E-retail factors for customer activation and retention: A case study from Indian e-commerce customers

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It is my radiant sentiment to place on record my best regards, deepest sense of gratitude to Ms. Sapna Verma, SME for giving the dataset and clear instructions to perform the complete case study process.

I perceive as this opportunity as a learning experience in my career development. I will strive to use gained skills and knowledge in the best possible way, and try to work on the improvement, in order to attain desired career objectives.

INTRODUCTION

Problem Statement

Customer satisfaction has emerged as one of the most important factors that guarantee the success of online store; it has been posited as a key stimulant of purchase, repurchase intentions and customer loyalty.

A comprehensive review of the literature, theories and models have been carried out to propose the models for customer activation and customer retention.

Five major factors that contributed to the success of an e-commerce store have been identified as: service quality, system quality, information quality, trust and net benefit.

The research furthermore investigated the factors that influence the online customers repeat purchase intention. The combination of both utilitarian value and hedonistic values are needed to affect the repeat purchase intention (loyalty) positively.

The data is collected from the Indian online shoppers.

Results indicate the e-retail success factors, which are very much critical for customer satisfaction.

What is Customer retention?
Customer retention refers to the ability of a company or product to retain its customers over some specified period. High customer retention means customers of the product or business tend to return to, continue to buy or in some other way not defect to another product or business, or to non-use entirely.

Customer retention measures not only how successful a company is at acquiring new customers but also how successful they are at satisfying existing customers. It also increases ROI, boosts loyalty, and brings in new custom

Customer satisfaction increases repeat purchases and improves clientele retention for a business.

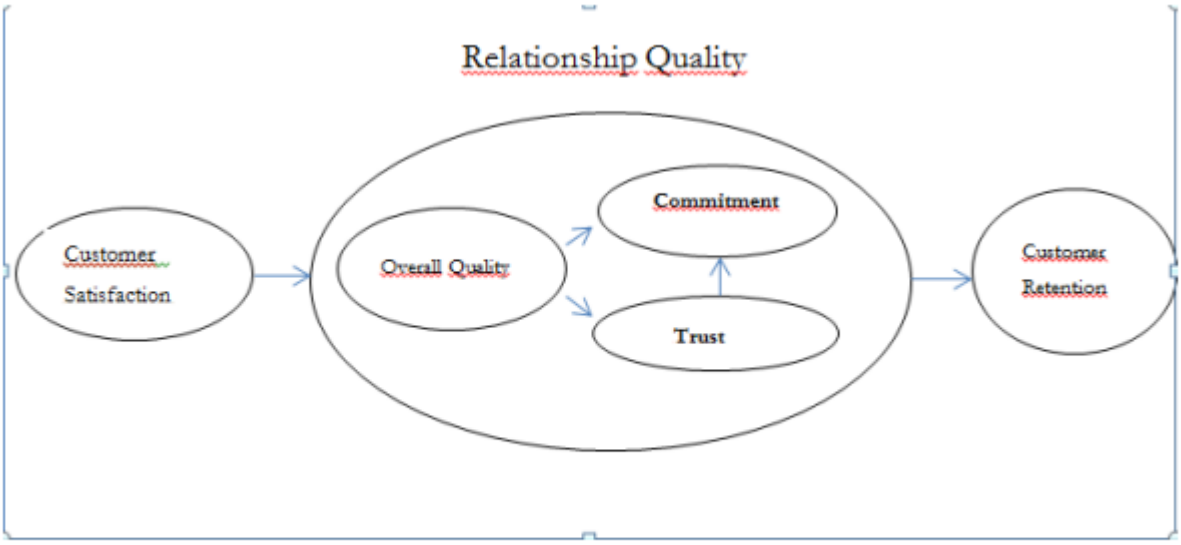
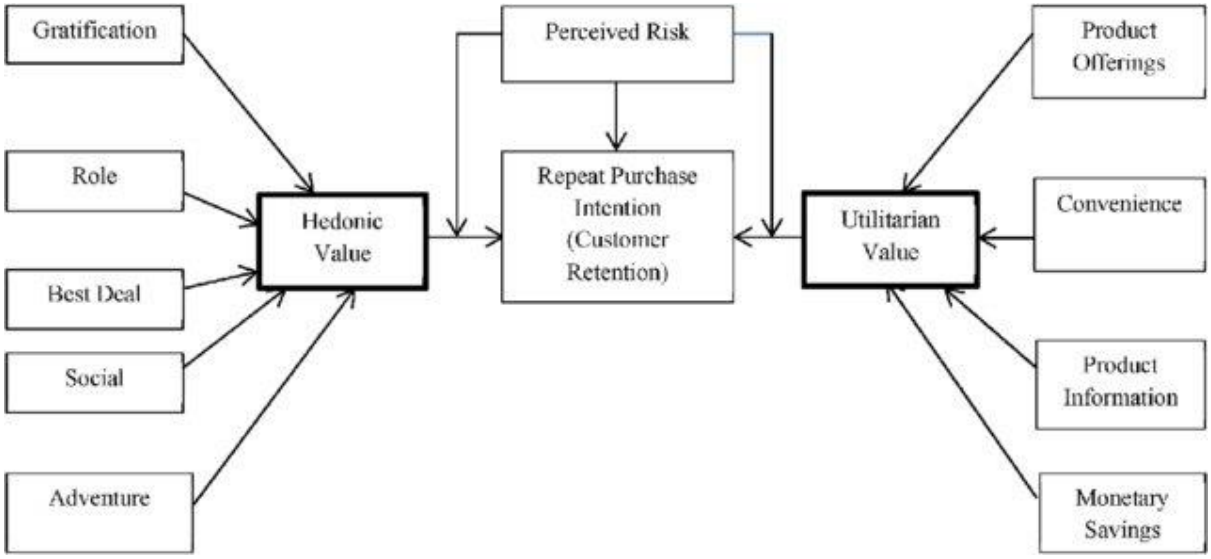


Figure 3.1 A conceptual model of Satisfaction-retention relationship

Source: adapt from Hennig-Thurau and Klee (1997.742)

Relation quality consists of three parts: overall quality, commitment and trust. Then customer and relationship quality leads to the customer retention. Thus, customer satisfaction, customer loyalty and service quality have influence on customer retention

Use Case Diagram



Let us first know the term Hedonic value and Utilitarian Value.

Utilitarian Value: It is derived from a product or service that helps the consumer solve problems and accomplish tasks. It can be seen as a means to an end.

Hedonic Value: the immediate gratification that comes from experiencing some activity.With hedonic value, the value received is provided entirely from the actual experience and emotions associated with consumption, not because some other end is or will be accomplished.

Thus we observe from the diagram that both utilitarian value and hedonic value affect repeat purchase intention positively.

Perceived risk affect repeat purchase intention negatively and moderate the effects of utilitarian and hedonic values on repeat purchase intention.

Utilitarian value is formed by product offerings, product information, monetary savings and convenience. Hedonic value is formed by the six hedonic benefits namely Adventure,Social,Best Deal,Role,Gratification. Thus both the utilitarian value and hedonic value are positively associated with buyers' repeat purchase intention. A higher level of perceived risk reduces the effect of utilitarian value and increases the effect of hedonic value on repeat purchase intention.

We will do the data analysis and come with the suitable solution and recommendation.

Objective: To get a deep insight on dataset and find out suitable outcomes, suggestions, conclusion using data analysis that would help to predict customer retention for a e-Retail company using their data on users provided over period of time.

Limitations of the Study

1. The study is confined to E-Commerce sector.
2. Only few firms are covered under the study.

Data Sources and their formats :

The data is collected from the Indian online shoppers.The datasets and figure(s) are highly confidential. The dataset is only available for academic purpose.

Dataset Details:

First, I imported all the necessary libraries to carry out detailed data analysis in Python.

1. Pandas- a library which is used to read the data, visualisation and analysis of data.

2. NumPy- used for working with array and various mathematical techniques.

3. Seaborn- visualization tool for plotting different types of plot.

4. Matplotlib- It pro vides an object-oriented API for embedding plots into applications

Importing Required Libraries

```
#importing all the necessary libraries
import warnings
warnings.simplefilter("ignore")
warnings.filterwarnings("ignore")
import joblib

import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

This is for maximising the rows,columns,width and expand the frame.

```
#Setting option to show max rows , max columns,maximum width,max expand frame
pd.set_option('display.max_rows', 500)
pd.set_option('display.max_columns', 500)
pd.set_option('display.width', 1000)
pd.set_option('display.expand_frame_repr', False)
```

Then the dataset in the form of excel sheet having two sheets i) datasheet ii) codesheet which was given to us for analysing have loaded only the sheet_name='datasheet' in the required dataframe creating an instance 'df'.The short representation is as below:

```
df=pd.read_excel('customer_retention_dataset.xlsx',sheet_name='datasheet') #loading sheet 1 for data analysis
df
```

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	4 What is the Pin Code of where you shop online from?	5 Since How Long You are Shopping Online ?	6 How many times you have made an online purchase in the past 1 year?	7 How do you access the internet while shopping on-line?	8 Which device do you use to access the online shopping?	9 What is the screen size of your mobile device? \t\t\t\t\t\t	10 What is the operating system (OS) of your device? \t\t\t\t	11 What browser do you run on your device to access the website? \t\t\t	12 Which channel did you follow to arrive at your favorite online store for the first time?	13 After first visit, how do you reach the online retail store? \t\t\t\t	14 Ho muc time yo explo the reta sto befo making purchas decisior
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window/windows Mobile	Google chrome	Search Engine	Search Engine	6-10 mir
						41 times								

With the help of python code, I carry out initial analysis first is dataframe 'shape'.The dataframe contains 269 rows and 71 columns.

```
df.shape #there are 269 rows and 71 columns  in the dataset
```

```
(269, 71)
```

In the dataframe, I saw tab spaces, \t which is not looking good, to make it more clear and identifiable, I did it with by importing digist and to remove tab space by 'str.replace method' ,removing digits by str.translate method and removing trailing and leading spaces by str.strip method.

```
from string import digits

#Removing tab spaces
df.columns = df.columns.str.replace('\t','')

#Removing digits
remove_digits = str.maketrans('', '', digits)
df.columns = df.columns.str.translate(remove_digits)

#Removing leading and trailling spaces
df.columns = df.columns.str.strip()
```

For checking columns of the dataset, I used df.columns which shows all the columns present in the dataset is as shown as short view:

```
df.columns   #Checking out the columns of the dataset
```

```
Index(['Gender of respondent', 'How old are you?', 'Which city do you shop online from?', 'What is the Pin Code of where you sh
op online from?', 'Since How Long You are Shopping Online ?', 'How many times you have made an online purchase in the past  yea
r?', 'How do you access the internet while shopping on-line?', 'Which device do you use to access the online shopping?', 'What
is the screen size of your mobile device?', 'What is the operating system (OS) of your device?', 'What browser do you run on yo
ur device to access the website?', 'Which channel did you follow to arrive at your favorite online store for the first time?',
'After first visit, how do you reach the online retail store?', 'How much time do you explore the e- retail store before making
a purchase decision?', 'What is your preferred payment Option?', 'How frequently do you abandon (selecting an items and leaving
without making payment) your shopping cart?', 'Why did you abandon the "Bag", "Shopping Cart"?',
       'The content on the website must be easy to read and understand', 'Information on similar product to the one highlighted
```

For checking the datatypes of the dataset, I used 'df.datatypes' which is as shown in short view: Thus we see all the datatypes are object except the pincode which is integer datatype. If we are heading for building model then the categorical columns needs to be converted to numeric data type;

```
df.dtypes #checking datatypes
```

```
Gender of respondent                                                                 object
How old are you?                                                                     object
Which city do you shop online from?                                                  object
What is the Pin Code of where you shop online from?                                   int64
Since How Long You are Shopping Online ?                                             object
How many times you have made an online purchase in the past  year?                   object
How do you access the internet while shopping on-line?                               object
Which device do you use to access the online shopping?                               object
What is the screen size of your mobile device?                                       object
What is the operating system (OS) of your device?                                    object
What browser do you run on your device to access the website?                        object
Which channel did you follow to arrive at your favorite online store for the first time?  object
After first visit, how do you reach the online retail store?                         object
How much time do you explore the e- retail store before making a purchase decision?  object
What is your preferred payment Option?                                               object
How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?  object
Why did you abandon the "Bag", "Shopping Cart"?                                      object
The content on the website must be easy to read and understand                       object
Information on similar product to the one highlighted  is important for product comparison  object
Complete information on listed seller and product being offered is important for purchase decision.  object
All relevant information on listed products must be stated clearly                   object
Ease of navigation in website                                                        object
Loading and processing speed                                                         object
User friendly Interface of the website                                               object
Convenient Payment methods                                                           object
Trust that the online retail store will fulfill its part of the transaction at the stipulated time  object
Empathy (readiness to assist with queries) towards the customers                     object
Being able to guarantee the privacy of the customer                                  object
Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)  object
Online shopping gives monetary benefit and discounts                                 object
```

DataFrame - head() function:

The head() function is **used to get the first n rows**. This function returns the first n rows for the object based on position. It is useful for quickly testing if your object has the right type of data in it. It **display first five rows of the dataset as shown;**

```
df.head() #display first 5 rows of the dataset
```

	Gender of respondent	How old are you?	Which city do you shop online from?	What is the Pin Code of where you shop online from?	Since How Long You are Shopping Online ?	How many times you have made an online purchase in the past year?	How do you access the internet while shopping on-line?	Which device do you use to access the online shopping?	What is the screen size of your mobile device?	What is the operating system (OS) of your device?	What browser do you run on your device to access the website?	Which channel did you follow to arrive at your favorite online store for the first time?	After first visit, how do you reach the online retail store?	How much time do you explore the e-retail store before making a purchase decision?	
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window/windows Mobile	Google chrome	Search Engine	Search Engine	6-10 mins	F
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	Wi-Fi	Smartphone	4.7 inches	IOS/Mac	Google chrome	Search Engine	Via application	more than 15 mins	C
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobile Internet	Smartphone	5.5 inches	Android	Google chrome	Search Engine	Via application	11-15 mins	F
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	IOS/Mac	Safari	Search Engine	Search Engine	6-10 mins	C
4	Female	21-30	Bangalore	530068	2-3 years	11-20 times	Wi-Fi	Smartphone	4.7 inches	IOS/Mac	Safari	Content Marketing	Via application	more than 15 mins	C

Describe Function: The describe() method returns description of the data in the DataFrame.If the DataFrame contains numerical data, the description contains these information for each column:
count - The number of not-empty values.
mean - The average (mean) value.
std - The standard deviation.
min - the minimum value.
25% - The 25% percentile*.
50% - The 50% percentile*.
75% - The 75% percentile*.
max - the maximum value.
*Percentile meaning: how many of the values are less than the given percentile

For categorical features to see ,we can use ‘include’ in describe as to see similar result in terms of count, unique value, frequency (number of times it appear) and top.We generally don’t prefer to use describe function for categorical.

For numeric : we see here only pincode is numeric datatype with observation as mentioned therein:

```
# description of  numerical feautres description:
df.describe().T
```

	count	mean	std	min	25%	50%	75%	max
What is the Pin Code of where you shop online from?	269.0	220465.747212	140524.341051	110008.0	122018.0	201303.0	201310.0	560037.0

Observation:

1.Pincode is the only int datatype present here in dataset.

2.Count is same as categorical columns implying there is no missing value in dataset.

3.If the mean is greater than the median, the distribution is positively skewed here its positively skewed.

4.if there is gap between 75% percentile and max,then ouliers are present.

For categorical:

```
# description of the categorcal features
df.describe(include=np.object).T
```

	count	unique	top	freq
Gender of respondent	269	2	Female	181
How old are you?	269	5	31-40 years	81
Which city do you shop online from?	269	11	Delhi	58
Since How Long You are Shopping Online ?	269	5	Above 4 years	98
How many times you have made an online purchase in the past year?	269	6	Less than 10 times	114
How do you access the internet while shopping on-line?	269	4	Mobile internet	142
Which device do you use to access the online shopping?	269	4	Smartphone	141
What is the screen size of your mobile device?	269	4	Others	134
What is the operating system (OS) of your device?	269	3	Window/windows Mobile	122
What browser do you run on your device to access the website?	269	4	Google chrome	216
Which channel did you follow to arrive at your favorite online store for the first time?	269	3	Search Engine	230
After first visit, how do you reach the online retail store?	269	5	Search Engine	87

Observation:

1.The count column is same,that means there is no missing value in categorical section.

2.Unique value gives the count of distinct values in each column e.g in gender column,there is male and female gender.

3.Top gives the highest counted value of the categorical values(most frequent element) like e.g female in gender column.

4.Freq means how many times that most frequent element(Top) was seen like e.g female has respondent 181 times**.**

Now we will check Null value/Missing value in the dataset. we use isnull() Function,short view as under :

```
df.isnull().sum()   #Checking for null values in the dataset
```

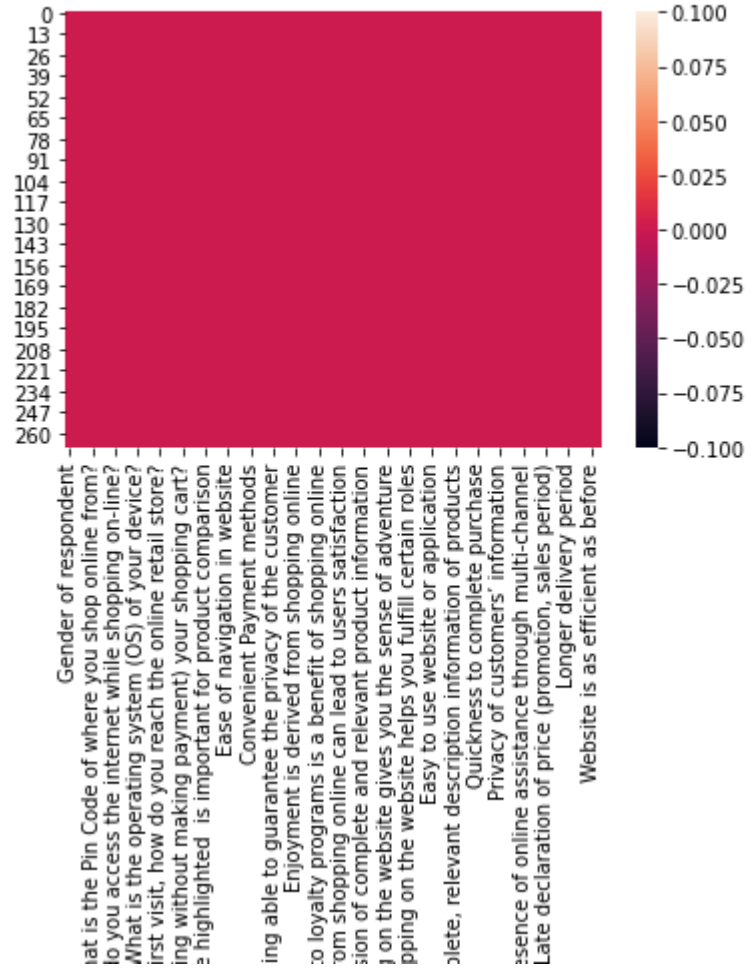
```
Gender of respondent                                                                    0
How old are you?                                                                        0
Which city do you shop online from?                                                     0
What is the Pin Code of where you shop online from?                                     0
Since How Long You are Shopping Online ?                                                0
How many times you have made an online purchase in the past  year?                      0
How do you access the internet while shopping on-line?                                  0
Which device do you use to access the online shopping?                                  0
What is the screen size of your mobile device?                                          0
What is the operating system (OS) of your device?                                       0
What browser do you run on your device to access the website?                           0
Which channel did you follow to arrive at your favorite online store for the first time?0
After first visit, how do you reach the online retail store?                            0
How much time do you explore the e- retail store before making a purchase decision?     0
What is your preferred payment Option?                                                  0
How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?  0
Why did you abandon the “Bag”, “Shopping Cart”?                                         0
The content on the website must be easy to read and understand                          0
Information on similar product to the one highlighted  is important for product comparison 0
Complete information on listed seller and product being offered is important for purchase decision.  0
All relevant information on listed products must be stated clearly                      0
Ease of navigation in website                                                           0
Loading and processing speed                                                            0
User friendly Interface of the website                                                  0
Convenient Payment methods                                                              0
```

Observation: We see that there is no missing value present in the dataset**.** so no need to apply imputation technique

I have also used heatmap for checking any missing value which will be seen visually. Heatmap is a representation of data in the form of a map or diagram in which data values are represented as colours.

```
sns.heatmap(df.isnull())
```

```
<AxesSubplot:>
```



Observation: Thus, we see that there is no white shades in the graph which tells us that there is no missing value.

Then I made a dataframe containing feedback column and kept all the feedbacks given by respondent inside it.Some of are mentioned below:

```
Feedback=["The content on the website must be easy to read and understand","Information on similar product to the one highlighte
         "Complete information on listed seller and product being offered is important for purchase decision.","All relevant inf
          "Ease of navigation in website","Loading and processing speed","User friendly Interface of the website","Convenient Pa
          "Empathy (readiness to assist with queries) towards the customers","Being able to guarantee the privacy of the custome

         ]
```

Next, I started checking the value counts of all the columns using for loop in the dataset. Some of are mentioned below:

```python
#checking the value count of all the features in the dataset using loo
for i in df.columns:
    print(i)
    print(df[i].value_counts())
    print("\n")
```

```
Gender of respondent
Female    181
Male       88
Name: Gender of respondent, dtype: int64


How old are you?
31-40 years           81
21-30 years           79
41-50 yaers           70
Less than 20 years    20
51 years and above    19
Name: How old are you?, dtype: int64


Which city do you shop online from?
Delhi            58
Greater Noida    43
```

```
Which city do you shop online from?
Delhi           58
Greater Noida   43
Noida           40
Bangalore       37
Karnal          27
Solan           18
Ghaziabad       18
Gurgaon         12
Merrut           9
Moradabad        5
Bulandshahr      2
Name: Which city do you shop online from?, dtype: int64


What is the Pin Code of where you shop online from?
201308    38
132001    19
201310    18
110044    16
173229     9
173212     9
250001     9
122018     8
560037     8
132036     8
560010     8
110011     7
110008     7
201306     7
```

```
Since How Long You are Shopping Online ?
Above 4 years       98
2-3 years           65
3-4 years           47
Less than 1 year    43
1-2 years           16
Name: Since How Long You are Shopping Online ?, dtype: int64


How many times you have made an online purchase in the past  year?
Less than 10 times    114
31-40 times            63
41 times and above     47
11-20 times            29
21-30 times            10
42 times and above      6
Name: How many times you have made an online purchase in the past  year?, dtype: int64


How do you access the internet while shopping on-line?
Mobile internet    142
Wi-Fi               76
Mobile Internet     47
Dial-up              4
Name: How do you access the internet while shopping on-line?, dtype: int64


Which device do you use to access the online shopping?
Smartphone    141
Laptop         86
Desktop        30
```

```
How do you access the internet while shopping on-line?
Mobile internet    142
Wi-Fi               76
Mobile Internet     47
Dial-up              4
Name: How do you access the internet while shopping on-line?, dtype: int64


Which device do you use to access the online shopping?
Smartphone    141
Laptop         86
Desktop        30
Tablet         12
Name: Which device do you use to access the online shopping?, dtype: int64


What is the screen size of your mobile device?
Others        134
5.5 inches     99
4.7 inches     29
5 inches        7
Name: What is the screen size of your mobile device?, dtype: int64


What is the operating system (OS) of your device?
Window/windows Mobile    122
Android                   85
IOS/Mac                   62
Name: What is the operating system (OS) of your device?, dtype: int64


How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?
Sometimes          171
Never               48
Frequently          35
Very frequently     15
Name: How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?,


Why did you abandon the “Bag”, “Shopping Cart”?
Better alternative offer        133
Promo code not applicable        54
Change in price                  37
Lack of trust                    31
No preferred mode of payment     14
Name: Why did you abandon the “Bag”, “Shopping Cart”?, dtype: int64


The content on the website must be easy to read and understand
Strongly agree (5)       164
Agree (4)                 80
Strongly disagree (1)     18
Indifferent (3)            7
Name: The content on the website must be easy to read and understand, dtype: int64
```

```
Information on similar product to the one highlighted  is important for product comparison
Strongly agree (5)    116
Agree (4)              92
Indifferent (3)        43
Dis-agree (2)          18
Name: Information on similar product to the one highlighted  is important for product comparison, dtype: int64


Complete information on listed seller and product being offered is important for purchase decision.
Agree (4)               101
Strongly agree (5)       87
Indifferent (3)          52
Dis-agree (2)            18
Strongly disagree (1)    11
Name: Complete information on listed seller and product being offered is important for purchase decision., dtype: int64


All relevant information on listed products must be stated clearly
Agree (4)               132
Strongly agree (5)      107
Strongly disagree (1)    18
Dis-agree (2)            12
Name: All relevant information on listed products must be stated clearly, dtype: int64


Ease of navigation in website
Strongly agree (5)      141
Agree (4)               105
Strongly disagree (1)    18
Dis-agree (2)             5
Name: Ease of navigation in website, dtype: int64



Being able to guarantee the privacy of the customer
Strongly agree (5)    185
Agree (4)              58
indifferent (3)        26
Name: Being able to guarantee the privacy of the customer, dtype: int64


Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
Strongly agree (5)      149
Agree (4)                94
indifferent (3)          15
Strongly disagree (1)    11
Name: Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.), dtype: int64


Online shopping gives monetary benefit and discounts
Strongly agree (5)      105
Agree (4)                85
indifferent (3)          50
Strongly disagree (1)    18
Dis-agree (2)            11
Name: Online shopping gives monetary benefit and discounts, dtype: int64


Enjoyment is derived from shopping online
Strongly agree (5)      86
indifferent (3)         75
Agree (4)               59
Strongly disagree (1)   30
Dis-agree (2)           19
Name: Enjoyment is derived from shopping online, dtype: int64
```

```
Offering a wide variety of listed product in several category
Strongly agree (5)    111
Agree (4)              94
indifferent (3)        57
Dis-agree (2)           7
Name: Offering a wide variety of listed product in several category, dtype: int64


Provision of complete and relevant product information
Strongly agree (5)    135
Agree (4)              98
indifferent (3)        31
Disagree (2)            5
Name: Provision of complete and relevant product information, dtype: int64


Monetary savings
Strongly agree (5)    148
Agree (4)              75
Disagree (2)           31
indifferent (3)        15
Name: Monetary savings, dtype: int64


The Convenience of patronizing the online retailer
Agree (4)             138
indifferent (3)        77
Strongly agree (5)     54
Name: The Convenience of patronizing the online retailer, dtype: int64
```

```
From the following, tick any (or all) of the online retailers you have shopped from;
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    82
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               44
Amazon.in, Flipkart.com                                         32
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                29
Amazon.in, Flipkart.com, Snapdeal.com                           27
Amazon.in, Paytm.com, Myntra.com                                20
Amazon.in                                                       16
Amazon.in, Paytm.com                                            12
Amazon.in, Flipkart.com, Paytm.com                               7
Name: From the following, tick any (or all) of the online retailers you have shopped from;, dtype: in


Easy to use website or application
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    64
Amazon.in, Flipkart.com                                         44
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               44
Amazon.in                                                       29
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                22
Amazon.in, Paytm.com, Myntra.com                                20
Amazon.in, Flipkart.com, Myntra.com                             19
Paytm.com                                                       12
Flipkart.com                                                     8
Amazon.in, Paytm.com                                             7
Name: Easy to use website or application, dtype: int64


Visual appealing web-page layout
Amazon.in, Flipkart.com                                         87
Amazon.in                                                       44
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    36
Amazon.in, Paytm.com, Myntra.com                                20
```

```
Perceived Trustworthiness
Amazon.in                                                          76
Amazon.in, Flipkart.com, Snapdeal.com                              36
Amazon.in, Myntra.com                                              35
Amazon.in, Flipkart.com                                            31
Flipkart.com                                                       27
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                  25
Myntra.com                                                         15
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com       13
Amazon.in, Flipkart.com, Paytm.com                                 11
Name: Perceived Trustworthiness, dtype: int64


Presence of online assistance through multi-channel
Amazon.in, Flipkart.com, Myntra.com, Snapdeal    61
Amazon.in                                        60
Amazon.in, Flipkart.com                          39
Amazon.in, Snapdeal                              26
Myntra.com                                       20
Amazon.in, Flipkart.com, Myntra.com              15
Amazon.in, Myntra.com                            15
Amazon.in, Flipkart.com, Paytm.com               13
Paytm.com                                        12
Flipkart.com                                      8
Name: Presence of online assistance through multi-channel, dtype: int64
```

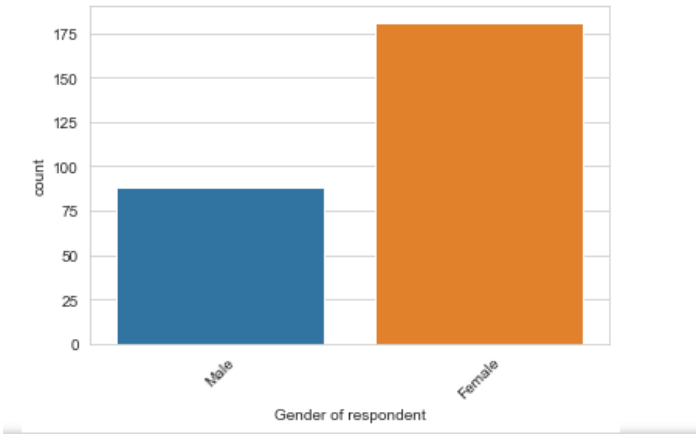
```
click to scroll output; double click to hide
Snapdeal.com                64
Flipkart.com                44
Amazon.in                   37
Paytm.com, Snapdeal.com     26
Myntra.com                  26
Name: Longer delivery period, dtype: int64


Change in website/Application design
Amazon.in                    96
Paytm.com                    63
Amazon.in, Flipkart.com      45
Myntra.com                   30
Flipkart.com                 20
Snapdeal.com                  8
Flipkart.com, Myntra.com      7
Name: Change in website/Application design, dtype: int64


