ADOPTION OF MOBILE WALLET SERVICES IN INDIA DURING COVID-19

[1]Aman Vats, [2]Ravi Kumar Gupta

Humanities and Management Science Department
Madan Mohan Malaviya University of Technology, Gorakhpur

Abstract: Since the start of the pandemic, there has been a growth in the number of people who utilize the web from approximately 40% to about 100%. Financial transactions are presently conducted through Internet-connected smartphones, computers, iPhones, and other devices. This paper aims to examine people's attitude towards mobile wallets in India at the time of the COVID-19 pandemic and the different factors that affect consumers' attitude towards the adoption and acceptance of mobile wallets among the users who reside in India. The results of this study provide information about the missing data, correlation between the variables, accuracy of sample size and data, explanation of the content of variables with the help of factor, number of factors extracted, and relationship between the factors and variables. The approachability of consumers towards mobile wallets in India was shown to be related to different factors, such as convenience, utility of innovation, ease of use, and trust among people. Thus, mobile wallets enhanced the e-shopping method and made payments easier, with the major factor of dependence being the utility of innovation.

Keywords: coefficients, mobile wallets, pandemic, intercept, perception, payment gateways, smartphones, utility of innovation

Introduction

As the Covid-19 pandemic was growing at a rapid rate, it harmed many nations, which resulted in the application of lockdowns. Many facilities or locations where many individuals assembled together and communicated with one another (e.g., schools, offices, temples, etc.) were shut down [1]. As a result of these lockdowns, many individuals started relying on the Internet to satisfy their needs. During this epidemic, dependency on the Internet rose from 40% to 100% [1]. For example, for meeting purposes, various video conferencing applications were used to conduct educational workshops, seminars, etc., to communicate with one another [2]), such as Zoom, Cisco Webex, Microsoft Teams, and Google Meet. These virtual meetings were all conducted online and required the Internet [3].

Furthermore, during this pandemic, a large group of individuals began depending on cashless payments, card payments, and mobile wallet payments instead of cash payments [4].Various forms of purchases or transfers are made over the Internet using software for mobile wallet purchases on mobile phones, smartphones, and all other devices utilizing digital wallets [5].These mobile wallets are also used to carry out transfers or payments for a number of purposes, including mobile recharges, DTH recharges, bill payments, tuition fee payments, etc., using ATM cards or wallet money. Moreover, all coupons, receipts for bills, recharge receipts, etc., are stored in the mobile wallets [6]. New digital payment systems and mobile wallets utilized for many kinds of transactions include Paytm, PayPal, Google Pay, MobiKwik, Freecharge, Phonepe, Oxigen, and others [7].

Abbreviations

NFC: Near Field Communication
PoS: Point of Sale
PC: Preference to continue using a mobile wallet
OT4: Number of usage of the digital mobile wallets for completing online transactions
PU: Plan to use mobile wallets if problems are addressed
PCT: Preference of using mobile wallets for completing transactions
IC: Intention to continue using a mobile wallet
CONV: Convenience
UI: Utility of Innovation
EU: Ease of use
MP2: An alternative mode of payment
MP3: Physical payment system
TRUST: Mobile Wallets provide trust among the users.
KMO: Kaiser-Meyer-Olkin

Literature Review

The safety and convenience qualities, irrespective of what kinds of payments are evaluated, such as cash payments, card payments, mobile payments, etc., are correlated with one another [8]. The usage of mobile wallets was significantly boosted because of the demonetization that led to the unavailability of money. Mobile wallet services make it much easy to purchase, trade, and manage purchases, payments, and other transactions. There has been an increase in the use of the mobile wallets, and interest in their potential, risks, benefits, elements, extent, requirements, significance, etc. [9]. Mobile payment services are effective under the

parameters of their usability, cost, efficiency, compatibility, and safety for engaging in money transactions for all categories of citizens [10].

