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The Influence of Digital Connectivity on the Purchase Intention of Rural Consumers in the E-Commerce Segment

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ABSTRACT: This study investigates the impact of digital connectivity on rural consumer purchase intentions in the e-commerce segment to understand how digital infrastructure would influence perceived usefulness, ease of use, and consumer behavior. The present study used a quantitative design with cross-sectional data, wherein the sample included 573 respondents from the Bengaluru Rural district. Data collection was made through a structured questionnaire adapted from earlier studies. To hold full representation across villages, the sampling contained a diverse range of people, students, private and government employees, farmers, laborers, and all. Data were analyzed using PLS-SEM via SmartPLS 4. The findings indicate that perceived ease of use and usefulness vary consistently with digital connectivity, which again drives purchase intentions and actual consumer behavior. These results give evidence of the pivotal role of digital infrastructure in enabling rural populations to engage with e-commerce platforms effectively. The study reprimands the need for better digital connectivity in rural households if equitable participation in the digital economy is to be attained and calls for valuable insights from all key stakeholders, such as policymakers and businesses.

Keywords: Digital Connectivity, Purchase Intention, E-Commerce, Consumer Behavior.

INTRODUCTION:

Fast-growing e-commerce has changed the retail landscape over the globe in such a way as to give consumers unparalleled access to goods and services. This growth, however, hasn't been even for all regions, especially in areas that are more rural where digital infrastructure is usually underdeveloped. Therefore, this dichotomy in digital connectivity has led to wide chasms in the adoption of e-commerce, raising several questions regarding the ease with which rural consumers find online shopping accessible and effective. Most such consumers complain of poor internet connectivity, lack of digital literacy, and mistrust of online platforms- all combined to limit their full engagement with e-commerce.

Digital inequality in this respect is, therefore, largely a socio-economic issue, as it reduces rural populations' opportunities to realize some of the convenience and variety of benefits that e-commerce can offer. Where traditional retail options are highly limited, e-commerce would improve access to goods and services. However, rural consumers cannot fully participate in the digital economy due to insufficient digital connectivity, further polarizing inequalities. The ensuing study addresses the pertinent question: How does digital connectivity influence rural consumers' e-commerce segment purchase intention, and what factors underlying that relationship mediate the same?

The significance of this study is in providing actionable insights for policymakers and businesses seeking to address the digital divide to ensure inclusive economic growth. Hopefully, specific barriers and drivers of e-commerce adoption in rural areas will allow stakeholders to develop targeted strategies to enhance digital infrastructure, increase digital literacy, and build trust in online platforms.

This study has tried to diagnose the effect of digital connectivity (DC) on rural consumers' purchase intention (PI) in the e-commerce segment, with special emphasis on the interface of digital infrastructure and shopping behavior. Further, this research will also analyze mediating factors of the relationship between DC and PI, thereby offering an all-spectrum view of challenges and opportunities regarding e-commerce adoption promotion in rural markets. The following hypothesis is proposed for this purpose. The research model is presented in Fig. 1.

H1: Digital Connectivity positively influences Perceived Usefulness.

H2: Digital Connectivity positively influences Perceived Ease of Use.

H3: Perceived Usefulness positively influences Purchase Intention.

H4: Perceived Ease of Use positively influences Purchase Intention.

H5: Purchase Intention positively influences Consumer Behavior.

H6: Perceived Usefulness mediates the relationship between Digital Connectivity and Purchase Intention.

H7: Perceived Ease of Use mediates the relationship between Digital Connectivity and Purchase Intention.

LITERATURE REVIEW:

E-commerce has truly revolutionized how people shop for products. Since then, scholars have flocked to understand what factors influence online purchase intention (Mejía-Trejo, 2021). One of the major challenges, as identified from most of the literature, is the main difference between urban and rural areas' adoption of e-commerce because of differences in digital connectivity. Generally speaking, rural consumers must overcome some particular barriers: poor internet infrastructure, low digital literacy, and partial distrust of online platforms impede effective engagement with e-commerce.

Therefore, it becomes an essential enabler of e-commerce (Gazieva, 2021), granting consumers access to online marketplaces and, hence, enabling them to participate in digital transactions effectively. Several studies do confirm that regions with better internet infrastructure are characterized by a higher level of e-commerce adoption due to improved use of other accesses to e-commerce, such as personal computers and mobile devices (Almousa, 2013). In rural consumers, however, inadequate digital connectivity remains one of the major barriers. (Yusof et al., 2013) noted that rural areas are mostly at a disadvantage due to limited access to reliable internet services, with two-thirds of the consumers unable to shop online, thus reducing their participation in the digital economy.

