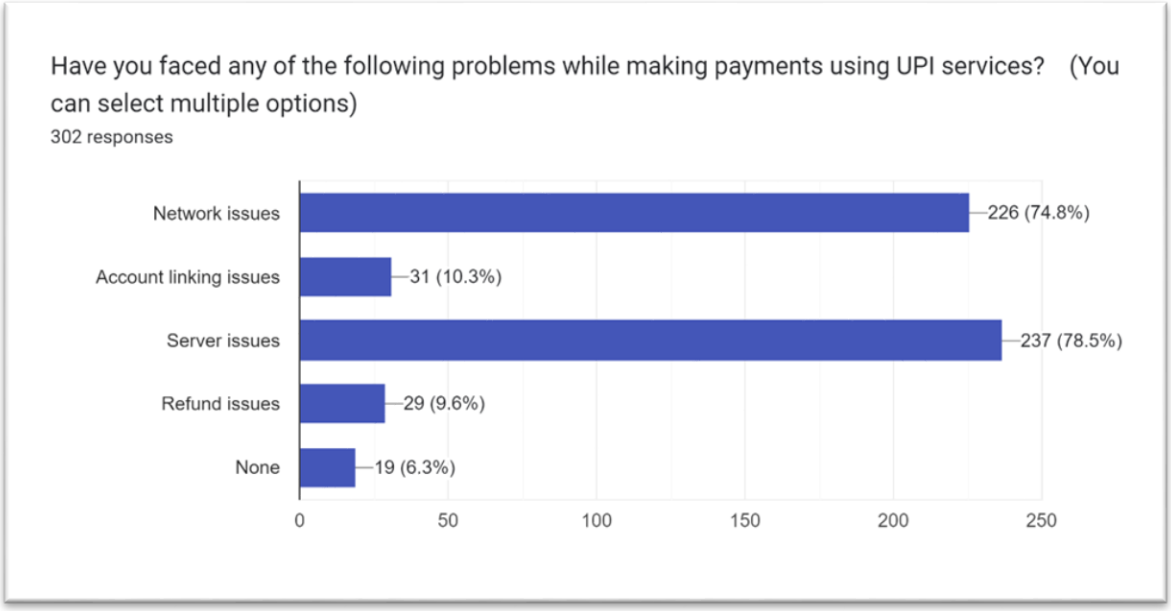


[Source: Primary] Figure No:6.1.2 Problems faced while using UPI

The above pie chart represents the proportion of respondents who faced problems while using UPI for their daily transactions. 76.5% of the respondents faced problems while making payments using UPI, and 23.5% of the respondents didn't face any problems while making payments using UPI.

TABLE NO: 6.1.3 ISSUES FACED BY UPI USERS

ISSUES	NUMBER OF RRSPONDENTS	PERCENTAGE % OF RESPONDENTS
NETWORK ISSUES	226	74.8%
ACCOUNT LINKING ISSUES	31	10.3%
SERVER ISSUES	237	78.5%
REFUND ISSUES	29	9.6%
NONE	19	6.3%



[Source: Primary] Figure No: 6.1.3 Issues faced by UPI users

(NOTE: RESPONDENTS WERE ALLOWED TO CHOOSE MULTIPLE OPTIONS)

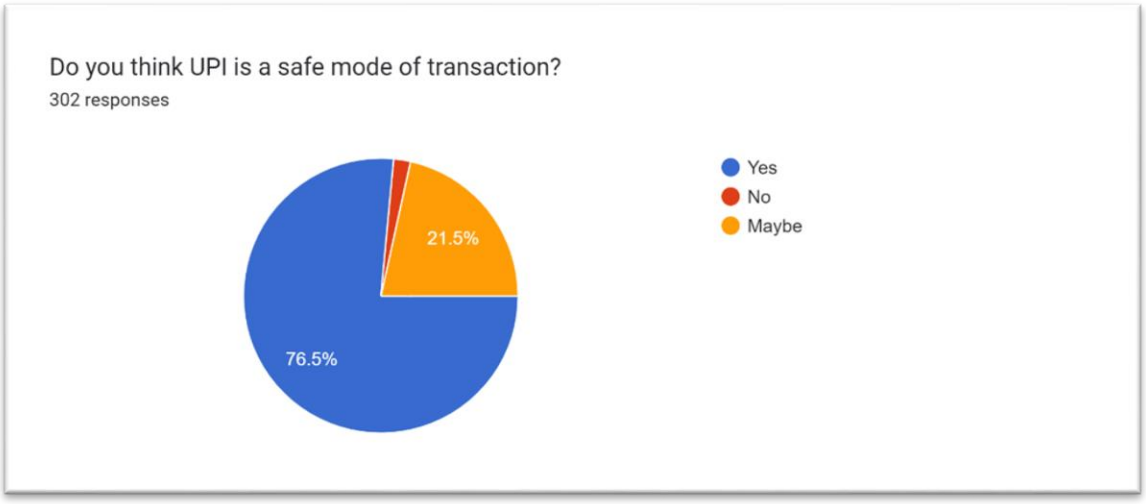
The above bar graph represents the issues that users of UPI have faced while using the interface. Out of a 100% provided for each option, 74.8% of the respondents reported Network issues, 10.3% of the respondents reported Account linking issues, 78.5% of them faced Server issues, 9.6% of the respondents have faced Refund issues and the remaining 6.3% of the respondents have faced no issues.

