

Challenges and Opportunities of E-Commerce Penetration in Rural Areas of India: A Literature Review

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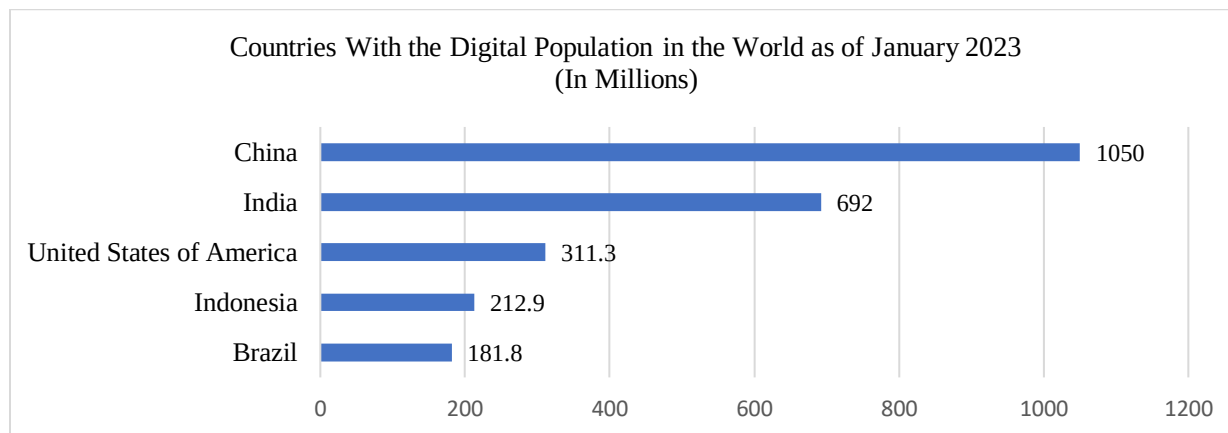
Abstract: This study provides a literature review on e-commerce scenarios in rural India. This study aims to synthesize the Challenges, opportunities and the impact of various government initiatives in e-commerce adoption in rural areas through an extensive review of research journals and published articles. A total of 34 peer-reviewed journal articles were selected after applying specific inclusion and exclusion criteria, emphasizing relevance to rural Indian contexts and developing countries. The findings show an increasing amount of e-commerce research in rural areas in foreign countries, especially China. The review reveals that although rural internet penetration is improving, significant barriers persist—including limited digital literacy, infrastructural constraints, and a lack of trust in online platforms. On the other hand, rising smartphone usage and government-led initiatives such as Digital India and Bharat Net are acting as important drivers of change. The study underscores the importance of integrated policy interventions and localized efforts to bridge the digital divide and encourage inclusive e-commerce growth in rural India.

Key Words: E-commerce, Rural Areas Development, Challenges, Government Support, Internet Penetration, Digital Literacy.

I. Introduction

A new kind of trade known as "E-Commerce" quickly emerged in the modern world's economy with the introduction of the Internet and its commercialization since 1994 (Peterson et al., 1997); (Poon & Jevons, 1997). According to WTO "Electronic commerce, or e-commerce, is defined as the production, distribution, marketing, sale or delivery of goods and services by electronic means. An e-commerce transaction can be between enterprises, households, individuals, governments, and other public or private organizations". E-commerce is a widespread phenomenon that is expanding at a growing rate in every country.

Chart (1): Top 5 Countries with highest numbers of Internet Users



Worldwide; Data Reportal; January 2023 | <https://www.statista.com/>

According to a report by Statista, the total number of Internet users is 5 billion globally as of January 2023. Yet, there are significant regional variations in user distribution. the percentage of internet connection was higher in urban than in rural areas (Petrosyan, 2023).

