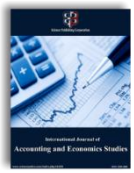
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Research paper



A secure Future for UPI: Identifying Key Drivers and Overcoming Challenges

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Abstract

India has seen a breakthrough in digital payments because of the Unified Payments Interface (UPI). Its rapid transfer capabilities and ease of usage have fueled widespread popularity. Security issues have surfaced as a result of this tremendous expansion. To guarantee a safe future for UPI, this study investigates two key drivers: security measures and UPI challenges. This paper depicts rural households' concerns about the security aspects of UPI usage and its challenges in the Palakkad district of Kerala. A structured schedule was followed to collect primary data from 400 rural households of the Palakkad district of Kerala. The responses are analysed using statistical tools such as regression, one-way ANOVA, mean, and standard deviation executed through the Statistical Package for Social Sciences, and the output disclosed that the most adversely affecting factor on usage behaviour of rural households is the usage barrier, and the security properties are significantly positively influencing the usage behaviour of rural households. The results support reducing the glitches in the usage behaviour of UPI among rural households and improvisation of security properties to extend the UPI services.

Keywords: *Usage Behaviour; Barriers; Security Factors; Perception; Innovation Resistance.*

1. Introduction

To encourage and promote digital payments in India, the government has been implementing a number of actions. The government wants to establish a "digitally empowered" economy that is "Faceless, Paperless, and Cashless" as part of the "Digital India" campaign(Tomić & Todorović, 2018).Digital payments come in many forms and configurations. Debit/credit card use, online banking, mobile wallets, digital payment apps, the Unified Payments Interface (UPI) service, and unstructured supplemental services are a few of them. UPI was developed to facilitate payment systems in retail digital payment transactions, and it now accounts for more than half of the total transactions performed in the digital payment ecosystem(Bhat, 2021).Digital payment options are frequently simple and more practical, and give clients the freedom to make payments whenever they want, from anywhere. These have shortened transaction cycles and are a good substitute for conventional payment systems(Narayanan, 2021)."

UPI has developed into an essential component of India's financial ecosystem, going beyond simply being a practical way to make payments. Its relevance as a pressing necessity in an increasingly digital society is highlighted by its capacity to advance financial inclusion, expedite transactions, improve security, spur economic progress, and garner international reputation. UPI is the flag bearer of the ongoing financial revolution (Kolte & Humbe n.d.). By facilitating smooth merchant onboarding, UPI's rapid and reasonably priced payment acceptance supports small enterprises like auto rickshaws and tea shops, and encourages financial inclusion in rural and semi-urban areas.

The Unified Payments Interface (UPI) is a system that integrates various bank accounts, smooth fund routing, and merchant payments into a single mobile application (of any participating bank). Additionally, it supports "Peer to Peer" collection requests that may be planned and paid for according to need and convenience(Baliyan et al., 2023).The RBI's annual report shows that UPI facilitated 185.8 billion transactions during 2024-25, which represents a 41 percent year-on-year increase. In value terms, UPI transactions rose to Rs.261 lakh crore from Rs 200 lakh crore in FY 24- UPI transactions rose to UPI transactions rose to Rs 261 lakh crore from Rs 200 lakh crore in FY24.

Palakkad, the third district in Kerala to attain 100 percent digital banking services, is examining UPI usage to determine how successful it is for different groups, including isolated tribal communities. Research may reveal who uses UPI, why they use it, and how often they use it. It makes it easier to comprehend how widespread digital payments are beyond simply having access to online banking. Kerala's high literacy and mobile penetration may hinder widespread adoption of digital transactions like UPI, prompting research among rural households to identify barriers and security factors. Because it offers a localised perspective of digital payment uptake in an area that has made progress in digital banking, studying UPI in Palakkad is crucial. The results can support the state's digital transformation goals, improve digital infrastructure and awareness, address user difficulties, increase financial inclusion, and boost economic efficiency.

