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TRANSFORMING E-COMMERCE: THE CRITICAL ROLE OF DIGITAL TRANSACTIONS

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Abstract

The paper examines the role of technological advancements which facilitate the rise of e-commerce in India by emphasising particularly on Digital Transaction. Digital transactions, ranging from credit cards and mobile wallets to foreseeable technologies such as crypto currencies, have transformed online buying and selling. Convenience, greater security measures, worldwide reach, and improved customer experience have all been highlighted as key drivers of the growing number of online transactions that have expanded the growth of e-commerce. The research relies on secondary data from credible sources such as RBI annual reports and IBEF report and statistics, covering the period 2013-14 to 2022-23 and appropriate statistical tools were used to examine the link between digital transaction volumes and E-commerce market share. The study supports the hypothesis that digital transaction volumes directly and significantly impact e-commerce market share. Furthermore, the findings also indicate that the e-commerce market has been expanding rapidly in the past few years and reached its saturation. However, India is likely to expand its market share much faster rate in comparison to the global e-commerce market due to its continuing digital transformation. The research states that digital payments are a crucial enabler of e-commerce growth, driving both market expansion and consumer engagement.

Keywords: E-commerce, E-commerce Model, Digital Transaction, E-commerce Market Share and E-commerce Revenue

Introduction

The rapid advancement of technology has transformed several industries and E-commerce is emerging as one of the most benefitted sectors through these advancements. The emergence of

E-commerce has significantly transformed the global retail scenario, allowing customers the convenience to purchase from anywhere and at any time. The shift toward e-commerce has been fuelled in large part by the growth of digital payment systems, which offer the required facilities for rapid, safe, and efficient transactions. From credit and debit cards to mobile wallets, digital banking, and future technologies such as cryptocurrency, these systems have transformed the way people purchase and sell goods and services online.

Digital payment methods make the checkout process easier for customers, reducing complexity and allowing them to complete their purchases instantaneously. This simplicity of transaction has played an essential part in stimulating the rapid expansion of e-commerce, encouraging greater frequency of online transactions, and expanding business organizations' reach to worldwide markets. Furthermore, improved security features of digital payments, such as encryption and fraud prevention, have increased customer trust in online transactions, alleviating concerns regarding data breaches and financial theft.

The key digital payments factors driving the expansion of e-commerce:

1. Convenience and Accessibility: Digital payment systems simplify transactions by providing many payment alternatives, allowing customers to make purchases from anywhere in the world. This convenience, offered by payment options such as PayPal, Apple Pay, and Google Pay, minimizes cart abandonment while increasing transaction volumes, consequently extending the customer base.

2. Enhanced Security: Encryption, tokenization, and features such as 2FA and biometric verification improve the security of digital payment systems, protecting sensitive data. These strategies increase customer trust, encouraging more participation in e-commerce.

3. Global Reach: Stripe and PayPal are two digital payment systems that allow e-commerce companies to accept cross-border payments in a number of currencies, increasing their worldwide reach. This enables businesses to enter foreign markets without requiring physical stores.

4. Improved Customer Experience: Seamless digital payment integration offers fast, simple and smooth transactions, increasing conversion rates and lowering cart abandonment. Customer loyalty is enhanced by features like as one-click payments and auto-renewals, which ease recurring transactions.

5. Financial Inclusion: Digital payments promote financial inclusion by allowing unbanked people to access online commerce through mobile payments and e-wallets. This broadens the consumer base, particularly in developing countries with limited financial facilities.

6. Reduced Transaction Costs: Compared to cash or checks, digital payments save transaction costs by eliminating processing fees and human handling. Because of their efficiency, e-commerce companies may reduce costs and provide more affordable prices, which stimulates market expansion.

7. Real-time Payments and Flexibility: Digital payment systems provide faster payment confirmations and order fulfilment, improving the consumer experience. Flexible choices, such as instalment payments and buy-now-pay-later services, appeal to a larger audience, increasing sales and attracting potential customers.

8. Data Analytics and Personalization: Digital payments give important insights about customer behaviour, preferences, and spending habits. This allows e-commerce enterprises to provide individualized promos and customized experiences, hence increasing client loyalty and sales.

