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IMPACT OF E-COMMERCE IN SUPPLY CHAIN IN INDIA

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ABSTRACT

The Grand India Grand explosion of e-commerce is dramatically altering logistics landscape as the estimates show that only four years from now, the market can grow from \$75 billion in 2022 to \$200 billion in 2026 which will come close to a CAGR of around 18.9% as stated. [1].

This immense growth is garnering radical changes within supply networks due to the route of technological innovations for advanced customer-centric strategies harnessing infrastructure upgrades and not by itself. Such a lot has increased the employment and adoption of AI (Artificial Intelligence) and ML (Machine Learning) in Indian infrastructures. Just for example, innovations in AI and ML can transform the logistics spaces to make supply chain forecasting and inventory management vastly improved-In fact, the potential impact of AI in reducing stockouts alone can be between 20-30% [2]. The operation of logistics is made even more efficient by adding these IoT technologies emerging out of the Internet, thereby generating errors in monitoring and enabling most of the orders to be delivered on time[4].

Now there are 918 million potential internet subscribers who are making the online business boom the most of course. This happens particularly because metro cities have about 70% of e-commerce shipments[4].

Local areas began seeing much of hyperlocal delivery models and microwarehousing strategies being evolved. The conditions showed that in the year 2025, logistics could be forecast at a \$380 billion revolution in India, even though the costs of logistics are very high at about 14% GDP unlike 8-10 % as in developed nations [1].

E-commerce houses are coming to call by starting the work of infrastructure and preparing over 15 million square feet of warehousing space, all sides contributing to the infrastructure through various projects like greening the last mile with electricity vehicles to get a fully electrical fleet by 2030[4].

There are a lot of possibilities that will come in this new state of observations, but there are also many problems that India must grapple with in order to realise them. It ranks 44th in 2023 according to India's Logistics Performance Index (LPI), so the kind of infrastructure bottlenecks and the regulatory hurdles will have to be addressed with permanent and sustained growth [2].

India is still a light but rapidly growing e-market because the future is extremely promising with youth leading the way fuelled by more digital reach.

INTRODUCTION

The impact on e-commerce was postulated as a major game-changer of the global economy tantamount in reshaping both operational settings in businesses and how customers interact and those of supply chain dynamics. Probably, the impact within Indian e-commerce is at its most severe level, driven by internet penetration speeds up accompanied by

an extension of smartphone utilization and increasing numbers of middle-class consumers. Likely, it is forecasted that the sector could primarily grow at a compound annual growth rate (CAGR) of 18.9 percent, to some US \$200 billion till 2026, further highlighting the pervasive influence on supply chain practices [5].



Intrinsically, the e-commerce supply chain is classified as the backbone of e-commerce, for there the goods start moving from the producers to the consumers. Contrary to the linear flow of things from manufacturers to consumers, this is a dynamic supply chain just e-commerce-driven by technology, and it necessitates very much agility, fulfillments, and accuracy to meet the rising consumer demand for quick and reliable delivery. With the advent of these needs, many capitals have been made in logistics, warehousing, and technology used to operate such features [6].

The Indian market is full of divergent pools of opportunities and challenges, which implies that the urban areas have to be converted into hyper-efficient systems for same-day or next-day deliveries. The concept suggests the provision of micro-warehousing, next-mile delivery networks, and advanced technology. In contrast, e-commerce has spread to Tier II-Tier III cities, and the expansion to rural regions is faced with several challenges, including infrastructure underdevelopment and high delivery costs. There are also regulations that confound heavier odds in dealing with logistic operations [7].

However, by the initiation of developing technology changes, this challenge greatly becomes a solution for smoothing out the processes. With the available system technology advancements, AI along with machine learning is used in demand forecasting, route optimization, and inventory management compared to the earlier scenario. All this leads us to gain extensively lower ineffective means of decision making with at least the size of the congestion. IoT-enabled systems that trace the passengers and luggage in it were used at the most prominent places in India. Millions of things can go at least full-fledged into each other enabling information shadowing. Less of the facilities concern ending up only increasing the efficiency in real time and increasing reliability overall. Manufacturing efficiency varies in automation -robotics-assisted warehousing productive entirely over everything.

