

Keywords
Mobile Wallet, Unorganized Retailers, Semi-Urban India, Trader Satisfaction, Financial Inclusion, Digital Payment Adoption

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Wallets in the Bazaar: What Keeps Semi-Urban Unorganized Traders Hooked on Mobile Payments

Abstract

Objectives: The quick advancement of digital payment technologies has changed the retail panorama and has inspired the retailers to go cashless. Of all these technologies, mobile wallets (M-wallets) have emerged as a key enabler to improve the convenience of transactions, efficiency of operations and financial inclusion in the unorganized retail sector. This work explores the adoption of mobile wallets (M-wallets) by unorganized retail stores in semi-urban India and the impact of digital payment adoption on financial inclusion, operational efficiency and sustainable business growth, despite ongoing technological, infrastructural and behavioral barriers.

Methods: This study used a cross-sectional survey with convenience and purposive sampling techniques to gather data from 356 unorganized retailers who are using mobile wallets in semi-urban areas of West Bengal. The data was collected using a valid multilingual questionnaire that had ten constructs with a five-point Likert scale. Confirmatory factor analysis, structural model assessment, and mediation-moderation analysis were used to analyze the proposed model via SmartPLS 4.1

Results: The study results revealed that in the context of unorganized street-side retailers in semi-urban India, Perceived Ease of Use, Trust and Trader Satisfaction are significant drivers of adoption and retention of mobile wallet, while Perceived Usefulness does not have a direct effect, and Perceived Risk has a slight moderating effect, thereby extending the TAM and SERVCON frameworks.

Conclusions: The study recommends that with a better understanding of the possibilities of digitalization, easier-to-use mobile wallet applications and more trust, it will be possible to achieve faster adoption rates among the unorganized retailers and thus achieve financial inclusion and business sustainability. The results offer policy guidance to policy makers, payment service providers and app developers in creating user-friendly, secure and accessible mobile payments solutions for the semi-urban unorganized sector.

Relevance: This study advances mobile wallet adoption, financial inclusion, operational efficiency, and sustainable growth among semi-urban unorganized retailers.

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Introduction

Traders have a challenging job, constantly adapting to changing customer preferences and lifestyles. An online payment option is crucial for credibility and efficiency. Retailers appreciate the ease and cost-effectiveness of mobile payment systems. The unorganised sector mainly includes small businesses (Plouffe et al., 2001). They can be either service or retail businesses. The unorganised sector thrives in agriculture because of small, scattered holdings, next comes transportation, followed by food and other retail services (Madan and Yadav, 2016). Small street-side retailers near households offer a range of essential and perishable goods, such as fruits, vegetables, and daily staples. Roadside kiosks are typically located near bus stops, train stations, marketplaces, behind roadways, and close to residential areas. Street vendors represent a form of small-scale commerce, offering self-employment to unemployed individuals, regardless of gender, in semi-urban regions (Plouffe et al., 2001).

Assessing the utilization of mobile wallets (M-wallets) in the unorganized retail sector is essential for promoting financial inclusion, enhancing efficiency, and fostering growth (Ram and Selvakumar, 2023). A significant number of unorganized retailers operate within cash-based economies and face challenges in accessing formal financial systems (Yang et al., 2023). M-wallets provide a gateway to digital payments, micro-loans, and financial services, fostering inclusion in the broader economic landscape (Adhikari et al., 2021). M-wallet effectively reduce the expenses and risks associated with cash management, such as theft and counterfeit currency and they wiped out intermediaries in financial transactions, resulting in time savings and reduced fees (Madan & Yadav, 2016). It is essential for retailers to consider the increasing customer inclination towards digital payments by adopting m-wallets. This enhances customer satisfaction and loyalty, which may contribute to increased foot traffic and sales (Babu and Verkijika, 2018). M-wallet transactions provide retailers with valuable digital records that facilitate performance analysis, inventory management, and sales trend tracking. Retailers have the opportunity to utilize these records to obtain credit by leveraging their transaction history (Musa, and Acheampong, 2015). Governments and financial institutions are providing support for digital ecosystems, enabling unorganized retailers utilizing m-wallets to maintain their competitiveness (Sivasubramanian, and Rajendran, 2020). Retailers that are unable to adapt may find themselves at a disadvantage, potentially leading to a shift of customers towards competitors who offer digital payment options. M-wallets facilitate digital transactions, promoting clarity and accountability in the unorganized retail sector. This fosters a harmonious relationship between retailers and Government regulations, ensuring compliance with tax systems for enduring sustainability (Shukla, and Chadha, 2023). Therefore, it is crucial to include not only the perspectives of consumers, but also the perspectives of merchants (specially traders in unorganized sector) in order to have a comprehensive understanding of the adoption of mobile service technology (Sivasubramanian, & Rajendran, 2020).

