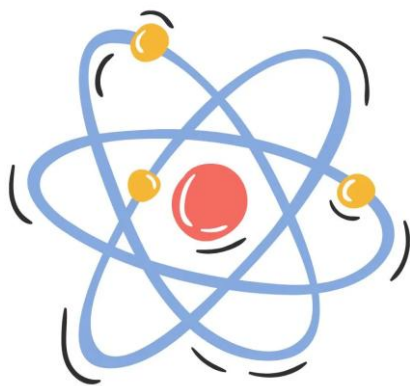




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DYNAMICS: THE ROLE OF DIGITAL
PAYMENTS IN INDIA'S
UNORGANIZED RETAIL SECTOR

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TRANSFORMING BUSINESS DYNAMICS: THE ROLE OF DIGITAL PAYMENTS IN INDIA'S UNORGANIZED RETAIL SECTOR

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Abstract: *This study analyses the factors influencing digital payment adoption by unorganized Indian retailers, with a spotlight on how varied business characteristics— qualification, nature of the business, years of establishment, nature of goods, turnover, and customer footfall influence the usage of digital payment systems. Independent samples t-tests and ANOVA were applied to assess variations across groups. Findings indicate significant associations between digital payment adoption and factors such as business type, product category, and customer visits per day, providing insights for policymakers and financial institutions aiming to accelerate digital inclusion in the unorganized sector.*

Keywords: *Digital Payment System, Unorganized Retailers, Anova, Digital Inclusion*

1. Introduction:

Digital Payment Systems (DPS) are technology-based channels for transferring money electronically, such as wallets, cards, UPI, devices, and internet banking. They have effectively taken the lead in changing the way payments are made by offering faster, safer, and more convenient alternatives. UPI was introduced by NPCI to promote digital payments, thus speeding the economy towards a cashless one, changing the way money moves between a consumer and a merchant. In India, informal merchants still face the brunt of numerous demographic and business barriers to adopting digital payments. This study seeks to map these very pain points and factors and delineate their force on the use of digital modes of payments. The UPI and mobile wallets were catalysts that raised the volume of digital payments by over 300% from 2017 to 2024 post the 2016 demonetization and Digital India drive. The technology has been readily embraced by organized retail, though it has put unorganized retail, which represents about 88% of the Indian retail market, at a distinct disadvantage because of infrastructural problems and low levels of digital literacy. The study will unpack how the different business traits impact the uptake of digital payments in this vital sector.

India's retail economy is undergoing a sea change as regards the adoptions of digital payments, most particularly embraced by the unorganized retail industry. This has more than an 85% share in the entire industry and is constituted mostly of small, informal businesses. Rapid adoptions of digital payments have enabled these firms to rationalize their operations and also to make the operations more efficient, as well as to reach a larger customer base. Therefore, embracing digital payments that make the life of customers easy as well as safe will bring more sales and customer satisfaction. These retailers, traditionally reliant on cash transactions and lacking technological infrastructure, are now adapting to a new environment influenced by widespread smartphone use, affordable internet access, and government digitization efforts. Understanding this aspect related to digital payments on areas like customer engagement, financial transparency, transaction volumes, and efficiency in operations and credit availability is necessary to understand the broader-based development in India's digital economy.

According to the Reserve Bank of India, there was a sharp rise in the volume of UPI transactions from 17.9 million in 2017 to more than 11 billion per month by 2024. This, therefore, reflected a significant change in the behaviour of consumers and merchants. The growth was also attributed to the support from the government's Digital India, PM Jan Dhan Yojana, BHIM APP, Aadhaar-enabled Payment Systems, etc., aimed at enhancing financial inclusion and reducing the uptake of cash. This has, in essence, redefined the retail sector in India. Although the general volume of digital payments has increased, the uptake is still not as prompt in the unorganized retail sector within the Tier-II stratum of cities such as Jaipur. While large and organized retailers have embraced digital payment systems with relative ease, the response from unorganized retailers has been mixed. Many small shopkeepers, street vendors, and local service providers are gradually integrating digital modes of payment into their daily operations, but adoption remains uneven due to infrastructural, behavioural, and economic barriers (Khaled et al., 2021; Rana et al., 2023). The shift to digital payment from cash changes the domains in which unorganized retailers traditionally operated informally and flexibly. These domains are the business practices, customer interaction, inventory management, and financial reporting of such small retail outlets. Therefore, the effects of DPS on their business characteristics, cost efficiency, customer satisfaction, competitive advantage, and data-based decision-making, has theoretical and practical relevance.

The literature that is available regarding digital payment adoption in India reflects that factors of compatibility, easy use and relative advantage with existing operations, and external support mechanisms amongst most of the factors contribute significantly to adoption rates (Hameed et

al., 2012; Venkatesh et al., 2012). While the challenges are substantial, the benefits of implementing digital payment systems are becoming increasingly clear. They will make transaction transparency possible, enable payments to be monitored in real time, reduce the effort and costs of cash management, and make an expedited and less cumbersome experience to the customers.

