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Determining Enablers of Technology Adoption in Unorganized Localized Retail Outlets in India: A Technology Acceptance Model (TAM) Approach

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ABSTRACT

Digital transformation has changed customer expectations and behaviours leading to increased pressure on traditional businesses and disrupting the markets. The Indian retail market which is the third largest in Asia and fourth largest in the world majorly consists of the unorganised sector predominantly due to the presence of local stores and vendors with characteristic of low capital investment, family ownership, heavy dependence on cash transactions. The e-commerce platform and the emergence of phygital technologies are posing threat to the existence of these retail stores. To prevent such vulnerabilities, it is vital for small retailers to digitise their sales and business operations for survival. This study focused on the identification of the enabler's technological adoption in unorganized small localized unorganized Kirana stores. A theoretical model was constructed with certain modifications based on technology adoption models: Technology Acceptance Model (TAM) and to understand the pertinent factors impacting the intention of retailers for technology adoption. Through survey method, the data was collected from 603 Unorganized Localized Retail Outlets Stores from different regions of India and the theoretical model was validated. Specifically, perceived trust emerged as a crucial factor in fostering positive attitudes toward technology adoption. Furthermore, the model explained a substantial proportion of variance in behavioural intention, highlighting the importance of addressing trust and usability concerns to facilitate Technological adoption. The study significantly adds value to the scant literature available before the era of phygital.

Keywords: Technology Adoption, Unorganized Retail Outlets, E-Commerce, Small Retailers, TAM, Kirana Store
JEL Classifications: O31, O33

1. INTRODUCTION

In the digital era, technological advancements have reshaped the global retail landscape, with Technology adoption emerging as a key driver of this transformation. Unorganized retail outlets, small traditional retail outlets, form the backbone of India's retail sector, catering to a large portion of the population (Ali et al., 2017). However, the rise of technology introduced both challenges and opportunities for these store owners. The ability to adopt and integrate Technology into their business operations could significantly enhance the competitiveness of Unorganized retail outlets in the rapidly evolving market (Islam et al., 2021). Technology Acceptance Model (TAM), which posits that perceived ease of use and perceived usefulness are key determinants of technology adoption, provides a robust framework for understanding Unorganized retail outlet owners' attitudes toward Technology adoption (Adhikary et al., 2021).

Across the globe, the retail industry has witnessed a shift toward digital platforms, driven by the convenience and flexibility they offer to both consumers and businesses. Small and medium-sized enterprises (SMEs), including local retail outlets, have increasingly embraced technology to expand their customer reach, improve operational efficiency, and remain competitive (Szajna, 1996).

Countries like China and the United States have seen a rapid proliferation of technological adoption across all retail sectors, fostering innovation and new business models (Roy et al., 2018a). However, despite the growth, many small businesses in developing economies face barriers such as lack of digital literacy, financial constraints, and infrastructure challenges in adopting Technological technologies (Dugar and Chamola, 2021).

India, with its burgeoning internet user base and smartphone penetration, presents vast opportunities for technological growth and adoption. Government initiatives like Digital India and the rise of fintech solutions have accelerated the digital transformation of the retail sector (Venkatesh and Davis, 2000). Unorganized retail outlets, despite their dominance in India's unorganized retail market, have been slower to adopt technological platforms compared to larger retailers (Dishaw and Strong, 1999a). This reluctance is often attributed to concerns over technological complexity, cost, and a perceived mismatch between traditional business models and digital sales channels (Gefen and Keil, 1998). However, with changing consumer behaviours, increased digital literacy, and the rise of hybrid retail models (both offline and online), Unorganized retail outlet owners are increasingly recognizing the value of adopting technology in business operations.

In the Indian retail industry, Unorganized retail outlets account for a significant portion of sales, particularly in rural and semi-urban areas. These stores offer convenience, personal relationships, and flexible credit to customers, which have been key to their success (Srivastava et al., 2024). The key characteristics of these stores include low capital investment, family ownership, heavy dependence on cash transactions, credit facilities to customers (Yun et al., 2012), low margins (Rani, 2013), home delivery facilities, and personalized services. These stores operate as small supermarkets while meeting the local community's needs (Sinha et al., 2015). However, the influx of online grocery delivery platforms like Big Basket, Grofers, and Amazon Pantry has disrupted the traditional retail ecosystem. (Van der Heijden, 2003) and characterized by low levels of technical and accounting standardization (Maruyama & Trung, 2007). To stay competitive, Unorganized retail outlet owners are now exploring digitalization of processes, including partnerships with online platforms, setting up their own digital stores, or using social media for order management (Malhotra, 2024). The adoption of digital payment systems, logistics support, and customer management tools has the potential to modernize these stores, enabling them to better serve tech-savvy consumers and access a broader market (Schierz et al., 2010). Understanding how unorganized retail outlet owners perceive the usefulness and ease of integrating Technology into their operations is essential for fostering wider technology adoption in this crucial segment of the retail industry.

In existing literature several studies have focused on aspects related to enablers and barriers of technology adoption by the retail store (Rodríguez-Espíndola et al., 2022; Battistoni et. al., 2023) but there these studies have overlooked the unique challenges and motivations of the small, unorganized neighborhood retailer segment, such as their financial constraints and affordability, limited technology expertise and training, low-to-moderate readiness to adopt technology, hyper-localized customer dynamics, and infrastructure issues and having low demand for high technology (Kim and Yoon, 2022).

