



BRIDGING THE DIGITAL DIVIDE: BARRIERS AND ACCESSIBILITY SHAPING ONLINE SHOPPING ADOPTION AMONG RURAL CONSUMERS IN SALEM DISTRICT

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Abstract: E-commerce has grown rapidly and this has affected the manner in which people buy products. However, rural areas still have many challenges in attracting people to e-commerce. This paper discusses the availability of digital infrastructure and the challenges that hamper the adoption of E-commerce among rural people in the Salem district of Tamil Nadu. The process of planning an investigation included descriptive analysis as well as analysis of the research data gathered by 300 individuals who live in rural areas through a structured questionnaire. The statistical methods chosen to analyze the information included percentages, Chi-square tests and Analysis of Variance (ANOVA). The results demonstrated considerable differences among the demographic factors (such as age, education, occupation and income) affecting access to the following types of digital infrastructures: Internet connectivity, use of smart phones and digital payments. Additionally, these findings show that there are four types of barriers preventing e-commerce use by rural consumers: 1) technological barriers, 2) socio-cultural barriers, 3) infrastructural barriers, and 4) psychological barriers. The number of individuals who have access to the internet to perform basic activities is increasing; however, there will still be very few consumers who shop online, as the majority do not have a trust in the shopping experience, do not know how to use it or cannot physically access the products (due to the lack of sufficient infrastructure). As stated in the research, in order to promote e-commerce growth in rural communities, it is important to improve digital literacy, improve infrastructure, and build trust with rural consumers.

KEYWORDS: Digital accessibility, Rural consumers, E-commerce adoption, Digital divide, Online shopping barriers

INTRODUCTION

The digital technology revolution has changed how we shop. Most of us now do at least part of our shopping online. Shopping from retail websites is transforming traditional physical retail stores by making it easier to shop, giving consumers a greater variety of choices, decreasing the cost of both goods and the cost of shopping, and allowing consumers to have their goods delivered to their homes. E-commerce is growing faster than ever in India and has been driven by an increase in the numbers of people using the internet, and ever-increasing numbers of people using smart phones, as well as the emergence of digital payment systems. Consequently, e-commerce is growing rapidly in urban areas, whereas the growth of e-commerce in rural areas is lagging considerably. Therefore, rural consumers are experiencing many challenges in the adoption of e-commerce due to barriers such as lack of digital infrastructure, digital illiteracy, and the perception that online shopping is not secure. Given that the majority of India's population resides in rural areas, rural consumers are unlikely to participate in the digital economy if access to digital technologies continues to be so limited. The Salem district in Tamil Nadu represents a purely rural area, has limited availability of digital technologies, and is slowly receiving access to those technologies. The district of Salem in Tamil Nadu is largely rural and has slowly been improving with regards to access to digital technology. Digital India, PMGDISHA, and BharatNet are government initiatives that aim to enhance the digital infrastructure in rural India. Yet, their influence is still unbalanced (Government of India, 2015; 2022; 2023). However, there is a lack of empirical evidence that explains the accessibility of digital infrastructure and the adoption of online shopping by rural consumers in this district and the barriers that impede the adoption of online shopping (Government of India, 2015). Therefore, the current study provides empirical evidence at the district level about the accessibility of digital infrastructure and the adoption of online shopping by rural consumers in the Salem district. The study contributes to the existing body of literature by exploring the effect of demographic variables on digital accessibility and identifying key technological, socio-cultural, infrastructural, and psychological barriers that affect online shopping behavior in rural settings.

OBJECTIVES OF THE STUDY

1. To investigate the extent of accessibility of digital infrastructure for rural consumers in the Salem district.
2. To establish the effect of demographic variables on the availability and usage of the digital infrastructure.
3. To identify the technological, social/cultural, infrastructure, and psychological barriers affecting online shopping.
4. To recommend improvements to the accessibility of digital technology and the adoption of on-line shopping.

LITERATURE REVIEW

1. Digital Infrastructure and rural access

The foundation for rural e-commerce is built on digital infrastructure. Past studies have shown that limited access to the internet, smartphones, and electricity disrupts the advancement of digital infrastructure in rural settings. Recently, Shukla and Sharma (2021) pointed out that while digital infrastructure in India has experienced development because of the launch of the Digital India initiative, adoption of e-commerce in rural India has been lukewarm because of infrastructure and costs. It has also been noted that socio-economic differences and inaccessibility of digital hardware have widened the rural-urban digital divide, which Sahu and Singh (2021) recently emphasized.