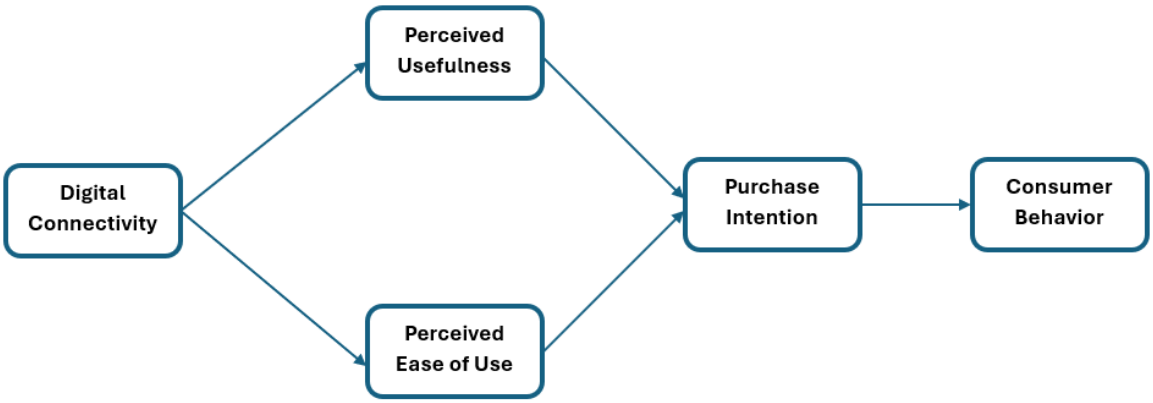

Figure 1: Research model

Despite these, little research specifically focuses on how digital connectivity influences purchase intentions in rural areas (Duan et al., 2009). Most of the literature has focused on the population in urban areas, where digital infrastructure is much more developed, and how the literature lacks the unique challenges rural consumers face. In this respect, this work tries to fill that gap, which is important in the rural context, considering how digital connectivity could greatly impact access and the general perception and behavior of rural consumers towards e-commerce (Almousa, 2013).

The two most important and pervasive constructs in understanding consumer behavior within adaptive technology are perceived usefulness (PU) and perceived ease of use (PEOU). Originally formed and part of the so-called Technology Acceptance Model (Davis, 1989), over the last two decades, these constructs have been widely applied in various fields to predict user acceptance and intention to use technology. PU refers to the extent to which individuals

believe that using a specific technology will improve their overall performance. On the other hand, PEOU is defined as the degree to which a user believes that interacting with the technology will require minimal effort (Davis, 1989).

Research into online purchases has determined that PU and PEOU contribute significantly to the intention to purchase. These studies included (Venkatesh et al., 2012). Most of these studies have been conducted in urban settings, focusing little on rural consumers. Given the differences between urban and rural settings regarding digital literacy and connectivity, the need exists to explore whether such constructs operate similarly within a rural setting. This study tries to fill this gap by understanding how PU and PEOU influence rural consumer purchase intentions amidst the varying levels of digital connectivity (Duan et al., 2009).

The overall literature is highly useful and forms the foundation for identifying those factors that either serve as a barrier to or facilitate the adoption of e-commerce; however, there are several limitations. First, the literature lacks work that specifically focuses on the experience of rural consumers about how their perceptions and behaviors are influenced by digital connectivity. Second, many studies have approached digital connectivity as a binary factor present or absent rather than nuanced, where gradations in its level might impact consumer behavior. Finally, most of the research has been carried out in the more developed regions, leaving a gap in challenges faced by rural consumers in developing areas.

METHODS:

This quantitative research has utilized a cross-sectional design to assess the role of digital connectivity in driving purchase intentions within rural consumers in the e-commerce segment. The study focused on how different ways of digital infrastructure affect PU and PEOU for PI, which is considered a crucial component of consumer behavior (CB).

Data collection was done using the convenience sampling method to ensure that data collected from 573 respondents represented the rural population. The sample was a diversified group of students, private employees, government employees, farmers, laborers, etc. This would enable the study to reflect a wide variation of perceptions on the issue of digital connectivity and e-commerce adoption. As inspired by the power analysis using G*Power, the least number that would be sufficient was 218, but the sample size of 573 enhanced the reliability and generalisability of the results.

Materials were collected by adopting a structured questionnaire from previous studies, which was modified to ensure that this study is valid. In the research model, each construct consisted of DC (Chong et al., 2023), PU (Sudaryanto et al., 2023), PEOU (Krishnan Vasanthi et al., 2023), PI (Wong et al., 2023), and CB (Ali et al., 2022), all measured by four items. The questionnaires were distributed online and offline to catch the different levels of digital access faced by the respondents. Data analysis was conducted with the help of PLS-SEM using SmartPLS 4. This study selected PLS-SEM due to its ability to manage complex models and effectively depict the relationships between multiple constructs.