Rationale Behind the Study

The current research falls within the wider context of digital financial inclusion and adoption of mobile payment in the unorganized retail sector with specific reference to semi-urban India. Even though mobile wallets (M-wallets) have become a significant tool of implementing cashless transactions, enhancing performance efficiency, and incorporating retailers into the formal financial landscape, the adoption of this tool among unorganized retailers is uneven and under-researched. Existing literature largely highlights the advantages of M-wallets in reducing transaction costs, minimizing risks associated with cash handling, and enhancing customer convenience and loyalty (Madan & Yadav, 2016; Babu & Verkijika, 2018). Nevertheless, the disorganized retail market, which is mostly comprised of small traders, street vendors, roadside kiosks, and household retailers, continues to rely on cash transactions mainly because of technological unfamiliarity, infrastructural constraints, and behavioural resistant to digital systems (Singh, 2020). Although the government provides incentives encouraging the adoption of digital transactions, there are still many semi-urban retailers who believe that mobile payment systems are not only complex but also less trustworthy than conventional cash-based practices. As a result, the particular problem area of the study is to understand how the adoption of M-wallet impacts the financial inclusion, operational sustainability, and competitive adaptability of unorganized retailers who operate in semi-urban emerging markets such as India (Ram and Selvakumar, 2023; Yang et al., 2023).

Research Gap and Research Questions

The literature review shows that the scholarly studies on digital payment systems have largely focused on the consumer, banking or organized retail sectors, but relatively little attention has been paid to the perceptions and experiences of unorganized retailers and small traders. The empirical evidence of M-wallet adoption in the semi-urban unorganized retail setting remains underdeveloped, although such studies have been partially done by Kapoor et al. (2024), Mishra et al. (2022), Adhikary et al. (2021), and Shukla and Chadha (2023). In addition, technological acceptance and customer convenience are the two main dimensions that have been given less analytical attention in previous studies. Also, there is a contextual gap in the fact that most of the studies are urban based and fail to capture the realities in the context of semi-urban traders who are faced with infrastructural, educational and technological constraints. Hence, a research gap in conducting a comprehensive study of the role of mobile wallets in enhancing digital financial inclusivity and business transformation among unorganized retailers in emerging economies like India, particularly in semi-urban trading environments.

The mobile payment must traverse the business, payment network, smartphone provider, software application, and financial institution to complete the transaction. Consequently, m-wallet payments initiate with retail (unorganized) vendors. To encourage towards digital platforms, the Government has provided incentives, refunds, and exemptions (Singh, 2020). Retail

vendors who are not tech-savvy find digital transactions difficult to embrace. These retailers favour cash transactions and appreciate physical access to transactions. Thus, in developing nations like India, mobile wallet apps for unorganised commerce are still in their infancy.

Very few research have explored the impact of digital transaction and their effects on semi-urban unorganized retailers. A limited number of studies (Kapoor et al., 2024; Mishra et al., 2022; Adhikary et al., 2021; Shukla, and Chadha, 2023) have been identified that examine the perspectives of unorganized merchants or retailers within the realm of mobile payments or wallet services. But there is a dearth of study which focuses digital financial inclusion in un-organized retail trade in the emerging economy like India (especially in semi-urban segment) – which triggers the idea of the present study.

Mobile payments and wallet services have seen limited research, with only a few studies examining the perspectives of merchants and retailers, and even fewer addressing the unorganized retail sector. Thus, from this point of view, this study is unique and addressing a perfect research gap which triggers the following research questions:

RQ1: Does Ease of use, perceived usefulness, time management, transaction and benefit convenience of mobile wallet having a vital influence on Traders' or Merchants' behavioural intention (in un-organized sector)?

RQ2: How significantly does the perceived risk linked to mobile wallets act as a crucial moderating factor in influencing the loyalty of vendors in the un-organised sector towards digital payment applications?

Research Objectives

In light of the identified problem domain and literature gap, the present study seeks to examine the role and implications of M-wallet adoption among unorganized retailers in semi-urban India. The primary objective is to analyse how mobile wallet usage contributes to digital financial inclusion and business efficiency within the unorganized retail sector. The study further intends to investigate the perceptions, acceptance behaviour, and operational challenges experienced by small traders and street vendors while adopting M-wallet technologies. Another important objective is to assess whether digital payment adoption enhances customer satisfaction, transaction transparency, sales management, and access to formal financial services such as credit facilities and digital transaction records (Musa & Acheampong, 2015). Additionally, the study aims to evaluate the influence of government initiatives and digital ecosystem support mechanisms in encouraging technological adaptation among semi-urban retailers (Sivasubramanian & Rajendran, 2020). Through these objectives, the research aspires to provide a comprehensive understanding of how mobile wallet adoption can strengthen the sustainability and competitiveness of unorganized retail businesses in the evolving digital economy of India.