Frequent disruption when moving from one page to another
Amazon.in                          53
Myntra.com                         52
Snapdeal.com                       49
Paytm.com                          39
Flipkart.com                       26
Amazon.in, Flipkart.com            25
Myntra.com, Snapdeal.com           14
Flipkart.com, Snapdeal.com         11
Name: Frequent disruption when moving from one page to another, dtype: int64
```

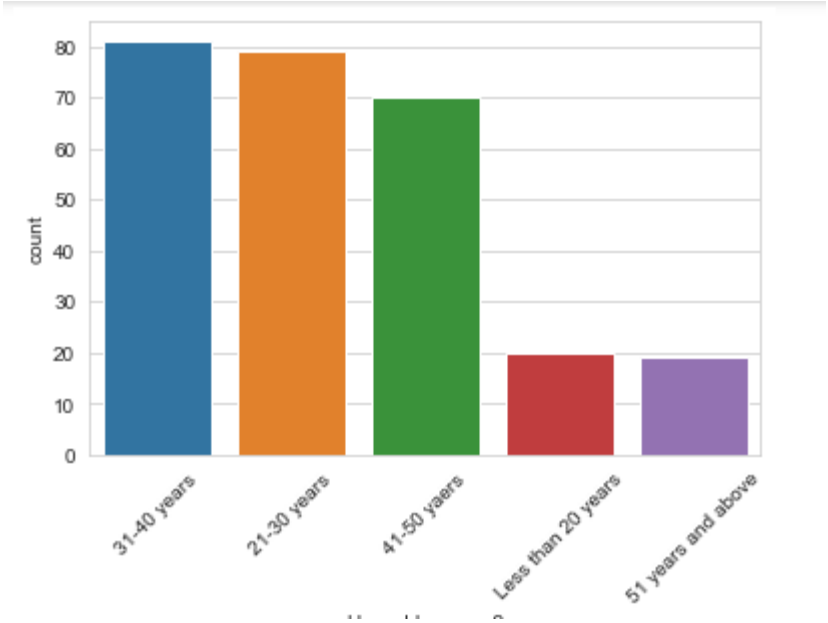
Comment: The value countplot() return a Series containing counts of unique values. The resulting object will be in descending order so that the first element is the most frequently-occurring element. Detailed description of above using seaborn countplot has been explained below in observation.

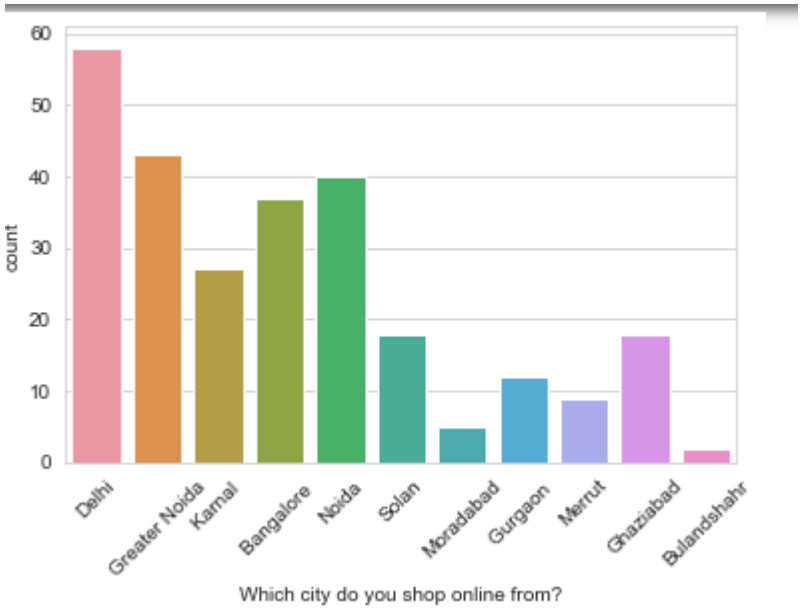
Data Visualization

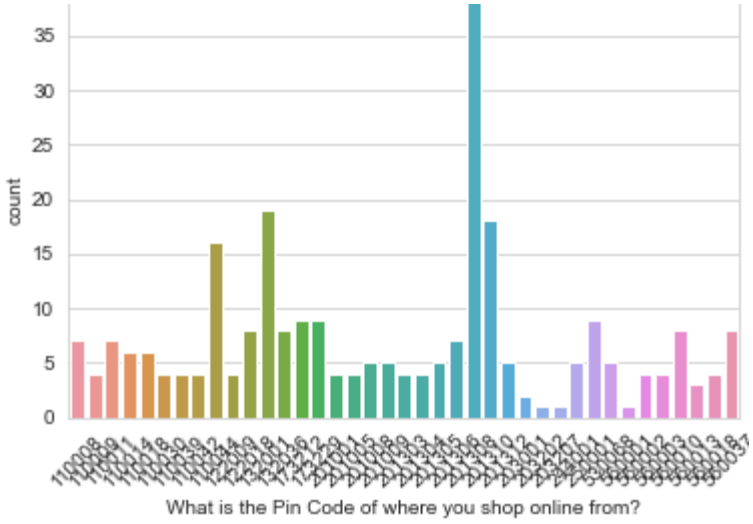
I have used seaborn countplot (sns.countplot function) which creates bar charts of the number of observations per category. When we use sns.countplot, Seaborn literally counts the number of observations per category for a categorical variable, and displays the results as a bar chart.

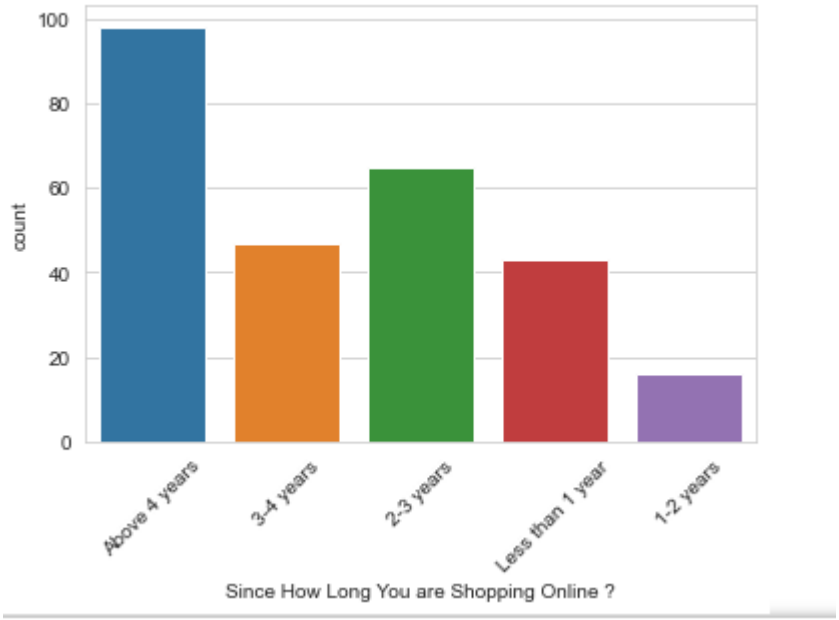
Graphs as pasted below;

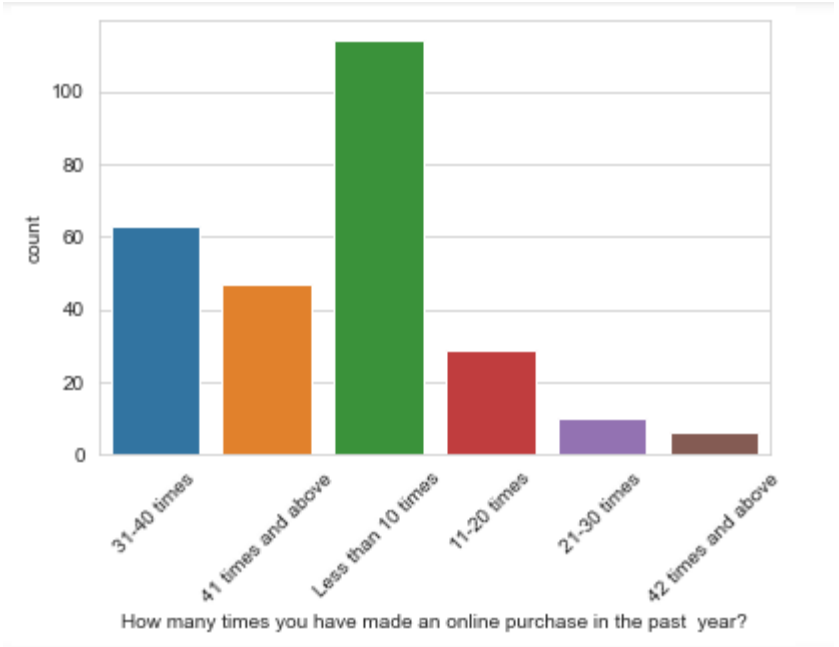

175
150
125
100
75
50
25
0
count
Male
Female
Gender of respondent

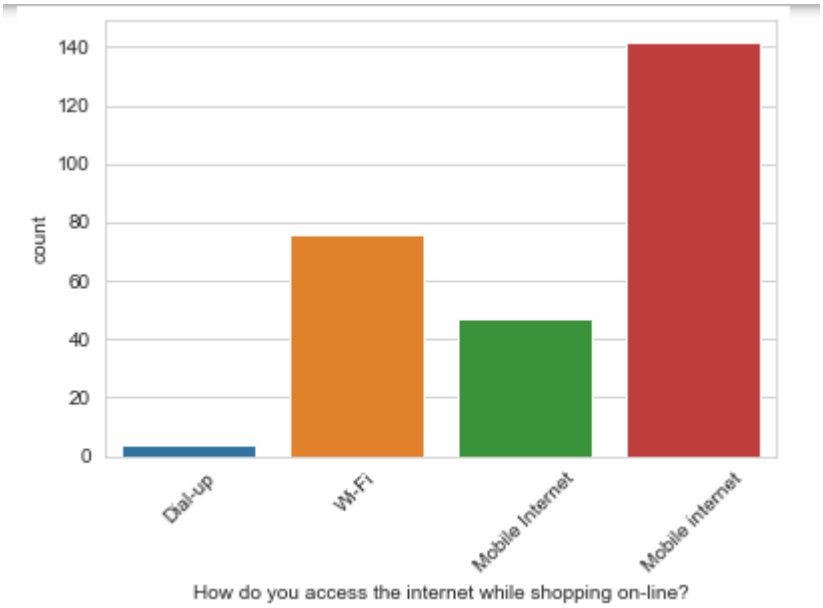

80
70
60
50
40
30
20
10
0
count
31-40 years
21-30 years
41-50 yaers
Less than 20 years
51 years and above


60
50
40
30
20
10
0
count
Delhi
Greater Noida
Karnal
Bangalore
Noida
Solan
Moradabad
Gurgaon
Meerut
Ghaziabad
Bulandshahr
Which city do you shop online from?