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Even though our country has been showing tremendous growth in UPI transactions, many people are forced to stay away due to the resistance factors and security glitches. Hence, this research work is focused on investigating the innovation resistance factors influencing rural households' usage behaviour towards UPI and on exploring the influence of security factors on UB. The study's focus on Palakkad offers an opportunity to gain a microcosmical understanding of UPI's security landscape, which may bring new insights for protecting the platform for its future expansion. The research aims to reveal the encounters faced by the UPI customers in Palakkad, like network problems, unsuccessful transactions, security issues, or merchant rejection in particular regions. In order to encourage broader use, these problems must be resolved. As the number of digital transactions increases, so does the potential of online fraud. What contributes novelty to this study is creating efficient fraud prevention and awareness campaigns by researching user experiences and understanding of online safety in UPI transactions, and also benefiting greatly from knowing the trends and difficulties associated with UPI usage, which will help them customise their digital services, enhance user experience, and cater to the unique demands of the community. The following Table 1 describes the constructs used to build our proposed research model.

Table 1: Constructs and Their Source

Usage Barrier (UB)	The usage barrier is one of the five perception barriers in innovation resistance theory, developed by Ram and Sheth in 1989. It refers to the perception that an innovation is difficult to use or requires a significant change in existing behavior. This can lead to resistance to adopting the innovation, even if it is perceived to be beneficial.	Brijesh Sivathanu (2018), Krishna Moorthy et al. (2016), Puneet Kaur (2020)
Value Barrier (VB)	A value barrier refers to the perception that an innovation is not worth the cost or effort required to adopt it. Value barriers can be a significant obstacle to the adoption of innovation	Brijesh Sivathanu (2018), Krishna Moorthy et al. (2016), Puneet Kaur (2020)
Risk Barrier (RB)	A risk barrier refers to the perception that an innovation is risky. If the potential risks associated with the innovation are perceived to be severe, users are more likely to experience a risk barrier.	Brijesh Sivathanu (2018), Krishna Moorthy et al. (2016), Puneet Kaur (2020)
Traditional Barrier (TB)	A traditional barrier refers to the perception that an innovation is not compatible with existing values, beliefs, or practices.	Brijesh Sivathanu (2018), Krishna Moorthy et al. (2016), Puneet Kaur (2020)
Image Barrier (IB)	An image barrier refers to the perception that an innovation has a negative image	Brijesh Sivathanu (2018), Krishna Moorthy et al. (2016), Puneet Kaur (2020)
Security Factors (SF)	The security properties of electronic payments are the characteristics that ensure the confidentiality, integrity, authentication, non-repudiation, and availability of financial transactions that are conducted electronically. These properties are essential to protecting the privacy of users, the accuracy of transactions, and the availability of funds.	Md Arif Hassan et al. (2020), Mostafa A Ali et al. (2019)

(Source: compiled data).

2. Literature review

Anchal Gulia, Leena Singh (2023) researched to understand the “Adoption of UPI (Unified Payment Interface) among rural people”. Anchal Gulia, Leena Singh researched to understand the “Adoption of UPI (Unified Payment Interface) among rural people”. The study explores the critical factors that influence the adoption of UPI among rural people and also discusses how this knowledge can be used to improve UPI adoption among rural people. UPI has provided a newer digital payment avenue to both urban and rural consumers in India. However, the adoption of UPI in rural India remains an unexplored area.

Puneet Kaur et al.'s (2020) research explores how functional and psychological barriers influence the intention to use and recommend mobile payment solutions. They developed a model based on innovation resistance theory and tested it on 1256 users. Results showed that use, risk, and value barriers negatively affect the intent to use mobile payment solutions, while tradition and image barriers do not.

Kuo Chen Chung and Silvia Wan-Ju Liang's (2020) research paper explores factors affecting innovation resistance of mobile payments in Taiwan. The study uses structural equation modeling and partial least squares (PLS) to analyze data from 348 valid samples. Results show self-determination predicts resistance to innovation, with psychological needs meeting resistance. The study highlights the debate on mobile payment resilience and its implications for practitioners and researchers. Tradition and image barriers do not affect intended use.

Md Arif Hassan et.al (2020) contributed a paper " A Review on Electronic Payments Security" and presented it as a review report based on 131 research articles. regarding electronic payments. In this research work, the authors identified important security properties such as availability, authorization, integrity, non-repudiation, authentication, and confidentiality. It was concluded that security properties must be inserted to make digital payments hurdle-free.

