



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 Issue: VI Month of publication: June 2026

DOI: <https://doi.org/10.22214/ijraset.2026.84010>

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Impact of E-Commerce Adoption on Retail Business Performance and Consumer Buying Behaviour: An Empirical Study in Ranchi District of Jharkhand

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Abstract: *E-commerce has changed the way retailers operate and how consumers buy things from retailers by enabling businesses to use digital technology in ways that they could not have imagined previously, and has also resulted in greater use of the internet via smart phones and other devices, as well as greater ease of use for consumers to use online payment systems. A descriptive analytical research design and quantitative method of analysis was used in the study. Primary data for the study were gathered through a structured questionnaire from 106 respondents, and secondary data were gathered from books and journal articles, as well as other published materials. Descriptive statistics and regression analysis were used to analyse data collected for the study.*

According to the data, e-commerce significantly influences the way retailers perform. The correlation coefficient shows a moderate, positive relationship ($R\text{-value} = .447$) and e-commerce accounted for a portion of the variation of retail performance as evidenced by the regression ($R^2 = .200$). The regression has been established as having statistical significance ($F\text{-statistic} = 25.988$; $p < .001$) thereby rejecting the null hypothesis.

Based on this information, e-commerce does enhance retail operations, extend into new markets, and positively impact buyer behaviour. This research provides a solid foundation of information to support retailers in their efforts towards adopting digital transformation and developing long-term sustainable retail growth.

Keywords: *E-commerce, Retail Business Performance, Consumer Buying Behaviour, E-commerce Adoption, Digital Transformation.*

I. INTRODUCTION

A. Background of the Study

E-commerce is defined as the transaction of buying and selling products or services through electronic means (via the Internet) only. The past two decades have seen the greater availability of smartphones, faster access to high-speed Internet, and the introduction of digital payment systems and online retail marketplaces fundamentally alter how companies operate and how consumers make purchasing decisions.

With technological advances, businesses now have the ability to reach outside of their geographic boundaries, reduce costs associated with doing business, provide better quality customer service and improve overall operational performance.

B. Statement of the Problem

E-commerce has quickly grown and provides retailers an opportunity to increase their market presence, operate more efficiently, and give consumers greater convenience. It has also created new challenges for some retailers, especially in regional markets. The majority of studies that exist have been limited to either consumers or retailers in isolation and primarily have been conducted in major metropolitan areas. This has resulted in limited knowledge on how e-commerce adoption affects both retailers and consumers simultaneously within the socio-economic and technological context of Ranchi District. This void in the literature formed the framework for this study.

C. Significance of the Study

This research study is important due to its providing empirical evidence of the effect of e-commerce adoption on the performance of retail businesses and the buying patterns of customers in Ranchi District, Jharkhand. The findings contribute to the literature in that they examine both the perspective of the retailer and the customer within one study, creating a more well-rounded view of the e-commerce ecosystem in this region.

D. Scope of the Study

This research examines the relationship between e-commerce adoption and retail performance for businesses and consumer buying behaviours in the Ranchi District of Jharkhand. The research looks at how e-commerce affects business performance, how consumers make buying decisions, and the factors that affect the adoption of e-commerce for retailers and consumers. Study results are shown to be only indicative of the specific sample of respondents investigated within the Ranchi District at the time the study was conducted, but nonetheless provide useful information that could be utilised for future research into e-commerce adoption in other regional markets.