Recent statistics also support the above points. Panwar and Sahoo (2025), for instance, noted the expanding penetration of smartphone technology across the lives of the rural population but also highlighted the inadequate network support and irregularities of internet sentiments towards digital engagement. Ananthoju (2025) additionally noted inadequate infrastructural support and logistics as major e-commerce adoption hiccups. The rural e-commerce ecosystem, where the generality of unavailability of reliable broadband connectivity and delivery infrastructure existed, was found to be inconclusively developed by Teoh et al. (2021). Overall, the findings indicate that though there is the improvement of digital infrastructure with in rural India, the gap leads to the hindrance of the participation process within online shopping.

2. Trust and Psychological Barriers

While trust and perceived risk are two of the most universally accepted key psychological drivers of online shopping, the pattern of online shopping adoption has been very different in rural markets. In this respect, the important factor is the fraudulent activities on the part of sellers, apprehensions regarding product authenticity, and lack of confidence in the online modes of paying for purchases, which Vakamullu and Misra (2022) found to be the key factors responsible for rural consumers to stay away from online shopping. Likewise, Pratiwi et al. (2025) showed how online trust exerts a stronger influence than convenience in influencing purchase decisions among rural e-commerce users.

Shaikh (2025) has highlighted that distrust of online platforms, in combination with the fear of financial loss, continues to represent a major psychological barrier to the adoption, despite the existence of the necessary digital technology. Another interesting observation made by Chouhan et al. (2025), concerning the consumers in the rural sector, is that they assign significantly more priority to trust-building capabilities than the consumers in the urban sector.

From the above findings, it can be stated that digital infrastructure enhancement is on its Own insufficient in ensuring a boost in the rate of e-commerce in the rural population, but mechanisms of building trust as well as confidence among the consumers themselves.

3. Digital literacy and socio-cultural resistance

Rural consumers are greatly influenced by digital literacy skills as well as socio-cultural factors. Meenakshi et al. (2025) found that, through their research, tribal artisans were not joining online commerce, even after awareness about online commerce. The main reason was differences in language, skills, etc. Pandey (2022) also found that rural consumers, particularly those belonging to the young and educated population, are inclined towards online commerce, whereas older consumers are not inclined towards online commerce.

Other socio-cultural preferences for physical shopping, dependency on interpersonal trust, and resistance to technology are also discussed in previous research. Ananthoju (2025) and Teoh et al. (2021) surmised that 'traditional buying habits and social influence inhibit rural consumers from switching to online buying'. Further, Shaikh (2024) mentioned that low digital literacy and limited awareness of electronic commerce mechanisms hinder integration in the digital economy. Overall, the literature confirms that socio-cultural norms and digital skill gaps moderate rural e-commerce adoption and gaps in digital skills as the most moderating factors in the adoption of e-commerce in rural settings.