The low levels at which more advanced technology is adopted shows that traditional retailers do not value technology as an enabler (Ramakrishnan, 2010). This study, through the lens of the Technology Acceptance Model (TAM), aims to examine the factors influencing Unorganized retail outlet owners' intention to adopt technology for their retail store, shedding light on the opportunities and challenges in this transition.

2. PROPOSED MODEL AND DEVELOPMENT OF HYPOTHESIS

The proposed research model of this study is based on technology adoption model technology acceptance model (TAM) which is widely regarded as a robust framework for analyzing the factors influencing technology adoption. According to TAM, perceived usefulness (PEU) and perceived ease of use (PEOU) directly impacts on behavioral intentions to use technology and includes based on beliefs and attitudes towards the adoption of technologies (Chatterjee and Kumar Kar, 2020). However, in context to unorganized retail sector of an emerging economy like India which is characterised by low-to-moderate readiness to adopt technology, security i.e. a feeling of distrust on technology primarily due to security and privacy reasons (Mukherjee et al., 2009) which has been identified as inhibitors to use new technologies (Parasuraman, 2000), is a significant factor which should be included as a key determinant to influence behavioral intent to adopt technology and influencing the attitude toward the technology. This attitude includes comfort, satisfaction, and trust in the buying process. Apart from this many other factor like important predictors for digitalization and digital transformation are cost, compatibility, social influence also impacts the behavioral intention to use the technology. These factors, focusing on their relevance and application to Unorganized retail outlet owners' decision-making processes concerning Technology adoption.

The proposed research model considers that the perceived usefulness, perceived ease of use, perceived trust as core determinants impacting the attitude towards digitalization intentions of businesses.

2.1. Perceived Ease of Use

Perceived ease of use (PEOU) is a critical factor influencing the adoption of Technology by Unorganized retail outlet owners (Gefen and Keil, 1998). This concept refers to the degree to which the technology is perceived as easy to understand, implement, and use in daily operations (Barkhi and Wallace, 2007). Ease of use is particularly important in the context of Unorganized retail outlets, where many owners may have limited technical expertise or access to digital resources. Small business owners, particularly in traditional sectors, may hesitate to adopt technologies that are perceived as complex or difficult to navigate (Mathieson, 1991).

One of the challenges faced by Unorganized retail outlet owners is integrating Technology with their existing business processes. Many of these stores operate using manual processes, with little prior exposure to automated systems or digital tools (Ahn et al., 2007a). Therefore, Technology must be intuitive, requiring minimal training and support. The learning curve should be short, with platforms providing easy-to-follow tutorials, customer support, and step-by-step guides to assist owners in adopting the new technology (Gefen et al., 2003a).

Platforms that offer seamless integration with inventory systems, payment gateways, and customer relationship management (CRM) tools further ease the adoption process. Additionally, platforms that offer 24/7 support through helplines or chatbots provide a safety net for users who may encounter technical issues, reducing potential barriers to adoption (Castillo and Bigne, 2021).

When Unorganized retail outlet owners perceive that Technology are not only beneficial but also easy to use, their willingness to adopt the technology increases substantially. Furthermore, as many small business owners rely on peer networks and word-of-mouth recommendations, the ease with which the technology can be adopted plays a crucial role in spreading acceptance throughout the community (Barkhi and Wallace, 2007). This idea supports the development of the subsequent hypothesis:

H_1: Perceived Ease of Use significantly influences perceived usefulness to adopt Technology among Unorganized Retail Outlet owners.

The constructs of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) are crucial elements of technology models that positively influence the adoption of technology or policies in small industries (Kim and Lee, 2018). *"The degree to which an innovation is perceived not to be difficult to understand, learn, or operate"*. Parasuraman et al. (2002) Although PEOU has an indirect impact on the adoption of new technology via intention, its effect can sometimes surpass that of PU (Calvino and Criscuolo, 2019).

H_2: Perceived Ease of Use significantly influences Attitude to adopt Technology among Unorganized Retail Outlet owners.

2.2. Perceived Usefulness

A key determinant of technology adoption, perceived usefulness refers to the extent to which Unorganized retail outlet owners believe that utilizing Technology will enhance their business operations (Evanschitzky et al., 2015a). Small retailers often operate in highly competitive environments where efficiency, customer reach, and adaptability play pivotal roles in sustaining business growth (Straub et al., 1997). For many Unorganized retail outlet owners, the ability to streamline operations through digital platforms is increasingly viewed as a necessity rather than an option.

The features provided by Technology adoption, such as online ordering, inventory management, and customer data analytics, are recognized as powerful tools that enhance operational efficiency (Chen et al., 2002). The advantages provided to customers will increase their readiness to adopt a technological innovation (Kazancoglu and Yarimoglu, 2017).

Moreover, the ability to offer home delivery or click-and-collect options expands the store's reach beyond its immediate geographical area, attracting customers who may not be able to visit the physical store (Ahn et al., 2007a). This digitalization also enable integration with digital payment systems, making transactions quicker and more convenient for both the store owner and the customer. Consequently, when Unorganized retail outlet owners perceive these platforms as valuable tools that can directly enhance their business performance and profitability, they are more inclined to adopt them (Doll et al., 1998).

H_3: Perceived Usefulness has a positive impact on Attitude to adopt Technology among Unorganized Retail Outlet owners.

