COVID-19 Effects on Electronic Shopping : A Review

Soumya Bajpai[1], Varsha Sontakke[2]

[1]BCA, MIT – WPU, School of Computer Science, Pune, Maharashtra, India
[2]Assistant Professor, MIT – WPU, School of Computer Science, Pune, Maharashtra, India

ABSTRACT

was before 25 years in 1994 when the first documented online purchase was made. Since then, Online shopping has grown exceedingly to make millions and trillions today. The COVID-19 is a infectious disease that spreads mainly by droplets generated when an infected person sneezes or speaks and by touching infected surface as well. Hence, it is suggested to maintain a safe distance and avoid touching unknown surfaces. Following these guidelines people avoided offline work including shopping. In this way online business got a lot of promotion immediately. Few industries have luckily experienced tremendous growth during and after COVID-19 but few have even faced losses as never before. This is based on the kind of product we take in consideration. In this paper we have attempted to analyse and predict the online shopping market before and after the pandemic applying various Supervised Machine Learning algorithms on the data available for Maximum accuracy. This Research will help online businesses to make more profit analyzing the public demand and the conditions.

Keywords - Online Shopping, Accuracy, Market Analysis and Prediction, COVID-19

I. INTRODUCTION

UNCTAD says that the acceleration in online shopping habits due to the COVID-19 Pandemic is expected to have a long lasting effect.[3]For example : almost doubled sales of groceries in march 2020 compared to before months suggest that e-commerce is being taken by Americans much faster. This is due to physical store closing due to corona virus. The statistics from adobe analytics(2020) tell that there has been an overall increased with 25% in e-commerce.[1] The Pandemic offered the forced opportunity of digitization to the population and the countries, it has benefited the online market the most, in all aspects. This Paper deals with the insights about the online market before and after the pandemic. This Paper will help the businesses to understand the key drivers boosting the online market in US.

II. RELATED WORK

Helin Oven and Melissa Hicintuka in "Covid-19: How Does it affect international e-commerce firms? A qualitative case study about how the Covid-19 situations affects e-commerce firms and how they respond to it", by Qualitative research method tried to explain in what ways external impacts can affect e-commerce business. According to their thesis the commerce firms have been affected in different ways based on the type of there firm.[1]

United States Census Bureau, in "Quaterly Financial Report: Large U.S. Retail Trade Corporations, Third Quarter 2020" under Third Quarter 2020 confirmed that seasonally adjusted profits after tax of U.S. retail corporations with benefits of $50million and over totaled $43.4billion, upto $4.7($\pm$0.2)billion from the $38.8billion recorded in the second quarter of 2020. [2]

III. DATA DESCRIPTION

For our work, we are using data of U.S. online sales present on Statista. The data set contains information about the e-commerce in recent years. To present a clear Report we have consider the data for only one country that is U.S.

IV. RESEARCH METHODS

We used our observation, exploratory analysis and the proposed experiment method for the Review using Machine Learning regression algorithm.

A. Random Forest

A group of regression trees, made from the random selection of samples of the training data is known as Random Forests [6]. A random forest is a predictor made of a collection of random regression trees[7]. Random forests are more accurate and efficient as the observations are finalized with number of classifiers and the model with the best accuracy is chosen.

B. Decision Tree

The values of attributes for the provided data decides the grouping of data in the Decision Tree[6]. In a decision tree each node represents a feature (attribute), each link (branch) represents a decision (rule) and each leaf represents an outcome (categorical or continues value) [9]. The main motive

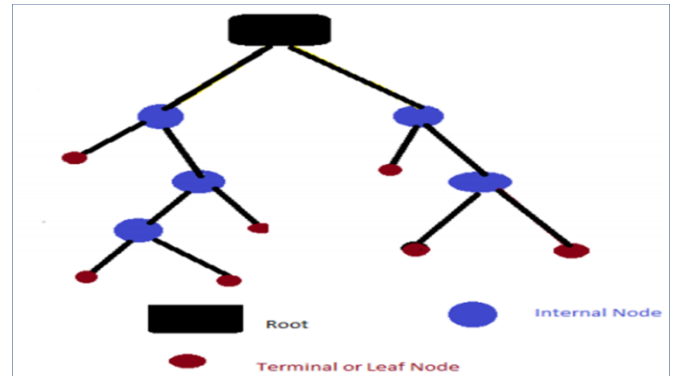behind plotting a decision tree is to plot the whole data and process a final outcome.

Fig 1. Tree Structure [6].
This Figure describes the structure of a tree [6].

