

An Effective Exploration of Accessing 5G Mobile Communication That Affects E-Commerce Using IoT



Elena Ljubimova, Rustem Shichiyakh, Rafina Zakieva, E. Laxmi Lydia, and K. Vijaya Kumar

Abstract To effectively answer these questions, your application's design needs to make a new user of your service feel at ease and not disoriented. This website is one of the most important parts of your marketing plan. If you have a fully functional, expert, and visually appealing website, it will be easier for consumers to do business with you. A user-friendly website will increase your revenue dramatically. It will be possible for your visitors to find the products on your website even more quickly than before. Many businesses have switched to selling their goods online, increasing the number of e-commerce platforms, thanks to COVID. In addition to retail and literature, e-commerce today supports a number of industries, such as books, home products, and cosmetics. Users will benefit from new features like augmented reality, chat capabilities, and recommended engines as 5G develops. Your business will get an immediate competitive edge over competitors by using these new features. Notwithstanding geographical disparities and the Covid pandemic, the business's target market has grown thanks to its offerings of groceries, essentials, and goods for the aged. These modifications suggest to people that e-commerce purchases now

E. Ljubimova

Department of Mathematics and Applied Computer Science, Kazan Federal University, Elabuga Institute of KFU, Yelabuga, Russia

R. Shichiyakh

Economic Sciences, Department of Management, Kuban State Agrarian University named after I.T. Trubilin, Krasnodar, Russia

R. Zakieva

Pedagogical Sciences, Department of Industrial Electronics and Lighting Engineering, Kazan State Power Engineering University, Kazan, Russia
e-mail: zakievarr@inbox.ru

E. L. Lydia (✉)

Department of Information Technology, VR Siddhartha Engineering College(A), Siddhartha Academy of Higher Education (Deemed to be University), Vijayawada 520007, India
e-mail: elaxmi2002@yahoo.com

K. V. Kumar

Department of Computer Science and Engineering, GITAM School of Technology, Visakhapatnam, GITAM (Deemed to be University), Visakhapatnam, India

involve more commonplace needs than luxuries. By providing the best customer care possible at every point of contact, we at Clever Data prioritize the needs of our clients. With a team of dedicated developers and industry knowledge, it can provide you with the greatest solution for your clients' comfort. They are thrilled to become a part of the intelligent Data family. 5G has a lot of potential and promises to help with these issues. Data processing and transmission speeds will soar to new heights with 5G. Thus, 5G will aid in the development and delivery of efficient online video advertising that can grab consumers' interest and yield the most outcomes. Similarly, 5G networks guarantee that gadgets maintain their Internet connections while moving from one place to another.

Keywords IoT · Online shopping · 5G communication · E-commerce

1 Introduction

After being finalized in December 2017, the 5G technology standard was used for the first time at the South Korean Winter Olympics in 2018. The GSMA, a trade association for cell phones, predicts that by 2025, there will be 1.2 billion 5G connections globally. The act of buying or reselling things using online platforms via the Internet is known as e-commerce. A few of the technologies utilized in electronic commerce are electronic money transfers, inventory management systems, supply chain management, online transaction processing, Internet marketing, mobile commerce, electronic data interchange (EDI), and automated data collection systems. Modern electronic commerce typically uses the World Wide Web at least in part throughout one stage of the transaction life cycle; alternative technologies, such as e-mail, may also be employed. Typical e-commerce transactions include buying books and music online from the iTunes Store or other digital audio distributors. Tailored or customized online inventory services for liquor corporations are less common.

E-commerce is the term used to describe the purchasing and selling of goods and services through the Internet. The term "ecommerce business" can also apply to strategies like affiliate marketing. You can use social media, well-known merchant sites like Amazon, and e-commerce platforms like your own website to increase your online sales. Certain e-commerce businesses operate entirely online, while others use e-commerce to enhance their physical storefront or to further establish their already established brands.

