

# Challenges and Opportunities in the Indian E-Commerce Industry

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## ABSTRACT

In today's age of technology and digitization, e-commerce as an industry has come a long way in leveraging the same and capturing the market in terms of retail sales. It has played a crucial role in completely changing the customer's outlook and experience of shopping, enabling them to do so within a few minutes in the comforts of their homes, with just a click of the mobile phone or laptop. The ever-increasing internet and smartphone penetration has helped bridge the gap between customers and e-commerce companies effectively. Online shopping is being preferred these days due to the availability of quality products at reasonable prices and also the convenience of having them delivered at the doorstep. However, any new technological development comes with its own share of pros and cons. This research paper deals with identifying these roadblocks and also points out the major opportunities which it can possibly utilize to further expand their growth and market share in the vast retail sector. One of the major challenges is the lack of having a significant reach in the rural areas and the population there not having the required technical know-how to exploit the services offered by companies. Another pertinent challenge is to address a certain decrease in the use of plastic cards for purchases due to the fear of card hacking and related theft of crucial customer data. Additionally, credit cards have the issue of authentication and recognition of electronic signatures. Cash on delivery mode of payment is manually painstaking and expensive as customers at times tend to not pay when the product is delivered home, and this leads to losses being incurred by companies. At the same time, the scope for expansion in the industry is galore because of the diversity of product choices for customers at affordable prices without compromising on quality and the convenience of having them delivered at their doorstep within a day or two of purchase. Some of the latest technological advancements which can help leverage these opportunities effectively are Artificial Intelligence, Big Data, and Machine Learning.

## Keywords

plastic cards, multiple linear regression, correlation coefficient, internet and smartphone penetration, artificial intelligence, big data, machine learning

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## Introduction

Over the last two decades, we have seen the world making rapid strides in technological advancements and going digital in our day-to-day transactions as much as possible. Developed economies like the United States and the European continent have led the digital transformation drive, which has paved the way for the other nations to follow suit. E-commerce is a very important part of this digital transformation process. It stands for electronic commerce and basically means the buying and selling of goods and services over the online platform by accessing the internet [5]. This transaction can either be business to business (B2B), business to customer (B2C) or customer to customer (C2C) with payment modes available such as net banking, credit card, debit card or even cash on delivery (COD) [5]. In an usual business to customer (B2C) transaction, once an order is placed on a particular company's website or its respective

mobile application, it typically takes two to three working days for its doorstep delivery. In extraordinary circumstances, the delivery could get delayed indefinitely. This could either be due to unusually high customer demand or a disruption in the supply chain network. It could also be possible that the particular product maybe out of stock. Reasonable delivery charges apply on every order, and this varies according to the size of the order placed by the customer. On the other hand, in a business to business (B2B) transaction, orders are made online in bulk by the particular enterprise. This is done to reduce the recurring costs of the company in the long run. A mutually agreed upon amount will be paid in advance as a guarantee to the company delivering the bulk order. In case the items are out of stock, the concerned people will be notified in advance.

To facilitate the growth of e-commerce, governments in various countries have had to put in place the necessary telecom infrastructure. In

the US, 22% of the population could access the internet hassle free in 1997 and there were 125 million credit card holders in the US in late 90s, accounting for almost 46% of the total population [22][25]. The status of e-commerce in developing countries like India is close to what it was in the United States back then. With respect to the number of internet users in our country, it exceeds about 450 million in the current scenario, roughly 33% of the entire population, and this increase is primarily due to the availability of cheap mobile data [5][24]. And, according to RBI estimates, India has more than 824 million debit card users and 50 million credit card users, as of 2019, which accounts together for almost 65% of the Indian population [23][24]. Hence, internet penetration in India is good and the availability of debit cards is also quite satisfactory.

Despite this, the e-commerce industry accounts for just 1.6% of all retail sales in India, compared to 12.4% in America [17][26]. This goes to show that there is tremendous opportunity and potential for e-commerce to grow in India. Big data, artificial intelligence, machine learning etc. are some of the tools which can possibly facilitate the necessary disruption in the e-commerce industry.