9. Reduced Barriers to Entry for Small Businesses: Digital payment systems make e-commerce setup easier by providing readily integrated payment channels. This enables small enterprises and startups to access the internet market fast, hence promoting total e-commerce growth.

10. Support for Emerging Technologies: Digital payments integrate with technology such as AI, machine learning, and blockchain, improving security and efficiency. AI chatbots help with payment procedures, while blockchain assures transparency in international transactions, which fuels e-commerce development.

As digital payment systems evolve, they become more important in influencing the future of e-commerce by encouraging innovation, boosting financial inclusion, and allowing firms of all sizes to establish themselves in the global marketplace. This article investigates the crucial role of digital payments in supporting the expansion of e-commerce, focusing on the fundamental variables that have led to their success and the larger consequences for the retail industry and the global economy.

Review of Literature

Thete, B. (2024). The paper titled "**E-commerce in India- Issues and Opportunities**", examines the present situation of e-commerce in India, focusing on its potential to stimulate rural development and help businesses such as textiles through new technology. It also addresses issues including limited infrastructure, as well as the need for stronger legal frameworks and more public awareness. The research approach used in this study is descriptive. Secondary data is collected from a variety of sources, including internet portals, newspapers, journals, and publications. The paper's result and findings show that e-commerce in India is rapidly growing and improving market access for both consumers and businesses. It emphasizes the benefits of e-commerce, including lower transaction costs and the potential to reach a worldwide audience. However, the study also recognizes major constraints, such as inadequate telecom infrastructure, a lack of regulatory frameworks, and insufficient public awareness, that limit the sector's full potential. The study suggests the need of collaboration between the government and the corporate sector in addressing these concerns and promoting long-term growth in e-commerce.

Varma, A. (2023). The research paper titled "**Future of E-commerce in India - 2023**", analyzes the substantial growth of e-commerce in India and its factors. The study assesses the industry's

current state, identifies significant developments, and considers future problems and possibilities. The study comprised exploratory and descriptive research methods. Secondary research approaches were used to obtain information, such as analyzing academic papers and reliable sources, to offer a full grasp of the present situation and future prospects of e-commerce in India. The paper's research and findings show that the Indian e-commerce sector has the potential for tremendous expansion, driven by rising smartphone penetration, digital literacy, and shifting customer behaviors. However, problems like as regulatory concerns, payment infrastructure, and last-mile delivery must be solved in order to maintain this development. Collaboration among stakeholders is critical for capitalizing on growing prospects in the e-commerce ecosystem. It also explores the key trends mentioned include the growth of mobile commerce (M-commerce), social commerce, and the use of artificial intelligence for tailored purchasing experiences.

Sathyapriya, M. & Manochithra, P. (2022). The research paper titled "**A Study on Impact of E-commerce on India's Commerce**", examines the role of e-commerce on Indian business, noting its rapid expansion and benefits. It also covers the challenges facing the Indian e-commerce sector, as well as the prospects for future growth. The research methodology employed in the paper is descriptive. Secondary sources, such as industry publications and academic journals, are used to study trends and issues in the e-commerce business. The result shows that -commerce in India is growing rapidly, owing to increased internet penetration and smartphone usage, with an estimated online retail turnover of $100 billion by 2022. However, factors such as limited credit card usage, poor infrastructure, and customer trust remain significant impediments to continued development. They have also suggested that To boost e-commerce growth in India, it is critical to strengthen IT security measures and establish strong payment gateways to generate customer confidence. Furthermore, government policies should prioritize making internet connection affordable and upgrading infrastructure, particularly in rural regions, to encourage greater involvement in e-commerce.

Gupta, P & Sharma, A. (2022). The paper titled "**E- Commerce in India – A New Perspective**", explores e-commerce's disruptive influence on the Indian market, emphasizing how advances in web technology allow small and medium-sized businesses to compete with bigger firms. It underlines the need of strategic positioning and excellent human resource management while leveraging e-commerce for business success. The research methodology employed in the paper is exploratory and descriptive. Data is collected mostly from secondary sources, including e-commerce reference books, national and international research publications, reviewed literature and Information collected from several websites pertaining to the topic area. The results show a huge increase in internet and smartphone usage in India, as well as government measures such as the ONDC to promote e-commerce. However, problems such as insufficient infrastructure and regulatory restrictions continue to be significant roadblocks to fully realizing e-commerce's promise.