Table 1 Integrating 5G with additional technologies to improve online shopping

Technology	Uses	IoT, AI, blockchain, AR, and VR with 5G
IoT	Boost customer satisfaction, monitor inventories in real time, and handle orders more skillfully	Facilitating the flow of data produced by Internet of Things devices
AI	Place online orders, keep track of orders, and carry out more e-commerce tasks	Will enable quicker access to more information and improved comprehension of the surroundings and context
Blockchain	Online sellers can utilize smart contracts to automate B2B e-commerce, supply chain management, and order fulfillment	Will deal with security concerns and more effectively provide data (from IoT devices, for example) needed for a smart contract
Augmented reality (AR) and virtual reality (VR)	With the use of augmented reality (AR)-enabled apps, prospective buyers can digitally position actual things in actual environments to see how they would be used	With greater bandwidth, lower latency, and greater consistency, 5G networks are better equipped to handle complex environments and sophisticated inputs that call for processing massive volumes of data

2 Integrating 5G with Additional Technologies to Boost E-commerce

Accompanying 5G are additional technologies like blockchain, augmented reality, virtual reality, and the Internet of Things (IoT) that have the potential to completely change the e-commerce business and industry. A few uses and advantages of integrating 5G with other technologies to improve e-commerce are shown in Table 1.

3 Various Types of E-Commerce

3.1 Business to Business

The exchange of goods or services between two or more companies is covered by the business to business (B2B) business model. In these situations, commerce usually takes place between producers and traditional wholesalers and merchants. Examples are Indian mart and trade India.

3.2 *Business to Consumer*

The business to consumer model of business is the area of e-commerce that deals with the retail side. Direct sales of goods and/or services to consumers are made using digital means. The business community has taken notice of this innovation, which enables customers to carefully review their intended purchases prior to completing their orders. Following order placement, the business or agent that receives the orders will deliver them to the customer in a timely manner. Notable brands like Amazon, Flipkart, and others are a few of the businesses using this specific platform. Examples are Amazon and Flipkart.

3.3 *Consumer to Consumer*

A consumer may use this business model to offer services and second-hand goods to other consumers via the digital medium. The operations carried out on this website make use of external platforms, such as Quikr and OLX. Examples are OLX and Quikr.

3.4 *Consumer to Business*

A B2C model is entirely different from a C2B model. In the first scenario, firms offer services to customers, but in the C2B model, customers sell products to businesses. This approach is frequently utilized in crowd-sourcing-based initiatives, such as making logos or offering royalty-free images, videos, or design elements for sale. Examples are like monster.com and timesjob.com.

3.5 *Business to Administration*

This specific paradigm makes it easier for businesses and government agencies to transact digitally. Information sharing is made possible by the government's creation of central websites. Businesses can use this platform to compete for government opportunities such as tenders, auctions, and application submissions. Investments in e-government have increased this model's applicability. Examples are MCA online portal services.

3.6 Consumer to Administration

The C2A platform's goal is to enable public sector users to interact with government officials and administration by making comments or requesting information. Examples are government services like PAN, ITR, and others.

4 E-Commerce in India

In May 2020, 636.77 million Indians, or about 40% of the nation's total population, were online. Although e-commerce has the second-largest user base globally, only surpassed by China (650 million, 48% of the population), its penetration is rather low when compared to markets such as the United States (266 million, 84%) or France (54 M, 81%). However, e-commerce is growing, with approximately 6 million new users joining each month. As per industry consensus, growth is expected to reach 75 percent of all e-retail transactions in India, with cash on delivery being the most favored payment method. The local supply of consumer goods from reliable wholesalers and online retailers is not keeping up with the rapid increase in demand for international goods, notably long-tail products. With the long-tail business model, organizations can make significant profits by selling low volumes of hard-to-find things to a wide consumer base, as opposed to merely selling big volumes of a select few popular items. The term was originally used in 2004 by Chris Anderson. In 2017, Flipkart, Snapdeal, and Amazon were the top three online retailers in India and the world. In terms of revenue, Amazon surpassed Flipkart in 2018 to take the top spot among Indian e-commerce companies. During the holiday shopping season in 2020, Flipkart considerably outsold Amazon, with a ratio of nearly two to one. The Open Network for Digital Commerce initiated a testing program in 2022 [1].

5 India e-commerce Market

See Figs. 1 and 2, Table 2.