For example, the Digital India program and the Goods and Services Tax (GST) have helped in improving e-commerce and streamlining supply

chain operations. These changes accelerated delivery times by enabling better interstate logistics. Also, as environmental consciousness has increased, e-commerce companies strive to introduce sustainable practices such as the use of electric vehicles for deliveries and the adoption of reusable packaging. [5].

But still the sector cannot overcome impeding challenges. Logistics in India costs around 14% of GDP that is way more than the global average of 8-10%. Furthermore, infrastructure deficits in rural areas prevent the smooth movement of goods while the rapid growth of e-commerce leads to additional pressure on the existing systems and scalability in the supply chain models. [6].

The impact of e-commerce on the supply chain in India is best understood through the lens of the various changes in technology innovation, market dynamics, and challenges and opportunities in the sphere. Accentuated by the analysis of data and the trends-the objective is to offer useful insights for policy and business decisions to maximize the benefits of India's burgeoning digital economy while minimizing its unique constraints.

LITERATURE REVIEW

The new era of e-commerce is significantly changing how supply chains are run- particularly in emerging markets like India. Studies have shown that as new technologies, such as Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), are gradually being employed in modern supply chains, AI tools are helping provide businesses with the ability to predict demand and manage inventory in real-time, therefore streamlining any inefficiencies. On the other hand, IoT supports visibility and eventually increasing customer satisfaction as it allows tracking of goods in the mode of real-time shipping. The leap in warehouse automation with robots and smart storage solutions increases as much as 40% productivity [8].

But for smaller businesses, the cost-effective and resource-thrifty approach to investing in such technologies can often seem impossible. With the country's geographically diverse and inadequate infrastructure, India is currently facing unique hurdles



for e-commerce supply chains. With current 14% logistics costs of those in India, GDP rates far exceed the global averages of about 8-10% [9][10].

Issues like bad road infrastructure and the fact that rural areas lack proper facilities for refrigerated storage have become reasons for higher and time-consuming costs. Businesses are responding to this issue by revising strategies like hyperlocal delivery models, micro-warehousing, and local logistics partnerships. Innovations in last-mile delivery in urban areas help expedite the turnaround time of deliveries and enhance customer satisfaction.

Consumer behavior in India is changing, which is also influencing their supply chain strategies. They are now going digital and always expect quick deliveries, real-time tracking, and excellent return policy. That is why some 70% of e-commerce demand is today coming from Tier II and III cities, so distribution networks expand to these areas. [10].

A significant shift has occurred opening more inclusive and effective logistics networks. Sustainability in business and now flicking back to e-business has gained importance. The study would indicate that companies are starting to adopt the use of electric vehicles (EVs) for last-mile deliveries and exploring reusable packaging options to reduce environmental impact [8].

Scaling such sustainable practices are not without challenges and require better inter-stakeholder collaboration, as well as government interest. Hence, it's paramount to look toward the Indian government as vital in regulating the entire landscape of e-commerce supply chains across the nation. The introduction of the Goods and Services Tax (GST) has made simple the interstate logistics, which, in turn, helped cut the transit times by about 30% [9].

Digital India and others are way up improving internet access and digital literacy. Consequently, e-commerce in urban, as well as rural areas, has increased. These achievements, however, are compensated by regulatory complexities and infrastructure problems. Although existing research brings some useful insights on e-commerce supply chains in India, there still remain gaps that need to be bridged by further research to illuminate this field. For

instance, very little is known about how blockchain could be a game changer in terms of lifting the veil off-in-transparency-and fraud. Also, there is need for more research on how to scale sustainable practices effectively in India and render them economically viable [10].

SCOPE OF THE STUDY

This paper looks at the e-commerce effects on the supply chain management of various ways in the fast-growing emerging economies such as India, which possess unique sets of challenges and opportunities. The focus of the work is to look at how the technological, logistical, and environmental factors and governmental policies affect the changes in the supply chains and how this affects e-commerce.

Research discusses how technological advances- Artificial Intelligence-AI, Machine Learning-ML, and Internet of Things- IoT aid with efficiency improvements and difficulty eradication in e-commerce supply chain management. The paper also outlines how such technologies help in demand forecasting, inventory management, and logistics optimization resulting in faster and cheaper services. In addition, the research talks about warehousing automation that uses robotics and smart spaces to boost productivity and scalability in the warehouse. [11].