### Literature Review

The paper talked about the rapid growth of the e-commerce industry with the increase in internet usage. This is because of the availability of a wider range of products at lower prices and lack of geographical limitations for businesses. The paper classified the different types of e-commerce transactions. All in all, with the advent of technological disruptions, it was predicted that e-commerce will provide employment to over a million people in the country and will be a significant contributor to the Indian economy in the coming years [5]. This paper gave an overview about e-commerce as an industry and how it is impacting the country positively. Greater economic efficiency was attained because of urban dwellers who faced a major paucity of time to shop offline due to their busy lifestyles. Some of the key issues facing the industry were highlighted, one of which was the return of purchased products and the other one being cash on delivery remaining the preferred payment mode, which can prove to be painstaking and expensive for companies [4]. This paper talked

about how e-commerce initially came up on the pretext of the economy opening up through various policy and procedural reforms post 1991 and a technological revolution which includes widespread use of internet, web technologies and related applications. Home internet usage was consistently on the rise due to which more online users in the country were willing to make purchases through the internet. Going further, various advantages of this industry were highlighted. The paper concluded on a positive note mentioning the importance of the industry in the 21<sup>st</sup> century with the expansion of technology and internet user base and suggested the role of the Government in providing a legal framework for companies so that cyber-crimes and related security issues can be minimized [6]. This paper defined e-commerce and then went on explaining about it and its categories in brief. Despite being a large internet user base, penetration of the industry in India was observed to be much lesser as compared to foreign markets like that of the US, the UK, Germany, and China. Advantages to customers as well as suppliers were analyzed in fair detail. The sector's key challenges and opportunities were highlighted as well. To conclude, the paper pointed out that e-commerce had reduced the gap in between the manufacturer and consumer and that the industry would keep expanding with almost equal increase in user base from urban as well as rural areas [13]. This paper began by mentioning the challenges Amazon faced in India before it could become profitable. Similarly, the paper analyzed the challenges confronting the other players like Flipkart, Snapdeal etc. and the measures they had taken to overcome them. To achieve its objectives, a survey was conducted with the help of a questionnaire and empirical data was collected too, in the process. After appropriate analysis, it was concluded that the group of employees, suppliers, logistic service providers and customers felt that logistics and shipment services to be the biggest challenge the companies faced. The paper predicted e-commerce companies to take about 10 years to witness some major profits akin to Amazon in the US [22]. This paper undertook the study of e-commerce to determine the current status and the facilitators of e-commerce in India, analyze the present trends of e-commerce and also examine its barriers in the current scenario. A few of the infrastructural barriers were also

highlighted, some of which presented new business opportunities for the present day. Some of these were the difficulties in manual payment collection, logistic issues, an inefficient system for inventory and vendor management and also the varying rules for taxation at that time. Finally, the future growth of the industry was attributed to the deployment of advanced wireless communication technologies as well a legal framework for the companies to follow easily [28]. This paper tried to get an insight into the problems faced by the dot com companies in reaching out and taking advantage of the untapped opportunities in the distant rural areas of the country, which was determined by researchers through an opinion poll. The study elaborated the customer's first-time experiences and their thoughts of using various e-commerce platforms and also the problems they faced. The objective of the study was to mainly design a framework to minimize the operational challenges the industry faced in rural areas. The research methodology and the tools employed to make the framework was with the help of primary and secondary data journals, publications articles, books, and websites [29]. This paper gave an overview on the differences between e-commerce and m-commerce. It helped in understanding the basic issues in m-commerce and analyze its impact on the current and future businesses and identify new business prospects, at the same time. In depth research was done with the help of company disclosure data, historical data analysis, company case studies, and sector reports. Secondary sources such as company websites, books and magazines were also used. Finally, the current situation of the mobile telephony market was determined in India and elsewhere [30]. This paper gave a brief overview of the future of e-commerce in India and its potential growth segments. It also tried to identify the various factors which could be essential for the future growth of the industry. Various opportunities were found for producers, distributors, retailers and also for the customers. It was concluded that the e-commerce industry on the whole would grow exponentially in the coming years [31]. This paper presented the various factors which would possibly drive growth in the e-commerce sector, the rapid growth in the use of mobile and internet being one of the major factors. The methodology for the study was primarily from secondary data sources like

articles, journals, reports, papers, blogs, and conference proceedings. The study covered diverse topics such as logistics infrastructure, internet regulations, key challenges, and future of e-commerce. It was concluded that companies needed to focus on providing better service to customers due to increasing competition in the sector [32].