2.3. Perceived Trust

Perceived trust is an essential factor that influences the adoption of Technology among Unorganized retail outlet owners (Sun and Chi, 2019b). Trust encompasses concerns about the security, privacy, and reliability of digital platforms. Unorganized retail outlet owners, particularly those with limited exposure to digital systems, may be hesitant to adopt Technology to fears about online fraud, data breaches, or payment security (slam et al., 2021). The technology must be considered as an object of trust (Shankar et al., 2002).

For small business owners to trust digital platforms, they must believe that the system is secure and that their transactions and customer data will be protected (Mariani et al., 2021a). This trust can be built through transparent data protection policies, secure payment gateways, and reliable customer support services (Liu et al., 2003). Platforms that offer clear privacy policies, encrypted transactions, and fraud protection mechanisms are more likely to gain the trust of Unorganized retail outlet owners (Dishaw and Strong, 1999b).

Moreover, trust can be established through educational initiatives that help store owners understand the technology and its security features (Gefen et al., 2003b). Offering training sessions, webinars, and customer support can reduce uncertainty and build confidence in the platform. When store owners trust that their business data and transactions are safe, they are more likely to adopt and fully utilize the technology (Mariani et al., 2021b). Rauniar et al. (2014) mentioned that the ability for a user should be free of worries related to privacy and safety concerns while using technology.

H_4: Perceived Trust positively affects Attitude to adopt Technology among Unorganized Retail Outlet owners.

2.4. Attitude Toward Technology

The attitude of Unorganized retail outlet owners toward adopting Technology is shaped by a combination of their perceptions of usefulness, ease of use, and prior experiences with technology (Barahona Vinasco and Calderón García, 2017). In the context of technology acceptance, attitude refers to the overall disposition

or mindset that an individual has toward adopting a particular tool or system (Gefen et al., 2003a). For Unorganized retail outlet owners, this attitude can range from enthusiastic acceptance to hesitant resistance, depending on their individual circumstances and business goals (Ahn et al., 2007a).

Owners who hold a positive attitude toward Technology are likely to view it as an opportunity to modernize their business operations, attract a wider customer base, and enhance customer service (Barkhi and Wallace, 2007). Many small retailers recognize that customer preferences are shifting toward digital shopping experiences, particularly in urban areas where convenience and time-saving measures are highly valued (Evanschitzky et al., 2015a). As a result, they see Technology adoption as a way to remain competitive and relevant in a rapidly evolving retail landscape.

Conversely, negative attitudes toward Technology adoption can stem from fear of the unknown, scepticism about the technology's long-term value, or concerns about disrupting well-established business practices (Roy et al., 2018a). For many Unorganized retail outlet owners, personal relationships with their customers are central to their business model. The shift to digital transactions, which are often perceived as impersonal, may create concerns about losing the direct, face-to-face interactions that have traditionally formed the backbone of their customer service approach (Sun and Chi, 2019a).

Additionally, the costs associated with adopting and maintaining Technological may discourage some owners, particularly those operating on slim profit margins. The ability to invest in technology was challenging for these retailers despite their willingness to adopt and use technology for business operations. (Choudhry, 2017; Ravi and Krishna, 2018) However, affordable smartphones and cheaper internet have changed the landscape over the last few years.

2.5. Behavioral Intention

Behavioral intention is a critical component of TAM and refers to the likelihood that Unorganized retail outlet owners will actually adopt and use Technology for business purposes. Behavioral intention is shaped by both perceived usefulness and ease of use but is also influenced by social factors such as peer influence and competitive pressure. (Chen et al., 2004) When store owners observe their competitors successfully adopting technological platforms, and reaping the benefits, they may feel compelled to follow suit to avoid falling behind (Ahn et al., 2007b).

In addition, social networks play an important role in shaping behavioral intention. Many Unorganized retail outlet owners rely on the experiences and recommendations of fellow business owners within their community. Positive word-of-mouth, successful case studies, and demonstrations of tangible benefits can strongly influence the intention to adopt Technological platforms (Roy et al., 2018b).

The behavioral intention to adopt Technological platforms is further strengthened by the ease of implementation and the perceived benefits. When store owners believe that Technological platforms will not only improve their business but also integrate seamlessly into their existing operations, their intention to adopt the technology becomes more concrete with positively influencing the attitude towards technology leading towards behavioural intention.

H_5: A positive Attitude Toward Technology increases Behavioral Intention to adopt Technology among Unorganized Retail Outlet owners.

Based on all these discussions, Figure 1 represents the proposed research model.

3. RESEARCH METHODOLOGY

For the validation of the proposed model and for the hypotheses testing, survey-based empirical analysis was used. This study employs a quantitative research design to investigate the factors influencing technology adoption among small retailers, specifically focusing on Unorganized retail outlets in major Tier 1 cities of India (Mishra et al., 2024). The research aims to provide empirical evidence on the variables that affect technology adoption decisions, leveraging statistical analyses to draw meaningful conclusions from the collected data.

3.1. Participants

The target participants for this research were small retailers operating Unorganized retail outlets across Tier 1 cities in India, namely Mumbai, Delhi, Chennai, Kolkata, Pune, and Bangalore. These cities were selected due to their significant economic activity, high population density, and diverse market dynamics, making them ideal locations for studying technology adoption in the retail sector.