There is a requirement of awareness, use, and the possibility of utilizing smartphones for the completion of monetary transactions. There is significant growth in the number of digital wallet users with the continuous increase in access to Internet connectivity and cellphones [11]. The effectiveness of the e-wallet development approach is raised by the examination of the elements that control the perceived ease of use [12].

Mobile wallet payments are incredible platforms for a variety of new technologies, which force Indian monetary establishments to use mobile technology to improve their customer base and use. The use of cellular pockets increases robotically as security problems emerge and are resolved. Vijai and colleagues (2020) note, "Everybody has a smartphone nowadays, but we aim to develop knowledge and give handy, secure, stable, and practical cell pockets without problems or hindrances". Secure transmission of sensitive information, such as credit card numbers stored on websites and e-commerce interfaces over a variety of channels, makes digital payment options the safest payment option. The Near Field Communication (NFC) feature of the point-of-sale (PoS) gateway makes it easy to pay for retail sales. Customers can choose to use a credit/contact card or tap their smartphone on a PoS device to pay with the mobile app's tap and pay feature [13]. The more tension the user has, the less satisfied he is with the mobile wallet services and the less tension a user has, the more satisfied he is with the mobile wallet services. It was found that user's adoption and recommendation to use mobile wallet services is greatly affected by the social influence [14].

Research Model

This model was analyzed with the help of automatic linear modeling. The value of adjusted R2 was observed to be 0.350 (i.e., 35% accurate). The values of all the coefficients are displayed in this model. There are only two modes in the model view, namely the diagram view and table view.

Diagram: Figure 1illustrates the intercept and the predictors ranked from most important to least important. Variables are arranged by decreasing order of their coefficients. The lines in Figure 1 are painted with different colors according to the symbol of the coefficient, with the width of the larger line showing more important coefficients (less p-value) [15].The blue color of the connected line in the model corresponds to the positive value of the coefficient and the yellow color of the connected line in the model shows the negative values of the coefficients [16]. The variables are labeled as follows:

PC: preference to continue using a mobile wallet
OT4: number of usage of the digital mobile wallets for completing online transactions
PU: plan to use mobile wallets if problems are addressed
PCT: preference of using mobile wallets for completing transactions
UI: means utility of innovation
IC: means intention to continue using a mobile wallet

In Figure 1, only intercept and PCT have a positive value of coefficients, whereas PC, OT4, PU, and UI have negative values of coefficients.

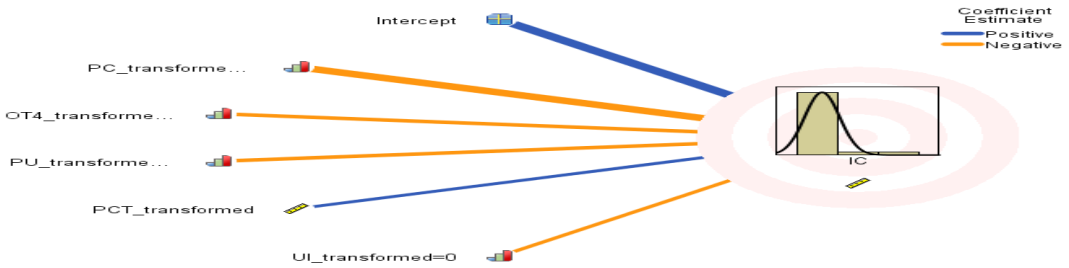

Figure 1: Coefficients of the Different Predictors

Table: Table 1 shows the value of the coefficients, standard error, t-value, significant values less than 0.05, lower and upper confidence intervals of 95%, and the importance level for different variables. Following the intercept, the ordering of the coefficients are done by ranking the predictors from most important to least important [15]. The table initially shows only the model term, values of the coefficients, significant values less than 0.05, and value of importance level. After clicking on the coefficient section located in the table, the values of standard error, t-value, and lower and upper confidence interval of 95% will be displayed [16].