Theoretical Framework and Hypothesis Development

Customers need to know that they can use their smartphones for payments. Customers must show a readiness to adopt the technology and trust the parties involved to complete financial transactions safely and correctly (Kesharwani, and Bisht, 2012; Al-Okaily et al., 2023; Singh et al., 2024). This section outlines our assumptions based on technology adoption theories, the Theory of Convenience and the Theory of Risk aversion. The Technology Acceptance Model (TAM), proposed by Davis (1989), remains one of the most influential theories for explaining technology adoption, including mobile wallet usage. According to TAM, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the primary determinants of users' behavioural intention to adopt a technology. These cognitive beliefs influence users' attitudes, intentions, and subsequent behavioural responses toward technology acceptance. Contemporary research continues to validate TAM in digital payment contexts, demonstrating that perceived usefulness, ease of use, and trust significantly predict merchants' and consumers' intentions to adopt mobile payment technologies (Chawla & Joshi, 2023; Al-Qudah et al., 2023; Singh et al., 2024).

People making purchasing decisions seek balance by weighing the prices of goods or services against the costs of acquiring them (Berry et al., 2002). Moreover, convenience costs are becoming more important as predictors of patronage (Brown & Dant, 2008). For roadside merchants, convenience is key. Transaction simplicity and overall benefits boost patronage, enhancing merchants' intention to use mobile wallets. Recent empirical evidence indicates that transaction convenience, accessibility, and time savings positively influence merchants' continued usage intentions and overall satisfaction with digital payment platforms (Kumar et al., 2023; Gupta et al., 2024).

This study focuses solely on the extraction and use of satisfaction as a dependent variable. They have also demonstrated that behavioural intention is an intermittent dependent construct that directly impacts Traders' Satisfaction (Oliver, 1980) and Trust (Morgan, and Hunt, 1994). Management believes that improving trader satisfaction can boost retention rates (Anderson, 1993), increase consumption, and encourage positive recommendations, influenced by socioeconomic factors. Traders' Retention means merchants' ongoing connection to a specific system. Merchants' adherence means favouring one system over others. Multiple factors keep traders engaged. This study explores the link between satisfaction and retention in street-side unorganized traders. Recent studies further demonstrate that satisfaction remains a strong predictor of merchant loyalty, continuance intention, and long-term retention in digital payment ecosystems (Verma & Sinha, 2023; Nguyen et al., 2024). Accordingly, this study investigates how satisfaction influences the retention behaviour of street-side unorganized traders.

The Theory of Perceived Risk (Bauer, 1960) and Risk Aversion (Pratt, 1964) examine how individuals evaluate and react to possible adverse outcomes during decision-making, especially in situations characterized by uncertainty. This theory finds extensive application in marketing, consumer behaviour, and psychology,

elucidating the reasons behind consumers' reluctance to embrace new products or services and the strategies they employ to mitigate risks and alleviate uncertainty. Present study shows that, unorganized retail merchants in India use risk-averse transactional approaches due to economic problems. Recent studies consistently report that perceived risk remains a significant barrier to mobile wallet adoption, while trust, regulatory protection, and digital literacy help mitigate these concerns (Al-Okaily et al., 2023; Sharma et al., 2023; Gupta et al., 2024). In the Indian context, many unorganized retail merchants continue to adopt risk-averse transactional approaches due to financial vulnerability, uncertainty, and concerns regarding transaction security. Therefore, perceived risk is expected to play an important role in shaping trader satisfaction and retention in the digital payment environment.

Thus, the following hypothesis have been postulated:

Hypothesis 1: m- wallet's Perceived Usefulness positively influences the behavioural intention to adopt it in the unorganized sector.

Hypothesis 2: The Perceived Ease of Use of m-wallet favourably impacts unorganized sector behaviour.

Hypothesis 3: The perceived usefulness of a mobile wallet has a favorable impact on the perceived Ease of use to adopt m-wallet in respect of un-organized sector.

Hypothesis 4: Time Management in respect of unorganized merchants' perspective strongly influences behavioural intention of m-wallet.

Hypothesis 5: Transaction convenience from un-organized retailers' standpoint substantially influences behavioural intention mobile wallet adoption.

Hypothesis 6: Benefit convenience from unorganized traders greatly affects mobile wallet use.

Hypothesis 7: Positive behavioural intention is having a positive impact on the Trust level of targeted traders.

Hypothesis 8: Positive behavioural intention is having a positive impact on the Satisfaction level of targeted traders.

Hypothesis 9: Trust is having a positive impact on the Satisfaction level of targeted traders.

Hypothesis 10: There is a significant impact of traders' satisfaction on retention.

Hypothesis 11: Perceived risk has a significant moderating role in respect of unorganized traders' Behavioural Intention and Trust.

