"Buying behavior of Customer on online sites for Groceries"

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Introduction

In today's rapidly changing world online grocery shopping has become a new trend and is getting bigger and essential due to certain change of events like the current pandemic situation of COVID-19. Research suggests that it is becoming essential in metropolitan cities and consumers prefer online medium more than anything currently.

According to Salomon: "consumer behavior is a process that includes pre-consumption, consumption and post-consumption phases. Consumers play several roles in the process of selecting, buying and using goods, services and experiences."
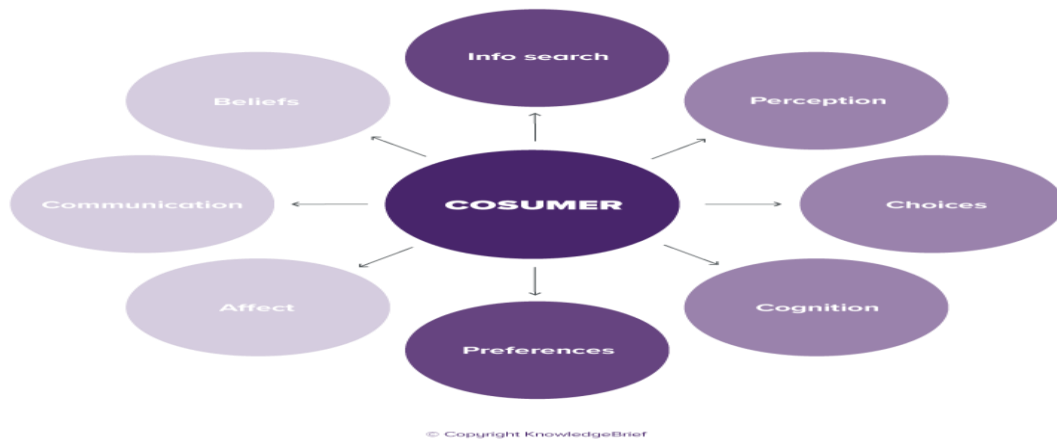
The advantage of online shopping of grocery is that it is time saving and economical whereas the disadvantage is that it can be risky and there can be fault in product perception and selection. In this project a survey of consumer behavior in online grocery shopping has been done using keeping factors such as time, money, incentives, variety of products in mind. A questionnaire of twenty questions was prepared and was floated among people residing mainly in Delhi-NCR area. According to research today only 3% of U.S. grocery shopping occurs online, but e-commerce penetration is projected to triple over the next 10 years. This will create a major shift in how consumers spend grocery dollars as they embrace digital and expect grocers to do the same.

Objectives of the Study

- To study about different factors affecting online grocery shopping like time, economical and variety.
- To predict weather a customer will buy grocery online using multiple regression method.

Literature Review

1. **CONSUMER BEHAVIOUR DURING ONLINE GROCERY SHOPPING**
   Source: Research Gate
   The paper talks about evolution of e-commerce of as new channel of market penetration for many retail players. It also discusses about the consumer attitude towards online grocery shopping and factors which affect them to buy products online.

2. **CONSUMER BEHAVIOR-ONLINE GROCERY SHOPPING IN INDIA: AN OVERVIEW**
   Source: IJARSE
   This paper deals with different online entries (such as big basket.com, amazon groceries) that have developed within the basic supply division clearing way to change consumption design of household within the show advanced situation. This paper gives an outline of these entries as well. By and large, the study covers the distinctive measurements of online buyer buy design and utilization conduct with the increased get to web clearing way to more systematised and modern approaches.

Research Methodology

A Google form which has 20 questions was floated online for the survey. The consumers are mainly of Delhi-NCR region. The following questions were created keeping in mind all the factors affecting consumer behavior of online grocery shopping:
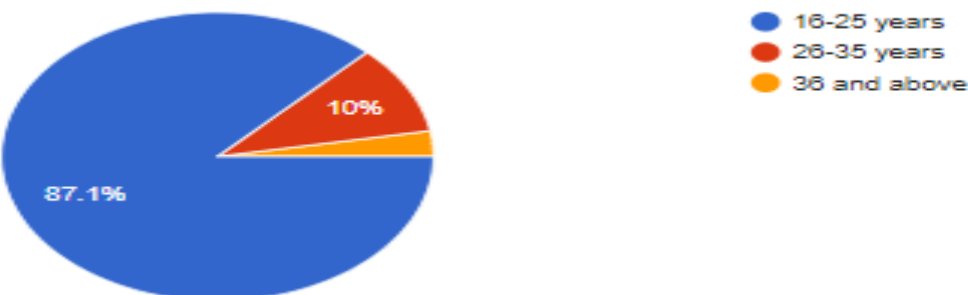
1. In which Age group you lie?
2. Please choose your Gender
3. Your Profession:
4. Do you feel online grocery shopping is time saving?
5. Do you feel online grocery shopping is trustworthy and secure?
6. Which device you mostly use while doing online grocery shopping?
7. Which payment option is mostly preferred by you for online shopping?
8. Are you more likely to buy a product if there is free or discounted shipping?
9. Do you like to receive an incentive or promotion from a brand before shopping online?