II. LITERATURE REVIEW

- 1) Laudon and Traver (2016): The study highlight that the traditional business environment has been significantly altered by e-commerce as a result of improved operational efficiency and reduced transaction costs. With e-commerce, businesses now have access to customers all over the world which increases the breadth of their market.
- 2) Turban (2017): This study found that using e-commerce leads to an increase in performance for businesses, as well as an increase in customer satisfaction. In general, a business that uses e-commerce is likely to have higher quality services, shorter transaction times and a better relationship with their customers than businesses not using e-commerce.
- 3) Chaffey (2019): This study has examined the effect that digital strategies have had on consumer buying processes, demonstrating that having comprehensive product detail, tailored marketing, as well as online discount promotions have a direct link to consumer purchasing behaviour.
- 4) Kotler (2014): Research provides evidence that technological innovation has dramatically changed consumer behaviour and that online consumer preferences have risen as a result of accessibility (convenience), the ability to access an abundance of information, and the ease with which price comparisons can be made.
- 5) Singh and Kaur (2019): In this research, the authors evaluate how e-commerce will affect the retail sector in India. The study finds that e-commerce provides retailers with new ways to grow, as they can easily access new customers and expand their businesses into other parts of the country. However, the evidence indicates that e-commerce creates increased competition for traditional retailers.
- 6) Gupta and Jain (2020): Various factors affecting how customers behave when making purchases are studied in great detail. Key determinants for making purchases and decisions are based around four primary areas including; creation of convenience, comparison of price, variety of products available and knowledge built through customer reviews.
- 7) Verma and Sharma (2021): This study showed that e-commerce has greatly improved sales efficiency and increased customer reach for retailers. They also found that retailers using digital platforms can sell to customers regardless of where they are located and that this can help them grow their businesses
- 8) Bansal and Singh (2018): The study looked into how traditional retailers faced difficulties as e-commerce grew. Their research indicated that small traditional retailers were encountering many problems such as fewer people coming into their stores and competing with other retailers on price. As a result of the research, it was suggested that small traditional retail outlets adopt new technologies to survive in the current retail environment, which is rapidly changing through e-commerce.
- 9) Kumar and Petersen (2016): E-commerce studies highlight how long-term relationships can be established with customers through e-commerce and how to create these relationships through data-driven marketing strategy implementation as well as through using customer data analytics to improve how to create personalised services and improve customer engagement.
- 10) Ramanathan (2017): The effects of e-special commerce on supply chains – retail performance will also be assessed. It will reveal that e-commerce provides greater efficiency from improved inventory control and timely delivery of goods and products to consumers but does caution that with higher demand, these retailers will have easier logistics' problems.
- 11) Kalia and Paul (2021): This study explores how consumers behave in developing countries when making purchases through the internet. Trust, usefulness, and ease of use were identified as three main drivers for consumers when making online purchases; social influence and digital awareness were also shown to have a large impact on this area

- 12) Reserve Bank of India (2021): This report discusses how payment systems have played an integral part in the expansion of (E) Commerce around India. The higher the number of people who are transacting online, whether through internet banking or using UPI, the easier and safer their transactions become when proposing to buy things online.
- 13) Sharma and Aggarwal (2020): This research examines the mixed effects e-commerce has on the retail industry today and into the future. On one hand, e-commerce creates competition for existing retailers by increasing the number of competitors; however, it also provides opportunities for retailers to increase their sales through online platforms.
- 14) Kumar and Singh (2020): This lookup provides analysis of the impact of e-commerce upon business performance; therefore, from the perspectives of increased revenue and improvement in customer satisfaction or operational efficiency through adopting digital platforms, there are benefits associated with using such platforms.
- 15) IBEF (2023): The document provides evidence illustrating the vast increase of India's E-Commerce sector as a result of the high levels of internet use and digital uptake; furthermore, smaller markets are found to be growing too through online purchases.
- 16) David(1989): The research of Davis (1989) was important because it provided a model (TAM) for understanding how users accept new technology and that two of the most significant aspects that affect acceptance of technology by consumers. Furthermore, the findings of the study indicated that user attitude and behavioral intention play an important role in shaping how technologies will be used by consumers.
- 17) Venkatesh et al., (2003): This research was also significant as it provided a framework for understanding how users accept and use different types of digital technologies (UTAUT). The study found that four primary drivers of technology acceptance and use are performance expectancy, effort expectancy, social influence, and facilitating conditions.
- 18) Gefen, Karahanna & Straub (2003): Trust in the online shopping world has proven to be the most vital component for influencing how consumers will respond to purchasing from an online business. The researchers stated that certain variables such as site security, privacy protection and trustworthy payment's systems increase a consumer's confidence in e-commerce and relate directly to their willingness to engage in online purchasing.
- 19) Pavlou, (2003): The researcher was examining online consumer's acceptance of purchasing goods or services from electronically based companies based on two factors: (1) trust and (2) perceived risk. The research data indicated that consumer's level of trust had a direct positive correlation to their intentions to conduct transactions electronically while consumer's level of perceived risk had a direct negative correlation on their behaviour of conducting transactions electronically
- 20) Chen & Dubinsky (2003): looked at customer satisfaction and e-loyalty from an online environment. Research revealed that design of Internet site, quality of service, product information, and transactional security greatly impact how satisfied customers feel about a site. Research showed that satisfied customers of an online shopping environment are more likely to be repeat purchasers and recommend a site to others