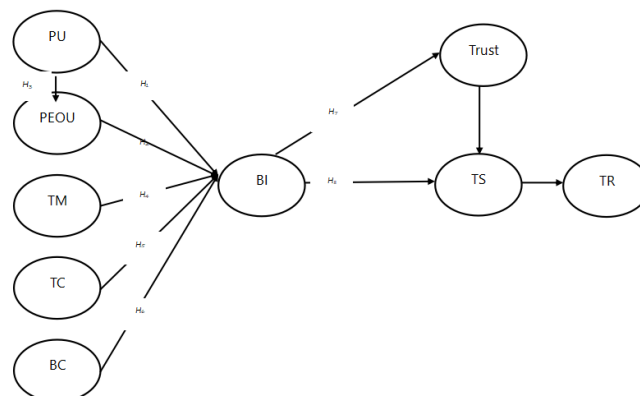


Figure 1: Conceptual Model

PU- Perceived Usefulness; PEOU- Perceived Ease of Use; TM- Time Management; TC- Transaction Convenience; BC- Benefit Convenience; BI- Behavioural Intention; TS- Traders' Satisfaction; TR- Traders' Retention; PR – Perceived Risk

Methodology Adopted

This study utilized convenience and purposive sampling techniques. Convenience sampling was chosen due to limited resources and easy access to respondents. This study uses purposive sampling to select specific individuals or units for investigation. This strategy works well when the researcher knows the key properties and aims to select a sample that truly represents them.

Researchers provided self-administered questionnaires to the respondents, aided by friends, and sought voluntary participation. Respondents received enough information to make informed choices about participating in the research and exercising their volunteer rights. The interviewers visited various street-side kiosks and unstructured outlets in semi-urban areas nearer to Kolkata and Siliguri City. This study involved individuals with

knowledge of digital banking, particularly those experienced with digital wallets. Precautions were taken at various stages to maintain the survey's integrity. The filter questions aimed to confirm if the respondent was at least 18 years old and had m-wallet experience. The final filter question sought to determine if respondents were willing to participate in the survey, ensuring their responses would remain confidential. Participants were contacted politely, and the research objective was explained. Research was conducted in six semi-urban areas nearer to Kolkata and Siliguri City to grab the essence and disparity of plane and hills, in West Bengal, with two trained interviewers explaining the questionnaire. Data collection occurred from January, 2023 to April 2023. Participants in this study were selected for their availability and willingness to answer the questions.

About 20% of those who were invited to take part in the poll ultimately decided not to take part. There were around 480 questionnaires sent out or distributed, and 384 were returned for analysis (the number of responses observed in the study was around 80 %). As 28 surveys

were missing data, the total usable sample size was 356. The researchers in this particular study decided against using online administration of the survey owing to the observed low rate of response (Herington and Weaven, 2009). The research investigated the minimal sample size need as suggested by Bartlett et al. (2010). They recommended setting a minimum sample size of 10 instances per item. Furthermore, the present sample also satisfies the minimum sample size requirements proposed by Kock, 2018, which is determined by the ratio of the sample size to the number of parameters. For normal distributions, the minimum threshold is set at 5:1.

In order to foster interest and emphasize the significance of the study some additional measures were taken to ensure the privacy and confidentiality of personal data. The estimated time required to complete the questionnaire ranged from 7 to 10 minutes. Each page of the questionnaire had an average of ten items. The majority of the questions were straightforward and designed as close-ended. In the questionnaire, the questions in sensitive nature, such as demographic information, were consciously avoided.

The present study had ten constructs: perceived usefulness, perceived ease of use, Time Management, Transaction Convenience, Benefit Convenience, Behavioural Intention, Traders' Satisfaction, Traders' Retention, Trust, and Perceived Risks. The research used previously validated scale (Referred to Table 1) to analyze the proposed conceptual model, which seeks to address the two specified RQs. The alterations included the replacement of questionnaire questions that were specifically tailored to a certain perspective. Content

validity (wording and meaning) was carefully assessed, and versions of the questionnaire were drafted in English and translated and narrated in Bengali and Hindi for maximum readability. The questionnaire's structure and content were then tested in a pilot study. The data obtained from the individuals involved in the pilot test was excluded from the analysis. Everything in the research was rated on a five-point Likert scale, from "strongly disagree" to "strongly agree," to ensure consistency. Table 1 contains information on the scales that were utilized.

In this work, a three-step analytical approach was used to evaluate the measurement model. Initially, a confirmatory factor analysis was used to identify the Reliability and Convergent and Discriminant Validity (Byrne, 2013; Hair et al., 2012). After that the Structural model estimation has been done to evaluate the path co-efficient and lastly, moderation and mediation analysis has been done. This analysis was conducted using PLS SEM 4.1 statistical software

Analysis and Result

4.1 Measurement Model Analysis

The main objective of a measurement model is to provide a thorough analysis of how well the observable latent indicators function as a valid and reliable tool for measuring the latent variables under investigation. This study employed a two-step analytical method to assess the measurement model. To begin with, a confirmatory factor analysis was employed to determine how each measure relates to a specific factor (Hair et al., 2012). Furthermore, the Fornell – Larcker Criteria analysis has been done to evaluate Discriminant Validity.