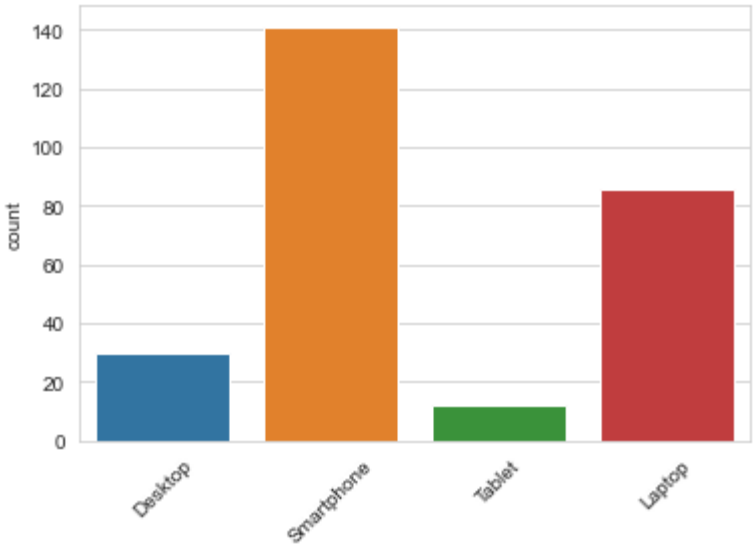

35
30
25
20
15
10
5
0
count
What is the Pin Code of where you shop online from?


100
80
60
40
20
0
count
Above 4 years
3-4 years
2-3 years
Less than 1 year
1-2 years
Since How Long You are Shopping Online ?

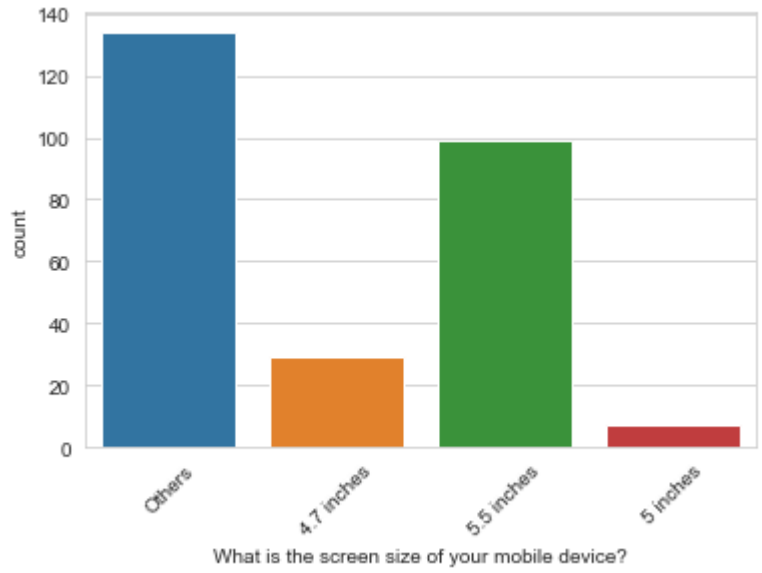

100
80
60
40
20
0
count
31-40 times
41 times and above
Less than 10 times
11-20 times
21-30 times
42 times and above
How many times you have made an online purchase in the past year?

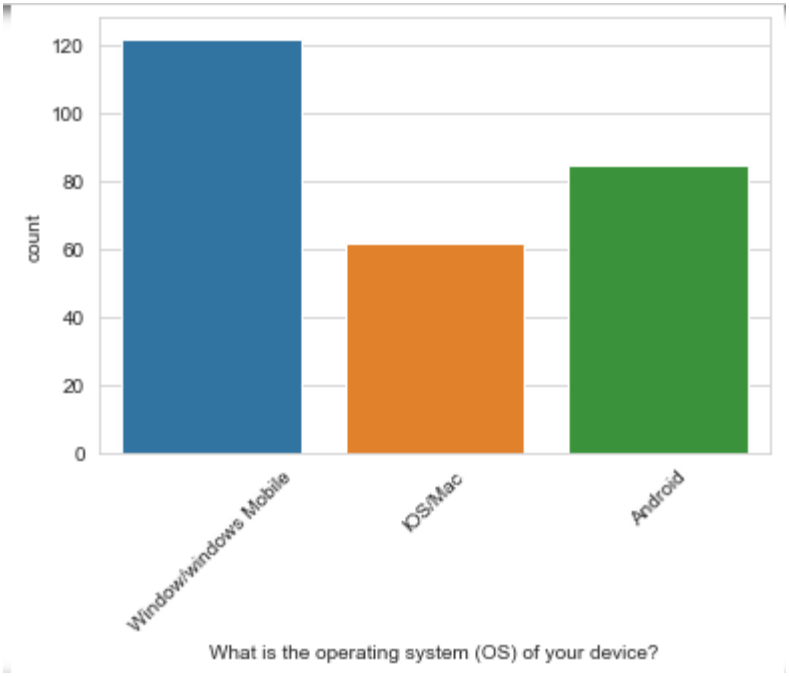


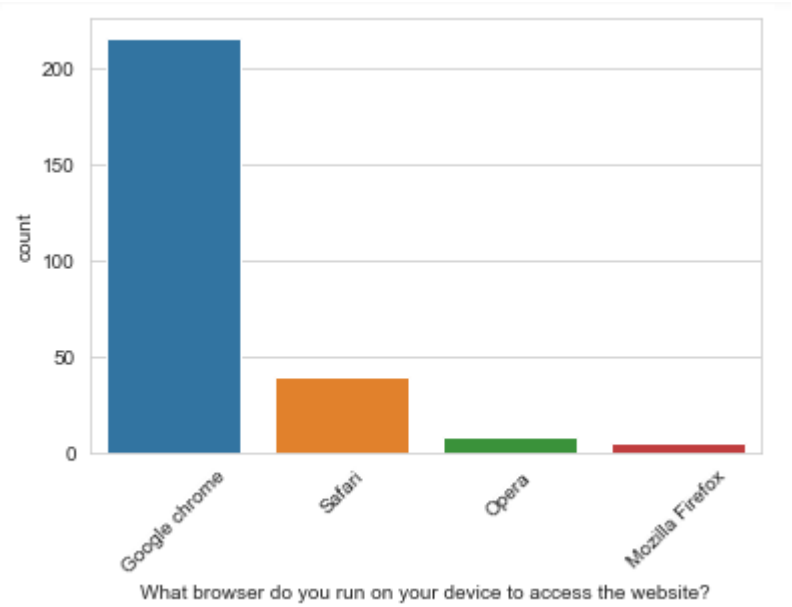
How do you access the internet while shopping on-line?



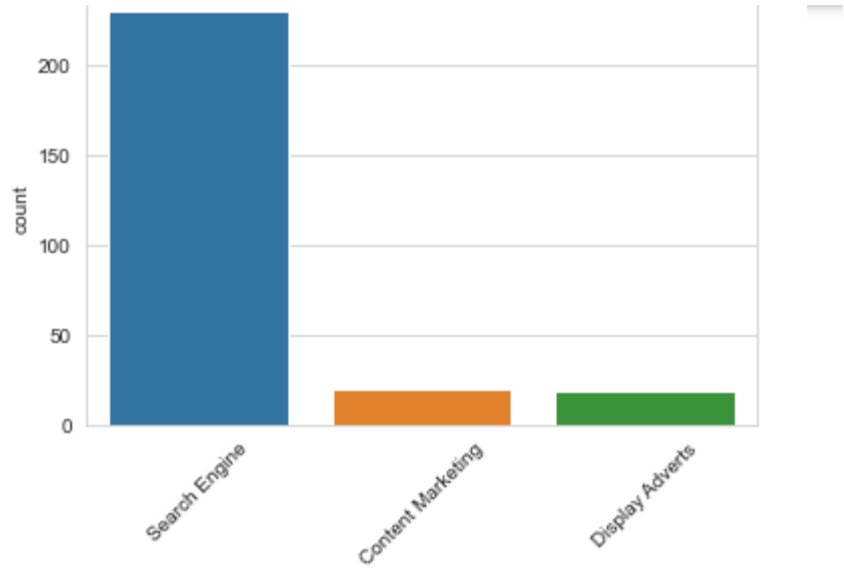
Which device do you use to access the online shopping?


140
120
100
80
60
40
20
0
count
Others
4.7 inches
5.5 inches
5 inches
What is the screen size of your mobile device?

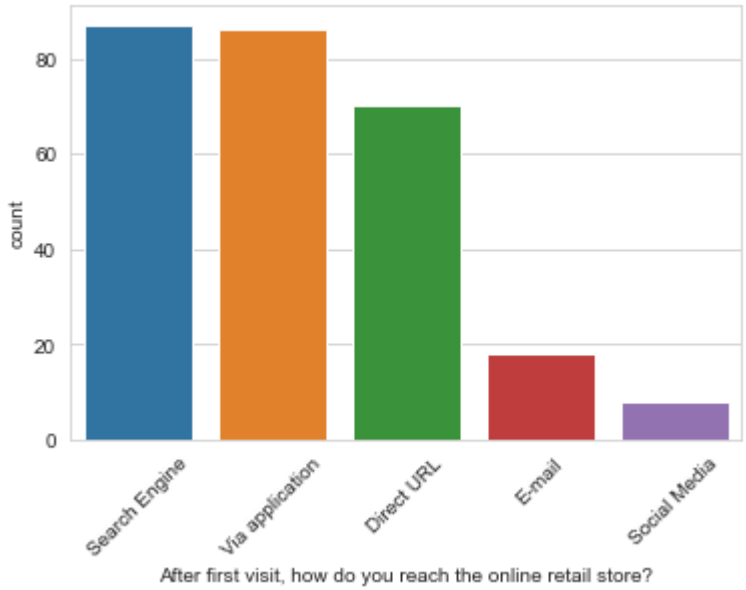

120
100
80
60
40
20
0
count
Window/windows Mobile
IOS/Mac
Android
What is the operating system (OS) of your device?



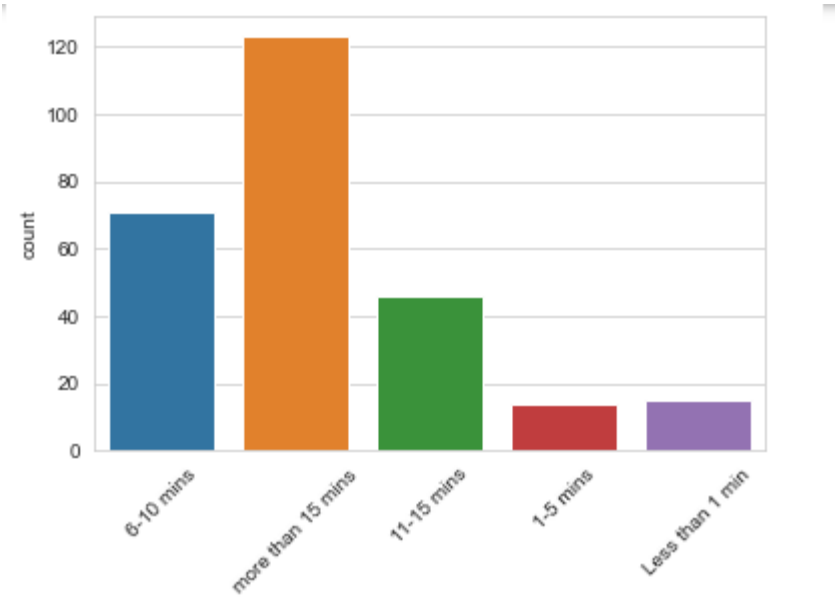
What browser do you run on your device to access the website?



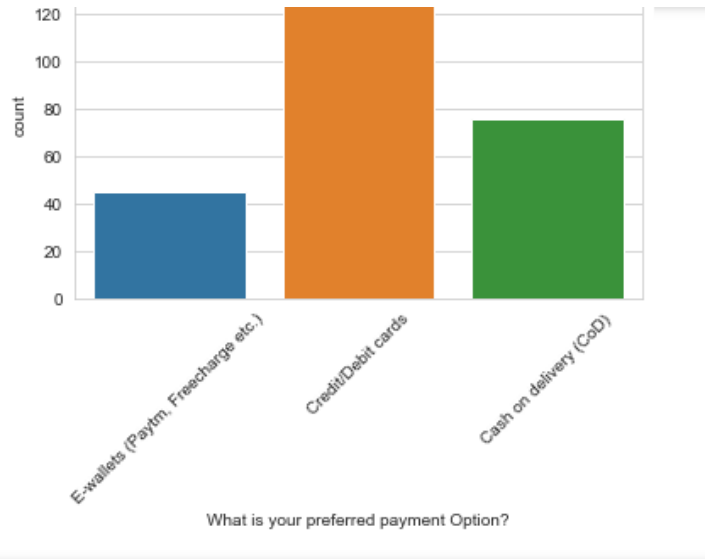
Which channel did you follow to arrive at your favorite online store for the first time?

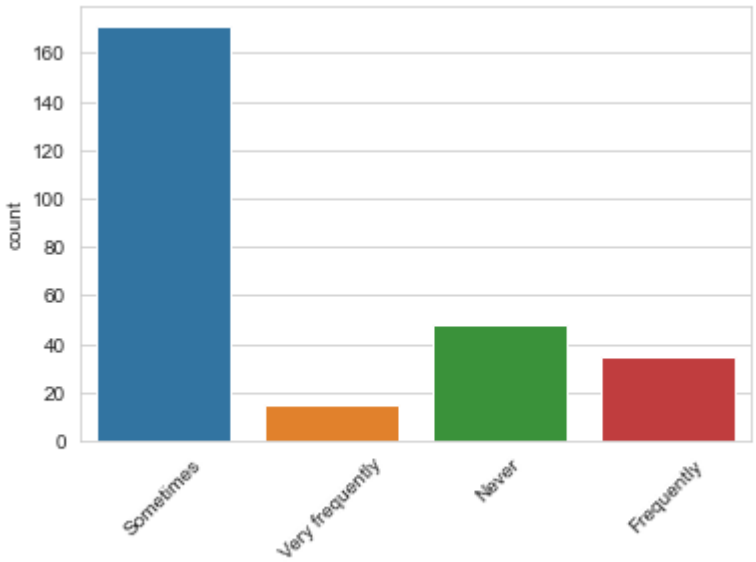


After first visit, how do you reach the online retail store?

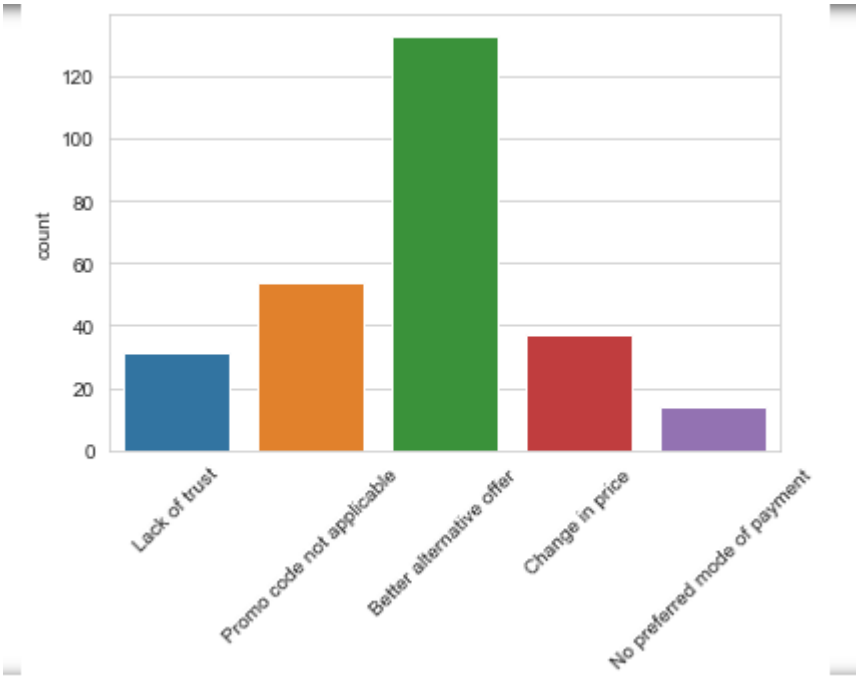


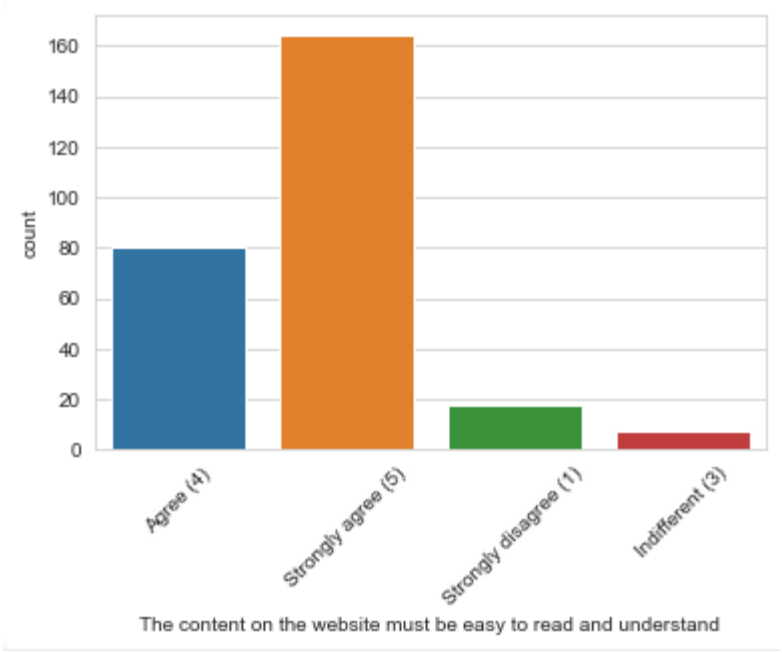
How much time do you explore the e- retail store before making a purchase decision?

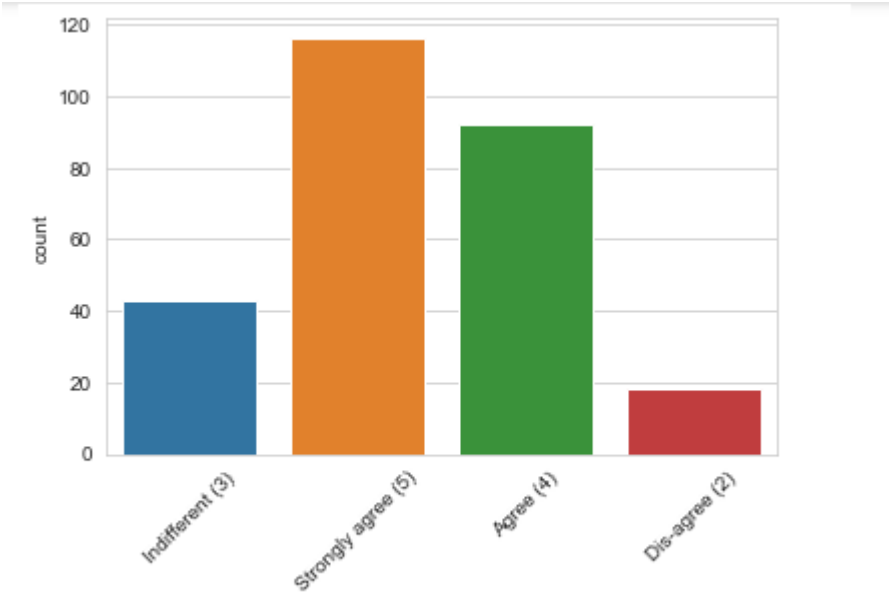




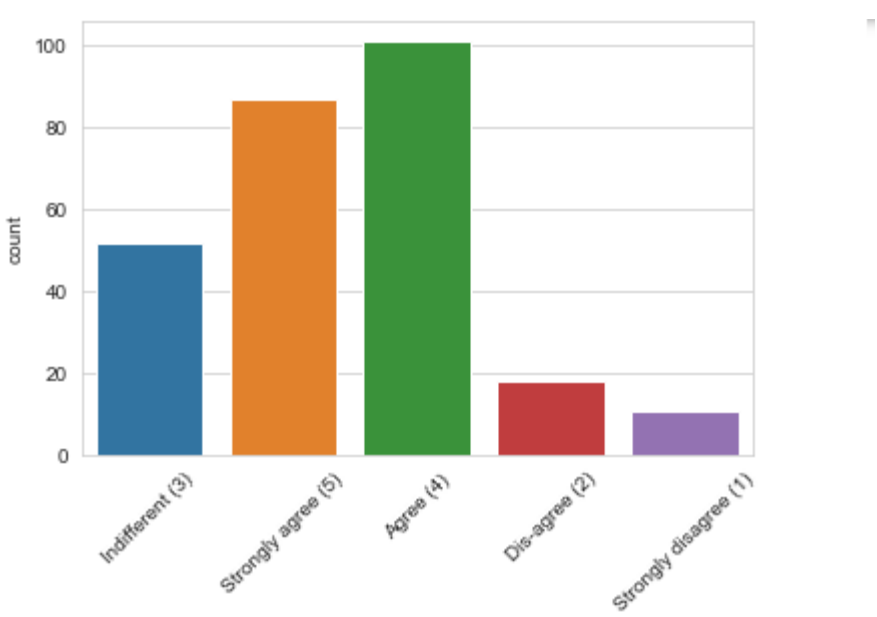
low frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?


count
120
100
80
