ANALYSING FACTORS INFLUENCING TECHNOLOGY ADOPTION BY UNORGANIZED RETAILERS USING UTAUT 2 FRAMEWORK

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ABSTRACT

The swift progress of technology has greatly altered the worldwide retail environment, but its implementation among loosely organised retailers, especially in developing markets such as India, has not been thoroughly investigated. This paper examines the determinants of technology adoption among unorganised merchants in Kolkata using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) paradigm. The main objective of the study is to examine the influence of Perceived Value (PV) and Perceived Ease of Use (PEU) on the implementation of technology in this industry. The study employed a quantitative empirical approach, gathering data from 698 participants using standardised questionnaires. The data underwent analysis using Partial Least Squares Structural Equation Modelling (PLS-SEM) and the Tukey HSD Post Hoc Test statistical tests. The results demonstrate that both perceived value (PV) and perceived ease of use (PEU) have a substantial impact on the adoption of technology. Specifically, higher-income groups tend to see more value and ease in utilising technology. The findings offer important perspectives for policymakers, technology suppliers, and retail groups to formulate focused approaches that promote the digitisation of unorganised retail, ultimately improving operational effectiveness and competitiveness. The present study enhances the overall comprehension of digital inclusion within the retail sector and its capacity to stimulate economic development.

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Keywords: *Technology Adoption, Unorganised Retail, UTAUT 2, Perceived Value, Perceived Ease of Use, Performance Expectancy, Perceived Risks, Effort Expectancy, Facilitating Conditions.*

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Introduction

Information technology has been allocated approximately 50% of all new capital investments during the 1980s, which is indicative of the substantial expansion in the scope and applicability of computers and information technologies in contemporary organisations (Mookerjee et al., 2022). In order to convert this investment into increases in productivity, it is crucial that these technologies obtain acceptance and utilisation among people inside organisations. It is essential to comprehend the aspects that contribute to the adoption of technology, especially the components that impact the acceptance of advances, to fully exploit the advantages of technological progress (Patel & Connolly, 2007).

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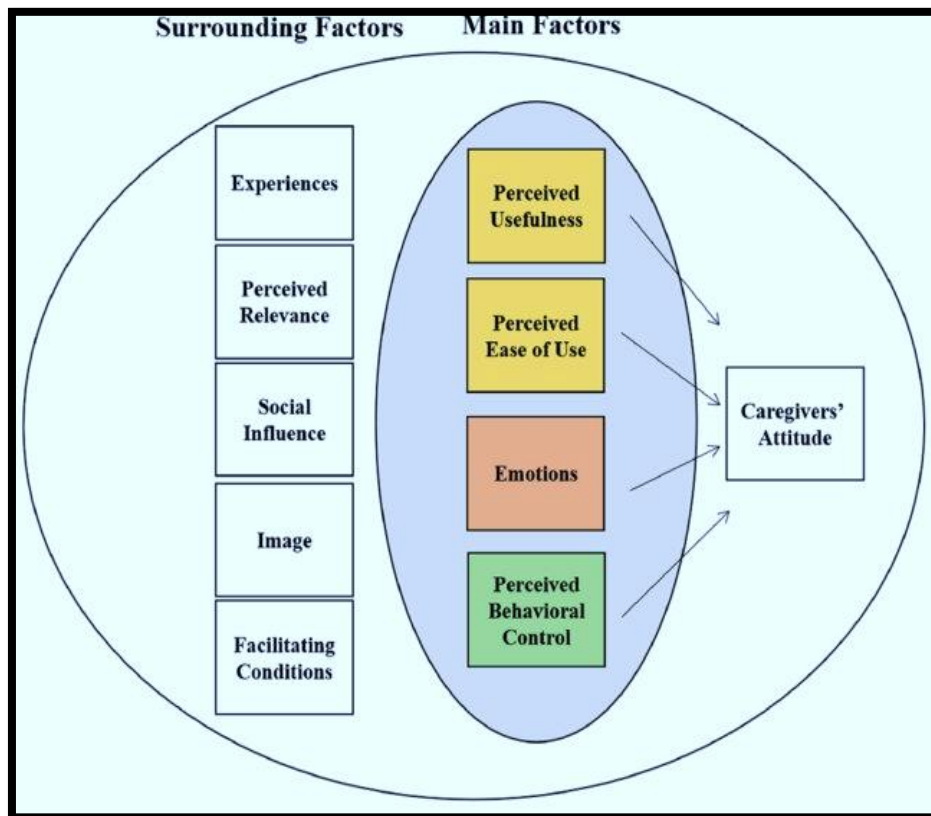
Figure 1: Factors Influencing Technology Adoption (Heitplatz et al., 2019)