This would make the retailer more creditworthy and easily accessible to institutional finance. Thus, in the present whirlwind economy, the use of digital payments is not a fashion but a compulsion for running a successful business. Small retailers who fully adopt the digital payment system are more likely to participate in digital advertising to adopt digital supply chain monitoring and digital inventory management-big data and analytics activities that were traditionally reserved for formal firms (Shama et al., 2023). However, empirical research on how the digital payment system pertains to the business characteristics of informal retailers is relatively slim. Much of the current studies focus on adoption intentions and technological readiness and do not expound on how digital payment systems would, in the first place, revolutionize business operations. This study intends to bridge this gap by analysing the influence that digital payments have on different dimensions under the general rubric of business characteristics, such as controlling costs and growing sales, not leaving out customer relationship management, operational efficiency, and innovation. It also seeks to evaluate how the factors of business type and education, in addition to digital knowledge, years in operation, and daily turnover, affect the nature and impact of this adoption.

2. Objectives of the Study

1. To identify significant variations in digital payment system usage among different sub-groups within the unorganized retail sector.
2. To examine the impact of digital payment system adoption based on the type and nature of unorganized businesses.
3. To analyse variations in customer footfall and goods traded in relation to digital payment practices.

3. Hypothesis:

H₀₁: There is no significant difference in digital payment system across different qualification level.

H₀₂: There is no significant difference in digital payment system adoption across different types of businesses.

H₀₃: There is no significant difference in digital payment system adoption based on how many years the business has been running.

H₀₄: There is no significant difference in digital payment system adoption across different types of goods sold.

H₀₅: There is no significant difference in digital payment system adoption across different levels of average monthly turnover

H₀₆: There is no significant difference in digital payment system adoption based on the average number of customers per day.

4. Literature Review:

The proliferation of digital payment systems has been rigorously examined through established theoretical frameworks, including the Technology Acceptance Model (TAM), Diffusion of Innovation Theory (Alqahtani et al., 2024; Davis, 1989; Sahin, 2006), and the Technology-Organization-Environment (TOE) framework (Venkatesh et al., 2012) underscore the pivotal role of perceived ease of use and perceived usefulness in influencing technology adoption decisions. Though they form a big part of the country's retail business- more than 85% as per the Confederation of Indian Industry (CII)- it is small sellers who often face big problems when it comes to joining up with the digital world. These problems mostly come from not knowing much about the digital world, not having the right tools for it, and most people not being able to use digital technology (Id et al., 2019; Malik et al., 2021). The use of digital payment systems has elicited much interest in scholarship—especially when considering small, unorganized businesses within developing economies. A model that identifies core predictors which influence digital technology adoption was introduced by (Venkatesh et al., 2012). The model is UTAUT2, though it helps gain a foundation for understanding user behavior in unorganized sectors. Expanding on this, (Hameed et al., 2012; Herget et al., 2021) emphasized organizational readiness, top management support, and perceived usefulness as critical for digital adoption in small firms.

In the Indian context, highlighted that while digital payments have proliferated post-demonetization, small vendors often adopt these systems under peer pressure rather than strategic planning. (Singh et al., 2019; Ya'kob et al., 2024) through an empirical study, noted that mobile payment knowledge, network accessibility, and external support significantly affect adoption among micro-retailers. (Gong et al., 2024; Melo et al., 2023) found that unorganized retailers in Tier-II cities like Jaipur show improved operational efficiency and better customer retention after integrating digital payments.

However, (Rastogi et al., 2021; Rosen et al., 2015) argued that adoption is hampered by lack of digital literacy, infrastructure gaps, and fear of tax formalization. (Nguyen et al., 2022; Piotrowska, 2024) demonstrated the integration of digital payment systems (DPS) leads to enhanced firm performance through improved transactional transparency, increased customer convenience, and greater access to working capital credit facilities. A behavioural perspective was offered by (Rai et al., 2023) highlighted that from a behavioural standpoint, perceived risk and trust serve as critical mediators influencing technology acceptance within digital payment adoption. (Le, 2022) specifically observed that the adoption of QR-code-based payment systems has simplified business operations for informal vendors., while (Khaled et al., 2021) affirmed that aligning new technologies with existing business practices is crucial for facilitating digital adoption decisions. The literature suggests that while Digital payment systems hold transformative potential for unorganized retailers, the extent of impact varies widely depending on technological, organizational, and environmental contexts.