Suryawanshi, S. (2017). The article titled "**E-commerce in India – Challenges and Opportunities E-commerce**", covers the evolution of e-commerce in India, focusing on its problems and prospects while focusing on technology improvements that ease online transactions.

The research methodology employed in the paper is exploratory as well as descriptive. The study largely involves the acquisition of secondary data from a various source, such as papers, journals, books, and websites. This technique enabled the researcher to investigate the conceptual framework, present trends, difficulties, and prospects in Indian e-commerce. The results and findings of the paper shows that India's e-commerce sector has enormous growth potential, owing to increased internet and mobile usage, but it confronts problems such as poor cybersecurity rules. However, only 19% of the population presently engages in online purchases, leaving a big untapped opportunity for e-commerce development.

Objective

1. To study the various models of e-commerce
2. To find out the presence of relationship between market share of e-commerce and digital transaction volume in India
3. To analyze the impact of digital transaction volume on market share of e-commerce in India
4. To compare the growth of Global and India's e-commerce revenue

Hypothesis

1- H_{01}: There is no significant relationship between market share of e-commerce and digital transaction volume

H_{A1}: There is a significant relationship between market share of e-commerce and digital transaction volume

2- H_{02}: There in no significant impact of digital transaction volume on market share of e-commerce

H_{A2}: There in a significant impact of digital transaction volume on market share of e-commerce

Research Methodology

This nature of this research is descriptive and analytical, focused to explain various e-commerce models, role of digital transaction in enhancing e-commerce growth and comparing the e-commerce revenue in Indian and global perspective. The research relies on secondary data arranged from RBI annual report, IBEF report, and statista, which has been rechecked thoroughly for authenticity. 10 years data from financial year 2013-14 to financial year 2022-23 of e-commerce and digital transactions was collected and analyzed using statistical tools such as Coefficient of Correlation, Linear Regression, and ANOVA with the help of SPSS. Coefficient of Correlation is used in this study to find out the relationship between e-commerce market share and digital transaction volume. Linear regression analysis and ANOVA is used to assess the contribution of digital transaction in the growth of market share of e-commerce.

Models of E-commerce

Models of e-commerce describe the numerous ways in which companies and customers engage in the digital marketplace. These models specify how products and services are exchanged, as

well as the interactions between ecosystem participants. The primary types of e-commerce models include:

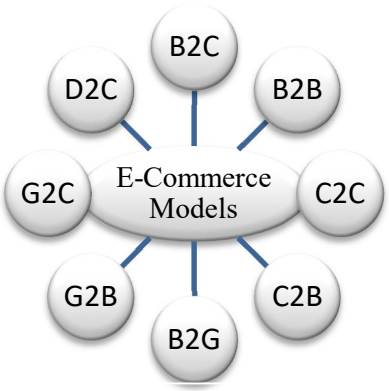


Figure 1.1 (Models of E-commerce)

1. **Business to Consumer (B2C) Model**
   This model involves businesses selling goods or services to individual customers direclty via online platforms like websites or mobile applications. This model is mostly adopted by online shops, streaming services, and digital product suppliers, who offer consumers with ease, a diverse product selection, and competitive price. To flourish, B2C enterprises must prioritize targeted digital marketing, a seamless user experience, quick delivery, and prompt customer service. The B2C model enables firms to access a worldwide audience and operate throughout all times, eliminating the need for physical storefronts.
2. **Business to Business (B2B) Model**
   This model enables helps business in transactions between one another, such manufacturers, wholesalers and retailers, rather than between firms and individual customers. B2B e-commerce is often characterized by big orders, long-term contracts, and more complex discussions than B2C. It is crucial to contemporary supply chains and corporate procurement. As technology advances, B2B is adopting AI-driven purchasing, real-time supply chain monitoring, and tailored experiences, resulting in increased growth and complexity.
3. **Consumer to Consumer (C2C) Model**
   This model helps people to sell and purchase goods and services to one another directly online, eliminating traditional retail intermediaries. C2C platforms, which function as digital markets, facilitate both new and used goods transactions, providing restricted entry barriers and a diverse selection of affordable options. This concept promotes sustainability and peer-to-peer connection, making it an important part of the global e-commerce landscape. However, trust, quality control, and logistics remain critical issues.
4. **Consumer to Business (C2B) Model**