3.2. Sampling Method

A purposive sampling technique was utilized to identify and select participants for the study. This non-probability sampling method allows for the intentional selection of individuals who are knowledgeable and experienced in the field of retail operations,

Figure 1: Proposed model

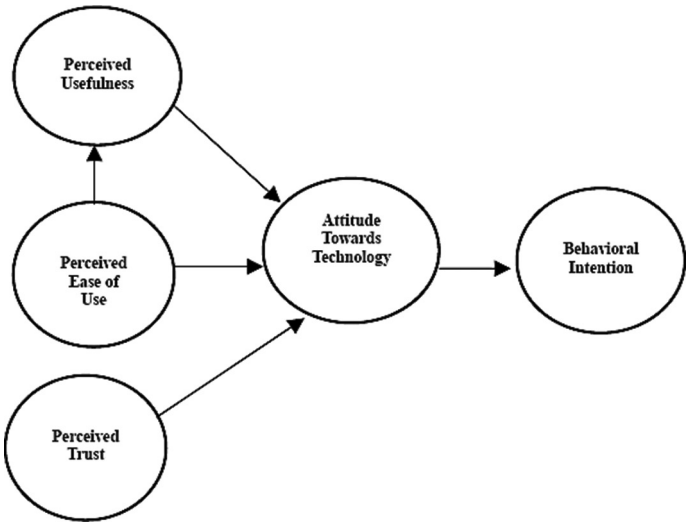

Table 1: Scale development

Item	Statement	Source
PT1	I trust the technology solutions I use for my store.	(AlSokkar et al., 2024a)
PT2	I believe that technology providers are reliable and trustworthy.	(AlSokkar et al., 2024b)
PT3	Customer data security is a priority when adopting new technology.	(Shaker et al., 2023)
PT4	I feel comfortable sharing sensitive information with technology platforms.	(Nasution and Azmin, 2018)
BI1	I intend to adopt new technologies in my store within the next year.	(Muthuswamy and Bayomei, 2023a)
BI2	I am willing to invest in technology to improve my business operations.	(Muthuswamy and Bayomei, 2023b)
BI3	I plan to encourage my employees to use new technology.	(Herrero-Crespo et al., 2022)
BI4	I believe that adopting technology will positively impact my business.	(Carter et al., 2012)
AT1	I have a positive attitude towards using technology in my store	(Yadav and Garg, 2017)
AT2	I believe that technology is beneficial for my business.	(Singh et al., 2024)
AT3	I feel enthusiastic about exploring new technological solutions.	(Yang and Yoo, 2004)
AT4	I think using technology can enhance my store's reputation.	(Premkumar et al., 2008)
PE1	I find it easy to learn how to use new technology tools.	(Chris Yang et al., 2012)
PE2	The technology I currently use does not require much effort to operate.	(Yadav and Garg, 2017)
PE3	I can easily find help when I encounter problems with technology.	(Chang and Caneday, 2011)
PE4	I feel comfortable troubleshooting minor technology issues myself.	(Shaikh et al., 2018)
PU1	Technology improves the efficiency of my store operations.	(Sardjono et al., 2019)
PU2	Using technology helps me serve my customers better.	(Alalwan et al., 2016)
PU3	I believe that technology can increase my store's profitability.	(Hikmah et al., 2023)
PU4	Technology adoption enhances my ability to compete in the retail market.	(Pandey et al., 2024)

Table 2: Demographic profile of respondents

Demographic variables	Category	Frequency	Percentage
Gender	Male	495	82
	Female	108	18
City	Delhi	94	15.6
	Mumbai	144	23.9
	Chennai	62	10.3
	Kolkata	76	12.6
	Pune	98	16.3
	Bangalore	129	21.4
Age	24 years-30 years	138	22.9
	31 years-37 years	172	28.5
	38 years-44 years	92	15.3
	44 years above	201	33.3
Education Level	No formal education	64	10.61
	High School	179	29.6
	Bachelor's degree	308	51
	Master's degree or higher	52	9
Monthly Income	<50,000	239	39.6
	50,000-1,00,000	172	28.5
	1,00,000-2,00,000	92	15.3
	Above 2,00,000	100	16.6
Year of Operation	<5 year	138	22.9
	5 year-10 years	273	45.3
	10 years-15 Years	92	15.3
	15 years and above	100	16.6

particularly those managing Unorganized retail outlets. By focusing on specific criteria, the research aims to ensure that the selected participants possess relevant insights into technology adoption within their businesses.

3.3. Sample Size

The sample size for this study was determined using Cochran's formula, which is a widely accepted statistical approach for calculating sample sizes in research. Based on the formula, a sample size of 603 respondents was identified as appropriate for ensuring reliable results.

3.4. Data Collection Procedure

Data collection took place between January 2024 and June 2024. The research involved the distribution of a structured questionnaire designed to capture various factors influencing technology adoption among the participants. The questionnaire was disseminated through both online and offline channels, including direct visits to Unorganized retail outlets and digital platforms to maximize outreach and response rates.

A total of 760 questionnaires were distributed to the identified participants, resulting in 676 responses, which corresponds to a response rate of approximately 89%. After conducting data cleaning and validation, 603 fully completed questionnaires were retained for the final analysis, with the remaining responses excluded due to incomplete information or inconsistencies.