Table 1: Indicators of Measurement Model

Latent Variable		Factor Loading	Alpha Value	CR (rho_a)	CR (rho_C)	AVE
01	Ease of Use (Venkatesh et al., 2012 & Davis et al., 1989)		0.807	0.811	0.886	0.722
EOU1	It is simple to use	0.877				
EOU2	The mobile wallet application may be conveniently accessed at any time and from any location.	0.805				
EOU3	The use of m-Wallet entails less exertion	0.866				
02	Perceived Usefulness (Venkatesh et al., 2012 & Davis et al., 1989)		0.768	0.771	0.866	0.683
PU1	M-Wallet made it easier for me to receive clients' Payment	0.839				
PU2	M-Wallet made it easier for me 24x7 transaction	0.837				
PU3	M-wallet payments is easy to handle.	0.805				
03	Time Management (Mobarek, 2007)		0.772	0.777	0.8681	0.687
TM1	m-Wallet saves time .	0.851				
TM2	M-Wallet payment makes easier to handle the consumer	0.780				
TM3	M-Wallet reduces the que of the consumer in short time	0.854				
04	Transaction Convenience (Berry et al., 2002)		0.773	0.784	0.869	0.689

TC1	m-Wallet makes transaction easy	0.886				
TC2	m-Wallet makes transaction convenient	0.772				
TC3	m-Wallet makes transaction hassle-free	0.828				
05	Benefit Convenience (Berry et al., 2002)		0.714	0.736	0.840	0.638
BC1	I can avail the digital advantage with minimum effort	0.789				
BC 2	M-Wallet is easy to handle and advantageous	0.873				
BC 3	M-Wallet ensures proof of Payment which helps me to update the accounts	0.727				
Moderating Variable						
06	Perceived Risk (Ou et al., 2014; Jia et al., 1999)		0.844	0.863	0.906	0.762
PR1	Rare possibility to lose the internet connection during online transaction	0.863				
PR2	Risk of losing confidentiality of the information is very low	0.915				
PR3	the integrity of the app can be trusted	0.840				
Dependent Variable						
07	Behavioural Intention (Venkatesh et al., 2012 and Davis et al., 1989)		0.705	0.711	0.836	0.630
IU1	To me using the m-wallet is an easier option than physical transaction	0.729				
IU2	I use the m-wallet facility more frequently than physical transaction	0.806				
IU3	I will keep utilizing m-wallet phone-based apps for most of my transactions in future	0.842				
08	Trust (Ou et al., 2014)		0.728	0.761	0.846	0.649
T1	m-wallet provide trustworthy financial services	0.802				
T2	m- wallets ensures trustworthy secure transactional services	0.884				
T3	m-Wallet safeguards confidential private information	0.722				
09	Traders' Satisfaction (Chang and Thai.,2016)		0.714	0.719	0.840	0.637
TS1	m-Wallet satisfy my satisfaction	0.760				
TS2	I am quite contended and prefer to use M-Wallet	0.781				
TS3	M-Wallet satisfies my purpose of use	0.850				
10	Traders' Retention (Ou et al., 2014)		0.789	0.792	0.877	0.704
TL1	I will continue utilizing mobile wallet apps in the future.	0.859				
TL2	The advantage which I conceive through the use of M-wallet makes me loyal.	0.850				
TL3	I will recommend others to use M-wallet	0.807				

This study's construct reliability and validity—factor loading, Cronbach's alpha, Dijkstra–Henseler's ρ_A , Composite Reliability, and Average Variance Extracted—are shown in Table 1. Each factor loading value above 0.7, suggesting substantial relevance. The AVE values for all constructs surpass Hair et al. (2017)'s 0.5 criteria. So, convergent validity is proven. All composite reliability (C.R.) values exceed 0.7. All values of Dijkstra–Henseler's ρ_a must be over 0.7 to measure internal consistency reliability in PLS-SEM, since all values match the requirement, internal consistency is confirmed.

The researchers also compared the square root of the average variance extracted (AVE) to the correlation coefficients for each concept to determine discriminant validity. The square root of AVE (Average Variance Extracted) surpassed correlation coefficients in Table 2. This verifies Fornell and Larcker's 1981 assertion that the measuring scale is discriminant. Additionally, each construct's correlation coefficients were significant.

Table 2: Discriminant Validity - Fornell and Larcker's Criteria

	BC	BI	PEOU	PU	PR	TC	TM	TRUST	TS	TR
BC	0.798									
BI	0.252	0.794								
PEOU	0.233	0.242	0.850							
PU	0.215	0.213	0.395	0.826						
PR	0.175	0.210	0.320	0.343	0.873					
TC	0.178	0.201	0.298	0.250	0.355	0.830				
TM	0.169	0.194	0.233	0.241	0.318	0.266	0.829			
TRUST	0.160	0.191	0.203	0.239	0.281	0.273	0.336	0.805		
TS	0.154	0.188	0.198	0.226	0.258	0.259	0.314	0.379	0.798	
TR	0.145	0.160	0.193	0.223	0.234	0.298	0.301	0.372	0.374	

4.2 Common Method Bias [CMB]

Both independent and dependent components were assessed by gathering responses from the same participant, which may result in the presence of common method bias (CMB). Therefore, to analyse the CMB, we used Harman's one-factor test (Fuller et al., 2016). The total variance explained was 32.1%, which is less than 50%. As a result, it may be said no significant CMB exists in the data. Since all the VIF findings are less than 3.0, it can be conformed that, no significant CMB exist.