This model reverses the usual B2C model, with people selling goods or services to businesses. This model prospers in fields such as crowdsourcing, freelancing, user-generated content, and influencer marketing, allowing users to benefit from their knowledge or influence. It enables individuals to participate in the digital economy on their own terms while also giving corporations with access to different skills and ideas. Despite obstacles such as revenue instability and platform dependence, the C2B model is transforming online interactions between consumers and businesses.

5. Business to Government (B2G) Model

This model comprises businesses selling goods or services to governmental agencies via contracts and procurement procedures. It is highlighted by large-scale contracts, complex bidding, and regulatory compliance, which are frequently supported by government procurement platforms. This strategy provides firms with several options for profitable, long-term partnerships with public-sector institutions. While the process can be challenging, public procurement allows both small and large enterprises to profit from stable and financially secure contracts.

6. Government to Business (G2B) Model

This model comprises government agencies providing services, information, and assistance to businesses to ensure compliance, development, and effective operation. It provides services such as licensing, taxation, procurement, and regulatory compliance, establishing a favorable climate for business expansion. G2B aspires to improve communication, transparency, and efficiency between the public and private sector. Despite obstacles such as the digital divide and bureaucracy, the benefits such as increased efficiency and accessibility are critical for fostering economic development and government-business partnership.

7. Government to Citizen (G2C) Model

The Government-to-Consumer (G2C) e-commerce model enables governments offering services, information, and resources directly to individuals, hence increasing access to public services and participation in society. It focuses on online services, e-governance, and public welfare, with the goal of promoting transparency, service delivery, and citizen engagement. G2C facilitates more efficient communication and interactions between the government and citizens via the use of technology. Despite issues such as the digital divide and data security, G2C promotes increased accessibility, efficiency, and community growth.

8. Direct to Consumer (D2C) Model

This model enables firms to sell directly to customers, avoiding intermediaries such as wholesalers and merchants. Driven by the advent of online commerce, social media, and technology, direct-to-consumer enterprises use their own channels, such as websites and social platforms, to establish stronger client relations. This methodology improves engagement, profit margins, and brand loyalty while utilizing data to deliver tailored

experiences. Despite constraints like as competition and logistics, direct to consumer (D2C) provides businesses with better control and development possibilities in today's market.

E-commerce market share and digital transaction volume in India

Correlation			
		Market Share of E-commerce	**Digital Transaction Vol**
Pearson Correlation	Market Share of e-commerce	1.000	.973
	Digital Transaction Vol	.973	1.000
Sig. (1-tailed)	Market Share of e-commerce	.	.000
	Digital Transaction Vol	.000	.
N	Market Share of E-commerce	11	11
	Digital Transaction Vol	11	11

Table 1.1 (Correlation between e-commerce market share and digital transaction volume in India)

The table 1.1 presents the Pearson correlation between e-commerce market share and digital transaction volume. The Pearson correlation value is 0.973, indicating high degree of positive correlation, at 0.05 level of significance. Thus, the first null hypothesis stating that there is no significant relationship between e-commerce market share and digital transaction volume is rejected and the alternate hypothesis is accepted.

Model Summary[b]									
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**				
					R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.973[a]	.947	.941	75863.114	.947	161.235	1	9	.000
a. Predictors: (Constant), Digital Transaction Vol									

b. Dependent Variable: Market Share of E-commerce

Table 1.2 (Model Summary)

The model summary presents the vital data for a regression study in which the dependent variable is e-commerce market share and the independent variable is digital transaction volume. R Square value of 0.947 indicates that 94.7% of the fluctuation in e-commerce market share is accounted for by digital transaction volume. The Adjusted R Square, which considers the number of predictors and adjusts for sample size, is somewhat lower at 0.941, indicating a little modification while still demonstrating an accurate fit. The R Square Change value is 0.947, same to the R Square, indicating that the inclusion of the predictor (digital transaction volume) significantly influences variation in market share. The F Change statistic is 161.235, with a significance value (Sig. F Change) of 0.000, suggesting that the model is statistically significant, demonstrating that the predictor variable significantly accounts for the variance in e-commerce market share.