Table (1): Largest E-commerce Market Worldwide

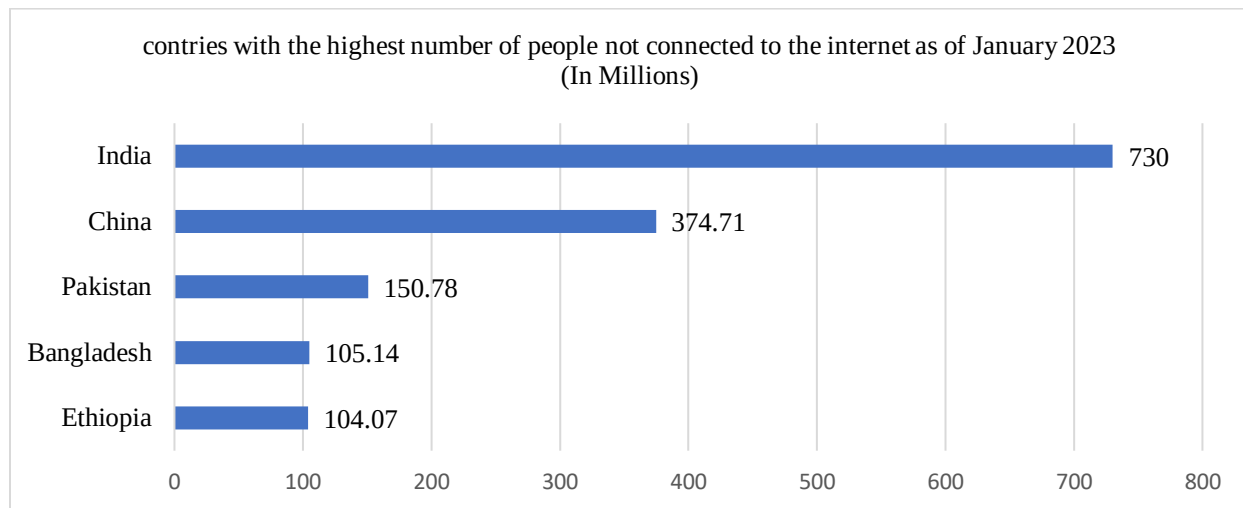
S. No.	Country	Annual Online Sale	E-commerce share of total retail sale
1.	China	\$2.78 trillion	52%
2.	United States	\$843 billion	19%
3.	United Kingdom	\$169 billion	4.8%
4.	Japan	\$144 billion	3%

5.	South Korea	\$120 billion	2.5%
6.	Germany	\$101.5 billion	2.1%
7.	France	\$80 billion	1.6%
8.	India	\$67.5 billion	1.4%
9.	Canada	\$44 billion	1.3%
10.	Spain	\$37 billion	0.72%

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India has the largest Internet user base, second only to China, but India is also in the first place in the world in terms of the offline population (Chart 2). This is because 64.61% of India's population lives in rural areas (World Bank, 2021), which is a strenuous shift connecting them to e-commerce.

Chart (2): Top 5 Countries with highest number of Offline Population



Source: Worldwide; Data Reportal; January 2023 | <https://www.statista.com/>

With recent growth in the popularity of online buying, e-commerce is expanding in rural India. Most people choose to use online platforms to purchase various types of products and services. According to a report by Statista, as of June 2022, there were more than 331 million Internet users in rural India, and Bihar was the leading service area in rural India, with the highest number of Internet subscribers across over 37 million (Sun, 2023). Recently, the NGO Oxfam India report revealed the rural-urban digital divide in India under the title of 'India Inequality Report 2022: Digital Divide'. This report showed that while experiencing a considerable digital growth rate of 13% per year, only 31% of rural dwellers use the Internet compared to 67% of urban dwellers. This shows that e-commerce in rural areas has started providing new options, but rural people are still unaware of all the benefits of e-commerce, such as getting better deals, saving time and money, getting things delivered at home conveniently, taking advantage of services without standing in a queue, and so on, which can help them to make their lives easy.

The government is leaving no stone in the penetration of internet/e-commerce in rural areas to bridge the gap in the digital divide, such as the Digital India Program, Bharat Net, Digital Payment, J-A-M trinity, E-vidya, E-PG Path Shala, and Jan-Dhan Yojana. Digital India aimed to increase Internet accessibility and digitally empower the Internet, benefitting numerous sectors such as e-commerce, financial technology, education, healthcare, social media, marketing, and diffusion of smartphones. Smartphones play a key role in digital transformation in India because they are commonly used by most people to access the web/internet. Nevertheless, millions of Indians still do not own smartphones (Bundhun 2022). Despite the fact, in 2022, Smartphone market of India has been flexible and outperformed several other economies (Malhotra, 2022).