60
40
20
0
Lack of trust
Promo code not applicable
Better alternative offer
Change in price
No preferred mode of payment

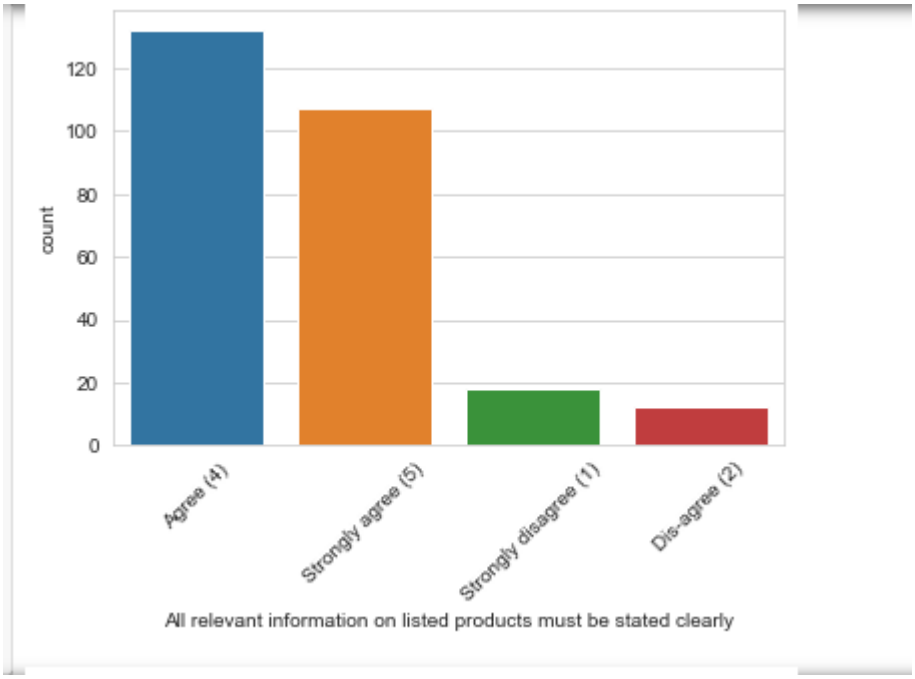

count
160
140
120
100
80
60
40
20
0
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Indifferent (3)
The content on the website must be easy to read and understand

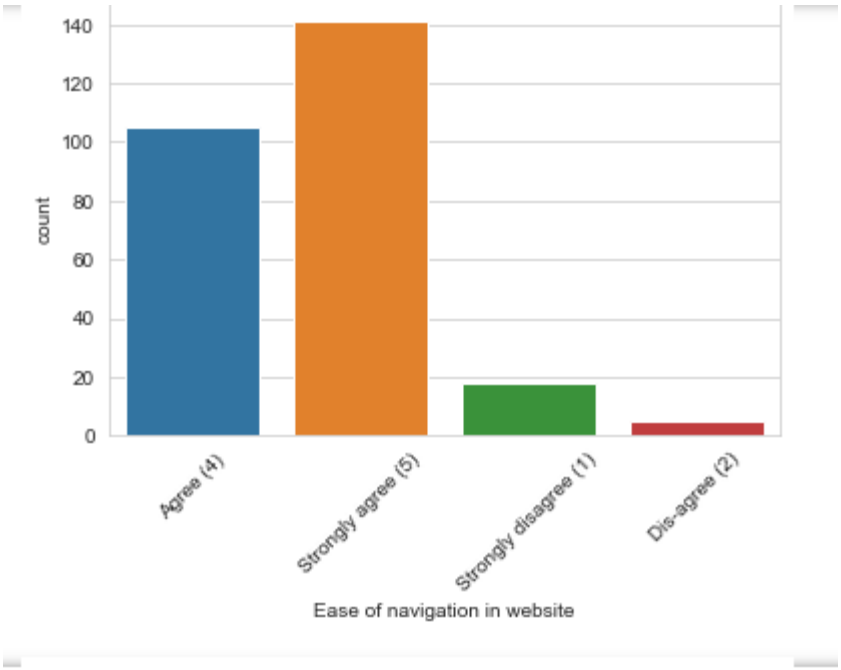


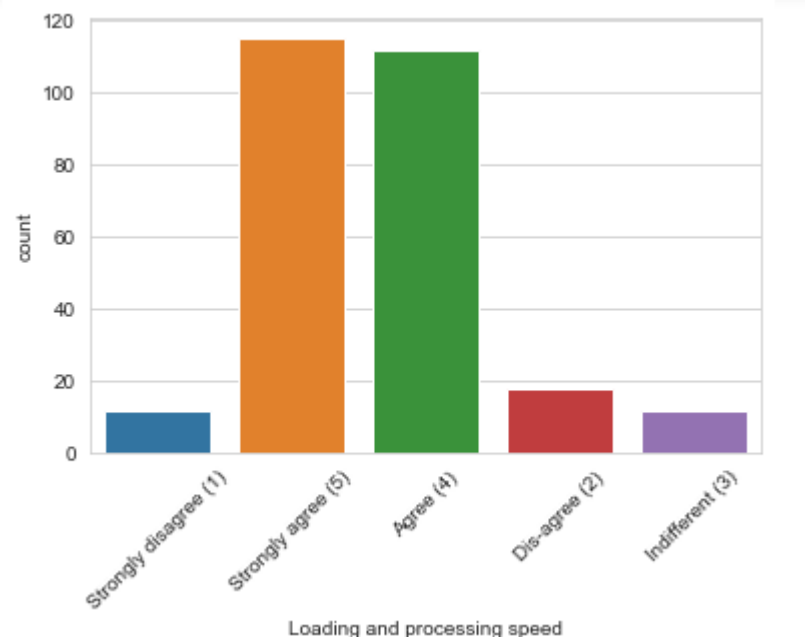
Information on similar product to the one highlighted is important for product comparison

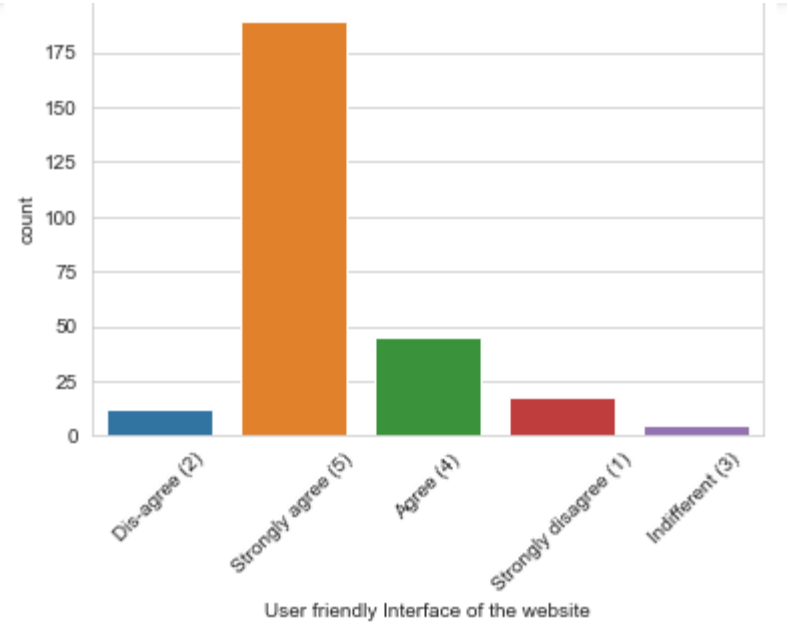


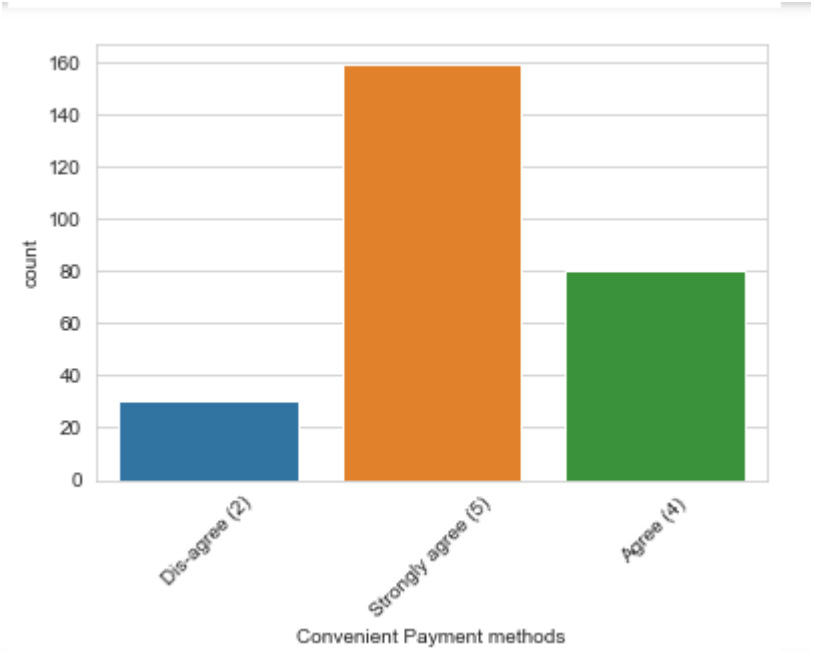
ımplete information on listed seller and product being offered is important for purchase decision.

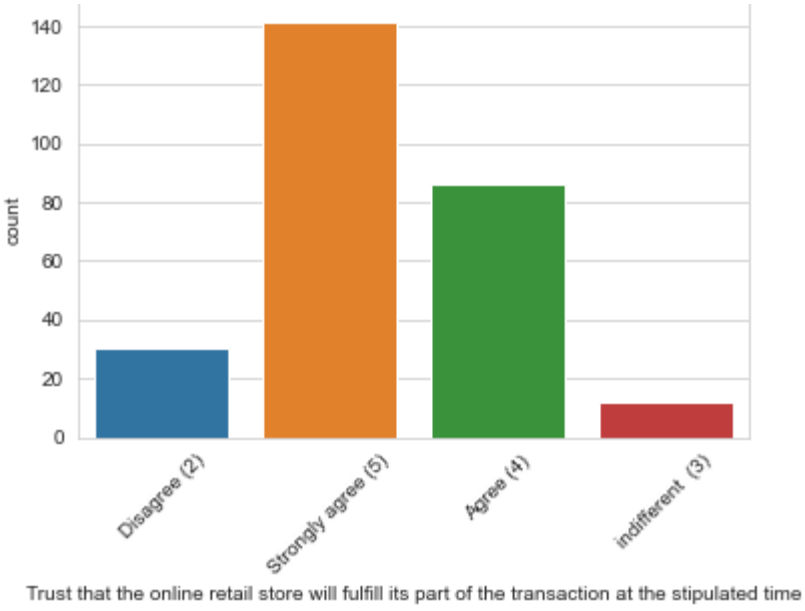

120
100
80
60
40
20
0
count
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
All relevant information on listed products must be stated clearly


140
120
100
80
60
40
20
0
count
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
Ease of navigation in website

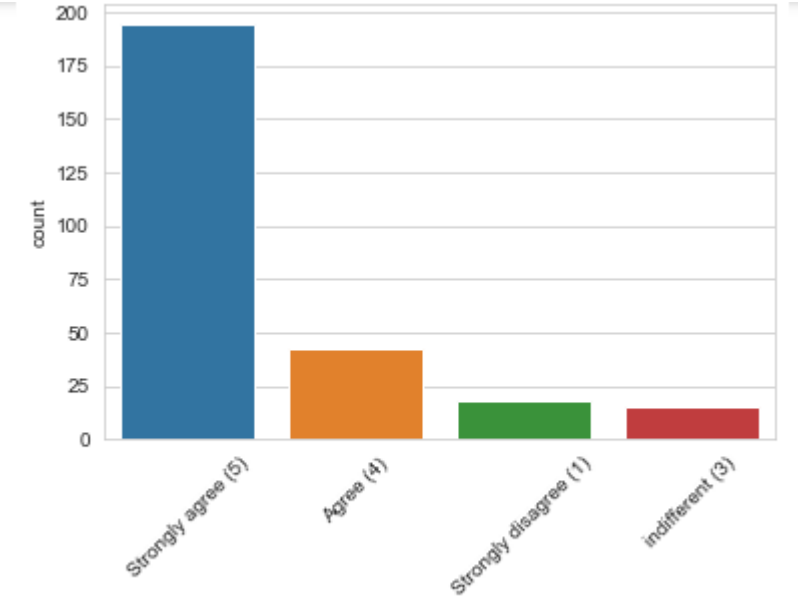

120
100
80
60
40
20
0
count
Strongly disagree (1)
Strongly agree (5)
Agree (4)
Dis-agree (2)
Indifferent (3)
Loading and processing speed


175
150
125
100
75
50
25
0
count
Dis-agree (2)
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Indifferent (3)
User friendly Interface of the website

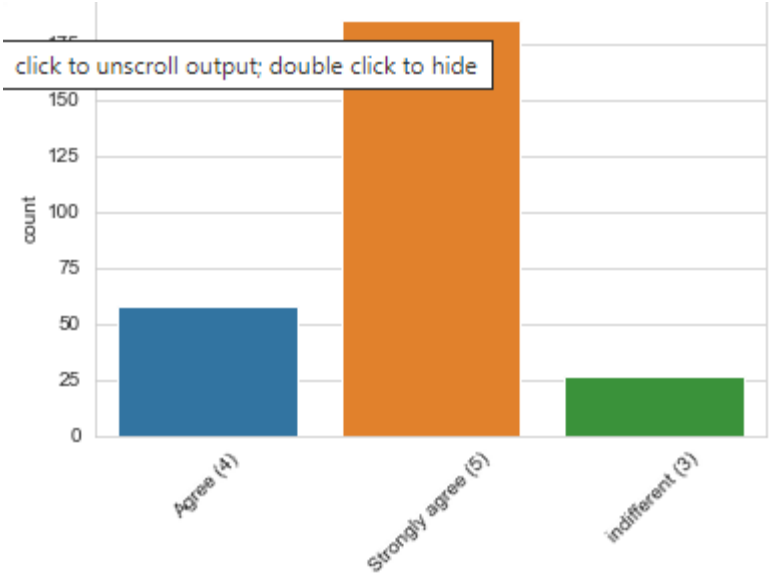




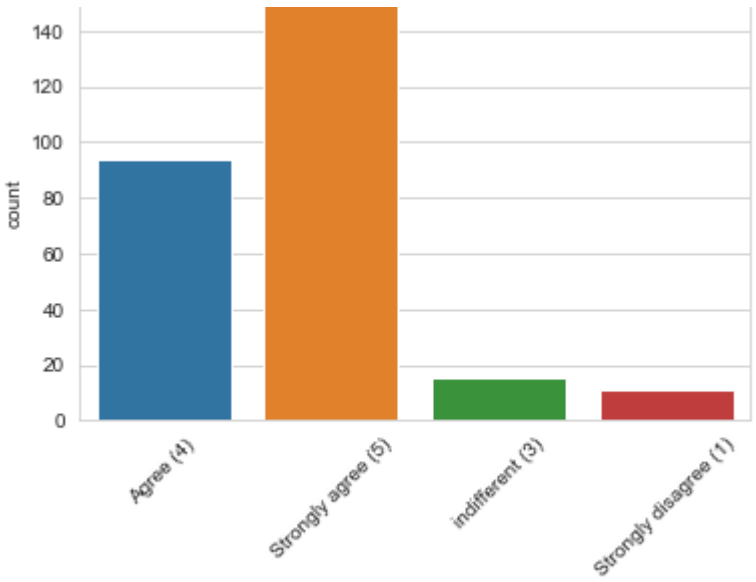
Trust that the online retail store will fulfill its part of the transaction at the stipulated time



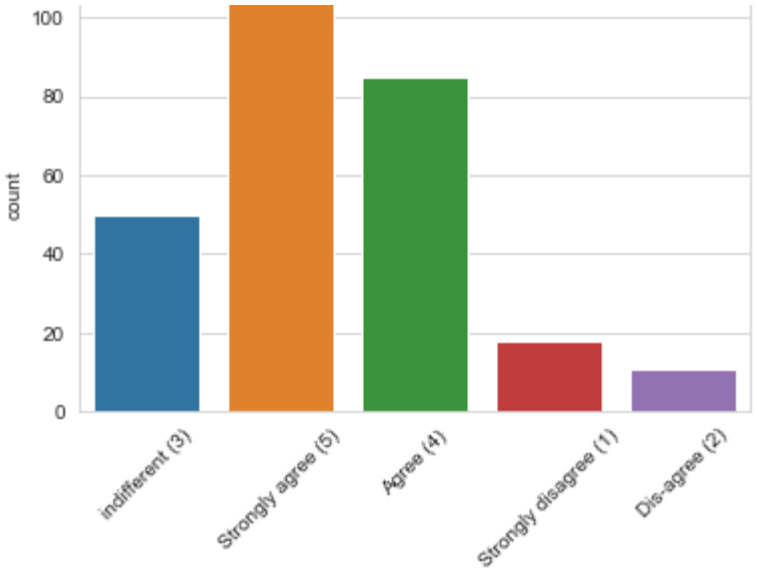
Empathy (readiness to assist with queries) towards the customers