In the model analysis (Table 1), PCT has the maximum values of the coefficient 0.024, a t-value of 2.206, a lower confidence interval of 95% (0.003), an upper confidence interval of 95% (0.046),a minimum value of standard error (0.011) a significant value of 0.029, and a value of importance level of 0.082.PC has the minimum values of coefficient -0.640, a t-value of-4.196, a significant value of0.000, a lower confidence interval of 95% (-0.942), an upper confidence interval of 95% (-0.339), maximum values of standard error 0.153, and an importance level of 0.295 among the five variables, excluding the value of the intercept.

Table 1

Coefficients Values of Different Predictors

Model Term	Coefficient	Std.Error	t	Sig.	95% Confidence Interval		Importance
					Lower	Upper	
Intercept	2.183	0.266	8.210	.000	1.658	2.708	
PC_transformed=1	-0.640	0.153	-4.196	.000	-0.942	-0.339	0.295
OT4_transformed=0	-0.209	0.074	-2.830	.005	-0.355	-0.063	0.134
PU_transformed=0	-0.144	0.055	-2.637	.009	-0.251	-0.036	0.117
PCT_transformed	0.024	0.011	2.206	.029	0.003	0.046	0.082
UI_transformed=0	-0.255	0.122	-2.087	.038	-0.497	-0.014	0.073

Research Objectives

- To examine users' demographic profile.
- To explore the various factors that affects the users' perceptions towards the acceptance of mobile wallet usage.

Research Methodology

Data Collection Method: A primary data collection method was adopted for this study, collected through primary sources, such as questionnaires created through Google Forms (https://www.google.co.in/forms/about/). The questionnaires were primarily distributed to friends and family members who live in India, so as to assemble data from respondents who either use or do not use mobile wallets. The questionnaires were created to explore the opinions of people on the use of mobile wallets in India during the Covid-19 pandemic.

Sample Design: The method of sampling used in this study was not random.

Sample Size: The final sample size was 200 and included both users and non-users of mobile wallets.

Data was analyzed by using factor analysis in the form of a principal components analysis method using the SPSS Statistics 25 software.

Data Analysis and Interpretation

Table 2

Demographic Profile of Respondents

Demographics		Frequency	Percentage (%)
Age	15-25 years	88	44.0
	26-35 years	103	51.5
	36-50 years	7	3.5
	Above 50 years	2	1.0
Gender	Male	166	83.0
	Female	34	17.0
	Other	0	0.0
Occupation	Student	73	36.5
	Business	23	11.5
	Teacher	11	5.5
	Engineer	53	26.5
	Service Sector	5	2.5
	Assistant Professor	2	1.0
	Other	33	16.5
	Below Rs. 200000	120	60.0
Income	Rs. 200000-300000	41	20.5
	Rs. 300000-400000	13	6.5
	Above Rs. 400000	26	13.0

As shown in Table 2, out of 200 respondents, about 44% are in the age range from 15–25 years; 52.5% ranged in age from 26–35 years, 3.5% ranged in age from 36–50 years, and the remaining 1% respondents were over age 50. Approximately 83% of respondents identified as males, while 17% identified as females; 36.5% were students, 11.5% were doing business, 5.5% were teachers, 26.5% were engineers, 2.5% were in the service sector, 1% were assistant professors, and the remaining 16.5% were involved in the other occupations. Additionally, 60% of respondents earned an income below Rs. 200000, 20.5% earned an income between Rs. 200000 to Rs. 300000, 6.5% earned an income between Rs. 300000 and Rs. 400000, and the remaining 13.0% earned an income above Rs. 400000.