Table (2): Active Smartphone Users by the Country

S. No.	Country	Smartphone Users	Total Population	Smartphone Penetration
1.	China	910.04 million	1.43 billion	63.38%
2.	India	647.53 million	1.42 billion	45.7%
3.	United States	249.29 million	338.29 million	73.7%

4.	Indonesia	192.15 million	275.5 million	69.7%
5.	Brazil	138.85 million	215.31 million	64.5%

Source: Exploding Topics, 26 January 2023 | <https://explodingtopics.com>

Table 2 reveals that more than half of Indians do not have smartphones, which shows a major roadblock in the penetration of e-commerce. In India, the rural market is large and untapped in terms of various goods and services, including telecommunication equipment offered in urban regio (Jain, 2011).

Objective and Research Questions

To Explore the opportunities, challenges and government support that help to penetrate the e-commerce adoption in rural & remote areas.

RQ1: What are the main obstacles limiting rural India from adopting e-commerce?

RQ2: What are the prospects and enabling elements for the expansion of rural e-commerce?

RQ3: What role have governments policies had in promoting online shopping in rural areas?

II. Research Methodology

This study is based on peer-reviewed journal articles, focused on e-commerce in India or similar developing economies and also Addressed rural, remote, or digitally underserved populations. It excluded Dissertations, working papers, non-peer-reviewed sources, Articles focusing solely on urban or foreign developed nations and Literature lacking direct relevance to rural challenges or policy impact. This review is based on the analysis of 34 peer-reviewed journal articles published between 2010 and 2023. The sources were identified through academic databases such as Google Scholar, JSTOR, and ResearchGate that are based on e-commerce in the Indian context and studies conducted in the context of developing countries, BRICS countries, and Southeast Asian countries. Keywords included: “*e-commerce rural India*,” “*digital divide*,” “*internet in villages*,” “*government digital initiatives*,” and “*ICT in rural areas*.” From an initial list of 75 studies, 34 were selected based on relevance, quality, and scope.

Table (3): Number of Supported Articles

Studies in Indian context	25
Studies in context of Developing Countries, BRICS countries and South-East Asian Countries	9
Studies in Foreign context	41
Total	75

III. Literature Review

Globally, firms across the globe have embraced e-commerce and are reaping the fruit of e-commerce adoption (Vaithianathan, 2010). E-commerce opened a market globally (Kshetri, N.,2007; Jain, V., 2021) and the whole world turned into the market (Pawan, R. D, 2020). In 1991, India had the opportunity to become a part of it due to economic reforms. The power of internet has united all people across the world on a single platform (Ray, S. 2011) and it has a significant impact on online sales (Agarwal, H., & Dixit, S.2017). E-commerce discloses many advantages for customers such as save time, easy access, comfort in purchasing, fast delivery, easy transaction, e-payment, lower cost, enhanced security, transparency, shopping comparison and knowledge of market (Jain,V., 2021;Verma & Shunmugasundaram, 2021;Shanabaga, V. et al., 2011; Kabango, C. M., & Asa, A. R. 2015; Mukherjee, S., & Michael, H. 2016). In developing countries, e-commerce is growing rapidly in cities, but is struggling in rural and remote areas (Kshetri, 2018). E-commerce has provided many opportunities for the rural population, but they are still unaware of the benefits of e-commerce. There are many failures, but few successes (Mukherjee, 2011). Limited basic infrastructure (Shanabaga, V. et al., 2011; Kabango, C. M., & Asa, A. R. 2015; Karine, H. A. J. I. 2021; Wen, L. Z., & Guy, H. A.2019), security and trust (Kshetri, N.,2007; Pawan, R. D, 2020; Gupta, N., & Batra, 2013; Karine, H. A. J. I. 2021), lack of internet, and low income (Anuj, K. et al., 2018; Singh, 2020; Prabhu, M., & Manoov, R. 2013; Kshetri, 2018; Anooja, A. 2015), unfamiliarity/unawareness (Kshetri,N.,2007; Mukherjee, S., & Michael, H. 2016), lack of education (Singh, 2020; Kshetri, 2018; Jain, V., 2021), local language (Khan et al., 2016), poor legal framework, delivery, poor telecommunication (Gupta, N., & Batra, 2013), risk, rules/regulation, (Verma & Shunmugasundaram, 2021), price difference, quality of product (Singh, 2020), digital payment/ digital literacy (Pawan, R. D, 2020; Bansal, R. 2013; Karine, H. A. J. I. 2021; Kshetri, 2018) and cyber-crime (Pawan, R. D, 2020; Bhosale, M. V. S. et al., 2020; Das, K., & Ara, A. 2015) found as basic challenges in penetration of e-commerce in rural areas.