III. RESEARCH GAP

There is a lack of empirical studies that considers the impact of ecommerce adoption on consumer purchasing behaviour and retail firm performance within a particular regional context. Previous studies have also failed to adequately investigate the influences on e-commerce adoption in semi-urban locations. Therefore, through its focus on Ranchi and its exploration of the impact of e-commerce adoption on retail firms and consumer behaviour within a developing urban market, this study will address these research gaps.

IV. RESEARCH QUESTIONS

- 1) How does e-commerce impact the performance of retail firms operating in Ranchi?
- 2) How is buying behaviour influenced by the emergence of e-commerce in Ranchi?
- 3) Which elements are most important in determining retailer and customer adoption of e commerce within Ranchi?

V. RESEARCH OBJECTIVES

- 1) To investigate how e-commerce affects the performance of retail businesses in Ranchi.
- 2) To study how e-commerce influences consumer behaviour when purchasing products in Ranchi.
- 3) To determine which factors are most significant for both retailers and consumers regarding the adoption of e-commerce within Ranchi.

VI. HYPOTHESIS

- 1) H_0 (Null Hypothesis): There is no significant relationship between e-commerce adoption and retail business performance of retail businesses in Ranchi.
- 2) H_1 (Alternative Hypothesis): There is a significant relationship between e-commerce adoption and retail business performance.

VII. RESEARCH METHODOLOGY

A. Research Design

This research paper uses two general types of analysis to assess how the use of e-commerce affects the performance of retail businesses and consumer buying behaviours in Ranchi District, Jharkhand. In addition, both methods can provide important insights into what makes e-commerce work (or not work) for retailers by measuring the different aspects of how they use e-commerce.

B. Sources of Data

The researchers also used secondary data to augment the primary data collected. Secondary data sources included: data from books, research journals, and other published materials; government reports; and data from the internet and other academic databases. These additional sources allowed the researchers to build a sound theoretical framework or context for their study.

C. Sampling Technique and Sampling Size

The research was performed in Ranchi District, located in the state of Jharkhand. Due to its convenience and ability to gather information from respondents who were easily accessible at the time of the study, convenience sampling was utilized as the sampling method. The total sample size obtained was 106 valid responses, which are to be used in statistical analysis.

D. Data Collection Method

Data were collected from primary sources, with the use of structured questionnaires. These questionnaires contained closed-ended questions and covered many aspects of respondents, such as their demographic profiles, the frequency/use of electronic commerce, consumer purchasing behaviour, and the perceived impact of electronic commerce on retail performance. The responses obtained were then checked thoroughly, coded, and entered into statistical software for analysis.

E. Statistical Tools and Software Used

The statistical analysis of the data was conducted utilizing the Statistical Package for Social Science (SPSS). Descriptive statistical analysis was utilized to summarise the characteristics of respondents and variables of study. Regression analysis was used to examine the relationship between electronic commerce adoption and retail performance and tested the proposed hypothesis. All statistical analyses were done with appropriate statistical techniques, including the coefficient of determination (R^2), Analysis of Variance (ANOVA), regression coefficients, and for significance levels.