Influential Factors

- **Qualification and Education:** Previous studies (Premkanth, 2012) suggest that education positively correlates with technology adoption. Education includes no formal education, matriculation, post-matriculation, UG, and PG, etc.
- **Type of Business and Goods:** Different product types have varying customer payment preferences, which influence merchants' adoption behaviours (Allen et al., 2022). Types of business consist of sole owner of Kirana, fruit vendor, vegetable vendor, walkway chat shop, milk dairy, roadside puncher shop and others.
- **Turnover and Customer Base:** Retailers with higher turnover or customer footfall have more incentive to offer multiple payment options (Hameed et al., 2012).

5. Research Methodology:

Research Design

The research is based on primary data gathered from 63 unorganized retailers in both urban and semi-urban territories of Jaipur, Rajasthan. A structured questionnaire was used to record information on the use of digital payments, demographics, nature of the business, average turnover, and customer visits.

Sampling Technique

Stratified random sampling is done to represent the unorganized retailers from 11 zones of Jaipur. A total of 63 valid responses were obtained.

Variables

- Dependent Variable: Digital Payment System Usage
- Independent Variables: Qualification, Type of Business, Years in Business, Type of Goods Dealt, Average Monthly Turnover, Average Daily Customer Visits

6. Results and Interpretation:

Table 1: Reliability Statistics

Cronbach alpha	No. of Items
.863	31

The reliability assessment of the 31-item scale yielded a Cronbach's alpha coefficient of 0.863, signifying a high level of internal consistency. (Nunnally, 1975) a Cronbach's alpha value of 0.70 or higher is generally considered acceptable, with values above 0.80 indicating good reliability. The high internal consistency reinforces the scale's suitability for further statistical analyses and supports its application in assessing the intended construct (Aggarwal et al., 2021; Bonett & Wright, 2015)

Table 2: KMO and Bartlett's Test

Kaiser- Meyer- Olkin Measure of Sampling Adequacy		0.742
Bartlett's Test of Sphericity	Approx. Chi – Square	1173.947
	df	62
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) measure yielded a value of 0.742, indicating good sampling adequacy for factor analysis, as values between 0.7 and 0.8 are considered acceptable (Kaiser, 1974). Additionally, Bartlett's Test of Sphericity was significant ($\chi^2 = 1173.947$, $df = 62$, $p < 0.001$), suggesting that the correlation matrix is not an identity matrix and that the variables are sufficiently correlated to justify the application of factor analysis (Bartlett, 1950; Hill, 2011)

Table 3 : Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Digital Payment System	Male	38	3.5789	.68306	.11081
	Female	25	3.4000	.86603	.17321

The Group Statistics table shows that male unorganized retailers ($N = 38$) have a mean score of 3.5789 in the table of Group Statistics of digital payment system adoption, against their female counterparts ($N = 25$) with a mean score of 3.4000; hence, it means that on average, the former are slightly more inclined or positive toward using the system than the latter (Awa & Ojiabo, 2016). The standard deviation of males is 0.68306, less than that of females, 0.86603. This means that the responses from males are relatively more uniform, whereas females are more variable about their mean response. In totality, though the mean scores of the two genders vary slightly, it would warrant further statistical testing to see if an actual difference exists, for instance, an independent samples t-test.

Table 4 : Independent Samples T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Digital Payment System	Equal variances assumed	1.195	.001	.914	61	.030	.17895	.19580	-.21257	.57047
	Equal variances not assumed			.870	42.994	.040	.17895	.20562	-.23572	.59361

An independent samples t-test was carried out to compare the adoption of digital payment systems between male and female unorganized retailers. If the p-value obtained from Levene's Test for Equality of Variances is less than .05, then it can be concluded that the assumption of equal variances is violated at .05 level of significance; therefore, the row "Equal variances not assumed" should be taken for interpretation (Alaloul et al., 2021; Perea-Khalifi et al., 2024). The output of the t-test is as follows: the value of t is 0.870 with 42.994 degrees of freedom, and the probability associated with this calculated value is 0.040, which is less than 0.05; therefore, the difference between males and females regarding the mean adoption of digital payment systems is said to be statistically significant. The mean difference is 0.17895, which indicates that the males have a little bit higher level of adoption or favorable perception as compared to the females. However, the 95% confidence interval for the difference is -0.23572 to 0.59361, which crosses zero, implying that the practical significance of this difference may exist.