From the above literature reviews, the following objectives were incorporated in the research paper. Firstly, the various challenges impacting the industry's profitable growth were identified. Next, the opportunities for improving the profitable growth were listed down as well. These objectives were completed with the help of secondary data sources like research papers, journals, articles, e-magazines, company websites etc. Additionally, a quantitative analysis was carried out on the software SPSS to identify the critical factors influencing the customer's perception of the general pricing of products sold online. This analysis was done with the help of a questionnaire floated online, which is a primary data source. The results hence obtained were analyzed, and managerial implications were suggested for the future road map of the Indian e-commerce industry.

### Challenges plaguing the industry

To expand the scope of the e-commerce industry, the rural areas have been rightly targeted as they form about 66 % of the total population [1]. According to the latest report by the Internet & Mobile Association of India (IAMAI) and Nielsen, the number of internet users in rural India have exceeded that of the urban users by 10% as of November 2019 primarily helped by the availability of cheap data [2]. Despite this, online shopping has not quite taken off and this could be due to a few reasons. People are still unaware of the fact that such an option exists and are also unfamiliar with e-commerce mobile applications and websites. They do not know how the website interface works and how to navigate through the different websites because of language barriers. Rural dwellers are ignorant of the benefits of e-commerce, how they can save on time and money and how they can get their goods delivered home conveniently. Another pertinent issue is the poor transportation network connecting most of these areas [3]. Products take more than a week's time

to get delivered and not all rural locations have the facility of home delivery since they may not be in an accessible locality and hence not listed on the application or respective website. In order to try and bridge this gap, India Post started its own e-commerce portal in December 2018 [3]. It is an online marketplace for different kinds of sellers ranging from rural artisans, self-help groups and women entrepreneurs and was started with the aim of increasing the rural outreach through their services [3]. Besides this, it has given access to state and central public sector companies as well as private players. The products subsequently purchased will be dispatched through the postal department's speed post service [3]. The challenges encountered here are that private players are yet to tie up with the India Post e-commerce portal to try and improve the efficiency of their last mile logistics to poorly connected villages and towns and hence improve net profits and also give a better of range of delivery options to the rural consumers [3].

While all major e-commerce companies require the use of debit/credit cards, net banking, and mobile wallets to make purchases, the electronic payment mode has not become very popular so far as there are not many plastic money holders in India, especially when it comes to credit cards [8]. People are also wary of the increasing threat of frauds happening by card hacking. Credit card growth has been stunted by authentication and recognition problems of electronic signatures. This is one of the biggest challenges in the growth of the industry. In order to minimize the impact of this issue and also of the security of online transactions, many of the companies started Cash-on-Delivery (COD) as an option in which it is sufficient for customers to pay as and when the product is delivered home. Low credit card penetration at 3.7% and little trust in the security of online transactions eventually led to cash on delivery being the preferred mode of payment for them. However, this is a difficult proposition for companies and delivery partners because unlike electronic payments, manual cash collection is painstaking and expensive. Many of the customers refuse to pay cash at the time of product delivery due to various reasons which result in heavy losses incurred in product transit and eventually these companies are losing out on revenue [8].

This is yet another challenge confronting the e-commerce industry.

