An empirical research on consumer online buying behaviour during the COVID-19 pandemic

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ABSTRACT - The extraordinary episode of the 2019 novel Corona-virus named as COVID-19 by the World Health Organization (WHO) has put various governments around the globe in a shaky position. The shortage of health care facilities to bear the COVID-19 has forced the countries to go with the hand of complete or partial lockdown. According to the World Health Organization (WHO) report 32.6 million cases has been recorded as on 26 September 2020. Corona-virus have its major influence on consumer buying behaviour which is going to change the consumers’ future hopping habits. This article highlights the change in consumer behaviour from physical store to online shopping. The present study was conducted during the month of July-August 2020, where questionnaires’ are formed and data collected using Google forms. Analysis of the data is made through Simple percentage method, ANOVA test, Chi square test and ranking method. After analysis it found that the majority holding 21-30 age group of customers prefer shopping while free shipping and their cart behaviour is also analysed for the same.

1. Introduction

The COVID-19 outbreak made the online business deals spike up to 45% in July 2020 alone. The web-based application is boomed in this pandemic situation and technology has to be adopted by the business persons to capture the consumer. It is mandatory to have online portal for all types of business scale application despite whether it is small scale, medium scale or large scale. The door of Internet has opened and make life for many retailers, people feel that purchasing through online mode is safe than that of visiting physical store the business people want to perceive this thought of consumers and they want to convert this thought process to profit. In order to capture more consumer the distributors want to use the Internet technology effectively. The focus of this article is to examine the factors that influence the online consumer. The data is collected as questionnaires’ from different categories of people through Google forms.

The questionnaire comprises of 12 questions, formatted in a way to identify the features that has major effect on the consumer. The survey deals with the consumer gender, age, occupation, family’s monthly income, the mode of payment they likely to prefer like EMI/Full payment, approximate amount they spent on online shopping per month, the most purchased product category in online, how often they purchase in online, how they use their shopping carts as to purchase/wish-list/load up their cart until they receive free shipping privilege, the factors they consider before purchasing the product focuses on: time spent to find their desired item for less cost, like to receive promotion from a brand, referring more than one social media site for buying the product, free shipping, offered free returns/exchange. Their satisfaction level is measured based on ease of checkout, variety of brands and offers, number of shopping and payment option offered, free or discounted shopping, ease of making returns and exchange, ability to contact a live customer service representative. Similarly their dissatisfaction level is calculated by the rankings of customer care negligence, uninformed money...
deduction, difficulty in payment, shipping charges, undistinguished product image, non-availability of brands and varieties, inconvenience in return and exchange of product. The sample space for this study is 307 the number of respondents and analysis of the data is made through Simple percentage method, ANOVA test, Chi square test and ranking method.

2. Literature Survey
In this paper[1] author tells that the 4P’s (Place, Product, Promotion, Price) has a significant influence on customer product purchasing behaviour by using the 4P+2C+2P+2S factors and analysed with the ANOVA and multiple linear regression.

This research paper[5] the study discuss about the Chi-square test and multinomial distribution in obtaining the customer satisfaction with two numerical examples.

This paper[6] study helps to know the implementation of ANOVA test in simulated environment by uploading Excel data table and envision the P value & sampling distribution.

In this paper[9] the author explains about the three factors that support for quantitative & quality research, (i) mixed method approach (ii) meta-inferences (iii) meta-inferences in Information System.

3. Methodology
Methodology is a progression of activity for an exploration venture and discloses how information to be gathered, investigated and introduced so they will give significant data. In this study we discussed about the e-marketing strategy by using the convenience sampling technique on consumer purchasing decisions in order to increase the revenue.

![Structural representation of research design](image)

**Figure 1.** Structural representation of research design

The research design figure[1] shows the sort of exploration philosophy used to gather the data for the investigation. This study focus on the explanatory and analytical type of research for predicting consumer behavior. The main aim of using explanatory research is to describe the state of events as it
exists at present; it involves surveys and inquiries of different kinds of consumer purchasing habit. The researcher have identified that using descriptive research it is effective to identify the consumer characteristics, it also includes demography characteristic of consumers. By the source of data collected through questionnaires previously tested the primary and secondary data are separated. The data are collected by the researcher which helps to find the major factor that influences the customer purchasing decision are elaborated. The methodology used are Simple percentage analysis, Chi-square test, ANOVA test and Ranking method for analyzing the data and arriving at the conclusion. The Chi-square test is used to examine the two categorical values of the same population whereas one-way ANOVA test is used to find the dependencies between the means of independent groups.