RESULTS:

This section presents the results of PLS-SEM using SmartPLS 4. First, the narrative presents results pertaining to the measurement model assessment with regard to its reliability and validity. Next, The structural model was utilized to evaluate the hypothesized relationships between the variables. Fig. 2: Research model with values of outer loading, R-square and path coefficients.

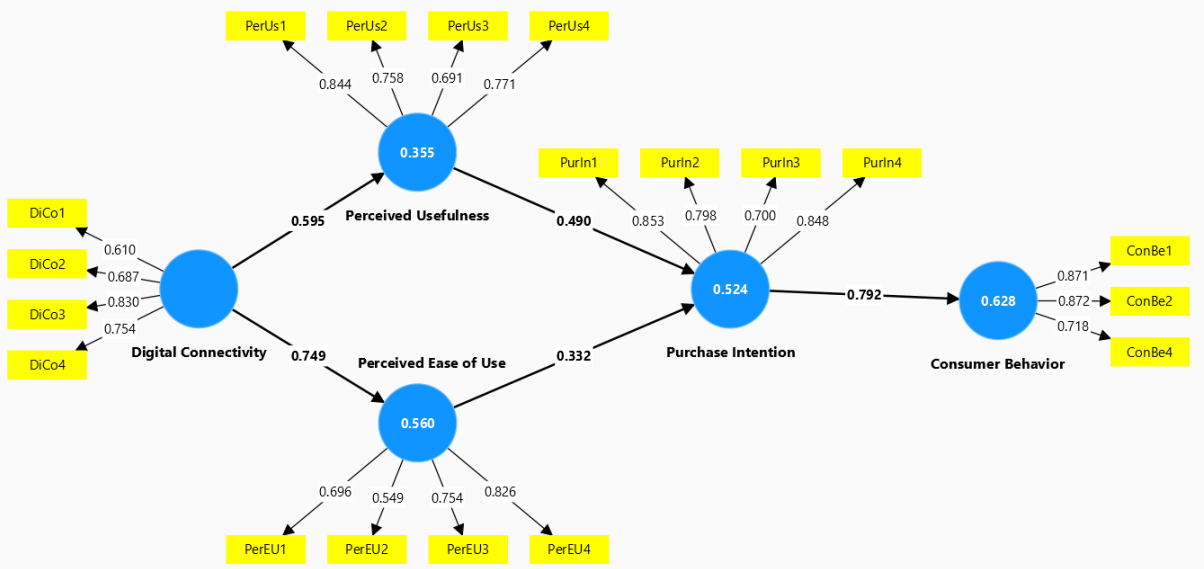

Figure 2: Statistical representation of Research model

The construct's reliability and validity were assessed using SmartPLS to conduct the analysis. The result of the measurement model is shown in the table below. In the table, outer loadings for all retained items surpassed the threshold of 0.6, except for PerEU2, which falls to 0.549 but is also acceptable. ConBe3 was dropped from the items because its two outer loadings showed low estimates. The Cronbach's Alpha values lie between 0.703 and 0.813, which is acceptable for internal consistency. Results also indicated that the CR values were greater than the threshold, ranging from 0.744 to 0.826; hence, these were reliable constructs. The AVE was also satisfactory because all the values were greater than 0.5, ranging from 0.509 to 0.678. This proves that there is a reliable and valid measurement model of the constructs that can be further used for analysis.

Table 1: Measurement model - Reliability and Validity

Constructs	Items	Outer loadings	Cronbach's alpha	CR	AVE
Consumer Behavior	ConBe1	0.871	0.757	0.760	0.678
	ConBe2	0.872			
	ConBe4	0.718			
Digital Connectivity	DiCo1	0.61	0.703	0.744	0.525
	DiCo2	0.687			
	DiCo3	0.83			
	DiCo4	0.754			
Perceived Ease of Use	PerEU1	0.696	0.798	0.759	0.509
	PerEU2	0.549			
	PerEU3	0.754			
	PerEU4	0.826			
Perceived Usefulness	PerUs1	0.844	0.776	0.826	0.590
	PerUs2	0.758			
	PerUs3	0.691			
	PerUs4	0.771			
Purchase	PurIn1	0.853	0.813	0.825	0.643

Intention	PurIn2	0.798			
	PurIn3	0.7			
	PurIn4	0.848			

The HTMT values reported in Table 2 are below the conservative threshold of 0.85, indicating good discriminant validity between the constructs. This confirms that each construct in the model is unique and measures different concepts, hence supporting the validity of the structural model. All VIF (Variance Inflation Factor) values for the items were significantly below the standard threshold of 5, confirming that multicollinearity is not an issue within the model. The SRMR values of 0.07 for the saturated model and 0.069 for the estimated model are below the accepted threshold of 0.08, suggesting a good fit between the model and the data.