Table 3
Method of Payment

Method of Payment	Frequency	Percentage (%)
Debit Cards	33	16.5
Credit Cards	4	2.0
Mobile Wallets	147	73.5
Other	16	8.0

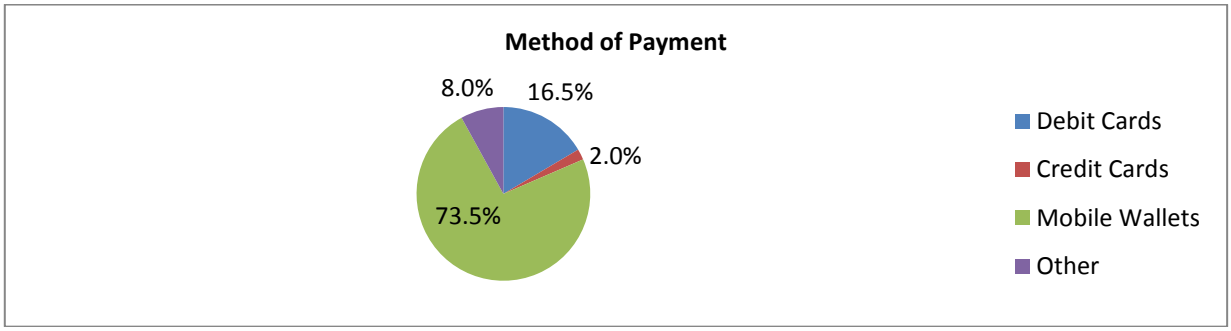

Figure 2: Method of Payment

As shown in Table 3, out of 200 respondents, about 16.5% used debit cards, 2% used credit cards, 73.5% used mobile wallets, and the remaining 8% used other types of payment methods.

Table 4
Preference in Mobile Wallet Payment Gateway Service Providers

Mobile Wallet Payment Gateways	Frequency	Percentage (%)
Paytm	64	32.0
PayPal	3	1.5
Google Pay	123	61.5
MobiKwik	5	2.5
Freecharge	0	0.0
Other	5	2.5

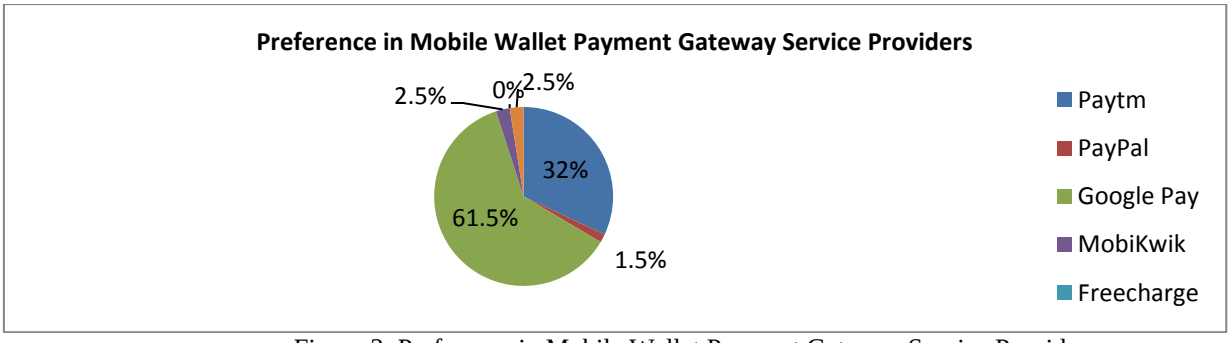

Figure 3: Preference in Mobile Wallet Payment Gateway Service Providers

As shown in Table 4, out of 200 respondents, about 32% used Paytm, 1.5% used PayPal, 61.5% used Google Pay, 2.5% used MobiKwik, none of the respondents used Freecharge, and the remaining 2.5% used other types of mobile wallet payment services.