Being able to guarantee the privacy of the customer

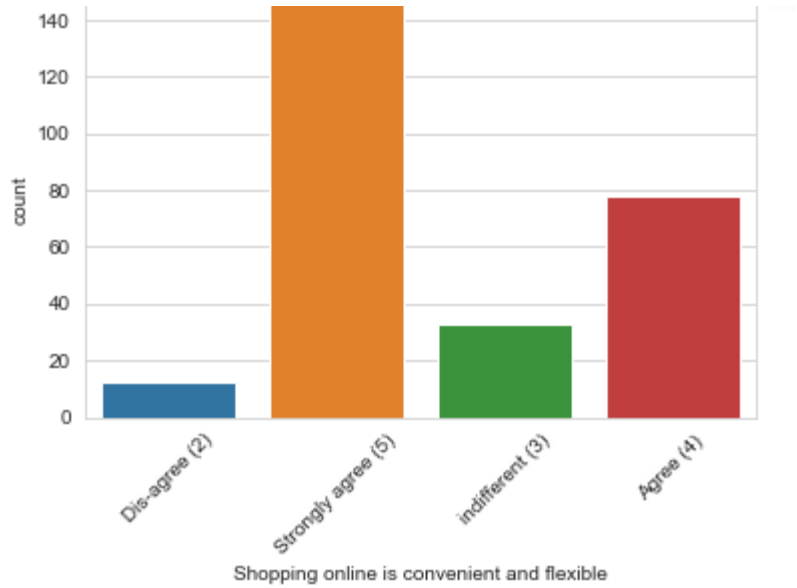


Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)

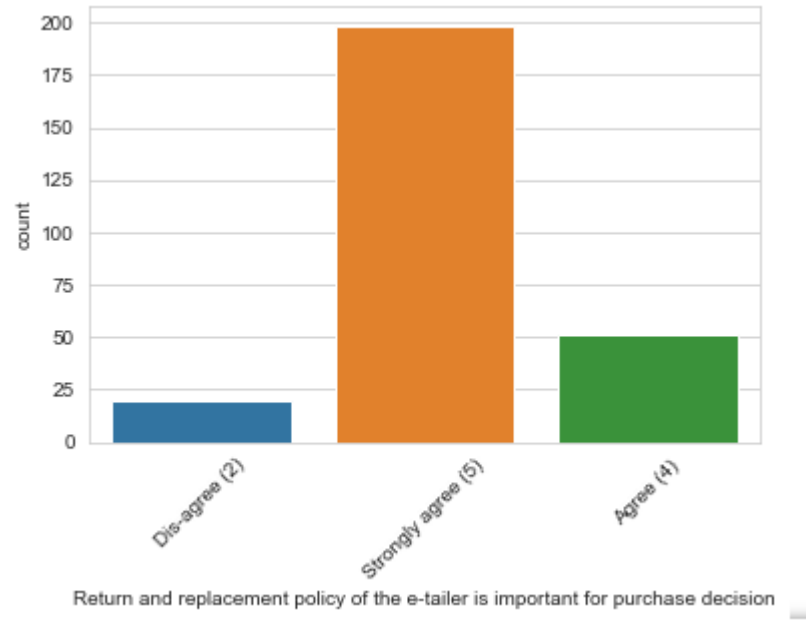


Online shopping gives monetary benefit and discounts

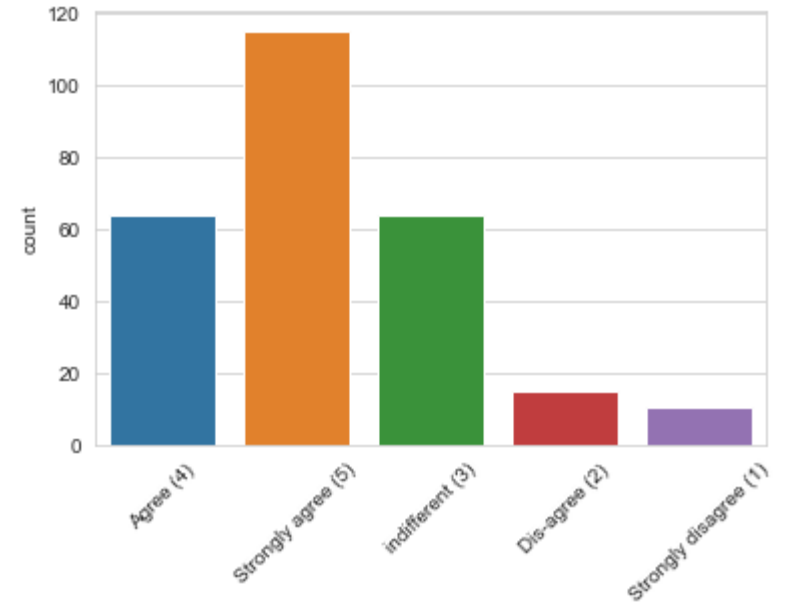
Enjoyment is derived from shopping online



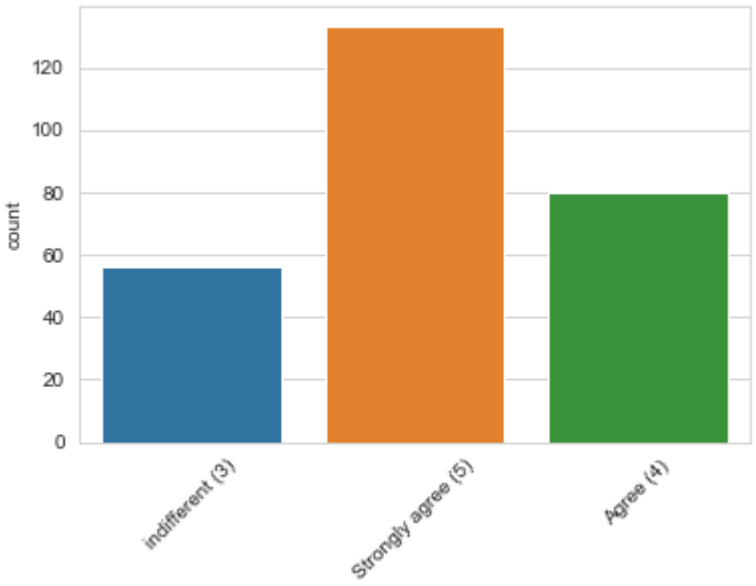
Shopping online is convenient and flexible



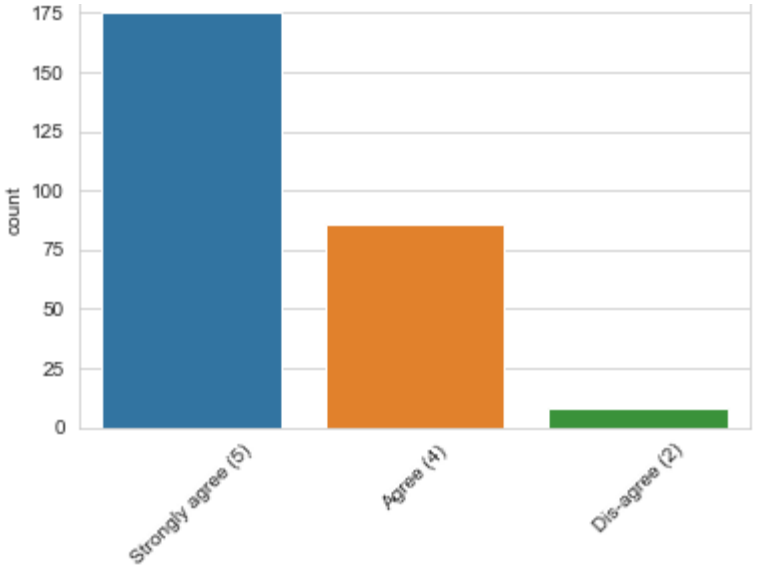
Return and replacement policy of the e-tailer is important for purchase decision



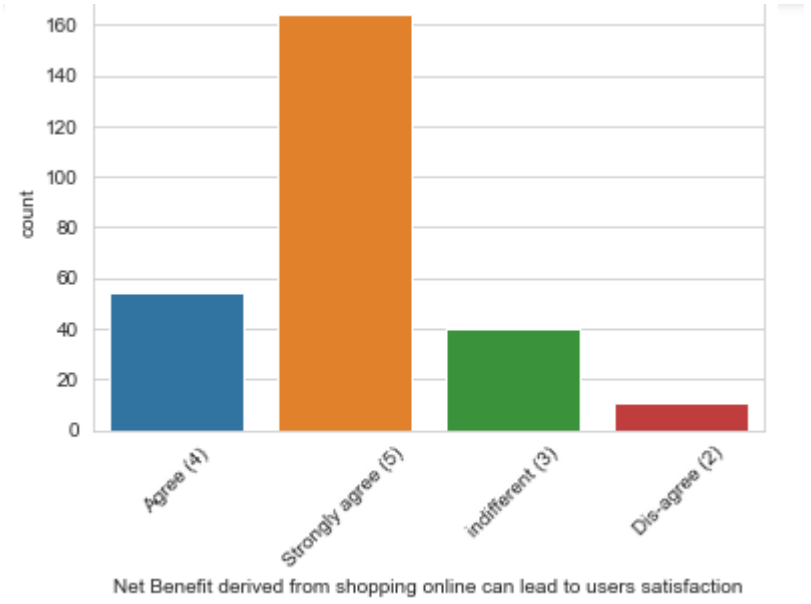
Gaining access to loyalty programs is a benefit of shopping online



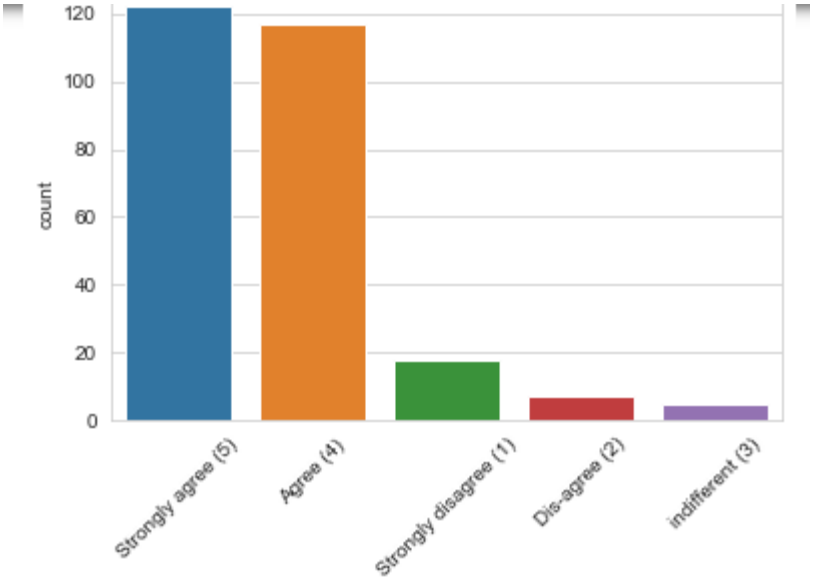
Displaying quality Information on the website improves satisfaction of customers



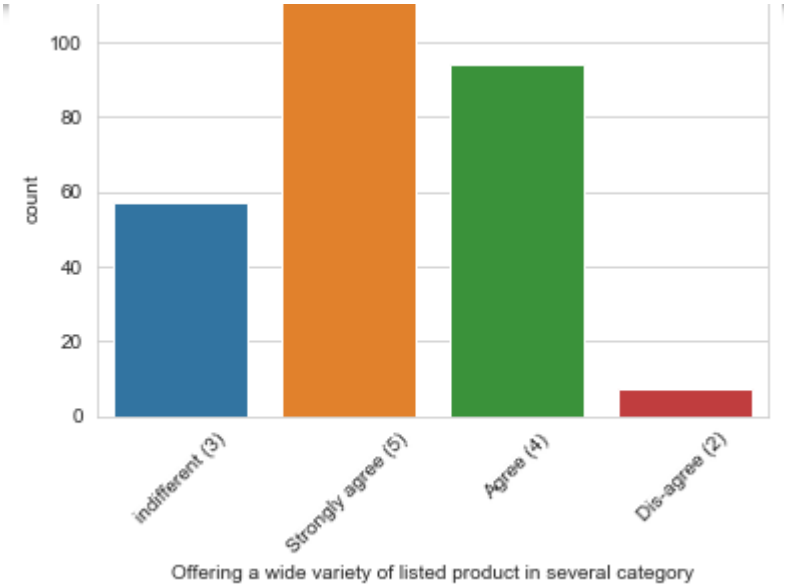
User derive satisfaction while shopping on a good quality website or application



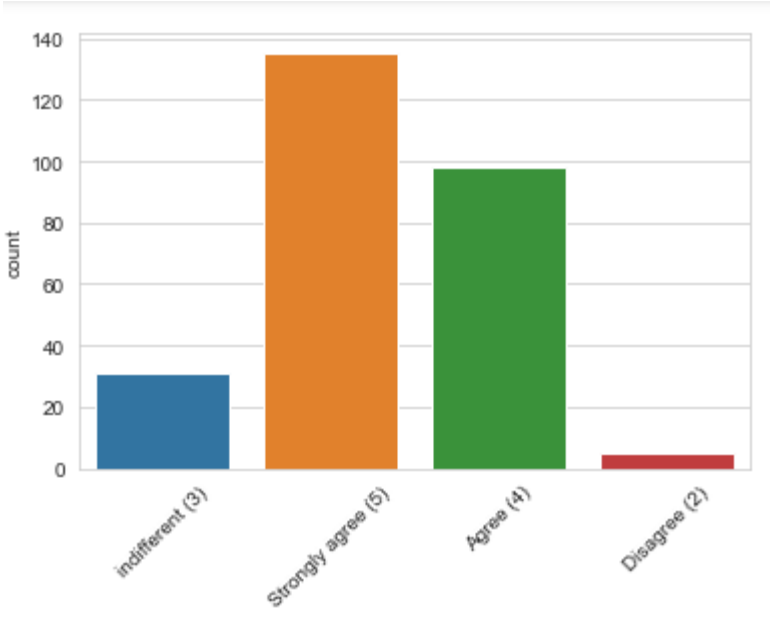
Net Benefit derived from shopping online can lead to users satisfaction



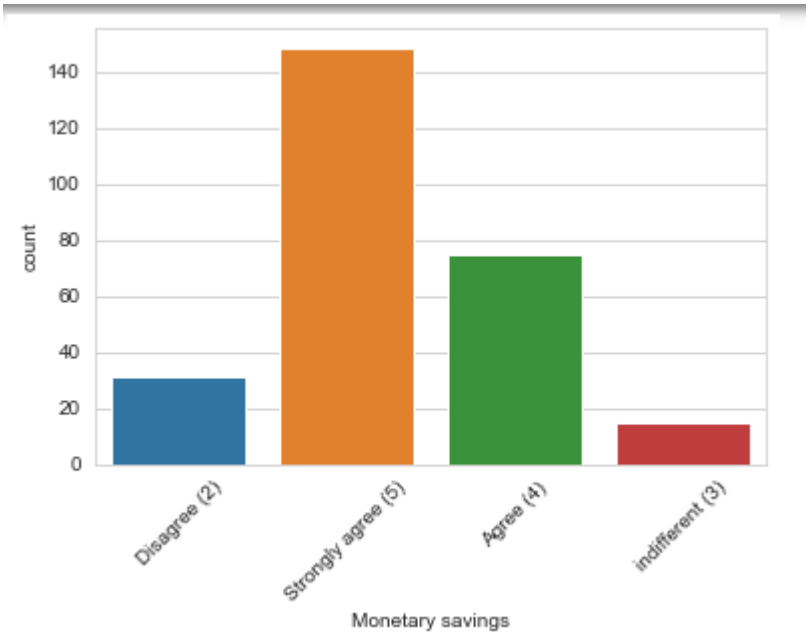
User satisfaction cannot exist without trust

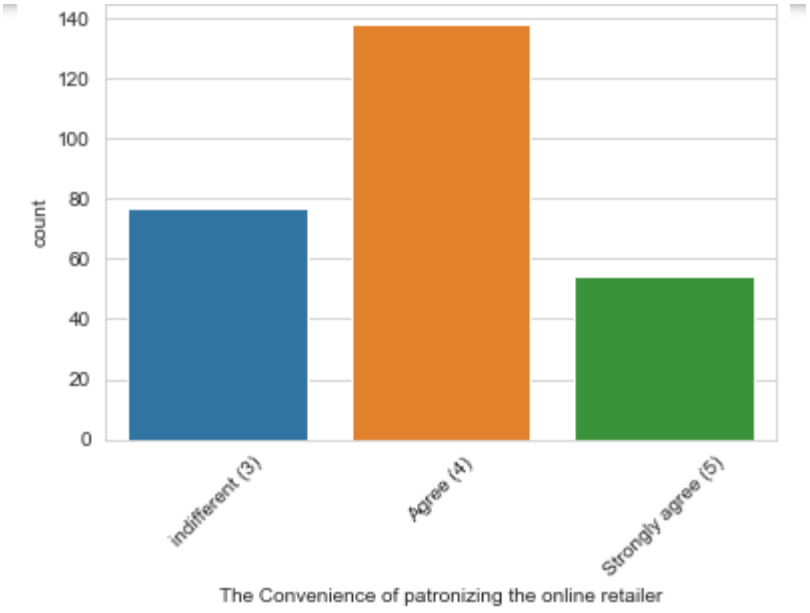


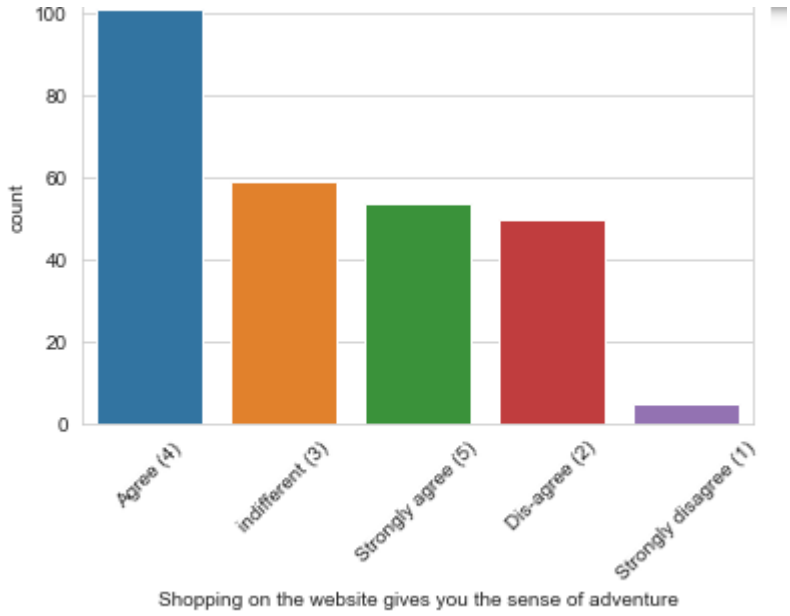
Offering a wide variety of listed product in several category



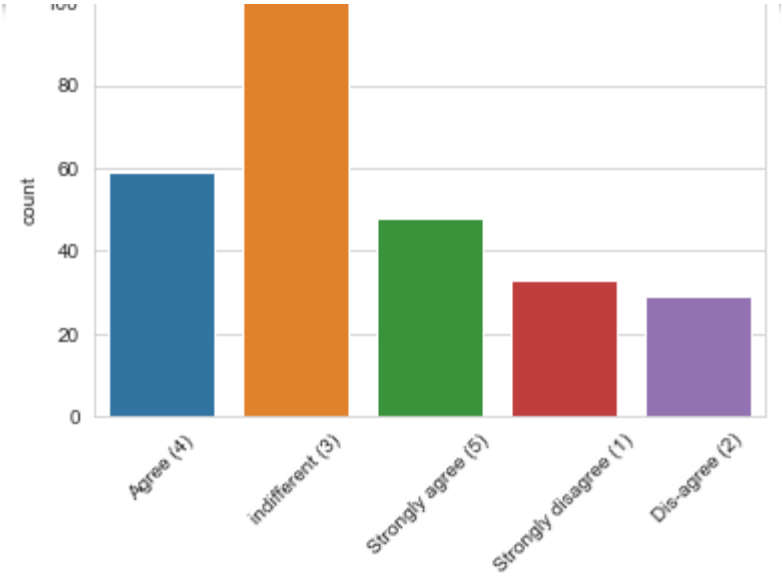
Provision of complete and relevant product information


140
120
100
80
60
40
20
0
count
Dissagree (2)
Strongly agree (5)
Agree (4)
indifferent (3)
Monetary savings

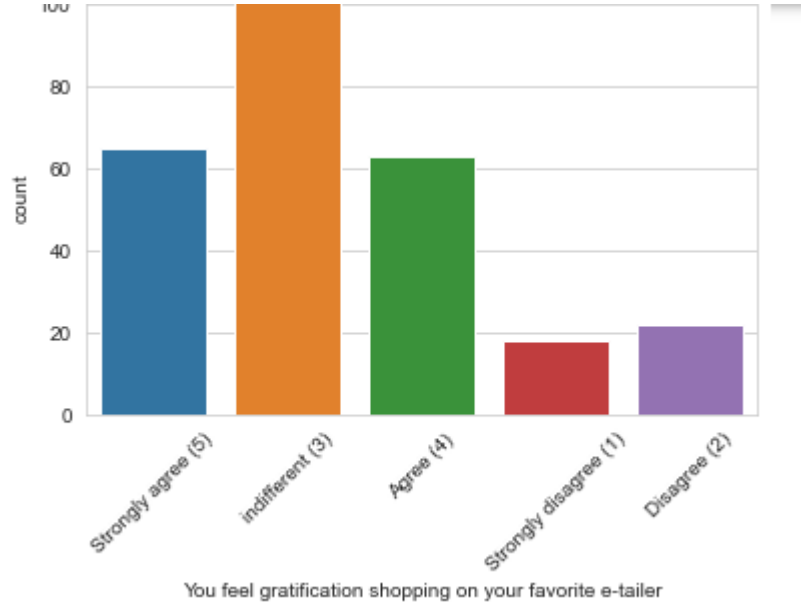

140
120
100
80
60
40
20
0
count
indifferent (3)
Agree (4)
Strongly agree (5)
The Convenience of patronizing the online retailer



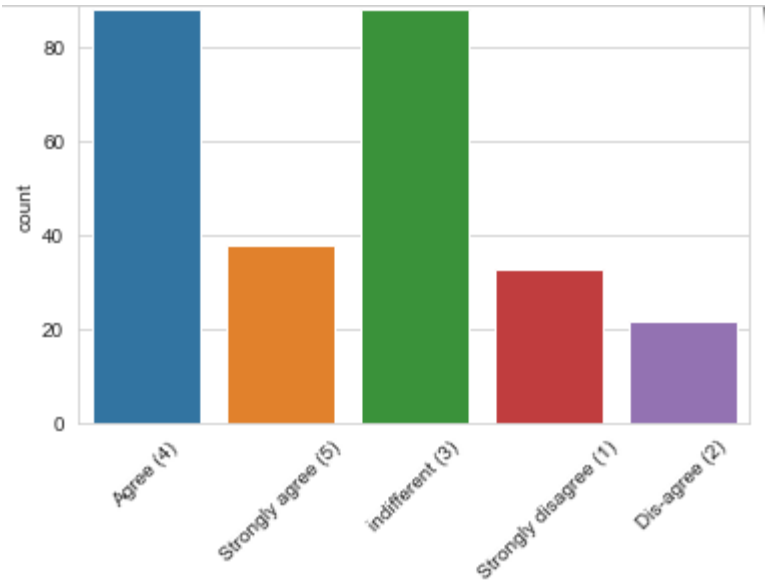