Any other problems which you'd like to report (for example, UPI frauds) :

This was a subjective, optional question where respondents had to report problems other than the ones mentioned in the previous question, which they had come across while using UPI. Most of the respondents didn't prefer attempting it. Out of those who did, one of them mentioned that there a high payment failure rates when it comes to small banks, then one of the other respondents mentioned that there might be an issue if you had an account in two banks that got merged and hence created a system level conflict wherein it doesn't allow money to be debited but credit works seamlessly.

TABLE NO: 6.1.4 OPINION ON UPI'S SAFETY

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
YES	231	76.5%
NO	6	2%
MAYBE	65	21.5%
TOTAL	302	100%



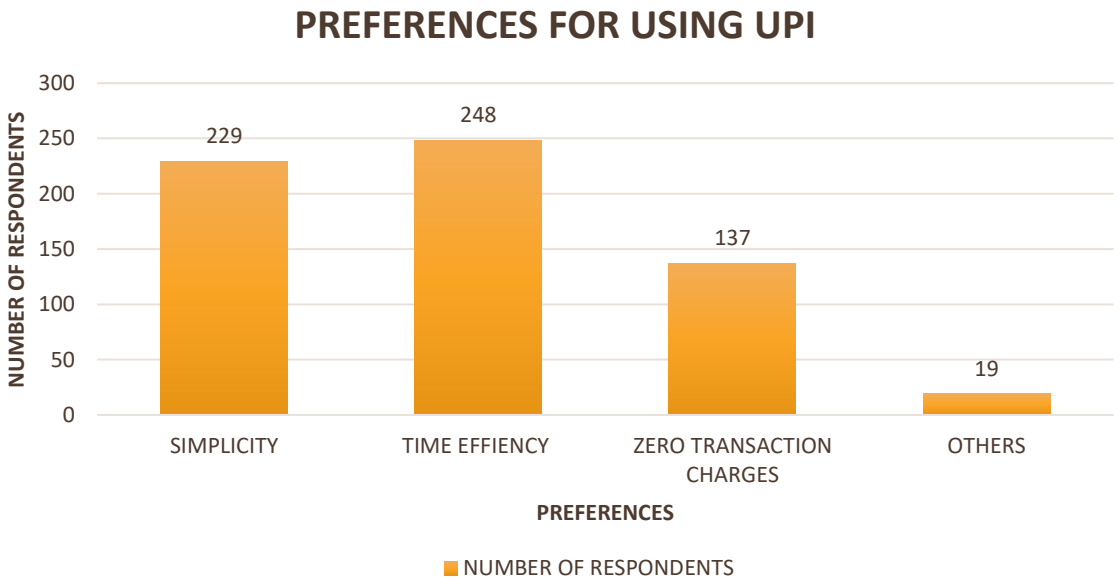
[Source: Primary] Figure No: 6.1.4 Opinion on UPI's safety

The above pie chart represents people's opinions over the safety of UPI transactions where 76.5% of the respondents consider UPI as a safe mode of transaction, 21.5% of them believe

that maybe it is a safe mode of transaction and the remaining 2% of respondents think it is not a safe mode of transaction.

TABLE NO: 6.1.5 PROPORTION OF RESPONDENT'S PREFERENCE FOR USING UPI FOR TRANSACTIONS

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE % OF RESPONDENTS
SIMPLICITY	229	75.8%
TIME EFFICIENCY	248	82.1%
ZERO TRANSACTION CHARGES	137	45.4%
OTHERS	19	6.3%



[Source: Primary] Figure No: 6.1.5Proportion of respondent's preference for using UPI for transactions

Out of 100% provided for all options, 75.8% of the respondents said simplicity, 82.1% of the respondents said time efficiency, 45.4% said zero transaction charges, and 6.3% of the respondents chose others and mentioned reasons which mean the same as aforementioned reasons.