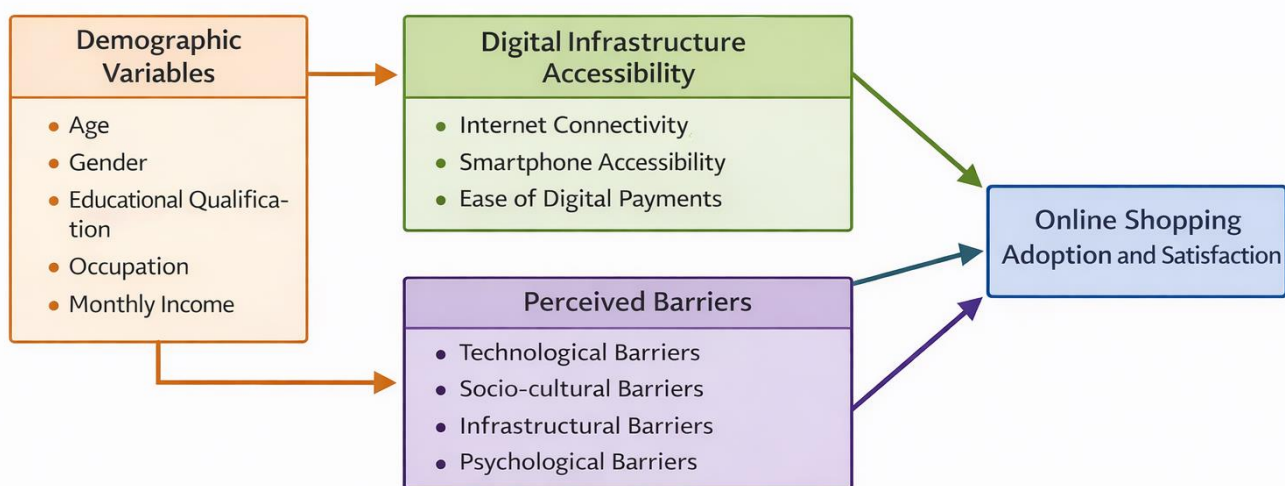
RESEARCH GAP

The literature on rural digital inclusion, infrastructure development, digital literacy, and especially trust-related barriers to e-commerce adoption has been highly discussed in the context of India. However, most prior studies have evidenced at the national level, state level, or comparative rural-urban analyses. Empirical district-level investigations that simultaneously take into account demographic factors, the accessibility of digital infrastructure, and multidimensional barriers-technological, socio-cultural, infrastructural, and psychological-remain scarce.

Additionally, previous studies have primarily investigated access to digital technology in isolation from the conduct of online shopping, without making the necessary connections between demographics, access to digital technology, and inhibitory factors in the context of e-commerce conduct. In this context, this study attempts to fill the gaps by offering district-level empirical research findings on rural consumers based on Salem district in Tamil Nadu, shedding new light on the effectiveness of demographic factors on digital infrastructure access and types of barriers influencing online shopping behavior. This can be considered a pioneering attempt in offering insights on digital inclusion and online shopping in rural emerging markets.

CONCEPTUAL FRAMEWORK

The conceptual model is derived based on the concept of the digital divide perspective and the consumer adoption theories, which are based on the idea that demographic factors influence the ease of access in terms of infrastructural barriers. In the proposed framework, the demographic variables – age, gender, educational qualification, occupation, and monthly income – are taken as independent variables. Together, these three factors dictate both (i) how much digital infrastructure is available regarding the availability of the internet, ability to use a smartphone, and being able to facilitate digital payments, and (ii) the perceptions of barriers to accessing e-commerce, which has included the technological, social/cultural, physical, and psychological barriers. Both accessibility to digital infrastructure and perceived barriers jointly influence online shopping adoption and satisfaction among rural consumers. This framework lays the basis for hypothesis formulation and empirical testing of the relationships among demographic characteristics, digital infrastructure accessibility, and perceived barriers to online shopping adoption.

**FIGURE - 1**

Conceptual Framework of Demographic Factors, Digital Infrastructure Accessibility, and Perceived Barriers Influencing Online Shopping Adoption and Satisfaction among Rural Consumers in Salem District

HYPOTHESES

H₀₁: No significant relationship exists between demographic characteristics like age, gender, educational qualification, occupation, and monthly income, and the accessibility of digital infrastructures such as internet access, smartphone adoption, and digital payments among rural consumers in Salem.

H₀₂: There is no significant difference in the perception of e-commerce barriers (technological, socio-cultural, infrastructural, and psychological) between the demographic groups of rural consumers in the Salem district.

METHODOLOGY OF THE STUDY

RESEARCH DESIGN

This study employed a descriptive and analytical research design. A descriptive method was used in profiling rural consumers and to account for their level of digital infrastructure accessibility and their online shopping behaviour. An analytic method is used in the relationship Examination between demographic variables, accessibility to digital infrastructure, and perceived barriers to adopting e-commerce.

POPULATION AND SAMPLE

The population consisted of rural consumers living in villages of Salem district, Tamil Nadu, who at least had basic exposure to any digital device, either a mobile phone, internet services, or digital payment applications. It would ensure that the respondents are capable of providing answers relating to digital access and online shopping experiences.

The total number of respondents is 300. Sample size is more than the minimum requirement for applying inferential statistical techniques such as Chi-square test and one way ANOVA, hence there is enough statistical power for hypothesis testing.

SAMPLING TECHNIQUE

Non-probability sampling design, namely convenience sampling, was used because of the lack of a comprehensive sampling frame. Due to the employment of a non-probability design, the findings of this study can be generalized to a broader area, i.e., the district level.