Shopping on the website gives you the sense of adventure



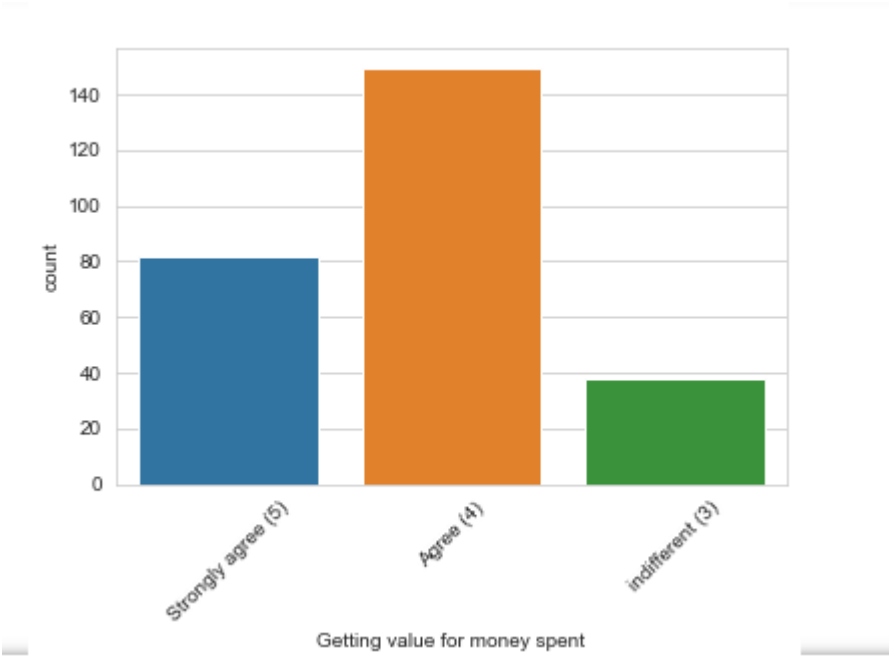
Shopping on your preferred e-tailer enhances your social status



You feel gratification shopping on your favorite e-tailer



Shopping on the website helps you fulfill certain roles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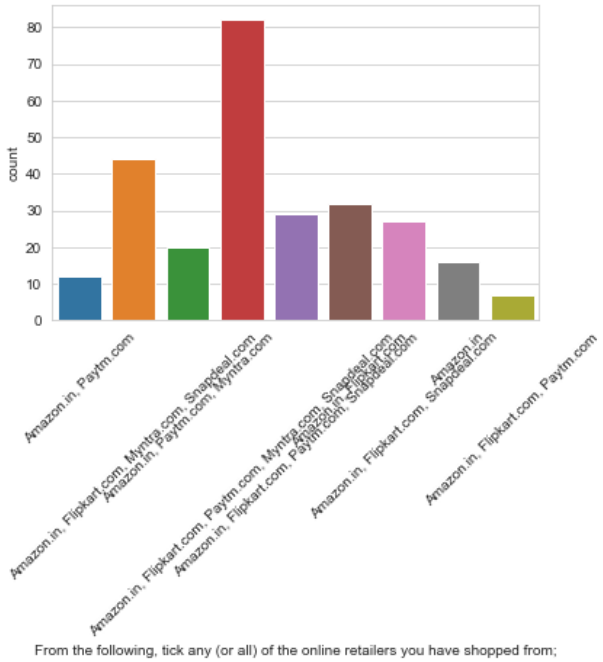
count
Strongly agree (5)
Agree (4)
indifferent (3)
Getting value for money spent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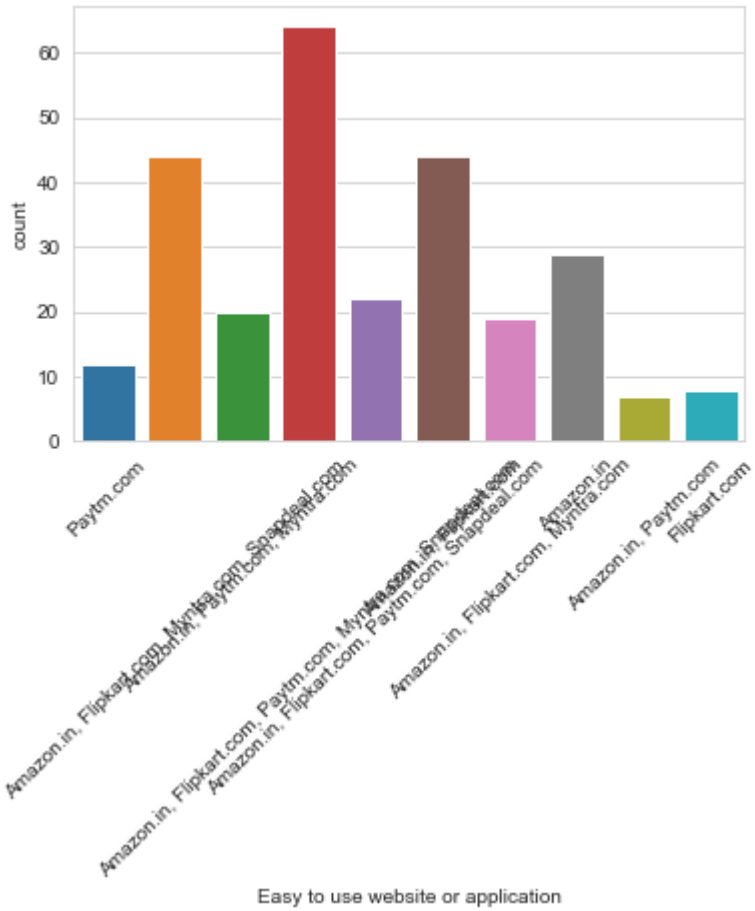
Amazon.in, Paytm.com
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com
Amazon.in, Flipkart.com, Paytm.com
Amazon.in, Flipkart.com, Snapdeal.com
Amazon.in, Flipkart.com, Paytm.com
From the following, tick any (or all) of the online retailers you have shopped from;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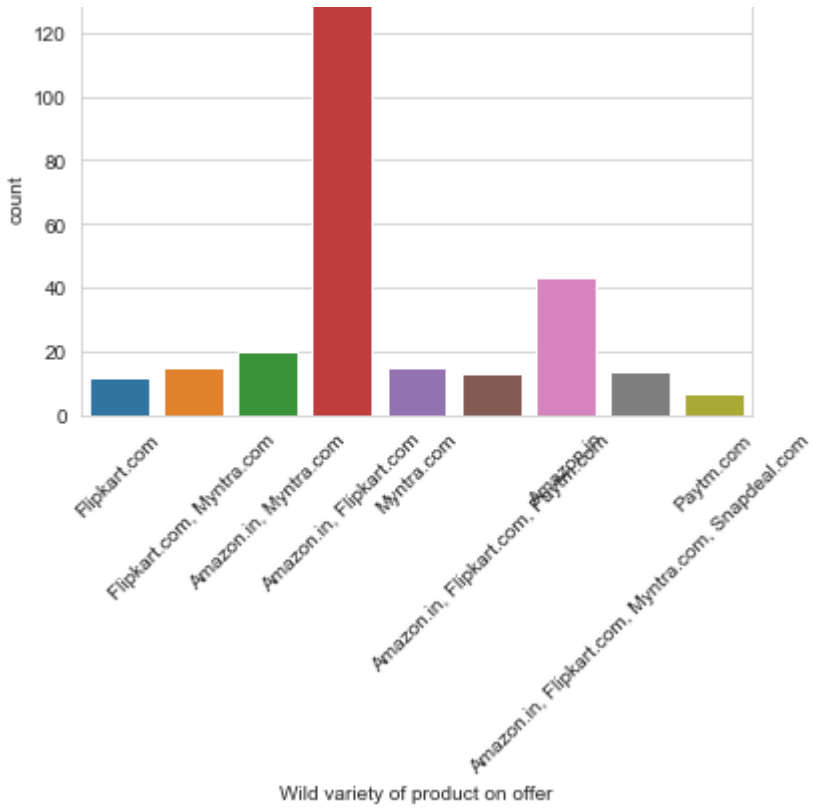
Paytm.com
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Amazon.in, Paytm.com
Flipkart.com
Easy to use website or application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Flipkart.com
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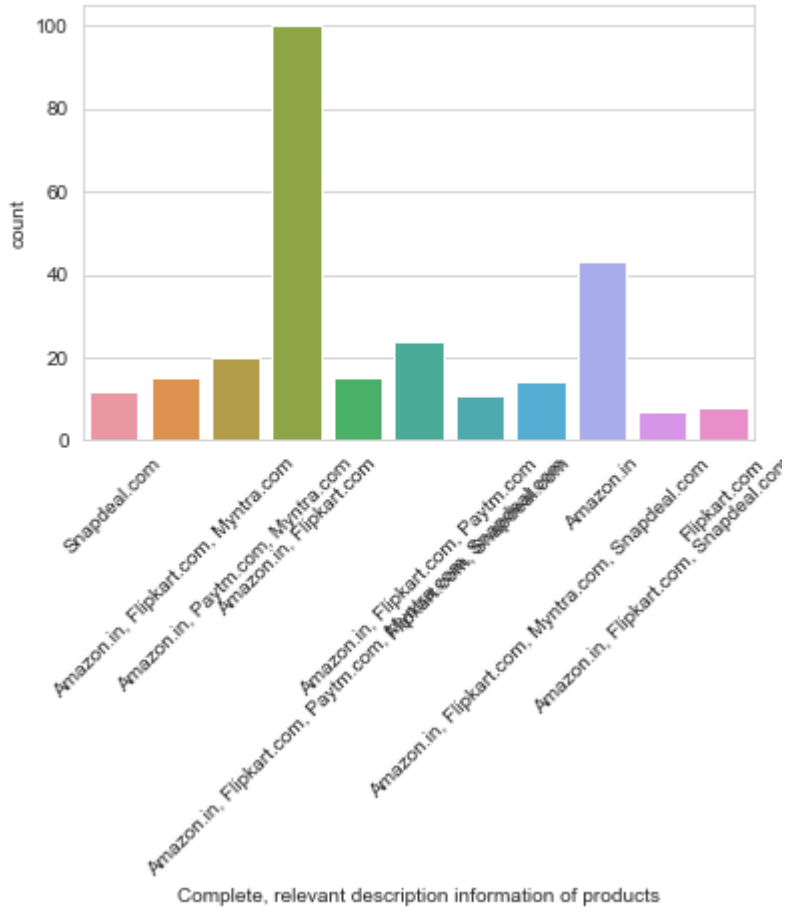
Amazon.in, Myntra.com
Amazon.in, Flipkart.com
Myntra.com
Amazon.in, Flipkart.com, Paytm.com
Paytm.com
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com
Wild variety of product on offer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Snapdeal.com
Amazon.in, Flipkart.com, Myntra.com
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Amazon.in, Flipkart.com
Amazon.in, Flipkart.com, Paytm.com
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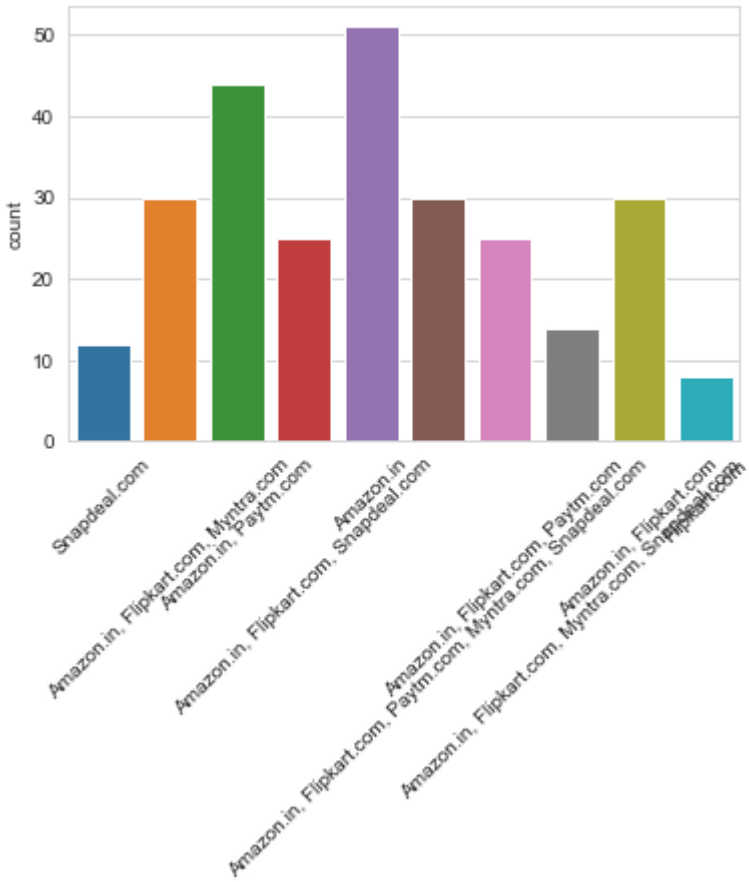