The swift progress of technology has vastly transformed the worldwide retail environment, offering enterprises several prospects to increase productivity, enhance consumer satisfaction, and stimulate expansion. Nevertheless, the implementation of these technologies by unorganised merchants, especially in emerging countries such as India, continues to be a multifaceted and little investigated domain (Mookerjee & Chattopadhyay, 2022a). Given the significant presence of unorganised retail in India's retail industry, it is crucial to comprehend the elements that impact the adoption of technology. This understanding is necessary to promote inclusive growth and guarantee the competitiveness of these small enterprises in an ever more digital economy (Prasad et al., 2023).

Utilising the Unified Theory of Acceptance and Use of Technology 2, this study aims to analyse the factors influencing the use of technology among unorganised merchants in Kolkata (UTAUT 2) framework. Developed as an expansion of the original UTAUT framework, the UTAUT 2 model incorporates hedonic motivation, price value, and habit, making it especially appropriate for studying technology adoption in consumer settings. The objective of this study is to identify the main factors that influence the acceptance of technology in the unorganised retail sector by applying this model to its specific environmental context (Mookerjee & Chattopadhyay, 2022b).

The present study primarily examined two fundamental variables, namely Perceived Value (PV) and Perceived Ease of Use (PEU). These aspects were crucial in comprehending the perception of technology adoption among unorganised shops (Bhattacharjee et al., 2024). The results obtained from this study will offer significant important perspectives for policymakers, technology suppliers, and retail groups, enabling them to formulate focused initiatives that facilitate the digitalisation of unorganised businesses (Mookerjee & Chattopadhyay, 2022c). Consequently, this could result in higher operational effectiveness, improved consumer interaction, and enhanced overall competitiveness in the retail industry. This study makes a valuable contribution to the wider knowledge of digital inclusion in the retail industry and its capacity to stimulate economic growth by conducting a thorough examination of the influences on technology adoption (Prasad et al., 2023).

Objectives

- To analyse the factors affecting technology adoption by unorganized retailers using PLS-SEM within the UTAUT 2 framework.
- To compare the impact of different product categories and retail formats on technology adoption among unorganized retailers using Tukey HSD- Post HOC Test.

Review of Literature

The aim of the study conducted by **Tandon et al. (2016)** was to investigate the perceived level of risk and the elements that impacted the behavioural intention of individuals who engage in online shopping in India. The present study employed the "Unified Theory of Acceptance and Use of Technology (UTAUT2)" to conduct an empirical evaluation of website design, cash-on-delivery (COD) as a payment method, and several dimensions of perceived risk. The study results revealed an inverse relationship between perceived risk and behavioural intention, whilst motives were positively associated with behavioural intention.

In the current era, the use of information systems and modern technology has become indispensable for almost every organisation. Using a theoretical framework derived from existing literature, researchers analysed and evaluated 15 models and theories of technology adoption at the individual level. The assessment focused on the models that were significantly dependent on assumptions. In their review, **Mookerjee and Chattopadhyay (2022a)** presented a succinct summary of the constraints and advantages of various models and concepts, providing useful perspectives on the determinants of technology adoption.

Mookerjee and Chattopadhyay (2022b) conducted a comprehensive analysis of statistical tests suitable for the UTAUT2 paradigm, which specifically investigates the adoption and effective use of technology. The primary objective of this study was to examine the incorporation of technology under unstructured retail environments. The present study investigated the statistical techniques used to assess the associations between technology usage and other characteristics within unstructured merchants. For academics and practitioners seeking to use the UTAUT2 model to gain a deeper understanding of technology adoption in unstructured stores, this paper is a crucial reference.

Ram and colleagues (2022) investigated the Technology Continuance Theory, which integrated the theoretical frameworks of the "Technology Acceptance Model (TAM)", "Cognitive Model (CM)", and Expectation Confirmation Model (ECM). The aim of this theory was to analyse users' motivations to persist in utilising information technology. This study rigorously supported the adoption of automation technologies in the retail sector, emphasising their substantial advantages and effectiveness for unstructured buyers.