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	**Regression**	927943389791.720	1	927943389791.720	161.235	.000[b]
	Residual	51796909151.189	9	5755212127.910		
	Total	979740298942.909	10			
a. Dependent Variable: Market Share of e-commerce						
b. Predictors: (Constant), Digital Transaction Vol						

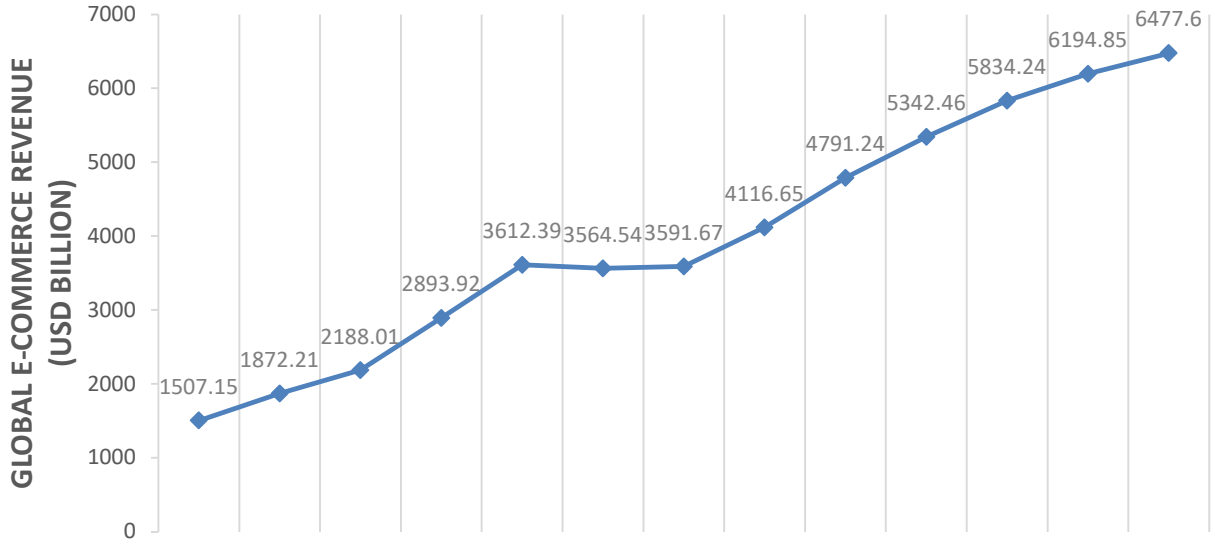
Table 1.3 (ANOVA)

The p-value (0.000) of F-statistics in ANOVA Table 5 indicates that the R^2 value is significant. The F-test is used to examine the model's overall validity and to determine whether any of the explanatory factors has a linear relationship with the dependent variable. In this case, the significant F change value is less than 0.05. As a result, the fitted linear model is valid and the explanatory variable has a significant linear relationship with the market share of e-commerce. As a result, the second null hypothesis, stating that market share of e-commerce has no significant impact on digital transaction volume, is rejected and the alternate hypothesis is accepted.

Figure 1.2 (Normal P-P Plot)

The figure 1.2 displays a Normal P-P Plot of regression standardized residuals for the dependent variable, market share of e-commerce, to assess the normality of the residuals from a regression model. The majority of the points lie close to the diagonal line, but with some minor variations. This indicates that the residuals are primarily normal distributed, with very slight deviations from normality. thus, the normality condition for the residuals seems to be valid for this regression model.