As soon as you decide to carry out a little survey in real time into India's complex terrain, you find logistical challenges arising from geographical variations and poor infrastructure. It evaluates hyperlocals, micro-warehouses, and closer servicing ascribed to consumer demand for quick and reliable service. It specifically dwells on supply chain advancements that are due to rapid growth of e-commerce in non-metro cities with the escalating rates of challenges of infrastructure and high logistics fees in those regions [12].

Another aspect of importance of this paper is on the environment via E-Commerce Supply Chains-it explores how environmentally sustainable practices-like Electric Vehicles (EVs) for deliveries and reusable packaging are followed but mentions what they



place challenges on scaling up these practices in India. [13].

Moreover, the government policy is taken into account in defining the landscape of the e-commerce supply chain. How would it take GST as a commendable move that combined with a better end-to-end logistics that the introduction of Goods and Services Tax (GST) has indeed optimized the reduction of the transit time and boosted the online mode in the country? What effect does the Digital India program have on providing internet access and digital literacy to drive e-commerce growth in rural as well as urban areas at the same time? [14]. The purpose of this study is to produce useful insights for various stakeholders, such as policymakers, the industry, entrepreneurs, to enhance the strategies they use concerning supply chains within the fast-evolving e-commerce ecosystem. The study thus tries to identify existing gaps and maximize its exploration into new alternatives for systematic and profitable growth between e-commerce and a supply chain in India.

RESEARCH OBJECTIVES

- 1.To assess the frequency and patterns of e-commerce shopping among Indian consumers.
- 2.To identify key factors influencing consumers' choice of e-commerce platforms.
- 3.To evaluate consumer satisfaction with delivery times and experiences in the e-commerce supply chain.
- 4.To examine consumer awareness and importance of eco-friendly practices in e-commerce supply chains.
- 5.To analyze the challenges faced by consumers in smaller towns and rural areas in accessing e-commerce services.

RESEARCH QUESTIONS

1. How often do you shop online?

- Daily
- Weekly
- Monthly
- Rarely

- Never

2. What factors are most important to you when choosing an e-commerce platform? (Select up to three options)

- Delivery speed
- Price
- Product availability
- Customer service
- Easy return/exchange process
- Discounts/Offers
- Platform interface and user experience
- Eco-friendly practices (e.g., reusable packaging, green delivery)

3. How satisfied are you with the delivery times of your online orders?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

4. Are you aware of whether the e-commerce platforms you use adopt eco-friendly practices (e.g., reusable packaging, sustainable delivery options)?

- Yes, I am aware and have observed these practices
- Yes, I am aware but have not noticed these practices
- No, I am not aware of these practices
- I don't think about it while shopping

5. Do you find it easy to shop online if you live in or have relatives in smaller towns or rural areas?

- Yes, it is very easy and convenient
- Somewhat easy, but there are occasional delays or issues
- Not easy, there are significant delivery delays or other problems



- I do not live in a smaller town or rural area

DATA SOURCES

This research incorporates a combined method approach by dietary intervention and survey methods, and it includes a structured questionnaire and other kinds of secondary data. These secondary data come from: other researches and blogs and news article. With this effort, it can provide an up-to-date understanding into quantitative and qualitative research about the influence of electronic commerce in the supply chain among those in India.

Primary: The main data is collected from a structured questionnaire with 100 respondents. They were selected in a convenient way due to the need to mix e-commerce consumers with varied demographic characteristics to test participants with age groups, areas, and online shopping frequencies. The structured questionnaire collected information on customer preference, satisfaction with delivery time, knowledge and attitude of green initiatives, and possible hindrances for shopping in smaller towns or rural areas by a consumer. It provided the basis for analyzing the descriptive statistics of consumer convenience and behavior trends through patterns.

Secondary: Many secondary sources like research papers, industry reports, or even blogging also contained valuable data. These hints referred to literature work done on the subject and provided a theoretical framework from past discussions as observed through research done on e-commerce as it affected Indian supply chains, with technological advancements and challenges in India. Here practical applications were put into context for new developments and practices about e-commerce. Another classification is as compared to news articles that would have been beneficial in gaining useful information in the areas of e-commerce, government policies (GST, Digital India) and sustainability practices within the e-commerce sector.