Research Methodology

- **Research Design:** The research methodology chosen for our study on unstructured retailers in Kolkata is empirical, with a specific focus on quantitatively analysing data obtained from a structured survey. This methodology enables a methodical analysis of the perspectives of unstructured retailers on the adoption of technology, particularly assessing concepts such as Perceived Value (PV) and Perceived Ease of Use (PEU).
- **Sampling:** The study sample included of 698 respondents, who were chosen to represent different kinds of unstructured retailers. A stratified random sample technique was used, whereby the population was partitioned into strata according to the type of store, therefore assuring proportional representation of each group.
- **Data Collection:** The researchers gathered primary data by administering structured questionnaires specifically created to assess the perceived value (PV) and perceived ease of use (PEU) of technology adoption among the participants.
- **Data Analysis:** The survey data was analysed using "Partial Least Squares Structural Equation Modelling (PLS-SEM)" and the Tukey HSD Post Hoc Test algorithm. The reliability and validity of the measurement model were evaluated using PLS-SEM, with a specific emphasis on important indicators such factor loadings, "inner VIF values, Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)". This methodology enabled the assessment of the magnitude of the associations between the concepts of Perceived Value (PV) and Perceived Ease of Use (PEU), therefore offering valuable understanding of how unstructured retailers perceive the worth and simplicity of adopting technology. Furthermore, the Tukey HSD Post Hoc Test was used to examine variations in views among respondents of varying income levels.

Results

In the PLS-SEM measurement methodology, the Perceived Value (PV) construct exhibits a high level of dependability and a robust representation of the idea. The factor loadings for PV1 (0.971) and PV2 (0.884) are significantly high, suggesting that these items possess strong predictive power in assessing respondents' perception of the value of technology adoption. Specifically, they demonstrate the ability to justify expenses by highlighting advantages such as operational efficiency and cost savings. The low Inner VIF (1.113) indicates the absence of substantial multicollinearity, suggesting that each item makes a distinctly independent contribution to the construct. Moreover, the reliability measures, such as "Cronbach's Alpha (0.856) and Composite Reliability (0.926)", above the permissible limits, thereby guaranteeing the robustness of the measurement. The Average Variance Extracted (AVE) of 0.862 indicates a high level of convergent validity, indicating that the items successfully measure the notion of perceived worth. Overall, respondents unequivocally link technology adoption with significant value, motivated by its prospective advantages and cost efficiency.

Table 1: Constructs and Item Descriptions of UTAUT-2 Factors

First-Order Construct Code	Item Code	Item
Perceived Value (PV)	PV1	The cost of adopting the technology is justified by the potential benefits it offers.
	PV2	Adopting technology offers cost-saving opportunities in terms of operational efficiency, reduced expenses, or increased revenue potential.
Perceived Ease of Use (PEU)	PEU1	Adopting technology in business is very useful.
	PEU2	With the help of technologies chances of achieving things have got increased.
	PEU3	Using the technology has simplified work processes and tasks.
	PEU4	Technology helped to accomplish things more quickly.

The construct of Perceived Ease of Use (PEU) determines how respondents evaluate the level of simplicity and effectiveness in using technology for their commercial applications. The factor loadings for the items vary between 0.641 and 0.892. Among them, PEU4 (0.892) is particularly noteworthy as a strong indicator, underscoring the significance of technology in accelerating tasks. Although PEU1, PEU2, and PEU3 have somewhat lesser loadings, they nonetheless offer significant insights into several dimensions of usability, including the utility of technology and its contribution to streamlining work procedures. Within the range of 1.189, the Inner VIF values reflect little multicollinearity, implying that each item contributes distinct value to the construct. The reliability characteristics, such as Cronbach's Alpha (0.778) and Composite Reliability (0.843), provide evidence that the concept is consistently assessed, albeit with somewhat greater variability in comparison to Perceived Value. The Average Variance Extracted (AVE) of 0.577 indicates that the construct has strong convergent validity, successfully reflecting the respondents' sense of ease of use. In general, the PEU construct consistently shows that workers value technology for its capacity to streamline and accelerate their work processes.