Table 5
Transactions Completed by Use of Mobile Wallets

Transactions Completed	Frequency	Percentage (%)
Recharge	75	37.5
Utility Bill Payments	18	9.0
Transportation	2	1.0
Food/ Movie Tickets	6	3.0
Online Shopping	40	20.0
Transfer of Money	43	21.5
Other	16	8.0

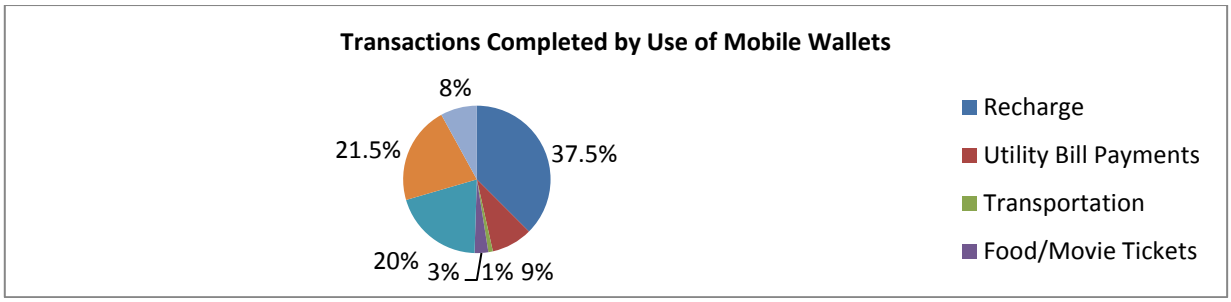

Figure 4: Transactions Completed by Use of Mobile Wallets

As seen in Table 5, out of 200 respondents, 37.5% used mobile wallets for various types of recharges, 9% used mobile wallets for payment of bills, 1% used mobile wallets for transportation purposes, 3% used mobile wallets for buying food or movie tickets, 20% used mobile wallets for shopping online, 21.5% used mobile wallets to transfer money, and 8% used mobile wallets for the other purposes.

Table 6

Number of Times of Usage of Mobile Wallets Per Week

Number of Times of Usage	Frequency	Percentage (%)
Once	25	12.5
Twice	10	5.0
Three Times	8	4.0
More than Three Times	157	78.5

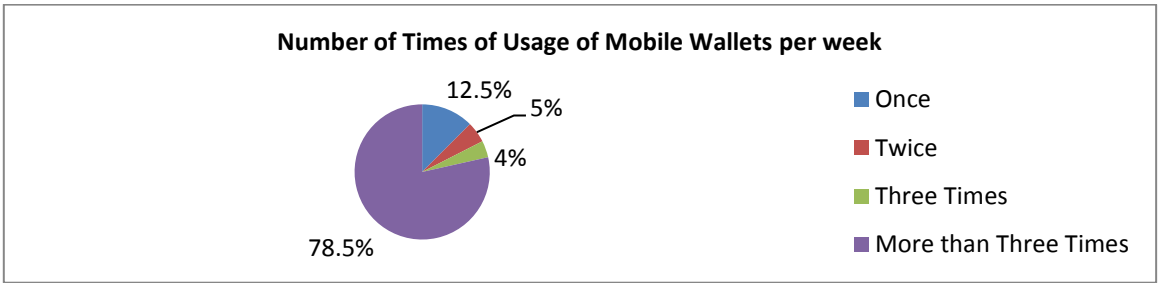

Figure 5: Number of Times of Usage of Mobile Wallets

Table 6 shows that out of 200 respondents, 12.5% used mobile wallets once, 5% used mobile wallets twice, 4% used mobile wallets three times, and the remaining 78.5% used mobile wallets more than three times per week.