DATA COLLECTION INSTRUMENT

The main data was collected through a structured questionnaire. The questionnaire had closed-ended questions on the following Demographic Characteristics Accessibility to digital infrastructure (internet connectivity, smartphone usage, digital payment systems). Perceived barriers – technological, socio-cultural, infrastructural, Online shopping – adoption and satisfaction. All perceptual items were measured using a five-point Likert scale, with the range of measurement from 1 (Strongly Disagree) to 5 (Strongly Agree). The measurement items used in the study are adapted from previous rural digital inclusion and e-commerce adoption studies. Both online mode using Google Forms and offline mode in which printed forms were used to ensure inclusion of responses from individuals with irregular internet access. The participation was entirely voluntary, and confidentiality of answers was guaranteed.

RELIABILITY OF THE INSTRUMENT

Reliability estimates of internal consistency were determined using Cronbach's Alpha. The scale returned an alpha value of 0.967, out of 20 items, which exceeds the threshold of 0.70 recommended for excellent reliability of the measuring instrument.

DATA ANALYSIS TOOLS

Data was analyzed using: Percentage analysis for descriptive profiling, Chi-square test of selected demographic variables against digital infrastructure accessibility, One-way ANOVA to test perceived barriers differences across the demographic groups. In testing hypothesis, 5% level of significance was adopted.

DEMOGRAPHIC PROFILE OF THE RESPONDENTS**TABLE -1****DEMOGRAPHIC PROFILE**

	Particulars	Number of Respondents	Percentage
Gender	Male	113	38%
	Female	187	62%
	Total	300	100%
Age	15-20	85	28%
	21-25	68	23 %
	26-30	57	19%
	31-35	55	18%
	Above36	35	12%
	Total	300	100%
Educational Qualification	School level	36	12%
	Graduate	95	32%
	Postgraduate	104	35%
	Others	65	22%
	Total	300	100%
Occupation	Student	51	17%
	Farmer	62	20%
	Government Employee	38	12%
	Private job	62	20%
	Business	50	16%
	Other	37	12%
	Total	300	100%
Income Level	Above10,000	131	44%
	10,001-20,000	91	30%
	20,001-30,000	40	13%
	30,001-40,000	28	9%
	Above40,001	10	3%
	Total	300	100%

Source: Primary data

A total of 300 rural consumers from the Salem district participated in the present study. Table 1 shows the demographic characteristics of the consumers. The distribution of genders reflects more female participation, i.e., 62%; however, most of the respondents were males, i.e., 38%.

Further, concerning the distribution of ages, the greater proportion of participants belongs to younger age groups, as 28% of participants fall into the 15-20 years group, while 23% of participants fall into the 21-25 years age group.

The background information in terms of educational qualification shows that the population had a good level of education, as reflected by the number of postgraduates (35%) and graduates (32%), thus having the potential to be literate and conversant with digital platforms.

The occupational distribution, shows that the number of both farmers and employees in the private sector are the same, at 20%. Students form 17%, while business owners on their own comprise 16%.

Income levels show that the majority of the respondents in the study, i.e., 44%, fall in the income category where the monthly income is up to ₹10,000, while 30% fall in the income category of ₹10,001 to ₹20,000, thus emphasizing income as one of the major factors affecting the affordability of digital devices, internet access, etc.

According to the demographics of the sample studied, there are probably a high percentage of young people, have higher education, and are considered economically-active, rural citizens; Therefore, it is useful to study this demographic group for assessing access to e-commerce and to aspects of digital infrastructure for accessing e-commerce.

RESPONDENTS' DIGITAL ACTIVITY, SHOPPING METHOD AND SATISFACTION LEVELS

TABLE – 2

RESPONDENTS' DIGITALACTIVITY, SHOPPING METHODS AND SATISFACTION LEVELS

	Particulars	Number of respondents	Percentage
Digital Activity	Using a smartphone	112	37%
	Searching for information online	138	46%
	Using mobile apps or social media	12	4%
	Making digital payments	26	8%
	Purchasing online	12	4%
	Total	300	100%
Methods used for Shopping	Mobile apps	155	52%
	Social media	72	24%
	Web browsers	24	8%
	Others	49	16%
	Total	300	100%
Satisfaction Level	Highly Dissatisfied	10	3%
	Dissatisfied	20	7%
	Neutral	121	40%
	Satisfied	130	43%
	Highly Satisfied	19	6%
	Total	300	100%

Source: Primary data

Digital Activities

The results show that the majority of the respondents' have stated that they are engaged in digital activities such as searching for information (46%) and the use of smartphones (37%). While only very small portions (8% for purchasing items digitally, and 4% for making digital payments) report using digital technology for commercial purposes, this indicates that there is a basic level of digital literacy among these individuals; however, their confidence in using this technology for making purchases through the Internet is still low.