Table 2: PLS-SEM Measurement Model for Price Value (PV)

Constructs	Item Code	Loadings	Inner VIF	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Perceived Value (PV)	PV1	0.971	1.113	0.856	1.154	0.926	0.862
	PV2	0.884					

Table 3: PLS-SEM Measurement Model for Perceived Ease of Use (PEU)

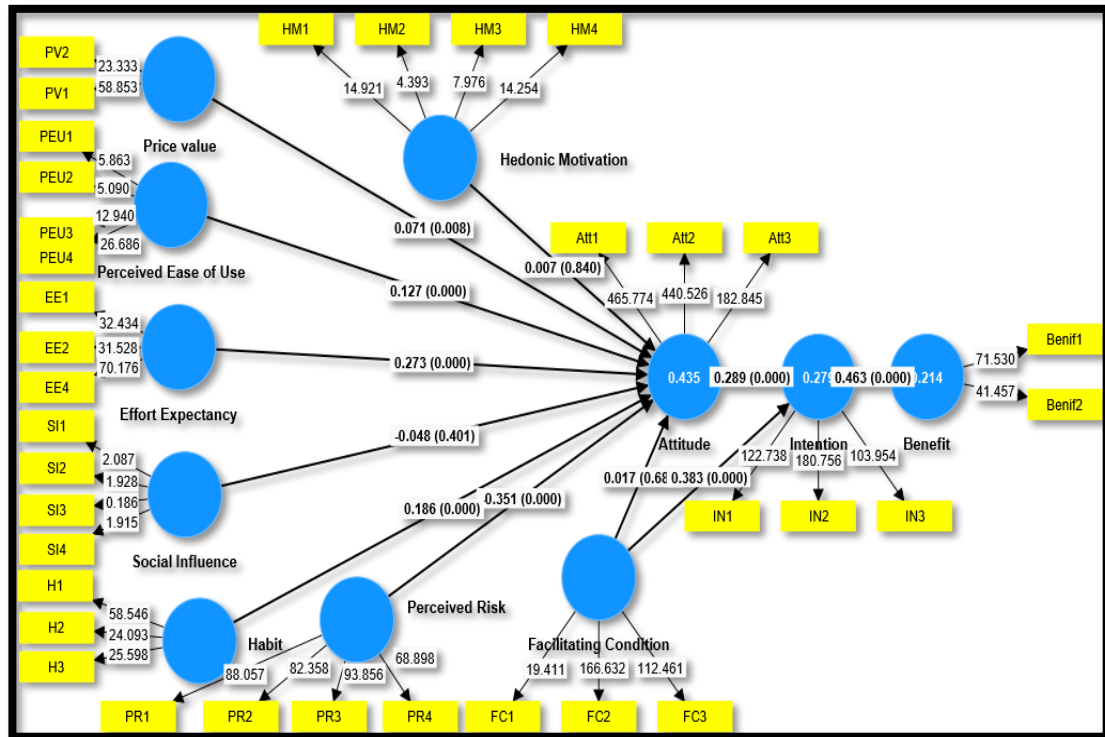| Constructs	Item Code	Loadings	Inner VIF	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Perceived Ease of Use (PEU)	PEU1	0.691	1.189	0.778	0.849	0.843	0.577
	PEU2	0.641					
	PEU3	0.788					
	PEU4	0.892					

Figure 2: Structural Equation Model (Path Analysis)

To assess Perceived Value (PV), the Tukey HSD post hoc test categorises respondents based on their income levels to evaluate their views of the value offered by technology. Survey results show that individuals with lower incomes (less than 25,000 and between 25,000 and 49,999) consider technology adoption to have moderate value, with average scores of 2.3796 and 2.4634, respectively. There is a positive correlation between income and perceived value, especially in the income ranges of 50,000 to 74,999 and 75,000 to 99,999, with mean scores of 2.8197 and 3.0263, respectively. This pattern indicates that when individuals' income increases, they are more likely to acknowledge the importance of the advantages provided by technology, maybe because they have more financial availability to invest in and utilise technology efficiently. The income group with the highest income (>1 Lakh) had the highest average score of 4.0000, suggesting a significant perception of value. This may be ascribed to their larger expectations and stronger ability to realise the potential advantages of technology. The obtained significance values of .502 for the first subset and .117 for the second subset indicate that although there exist variations in perceived value among different income levels, these variations do not reach statistical significance at the 0.05 alpha level. The findings suggest that although money does have an impact on perceived value, the differences are not substantial enough to be statistically significant. This implies that there is a somewhat consistent perception of value among various income levels.