Muhammad Fikry Aransyah et al. (2019) conducted a study on Innovation Resistance and Perceived Novelty on e-wallet services. The study aimed to evaluate the Innovation Resistance Theory, which includes Use, Value, Risk, Tradition, and Image Barrier, to assess e-wallet resistance. The research found that self-determination predicts resistance to innovation, and as consumers' psychological needs are met, their resistance to new products decreases. The study has implications for practitioners and researchers, as it provides a baseline for future e-wallet offerings.

It is evident from the reviews mentioned above that the majority of earlier research concentrated either on obstacles or security concerns associated with digital payments. Numerous studies have examined the barriers to the adoption of digital payments using Ram and Sheth's (1989) innovation resistance theory; however, there haven't been any studies that look at both the barriers and security concerns simultaneously. Research substantiates the existence of a digital gap in rural areas. One cannot overlook security precautions when researching UPI. Therefore, the main focus of this study is on how security measures and obstacles impact rural households' adoption of UPI.

3. Objectives of the study

3.1. To examine the resistance factors' influence on usage behaviour among rural households.

3.2. To explore the security factors associated with UPI services

4. Theoretical background and hypotheses development

The authors focused on innovation resistance theory (Ram and Sheth, 1989) and security factors (Mostafa Ali, 2019) to develop a theoretical model that understands the challenges and security properties associated with UPI transactions among rural households. The five barriers of usage behaviour (UB) of technology are derived from the IRT (Usage Barrier (UB), Value Barrier (VB), Risk Barrier (RB), Tradition Barrier (TB), and Image Barrier (IB). The model posits the influence of these five key constructs (UB, VB, RB, TB, and IB) along with Security factors on Usage Behaviour (UB). Reviewing previous studies revealed many works on online /digital banking problems and prospects, but we noticed rare studies on security-related matters by incorporating challenges. These observations vividly point out the need to conduct factors contributing to rural households' resistance as well as security factors towards UPI. The focus of the IRT in explaining consumers' response to any product in terms of barriers, such as usage, risk, value, tradition, and image, provides scholars with a theoretical basis for explaining resistance towards innovations (Puneet Kour et al,2020)

5. Hypothesis development

The proposed research model (Figure 1) and its theoretical background are explained in this section.
, but we noticed a rare focus on security-related matters that incorporate

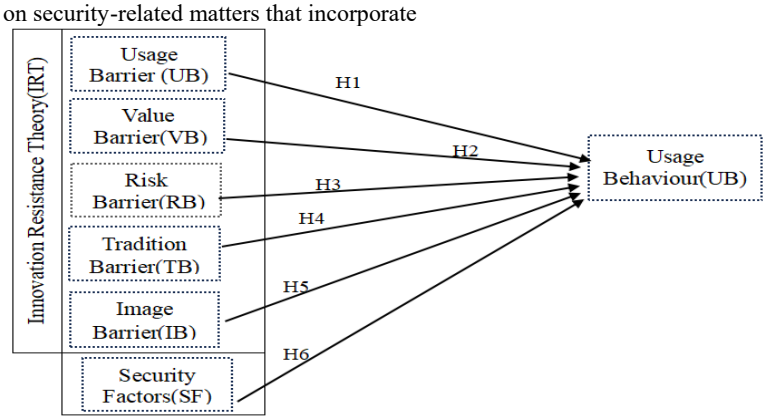


Fig. 1: Research Model (Source: Author's compilation).

6. Usage barriers (UB)

In Innovation Resistance Theory, a usage barrier refers to the perceived difficulty or inconvenience of using a particular innovation. It essentially boils down to the effort and time a user must invest to adopt and effectively utilize the new technology or system. Usage barriers are an important variable because the usage-related complexity of newer digital innovations can significantly jeopardize their chances of becoming mainstream innovations. Studies have also strengthened our argument because users' inefficiency on account of literacy levels (Rahman,2013; Puneet Kaur,2020). Hence, the following hypothesis is proposed:
H1: Usage barriers negatively affect the usage behaviour with UPI.