3.5. Research Instrument Development

The primary data collection method utilized in this research was a structured survey questionnaire, which included a series of statements aimed at gauging participants' perceptions and attitudes towards technology adoption. The questionnaire was designed to capture the key constructs identified in the literature review, including perceived usefulness, perceived ease of use, cost considerations, social influence, facilitating conditions, technological readiness, cultural factors, and market dynamics.

To assess these constructs, a 5-point Likert scale was employed, where participants were asked to indicate their level of agreement with each statement ranging from 1 (strongly disagree) to 5 (strongly agree). This scale allows for nuanced responses and facilitates the quantification of attitudes towards technology adoption.

The structured questionnaire was pre-tested with a small group of Unorganized retail outlet owners to ensure clarity, relevance, and comprehensiveness of the items. Based on feedback received during the pre-testing phase, necessary adjustments were made to

enhance the validity and reliability of the questionnaire. Table 1 Demonstrate the Scale development and Items with sources , The Items has adapted from previous studies were used for the analysis.

4. DESCRIPTIVE AND EMPIRICAL ANALYSIS

The demographic analysis in Table 2 reveals that the majority of respondents were male, accounting for 82%, while females made up 18% of the sample. In terms of geographic distribution, the largest group of respondents came from Mumbai (23.9%), followed by Bangalore (21.4%) and Pune (16.3%), with other cities like Delhi (15.6%), Kolkata (12.6%), and Chennai (10.3%) having smaller representations. Regarding age, a significant proportion of respondents were between 31 and 37 years old (28.5%), followed closely by those aged 44 and above (33.3%).

Educational qualifications indicate that over half of the respondents (51%) held a bachelor's degree, while 29.6% had completed high school. A smaller percentage had no formal education (10.61%) or had attained a master's degree or higher (9%). In terms of monthly income, 39.6% of respondents earned <₹50,000, while 28.5% fell within the ₹50,000-₹1,00,000 range. Approximately 15.3% earned between ₹1,00,000 and ₹2,00,000, and 16.6% had a monthly income exceeding ₹2,00,000. Lastly, the year of operation showed that the largest portion (45.3%) had been in operation for 5-10 years, with a significant number operating for <5 years (22.9%).

Table 3 presents the reliability coefficients (Cronbach's Alpha), minimum and maximum values, means, standard deviations, skewness, and kurtosis of the items used in the analysis. All items were measured on a 5-point Likert scale. The perceived trust (PT) items (PT1-PT4) have Cronbach's Alpha values ranging from 0.767 to 0.772, indicating good internal consistency. The mean scores for these items range from 2.630 to 2.758, with standard deviations around 1.40, suggesting moderate agreement among respondents. The skewness values are positive, indicating a slight skew towards lower agreement, while the kurtosis values are negative, implying a distribution that is somewhat flatter than normal.

Behavioral intention (BI) items (BI1 to BI4) show Cronbach's Alpha values between 0.766 and 0.769, reflecting reliable consistency. The mean scores are between 2.569 and 2.695, with similar standard deviations around 1.40, indicating moderate variability in responses. The skewness is positive, suggesting a slight inclination towards disagreement, while kurtosis values, mostly negative, again reflect flatter distributions.

Attitude toward technology (AT) items (AT1-AT4) exhibit slightly higher mean scores, ranging from 3.041 to 3.226, with Cronbach's Alpha values between 0.760 and 0.763. This suggests that respondents generally have a neutral to slightly positive attitude toward technology. Skewness values are close to zero or slightly negative, indicating a relatively symmetric distribution of responses, while kurtosis values suggest flatter distributions.

Perceived ease of use (PE) items (PE1 to PE4) have mean scores between 2.713 and 3.036, with Cronbach's Alpha values around 0.762-0.770, indicating consistency across items. The skewness and kurtosis statistics show slight deviations from normality, but overall, the data points toward moderate agreement.

Perceived usefulness (PU) items (PU1-PU4) show Cronbach's Alpha values ranging from 0.769 to 0.777, indicating strong internal reliability. The mean values range from 2.561 to 2.735,

Table 3: Descriptive statistics

Item	N statistic	Cronbach's alpha	Minimum statistic	Maximum statistic	Mean statistic	Standard deviation	Skewness		Kurtosis	
						Statistic	Statistic	Standard error	Statistic	Standard error
PT1	603	0.768	1.0	5.0	2.758	1.4075	0.303	0.100	−1.234	0.199
PT2	603	0.767	1.0	5.0	2.660	1.4138	0.401	0.100	−1.171	0.199
PT3	603	0.772	1.0	5.0	2.630	1.4309	0.406	0.100	−1.194	0.199
PT4	603	0.770	1.0	5.0	2.650	1.4019	0.400	0.100	−1.146	0.199
BI1	603	0.767	1.0	5.0	2.695	1.4374	0.481	0.100	−1.156	0.199
BI2	603	0.766	1.0	5.0	2.683	1.4378	0.479	0.100	−1.187	0.199
BI3	603	0.767	1.0	5.0	2.569	1.4059	0.591	0.100	−1.011	0.199
BI4	603	0.769	1.0	5.0	2.682	1.4253	0.432	0.100	−1.175	0.199
AT1	603	0.762	1.0	5.0	3.226	1.3877	−0.165	0.100	−1.264	0.199
AT2	603	0.760	1.0	5.0	3.159	1.4135	−0.093	0.100	−1.378	0.199
AT3	603	0.763	1.0	5.0	3.041	1.3845	−0.010	0.100	−1.292	0.199
AT4	603	0.763	1.0	5.0	3.144	1.4493	−0.076	0.100	−1.373	0.199
PE1	603	0.770	1.0	5.0	2.930	1.3487	0.119	0.100	−1.245	0.199
PE1	603	0.767	1.0	5.0	3.036	1.4126	0.003	0.100	−1.335	0.199
PE3	603	0.762	1.0	5.0	2.713	1.4044	0.314	0.100	−1.231	0.199
PE4	603	0.766	1.0	5.0	2.705	1.4186	0.307	0.100	−1.225	0.199
PU1	603	0.777	1.0	5.0	2.735	1.4511	0.286	0.100	−1.323	0.199
PU2	603	0.773	1.0	5.0	2.633	1.4119	0.426	0.100	−1.124	0.199
PU3	603	0.769	1.0	5.0	2.590	1.3868	0.442	0.100	−1.089	0.199
PU4	603	0.772	1.0	5.0	2.561	1.4157	0.495	0.100	−1.089	0.199