6 Growth of Internet

The Internet is growing everywhere, day and night. The typical person who works with technology or is active in connecting information technology and the worldwide online community is becoming increasingly literate. In [2] recently, there has been

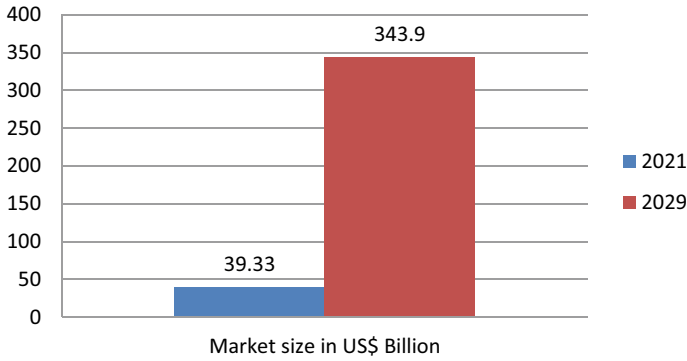


Fig. 1 Size of the market in US dollars, with a 31.13% CAGR difference

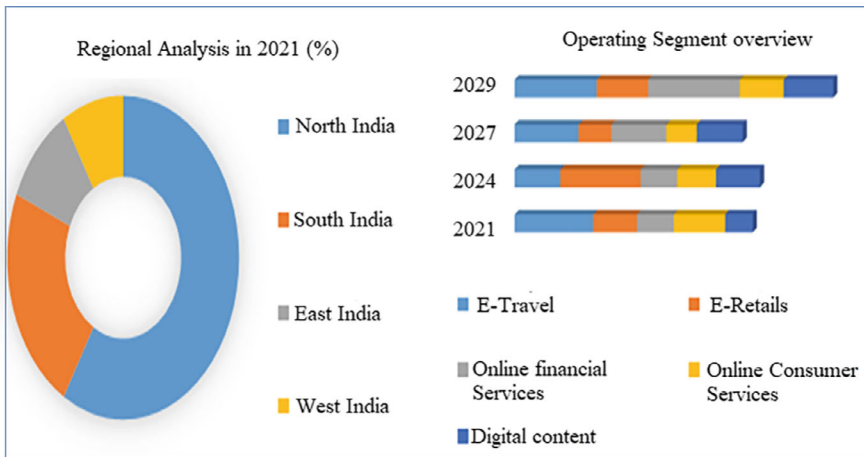


Fig. 2 Regional analysis in 2021

Table 2 Key players for online shopping

Key players	
eBay	Infibeam
Amazon	Nykaa
Phone pay	Limeroad
Google	Shopclues
Flipkart	Naaptol online shopping
Snapdeal	Yepme Vas data
Jabong	Services Pvt Ltd
Myntra	Tata cliq
Paytm	Cleatrip.com

a rise in the use of online tools on PCs, laptops, and mobile devices where a multitude of Internet users handle global information by connecting to local and international networks where the usage of the internet has expanded among professionals, engineers, laypeople, individuals, students, and even all global communities, etc. Computers, robots, or artificial intelligence are used to do most of the labor. Because information is easily accessible, internet use for computer technology is becoming more and more common. In June 2012, 2336 million people, or 33.3% of the world's population, accessed the Internet. It is currently growing significantly every day and is utilized by everyone for both personal and business reasons. The internet, which links millions and billions of small and large, local and global connected networks, is the largest and fastest-growing dynamic network in the world. It creates a global network village where you can connect and use a computer anywhere that your laptop, desktop, and phone are connected to the internet. Because Internet technology is not controlled or operated by a single government, organization, company, or nation, this knowledge concerning Internet ownership is not definitive which is connected to it by the internet, extranet, and other small private networks where a disjointed network, like a smaller segment network, or the internet, both exist. Early in 1964, the Arpanet USA Defense Services built or developed a small network that served as the forerunner to the Internet. In the past, a few influential companies or organizations had complete control over the Internet individuals who buy or exchange telecom gear to be used later in the public, commercial, or educational domains.

7 5G in India

Indian mobile speeds increased by 115%. India has risen 49 places on the Speed test Global Index™ after the introduction of 5G, from 118th place in September 2022 to 69th place in January 2023. In [3] Ookla® data shows that Jio and Airtel's LTE speeds have increased since the introduction of 5G services, proving the effectiveness of their entire network modernization initiative [3].