7. Value barriers (VB)

Value barriers refer to resistance resulting from inconsistency with the existing value system, specifically in the context of balancing between the cost of using the innovation and learning it in contrast with the offered benefits(Morar,2013; Puneet Kaur,2020). Most of the prior literature suggests that value barriers have a negative association with user intentions in various contexts like online shopping(Lian &Yen,2014), mobile commerce(Moorthy et.al.,2017), and mobile banking (Laukkanen,2016). The following hypothesis is expected to be significant in the study:
H2: Value barriers negatively affect the usage behaviour with UPI.

8. Risk barriers (RB)

A risk barrier exists when users confront or perceive risk in an innovation. Uncertainty also becomes part of it, which probably arises from the use of Unimproved. Dotzauer and Haiss (2017) disclosed that RB negatively affects German consumers 'adoption intention towards mobile payment services. The literature has confirmed that risk barriers result from the resistance toward various digitisation initiatives,such as m-banking(Yu and Chatatub, 2016)and m-shopping(Gupta and Arora,2017). Similarly, in the context of mobile payment services, risk barriers exert a positive impact on consumer resistance(Sivathanu,2018). The above discussion leads to the following hypothesis:
H3: Risk barrier negatively affects the usage behaviour with UPI.

9. Tradition barriers (TB)

Traditional barriers refer to the obstacles posed by any innovation if that innovation brings changes in a user's existing routine, culture, and behaviour (Kuo Chung,2020). Some individuals may be resistant to adopting UPI simply because it disrupts their existing payment methods. They may be comfortable with traditional methods like cash or cheque payments and reluctant to switch to a new, unfamiliar system. It is proposed that :

H4: The traditional barrier negatively affects the usage behaviour with UPI.

10. Image barriers (IB)

Prior research has reported that barriers have a negative influence on users' behaviour regarding different digitization initiatives. For example, image has a negative association with users' adoption-related intentions toward mobile banking (Laukkanen,2016), mobile commerce (Moorthy et.al.,2017), Ewallets (Puneet Kaur,2020), so it is decided to propose a hypothesis:
H5: Image barrier negatively affects the usage behaviour with UPI

11. Security factors (SF)

Security properties of electronic payments are the characteristics that ensure the confidentiality, integrity, authentication, non-repudiation, and availability of financial transactions that are conducted electronically. These properties are essential to protecting the privacy of users, the accuracy of transactions, and the availability of funds(Md Arif Hassan et al. 2020). Users may have concerns about the privacy of their financial data, especially with the increasing use of UPI for a wide range of transactions. Studying these security issues is crucial to ensure the safety and security of UPI users and the overall integrity of the system. It involves analyzing past incidents, identifying potential vulnerabilities, and developing robust security measures to mitigate risks. Six security experience dimensions of UPI have been investigated. They are confidentiality, integrity, authorization, authenticity, availability, and non-repudiability (Hassan et al. 2020). Hence, the following hypothesis is proposed:
H6: Security factors positively affect the usage behaviour with UPI.

12. Research methodology

Research methodology systematically explains how a researcher intends to carry out the research. The researcher follows both descriptive and empirical research designs. The population consists of residents of rural households in Palakkad district in Kerala. The sample size represents 400. Primary and secondary data sources are used, and a simple random sampling method under the probability sampling technique is used to determine the sample size. The information gathered from respondents through questionnaires is analysed using various statistical methods, including regression, Spearman rank correlation, independent sample t-tests, one-way ANOVA, mean, standard deviation, and simple percentage analysis, all executed using SPSS.

Table 2: Reliability of Constructs

Constructs	Cronbach's alpha	Number of items
UB	0.90	4
VB	0.89	2
RB	0.87	4
TB	0.89	5
IB	0.86	2
SF	0.94	15

(Source: Computed data).

Cronbach's alpha coefficients were well above the recommended threshold levels of 0.70, and hence all the constructs meet the reliability criteria sufficiently.