JUSTIFICATION OF THE STUDY

E-commerce has triggered the evolution of the supply chain ecosystem, and its impact is particularly significant in the Indian context where these sectors are the fastest growing with the most

significant impacts on logistics, consumer behavior, and supply chain management. E-commerce has witnessed a sudden and quantifiable overall growth in the Indian setting. This sudden surge can also be attributed to the fact that many people had ready access to the internet due to the earlier rise of smartphones, and a paradigm shift in consumer behavior. Discontinuous change typically signifies transformation as demand makes its toll on the complexity and speed in supply chains, especially when the product meets the expectations of a consumer with reference to fast delivery, efficiency, and sustainability. This study fills a gap to examine the effects of e-commerce on supply chain management and how it passes an evolution. [11].

The study involved 40 customers who directly examined the relationship firm and income. Efficiency, effectiveness, and economic, ethical, and social responsibility are among specific organizational documents and theoretical aspects. A high-level skilled workforce could influence the economic connection between those practicing personal interest and the spillover effect process on the industrial revolution as seen in past sociological research. [12].

Any kind of scientific research conducted in Tier II and III cities on eCommerce reveals freight-related problems, showing variants for the areas where eCommerce opportunities actually reach beyond major urban centers, specifically facing some other delivery and product availability issues, from the motives. [13].

Novice will be the application of IoT. Afterward, the company puts automatic and radical changes to send ads directly to cell phones, little knowledge having companies into past advertising platforms. A shift from continuing studies and business to technology and the environment must be worked out [15]. It is very important to familiarize oneself with how sustainability influences and adds value to the terms in supply chains of a particular business to help sustain competitive, responsible enterprises in a rapidly expanding, consumer-facing world. The other aspect being viewed is the government strategies like Goods and Services Tax (GST) and some Digital India programs that have resulted in huge effects for



supply chain and logistics operations [16]. This is necessary for effective regulation since it talks about how businesses structure their supply chains in order to manage the problems that substantially affect it in the Indian market.

IMPACT OF E-COMMERCE ON SUPPLY CHAIN IN INDIA

E-commerce in India has seen significant growth owing to it having reached an approximate market valuation of 46.2 billion in 2020 and is presumed to climb upto \$112 billion by 2024. It has been mainly driven by the urbanization rate and increment in the number of internet subscribers which had reached a record figure of nearly 918 million as at September 2023. The manifestation of the trend is that the respective e-commerce growth is expected to surge up to \$136.47 billion by 2026 [17].

Probably the most significant transformations in consumer behavior in India is the onset of quick commerce. With an expected value of bellwethering \$6 billion by 2024, this sector flourished from merely over \$100 million in 2020. All this was raised on the grounds of the fact that a very substantial number of customers prefer getting a quick delivery and they, actually, wanted it dispatched within 10 to 30 minutes. This will have a significant impact on conventional small retail businesses whose sales continue to decline in the light of the competitive advantage enjoyed by these quick commerce platforms [18].

The massive growth of e-commerce in India has greatly influenced logistics and delivery systems with much complexity introduced into supply chain dynamics. The e-commerce logistics market in India is expected to grow from \$4.42 billion in 2025 to around \$7.85 billion by 2030 with a cumulative annual growth rate of 12.18%. Also despite this huge growth, there are so many challenges. Fragmented infrastructure and, ultimately, high operational costs are among the top challenges. Festivities further underscore the necessity for good supply chain handling, especially when Gross Merchandise Value (GMV) growth is being forecast as a 7% hike in GMV by e-commerce transactions in 2024, engineered by increased spending capacity and rural consumption [19].

Practically, the entire supply chain uses the efficiencies gained from the transformed Indian e-commerce sector. Digital integration is the heart of the resilience agenda for supply chain. Think big about the Indian freight and logistics networks that could rise up to be a \$480 billion industry by 2029 at 9 percent yearly growth. Innovations with support from smart logistics solutions and technology in place are much efficient and cost-effective as well. More transcending is the adoption of cleaner fuel technology by major companies, such as LNG trucks, to bring the carbon footprint down and align with sustainability agendas [20].