Table 3: Goodness to Fit Model

	Saturated model	Estimated model
SRMR	0.045	0.058
d ULS	0.3029	0.3113
d G	0.2212	0.2466
Chi-square	766.2455	784.552
NFI	0.921	0.943
rms Theta	0.0492	

4.3 Goodness to Fit Model

It is imperative to verify the proposed research model's suitability for the intended purpose of this study before testing the primary hypotheses. This can be achieved by utilizing a set of indicators. This was achieved by employing a goodness-of-fit model. The model has a reasonable fit, as evidenced by different criteria which gives a moderately satisfactory result exhibited in Table 3.

4.4 Structural Model Estimation

The structural model was estimated using the bootstrapping technique (Vinzi et al., 2010), a resampling method that generates around 5,000 subsamples from the original data. We estimated the path coefficients and their significance.

Table 4: Path Co-Efficient

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Remarks	VIF
H1	PU -> BI	0.024	0.024	0.074	0.330	0.741ns	Not Significant	1.906
H2	PEOU -> BI	0.239	0.236	0.075	3.203	0.001**	Significant	1.744
H3	PU -> PEOU	0.795	0.796	0.016	50.311	0.000**	Significant	1.009
H4	TM -> BI	0.153	0.153	0.080	1.925	0.05 *	Marginally Significant	2.870
H5	TC -> BI	0.323	0.327	0.089	3.625	0.000**	Significant	1.227.
H6	BC -> BI	0.198	0.199	0.062	3.211	0.001**	Significant	2.183
H7	BI -> TRUST	0.324	0.327	0.042	7.715	0.000**	Significant	2.085
H8	BI -> TS	0.542	0.542	0.049	11.102	0.000**	Significant	2.287

H9	TRUST -> TS	0.381	0.381	0.048	7.902	0.000**	Significant	1.188
H10	TS -> TR	0.874	0.875	0.012	73.784	0.000**	Significant	1.099

Note: **Indicates p-value significant at 1% level; *Indicates p-value significant at 5% level

In Table 4 the Structural Model Estimation has been shown. Table 4 presents the results of hypothesis testing, indicating that all hypotheses [except H1; it is not supported] are supported. The perceived usefulness ($\beta = 0.024$, $t = 0.330$) has no impact on Behavioural Intention, that's why, H1 is not supported. Other hypothesis are supported and significant. In addition, the multi-collinearity issue is not detected as all values of VIF are less than 3.

Table 5: Estimation of R2 and adjusted R2

	R-square	R-square adjusted
Behavioural Intention	0.790	0.787
TRUST	0.821	0.819
Traders' Satisfaction	0.784	0.782
Traders' retention	0.763	0.763

The SmartPLS algorithm calculated R2 measures for each endogenous construct. The adjusted R2 values for m-wallet based digital transaction in respect of unorganized Traders "Behavioural intention", "Trust", "Traders' Satisfaction", and "Traders' Retention" were 0.787, 0.819, 0.782, and 0.763 respectively. These values indicate that the proposed model accounted for 78.7% of the variation in Behavioural intention towards mobile- wallet based payment system adoption in respect of unorganized traders and 81.9% of the variance in respect of Trust factor and 78.2% of the variation in Traders' Satisfaction and i.e. 76.3% of the variation in Traders' Retention.

Mediation and Moderation Analysis

Table 6: Mediation Analysis

Paths	Direct Impact (Beta Value)	Indirect Impact (Beta Value)	Mediation Impact
PU -> PEOU -> BI	0.024ns	0.190**	Full Mediation
BI → TRUST → TS	0.123**	0.542**	Partial Mediation

Note: **Indicates p-value significant at 1% level; *Indicates p-value significant at 5% level

During the evaluation, particularly in the context of mediation analysis, it has been observed that Perceived Ease of Use plays a Full mediating role between Perceived Usefulness and Behavioural intention. Trust plays a Partial mediating role between Behavioural intention and Traders' Satisfaction.

Table 7: Moderation Analysis

Interaction and Direct Effect	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	p-value	Remarks
H9: Perceived Risk X BI → Trust (Interaction Effect)	-0.084	-0.084	0.035	2.377	0.017	Supported
Perceived Risk → Trust (Direct Effect)	0.587	0.585	0.039	15.114	0.000	Supported

Note: **Indicates p-value significant at 1% level; *Indicates p-value significant at 5% level

Effect on Adjusted R-Square

Trust [without PR moderator]	0.693	Substantial Increase in adjusted R2 value when moderator added
Trust [with PR moderator]	0.819	

f2 VALUE

Perceived Risk x BI → Trust	0.024	Large effect
Perceived Risk → Trust	0.639	Large Effect

Hypothesis 11 is supported as the p-value is below the 1% significance level. Thus, it can be inferred that Perceived Risk greatly influences the Trust factor in digital m-wallet based transaction in respect of Unorganized Retailers. The researchers have identified a substantial negative association of Perceived Risk as moderator between Behavioural Intention (BI) and Trust. It may be inferred that, enhancement of effect of Perceive Risk weaken the relationship between BI and Trust. It has also been observed that Substantial Increase in adjusted R2 value when moderator added.