3.1. Simple Percentage Method
The primary data is analyzed and interpreted using percentage analysis tool. From the total sample space the frequency of each respondents for the study.

\[
\% = \frac{f}{N} \times 100
\]

Where, \( f \) = Frequency  
\( N \) = Number of cases

3.2. Henry Garrett ranking technique
Garrett's ranking technique analyses the views of the consumers. The rank given by the consumer for each considered factor was converted into ranks by using the following formula.

\[
PercentPosition = \frac{100(R_{ij} - 0.50)}{N_j}
\]

Where, \( R_{ij} \) = Rank given for \( i^{th} \) item \( j^{th} \) individual  
\( N_j \) = Number of items ranked by \( j^{th} \) individual

The Garrett rank table is used to evaluate the percent position into scores. The scores of the respondent that is obtained during the survey is added and divided by its total. The important factors are found by the mean scores that are arranged in ascending.

3.3. Chi-square test
Chi-square techniques at different places are made on the basis of data available and requirements of analysis chi-square test at 5% level of significant. Chi-square value has been obtained by applying the following formula.

\[
X^2 = \sum \frac{(O_i - E_i)^2}{E_i}
\]

Where, \( O_i \) = Observed frequency  
\( E_i \) = Expected frequency.

3.4. One-way ANOVA (Analysis of variance)
The comparison of two independent group means using F-distribution is evaluated by one way ANOVA test. The assumptions are defined based on that the test process is carried out. The analysed test result defines whether the two means are dependent or not.
4. Respondent Profiles

During the survey analysis by Simple percentage method, it is noticed that, among 307 respondents, male respondents leading with (68.7%) and female with (31.3%). In case of age of respondents, below 20 (9.8%), 21-30 (62.2%), 31-40 (11.4%), 41-50 (8.1%), above 51 (8.5%). The occupation term ranges from idle (2.9%), student (30.3%), business (15.0%), job (45.0%), retired (6.8%). In terms of Monthly Income 5000-10000 (9.1%), 10001-15000 (18.9), 15001-20000 (42.7%), 20001-30000 (13.0%) and 30001 & above (16.3%).

The mode of payment they prefer more is full payment (81.4%) and EMI (18.6%). When it comes the approximate amount one spent on online purchasing per month is below 3000 (53.7%), 3001-5000 (29.6%), 5001-7500 (9.8%), 7501-10000 (4.9%), 10001 & above (2.0%). In terms of most purchased product in online electronic goods (30.9%), books (14.0%), clothing and apparel (24.8%), household goods (11.7%), office supplies (0.7%), customer packaged goods (3.6%), sports goods (2.9%), food and groceries (11.4%). The percentage for how often they purchase a product from online relates to twice a day (12.4%), weekly (16.2%), two weeks once (22.4%), every month (34.6%), two months once (14.4%). The percentage over cart usage distributed as aim to purchase (32.2%), as wish-list (31.8%), loading cart until they receive free shipping privilege (20.4%) and abandon cart (15.6%). These percentage analysis by descriptive research evaluates the different characteristics of the various respondents.

5. Analysis of Data

5.1. Testing using Chi-square

The analysis of data using chi-square value helps to compare one or more category significant difference of the expected frequency and the observed frequency. In this study we compared the significant frequencies of age group of people with the list of actors that dominating the consumer product purchasing decision.
Table 1. Age vs factors considered while purchasing product Chisquare test

|                      | Value  | df  | Asymptotic Significance (2-sided) |
|----------------------|--------|-----|----------------------------------|
| Pearson Chi-Square Value | 20.421  | 4   | .000                             |
| Like-hood Ratio       | 21.234 | 4   | .000                             |
| Linear-by-Linear Association | 3.659  | 1   | .056                             |
| N of Valid Cases      | 307    |     |                                  |

a.0 cells (0.0%) have expected count less than 5. The minimum expected count is 31.44

Where, H0 = Null assumption
H1 = Alternative assumption
H0 = No relationship between respondents age and product purchase decision factors.
H1 = Relationship between respondents age and product purchase decision factors.
From the table [1] calculated chi-value (20.421) is higher than the distribution table value (9.488) so, H1 assumption is accepted. Hence, they both are related.