Table 7

Information Received About Mobile Wallets

Information Received	Frequency	Percentage (%)
Internet	98	49.0
Magazine	1	0.5
Television	7	3.5
Social Media	52	26.0
Other	42	21.0

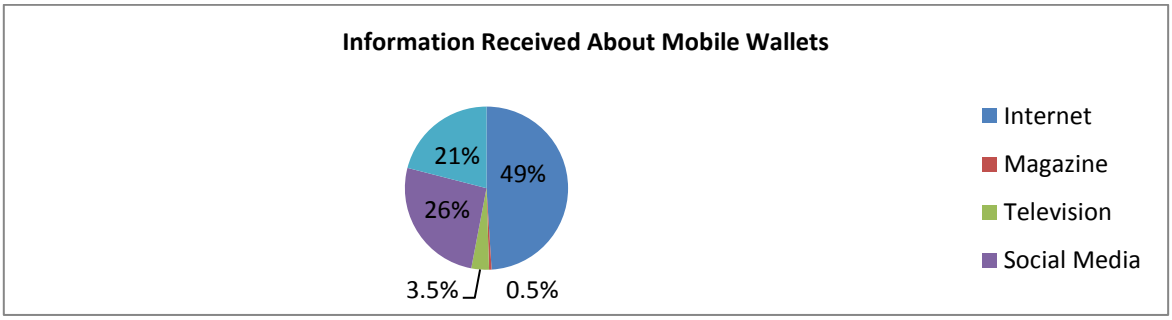

Figure 6: Information Received About Mobile Wallets

As can be seen in Table 7, out of 200 respondents, about 49% received information from the Internet, 0.5% received information from magazines, 3.5% received information from television, 26% received information from social media, and the remaining 21% received information from other sources.

Table 8
Intention to Continue Using a Mobile Wallet

Intention to Use	Frequency	Percentage (%)
Yes	184	92.0
No	8	4.0
Maybe	8	4.0

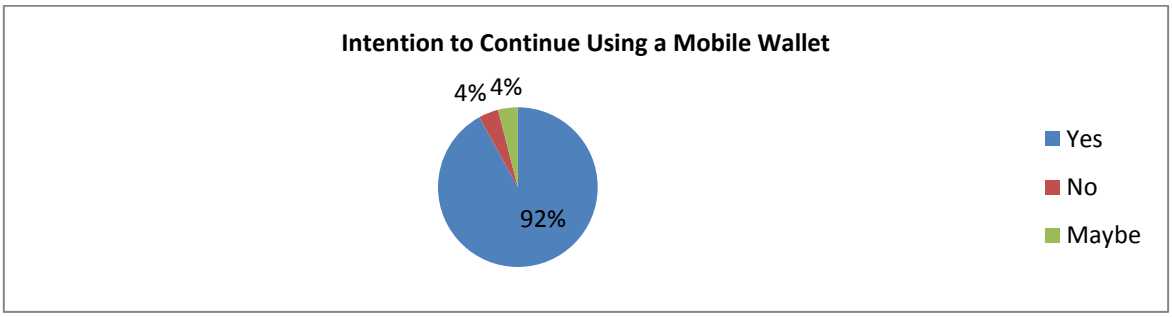

Figure 7: Intention to Continue Using a Mobile Wallet

Table 8 shows that out of the 200 respondents, about 92% have intention to use a mobile wallet, 4% do not have any intention to use a mobile wallet, and the remaining 4% might either use or not use a mobile wallet.

Data Analysis by Factor Analysis with Correlation Matrix

The factor analysis involves several steps or tests for the reduction of the variables into fewer factors and to demonstrate the relationship between them. These steps or tests includes descriptive statistics, correlation matrix, determinant value, KMO and Bartlett's test of Sphericity, communalities, total variance explained, Scree plot, component matrix, and rotated component matrix, if analysis is done through principal components [17].

If the analysis is done through maximum likelihood, then component matrix and rotated component matrix is replaced by factor and structure matrix, with all the other analyses remaining the same. However, since the analysis is done through principal components, the component matrix and the rotated component matrix will be applied.

The variables CONV means convenience, UI means utility of innovation, EU means ease of use, MP2 means an alternative mode of payment, MP3 means physical payment system, and TRUST means mobile wallets provide trust among the users. Descriptive statistics (Table 9) provide different values for different variables having adequate sample size. It is used to search for any missing data.