VIII. DATA ANALYSIS AND HYPOTHESIS TESTING

A. Demographic Profile

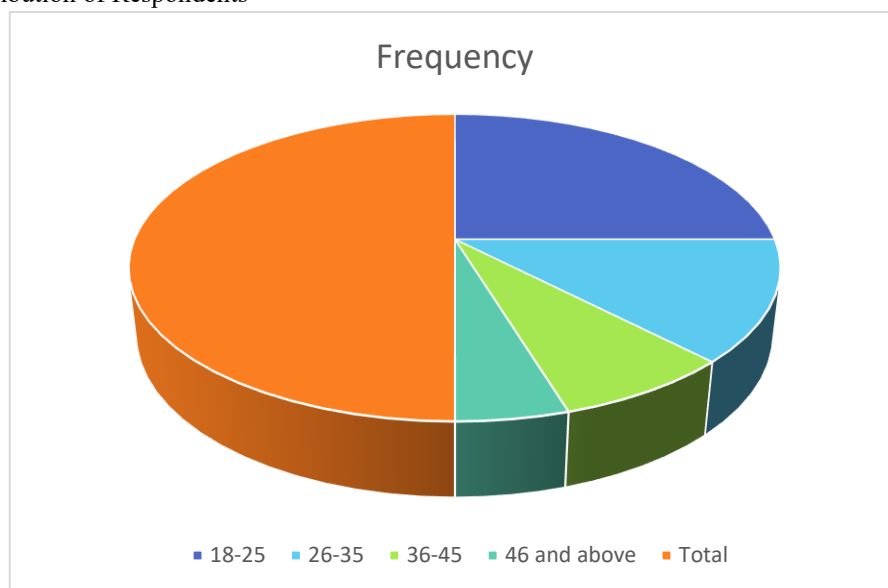
1) Age

Table 8.1 Age-wise Distribution of Respondents

Age Group (Years)	Frequency	Percentage (%)
18-25	53	50.0
26-35	27	25.5
36-45	16	15.1
46 and above	10	9.4
Total	106	100.0

Source: Primary Data

Figure 8.1 Age-wise Distribution of Respondents



Source: Computed by the researcher using Microsoft Excel

Interpretation: The above table shows the age-wise distribution of the respondents. This table indicates that the study is predominantly represented by younger individuals, who are generally more familiar with digital technologies and online shopping, making them an appropriate group for examining the impact of e-commerce on consumer buying behaviour and retail business performance.

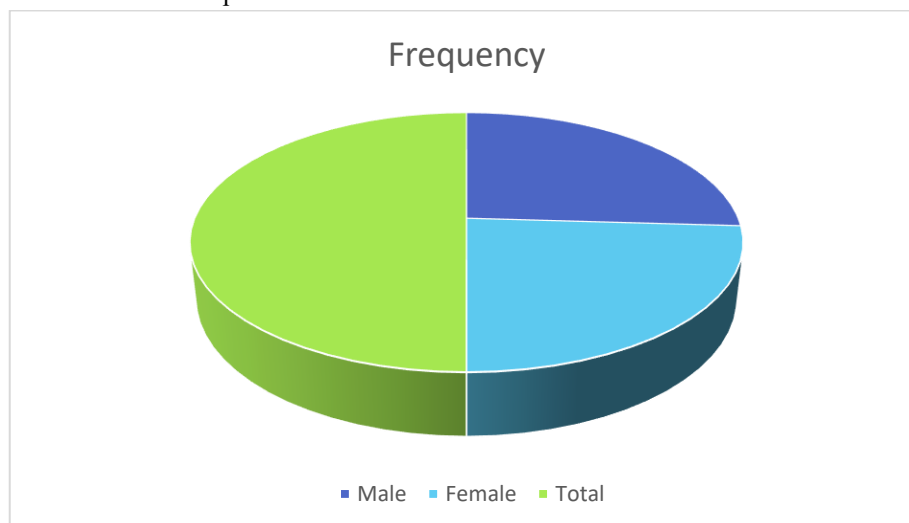
2) Gender

Table 8.2 Gender-wise Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	55	51.9
Female	51	48.1
Total	106	100.0

Source: Primary Data

Figure 8.2 Gender-wise Distribution of Respondents



Source: Computed by the researcher using Microsoft Excel

Interpretation: The above table presents the gender-wise distribution of the respondents included in the study. The findings indicate a nearly balanced representation of both genders, ensuring that the study reflects the perspectives of both male and female respondents regarding e-commerce adoption, consumer buying behaviour, and retail business performance