Table 5 : ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Qualification	Between Groups	2.325	4	.581	.222	.020
	Within Groups	151.993	58	2.621		
	Total	154.317	62			
Type of business	Between Groups	26.649	4	6.662	1.414	.000
	Within Groups	273.288	58	4.712		
	Total	299.937	62			
How many years have you started business	Between Groups	5.812	4	1.453	.831	.050
	Within Groups	101.458	58	1.749		
	Total	107.270	62			
Type of goods dealing	Between Groups	29.287	4	7.322	2.128	.011
	Within Groups	199.601	58	3.441		
	Total	228.889	62			
Average Monthly Turnover	Between Groups	2.113	4	.528	1.302	.218
	Within Groups	23.538	58	.406		
	Total	25.651	62			
Average No. of customers visit per day	Between Groups	1.392	4	.348	.377	.041
	Within Groups	53.592	58	.924		
	Total	54.984	62			

ANOVA results, therefore, indicate whether there are statistically significant differences in the adoption of digital payment systems based on various demographic and business characteristics of unorganized retailers. Results show that qualification, type of business, years since business started, type of goods dealt, and average number of customers per day all have statistically significant effects on the adoption of digital payment systems as their p-values are less than or equal to 0.05. This means that the variation in educational background, category of business, experience in business, type of goods, and foot traffic of customers all matters in how the retailers adopt or perceive digital payments. However, the average monthly turnover shows no significant effect ($p=0.218$) which means that the levels of turnover do not significantly differentiate the adoption of digital payments within this sample.

7. Results & Discussion:

One-Way ANOVA Results:

- **Qualification** ($p = 0.020$): The p-value of 0.020 shows the statistically significant difference in the dependent variable at different qualification levels of unorganized retailers. It is less than a commonly used level of significance of 0.05; hence, we reject the following null hypothesis of the same mean for all qualification groups.
- **Type of Business** ($p = 0.000$): The p-value(0.000) which is less than 0.05, we reject the null hypothesis, which assumes that all business types have the same mean. This means the type of business significantly affects how retailers interact with or benefit from digital payment systems.
- **Years in Business** ($p = 0.050$): The p-value (0.050) is exactly at the 0.05 threshold, it suggests that the number of years a retailer has been in business may have a modest yet statistically significant impact on factors such as digital payment adoption or business performance. This implies that business experience potentially influences how retailers adopt or benefit from digital payment systems.
- **Type of Goods Dealt** ($p = 0.011$): The p-value(0.011) is less than 0.05 which indicate that we reject the null hypothesis that all groups have the same mean. This suggests that the nature of goods a retailer deals in significantly affects how they adopt or benefit from digital payment systems.

- **Monthly Turnover** ($p = 0.218$): The p value(0.218) is more than 0.05 which implies that it is not significant. Since the p -value is greater than 0.05, we fail to reject the null hypothesis, suggesting that monthly turnover does not have a significant impact on how retailers use or benefit from digital payment systems in this analysis.
- **Daily Customer Visits** ($p = 0.041$): The p -value(0.041) which is less than 0.05 proves that it is significant so we reject the null hypothesis; therefore, the frequency of customer visits has a very significant influence on how the unorganized retailers engage with or benefit from the digital payment system. There is meaningful difference; in their behavior or outcomes, of different categories of retailers with respect to customer footfall. higher customer traffic may motivate digital adoption.

8. Discussion:

The findings align with existing literature that suggests higher education levels and greater business exposure facilitate the use of digital technologies (Aggarwal et al., 2021; Hasan & Atifaman, 2020). Businesses dealing with perishable or fast-moving consumer goods showed higher adoption, likely due to faster transaction demands. Surprisingly, turnover did not emerge as a significant factor, contradicting previous findings (Adhikary et al., 2021; Almasria et al., 2024; Premkanth, 2012) that link higher financial volume with tech adoption. This may reflect affordability of mobile-based solutions among small vendors.

The above factors show that there is a great need for customized outreach by financial institutions based on the business type and goods category. More footfall retailers, like food stalls and convenience stores, were more inclined toward digital payments, showing the influence that operational dynamics have over the financial scale.(Bhattacharjee et al., 2024; Soni et al., 2020).

9. Conclusion:

This study highlights that the adoption of digital payments by unorganized retailers in Jaipur is influenced by factors such as business type, educational background, types of goods sold, and customer volume. These findings align with the Technology-Organization-Environment (TOE) framework, which suggests that both organizational readiness and environmental conditions impact technology adoption(Hanna et al., 2020). Policymakers ought to come up with strategies befitting the varied profiles among the retailers to enable effective digital integration and, more

actively, to increase the levels of digital literacy to spur more significant participation. The results offer critical information on the digital transformation of India's informal economy and, from a policy perspective, how to make financial inclusion more conducive to fintechs designing solutions for micro-retailers. Improving the digital capabilities of unorganized retailers can significantly boost financial inclusion, support business formalization, and strengthen economic resilience at the community level (Urus et al., 2022).

10. Limitations and Future Scope:

This study offers important insights into unorganized retailers' digital payment adoption, this study is not without its limitations. 63 sampled retailers may not be sufficiently large to provide an accurate representation of the informal retail sector's diversity in Jaipur. The findings are applicable in the rural areas or other regions of India from Jaipur. There is also the issue of the self-reported nature of the data, which can be influenced by recall and social desirability biases. A rural-urban comparison longitudinally, looking further into specific platforms would be useful for future research.

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