What changes regionally for the Open Network for Digital Commerce (ONDC) is that this continues to progress expansively across India with over 370,000 vendors and service providers in over 800 cities as of February 2024. This endeavor will make digital commerce more accessible and democratize it, improving small retailers' chances who previously were marginalized by regional e-commerce progression [17].

For the future, the Indian e-commerce sector is showing that there will be a further expansion. Forecasts for the market suggest a potential \$163 billion in 2026, up at a CAGR of 27%. Furthermore, it will push the requirement for the business to upgrade the supply chain infrastructure with technology to keep pace with escalating consumer demand and maintain competition on the global level [18].

SURVEY ANALYSIS AND INFERENCE

1. How often do you shop online?

- **Daily:** 2 participants
- **Weekly:** 16 participants
- **Monthly:** 37 participants
- **Rarely:** 11 participants
- **Never:** 2 participants

INFERENCE:

Having reported monthly (37%) shopping online with all these details, it does note that each consumer tends to shop online frequently, if not daily. However, most respondents reported shopping online weekly (16%), something that typically shows a higher



degree of functional integration with e-commerce platforms, most likely on basic purchases such as groceries or daily-use items. Some, however, balance this phenomenon slightly through only rarely shopping. From the data available, it can be seen that 11 respondents infrequently report having shopped through the internet. That means that the vast majority of the population buys frugally on the spot through digital means, as the consumer world is virtually revolving around everyday online activities, yet a small portion still sticks to old ways.

Interestingly, only 2 out of the 50 shop daily, showing that there is no virtual-ly habitual or frequent nature that is ascribed to online shopping by consumers in the modern world. Therefore, two outright state they have never shopped online before, for different reasons including absence of internet facilities, absence of belief in e-commerce, or it may mean that a physical store is their go-to place each time they want to shop for items. Therefore, it shows that the trend across the board being witnessed is that e-commerce has been selling its way into consumer lifestyles with great shopping frequencies, which are based on individual preferences and needs.

2.What factors are most important to you when choosing an e-commerce platform? (Select up to three options)

- **Delivery speed:** 60 participants
- **Price:** 71 participants
- **Product availability:** 50 participants
- **Customer service:** 40 participants
- **Easy return/exchange process:** 45 participants
- **Discounts/Offers:** 55 participants
- **Platform interface and user experience:** 35 participants
- **Eco-friendly practices:** 20 participants

INFERENCE:

Price is the most significant factor for respondents when selecting a platform for online shopping, closely followed by delivery speed and discounts/offers. Price matters first to 71 respondents,

which means that cost competitiveness still ranks very high on the platform-selection criterion. Speed comes second (60) with Discount/Offers following closely (55), making both convenience and cost-saving quite pertinent in motivating consumers to spend online. Product availability ranked third (50); the number of options is offered by the platform by alluding to the fact that easy return and exchange processes (45) and good customer service (40) are important areas for e-customers; the total, not less than these two together, corresponds to the prior trio's value. On the contrary, 35 participants underlined the importance of user interface and user interactions, reflecting the growth in the demand for simple and self-explanatory designs. This does not seem to be so imperative in this context, even though eco-friendly products appear infrequently inclusions. Only 20 responded to that question thus: consumers were less on the watch, though, for emerging on ethically conscious niches. Broadly speaking, consumers attach costs and convenience as their top priorities, but user experience and sustainability are gaining even more significance slowly.

3. How satisfied are you with the delivery times of your online orders?

- **Very satisfied:** 25 participants
- **Satisfied:** 40 participants
- **Neutral:** 20 participants
- **Dissatisfied:** 10 participants
- **Very dissatisfied:** 5 participants

INFERENCE:

The results of the survey show that a very high majority, 65 participants, would say they were either satisfied (40) or very satisfied (25) with the delivery times of online orders in terms of logistics and fulfillment operations in e-commerce. However, the indifference of 20 participants might suggest that they did not encounter any immense problems, while they stated that the delivery experience just does not reach the high standards they expected. A small but noticeable group of 10 other respondents gave dissatisfaction responses, while among participants, five people were very unsatisfied. Such expressions could be the result of specific problems such as



delays, inconsistent delivery timelines, or bad last-mile logistics. The data reveals that, while a significant number of consumers are fine with the current delivery standards, indeed, several improvements could be worked out to put this concern into quiescence of dissatisfied faces and, consequently, boost satisfaction overall.