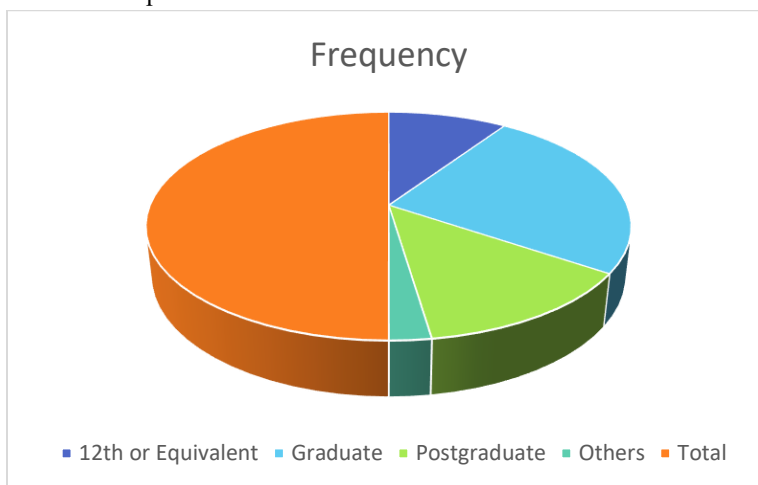
3) Educational Qualification

Table 8.3 Educational Qualification of Respondents

Educational Qualification	Frequency	Percentage (%)
12 th or Equivalent	20	18.9
Graduate	53	50.0
Postgraduate	28	26.4
Others	5	4.7
Total	106	100.0

Source: Primary Data

Figure 8.3 Educational Qualification of Respondents



Source: Computed by the researcher using Microsoft Excel

Interpretation: The above table shows the educational qualification of the respondents. The findings indicate that the majority of the respondents are well educated, suggesting that they are more likely to possess adequate knowledge and awareness of e-commerce and online shopping practices, thereby providing reliable responses for the study.

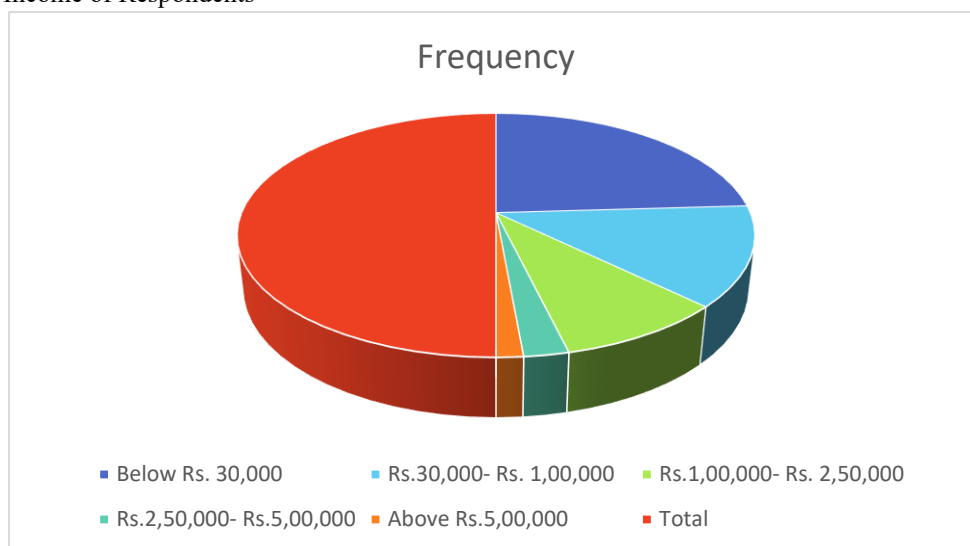
4) Monthly Income

Table 8.4 Monthly Income of Respondents

Monthly Income	Frequency	Percentage (%)
Below Rs. 30,000	51	48.1
Rs.30,000- Rs. 1,00,000	28	26.4
Rs.1,00,000- Rs. 2,50,000	19	17.9
Rs.2,50,000- Rs.5,00,000	5	4.7
Above Rs.5,00,000	3	2.8
Total	106	100.0

Source: Primary Data

Figure 8.4 Monthly Income of Respondents



Source: Computed by the researcher using Microsoft Excel

Interpretation: The above table presents the monthly income distribution of the respondents. The findings indicate that the majority of respondents belong to the lower and middle-income groups, providing useful insights into the e-commerce preferences and buying behaviour of these consumer segments.