13. Results and discussion

Table 3: Demographic Characteristics of Respondents (N =400)

Demographics	Frequency	Percentage (%)
Gender		
Male	163	40.75
Female	237	59.25
Age		
18-24	32	8.00
25-34	103	25.80
35-44	118	29.50
44-54	65	16.30
55-64	69	17.30
65+	13	3.30
Number of Household members		
less than 3 members	28	7.00
3-4 members	265	66.30
More than 4 members	107	26.80
Highest educational qualification		
Primary education	23	5.80
10th grade	88	22.00
Higher secondary	24	6.00
Undergraduate	92	23.00
Post-Graduation and above	173	43.30
Employment status		
Government employee	80	20.00
Private employee	215	53.75
Business	35	8.75
Professional	15	3.75

Daily wages	55	13.75
Income (monthly)		
Less than 10,000	89	22.30
10,000-20,000	135	33.80
20,001-30,000	50	12.50
30,001-40,000	32	8.00
40,001-50,000	36	9.00
50,001+	58	14.50

(Source: Computed Data).

Table 1 presents the demographic features of the respondents. Since the study's respondents are from rural households, most respondents were female (40.75%) compared to males (59.25%), as they are available in their houses. In the Indian scenario and Southern states like Kerala, female household members are available at home as they are involved mainly in unpaid domestic work. A National Statistical Office (NSO) survey conducted between January and December 2019 shows that more than 84% of women participated in unpaid domestic work (NSO, 2020).

More respondents in the rural households belonged to age groups 35-44 (29.50%) and 25-34 (25.80%), representing the youth segment, even though only 32 respondents belonged to the age group 18-24 (8.00%). The rest age categories include around 37 percent of respondents who are distributed in age categories 44-54 (16.30%), 55-64 (17.30%), and 65 and above age, a mere 3.30 percent.

Most of the respondents in rural households possessed high educational qualifications, 43.30 percent had post-graduation and above qualifications, and about 23.00 percent were graduates. Only 6.0 percent had the highest education qualification as higher secondary education. The remaining respondents' highest qualifications comprised 10th grade (22%) and primary education (5.80%).

The employment status is important for understanding the economic conditions of a population. A significant chunk of the respondents from rural households are private employees (53.75%), followed by government employees (20.00%), daily wage employees (13.75%), entrepreneurs or self-employed (8.75%), and professionals (3.75%).

The sample rural household's monthly income can be a crucial characteristic affecting the adoption of the digital payment system. 33.80 percent of households in the sample have a monthly income between ₹10,000 and ₹20,000, and 23.30 percent have a monthly income of less than ₹10,000. That is, about half of the respondents have low household incomes. The households have a higher threshold of monthly income of ₹50,000 and above, consisting of 14.50 percent of the total sample. Only 12.50 percent of households have a monthly income between ₹20,000 and ₹30,000. Furthermore, 9 percent of households have an income level between ₹40,000 and ₹50,000.

14. Security factors of UPI

This section provides a summary statistic measure of the level of perception of respondents on various security dimensions of UPI. Six security experience dimensions of UPI have been investigated. They are confidentiality, integrity, authorisation, authenticity, availability, and non-repudiability.

Table 4: Perception of Rural Households Towards Security Dimensions

Criteria	Items	Mean	SD.	MPS	Rank
Confidentiality	Belief that only an authorised person has access to an encrypted message	4.01	0.92	80.20	3
	A client should be allowed to use the UPI after adequate verification.	4.03	0.92	80.60	2
	I believe that getting an OTP increases confidence while doing UPI	4.32	0.85	86.40	1
	Overall	4.12	0.81	82.40	
Integrity	I believe that UPI needs valid credentials to process	4.04	0.87	80.80	2
	UPI transactions are processed only after the customer gets a "confirm" message.	4.14	0.87	82.80	1
	Overall	4.09	0.83	81.80	
Authorisation	I believe that only authorised customers can access UPI	3.83	1.05	76.60	2
	The details exchanged for the payment only cover the authorized topics.	3.86	1.02	77.20	1
	Overall	3.85	0.88	76.95	
Authenticity	Asking secret questions and answers helps to ensure credibility	4.01	0.95	80.20	1
	While trying to log in, picking images like activities ensures authenticity.	4.01	0.91	80.15	2
	Overall	4.01	0.88	80.18	
Non-repudiability	The banker ensures complete transparency in all UPI transactions.	3.86	0.91	77.20	1
	I believe that the banker will never deny the mismatches, if any, in UPI transactions.	3.74	0.95	74.80	2
	Overall	3.80	0.773	76.05	

(Source: Computed Data).