ANALYSIS 6.1

Under this objective, the study was aimed at assessing the problems faced by UPI users and to explore their opinions on user experience. As per the data collected from the sample, it is evident that the problems of connectivity, server issues, account linkage, and refund of transactions have been prominent among the respondents. However, the above-mentioned problems are not severe issues that could hinder people's decision to adopt UPI services in the future as people do find it easy to install and make payments using the various UPI applications of UPI and the fact that it doesn't require any serious software or hardware requirements and it is easy to install these UPI applications which makes it much more user friendly and allows seamless transactions across a variety of devices.

CHAPTER 7

TO INVESTIGATE THE IMPACT OF GENDER, EDUCATION QUALIFICATION, SATISFACTION, RELIABILITY, AND CONVENIENCE ON THE FREQUENCY OF USE OF UNIFIED PAYMENTS INTERFACE (UPI).

This chapter aims to research the different factors influencing the number of times a Unified Payments Interface (UPI) is used in terms of gender, education qualification, satisfaction, dependability, and ease. Due to this digital payment ecosystem growing at an exponential rate, it is important to know what determines how often UPI is used in India and abroad. This would also help improve user experience and maximize the effectiveness of UPI services. Finally, this study will highlight how gender-based segregations, educational achievements by individuals as well as satisfaction rating levels influence people's choice to use UPI more frequently. Such findings can be useful for developing strategies that can enhance the widespread adoption and usage of UPI by manipulating gender-related differences in customer experiences.

Regression Equation:

The regression equation for predicting the frequency of use of Unified Payments Interface (UPI) based on the impact of gender, education qualification, satisfaction, reliability, and convenience can be formulated as follows:

$$\textbf{Frequency of UPI Usage} = \beta_0 + \beta_1(\text{Male}) + \beta_2(\text{Education Qualification}) + \beta_3(\text{Satisfaction}) + \beta_4(\text{Reliability}) + \beta_5(\text{Convenience}) + \varepsilon$$

Where:

- **β0** represents the intercept, the expected frequency of UPI usage when all predictor variables are zero.
- **β1, β2, β3, β4,** and **β5** are the regression coefficients representing the change in frequency of UPI usage associated with one unit increase in gender (dummy coded), education qualification (dummy coded), satisfaction (Likert scale), reliability (Likert scale), and convenience (Likert scale) respectively.
- Male is a dummy variable coded as 1 for males and 0 for females.
- Education Qualification is a dummy variable coded with higher values indicating higher levels of education.
- Satisfaction, Reliability, and Convenience are measured on Likert scales, with higher values indicating greater satisfaction, reliability, and convenience respectively.
- **ε** represents the error term, accounting for unexplained variance in the frequency of UPI usage.

In this study, the Ordinary Least Squares (OLS) regression model is used to examine the impact of gender, education qualification, satisfaction, reliability, and convenience on the frequency of use of Unified Payments Interface (UPI) using the R-studio. OLS regression is a widely used statistical method to analyze the relationship between independent variables and a dependent variable by minimizing the sum of the squared differences between observed and predicted values. By running an OLS model, we see the influence of each predictor variable on the frequency of UPI usage, which makes it easy to understand the determinants driving UPI adoption and usage patterns within the study sample.

The diagnostic tests will be employed to ensure the validity and reliability of the regression model:

- **Breusch – Pagan Test for Heteroscedasticity:** The Breusch-Pagan test was conducted to see if there is any heteroscedasticity in the regression model. This test shows whether the variance of the residuals is constant across different levels of the independent variables.
- **Variance Inflation Factor (VIF) for Multicollinearity:** Multicollinearity among the variables was seen using the Variance Inflation Factor (VIF). Higher VIF values indicate a potential multicollinearity problem, which can affect the reliability of estimates in the regression model.

TABLE NO: 7.1.1 RESULTS OF THE OLS MODEL

Coefficients	Estimates	Standard errors	t – value	P – value
(Gender)	0.05146	0.09315	0.552	0.58106
(Education Qualification)	-0.05316	0.06517	-0.816	0.41525
(Satisfaction)	0.38556	0.07942	4.854	1.96e-06 ***
(Convenience)	0.21637	0.06774	3.194	0.00155 **
(Reliability)	0.130023	0.08453	1.538	0.12508

R – Squared: 0.2453

Adj. R – Squared: 0.2326

F-statistic: 19.25 on 5 and 296 DF, p-value: < 2.2e-16

Breusch – Pagan Test for Heteroscedasticity:

Null Hypothesis (H0):

Heteroscedasticity is not present in the regression model.