Growth of Global and India's e-commerce revenue



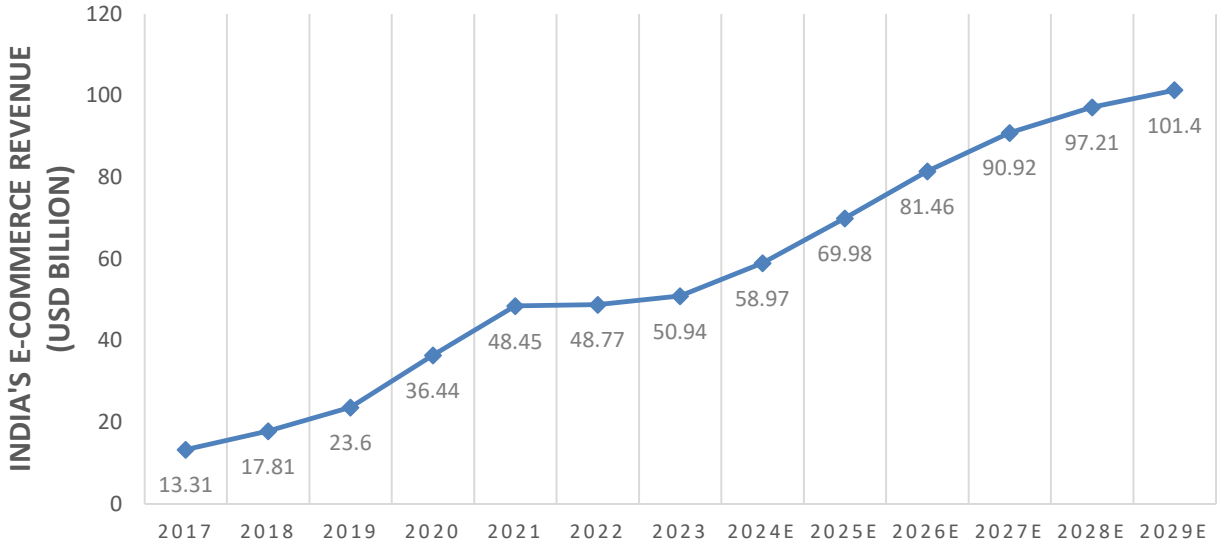


Figure 1.3 (E-commerce Revenue in USD billion)

The figure 1.3 shows that the global and Indian e-commerce markets have seen significant growth from 2017 to 2029, however with differing paths and scales. Worldwide, e-commerce revenue increased from $1507.15 billion in 2017 to an anticipated $6477.6 billion by 2029. The most notable increase occurred in 2020, with a 32% growth rate, mostly fueled by the COVID-19 pandemic, which expedited the transition to online buying as customers moved away from conventional shops. Following to this rise, the worldwide market had a gradual slowdown, with growth diminishing to just 1% by 2023; however, forecasts indicate a comeback, attaining a stable 5% growth by 2029. India's e-commerce market, even though being smaller in absolute figures, had much more rapid expansion relative to the worldwide average. Revenue rose from $13.31 billion in 2017 to an anticipated $101.4 billion by 2029. India's e-commerce sector had a significant surge in 2020, with a remarkable 54% rise, indicative of the rapid digital revolution prompted by the pandemic. Similar to the worldwide market, India's growth rate started a decline after the pandemic, decreasing to 4% by 2023. By 2029, the growth rate is anticipated to decline to only 4%, indicative of a mature market. Although both markets are anticipated to persist in their growth, the pace of increase will be much slower than during the original boom period. The worldwide market is far bigger and more established, resulting in growth that is steady but modest. Conversely, India's e-commerce business remains in a developmental stage, reflecting for its faster but inconsistent growth rates. The slowdown in both areas from 2024 onwards indicates a transition towards maturity, when growth is expected to be driven by enhanced online retail penetration and infrastructural advancements, rather than increases in demand caused by the global epidemic.