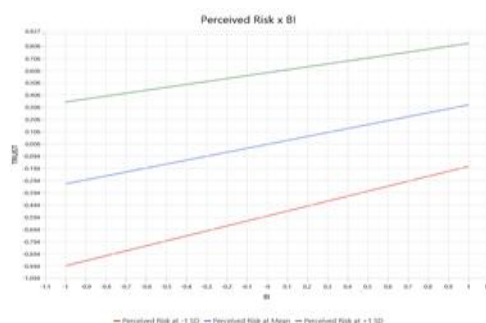


Fig 2: Slope Analysis

Simple Slope Analysis gives conditional (simple effect) of exogenous are various level of moderators. When we are having moderation effect – it always tested on +1 sigma and -1 sigma to see its effect on the relationship between Behavioural Intention (BI) and Trust (TR). Here moderation effect is significant; +1 standard deviation increase in Perceived Risk (PR) would cause i.e. $(0.542 + (-0.084))$ (i.e. green line) change in relationship between BI and Trust. Here moderation effect is significant -1 standard deviation decrease in Perceived Risk would cause $(0.542 - (-0.084))$ (i.e. red line) change in relationship between BI and Trust. As p-value is significant, we can say that Perceived Risk (PR) negatively moderates the relationship between BI and Trust. That means the increase of PR value weakens the relationship between BI and Trust.

Since slope and statistical value are incompatible, the authors theoretically prioritized slope analysis and concluded that, because unorganized semi-urban vendors lack knowledge or understanding of perceived risk (PR), PR moderates BI and trust to a mild degree.

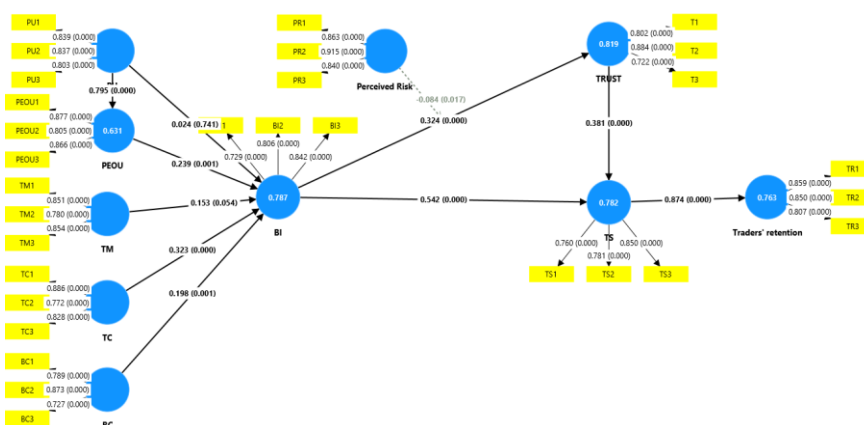


Fig 3: Statistically Proven Model

PU- Perceived Usefulness; PEOU- Perceived Ease of Use; TM- Time Management; TC- Transaction Convenience; BC- Benefit Convenience; BI- Behavioural Intention; TS- Traders' Satisfaction; TR- Traders' Retention; PR – Perceived Risk

Discussion and Implication

In the earlier study (Kapoor et al., 2024), - they show that there are thirteen inhibitors in respect of adoption of m-wallet. But in the present study the authors have tried to portray the adoption of m-wallet in respect of Unorganized Street kiosk in semi-urban segment. In another study Agarwal and Yadav, 2024 have shown that the adoption of m-wallet in rural MSME sector. In another study Kumar and Mathur (2021) have tried to portray the contactless m-payment in pandemic time through TAM model. But in the present study, the authors have tried to blend extended TAM and SERVCON framework and show that Perceived Usefulness has no significant impact on behavioral intention but the mediation effect through Perceived Ease of Use is evident. This is very unique finding and worth mentioning. Since people in the

unorganized retail trade sector are less educated and aware, usefulness alone doesn't change people's plans to behave, but making something easy to use will have a big effect on people's plans to behave. In the present study, there is a contradiction of statistical result and slope analysis of Moderation analysis. According to theory, Slope analysis is important thus it can be said that there is a mild moderation effect of Perceived Risk. Other latent factors directly influence behavioural intention, which significantly affects trust, whereas traders' satisfaction substantially impacts traders' retention.

TAM and UTAUT models dominate e-wallet adoption and experience studies (Turker et al., 2022). We focused on TAM and SERVCON in our investigation. We carefully selected and integrated components to discover how they affect satisfaction and trust, which drive traders' (here unorganized retailers) loyalty. The integration of the TAM and SERVCON frameworks has received limited attention in prior literature; thus, this study significantly enhances the current body of knowledge. The primary theoretical contribution is the endeavour to assess the readiness of unorganized

merchants in semi-urban area to adopt technologies such as mobile wallets. The street-side kiosk and informal vendors substantially enhance the proliferation of mobile wallet apps. In this study, Perceived Risk and Risk aversion Theory also contributes to the existing corpus of literature.