10. Do you refer to at least one social media site for recommendations before shopping online?
11. If answer to the above question is yes, then which social media site do you refer?
12. What items in grocery shopping you mostly avoid while shopping online?
13. Do you feel online grocery shopping is
14. Did you use online applications for shopping of grocery during this COVID time?
15. Which categories items you most likely to buy while doing online grocery shopping?
16. How many times are you likely to use an online medium for Grocery Shopping in a month?
17. How do you use your shopping cart while shopping online?
18. Do you feel purchasing groceries online is convenient than traditional grocery store?
19. The variety of grocery products available online encourage you to buy items online.
20. Do you find websites for online shopping easy to use?

A total of hundred responses were collected and sample dataset is shown in the image below:

The survey conducted gave amazing results and many observations were recorded and these are as follows:

The chart shows the age distribution of consumers

Legend:
- Female
- Male
- Prefer not to say

45.7%

54.3%

The chart shows gender distribution of consumers

Legend:
- Student
- Self-employed
- Government Employee
- Professional
- Home maker

14.3%

78.6%
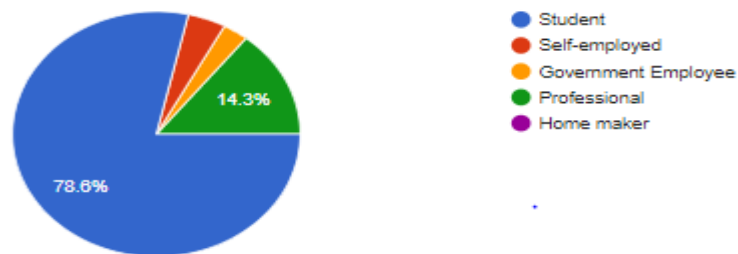
The chart shows to percentage of consumer's profession wise

Legend:
- Yes
- No
- Maybe

12.9%

10%

77.1%

Legend:
- Yes
- No
- Maybe

12.9%

22.9%

64.3%

Legend:
- Laptop
- Smart Phone
- Tab

95.7%

Legend:
- Credit/Debit card
- Net banking
- Third Party apps eg Paytm
- COD

37.1%

17.1%

40%

Chart 1

- Yes
- No
- Maybe

85.7%
8.6%

Chart 2

- Yes
- No
- Maybe

24.3%
15.7%
60%

Chart 3
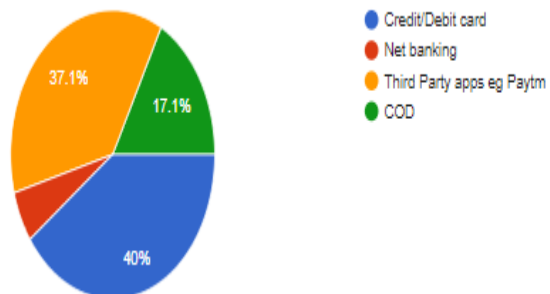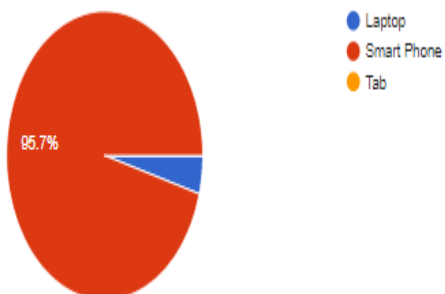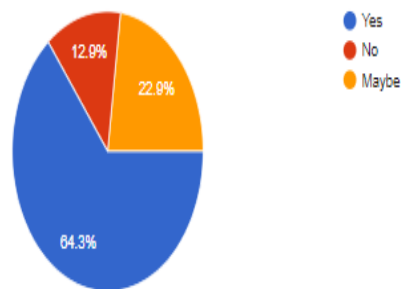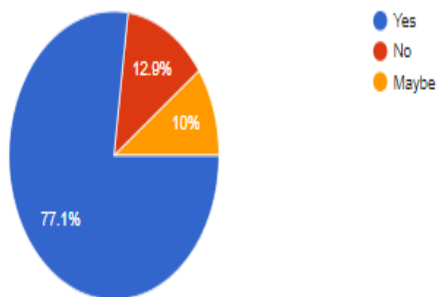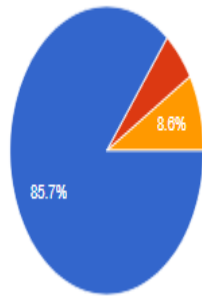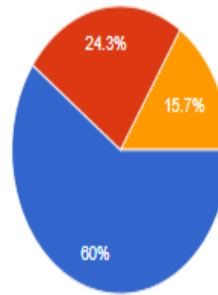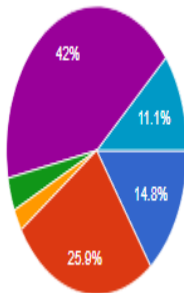
- Facebook
- Instagram
- Twitter
- Linkedin
- Not Applicable
- Other