Compared to 4G, the average download speed via 5G is 25 times faster. In [3] 5G performance has improved in most telecom circles; in January 2023, Kolkata recorded the fastest median 5G download rates, reaching over 500 Mbps. Jio had the fastest median 5G internet speed in Kolkata, at 506.25 Mbps, while Airtel had the fastest in Delhi, at 268.89 Mbps [3].

The 5G network is now 55 times more accessible. Both Jio and Airtel have ambitious plans for deploying the 5G network. 5G availability has increased across 5G-capable devices since the introduction of 5G networks, reaching 8.0% for Airtel and 5.1% for Jio [3].

5G is going to further change the competitive landscape [4]. Vi is losing Speedtest® users, and the operator's inability to roll out 5G has made this trend worse.

The 5G services are Airtel and Jio, Airtel has started the 5G in India with specified speed of up to 300 Mbps.

In eight cities, including Delhi, Mumbai, Varanasi, and Bangalore, Airtel has begun deploying 5G. Although the whole list has not yet been made public, there are rumors that Gurugram, Kolkata, Hyderabad, and Chennai are among the other cities [4]. Nevertheless, we are unsure of whether Airtel's 5G services are accessible in every city or just in specific ones. What is known is that the telecom has agreements with Ericsson, Nokia, and Samsung as network partners to supply 5G services in the nation and that the telco is ready for 5G. In 2017, Airtel declared the introduction of the nation's first advanced Massive Multiple-Input Multiple-Output (MIMO) technology, a crucial component of 5G networks. The generation has already been deployed by the organization around the nation, including Bangalore, Kolkata, and many other locations. Fees for Airtel's 5G plans are allegedly going to be the same as for 4G [4].

Jio will provide the 5G services available in India from October 2022 having good plans, these services are provided in initially at Chennai, Delhi, Kolkata, and Mumbai.

The formal launch of Jio's 5G network in India has been confirmed. Beginning with Diwali in October of this year, the telecom will be operational throughout the nation. Jio asserts that the country's network would not fully mature for at least 18 months. Furthermore, Jio's 5G services are built on a standalone (SA) 5G network, which offers superior latency and quicker connection rates than an NSA network. The current 4G network is not connected to the SA network, which has an entirely distinct infrastructure.

8 E-Commerce in 5g

India has finally seen the arrival of 5G services, following years of impending reports. Customers and companies alike are eager to take advantage of 5G's extraordinary online experiences and lightning-fast speeds [5]. Similar to how 4G had a significant nationwide influence, 5G is expected to boost adoption in rural and small towns when it becomes available nationwide. This will have a significant positive impact on e-commerce, as millions of customers and small and medium-sized enterprises from underserved areas of the nation will learn what e-commerce is truly all about. Using 5G will make the shift from physical store to online store easier. For instance, it enables artificial intelligence and augmented reality to reach their full potential, opening up a world of novel purchasing experiences. The buyer may effortlessly order the product from home and view it from any angle thanks to efficient 3D interfaces. More significantly, the extra bandwidth will support live and video commerce, enabling merchants to give customers an even more engaging purchasing experience. Nonetheless, a key element in the adoption of these technologies is the accessibility and cost of the accompanying gear [5].

9 Conclusion

The implementation of 5G networks has the potential to address several current obstacles facing the growth of e-commerce, including those related to IoT devices. Keeping up with the Internet of Things' exponential growth will be challenging. However, the volume of data being carried from IoT devices exceeds the capacity of contemporary 4G networks. 5G's higher processing and data transfer rates will help with this problem. In particular, 5G will have a big impact on how the e-commerce industry and business are run, coupled with AI, VR, AR, and other technologies. Such a combination can result in a robust e-commerce environment and an enhanced customer experience.

References

1. <https://www.google.com/url?sa=i&https://%3A%2F%2Fwww.maximizemarketresearch.com%2Fmarket-report%2Findia-e-commerce-market%2F44404%2F&psig=AOvVaw2XTSmpzw mhs6AiV3kChOhS&ust=1681445885417000&source=images&c>
2. https://en.wikipedia.org/wiki/E-commerce_in_India
3. <https://www.ookla.com/articles/5g-india-performance-jio-airtel-q1-2023>
4. <https://mitacademys.com/growth-of-the-internet/>
5. Shinde S, Nikam A, Joshi S (2016) An overview of 5G technology. *Int Res J Eng Tech (IRJET)* 3(4) (2016)