Funding remains a major concern for established companies as well as emerging e-commerce startups. Companies like Urban Ladder had to lay off about 90 employees for the March quarter of 2019 mainly because of the inability to raise more funds and the struggle to make profit. This issue was allegedly because of the new FDI rules brought in by the government. Similarly, online furniture company Pepperfry posted a loss of around 183 crores around the same time, although their revenues were healthy. However, the two companies tackled the situation differently. While Urban Ladder used re-alignment and retrenchment to cut costs and improve their profits, Pepperfry was on an expansion spree from March 2018 and the company raised Rs 250 crore from the US based State Street Global Advisors and started opening new stores, expanding their reach to Tier 2 cities and improving the logistics and supply chain. Apart from funding challenges, the top-line numbers and subsequently the bottom-line profitability of Pepperfry point to the pressure from increasing competition, not only from Urban Ladder but also from top companies like Amazon, Flipkart and even the popular Swedish furniture brand Ikea entering the online furniture segment [11][12].

### Opportunities in the industry

In a rapidly developing economy like India, while some challenges need to be addressed by the industry, there are quite a lot of opportunities as well for e-commerce as a segment to capture the market and account for a bigger share in the total retail sales. According to a report by the World Bank, although e-businesses have grown substantially in recent years, online sales accounted for just about 1.6% of total retail sales in 2019 as against 15% for China and around 14% globally, which puts the situation in perspective [17].

The rise in the growth and the enormous potential in the industry can be tapped by the increased internet and smartphone penetration with total number of users expected to reach 829 million by 2021, up from 636 million in 2019 [14][16]. India's smartphone market has currently grown to 560 million, larger than the entire US population, with individual data consumption of 8.3



GB/month as compared to 5.5 GB/month in China [14][15]. Internet has the advantage of low search costs and lucid price points. This has proved to be highly cost effective for online businesses as it reduces a lot of the marketing, processing, inventory and after sales service costs. It also reduces the usage of infrastructure and the inherent costs that come with its management. Increased usage of online classified sites encourages and improves second hand buying and selling too.

We have many important tools emerging from the IT industry which are trying to leverage the several opportunities that have been mentioned and hereby looking to improve the share of retail sales of the e-commerce industry and their overall profitability. Some of these tools are Artificial Intelligence, Machine Learning and Big Data, whose meanings, and applications in e-commerce we will be delving into.

#### Artificial Intelligence

Artificial Intelligence is a very significant tool which basically programs human intelligence in machines to help it mimic their actions and perform day-to-day tasks which can be simple or complex human like work. AI is essentially about allowing these machines to perform more tedious tasks and let humans work smarter and intelligently. The purpose of AI is learning, reasoning and perception. AI has various applications in e-commerce like Chatbots, virtual assistants, cyber security, customer relationship management, after sales services etc. This tool is being utilized increasingly by major players as they can analyze customer behavioral patterns. It uses algorithms to collect information regarding the product preference and current purchases of customers based on their buying patterns and the website's engine in turn offers product choices and brands accordingly. This is called as the recommendation system which we more commonly view as the 'Frequently Bought Together' section on the company's homepage [18][19].

These days, customers are seeking a quick fix for an enhanced shopping experience, without compromising on quality. The role of online chatbots helps in this endeavor, by engaging customers in their purchases and enlightening them on the various product categories they may

be interested in. Artificial Intelligence has made it possible for online shopping using illustrations. This feature comes in-built in many smartphones today wherein if we just point our camera towards a product, we will find all details pertaining to it. AI has completely changed the outlook of companies towards inventory management. Through its applications, companies can track down the total purchase orders, organize and manage inventory in warehouses and ensure it has enough stock, especially when products are in high demand [19].

#### Machine Learning

Machine Learning is basically a subset of AI, a concept that a computer program can learn and adapt to new data without human interference. One of the techniques which AI uses for big data processing is machine learning [20].

Flipkart is leading the way in offering solutions to unique problems in our country. Indian postal addresses are complex and may be difficult to comprehend for customers who might be illiterate, and this poses a major problem for last mile logistics and customer satisfaction. The data science team at Flipkart built a Machine Learning model which had different locality features stored in the system like the names of localities, sub localities, building names and possible alternate spellings. This data was collected based on what the customers used to commonly write in addresses. Based on the PIN code and location information, the addresses were identified, and this familiarized the last mile delivery staff in turn which had a very positive impact on sales [20][21].

#### Big Data

The population in our country is so vast that companies are having to deal with huge amounts of data, available in different formats from contrasting sources. This data, known as big data, is becoming easily available off late due to the continuous use of technology. To reinforce what has been said earlier, one of the methods of big data processing in AI is machine learning.