Methods Used for Shopping

The majority of respondents (52%) used mobile devices to shop online, while a smaller number (24%) used social media sites for this purpose. This indicates that the use of mobile and social commerce is becoming more common throughout rural areas. In contrast, 8% of people used their web browsers to shop online, suggesting that fewer people are using browser-based online shopping platforms than in the past.

Satisfaction Level

Regarding customer satisfaction, almost half (43%) of participants reported they were satisfied with the online shopping services. A smaller number of respondents (40%) were neutral towards the online shopping services, while 10% reported feeling dissatisfied with them. This would suggest that the majority of people had a positive impression of shopping online; however, this large percentage of respondents remaining neutral also indicates areas where improvements can occur in the quality of services provided.

RELIABILITY STATISTICS

Reliability analysis was conducted to assess the internal consistency of the measurement scale used in the study. Cronbach's Alpha was employed as it is widely accepted for evaluating the reliability of multi-item Likert-type scales. The analysis yielded a **Cronbach's Alpha value of 0.967 for 20 items**, indicating a very high level of internal consistency among the scale items. This result suggests that the questionnaire items are highly reliable and consistently measure the underlying constructs related to digital infrastructure accessibility, barriers to e-commerce adoption, and consumer perceptions. Since the obtained alpha value exceeds the commonly recommended threshold of 0.70, the instrument is considered statistically reliable and suitable for further analysis and interpretation.

TABLE – 3**RELIABILITY STATISTICS**

Cronbach's Alpha	No. of Items
0.967	20

CHI-SQUARE ANALYSIS

A Chi-square test was conducted to analyse the associations between demographic variables and digital infrastructure accessibility, reasons for the accessibility and increased usability of digital infrastructure were made.

TABLE–4**Internet connectivity**

Demographic Variables	df	Level of Significance	Chi-Square Value	P Value	Significant
Age	40	5%	407.250	.000	Significant(p <.001)
Gender	10	5%	111.440	.000	Significant(p <.001)
Educational Qualification	20	5%	243.141	.000	Significant(p <.001)
Occupation	50	5%	706.332	.000	Significant(p <.001)
Monthly Income	40	5%	125.272	.000	Significant(p <.001)

Source: Author's computation

Internet connectivity varied significantly across age, $\chi^2(40) = 407.25$, $p < .001$, gender, $\chi^2(10) = 111.44$, $p < .001$, educational qualification, $\chi^2(20) = 243.14$, $p < .001$, occupation, $\chi^2(50)$

=706.33, $p < .001$, and monthly income, $\chi^2(40) = 125.27$, $p < .001$.

Smartphone accessibility also differed significantly across age, $\chi^2(44) = 438.16$, $p < .001$, gender, $\chi^2(11) = 135.39$, $p < .001$, educational qualification, $\chi^2(22) = 255.17$, $p < .001$, occupation, $\chi^2(55)=766.18$, $p<.001$, and monthly income, $\chi^2(44)=99.88$, $p<.001$.

Digital payment usage showed significant demographic differences across age, $\chi^2(40) = 387.72$, $p<.001$, gender, $\chi^2(10)=98.07$, $p<.001$, educational qualification, $\chi^2(20)=274.53$, $p< .001$, occupation, $\chi^2(50) =646.59$, $p <.001$, and monthly income, $\chi^2(40) =86.91$, $p<.001$.

TABLE-5

SMARTPHONES

Demographic Variables	df	Level of Significance	Chi-Square Value	P Value	significant
Age	44	5%	438.162	.000	Significant($p < .001$)
Gender	11	5%	135.392	.000	Significant($p < .001$)
Educational Qualification	22	5%	255.167	.000	Significant($p < .001$)
Occupation	55	5%	766.183	.000	Significant($p < .001$)
Monthly Income	44	5%	99.883	.000	Significant($p < .001$)

Source: Author's computation

The results show that there is a Significant ($p < .001$) relationship between demographic variables and smartphone accessibility and usability. The Chi-Square values for age ($\chi^2 = 438.162$), gender ($\chi^2 = 135.392$), educational qualification ($\chi^2 = 255.167$), occupation ($\chi^2 = 766.183$), and monthly income ($\chi^2 = 99.883$) are all statistically significant at the 5 per cent level ($p<0.001$).The results imply that the ownership, affordability, and usability of smart phones are vastly different across the demographic variables, and this supports the idea that demographic factors are important in determining the digital engagement of rural consumers through smart phones.