Alternative Hypothesis (H1):

Heteroscedasticity is present in the regression model.

TABLE NO: 7.1.2 BREUSCH – PAGAN TEST

studentized Breusch-Pagan test
data: fre1
BP = 43.275, df = 5, p-value = 3.25e-08

Interpretation:

Since the p-value is small **(3.25e-08)**, lower than the significance level of **0.05**, we reject the null hypothesis. This suggests that there is significant evidence of heteroscedasticity in the regression model.

Variance Inflation Factor (VIF) for Multicollinearity:

Null Hypothesis (H0):

There is no multicollinearity among the independent variables in the regression model.

Alternative Hypothesis (H1):

There is multicollinearity among the independent variables in the regression model.

TABLE NO: 7.1.3 VARIANCE INFLATION FACTOR

gen	ed	satis	con	reli
1.023053	1.016027	1.512413	1.435025	1.479018

Interpretation:

Based on the Variance Inflation Factor (VIF) values for each independent variable:

1. Gender: VIF = 1.023053
2. Education Qualification: VIF = 1.016027
3. Satisfaction: VIF = 1.512413
4. Convenience: VIF = 1.435025
5. Reliability: VIF = 1.479018

VIF values of all the variables are less than 5, indicating that multicollinearity is not significant in the regression model. Therefore, based on these tests, we fail to reject the null hypothesis of no multicollinearity among the independent variables.

From the above OLS model, we see that there exists the problem of heteroscedasticity, to correct this condition, the **Robust – Standard error** model was used to correct the p – values keeping the estimates constant.

TABLE NO: 7.1.4 RESULTS AFTER THE ROBUST STANDARD ERROR MODEL

Coefficients	Estimates	Standard errors	t – value	P – value
(Gender)	0.05146	0.091882	0.5601	0.5758651
(Education Qualification)	-0.05316	0.081522	-0.6522	0.5148085
(Satisfaction)	0.38556	0.101629	3.7938	0.0001799 ***
(Convenience)	0.21637	0.103077	2.0991	0.0366529 *
(Reliability)	0.13002	0.101725	1.2782	0.2021882

Interpretation:

Based on the coefficients, standard errors, t-values, and p-values, we can interpret the results of the robust standard error model as follows:

The estimate for gender is 0.05146. The standard error estimate is 0.091882. The t-value is 0.5601, indicating that the coefficient is not statistically significant at conventional significance levels (p-value = 0.5758651). The estimate for education qualification is -0.05316. The standard error estimate is 0.081522. The t-value is -0.6522, indicating that the coefficient is not statistically significant (p-value = 0.5148085). The estimate for satisfaction is 0.38556. The standard error estimate is 0.101629. The t-value is 3.7938, indicating that the coefficient is

statistically significant at conventional significance levels (p-value = 0.0001799 ***). The estimate for convenience is 0.21637. The standard error estimate is 0.103077. The t-value is 2.0991, indicating that the coefficient is statistically significant at conventional significance levels (p-value = 0.0366529 *). The estimate for reliability is 0.13002. The standard error-associated estimate is 0.101725. The t-value is 1.2782, indicating that the coefficient is not statistically significant (p-value = 0.2021882). So we can conclude that Satisfaction and Convenience has a positive impact on the frequency of usage of UPI services.

Overall, satisfaction and convenience show statistically significant effects on the dependent variable, while gender, education qualification, and reliability do not show significant effects in this model.

ANALYSIS 7.1

From the above chapter, we can conclude that the variables satisfaction and convenience come out as statistically significant concerning the dependent variable, which indicates that the higher the levels of satisfaction and convenience will be are more will be the usage of the Unified Payments Interface (UPI). However, gender, education qualification, and reliability do not show any significant effects in this model. Therefore these findings suggest that user satisfaction and perceived convenience play an important role in determining the frequency of UPI usage, which highlights the importance of user experience and ease of use in the adoption and usage of digital payment platforms.

CHAPTER 8

SUMMARY AND CONCLUSION

FINDINGS 8.1

UPI in India has come a long way, since the demonetization in 2016, till the year 2024 several improvements have taken place in this particular domain. India as a nation is heading towards a cashless economy and UPI is an accelerating factor to accomplish this objective.