V. EXPLORATORY ANALYSIS

AVERAGE VALUE OF ONLINE SHOPPING ORDERS IN UNITED STATES AS OF 2ND QUARTER 2020, BY DEVICE	
DEVICE NAME	**PERCENTAGE USAGE**
Desktop	131.16
Tablet	96.75
Mobile Phone	90.82
Others	63.72

Fig 2: table showing percentage usage for various devices for online shopping
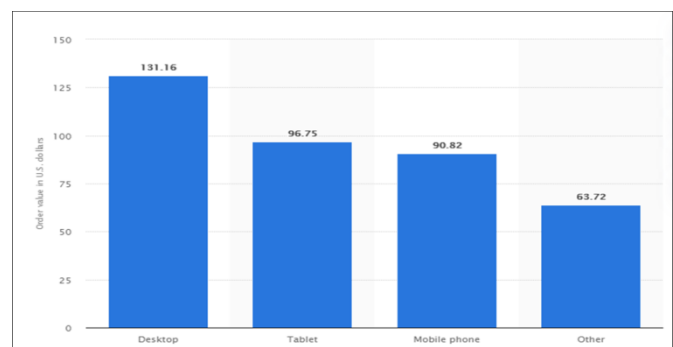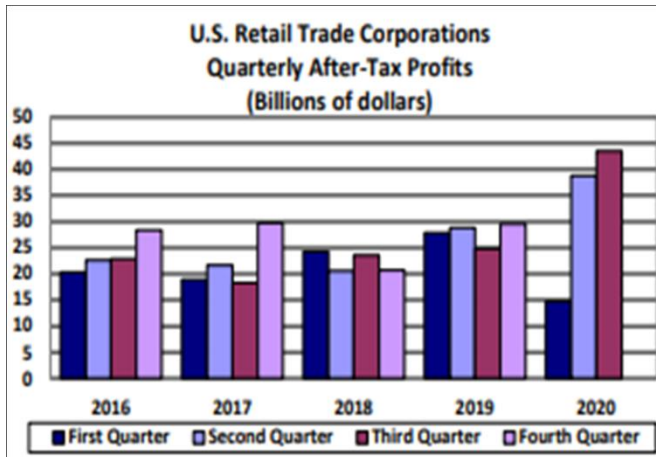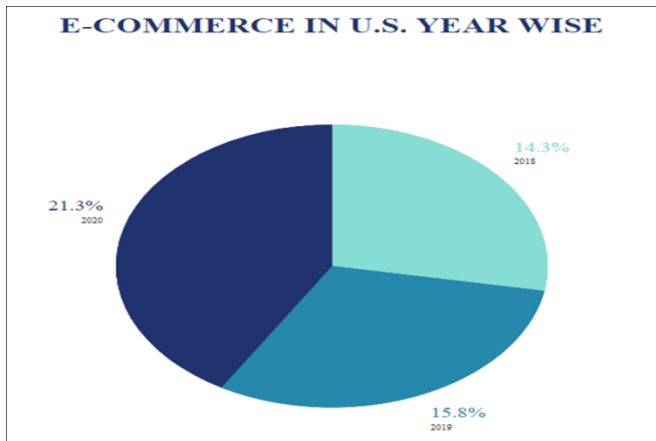Data Source : Statistic 2021

Fig 3: graphical representation for the data shown in figure 1.
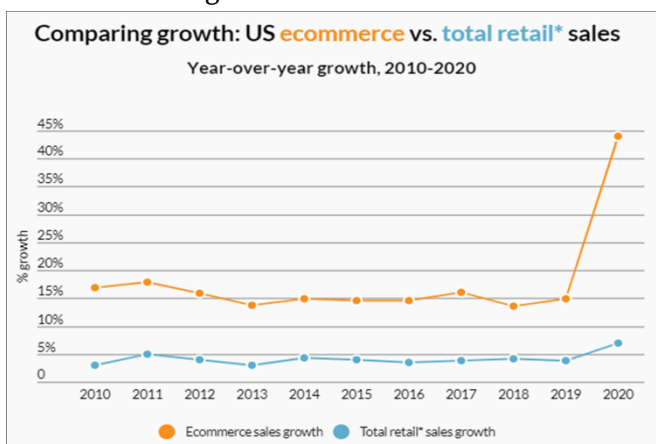
Fig 4: Adjusted Data only for Seasonality but not changes in price