Specifically focussing on mediators and moderator, this research presents a mediation and moderation study which is distinctive in its presentation. This is another aspect in which the study has made a distinctive contribution to the corpus of literature that is currently available.

Mobile wallets offer a game-changing chance for unorganized vendors in semi-urban area, frequently working outside the formal financial system. M-wallet boost efficiency and security in daily transactions, empowering vendors who usually depend on cash. This digital shift minimizes risks and enhances financial management opportunities. The implications go beyond individual vendors; systemic factors significantly impact access to digital tools, highlighting issues of labour and economic equity. M-wallets can help unorganized vendors gain financial inclusion, but policymakers need to tackle the barriers to widespread use (Arora et al., 2023).

This study examines unorganized merchants' opinions on mobile wallet apps and their readiness to incorporate these tools into their business strategies. Unorganized merchants clearly resist adopting m-wallet systems. The hesitation stems from a reliance on cash, fear of technology, perceived risks, and a lack of understanding of electronic wallets.

This will help app developers effectively showcase the user-friendly features and advantages of their systems to merchants. Payment providers should focus on the small, unorganized sector to boost their awareness and adoption of mobile wallet services. Payment providers can encourage offline merchants to adopt mobile wallet services by emphasizing key benefits like compatibility, convenience, loyalty addition, and seamless transactions.

Conclusion and Recommendations

Semi-urban retailers encounter distinct challenges like low digital literacy, infrastructure problems, and cultural obstacles. Semi-urban areas frequently have limited access to formal banking services. M-wallets offer a simple digital payment solution. Trust and Perceived Risk are key for m-wallet adoption. Awareness and training gaps, poor internet connectivity, resistance to cash systems, and perceived risks are crucial for successful m-wallet integration. Tailored interventions can make digital payment systems work well for the semi-urban economy. Semi-urban areas close to cities combine urban and rural traits and flavour, influencing digital transformation. This research significantly enhances our understanding of technology, retail, and socioeconomics in a changing semi-urban landscape.

Perceived Usefulness does not significantly affect behavioural intention, but there is a clear mediation effect through Perceived Ease of Use. This finding is unique and noteworthy. In the unorganized retail trade sector, lower education and awareness indicate that usefulness alone won't change behaviour. However, simplifying usage can

significantly influence people's actions. An empirical model was developed based on elements identified in the literature, which were subsequently examined in their association with the adoption of technology by street side retail kiosk in the semi-urban segment. In this study, structural equation modelling was employed to conduct factor analysis and examine the linear associations among several aspects, including perceived usefulness; perceived ease of use; Time Management; Transaction and Benefit Convenience on kiosk-merchant's behavioural intention. Furthermore, we conducted an examination of the mediating and moderating impact of Trust and perceived risk on traders' satisfaction and retention and observed that "perceived risk" plays a pivotal moderating role for Traders' trust aspect which has a cascading impact on traders' satisfaction and retention in respect of adoption of m-wallet. Since there is a dearth of prior research on unorganized retail traders, our examination of merchant intent makes our study unique and noteworthy.

M-wallets can boost the efficiency of unorganized retailers, paving the way for economic growth and stability. Digital payment systems are beneficial because they lessen cash reliance, reducing theft risks and the hassle of handling physical money. M-wallets enable faster transactions, enhancing customer experience. Integrating m-wallets allows unorganized retailers to access valuable consumer behaviour and sales trend data, helping them to organize their strategies and inventories. The shift to digital finance helps retailers compete better and access larger markets, boosting their sustainability and profitability. Innovative technologies in mobile payments offer great opportunities for small kiosk retailers and customers alike. New technologies are seen as more beneficial than traditional methods. To remain competitive, unorganized retail traders are quickly adopting mobile wallet apps to serve their customers. Thus, from this point of view, the purpose of the study satisfy that entails the adoption of m-wallet payment systems by unorganized retail merchants in the semi-urban sector, focusing on their behavioural intentions, the mediating influence of trust, and the moderating impact of perceived risk, all crucial for financial inclusion and social transformation. Retailers can track customer purchases, gather ratings and reviews, and manage customer relationships using a mobile wallet system. Street-side merchants track customer purchase intentions and manage customer relationships through periodic promotions and intangible benefits, providing value-added services to loyal customers.

Future Scope of Study

To enable the development of attractive future research prospects, it is essential to underscore some critical limitations. Individuals among unorganized street vendors without prior experience with e-wallet payment methods are excluded from the research. Other contributing variables, such as financial situation, professional history, and educational achievement, should also be considered as moderating construct. This research concentrates only on the essential sectors of the neighbouring semiurban region of the Kolkata metropolitan area; yet, it has the capacity for extension to include both rural and urban demographics as well.

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