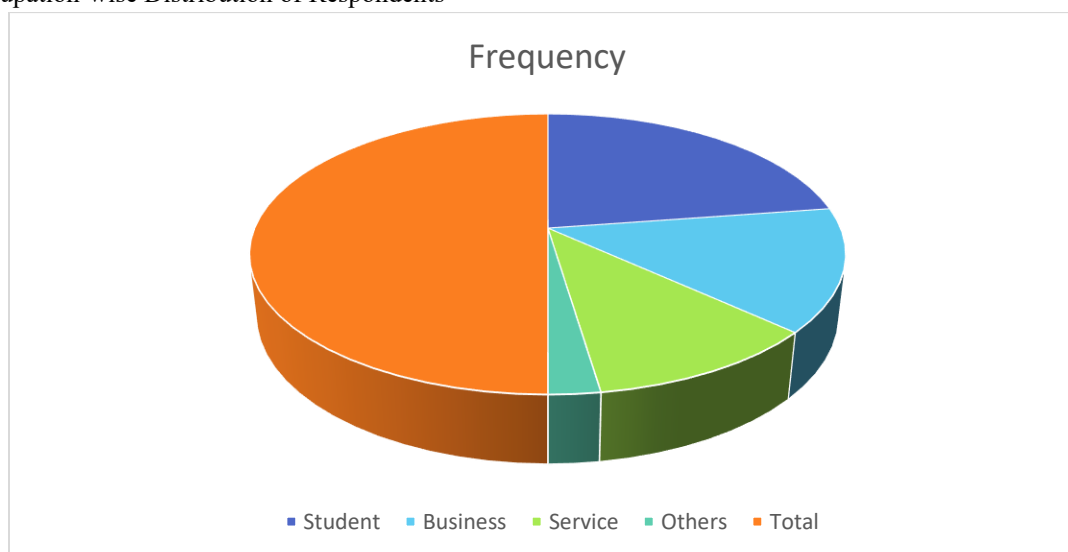
5) Occupation

Table 8.5 Occupation-wise Distribution of Respondents

Occupation	Frequency	Percentage (%)
Student	48	45.3
Business	30	28.3
Service	23	21.7
Others	5	4.7
Total	106	100.0

Source: Primary Data

Figure 8.5 Occupation-wise Distribution of Respondents



Source: Computed by the researcher using Microsoft Excel

Interpretation: The above table presents the occupational distribution of the respondents. It is observed that 48 respondents (45.3%) are students, constituting the largest proportion of the sample, followed by 30 respondents (28.3%) engaged in business, 23 respondents (21.7%) employed in the service sector, and 5 respondents (4.7%) belonging to other occupations. The findings indicate that the study includes respondents from diverse occupational backgrounds, providing varied perspectives on e-commerce adoption, consumer buying behaviour, and retail business performance.

B. Regression Analysis

Table 8.6 Simple Linear Regression
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.447 ^a	.200	.192	.46950

a. Predictors: (Constant), IV

Source: Computed by researcher using SPSS software

Interpretation: The above table presents the model summary of the regression analysis. The correlation coefficient ($R = 0.447$) indicates a moderate positive relationship between e-commerce adoption and retail business performance. The coefficient of determination ($R^2 = 0.200$) shows that 20.0% of the variation in retail business performance is explained by e-commerce adoption, while the remaining 80.0% is influenced by other factors.

Table 8.7 ANOVA Table- Overall Model Significance
ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.729	1	5.729	25.988	<.001 ^b
	Residual	22.925	104	.220		
	Total	28.654	105			

a. Dependent Variable: DV

b. Predictors: (Constant), IV

Source: Computed by researcher using SPSS software

Interpretation: The ANOVA results show that the regression model is statistically significant ($F = 25.988$; $p = 0.000$), as the significance value is less than 0.05. This indicates that e-commerce adoption has a significant effect on retail business performance and that the regression model is suitable for the study.