Source: U.S. Census Bureau, Quarterly Financial Report, December 8, 2020

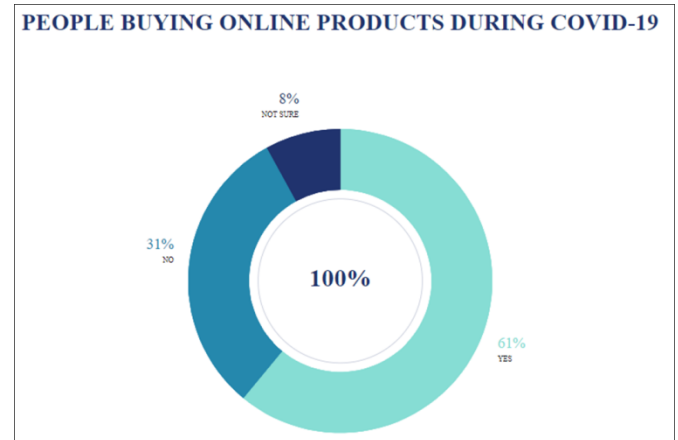**Fig 5:** Pie-Chart for E-Commerce Penetration in year 2018, 2019, 2020.

Data Source : Digitalcommerce360

Fig 6: Comparision between Growth of E-Commerce and total retial sales.

Source : Digital Commerce 360, U.S

This figure clearly shows the drastic increase in the e-commerce sales from the year 2019 to 2020 (during the COVID-19 pandemic)

Fig 7: People buying online products during COVID-19. [5]

These figures clearly indicate that COVID-19 has boosted the online shopping market surprisingly.

Fig 8: Top 10 Retailers in U.S. for online shopping with their 2020 Rankings.

Source : Digital Commerce 360.

VI. RESULT AND DISCUSSION

With the implementation of lockdown people were in a way forced to switch to digital work and digital market as compared to offline interactions. Though the situation due to the pandemic was entirely new and unexperienced for most of the public but now, with time people have adapted to the circumstances and have learnt the new technologies realising the current demand of time.

Now since, people have learnt the technologies, learnt how to operate it, have gone through the experience and hence, realised the benefits as well as harms about it.

Now, even if COVID has slowed down as compared to before but people have already adapted

VII. CONCLUSION

After analysis all the available data we come to conclude that online business market got a huge boost of income after COVID-19.

Hence, we can say that the people are getting more attracted towards internet shopping during Corona Phase.And keeping in mind the current trend we can expect to see similar trend for coming years.

VIII. REFERENCES

[1]. "Covid-19: How Does it affect international e-commerce firms? A qualitative case study about how the Covid-19 situtaions affects e-commerce firms and how they respond to it " by Helin Oven and Melissa Hicintuka.Term: VT20; Subject: International Business; Course Code: 2FE51E.

[2]. " Quaterly Financial Report: Large U.S. Retail Trade Corporations, Third Quarter 2020". by United States Census Bureau, U.S. Department of Commerce.Release At: 10:00 AM EST, Tuesday, December 8, 2020 Release Number : CB20-188.

[3]. "United Nations Conference on Trade and Develeopment" .

[4]. "A Decade in Review : Ecommerce Sales Vs. Retail Sales 2007-2020" by Fareeha Ali. Jan 29, 2021.

[5]. "COVID-19 IMPACT ON ONLINE SHOPPING" by Muhammad Kashif, Aziz-Ur-Rehman, Muhammad Kashan Javed. Publish date : 01-07-2020.

[6]. "Random Forests and Decision Trees" by Jehad Ali1, Rehanullah Khan, Nasir Ahmad, Imran Maqsood. IJCSI International Journal Of COmputter Science Issues, VOl 9, Issue 5, Vol. 9, Issue 5, No 3, 3 September 2012.

[7]. "Analysis of a Random Forests Model" by Gerard Biau; LSTA & LPMAUniversite Pierre et Marie Curie – Paris VI ´Boˆıte 158, Tour 15-25, 2eme ` etage ´ 4 place Jussieu, 75252 Paris Cedex 05, France;Editor: Bin Yu. Published 4/12.

[8]. "Study and Analysis of Decision Tree Based Classification Algorithms. International Journal of Computer Science and Engineering. 6. 74-78. 10.26438/ijcse/v6i10.7478." by Patel, Harsh & Prajapati, Purvi. (2018).

[9]. Jadhav SD, Channe HP. Efficient recommendation system using decision tree classifier and collaborative filtering. Int. Res. J. Eng. Technol. 2016;3:2113-8.