Table 2: HTMT - Discriminant validity

Constructs	CB	DC	PEOU	PU
DC	0.738			
PEOU	0.626	0.656		
PU	0.794	0.747	0.709	
PI	0.512	0.811	0.711	0.77

R-square values, the variance explained by independent variables for each endogenous construct, are as follows: the model explains 62.8% for CB, 56% for PEOU, 35.5% for PU, and 52.4% for PI. Thus, the model has a moderate to substantial explanatory power on all these variables. The R-square values can be seen in Table 3.

Table 3: R-square values

Endogenous Construct	R-square	R-square adjusted
CB	0.628	0.627
PEOU	0.56	0.559
PU	0.355	0.353
PI	0.524	0.522

PLS-SEM hypothesis testing results show that direct and indirect paths are statistically significant, with a p-value of 0.000. The scale of the path coefficients is high, reflecting a strong positive relationship; hence, DC significantly influences PU ($\beta = 0.595$) and PEOU ($\beta = 0.749$). PU ($\beta = 0.49$) and PEOU ($\beta = 0.332$) are significant factors that affect PI, which are strong predictive measures of CB (0.792). The mediation analysis shows that PU and PEOU significantly

mediate the relationship between DC and PI. Table 4 presents the path coefficients of the hypothesized relationships with significance values.

Table 4: Hypotheses Results

Hypotheses	Constructs	Original sample (O)	T statistics (|O/STDEV|)	P values
Direct Effects				
H1	Digital Connectivity -> Perceived Usefulness	0.595	10.056	0.000
H2	Digital Connectivity -> Perceived Ease of Use	0.749	13.526	0.000
H3	Perceived Usefulness -> Purchase Intention	0.490	5.452	0.000
H4	Perceived Ease of Use -> Purchase Intention	0.332	3.706	0.000
H5	Purchase Intention -> Consumer Behavior	0.792	17.324	0.000
Specific Indirect Effects				
H6	Digital Connectivity -> Perceived Usefulness -> Purchase Intention	0.292	5.027	0.000
H7	Digital Connectivity -> Perceived Ease of Use -> Purchase Intention	0.249	4.251	0.000

The data strongly supports all the hypotheses, as the significant path coefficients and p-values indicate.

DISCUSSION:

The results from this study provide enough evidence to substantiate the proposed research model, especially in relation to rural consumers' adoption of e-commerce. The high path coefficients originating from DC to PU and PEOU hint that the infrastructure plays a very important role in shaping consumer perceptions. This aligns with the literature, suggesting that a higher degree of DC will be associated with perceptions of greater usefulness and ease of use for consumers in electronic commerce (Yusof et al., 2013). The much stronger relationship of DC to PEOU, $\beta = 0.749$, than to PU, $\beta = 0.595$, would thus suggest that connectivity is supportive of ease of use, which could be more important in rural areas when technological literacy might not be as strong.

Moreover, strong paths from PU to PI, $\beta = 0.49$, and from PEOU to PI, $\beta = 0.332$, confirm the applicability of TAM in the setting. When consumers perceive e-commerce platforms to be useful and easy to navigate, they are more likely to intend to purchase through them (Zhang et al., 2023). This supports the existing literature, emphasizing the importance of usability and perceived value in driving online purchase intentions.

According to the Theory of Planned Behavior, the strong path from Purchase Intention to Consumer Behavior $\beta = 0.792$ underlines the relevance of intention as a predecessor of real behavior (Wang, 2023). That is, in rural e-commerce buying contexts, when there is an intention on the part of consumers to buy online, this behavior will almost certainly be executed.

The mediation effects of H6 and H7 explain the underlying processes whereby Digital Connectivity influences Purchase Intention. Specifically, PU and PEOU are both strong mediators, which underlines the fact that renovation of

digital infrastructure influences not only the direct perception of consumers but also approaches and value addition of online purchase platforms, indirectly increasing the intention to purchase.

CONCLUSION:

This foregoing study achieved its objectives in evaluating the critical role of digital connectivity in shaping rural consumers' purchase intentions in the e-commerce segment. The findings indicate that while much of the contribution of digital connectivity lies in enhancing perceived usefulness and ease of use, it also plays a crucial role in mottling purchase intention, eventually driving actual consumer behavior. These findings indicate that there is a greater need to develop better digital infrastructure in rural areas so that access to this retail channel is truly possible and can be accessed both more intensively and actively. This research, therefore, explores the challenges that rural consumers face and contributes to a better understanding of how to get across the digital divide to economically develop an area inclusively through electronic commerce.

Future studies should also dwell further on the wider implications of improved digital connectivity, factoring in aspects such as demographic differences and the long-term effects of digital literacy interventions. This would further strengthen the approach toward stimulating greater e-commerce adoption in rural areas to ensure that benefits accruing from the digital economy are equitably distributed.

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