The table provides summary information on rural households' perceptions of the confidentiality of the security dimension on UPI. Overall, MPS 82.4 shows a high level of confidentiality on UPI, with a mean of 3.86 and a standard deviation of 0.82. The third element, "I believe that getting an OTP increases confidence while doing UPI," received the first rank, followed by the element with second rank, "A client should be allowed to use the UPI after adequate verification." The table provides summary information on rural households' perceptions of the integrity of the security dimension on UPI. Total MPS (81.80) value of the two elements indicates a good, significant relation of integrity of UPI. The total MPS (79.65) value of the two elements indicates a great significant relationship of UPI authorization. Within the construct, rank one based on mean value is for the item "the details exchanged for the payment only cover the authorized topics" as MPS is 79.65 percent (mean=3.86, S.D.=1.02) and the rest elements in the construct are ranked as two.

The above table depicts the summary statistics of the Perception of the authenticity of UPI. It shows a substantial authenticity of UPI as MPS is 80.18 percent (Mean=4.01, S.D.=0.91). All the elements used in the availability construct have a high-level MPS (MPS >75), indicating significant availability is experienced by the respondents from UPI. The first rank is assigned based on the mean to "I think information sources are always available to make UPI." Third rank is given to "I feel that UPI is available anywhere at any time," and the item "The banker supports whenever the user demands UPI" is ranked with two. The table provides summary information on rural households' perceptions of the non-repudiability of the security dimension on UPI. The total MPS (76.05) value of two elements indicates a good, significant relation of integrity of UPI. It indicates that substantial non-repudiability is experienced by the rural households from UPI.

Table 5: ANOVA (Model fit)

	Sum of Squares	df	Mean Square	F	p-value
Regression	159.424	6	26.571	82.745	0.001
Residual	126.197	393	0.321		
Total	285.621	399			

(Source: Computed Data) Note: Dependent variable = UB.

Table 6: Barriers to UPI Adoption and Security Experience on Usage Behaviour

Dependent variable	Independent variables	β	SE	T	p-value
UB	IRUB	-0.459	0.044	-11.28	0.001
	IRVB	-0.297	0.032	-7.396	0.001
	IRRB	-0.169	0.035	-4.256	0.001
	IRTB	-0.281	0.037	-7.148	0.001
	IRIB	-0.147	0.037	-3.446	0.001
	SECURITY MEASURES	0.192	0.053	4.344	0.001
R^2		0.558			
F		82.745			

(Source: Computed Data) Note: B = Standardized Coefficient; SE = Standard Error.

Six predictors (IVs) are used in multiple linear regression to predict the usage behaviour of UB(DV). Since the five Innovation Resistance Theory (IRT) predictions act as obstacles to UB, it is anticipated that they will have an impact on UB. A statistically significant regression equation is built, with an R^2 of 0.558 and F (6, 393) = 82.75, p = 0.001. According to the R^2 value, the six predictors account for 55.8% of the variance in UB, with the remaining variation resulting from variables not examined in this study. According to Krishna Moorthy et al. (2017), one of the most promising and useful theories used to comprehend the obstacles to UPI is (IRT.

The above table revealed that IRUB negatively predicted or affected the UB (B = -0.459, p = 0.001). In other words, a one standard deviation change, for instance, an increase of one standard deviation in IRUB score, will cause a 0.459 standard deviation decrease in UB of UPI. Similarly, IRVB negatively predicts or affects the UB (B = -0.297, p = 0.001), IRRB negatively affects UB (B = -0.169, p = 0.001), IRTB negatively affects UB (B = -0.281, p = 0.001), and IRIB negatively affects UB (B = -0.147, p = 0.001). Conversely, the security properties positively affect UB (B = 0.192, p = 0.001). The same result of multiple regression presented in the Table is illustrated in the Figure.