Table 8.8 Regression Coefficient
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.019	.379		5.322	<.001
	IV	.483	.095	.447	5.098	<.001

a. Dependent Variable: DV

Source: Computed by researcher using SPSS software

Interpretation: The coefficients table indicates that e-commerce adoption has a positive and statistically significant impact on retail business performance ($B = 0.483$, $\beta = 0.447$, $p = 0.000$). This implies that an increase in e-commerce adoption leads to an improvement in retail business performance among the respondents

C. Hypothesis Testing

Null Hypothesis	Statistical Test	p-value	Decision
There is no significant relationship between e-commerce adoption and retail business performance	Regression Analysis	0.000	Rejected

Interpretation: The hypothesis was tested using simple linear regression analysis. Since the obtained significance value (0.000) is lower than the accepted level of significance (0.05), the null hypothesis is rejected and the alternative hypothesis is accepted. The findings provide sufficient statistical evidence to conclude that e-commerce adoption has a significant positive impact on retail business performance.

IX. OBJECTIVE-WISE ACHIEVEMENT OF OBJECTIVES

Objective 1: To investigate the impact of e-commerce on the performance of retail businesses in Ranchi District.

Achievement: Achieved; The regression analysis confirmed a significant positive relationship between e-commerce adoption and retail business performance ($p < 0.05$). Therefore, the first objective of the study was successfully achieved.

Objective 2: To study the influence of e-commerce on consumer buying behaviour in Ranchi District.

Achievement: Achieved; The descriptive analysis revealed that factors such as convenience, product variety, competitive pricing, and digital payment facilities positively influenced consumer buying behaviour. Thus, the second objective was achieved.

Objective 3: To determine the factors influencing the adoption of e-commerce among retailers and consumers in Ranchi District.

Achievement: Achieved; The study identified internet accessibility, trust, ease of use, and digital payment systems as key factors influencing e-commerce adoption. Hence, the third objective was successfully achieved.

X. FINDINGS, CONCLUSION AND RECOMMENDATIONS

A. Findings

- 1) Most respondents were young people with a good education level that live in low to middle-income ranges; thus, indicating participants are very much aware of e-commerce and participate in it.
- 2) The study has concluded that e-commerce has had a positive effect on the performance of retail businesses by enabling retailers to reach more customers, enabling retailers to sell more products, and by improving the operational efficiency of retail businesses.
- 3) The findings of the study have also indicated there are several major determinants or factors that affect consumer buying behaviour, including: convenience and availability of e-commerce sites, competitive pricing for products on e-commerce sites, the variety of products available to be purchased through e-commerce.
- 4) The internet access; easy to use E-Commerce websites; trust for E-Commerce transactions; and trustworthy digital payment systems have all been identified as important factors that have encouraged consumers and retailers to adopt e-commerce.
- 5) The regression analysis performed during the study showed that the correlation between e-commerce adoption and retail business performance is statistically significant ($p < 0.05$) therefore the null hypothesis has been rejected and the alternative hypothesis has been accepted.

B. conclusion

From this research, it can be concluded that e-commerce plays a significant role in supporting growth in the Retail Industry. It has been confirmed that by using e-commerce, Retail Business Performance improves because of greater access to an expanded customer base and being able to run their operations more efficiently as well as providing increased levels of satisfaction for their customers. In addition to improving a Retailer's Business Performance, this research highlights how Consumer Buying Behaviour has been influenced by Convenience, Product Variety, Competitive Price, and Secure Digital Payments. Therefore, the findings of this study indicate that further investing in and upgrading E-Commerce Technologies will help Retailers remain Competitive and Sustain Economically Long-term in the District of Ranchi.