4. Are you aware of whether the e-commerce platforms you use adopt eco-friendly practices?

- **Yes, I am aware and have observed these practices:** 30 participants
- **Yes, I am aware but have not noticed these practices:** 25 participants
- **No, I am not aware of these practices:** 35 participants
- **I don't think about it while shopping:** 10 participants

INFERENCE:

The data reveal that awareness of consumer attention to eco-friendly practices in electronic commerce is on the rise all in all, with uneven growth. A total of one hundred participants from which the results emerged showed that thirty of them had been aware and had seen such practices, suggesting that some platforms on updating their sustainability programs are influencing patrons very properly. Twenty-five respondents reported that their radar turned on but they have not seen the appropriate eco-friendly practices making their way between being aware and visible implementation. The largest block, fifty participants, is completely ignorant of eco-friendly practices, showing a non-representative internal communication or accent in establishing priorities when it comes to sustainability in the e-commerce context. The next category belonged to ten participants and these ten do not care what the products are made of or what family they contribute. The figure is impressive from the larger perspective. Thus, the findings strongly suggest that great progress has been achieved overall, but a very large proportion of potential stakeholders need to become embedded in this thinking.

5. Do you find it easy to shop online if you live in or have relatives in smaller towns or rural areas?

- **Yes, it is very easy and convenient:** 40 participants
- **Somewhat easy, but there are occasional delays or issues:** 35 participants
- **Not easy, there are significant delivery delays or other problems:** 15 participants
- **I do not live in a smaller town or rural area:** 10 participants

INFERENCE:

Results from the survey shows about 40 individuals most likely claiming that e-commerce is simple and convenient for online shopping irrespective of the size of towns or even in the rural areas. E-commerce platforms have showed signs of huge development because they have started to break the boundaries indicative to penetration into minor town and rural areas and increasing accessibility in even lesser urbanized localities. 35 individuals have stated that easy online shopping is marred sometimes by delays or some other issues alive in these cases that logistics challenges have not been removed across the board. For 15 others, it is very difficult to shop online due to delays of up to weeks were largely due to such vast delivery-related problems in logistics still persisting in rural areas. Ten others do not live in, or have relatives in smaller towns or the country at all, therefore they hardly accept problems of the proportion just mentioned. In the final part of the questionnaire, a critical need for development is sensed in the evolvement of a consistent and efficient service in e-commerce at a pan-Indian level.

KEY FINDINGS

1. FREQUENCY OF ONLINE SHOPPING:

- In the survey, it was disclosed that 37% of respondents shop online monthly, reflecting aspects that not all participants have made it a daily activity in order to become so called weekly W. This may as well be based on the items that are involved with occasional uses or bought in bulk.



- As much as 16% of respondents shop on a weekly basis, which means e-commerce might be now used for the very frequently used, such as groceries, household supplies, and personal care products.
- Around 11% were interviewed and claimed that they shopped rarely, bringing us into an aspect of the constraints that people cannot buy thanks to digital illiteracy, especially since the majority of people have the traditional outlets to turn to, some of which are located near their areas of residence.
- Only 2% do their shopping daily online, indicating how e-commerce is actually becoming popular but not for each man as an integral part of a majority's daily life. Furthermore, 3% replied that they have never shopped online, implying once more that several people in any human population would not be engaged with the digital economy due to their trust issues, limited knowledge about the opportunities, or barriers to Internet access.

2. FACTORS INFLUENCING PLATFORM CHOICE:

- Actual price accounts for compactness at around 71%, showing that consumers in India are very price-conscious and consequently, they are placing it on an even pedestal with other aspects anywhere the platforms are offering competitive rates.
- Following this particular ranking, one can note that delivery speed accounts for up to 60%, followed by discounts/offers, at about 55%, thereby suggesting that consumers probably regard convenience and low costs as their primary motivations.
- Product availability accounted for a vast majority of responses, particularly when contextualized with such substantial product diversity; its availability is indeed termed critical since one assumes that it relates directly to consumer demand.
- Return and exchange was not easy at all. The other preferred aspect was customer service, characterized by some 40% with a view to the importance of post-purchase services for building customer trust and afterward loyalty.