Price has been the most dominant factor in the Indian market and e-commerce players have a long way to go when it comes to the retention of customers and winning their loyalty towards brands, as the customer is tempted to make the

switch to other brands because of product promotions and exciting deals. The key to customer loyalty and retention lies in understanding their needs and wants, and this is possible by developing strategies through analytics produced using big data techniques to predict product preferences and buying behavior. With smartphone usage increasing by the day, online businesses can easily retrieve large amounts of consumer data, which can in turn be used to carry out target-based marketing and advertising [13].

## Methodology

### 5.1 Dataset

A survey was carried out and primary data was collected with the help of a google form in which 163 responses were recorded. People of all age groups were taken into consideration for diversity of data. It was found that almost 81% of online shoppers and users were comfortable and satisfied while shopping online and about 85% of these users fell in the age bracket of 20-30.

Similar to the general trends on ground, most of these shoppers preferred to buy electronic items online (38.6%), followed by about 28% who bought apparel. Groceries and other items accounted for the remaining share. Citing an example mentioned earlier, online retail sales in India in 2018 followed these patterns with electronics having a 48% share followed by apparel with 29%. This opens up the opportunity for e-commerce companies to exploit other segments such as furniture, books, cosmetics, household cleaning products etc.

Data related to the general pricing of products was quantitatively determined on the likert scale with 1 labelled as extremely cheap and 5 as extremely costly.

### 5.2 Modelling technique

Linear regression is one of the simplest supervised learning techniques which is used to predict an outcome in numerical value using predictors. This method identifies the most significant influencing factors for the outcome variable. The impact of the outcome variable can be determined by the coefficients of the independent variables from the model. In this way, this technique can provide useful insights which can be analyzed in detail.

Multiple linear regression is a method employed to understand the relationship between the outcome variable and a set of independent variables, by fitting a linear model based on the train set of original data. Mathematically, it can be expressed as 'Target = Residual + Fit' in which 'Fit' term indicates the expression  $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n$ . The "Residual" term indicates the fluctuations of the noted values 'y' from their means ' $\mu_y$ ', which are normally distributed with mean 0 and variance ' $\sigma$ '. Below is the expression for linear regression with multiple influencing factors

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n.$$

Where Y represents the outcome variable and  $\beta_0$  is intercept or the constant term.  $\beta_{1,2,n}$  represents coefficients of independent variables ( $X_1, X_2, X_n$ ).

In order to get an accurate idea of what factors influence the customer's perception of how products are priced online, regression analysis was carried out on the software IBM SPSS Statistics Data Editor. The general pricing of products was taken as the dependent variable and eight independent variables were taken as the factors which were most likely to influence the pricing of products sold online, from a customer's viewpoint. These variables are quality of products sold, products being out of stock, products delivered in damaged condition, shipping delays, frequent cancellation of orders by seller, return policy not robust or unavailable, payment gateway errors and cyber security issues, being non-operational in Tier-II and Tier-III cities. A multiple regression analysis was carried out for this purpose with descriptive statistics in which about 150 data points were applied.