Table 4: Correlation

	PT	BI	AT	PE	PU
PT					
Pearson correlation	1	0.347**	0.164**	0.225**	0.223**
Sig. (2-tailed)		0.000	0.000	0.000	0.000
N	603	603	603	603	603
BI					
Pearson correlation	0.347**	1	0.345**	0.371**	0.171**
Sig. (2-tailed)	0.000		0.000	0.000	0.000
N	603	603	603	603	603
AT					
Pearson correlation	0.164**	0.345**	1	0.459**	0.145**
Sig. (2-tailed)	0.000	0.000		0.000	0.000
N	603	603	603	603	603
PE					
Pearson correlation	0.225**	0.371**	0.459**	1	0.334**
Sig. (2-tailed)	0.000	0.000	0.000		0.000
N	603	603	603	603	603
PU					
Pearson correlation	0.223**	0.171**	0.145**	0.334**	1
Sig. (2-tailed)	0.000	0.000	0.000	0.000	
N	603	603	603	603	603

with skewness values suggesting a slight positive skew. The kurtosis values are negative, suggesting a flatter distribution.

Overall, the reliability of the constructs is confirmed with Cronbach's Alpha values all above 0.76, and the descriptive statistics reveal moderate agreement across the items, with slight skewness and kurtosis in the data.

The correlation analysis in Table 4 aligns well with the proposed model, which highlights the relationships among perceived trust (PT)**,** Attitude toward technology (AT)**,** perceived ease of use (PE)**,** perceived usefulness (PU)**,** and behavioral intention (BI) in the context of technology adoption among Unorganized Retail Outlet owners. Based on the proposed model, here's an adjusted explanation of the correlation analysis:

a. Perceived trust (PT) shows a moderate positive correlation with attitude toward technology (AT) ($r = 0.347$, $P < 0.001$), indicating that as trust in technology increases, retail owners develop a more favorable attitude toward the technology. This emphasizes the importance of fostering trust to create positive attitudes, which can subsequently influence adoption.
b. PT also exhibits smaller but significant positive correlations with perceived ease of use (PE) ($r = 0.225$, $P < 0.001$) and perceived usefulness (PU) ($r = 0.223$, $P < 0.001$). This suggests that higher levels of trust in the technology contribute to the belief that the technology is easy to use and useful, reinforcing its value and practicality in business operations.
c. Attitude toward technology (AT) is strongly correlated with behavioral intention (BI) ($r = 0.345$, $P < 0.001$), highlighting that positive attitudes toward technology lead to a stronger intention to adopt it. This underscores the central role of attitude in influencing adoption behavior.
d. AT also shows a strong positive correlation with perceived ease of use (PE) ($r = 0.459$, $P < 0.001$), indicating that individuals who perceive the technology as easy to use are more likely to hold a positive attitude toward it. The link between perceived usefulness (PU) and AT is weaker ($r = 0.145$, $P < 0.001$), but still significant, suggesting that the perceived benefits of technology also contribute to a favorable attitude, albeit to a lesser extent than ease of use.
e. Perceived ease of use (PE) and perceived usefulness (PU) are moderately correlated ($r = 0.334$, $P < 0.001$), implying that technologies perceived to be easier to use are also seen as more useful. This interrelationship strengthens the overall perception of the technology's value.
f. Behavioral intention (BI) is strongly correlated with Perceived Ease of Use (PE) ($r = 0.371$, $P < 0.001$), which means that retail owners who find the technology easy to use are more likely to intend to adopt it. The correlation between BI and perceived usefulness (PU) was not directly discussed but would be expected based on the model to show a positive relationship, as greater perceived usefulness typically leads to a stronger adoption intention.

Table 5 provides the model summary for the regression analysis. The model explains 24.2% of the variance in the dependent variable, as indicated by the R Square value of 0.242. The Adjusted R Square, which accounts for the number of predictors in the model, is slightly lower at 0.237, suggesting that the model performs well even after adjusting for additional predictors. The Standard Error of the Estimate is 3.23098, indicating the average distance between the observed and predicted values.

The R square change of 0.242 shows that the model accounts for 24.2% of the variance, with the F Change statistic of 47.851 being significant at $P < 0.001$, as denoted by the Sig. F change value of 0.000. This indicates that the model as a whole, including the predictors perceived usefulness (PU), attitude toward technology (AT), perceived trust (PT), and perceived ease of use (PE), significantly contributes to explaining the variance in the dependent variable.