Figure 4. Factors considered while purchasing a product among different age groups

Among various factors in figure[4], ordered when free shipping available has more influence on customer product purchase decision. The free return and exchange has the next major influence on product purchasing. Next we analyse the same age group of people and their value added cart management behaviour does they both have any significant influence by chi-square test.
Table 2. Age vs Vas of customer cart Chi-square test

|                         | Value  | df | Asymptotic Significance (2-sided) |
|-------------------------|--------|----|-----------------------------------|
| Pearson Chi-Square Value| 26.529 | 8  | .001                              |
| Likelihood Ratio        | 27.347 | 8  | .001                              |
| Linear-by-Linear Association | 4.854 | 1  | .027                              |

N of Valid Cases = 307

a.0 cells (0.0%) have expected count less than 5. The minimum expected count is 62.56

Table 2. Age vs Vas of customer cart Chi-square test

Where, H0 = No relationship between respondents age and value added cart services of the respondents.

H1 = Relationship between respondents age and value added cart services of the respondents.

From the above result of table[2], the chi-value (26.529) is higher than the value of distribution table (15.507) so, the H1 assumption is accepted. Hence, it is found that the age and value added cart services of the respondent are related.

Figure 5. Consumer Cart Behaviour

The above graph figure[5] shows that mostly all the age users like to use their cart as loading up with product until they get privilege of free shipping. The two chi-square test relates that the different age group of consumer purchasing decision revolves around they load their carts with products until they get the privilege to free shipping.

5.2 One-way ANOVA Test

The consumer must be satisfied with their income and the offers provided or while online purchasing. For finding their satisfaction level we can analyse their family monthly income of the consumer with the consumer’s satisfaction level in one-way ANOVA test by comparing the two groups mean.
Let, $H_0$ - NULL assumption,$H_1$ - Alternative assumption

$H_0 = \text{No relationship associated with the respondents monthly income and satisfaction level of the respondent towards online shopping.}$

$H_1 = \text{Relationship associated with the respondents monthly income and satisfaction level of the respondent towards online shopping.}$

From the above table[3] the calculated value(7.253) is higher than the value of distribution table (5.6.) so, the alternative assumption is accepted. Hence, it is found that the respondents’ monthly income and satisfaction level are related to each-other.

### 5.3. Ranking Method

Normally the consumer faces few dissatisfaction while purchasing the product on online. The Henry Garret ranking method is used to rank the customers’ dissatisfaction level toward various factors taken into consideration.

| S.NO | PROBLEM                                       | MEAN SCORE | TOTAL SCORE | RANK |
|------|-----------------------------------------------|------------|-------------|------|
| 1    | Customer Care Negligence                      | 1399       | 5596        | I    |
| 2    | Difficulty in payment                         | 1702       | 3404        | VI   |
| 3    | Inconvenience in return and exchange          | 1663       | 4989        | III  |
| 4    | Undistinguished product image                 | 602        | 4214        | V    |
| 5    | Shipping Charges                              | 1030       | 5150        | II   |
| 6    | Uninformed Money Deduction                    | 712        | 4272        | IV   |
| 7    | Non-availability of brands and varieties      | 1796       | 1796        | VII  |

*Table 4. Dissatisfaction level towards various consequences ranking method*

The above table[4] shows the mean score that the probability to occur and the total score that is observed value from the consumer and are ranked accordingly. The non-availability of brands and varieties(1796) is placed last, the second last is difficulty in payment (3404), undistinguished product...
image(4214) comes fifth, uninformed money deduction(4272) placed as fourth, inconvenience in return and exchange(4986) is third. The factors that cause more inconvenience to the consumer than others are shipping charge with(5150) is second and the customer care negligence holds the first place with the frequency of 5596. This ranking method with the frequency measured helps the vendor that how they can increase their revenue by reducing the above mentioned factors.

6. Conclusion
Forrester survey in late 2019,”The State of Retailing Online” in hands with the National Retail Federation(NRF) shows majority of online retailers ended with number of barriers. Due to the sudden outburst of Corona virus, the retailers are enraging to improve their digital experience. In assistance to help their digitized way the above testing results of this study ensures that the consumer from 21-30 age group are the persons who do more online shopping by the descriptive percentage analysis. Both the chi-square test shows that the age of the respondent are significantly associated with the customer cart behaviour and the product purchasing factors. Their frequency on ordered when free shipping available and preferring to load their cart until they get the privilege to free shipping. By the ANOVA test result it is revealed that the consumers’ satisfaction level has met. From the ranking result it is found that the customer care negligence is still quite a dissatisfaction remains. As the study helps with the frequencies of various aspects that is preferred by the consumer, with this the vendors can manage on how to increase their revenue.

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