Perceived Value				
Inc		N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a,b]	<25000	432	2.3796	
	25000 to 49999	123	2.4634	
	50000 to 74999	122	2.8197	
	75000 to 99999	19	3.0263	3.0263
	> 1 Lakh	2		4.0000
	Sig.		.502	.117

The Tukey HSD post hoc test for Perceived Ease of Use (PEU) indicates variations in the perception of technology usability across respondents from different income levels. The test classifies income levels into subgroups in order to compare their average scores on the PEU.

Survey results show that individuals with lower income levels (less than 25,000 and between 50,000 and 74,999) consider technology to be rather user-friendly, with average scores of 2.0469 and 2.0492, respectively. This indicates a predominantly favourable perception of the user-friendliness of technology among these demographic profiles. Higher income levels, especially in the income ranges of 25,000 to 49,999 and 75,000 to 99,999, are associated with higher perceived ease of use. The mean scores for these brackets are 2.2134 and 2.5132, respectively, indicating a more positive perception of the ease of use of technology. The segment with the greatest income (>1 Lakh) has a notably higher average score of 4.0000, suggesting that individuals in this income range consider technology to be even more user-friendly, maybe because of improved availability of resources or greater experience with technology.

The obtained significance values of.612 for the first subset and 1.000 for the second subset indicate that although there are variations in mean scores, these differences lack statistical significance at the 0.05 alpha level. This implies that the variation in perceived ease of use among income groups is not sufficiently substantial to be deemed meaningful.

Perceived Ease of Use				
Inc		N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a,b]	<25000	432	2.0469	
	50000 to 74999	122	2.0492	
	25000 to 49999	123	2.2134	
	75000 to 99999	19	2.5132	
	> 1 Lakh	2		4.0000
	Sig.		.612	1.000

Discussion

The PLS-SEM measuring methodology and Tukey HSD post hoc tests yield valuable insights into the views of technology adoption, specifically examining Perceived Value (PV) and Perceived Ease of Use (PEU) of technology across various socioeconomic levels. The PLS-SEM results demonstrate that the PV construct is very reliable, as seen by robust factor loadings for both PV1 and PV2. This suggests that respondents firmly link technology adoption with value, namely in relation to operational efficiency and cost reductions. The lack of multicollinearity and substantial reliability scores provide additional evidence of the measurement's robustness, while the high average variance extracted (AVE) indicates that the construct successfully represents the perceived value. The research findings suggest that, on the whole, participants perceive the use of technology as providing significant advantages, with the impression of value growing in correlation with income.

Furthermore, the PEU construct consistently shows that respondents, especially those in higher income groups, consider technology to be very helpful in streamlining work procedures and improving productivity, as indicated by factor loadings. Although there is significant variation in the factor loadings, the reliability analyses provide confirmation that the PEU construct is consistently evaluated. Despite being somewhat lower than that for PV, the Average Variance Extracted (AVE) for PEU nevertheless demonstrates robust convergent validity, implying that respondents usually see technology as user-friendly.

The post hoc tests conducted using Tukey HSD further emphasise these results by elucidating the correlation between income levels and judgements of value and convenience of use. Although higher income groups generally have a stronger opinion of the value and usefulness of technology, the differences in these perceptions among income groups are not statistically significant. This suggests that there is a rather uniform perspective on the advantages and functionalities of technology across various income levels. The observed consistency indicates that although income may have a certain impact on attitudes, the general favourable view of technology adoption is widely held among the participants. This further supports the notion that technology is highly appreciated for its capacity to improve efficiency and streamline activities.

Conclusion

The present study offers a thorough analysis of the primary determinants persuading the adoption of technology among unorganised retailers in Kolkata, specifically focussing on the UTAUT 2 framework. The results emphasise the critical influence of Perceived Value (PV) and Perceived Ease of Use (PEU) on the adoption and use of digital technologies by retailers. The strong association between income levels and perceived value highlights the significance of financial capacity in the adoption of technology, since those with higher incomes generally estimate bigger advantages from digitalisation. The study's rigorous methodology, which employed PLS-SEM to assess construct reliability and validity, guarantees that the results are both representative and statistically strong.

The implications for policymakers, technology providers, and retail associations are evident: by improving the perceived value and user-friendliness of technology, the unorganised retail sector may be driven towards digitalisation, resulting in enhanced operational efficiency and competitive positioning. The present study adds to the continuous discussion on digital inclusion by proposing that focused efforts can facilitate the digitalisation of unorganised retail, thereby promoting a more comprehensive and enduring economic development in developing countries such as India.

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