TABLE-6

EASE OF DIGITAL PAYMENT

Demographic Variables	df	Level of Significance	Chi-Square Value	P Value	significant
Age	40	5%	387.715	.000	Significant($p < .001$)
Gender	10	5%	98.073	.000	Significant($p < .001$)
Educational Qualification	20	5%	274.525	.000	Significant($p < .001$)
Occupation	50	5%	646.585	.000	Significant($p < .001$)
Monthly Income	40	5%	86.905	.000	Significant($p < .001$)

Source: Author's computation

The Chi-Square test results show that there is a Significant ($p < .001$) relationship between demographic variables and the ease of using digital payment systems. Age ($\chi^2 = 387.715$), gender ($\chi^2 = 98.073$), educational qualification ($\chi^2 = 274.525$), occupation ($\chi^2 = 646.585$), and monthly income ($\chi^2 = 86.905$) are all significant at the 5 per cent level ($p < 0.001$). This means that the confidence, convenience, and security of using digital payments are highly affected by demographic variables. The results underline the importance of targeted digital literacy and financial inclusion initiatives to improve digital payment adoption among different rural demographic segments.

Since the p value is less than 0.05 the null hypothesis is rejected. So it is identified that there is a high significance association between demographic variables and reasons for the accessibility and increased usability of digital infrastructure

ANOVA

Analysis of Variance (ANOVA) was employed to examine whether significant differences exist in the perceived barriers to e-commerce adoption across various demographic group so rural consumers in Salem district. ANOVA is appropriate for comparing the mean scores of multiple groups and determining whether demographic variables such as age, educational qualification, occupation, and monthly income significantly influence the intensity of technological, socio-cultural, infrastructural, and psychological barriers faced by consumers while engaging in e-commerce. The level of significance was fixed at 5 per cent, and the results were interpreted using the F-values and corresponding p-values.

DEMOGRAPHIC VARIABLES AND BARRIERS WHEN TRYING TO USE E- COMMERCE

TABLE-7

TECHNOLOGICAL BARRIERS

Demographic Variables	Source of Variables	Sum of Squares	Degrees of Freedom	Mean Square	5 Percent level Of significance		Significance
					F Value	P Value	
Age	Between groups	235.451	13	18.014	18.014	.000	Significant($p < .001$)
	Within groups	287.549	286	1.005			
	Total		299				
Educational Qualification	Between groups	286.306	13	22.024	32.410	.000	Significant($p < .001$)
	Within groups	191.861	286	.671			
	Total	478.170	299				
Occupation	Between groups	366.337	13	28.180	17.711	.000	Significant($p < .001$)
	Within groups	455.060	286	1.591			
	Total	821.397	299				
Monthly Income	Between groups	65.673	13	5.052	4.702	.000	Significant($p < .001$)
	Within groups	307.243	286	1.074			
	Total	372.917	299				

Source: Author's computation

ANOVA showed that perceived technological barriers differed significantly across demographic groups. Age, $F(13, 286) = 18.01$, $p < .001$, educational qualification, $F(13, 286) = 32.41$, $p < .001$, occupation, $F(13, 286) = 17.71$, $p < .001$, and monthly income, $F(13, 286) = 4.70$, $p < .001$ had a statistically significant difference in the variation of mean scores on technological barriers.

TABLE-8

SOCIO- CULTURAL BARRIERS

Demographic Variables	Source of Variables	Sum of Squares	Degrees of Freedom	Mean Square	5 Percent level of significance		Significance
					F Value	P Value	
Age	Between groups	206.682	12	17.224	15.627	.000	Significant(p<.001)
	Within groups	316.318	287	1.102			
	Total	523.000	299				
Educational Qualification	Between groups	256.860	12	21.405	27.758	.000	Significant(p<.001)
	Within groups	221.310	287	.771			
	Total	478.170	299				
Occupation	Between groups	336.688	12	28.057	16.613	.000	Significant(p<.001)
	Within groups	484.708	287	1.689			
	Total	821.397	299				
Monthly Income	Between groups	30.352	12	2.529	2.119	.016	Significant
	Within groups	342.565	287	1.194			
	Total	372.917	299				

Source: Author's computation

Overall, there were significant differences in socio-cultural barriers according to age, $F(12,287)=15.63, p<.001$; educational qualification, $F(12,287)=27.76, p<.001$; occupation, $F(12,287)=16.61, p<.001$; and monthly income, $F(12,287)=2.12, p=.016$.