## Results and Analysis

### 6.1 Exploratory Data Analysis

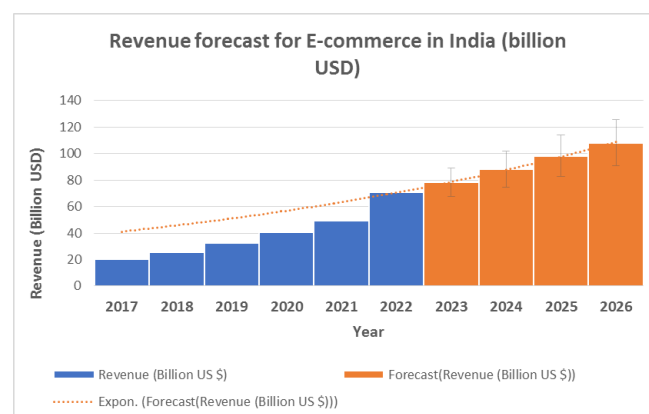


Fig. 1

Source: e-commerce-revenue-forecast-in-india/statista.com/statistics/289770,

<https://www.ibef.org/industry/ecommerce.aspx>

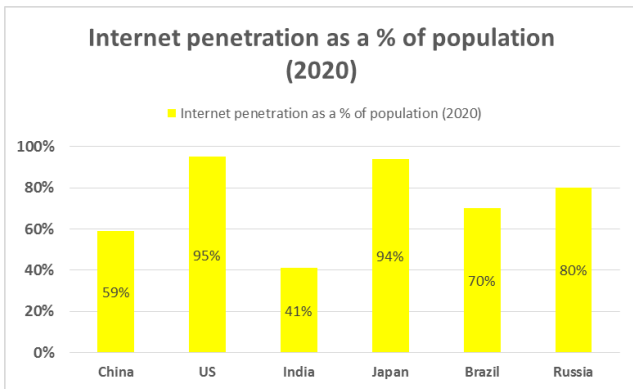


Fig. 2

Source:

<https://www.internetworldstats.com/top20.htm>

The above graphs point to the fact that the revenue growth potential for the industry is steadily increasing through the years 2023 to 2026. This is primarily due to a steady percentage increase in internet penetration in the country, which is already a significant 41% as of 2020.

If no, what are the reasons?  
47 responses

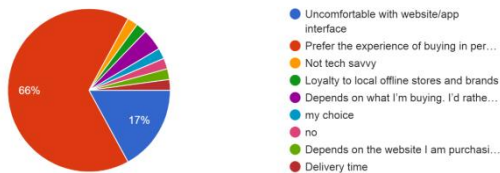


Fig. 3

From the above chart, it is observed that 19% of the respondents do not shop online mainly because 66% prefer the experience of buying in person and 17% of them are uncomfortable with the website/application interface.

What do you feel about the general pricing of products as compared to offline stores?

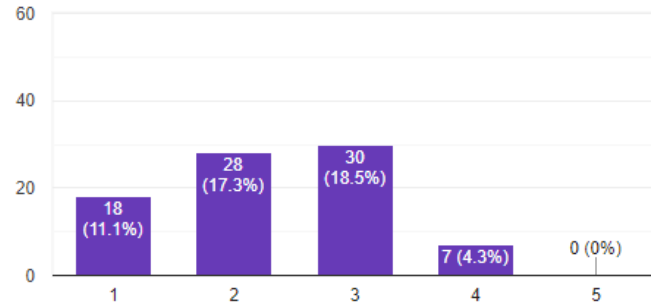


Fig. 4

It was known that while 17% of the shoppers found their products fairly cheaply priced, there were about 19% of them who felt that the products purchased online were competitively priced. A meagre 4.3% felt that these purchases pinched their pockets.

	Pricing_of_products	Quality_of_products_sold	Unavailability_of_products_out_of_stock	Products_in_damaged_condition	Shipping_taking_time	Frequent_cancellation_by_seller	Return_policy_not_robust	Payment_gateway_errors_and_cyber_security_issues	Non_operational_in_Tier_two_and_Tier_three_cities
Pearson Correlation	1.000	-.644	-.324	.275	-.211	-.331	-.202	-.120	-.272
Quality_of_products_sold	-.644	1.000	-.384	.435	.091	-.249	-.197	-.483	-.451
Unavailability_of_products_out_of_stock	-.324	-.384	1.000	.162	.138	-.353	-.188	-.574	-.113
Products_in_damaged_condition	.275	.435	.162	1.000	.285	-.042	-.234	-.385	-.322
Shipping_taking_time	-.211	.091	.138	.285	1.000	.264	.108	-.379	-.289
Frequent_cancellation_by_seller	-.331	-.249	-.353	-.042	.094	1.000	-.172	-.007	-.169
Return_policy_not_robust	-.202	-.197	-.188	-.234	.139	-.172	1.000	.151	-.283
Payment_gateway_errors_and_cyber_security_issues	-.120	-.483	-.574	-.385	-.379	-.067	.151	1.000	.096
Non_operational_in_Tier_two_and_Tier_three_cities	-.272	-.451	-.113	-.322	-.288	-.169	-.283	.096	1.000