This study particularly focuses on the UPI's growth, its usability, the problems associated with it and to see if there is a correlation between the frequency of use of UPI and the various social and economic factors. When it comes to the growth of the UPI as the payment method in the entire country, as per the NPCI (National Payments Cooperation of India) data, UPI has seen an upward trajectory since its launch, the data provided by NPCI suggests, the Volume of transactions (in millions), the Value of monetary transactions (in crore) and the number of live banks connected to these UPI services have been rapidly growing over each financial year, for instance after its launch till the end of the financial year 2017, 44 Banks got connected to UPI, but by the march of 2024, the number rose to 572 banks. Similarly, the Volume of transactions by March 2017 was 6.37 million, but by March 2024, the number rose to 13,440.00 million. And finally, the Monetary value of transactions rose to 19,78,353.23 crore in the March of 2024 from 2.425.14 crore in the year 2017. Hence we can conclude that the UPI is seeing an upward growth over the years and it is only expected to increase.

The usability of these UPI services and customer satisfaction with the use of these services was determined with the help of the primary survey conducted by the people of Goa. The results were impressive as over 97% of the respondents use UPI to make their daily transactions, and

Google Pay and Paytm were two of the most favorable UPI applications amongst the respondents. By this, we can conclude that the use of UPI services is very evident concerning the people of Goa. The adoption rate of UPI itself showcases its reliability and its convenience due to which the people of Goa use it to make their daily transactions.

Every technology has its drawbacks and UPI is no exception, one of the objectives of the study was to determine the problems faced by UPI users, and the study revealed almost 76.5% of respondents faced problems using UPI services where the server issues and the network issues being the most faced problems along with account linking issues and refund issues etc. Though these problems persist, it is not a sign of worry as these are technical issues and they can be sorted with the advancement is the UPI ecosystem soon it is evident as almost 77% of the people think it's a safe mode of transactions. So we can conclude that even though the problems exist they are not serious which can create a cause of concern to use UPI, seamless use of these services will be prominent shortly.

The regression analysis gives a wider prospect of the issue. The objective was to find if there lies any correlation between the frequency of use of UPI concerning gender, education qualification, satisfaction, reliability, and convenience. The results showcased that the variable satisfaction was highly significant and the variable convenience was significant. By this, we can conclude that the higher the satisfaction and convenience levels the customer gets, the more will be the use of UPI services.

CONCLUSION 8.2

In conclusion, the study dived deep into every aspect of the Unified Payments interface. Its usability, There has been a significant increase in the usage of UPI services across the nation ever since it was introduced in the year 2016. The evident increase in terms of the number of banks linked to this service, the volume of transactions, and its value makes it very clear that the growth of UPI is quite commendable and the same trend is expected in the future. The usability factor of UPI has been completely positive as its near-perfect adoption rate suggests it's a reliable mode of payment. Under problems that UPI users have faced, there have been no serious issues with its user interface which can affect the adoption rate of UPI. Respondents believe in the compatibility and security features of this modern technology. So the problems associated with UPI are simple and don't pose a threat in the future, and the higher satisfaction and convenience levels that the respondents get with the use of these services indicate a higher frequency of use of UPI.

SUGGESTIONS 8.3

The Unified Payments Interface (UPI) is a revolutionary payment technology that was developed to digitize and enable people to make payments in a secure, digital ecosystem. The degree of theft and money laundering can be significantly reduced through the usage of an interface like UPI. Its scope in terms of adoption by the masses is vast. However, due to certain infrastructural constraints of communication that prevail in the country, some may find it difficult to use.

To solve the problems associated with connection and server, the National Payments Corporation of India (NPCI) has launched the most awaited facility/ feature for UPI, which enables offline transactions, known as "UPI lite", which is an on-device wallet which doesn't

require a network connection and is currently restricted to small level transactions of rupees 500 and the maximum amount that can be held has been set to rupees 4000. Considering its initial stage the NPCI has mentioned that it would soon expand the facilities offered by UPI lite, the future of UPI for carrying out transactions seems quite promising. It is also suggested that every linked bank should dedicate a higher server space to reduce the errors resulting from traffic during peak hours of the day.

The younger population is more aware of UPI transactions concerning their usability and overall functioning. Whereas the older population is lagging in this area. This lag can be compensated by conducting drives and awareness programs to empower the older sections of the population. Not all individuals in the country use a smartphone that allows people to use such digital services. NPCI will have to come up with new and innovative solutions like designing software that can be compatible with all forms of portable devices to handle the issue.