42%
11.1%
14.8%
25.9%

Chart 4
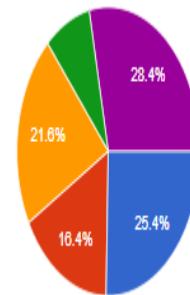
- Vegetables and fruits
- Eggs
- Milk
- Snacks
- Meat Products

28.4%
21.6%
16.4%
25.4%

Chart 5

- Yes
- No
- Maybe

11.4%
31.4%
57.1%

Chart 6

- Yes
- No
- Maybe

22.9%
8.6%
68.6%

Chart 7
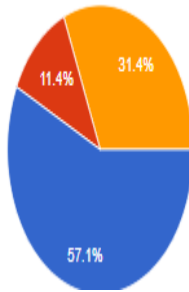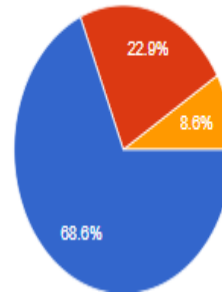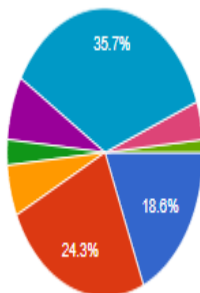
- Grocery and Staples
- Household items
- Breakfast and Dairy
- Beverages
- Fruits and vegetables
- Packaged Food
- Baby and Pet care
- Na

35.7%
18.6%
24.3%

Chart 8
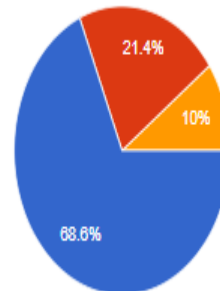
- 1-2 times
- 3-5 times
- More than 6

21.4%
10%
68.6%
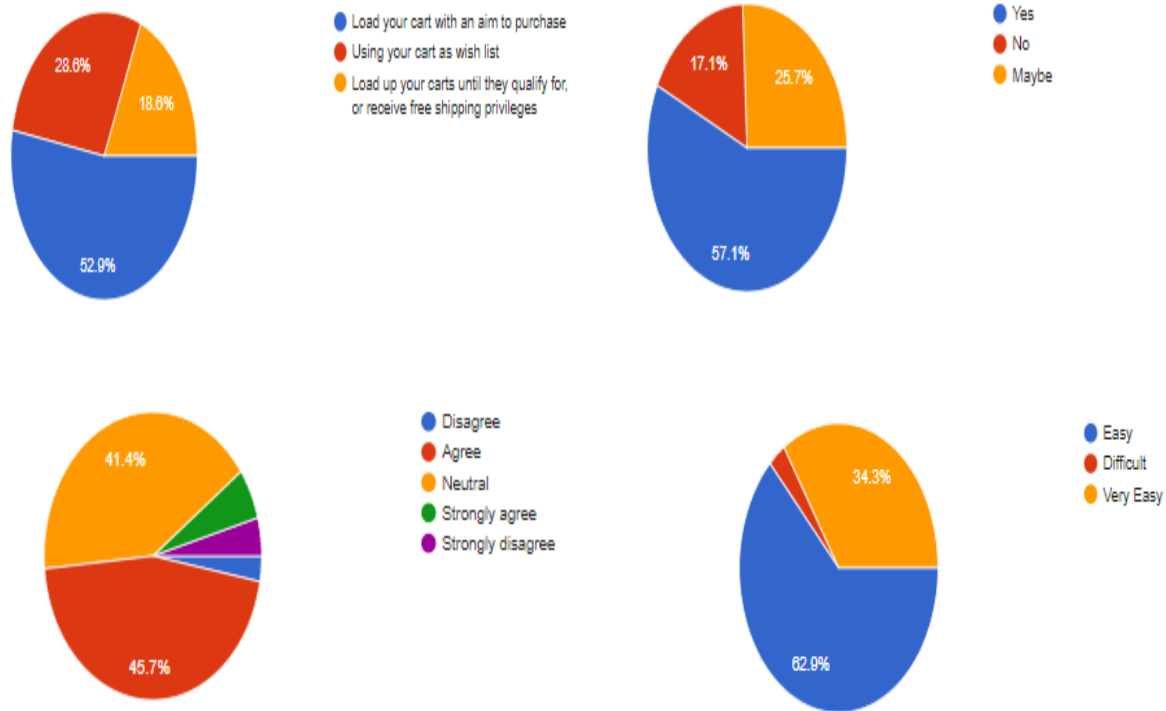
Following observations are summarized:

- The consumers who think grocery shopping online is time saving is 77%
- 64% consumers feel that online grocery shopping is trustworthy and secure
- The smart phone device is mostly used for online grocery shopping.
- For the mode of payment 40% consumers use credit/debit card, 37% consumers use third party applications and 17% consumers use cash on delivery.
- Approximately 86 % people buy a product if there is free or discounted shipping.
- It is found that while doing grocery shopping online about 53% consumers don't refer to social media sites.
- About 28% consumers avoid buying meat products, 25% avoid vegetables and fruits, 22% avoid milk and 16% avoid eggs while shopping online.
- 57% consumers feel online grocery shopping is economical.
- During pandemic times 69 % people prefer online grocery shopping.
- 36% consumers prefer buying Packaged food from online sources.
- About 63% people find online grocery sites easy to use.
- The variety of products encourages more than 50% of consumers to shop online.
- More than 57% people prefer online mode of shopping

Further the dataset was exported to MS-Excel and the dataset provided above was converted to numeric form using the below conditions:

1. For Age enter 1 for 16-25 years,2 for 26-35 years and 3 for 36 and above
2. For Gender ENTER 1 for female and 2 for Male
3. For Profession ENTER 1 for Government Employee,2 for Professional,3 for Self Employed and 4 for Student
4. For Time Saving ENTER 0 for Yes 1 for No
5. For Trustworthy and secure ENTER 0 for Yes and 0 for No
6. For device used ENTER 1 for Smartphone and 2 for Laptop
7. For Payment Option used ENTER 1 for COD 2 for Credit/debit card 3 for Net banking and 4 for Third Party app
8. For refer social media ENTER 1 for Yes and 0 for No
9. For free shipping ENTER 1 for yes and 0 for no
10. For Like to receive incentive before shopping Enter 1 for yes and 0 for No
11. For economical ENTER 1 for yes and 0 for no
12. For categories one prefer ENTER 1 for Baby and Pet care,2 for Beverages, 3 for Breakfast and Dairy,4 for Fruits and vegetables, 5 for Grocery and Staples, 6 for Household items, 7 for Packaged Food
    and 8 for NA

The dataset converted looks like:

- The technique applied over dataset is Multiple Regression.

- **Multiple regression** basically gives the relationship between multiple independent or predictor variables and one dependent or criterion variable. A dependent variable is modeled as a function of several independent variables with corresponding coefficients, along with the constant term. Multiple regression requires two or more predictor variables, and this is why it is called multiple regression.

- The multiple regression equation explained above takes the following form:
$$y = b_1x_1 + b_2x_2 + \ldots + b_nx_n + c.$$

Here, bi's (i=1, 2…n) are the regression coefficients, which represent the value at which the criterion variable changes when the predictor variable changes.

- In this case the dependent variable is Buy online or not since we want to predict this variable. The independent variables are the rest fourteen variables which are described above.

After applying Multiple Regression following results are obtained:

Regression Statistics	
Multiple R	0.769659007
R Square	0.592374986
Adjusted R Square	0.465558315
Standard Error	0.250608153
Observations	60

The value of R Square suggests that the line is a fine fit.