Fig. 5

‘Quality of products sold’, ‘Non-operational in Tier two and Tier three cities’, and ‘Payment gateway errors and cyber security issues’ had a negative correlation with the pricing of products. This implies that products in such remote cities are priced comparatively higher and better the quality of products sold, slightly lesser were their prices due to greater demand and customer satisfaction. Payment gateway errors and cyber security issues required companies to adequately compensate the customers. ‘Products in damaged condition’ had the highest positive correlation, which means that damaged products incurred additional expenses for companies. ‘Shipping taking time’ also had a positive correlation which means that cancelled orders let to losses for companies and this in turn forced an increase in the price of the product.

6.2. Model Analysis

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 <sup>a</sup>	.351 <sup>a</sup>	.123	.073	.787	.123	2.453	8	140	.016

<sup>a</sup> Predictors: (Constant), Non\_operational\_in\_Tier\_two\_and\_Tier\_three\_cities, Frequent\_cancellation\_by\_seller, Return\_policy\_not\_robust, Payment\_gateway\_errors\_and\_cyber\_security\_issues, Shipping\_taking\_time, Products\_in\_damaged\_condition, Quality\_of\_products\_sold, Unavailability\_of\_products\_out\_of\_stock

**Fig. 6**

The model has a R value of 0.351. R value determines the quality of prediction of the dependent variable. R<sup>2</sup> value of 0.123 here explains roughly 12% of variability of the dependent variable ‘Pricing of products.’ Adjusted R<sup>2</sup> value of 0.073 accounts for the variation in correlation between two independent variables, which is undesirable.

The equation which can be written down to predict the pricing of products from quality of products sold, products being out of stock, products delivered in damaged condition, shipping delays, frequent cancellation of orders by seller, return policy not robust or available, payment gateway errors and cyber security issues, being non-operational in Tier-II and Tier-III cities from the below table is:

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.429	1.235		3.586	.000
	Quality_of_products_sold	-.061	.038	-.207	-1.603	.111
	Unavailability_of_products_out_of_stock	-.031	.047	-.088	-.663	.508
	Products_in_damaged_condition	-.020	.045	-.047	-.440	.661
	Shipping_taking_time	-.073	.050	-.138	-1.467	.145
	Frequent_cancellation_by_seller	-.030	.049	-.066	-.621	.536
	Return_policy_not_robust	-.073	.044	-.173	-1.632	.105
	Payment_gateway_errors_and_cyber_security_issues	-.078	.049	-.228	-1.597	.112
	Non_operational_in_Tier_two_and_Tier_three_cities	-.121	.037	-.417	-3.264	.001

a. Dependent Variable: Pricing\_of\_products

**Fig. 7**

Predicted pricing of products = 4.429 – (0.061 x quality of products) - (0.031 x products out of stock) - (0.020 x products damaged) - (0.073 x shipping delays) - (0.030 x frequent cancellation) - (0.073 x return policy not available) - (0.078 x payment gateway errors) – (0.121 x non-operational in Tier-II/Tier-III cities)

The unstandardized coefficient for quality of products sold is -0.061. This means that for every one-unit decrease in the quality of the product, there is a decrease in the price of the product by 0.066 units.

**Managerial Implications**

**Roadmap for the E-Commerce Industry**

According to the analysis, products in damaged condition contribute to reduced sales which leads to an increase in their pricing. Companies need to

make sure that the logistic partners they are tying up with, safely deliver the products in the first go to avoid unnecessary expenses from cropping up. They can try and execute this by additionally incentivizing the delivery partners on a monthly basis for getting consistent delivery reviews and feedback from the customers. In case they falter over a significant period, companies can levy a fine per every faulty delivery, to make the process accountable and transparent.

Shipping delays have a relatively high correlation with the pricing of products. Companies can avoid the high pricing of products by ensuring timely delivery. One way of doing this can be the central location of the warehouse center from which shipments are delivered across to various areas. Ensuring adequate inventory will also make sure products are delivered punctually. Hiring delivery partners who have good knowledge of the local surroundings and parlance will also help immensely in this cause.