- According to the research, only some 35% of the total respondents, according to which the platform's design and user experience seem to be trending with user-friendly and intuitive design becoming increasingly important since people are spending more of their time on digital platforms.
- Place assumed the last priority, as analyses indicated that green programs are making noise today, but up to now they haven't been such crucial issues in the target population of a great majority of said consumers.

3. SATISFACTION WITH DELIVERY TIMES:

- Although 20% of respondents did admit to neutrality, suggesting that services for the most part meet up to expectations, only few actually go beyond it.
- The dissatisfaction (dissatisfied 10%, very dissatisfied 5%) rate reached 15% showing it as rising from complications arising out of delay in delivery, inconsistency in timelines, or some remote locations.
- This helps e-commerce companies optimise and address concerns related to logistics; hence those with the issue are further strained.

4. AWARENESS OF ECO-FRIENDLY PRACTICES:

- Only 30% of participants are aware of and have seen initiatives that are environmentally friendly, which suggests a developing trend towards incorporating sustainability initiatives on certain platforms but that they are not well known or visible to larger audiences.
- Another 25% have been informed of "environment-friendly practices" but have not seen them this suggests that there is a major gap between awareness and putting into practice all these efforts; it pinpoints the area for improvement in communication and visibility intervention for sustainability effort in e-commerce platforms.
- A major portion (35%) of them have not any idea of any eco-friendly practices; this also shows that the e-commerce sector is also very scanty in making environment-conscious people part of their customer's role.



- Ten percent of the respondents did not consider the eco-friendly during shopping. There are segments of consumers for whom issues about the environment are just not a priority.

5. ACCESSIBILITY IN RURAL AND SMALLER TOWNS:

- 40% Of Very Easiness and Convenience Found That It Is Very Easy and Convenient to Do Online Shopping for People Living in Their Small Rwandan Towns and Even Rural Areas Where E-commerce Is Growing.
- But Occasionally 35% Have Had Some Delays and Issues, an Indication as While They Have Increasingly Expanded Their Reach, Hence Difficulties Related to Semi-Urban and Rural Areas.
- As for 15%, it showed challenges among those with major issues, and that seems to be in some hinterlands due to poor infrastructure or delivery network and less effectiveness of supply chains.
- The last 10% said they had no family or friends living in smaller towns and rural areas.

IMPLICATIONS OF THE SURVEY

1. CONSUMER BEHAVIOR AND SHOPPING FREQUENCY

- **E-COMMERCE PLATFORMS:**
So people generally purchase and shop online virtually every month—an indication of how largely consumer behavior has been converted into dynamic digital shopping. However, weekly shoppers are more faithful because they generally buy more mundane items such as groceries or household goods; now apps will also be considered. Non-buyer attendees were able to identify these barriers. Something seemed not right as he/she may not feel safe, a lack of availability, or preferences as old-fashioned shopping. For those myths, eCommerce world needs to focus on their strategy to clean up with the implementation of customer-faith campaigns, customer education, and first-time parties offers.
- **SUPPLY CHAIN IMPACT:**
The way consumers interact with brands has changed; consumers scarcely purchase goods without considering either the brand, product

experience, after purchase servicing, or, even more, the stature in their social surroundings.

2. FACTORS INFLUENCING PLATFORM CHOICE

- **E-COMMERCE PLATFORMS:**
The price emerged as one of the major critical factors because affordability is important. Several others that received high ratings included speed of delivery as well as discounts/offers, indicating the value that customers attach to convenience and good merchandise deals. Among customer satisfaction factors, comfortable return of goods, and attention to customer complaints were the primary affecters to ensure customer loyalty. Relatively low priority was attributed to the ecology-friendly attributes, obviously to say that while sustainability started to become a buzzword nowadays, it was not yet the top drawer for the majority of consumers at large.
- **SUPPLY CHAIN IMPACT:**
Costs, therefore, must get through streamlined procurement and good cost management. A fast supply chain necessitates a well-hosted logistics network embedded in optimized warehousing facilities. Post-sales services, like a comfortable return policy and immediate response to customer complaints, could also cater to enhanced customer satisfaction.