Table 6 presents the results of the ANOVA analysis, which assesses the overall significance of the regression model. The regression sum of squares is 1998.117, and with 4 degrees of freedom **(**df**),** the Mean Square for the regression is 499.529. The residual sum of squares is 6242.672 with 598 degrees of freedom, leading to a mean square of 10.439 for the residuals.

The F-statistic is 47.851, and the associated Sig. value is 0.000, indicating that the regression model is statistically significant at $P < 0.001$. This confirms that the predictors in the model (perceived usefulness, attitude toward technology, perceived trust, and perceived ease of use) collectively explain a significant portion of the variance in the dependent variable.

The results of the regression analysis, as shown in Table 7, highlight the impact of various factors on behavioral intention (BI) to adopt technology among Unorganized Retail Outlet owners. The model includes perceived trust (PT), attitude toward technology

Table 5: Model summary

Model	R	R-square	Adjusted R square	Standard error of the estimate	Change statistics				
					R-square Change	F-change	df1	df2	Sig. F change
1	0.492[a]	0.242	0.237	3.23098	0.242	47.851	4	598	0.000

Table 6: ANOVA

Model	Sum of squares	df	Mean Square	F	Sig.
1					
Regression	1998.117	4	499.529	47.851	0.000[b]
Residual	6242.672	598	10.439		
Total	8240.789	602			

(AT), Perceived ease of use (PE), and perceived usefulness (PU) as independent variables.

The unstandardized coefficients reveal that perceived trust has a coefficient of 0.252 ($P < 0.001$), indicating a significant positive relationship with BI. This suggests that for every unit increase in perceived trust, the intention to adopt technology increases by 0.252 units. Similarly, attitude toward technology has a coefficient of 0.175 ($P < 0.001$), demonstrating that a favorable attitude also contributes positively to the intention to adopt, with an increase of 0.175 units for each unit increase in attitude.

Perceived ease of use shows a coefficient of 0.228 ($P < 0.001$), which highlights its significant influence on BI, meaning that as the perceived ease of using technology increases, so does the intention to adopt it. In contrast, Perceived Usefulness has a coefficient of 0.231**,** but with a significance level of 0.785, indicating that it does not have a statistically significant effect on behavioral intention in this context.

The standardized coefficients (Beta) further illustrate the relative strength of these relationships, with PT showing the highest impact (Beta = 0.263), followed by AT (Beta = 0.201) and PE (Beta = 0.217). The collinearity statistics indicate that there are no multicollinearity issues among the independent variables, with tolerance values above 0.2 and VIF values below 5, confirming the robustness of the regression model. Overall, the findings suggest that while trust, attitude, and ease of use are key predictors of technology adoption intention, perceived usefulness does not significantly contribute to this intention among Unorganized Retail Outlet owners.

The collinearity diagnostics presented in Table 8 examine the potential multicollinearity among the independent variables—perceived trust (PT), attitude toward technology (AT), perceived ease of use (PE), and perceived usefulness (PU). The eigenvalues and condition indices indicate that the model does not suffer from severe multicollinearity, as no condition index exceeds the threshold of 15, with the highest being 11.122.

The variance proportions further show that each variable contributes differently across components, with notable proportions for PT (49% and 37%) and PE (90%) in components 2 and 4, respectively. Perceived Usefulness (PU) also shows a higher variance proportion (66%) in component 3, which suggests some shared variance but not enough to raise multicollinearity concerns. The overall diagnostics suggest that multicollinearity is within acceptable limits.

4.1. Hypothesis Results

- H_1: Perceived ease of use significantly influences perceived usefulness to adopt technology among unorganized retail outlet owners.
  Result: The analysis supports H_1, indicating a significant positive relationship between Perceived Ease of Use (PE) and Perceived Usefulness (PU), with a correlation coefficient of 0.334 ($P < 0.001$). This implies that as Unorganized Retail Outlet owners find the technology easier to use, they are more likely to perceive it as useful for their business operations.
- H_2: Perceived ease of use significantly influences attitude toward technology among unorganized retail outlet owners.
  Result: H_2 is strongly supported by the findings, showing a strong positive correlation between Perceived Ease of Use (PE) and Attitude Toward Technology (AT), with a coefficient of 0.459 ($P < 0.001$). This suggests that the ease of use significantly influences a favorable attitude toward technology adoption.
- H_3: Perceived Usefulness has a positive impact on attitude toward technology among unorganized retail outlet owners.
  Result**:** The hypothesis H_3 is supported, as there is a significant positive correlation between perceived usefulness (PU) and attitude toward technology (AT), with a correlation coefficient of 0.145 ($P < 0.001$). However, this relationship is relatively weaker compared to other variables, indicating that while usefulness contributes to shaping attitude, ease of use plays a more dominant role.
- H_4: Perceived trust positively affects attitude toward technology among Unorganized Retail Outlet owners.
  Result: H4 is supported, with a significant positive correlation between perceived trust (PT) and attitude toward technology (AT) ($r = 0.164$, $P < 0.001$). This suggests that building trust in technology enhances a positive attitude toward its adoption.
- H_5: A positive attitude toward technology increases behavioral intention to adopt technology among unorganized retail outlet owners.
  Result: H_5 is strongly supported, as the analysis shows a strong positive correlation between attitude toward technology (AT) and behavioral intention (BI), with a coefficient of 0.345 ($P < 0.001$). This confirms that a positive attitude significantly enhances the intention to adopt technology among these retail owners.