ANOVA

	df	SS	MS	F	gnificance
Regression	14	4.107133	0.293367	4.671113	3.75E-05
Residual	45	2.8262	0.062804		
Total	59	6.933333			

	Coefficients	andard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	-0.035733301	0.502391	-0.07113	0.943612	-1.0476	0.976135	-1.0476	0.976135
Age Group	-0.09118677	0.084872	-1.07441	0.288368	-0.26213	0.079754	-0.26213	0.079754
Gender	-0.10802556	0.074026	-1.45929	0.151432	-0.25712	0.041071	-0.25712	0.041071
Profession	0.008642863	0.04775	0.181003	0.857178	-0.08753	0.104816	-0.08753	0.104816
Time Saving	0.650038428	0.112649	5.770477	6.83E-07	0.423152	0.876925	0.423152	0.876925
Trustworthy and Secure	0.146128357	0.133433	1.095146	0.27928	-0.12262	0.414876	-0.12262	0.414876
Device used	-0.203914459	0.17321	-1.17727	0.245277	-0.55278	0.144948	-0.55278	0.144948
Payment option	0.032361564	0.030463	1.062331	0.293753	-0.02899	0.093717	-0.02899	0.093717
Free shipping	-0.085170502	0.17499	-0.48672	0.628821	-0.43762	0.267277	-0.43762	0.267277
Like to Receive incentive before shopping	-0.047022576	0.084646	-0.55552	0.581291	-0.21751	0.123464	-0.21751	0.123464
Prefer Social media Site	0.114619844	0.071814	1.596055	0.117476	-0.03002	0.259262	-0.03002	0.259262
Economical	0.163911526	0.120091	1.36489	0.179073	-0.07796	0.405788	-0.07796	0.405788
Categories Preferred	0.021018207	0.019766	1.063365	0.29329	-0.01879	0.060828	-0.01879	0.060828
Vareity of products encourage	-0.094437529	0.152317	-0.62001	0.538381	-0.40122	0.212345	-0.40122	0.212345
Easy	0.443606138	0.204481	2.169424	0.035371	0.03176	0.855452	0.03176	0.855452

All the values of coefficients is provided in the table above and can be used in final equation to get the final value of dependent variable Y.

Conclusion

Finally the verification of regression model was done and the result is highlighted in the table below in yellow color:

Age Group	Gender	Profession	Time Saving	Trustworthy and Secure	Device used	Payment option	Free shipping	Like to Receive incentive before shopping	Prefer Social media Site	Economical	Categories Preferred	Vareity of products encourage	Easy	Buy Grocery online
1	1	4	1	1	1	3	1		1	0	1	1	1	1
1	2	4	1	1	1	4	1		1	1	1	7	1	1
1	1	4	1	1	1	4	1		1	0	1	7	1	1
1	1	4	1	1	1	2	1		1	0	1	7	1	1
1	2	4	1	1	1	2	1		1	1	1	7	1	1
1	2	4	1	0	1	4	1		1	0	1	7	1	1
1	1	4	1	1	1	3	1		1	1	1	7	1	1
1	2	4	1	1	1	2	1		1	0	1	7	1	0
1	1	4	1	1	1	4	1		1	0	1	7	1	1
1	1	4	1	1	1	2	1		1	1	1	7	2	1
1	2	4	1	0	1	2	0		1	1	1	7	1	1
1	2	4	1	1	1	4	1		1	0	1	7	1	1
1	1	4	1	1	1	4	1		1	0	1	7	1	1
1	2	4	1	0	1	2	0		1	1	1	7	1	1
1	2	4	1	1	1	1	1		1	1	1	7	1	1
1	1	3	1	1	1	1	1		1	1	1	7	1	1

The consumer who lies in 16-25 years age group for which we are predicting that whether she will buy grocery online or not is self-employed and who thinks online grocery shopping is time saving, trustworthy, economical, likes to receive incentives before shopping, refer to social media sites, variety of products encourage her to shop online, prefers packaged food for online shopping and uses smart phone for online grocery shopping. The model predicts that the user with such factors will buy grocery online.

E-commerce is one of the foremost powerfully developing shapes of exchange. Customers can purchase nearly anything through the Web. Several studies appear that there's a essentially expanding notoriety of online basic need shopping. There are various contrasts between online and conventional shopping in this region. In basic need e-shops, shoppers maintain a strategic distance from the confinements related with localization or opening hours. They can buy products more helpfully and speedier. Be that as it may, the foremost imperative advantage of online basic need shopping within the consumers' conclusion is the plausibility of sparing time (they don't got to take off domestic and hold up in long lines). In spite of the fact that, online basic supply shopping postures a few hazard in inaccurately valuating certain items since of the insufficient introduction on the site. In expansion, online customers forego the opportunity of overseeing their choices agreeing to the expiry dates of items.

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