C. Suggestions

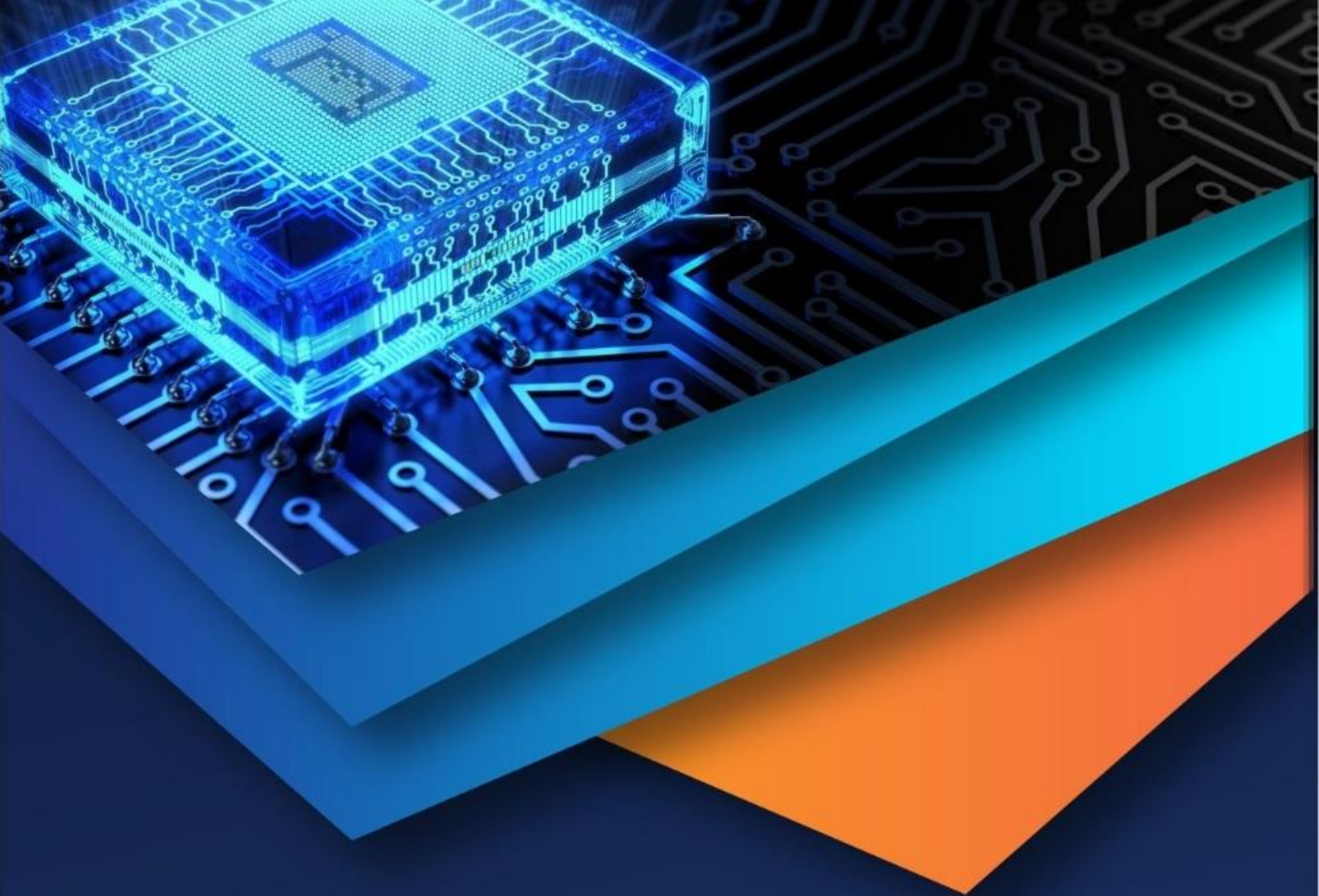
- 1) Retail companies should build upon their presence on the Internet through user-friendly e-commerce system and through digital marketing.
- 2) Retail companies should also use secure payment systems when selling online and should maintain privacy of consumer data to develop consumer trust.
- 3) Government and appropriate authorities should improve the infrastructure supporting e-commerce and arrange educational, training programs to increase ecommerce.
- 4) Retail companies should routinely evaluate consumer preferences and offer high-quality products and rapid or effective distribution of these products to develop consumer satisfaction.
- 5) Small retail businesses must implement modern digital technologies to be competitive in the rapidly expanding e-commerce marketplace.

D. Scope For Future Research

This research was limited to a specific group of respondents within Ranchi District (Jharkhand, India). Future studies should include other geographical areas and larger samples of respondents so that there will be more comprehensive findings. Future studies should also focus on how new forms of technology including artificial intelligence, social commerce, mobile commerce, and omnichannel retail will affect both consumers' behaviours toward purchasing and retail's performance.

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