Challenges

(Kshetri, N., 2007) According to research, developing nations' slow Internet adoption has resulted in a low level of IT business value as assessed by productivity and performance. There is widespread recognition of the difficulties caused by the lack of economies of scale in developing nations.

(Ray, S. 2011) Emphasized on trendy usage of e-commerce in global market and existing barriers in rural areas. The study concluded that e-business is risky and that linking rural regions to e-commerce is a major issue.

(Mukherjee, 2011) Expressed that technology has not aided the underprivileged in improving their socioeconomic status. Illiteracy, power cuts, connectivity, and financial constraints continue to be barriers to the successful progress of ICT in rural areas.

(Chitla, A. 2012) Found that the implementation of the digital projects in rural areas has several gaps. If ICT properly contributes to the needs of the poor, it can help reduce poverty.

(Prabu, M., & Manoov, R. 2013) Revealed that India's rural areas are a large market for its newest technological products. Most rural residents lack internet connections. The rates of subscription of broadband, wired narrowband, and Internet growth are correlated with each other.

Mohsin et al. (2016) found that people in rural areas are not aware of and efficient with technology. Therefore, e-education is needed to make them digitally literate.

(Pawan, R. D, 2020) Found that e-commerce has survived in the urban areas of India, but it is still struggling in rural and remote regions. The basic challenges are security, digital payment systems, and cyber-crime. A legal framework is required to address these roadblocks in rural areas.

Opportunities

(Agarwal, S. 2015) Found that e-payment, the proliferation of digital platform, shifting consumer buying behaviour, the, convenience and competitiveness of e-retailers are the factors fuelling the expansion of e-commerce.

(Mukherjee, S., & Michael, H. 2016) concluded that e-commerce has provided many opportunities for wholesalers, retailers, and consumers; however, some challenges are associated with it. India can better avail the benefits of e-commerce by overcoming these challenges.

(Vyas, A., & Gupta, S. 2017) Expressed that growth rate of Indian e-commerce market is significantly higher than any other emerging industries in India but rural areas market is still untapped. Customers prefer to visit physical stores rather than online stores.

(Anuj, K. et al., 2018) Found that growth of e-commerce is directly correlated to education and literacy. The government also plays a crucial role in the penetration of e-commerce, such as a cashless economy and demonetization. There is a need for strict cyber laws to ensure the reliability of this process.

(Verma & Shunmugasundaram, 2021) India has seen a tremendous increase in internet users, but not as much in e-commerce. This is largely because people are unaware of, or lack in-depth knowledge of, e-commerce.

Government Support

(Bădîrcea et al., 2021) demonstrated that in developing countries, engaging rural residents in e-commerce activities helps to eradicate poverty, pave the way for inclusive growth, and shift the paradigm of information and knowledge.

The government is attempting to address these issues through initiatives such as e-governance, the Digital India Program, and the Digi-locker. (Anooja, A. 2015) and making necessary schemes and incentives to stimulate digitalization (Anuj, K. et al., 2018). These programs are playing a crucial role as a middleman between recipients and government (Chitla, A. (2012). To connect rural areas and bring them all under one network by 2019, the government provided 1 lakh crore to the "Digital India" program (Anooja, A. 2015). Bezos, Ratan Tata, and Bharti Enterprises invested heavily in e-commerce to reach out to rural areas (Agarwal, S. 2015).

Literary Analysis

On the basis of literature review, this study found some common discussions regarding e-commerce penetration in rural areas as follows:

Barriers: Based on literature review, study found that all the firms are not equally successful in influencing rural customers towards technology adoption in developing countries like India. However, China holds top position in e-commerce business worldwide and quite successful to tap its rural areas market. Study found that lack of education, low level of income, poor internet, lack of infrastructure, security/privacy/risk and digital divide are some common hurdles in the adoption of e-commerce in rural areas in India and connecting rural people to e-commerce is a major challenge to compete worldwide.