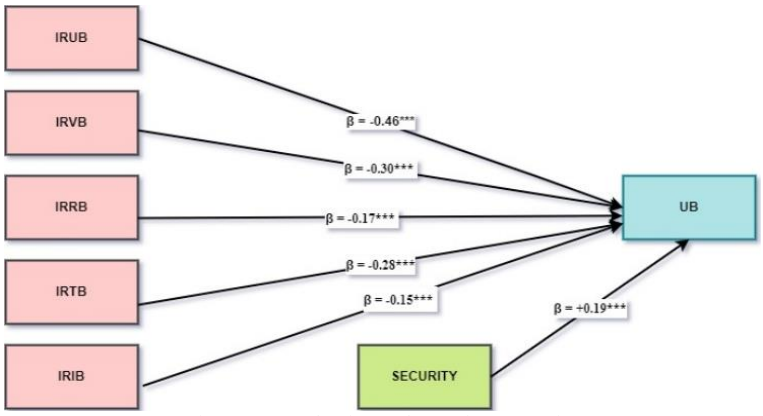


Fig. 2: Barriers to UPI Adoption and Security Properties on Usage.

Note. *** significant at a 1% significance level (Source: Computed data).

The regression result depicts that all five barriers significantly and adversely affect the usage behaviour of UPI among rural households. From the larger standardized regression coefficient of IRUB, IRUB is the largest barrier to the usage behaviour of UPI. At the same time, rural households' security experience improves UPI's usage behaviour.

15. Findings

Female respondents are more than the male respondents in the study group. Adult respondents are more numerous in the study group. Educated youth are more familiar with using UPI services. Respondents with salaried income and highly educated are more aware of UPI services. It is found that there is no significant difference between males and females regarding awareness of UPI($p>0.05$). More than 14 billion transactions were made using UPI in May 2024 alone, accounting for more than 75% of India's retail digital payments. (The Council for European Payments). This highlights its pervasive presence. "One-way ANOVA and post hoc test analysis reveal that highly educated respondents are more aware of UPI transactions and related services. The main obstacle faced by the respondents is too much time required to complete of UPI transaction(mean=3.23). Respondents have revealed that the security-related issue is recalling more than one ID and password to operate UPI services(mean=3.36). The regression result found that all resistance factors negatively affecting the usage behaviour (UB) and security factors (SF) have a positive effect on the usage behaviour of UPI.

16. Suggestions

UPI service platforms should be updated as well as more user-friendly. Technical errors should be mitigated to enhance transaction efficiency. Instructions should be given timely and speedy grievance mechanism should be followed by the service providers. Avoid downloading programs from unreliable sources and clicking on dubious links. Keep an eye on transactions regularly. To spot any illegal behavior, regularly review your transaction history. Notify your bank of any questionable transactions right away. Focus on making UPI security

solutions user-friendly - features like password managers and fingerprint authentication can benefit everyone. Despite the various obstacles linked to IRUB, enhancing security measures for rural households could promote a broader adoption of UPI. Consequently, addressing these security concerns might encourage rural households to more frequently adopt and utilise UPI.

17. Future implications

The findings may serve as a basis for additional investigations into user behaviour and preferences about UPI security measures. Future system improvements may be unaffected by this.UPI has the potential to greatly benefit society by fostering financial inclusion, trust, efficiency, economic growth, and social advancement by placing a high priority on security. Resolving the security issues the study raised opens the door to a more reliable and comprehensive digital payment system.

18. Conclusion

Unified Payment Interface (UPI)is gaining popularity in the digital era, and awareness regarding UPI services is also increasing day by day. Although many are familiar with UPI services still a small group of rural households are still standing away from the services due to low-income level, unawareness, lack of interest, ignorance, etc. The UPI services will work properly if the device has sufficient net support. They provide a quicker, safer, and more affordable option to cash transactions, which is advantageous for both people and businesses. Hence, it is better to make use of UPI services efficiently and effectively so that it is good for both the individuals and the economy of our country.

Because UPI prioritizes security, users may execute transactions with confidence and ease. By facilitating quicker and more effective financial transactions across a range of industries, the widespread use of secure UPI transactions can promote economic growth. Secure UPI transactions can help small enterprises and individuals become more powerful, reducing poverty and promoting social progress. The only prerequisite is for service providers to conduct successful awareness efforts and take adequate action to resolve user-experienced problems. As the next generation becomes more technologically savvy, this will guarantee that digital platforms are more appealing to them. UPI will support the growing scope of the Digital India campaign, which seeks to propel India, as well as the economic development of the nation.

19. Declaration of conflicting interest

The authors declared no potential conflicts of interest concerning the research, authorship, and /or publication of this article.

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