Table 9 *Descriptive Statistics*

Descriptive Statistics

	Mean	Std. Deviation	Analysis N	Missing N
CONV	1.59	0.828	200	0
UI	1.74	0.840	200	0
EU	1.55	0.769	200	0
MP2	1.77	0.906	200	0
MP3	1.78	0.941	200	0
TRUST	1.71	0.819	200	0

The correlation matrix shows the correlation between similar or different variables. For similar variables, the value of correlation is one, whereas for different variables, it is less than one. The different correlation values between similar and different variables and the determinant value are shown in Table 10. The correlation value between different variables is > 0.5.

Table 10
Correlation Matrix and Determinant Validity

Correlation Matrix

		CONV	UI	EU	MP2	MP3	TRUST
Correlation	CONV	1.000	0.633	0.629	0.564	0.516	0.510
	UI	0.633	1.000	0.610	0.766	0.709	0.596
	EU	0.629	0.610	1.000	0.556	0.611	0.608
	MP2	0.564	0.766	0.556	1.000	0.706	0.646
	MP3	0.516	0.709	0.611	0.706	1.000	0.574
	TRUST	0.510	0.596	0.608	0.646	0.574	1.000
Sig. (1-tailed)	CONV		0.000	0.000	0.000	0.000	0.000
	UI	0.000		0.000	0.000	0.000	0.000
	EU	0.000	0.000		0.000	0.000	0.000
	MP2	0.000	0.000	0.000		0.000	0.000
	MP3	0.000	0.000	0.000	0.000		0.000
	TRUST	0.000	0.000	0.000	0.000	0.000	

a. Determinant = .024

The Kaiser-Meyer-Olkin (KMO) test is used to test the adequate sample size or enough sample size for taking factor. If the value is greater than 0.5, the KMO test indicates that the sample size is adequate. Bartlett's test of Sphericity is used to test adequate sample data or enough sample data for taking factor. If the significant value is < 0.05, sample data is adequate to apply factor analysis (See Table 11).

Table 11
KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.881
Bartlett's Test of Sphericity	Approx. Chi-Square	728.094
	df	15
	Sig.	0.000

Communalities (Table 12) help to determine content of variable explained by the factor. For satisfying communalities the value should be greater than 0.5.

Table 12
Communalities

Communalities

	Initial	Extraction
CONV	1.000	0.597
UI	1.000	0.769
EU	1.000	0.652
MP2	1.000	0.742
MP3	1.000	0.697
TRUST	1.000	0.627

Total Variance Explained (Table 13) is used to identify the number of the variables retained and extracted. Only those variables whose Eigen value is greater than one will be extracted. The Scree plot in Figure 2 depicts the diagrammatical representation of how many factors have Eigen value greater than one.

Table 13
Total Variance Explained

Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.085	68.079	68.079	4.085	68.079	68.079
2	0.569	9.482	77.561			
3	0.478	7.973	85.534			
4	0.393	6.556	92.090			
5	0.258	4.300	96.390			
6	0.217	3.610	100.000			

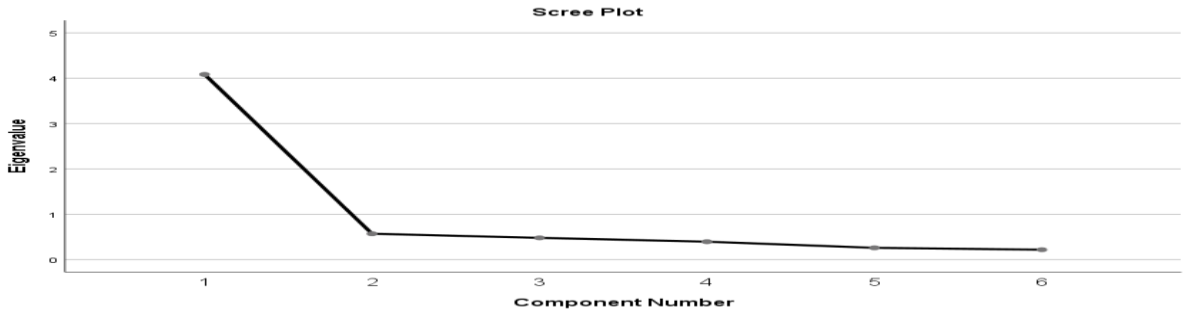

Figure 8: Scree Plot

The last part in the analysis is the component matrix (Table 14). The component matrix represents the relationships between different variables with the extracted factors. Component thus extracted is renamed as approachability of the consumers' towards the mobile wallets.