With more and more banks linking to the interface and IT giants working rigorously on improving the user experience along with integrating a whole bunch of other facilities like shopping, booking tickets, investments, etc. This interface has a massive potential to simplify the lives of people and it is highly recommended that more and more people should start utilizing UPI for financial transactions.

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APPENDIX: QUESTIONNAIRE FOR RESPONDENTS

Q1) GENDER

- MALE
- FEMALE
- OTHERS

Q2) AGE

_____

Q3) THE DISTRICT WHERE YOU LIVE

- NORTH GOA
- SOUTH GOA

Q4) EDUCATION QUALIFICATION

- 10^{th} PASS
- 12^{th} PASS
- UNDER – GRADUATION
- POST – GRADUATION
- PhD/ DOCTORATE
- NONE

Q5) OCCUPATION

- STUDENT
- HOMEMAKER
- AGRICULTURE AND ALLIED AREAS
- EDUCATION AND ALLIED AREAS
- TECHNOLOGY AND ALLIED AREAS
- SPORTS AND ALLIED AREAS
- HOTELS AND HOSPITALITY
- MEDICAL ALLIED AREAS
- ENTERTAINMENT
- ADMINISTRATION
- DEFENCE
- BUSINESSES AND ALLIED AREAS
- LOCAL VENDORS AND MERCHANTS
- OTHERS

Q6) ANNUAL INCOME (IN LAKHS)

- 0 – 200000 LAKHS
- 200000 – 400000 LAKHS
- 400000 – 600000 LAKHS
- 600000 – 800000 LAKHS
- 800000 AND ABOVE

Q7) DO YOU USE UPI FOR MAKING PAYMENTS?

- YES
- NO

Q8) WHICH OF THE FOLLOWING APPS DO YOU FOR MAKING PAYMENTS?

- GOOGLE PAY
- PAYTM
- PHONE PE
- AMAZON PAY
- BHIM
- MOBIKWIK
- OTHERS

Q9) IS IT EASY TO INSTALL THE ABOVE-MENTIONED APPLICATIONS?

- YES
- NO

Q10) HAVE YOU EVER FACED ANY PROBLEMS OR ANY ISSUES WHILE MAKING PAYMENTS USING UPI

- YES
- NO

Q11) HAVE YOU FACED ANY OF THE FOLLOWING PROBLEMS WHILE MAKING PAYMENTS USING UPI SERVICES?

- NETWORK ISSUES
- ACCOUNT LINKING ISSUES
- SERVER ISSUES
- REFUND ISSUES
- NONE

Q12) ANY OTHER PROBLEMS THAT YOU MIGHT HAVE FACED? (EG: FRAUD, CHEATING ETC.)

Q13) DO YOU THINK UPI IS A SAFE MODE OF TRANSACTIONS?

- YES
- NO
- MAYBE

Q14) HOW FREQUENTLY DO YOU USE UPI SERVICES TO MAKE PAYMENTS?

1. VERY RARELY
2. RARELY
3. OCASSIONALLY
4. FREQUENTLY
5. VERY FREQUENTLY

Q15) HOW SATISFACTORY DO YOU FEEL UPI SERVICES ARE TO MAKE PAYMENTS?

1. VERY DISSATISFACTORY
2. DISSATISFACTORY
3. NEUTRAL
4. SATISFACTORY
5. VERY SATISFACTORY

Q16) HOW CONVENIENT IS IT TO USE UPI SERVICES FOR MAKING PAYMENTS?

1. VERY INCONVENIENT
2. INCONVENIENT
3. NEUTRAL
4. CONVENIENT
5. VERY CONVENIENT

Q17) HOW RELIABLE DO YOU THINK UPI SERVICES ARE FOR MAKING PAYMENTS?

1. VERY UNRELIABLE
2. UNRELIABLE
3. NEUTRAL
4. RELIABLE
5. VERY RELIABLE

Q18) WOULD YOU RECOMMEND THE USE OF UPI SERVICES AS A PAYMENT METHOD TO OTHERS?

- YES
- NO
- MAYBE

Q19) WHAT ACCORDING TO YOU MAKES PAYMENTS THROUGH UPI BETTER COMPARED TO OTHER FORMS OF PAYMENTS?

- SIMPLICITY
- TIME EFFICIENCY
- ZERO TRANSACTION CHARGES
- OTHERS