3. DELIVERY SATISFACTION

- **E-COMMERCE PLATFORMS:**
Many respondents noted that they were satisfied quickly with the shipment. Notwithstanding that, neutral and dissatisfied expressions indicated areas of improvement especially those concerning better communication concerning delivery times, lessening delays, increasing certainty about delivery, etc. Online platforms should develop premium delivery option aimed at quickness-minded customers.
- **SUPPLY CHAIN IMPACT:**
Faster and more accurate delivery can be ascertained by the improvement of processes leading towards last mile delivery through real tracking and automated dispatch systems. An amalgamation of outreach for delivery partnerships



with investments in regional fulfillment centers will curtail lags to further guarantee consistency in services.

4. AWARENESS OF ECO-FRIENDLY PRACTICES

• E-COMMERCE PLATFORMS:

30% of interviewed respondents mentioned that they observed some sustainable practices on e-commerce platforms, but the number is still significant—these are the respondents who felt either not well informed or at all about these efforts. This probably indicates that there might be some sustainability initiatives by platforms, but they are not effectively communicating or people do not notice them. A simple suggestion is improving visibility, sustainability labels, and more of eco-awareness campaigning. More incentives on green options would also make people notice.

• SUPPLY CHAIN IMPACT:

They even named it loyal customer base among environmentalists because it is not only cool but also contributes to sustainable branding thus uses packaging that can be recycled or even uses electric delivery vehicles and is also carbon neutral. The platform that attributes its practices with eco-friendly operations would set a new USP for the business.

5. ACCESSIBILITY IN RURAL AREAS

• E-COMMERCE PLATFORMS:

Many respondents, especially those living in small towns or rural surroundings, feel e-buying is everything due to the effect that most of the very little commerce sites have on fulfilling the needs in terms of distance. However, major issues include high delivery time, greater logistical bottlenecks, and all of them should be somehow resolved on behalf of the firms in an even healthier way in order to reach out to rural markets.

• SUPPLY CHAIN IMPACT:

Supply chains community in e-commerce ideally have to consider the need in investment, especially in enhancing the various links between seller and buyer—investing time and other resources. Buying from the portals is easy, and probably because presence of strong e-commerce sites has uprooted

the distance, or rather, the amount of time that usually buses take to the towns. However, significant issues include high delivery periods, possibly severe logistical bottlenecks which have to be resolved in a more appropriate manner towards much wider penetration into rural markets.

CONCLUSION

Insight about e-commerce trends and new dynamics in Indian e-commerce and their impact on supply chains can be viewed through a series of surveys and analysis. Recently, e-commerce has become one key constituent in the retail space caused by the change in consumer behavior and expectations. Major results are trends and areas, which will improve platforms to increase customer satisfaction and to gain competitive advantage.

The overall frequency of an average online shopper shows that a majority of the consumers report buying once a month and a power segment which affirms to shop once a week, which further indicates high growth but also underscores a high degree of consumer non-penetration or rare/non-shoppers. One method for broadening the consumer base is through targeted campaigns and opening up extensive access and trust or preference for shopping through traditional methods. Influenced by the price, delivery speed, and discounts/offers, and convenience, e-commerce platform selection is largely influenced by these three factors for consumers. Of course, easy returns and product availability after-sales also give them a pill, and customer service guarantees a much higher level of trust and loyalty. At the more general but low ranks, consumer shoppers also point out that environmental-friendly practices are becoming a new trend as more and more consumers are loving nature. One such step may be to enhance an environmentally friendly image for the e-commerce platform by popularizing eco-practices like the use of reusable packaging or green delivery.

There is an average online buyer by frequency, and so far the standard in terms of regularity for most buyers remains as once-a-month buying. That, in itself, signifies a power segment which confirms shopping once a week further. The very high growth signaled above is also stripped by the fact that there



is a high degree either of consumer non-penetration or of rare/non-shopper. Opening extended access and creating trust or preference for shopping through traditional methods will be beneficial for making more consumers. Item breakage by discount/offers and delivery speed gets to exercise the most significant influence on an e-commerce platform selection for consumers. All of this is certainly accompanied by easy returns and product availability after-sale, though customer service ensures a much higher trust and loyalty guarantee. A growing new trend for most consumers concerns moving from average consumer shoppers to some considering that being 100% or say green is very well associated with nature-loving. One such step might include casting around an ecoverity-friendly image for the e-commerce platform. That could mean good popularization via reusable packaging or green delivery practice.

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