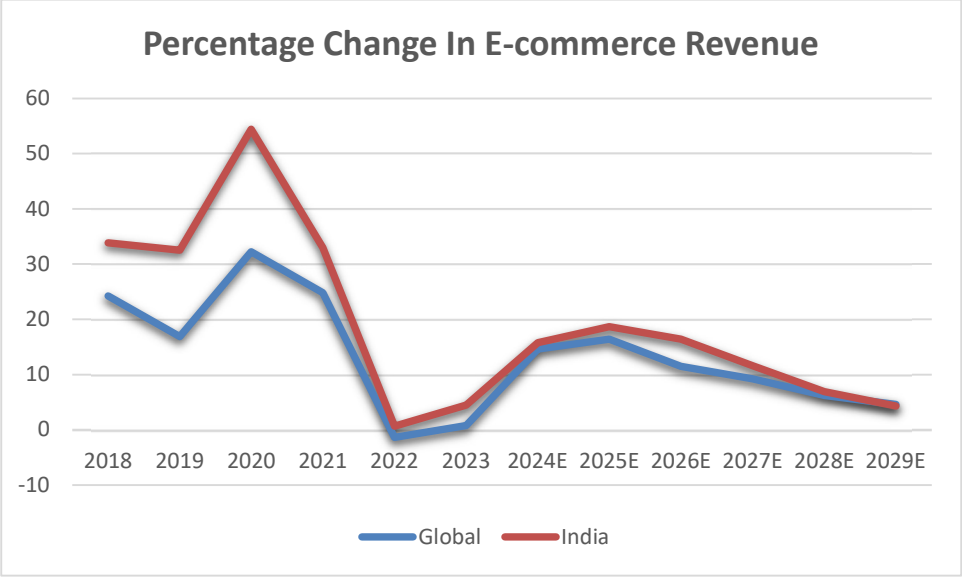


Figure 1.4 (Percentage change in E-commerce Revenue)

The figure 1.4 illustrates the percentage variation in e-commerce revenue for India and the worldwide market from 2018 to 2029. In 2020, India saw a significant revenue surge of 54%, surpassing global growth rates. In 2022, global e-commerce had a decline of 0.66%, while India sustained positive growth throughout the period. Both areas witness a slowdown post-2020, with modest growth anticipated until 2029. India's growth continues to exhibit more volatility, particularly from 2020 to 2023. Following a rough phase, global e-commerce is expected to rebound, with consistent yet moderate growth, reaching around 4.31% by 2029. India's growth is projected to stabilize post-2023, with forecasts of about 11.5% by 2026 and 11.6% by 2027, indicating less volatility relative to previous years. Both areas are anticipated to undergo a steady and incremental increase in e-commerce revenue until 2029.

Results and Findings

1- The study highlights the prominent e-commerce models including B2C, B2B, C2C, C2B, B2G, G2B, G2C, and D2C, each characterized by distinct dynamics, these models have transformed global trade by providing innovative prospects for expansion, efficiency, and accessibility.
2- The results of correlation analysis revealed that there is high degree of positive correlation between e-commerce market share and digital transaction volume which means that the rise in digital transaction volume is closely linked to a growth in the market share of e-commerce and an increase in digital transactions leads to e-commerce platforms acquiring a greater market share.
3- The regression analysis results show that the volume of digital transactions significantly contributes to the growth in e-commerce market share. This indicates that rising digital transaction volumes directly and measurably influence the growth of e-commerce.

Moreover, the ANOVA study revealed that the explanatory variable, digital transaction volume, has a significant linear association with e-commerce market share. This validates the linear regression model and establishes that digital transaction volume can consistently account for variations in e-commerce market share. Consequently, the preset model effectively illustrates how the expansion of digital transactions drives the growth of e-commerce market share.

4- The analysis revealed that the revenue of e-commerce has grown steadily over the years in both India as well as global market and has reached its saturation point because of which a slower growth rate has been estimated over the coming years. It was also revealed that the absolute figures of global e-commerce revenue are much higher compared to India, however India witness much faster growth over the period 2018 to 2023 and also a higher rate has been estimated for the period 2024 to 2029.

Conclusion

The rise of digital transaction has transformed the e-commerce sector, serving as the catalyst for its rapid growth and accessibility. Technological advancements have optimized digital payments, enhancing transaction security, minimizing expenses, and expanding market prospects for enterprises. These payment methods have transitioned from simple conveniences to essential drivers for e-commerce expansion. The influence of digital payments extends beyond transaction convenience; it is transforming the whole e-commerce industry. The developments in technology promote the continuous rise of e-commerce by delivering more smoother, quicker, and secure payment methods, letting firms reach a worldwide audience more efficiently. Nonetheless, its expansion is accompanied by many problems. Regulatory difficulties and infrastructural constraints continue to provide substantial obstacles, particularly in emerging nations. Despite these challenges, the continuous advancement of digital payments will be essential for maintaining long-term development in both domestic and global e-commerce sectors. With the emergence of new developments, digital payments will remain essential in the future e-commerce growth.

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