Table 14
Component Matrix

Component Matrix[a]

	Component
	1
CONV	0.773
UI	0.877
EU	0.808
MP2	0.861
MP3	0.835
TRUST	0.792

a. 1 component extracted.

Findings

- The descriptive statistics show different values of mean and standard deviation for different variables, and from the sample of 200 responses, there was no missing data.
- The data analyzed showed that the value of correlation was one between two similar variables, whereas the correlation value was different for the two different variables. The value of correlation between different variables was> 0.5. For example, in the analysis, the value of the correlation between CONV and CONV was one and between CONV and UI was 0.633, which indicates that the correlation between convenience variables (CONV) was 100% and the correlation between convenience variable (CONV) and the utility of innovation variable (UI) was 63.3%.
- The value of the determinant should be greater than zero (i.e. determinant > 0) for the correlation to be effective. The value of the determinant in the analysis was 0.024. Since 0.024 > 0, the correlation between the different variables exists.
- The KMO (Kaiser-Meyer-Olkin Measure Test) was used to test whether the sample size was adequate enough to perform a factor analysis. For adequacy, the value obtained from KMO test should be greater than 0.5. The following are the criteria for the KMO test to be successful:
- If X > 0.5: Good
  0.5 < X < 0.7: Very Good

0.7 < X < 0.9: Excellent
X > 0.9: Superb
Here, X = 0.881

This value of X was between 0.7 to 0.9, which indicated that sample size was adequate or accurate enough to apply factor **analysis.**

- Bartlett's Test of Sphericity was used to see if there was adequate sample data or enough sample data to perform a factor analysis. If the significant value < 0.05, the sample data is adequate or accurate enough to apply factor analysis. Here, the significant value equalled zero, which indicated that the significant value was< 0.05, thus the sample data could be used for applying factor analysis.
- Communalities help to determine how much the variable is explained by factors.
  If X < 0.5, it is not acceptable (a value below 0.5 is unacceptable).
  In the analysis, X = 0.597 (59.7 % content variable is explained by the factor).
- Total Variance Explained is used to identify how many variables are retained and extracted.
  If the Eigen value > 1, the variable is extracted.
  Example: Eigen value = 4.085 (variable extracted).
  In the above analysis, out of seven components, only one component is extracted as the Eigen value of only one component was greater than one.
- The Component Matrix was used to identify how much a variable was related with a factor.
  Example: X = 0.773 (77.3% variable is related to the factor).

Conclusion

There is a continuous rise in the adoption and usage of mobile wallet service providers during the Covid-19 pandemic situation. Mobile wallets are the most majorly used payment methods, with Google Pay being the best mobile wallet, primarily used for recharge purposes. Approachability of consumers towards mobile wallet usage in India is related to different factors that include:

- A consumer's desire to continue using a mobile wallet
- The number of times a consumer uses digital mobile wallets for completing online transactions
- The consumer's plan to use mobile wallets if problems are addressed
- Consumers' preferences for using mobile wallets for completing transactions
- The convenience of using digital mobile wallets
- The utility of innovation and ease of use provided by digital mobile wallets as an alternative mode of payment
- The physical payment system
- Trust among the people
- A consumer's intention to continue using a mobile wallet, as an enhanced e-shopping method, easier payments, etc.

However, the major factor of dependence on digital mobile wallet use was found to be utility of innovation.

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