TABLE-9

INFRASTRUCTURAL BARRIERS

Demographic Variables	Source of Variables	Sum of Squares	Degrees of Freedom	Mean Square	5 Percent level of significance		Significance
					F Value	P Value	
Age	Between groups	250.200	15	16.680	17.365	.000	Significant(p<.001)
	Within groups	272.800	284	.961			
	Total	523.000	299				
Educational Qualification	Between groups	292.802	15	19.520	29.906	.000	Significant(p<.001)
	Within groups	185.368	284	.653			
	Total	478.170	299				
Occupation	Between groups	402.503	15	26.834	18.193	.000	Significant(p<.001)
	Within groups	418.893	284	1.475			
	Total	821.397	299				
Monthly Income	Between groups	66.237	15	4.416	4.089	.000	Significant(p<.001)
	Within groups	306.680	284	1.080			
	Total	372.917	299				

Source: Author's computation

One-way ANOVA showed that infrastructural barriers vary significantly according to age, $F(15,284)=17.37, p<.001$; educational qualification, $F(15,284)=29.91, p<.001$; occupation, $F(15, 284)= 18.19, p<.001$; and monthly income, $F(15, 284)=4.09, p<.001$.

TABLE-10

PSYCHOLOGICAL BARRIERS

Demographic Variables	Source of Variables	Sum of Squares	Degrees of Freedom	Mean Square	5 Percent level Of significance		Significance
					F Value	P Value	
Age	Between groups	160.473	13	12.344	9.738	.000	Significant(p<.001)
	Within groups	362.527	286	1.268			
	Total	523.000	299				
Educational Qualification	Between groups	227.170	13	17.475	19.911	.000	Significant(p<.001)
	Within groups	251.000	286	.878			
	Total	478.170	299				
Occupation	Between groups	444.012	13	34.155	25.884	.000	Significant(p<.001)
	Within groups	377.385	286	1.320			
	Total	821.397	299				
Monthly Income	Between groups	49.795	13	3.830	3.390	.000	Significant(p<.001)
	Within groups	323.122	286	1.130			
	Total	372.917	299				

Source: Author's computation

There were significant differences in psychological barriers across age, $F(13,286)=9.74$, $p<.001$; educational qualification, $F(13,286)=19.91$, $p<.001$; occupation, $F(13,286)=25.88$, $p<.001$; and monthly income, $F(13,286)=3.39$, $p<.001$.

Interpretation

The findings suggest the level of access to internet connectivity, smart phone technology, and digital payment systems differs between various demographics, particularly whereby the younger, more educated, and economically active populations displayed higher access to digital technology, compared to the older aged and lower-income communities, implying that the findings show that digital inclusion in the rural area is stratified but not uniform.

This is in line with Shukla & Sharma's (2021) assertion of a non-uniform penetration of the internet in rural India in spite of government digital schemes. Additionally, Panwar & Sahoo's (2025) noted that the increased adoption rate of smart handheld devices in rural regions of India did not completely reduce barriers in terms of network accessibility. The hesitational behavior of trust in relation to digital payments in the present study is in line with the assertion of Vakamullu & Misra (2022) that people's perceived sense of risk and lack of self-confidence influence behavior in terms of online transactions in the context of rural regions.

Technological Barriers

Variation in technological constraints between age, education, occupations, and income shows that differences in digital skills, lack of experience in online platforms, and lack of technical competency are high in elderly and lower-income rural populations. Moreover, younger and more educated consumers were more technically ready. This result supports Meenakshi et al. (2025), who ranked limited digital skills as one of the top factors affecting lower online-platform engagement in rural populations. Teoh et al. (2021) reported that technical competency remains one of the basic constraints in rural e-commerce environments.

Socio-cultural Barriers

The findings in socio-cultural barriers indicated differences implying the impact of conventional shopping styles, difficulties in communication, and the need to rely on social trust on the opposition to online shopping in the rural sector. The low-income group, particularly those with low educational attainments, expressed higher socio-cultural barriers in the adoption of

electronic commerce. The findings supported Pandey (2022), whose research found that the culture pertaining to conventional shopping acts as an important barrier to adopting the culture of online shopping in the rural sector. Ananthoju (2025) highlighted the social influence on the place of digital adoption in the rural sector.