Semi-rural areas like Tier-II and Tier-III cities and rural areas in India are a huge opportunity for e-commerce companies to tap into as they make up about 66% of the entire population. They also constitute a whopping 50% of the national income. These factors point out the importance of turning their focus equally towards the rural sector.

There is another major challenge, which if addressed, can be turned into a good opportunity for all companies. Credit card penetration is very less, currently at 3.7%, and authentication of electronic signatures is another major problem. More attention should be given to the electronic mode of payment since the cash on mode method is painstaking and expensive for companies and tie ups should be made with secure payment gateways to ensure that transactions happen safely without theft or loss of highly confidential customer data.

Many first-time online buyers do not understand the interface of the shopping website or mobile application at times and do not have the patience to navigate through to the end of the transaction. These people do not know what to expect from the products or services which are sold and tend to return a lot of them after purchase. This calls for companies to design their website homepages and applications in a simple and lucid manner so that



they can convert first time customers and visitors into regular buyers. Companies should use appropriate keywords to direct customers onto their websites and put relevant content and illustrations which can attract and kindle the users' interest to stay on and complete purchases.

### Conclusion

Although the internet penetration in rural areas have outnumbered their urban counterparts by 10% as of November 2019, there are a lot of other bottlenecks in these areas such as lack of adequate infrastructure, road connectivity and technological know-how to seamlessly bridge the needs of the people and this remains a major challenge as well as a good opportunity for e-commerce companies to venture into [2].

Another challenge for companies is the limited funding they have access to. This could be either due to the strict FDI rules put in place by the Central Government due to which foreign investors are hesitant in providing much needed funding to local companies. Another reason for lack of enough capital could be based on the performance of the enterprise in a particular quarter or fiscal year. With more and more startups on the rise, investors could find it even more difficult to choose the right company to grow their fortunes.

From the primary data analysis, it was known that about 50% of the respondents were not satisfied with how customer complaints were handled. Majority of these customers felt that complaint redressal took too long to address mainly because of inefficiency and lack of adequate customer support staff.

To reiterate once again, the industry accounted for just 1.6% of all total retail sales in the country in 2019 as against China and US which make up a much larger % of their entire sales [22]. This opens up tremendous opportunity for further growth in the coming years.

### Future work

The accuracy of the model can be improved significantly with the help of more data points. The data collected can be more quantitative by having necessary access to specific company reports, employee and even supplier data. This would eventually help in designing a better regression model and stronger correlations can be

drawn between the outcome variable and the set of independent variables. Future work can focus on understanding how the profitable growth of e-commerce companies is being impacted negatively by various influential factors. A multiple linear regression analysis can be carried out for this purpose yet again, by getting the required quantitative company and customer related data. In case the data collected is fully qualitative in nature, appropriate sentiment analysis can be carried out in R programming language and a word cloud can be made to understand the frequently used terms and keywords by shoppers on online platforms.

It was not possible to get access to the above-mentioned data due to the prevailing Covid-19 situation. Hence, industry related challenges and opportunities were determined qualitatively through various secondary data sources and quantitative data was obtained and its related comparison and analysis was done mainly with the help of an online questionnaire floated across to respondents from diverse age groups, which is a source of primary data. The information collected here was more general and industry specific.

To satisfy one of the objectives, initially, data related to profitability growth of the major e-commerce players corresponding to the various influential factors, was to be collected in order to do a quantitative study. It was not possible to get virtual access for the same and also not feasible to reach out to companies through questionnaires or online surveys because of the lack of corporate exposure and experience. To try and overcome this challenge, the objective had to be tweaked slightly to get a perspective of product pricing from the customer's point of view. This was done by floating a questionnaire as suggested above.

Also, getting necessary data from the primary source was restricted to only online means of data collection. Due to the ongoing pandemic, it was not possible to distribute forms or brochures in person or have informal discussions with various e-commerce website/application users.

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### 11. Data availability

The data underlying this article are available in the article and in its online supplementary material.