Table 7: Coefficient

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% confidence interval for B		Collinearity statistics	
	B	Standard error	Beta			Lower bound	Upper bound	Tolerance	VIF
1									
(Constant)	3.033	0.600		5.054	0.000	1.854	4.211		
PT	0.252	0.036	0.263	7.077	0.000	0.182	0.321	0.920	1.087
AT	0.175	0.035	0.201	4.994	0.000	0.106	0.243	0.785	1.274
PE	0.228	0.045	0.217	5.116	0.000	0.141	0.316	0.707	1.415
PU	0.231	0.039	0.230	0.273	0.785	−0.065	0.086	0.865	1.156

Table 8: Collinearity diagnostic

Model	Eigenvalue	Condition index	Variance proportions				
			Constant	PT	AT	PE	PU
1							
1	4.730	1.000	0.00	0.00	0.00	0.00	0.00
2	0.098	6.946	0.00	0.49	0.32	0.06	0.07
3	0.087	7.369	0.00	0.37	0.08	0.00	0.66
4	0.046	10.117	0.01	0.00	0.44	0.90	0.13
5	0.038	11.122	0.99	0.14	0.16	0.04	0.15

The results indicate that perceived trust (PT), perceived ease of use (PE), and attitude toward technology (AT) are key factors that influence behavioral intention (BI) to adopt technology among unorganized retail outlet owners. perceived usefulness (PU), while still significant, shows a comparatively weaker influence on shaping attitudes and behavioral intentions compared to ease of use and trust. Therefore, improving ease of use and building trust should be prioritized to encourage the adoption of technology in this context

5. CONCLUSION, IMPLICATIONS AND LIMITATIONS

This study provides valuable insights into the key factors influencing technology adoption among unorganized retail outlet owners. The analysis highlights the critical role of perceived ease of use in shaping both perceived usefulness and attitude toward technology, suggesting that making technology user-friendly is fundamental to fostering positive attitudes and perceived benefits. This relationship underscores the importance of simplifying technological interfaces to encourage broader acceptance among retail owners. The hypotheses from the TAM model for PEU and PEOU were found to be supported in our study and also consistent with the earlier findings (Chatterjee and Kumar Kar, 2020; Venkatesh et al., 2012).

Moreover, Perceived Trust is shown to significantly affect both attitude toward technology and behavioral intention, indicating that trust-building measures are crucial for promoting technology adoption. Retail owners are more likely to adopt technology when they trust it, further reinforcing the need for reliable, secure, and transparent technological solutions.

While Perceived Usefulness contributes to a positive attitude, its influence is comparatively weaker, implying that ease of use and trust may have a more substantial impact on the adoption process than the mere perception of usefulness. This suggests that practical considerations—such as ease of integration and reliability—may take precedence over perceived utility in the decision-making process.

Finally, the strong positive correlation between attitude toward technology and behavioral intention underscores the importance of cultivating favorable attitudes to drive actual technology adoption. Retail owners with a positive outlook toward technology are more likely to exhibit higher intentions to integrate it into their businesses.

Overall, these findings emphasize the importance of focusing on ease of use, trust, and attitude formation in efforts to promote technological innovations in the unorganized retail sector. Policymakers and technology providers should prioritize these aspects to facilitate smoother adoption and integration of new technologies.

As retail moves towards 'phygital' which refers to the blend of physical and digital elements, encompassing scenarios where brick-and-mortar stores accept digital payments, oversee their operations through digital means, and maintain an online presence, the challenges for the unorganized kirana store to sustain remain a challenge. A major hurdle for kirana retailers is drawing in new customers who are tech-savvy, as many of these retailers face difficulties with technology and are unable to provide contemporary services like online ordering. Small-format retailers can broaden their customer reach by adopting digital technologies and e-commerce approaches. Additionally, digitisation improves their creditworthiness; using point-of-sale (POS) systems, digital payment options, as well as debit and credit methods, produces useful data that assists lenders in offering credit. For kirana stores, adopting digitisation means shifting from cash transactions to digital or online payments, employing applications for handling different operations (such as inventory, billing, and finances), and integrating into the e-commerce environment. By addressing these factors, stakeholders can encourage greater adoption of Technology in this vital sector, ultimately contributing to the digital transformation of the retail industry (Martínez-López et al., 2015).

These implications suggest that policymakers and Technological platform developers should prioritize building trust and simplifying the user experience to encourage adoption among

Unorganized retail outlet owners. By enhancing these critical factors, stakeholders can contribute to the digital transformation of traditional retail in India, ultimately leading to improved competitiveness and sustainability in the evolving market landscape. This research adds to the existing literature on technology adoption in small businesses and provides valuable insights for promoting Technological in the retail sector.

This study has several limitations. First, it uses a cross-sectional design, which may not allow for establishing causal relationships among the variables. Second, self-reported data can lead to inaccuracies, as participants might not accurately represent their technology use or perceptions. Additionally, focusing solely on Tier 1 cities may limit the generalizability of the findings to smaller towns or rural areas. Lastly, external factors such as market trends or economic changes were not considered, which could also impact technology adoption among Unorganized retail outlet owners.

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