Infrastructural Barriers

Significant variations in infrastructural barriers point out that irregularities in internet connectivity, power supply, and logistics for the delivery mechanism still remain unequal among demographic segments. For instance, infrastructural barriers were more serious for the older and economically deprived respondents. This result agrees with Shukla and Sharma (2021) and Sahu and Singh (2021) when they noticed that poor rural infrastructure continues to impede the path of proportionate digital inclusion. More recently, Panwar and Sahoo (2025) also noted that network unreliability restricts the growth of rural e-commerce despite an increased ownership of smartphones.

Psychological Barriers

The main psychological barriers were fear of fraud, lack of confidence, and distrust in online transaction activities, which vary significantly between demographic groups. Less educated and older respondents were more psychologically resistant. These findings corroborate Vakamullu and Misra (2022), who report perceived risk and lack of trust as the leading inhibitors of rural online shopping. Shaikh (2025) similarly concluded that psychological insecurity is one of the important barrier in the participation of rural e-commerce.

MANAGERIAL IMPLICATIONS

The results of this study have significant managerial and policy implications for government agencies, digital service providers, e-commerce companies, and rural development organisations seeking to encourage online shopping adoption in rural markets.

First, the fact that demographic factors have a big effect on how easy it is to access digital infrastructure shows that rural digital inclusion programs need to be specific rather than general. Telecom companies and policymakers should make it a priority to improve internet connectivity, electricity reliability, and network coverage in villages with older and poorer populations, where infrastructure problems are still the worst.

Second, the low level of participation in online shopping and digital payments shows that there is an urgent need for localised programs to teach people about money and technology. Conducting training programs for individuals from Panchayats, self-help groups, and community centres (rural) as well as students in Schools will help rural communities (including many who are older and/or have a low level of education) feel more at ease using smartphones, mobile apps, and digital payments.

Thirdly, due to the fact that many users have high levels of psychological and trust-related barriers, it is appropriate for e-commerce companies to incur expenses related to developing trust. Developing better return policies, providing local language support on e-commerce sites, allowing customers to receive cash on delivery (when possible), providing clear information on pricing, and providing local language support in relation to customer services/support are all great examples of how to support users' feelings of security while they are shopping online.

Fourthly, since mobile apps and social media represent the main means of purchasing goods and services by users, e-commerce companies in rural communities should focus on all of their activities from a "mobile first" and "social commerce" perspective. Properly using lightweight applications, low data interface, and promotion activities that are tailored to each region will make the e-commerce platform much easier to navigate and much more enjoyable for the end-users.

Logistic & delivery service providers can improve last-mile delivery networks by partnering with local kirana store, local postal networks and rural entrepreneurs to create a better delivery network. This will improve access to consumers for their deliveries on time and remove barriers to access within the infrastructure to increase overall customer satisfaction for rural e-commerce services.

Overall, findings from this research study suggest that, in order for rural e-commerce to succeed, there is a requirement for an integrated approach that includes the development of infrastructure, educating individuals about utilizing technology, building trust and creating platforms specific to that geographic region.

CONCLUSION

The goal of this research was to determine how rural individuals within the Salem district experienced difficulties when attempting to shop online due to limited access to digital technology. The results of this research indicate that individuals located in rural areas possess some basic digital skills; however, the barriers associated with using e-commerce platforms limit their ability to use them due to their experience with various technological barriers, infrastructural barriers, socio-cultural barriers (attitudes about using e-commerce), and psychological barriers (such as fear of being taken advantage of). In addition, the results illustrate that age/education/occupation/income level are important factors that influence an individual's ability to access digital technology and how they perceive barriers to using e-commerce. Younger and more educated consumers were more likely than older or lower-income consumers to apply e-commerce to purchase goods and services. The study demonstrated that the small proportion of individuals that purchased goods online provides evidence that there is a great need for specific digital literacy programs, as well as establishing mechanisms designed to build trust in an individual's ability to safely and effectively conduct e-commerce. According to research carried out by means of statistically valid data collected at the district level, rural community residents have substantial difficulties obtaining access to Digital Technologies. Consequently, prevent them from using On-Line Shopping Services. Upon completion, the challenges documented in the research can be addressed by implementing infrastructure development and Digital Education Programs, along with the support of corresponding policies, thereby providing rural consumers an opportunity to be integrated into the Digital Economy. The integrated application of this will foster development as well as create better access to markets and overall better quality of life in rural regions.

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