Drivers: According to previous literature, e-commerce discloses many benefits for customer such as easy transaction, save time, easy access, lower cost, security, informativeness, easy delivery of goods and services etc. it has also been successful in gaining the trust of Indian customers by improving the security of user data. Increased use of electronic devices and low communication cost fueled the growth of e-commerce. Consumer can shop online anytime globally. E-commerce has been tremendously successful because of its transparency and consumer-friendly business model. Study also found that urban people are more aware and familiar with these advantages than rural dwellers.

Government initiatives: As per the literature, government is making all the necessary steps to bridge up the gap of digital divide. E-governance programs are helping to enhance penetration of e-commerce in remote & rural areas. E-commerce policy enhanced transparency. Since 2014, government has initiated many programs to boost e-commerce like Skill India, Startup India, Digital India, Innovation Fund etc. Government also giving many opportunities to the sellers and e-commerce giants by providing 100% FDI in B2B, logistics and value-added services.

Table (4): Comparative Summary of Findings

Key Area	India	China	Insight
Rural Connectivity	Low; ~31% internet usage (Oxfam, 2022)	High; >57% (Statista, 2022)	China more proactive in rural ICT inclusion
Smartphone Penetration	45.7% (Exploding Topics, 2023)	63.3%	India lags behind despite affordable devices
Policy Implementation	Digital India, Bharat Net	Digital Villages, Taobao Villages	China has village-specific e-commerce plans
Trust and Usage	Growing but cautious	Mature and integrated	Indian users need digital literacy programs

Table (5): Classification of Reviewed Literature

Key Point	References
Barriers/ Challenges in penetration of e-commerce.	(Kshetri,N.,2007), (Ray, S. 2011), (Jain,V., 2021), (Verma & Shunmugasundaram, 2021), (Pawan, R. D, 2020), (Shanabaga, V. et al., 2011), (Gupta, N., & Batra, 2013), (Anooja, A. 2015), (Bansal, R. 2013), (Kabango, C. M., & Asa, A. R. 2015), (Karine, H. A. J. I. 2021), (Mukherjee, S., & Michael, H. 2016), (Kshetri, 2018), (Das, K., & Ara, A. 2015), (Bhosale, M. V. S. et al., 2020), (Prabu, M., & Manoov, R. 2013), (Singh, 2020), (Wen, L. Z., & Guy, H. A.2019), (Anuj, K. et al., 2018), (Khan et al., 2016).
Drivers of e-commerce.	(JAIN, V., 2021), (Verma & Shunmugasundaram, 2021), (Shanabaga, V. et al., 2011), (Kabango, C. M., & Asa, A. R. 2015), (Mukherjee, S., & Michael, H. 2016), (Bhosale, M. V. S. et al., 2020).
Role of Government	(Agarwal, S. 2015), (Anooja, A. 2015), (Chitla, A. (2012), (Anuj, K. et al., 2018),

IV. Conclusion

This literature review highlights the current state of e-commerce in rural India, emphasizing the gaps and prospects for future growth. Although government support and technological advancements are enabling factors, widespread adoption still depends on tackling deep-rooted socio-economic barriers. Digital education, trust-building, infrastructure development, and focused policy efforts are essential to ensure equitable access to the digital marketplace.

This study presents a current view of e-commerce in remote areas in India based on past researches. In recent years, India has experienced a boom in internet and smartphone penetration. Increasing rate of internet and smartphone users has fueled the growth of e-commerce industry. By the passing of years people are embracing advance technology and making themselves more digital which is reducing the hurdles of digital growth but e-commerce adoption by the uneducated people is still far away. E-commerce penetration in developing countries is greater challenge than in developed countries. People of urban areas and metropolitan cities are experiencing more benefits of e-commerce and enjoying fast speed of internet but in rural areas, it is relatively low. Rural people are still facing many problems to make themselves digital. Migration from rural to urban areas will increase internet penetration in the future and help connect people to the digital platform. Secure payment policies and government intervention regarding security will help build people's confidence and trust. Education, ICT programs and training are the significant facilitator to bridge up the gap of digital divide. By eliminating these challenges, India's e-commerce industry will shine in future.

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