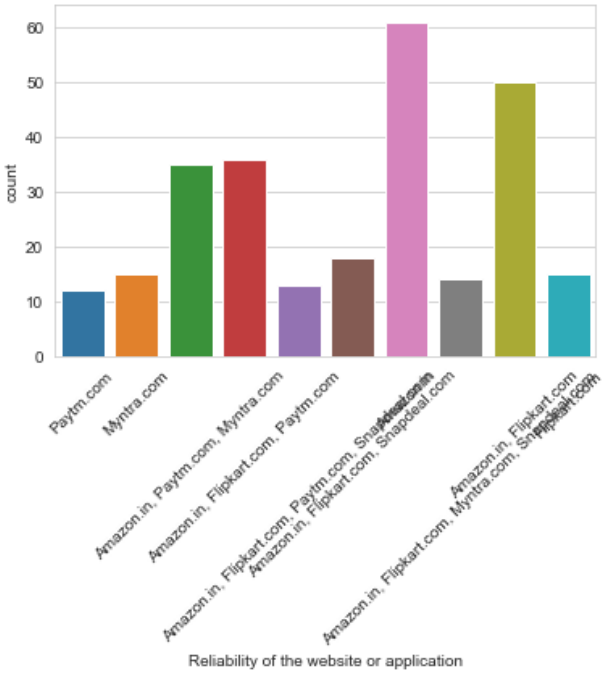
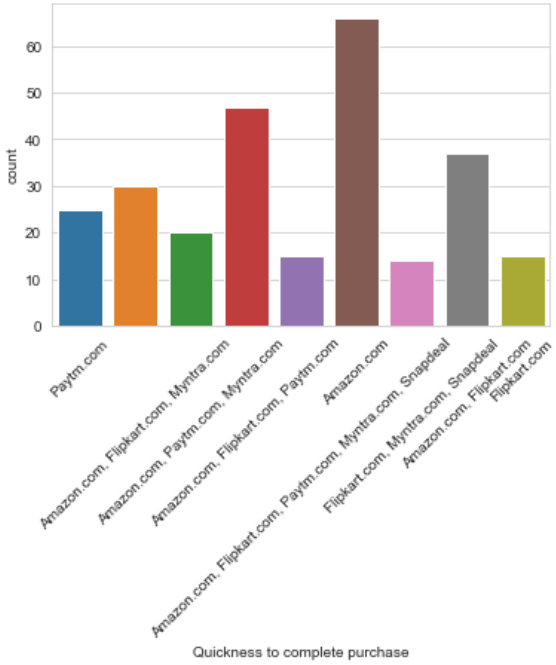
Flipkart.com
Amazon.in, Flipkart.com, Snapdeal.com
Complete, relevant description information of products



Fast loading website speed of website and application



Reliability of the website or application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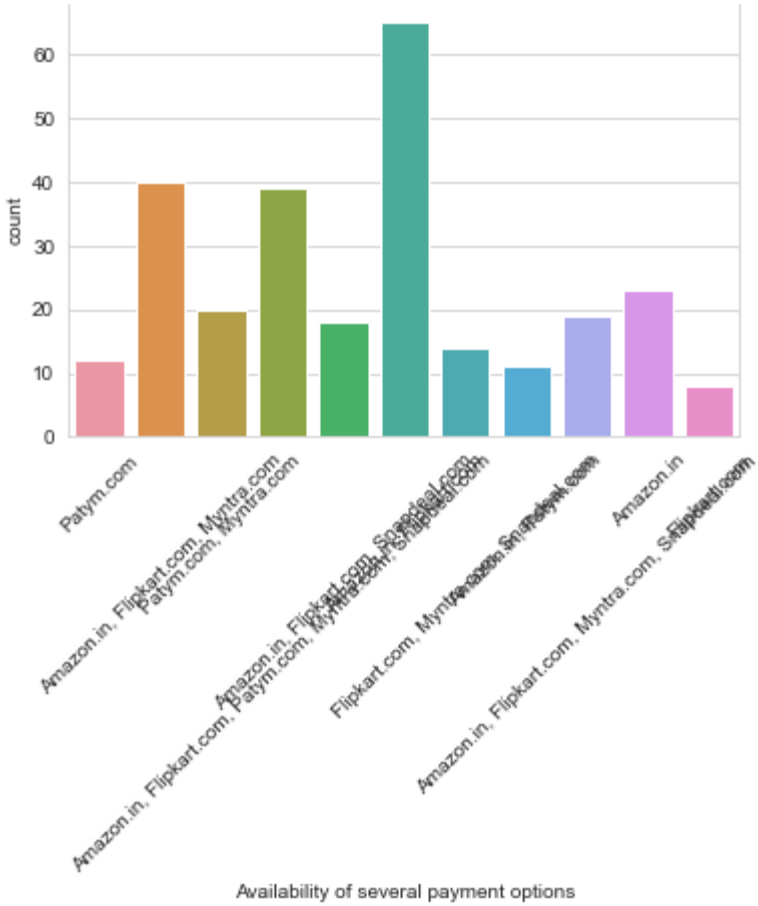
Amazon.com
Amazon.com, Flipkart.com, Paytm.com, Myntra.com, Snapdeal
Flipkart.com, Myntra.com, Snapdeal
Amazon.com, Flipkart.com
Flipkart.com
Quickness to complete purchase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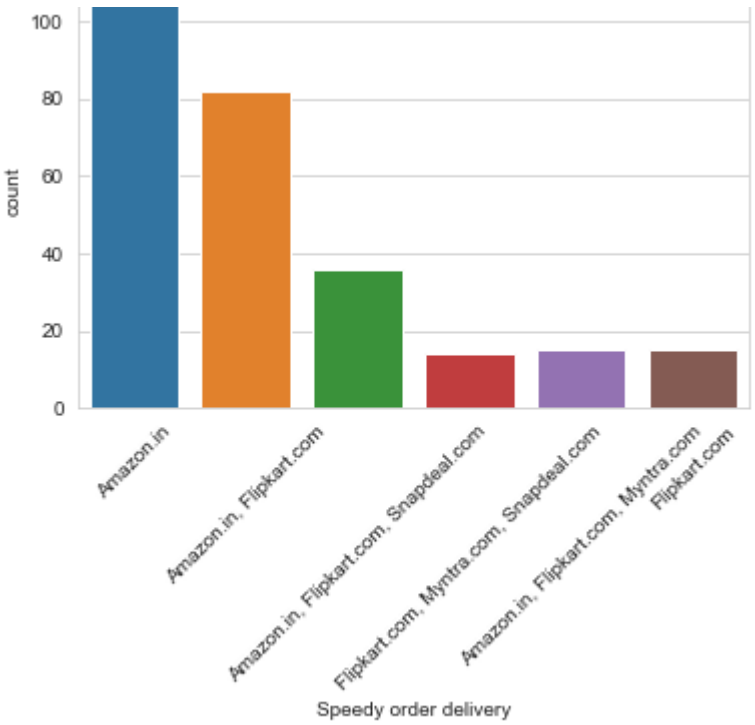
Availability of several payment options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Amazon.in
Amazon.in, Flipkart.com
Amazon.in, Flipkart.com, Snapdeal.com
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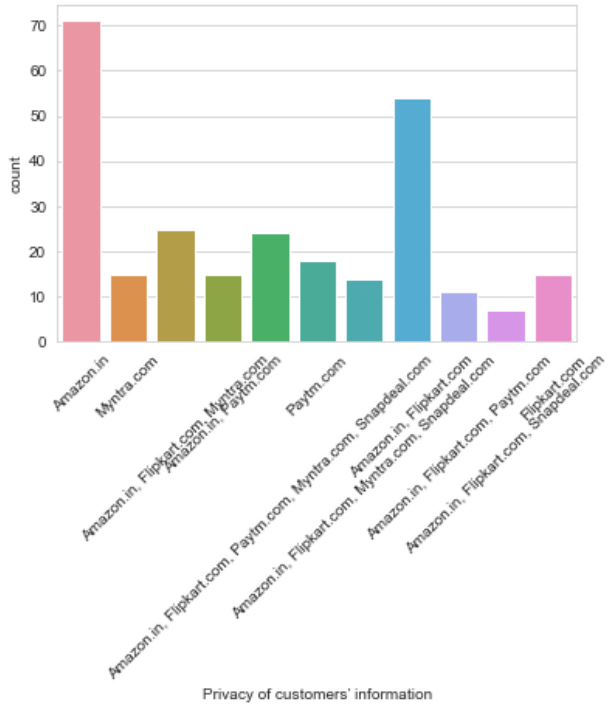
Amazon.in, Flipkart.com, Myntra.com
Flipkart.com
Speedy order delivery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Myntra.com
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Amazon.in, Paytm.com
Paytm.com
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com
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Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com
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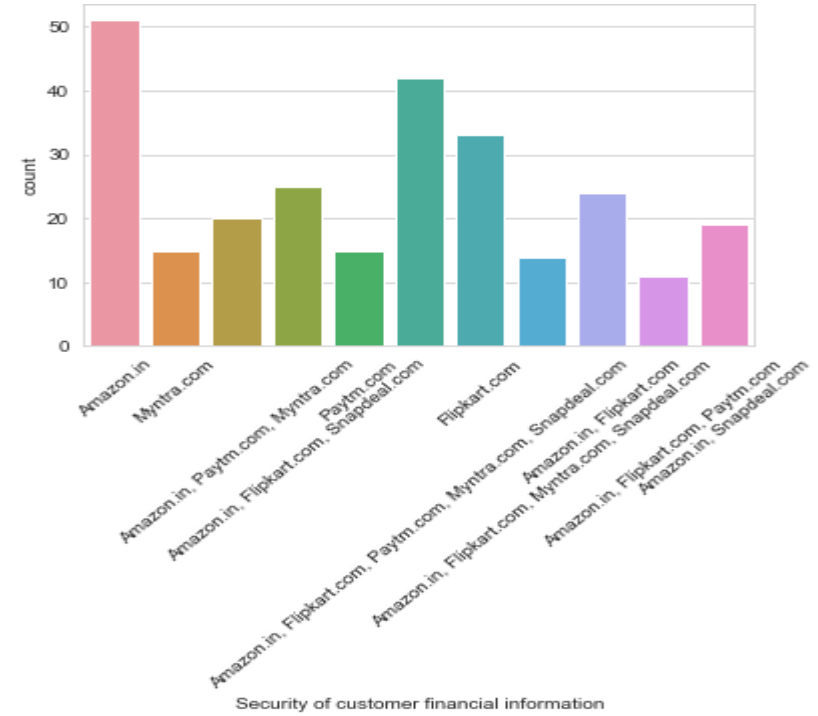
Flipkart.com
Amazon.in, Flipkart.com, Snapdeal.com
Privacy of customers' information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Paytm.com
Amazon.in, Flipkart.com, Snapdeal.com
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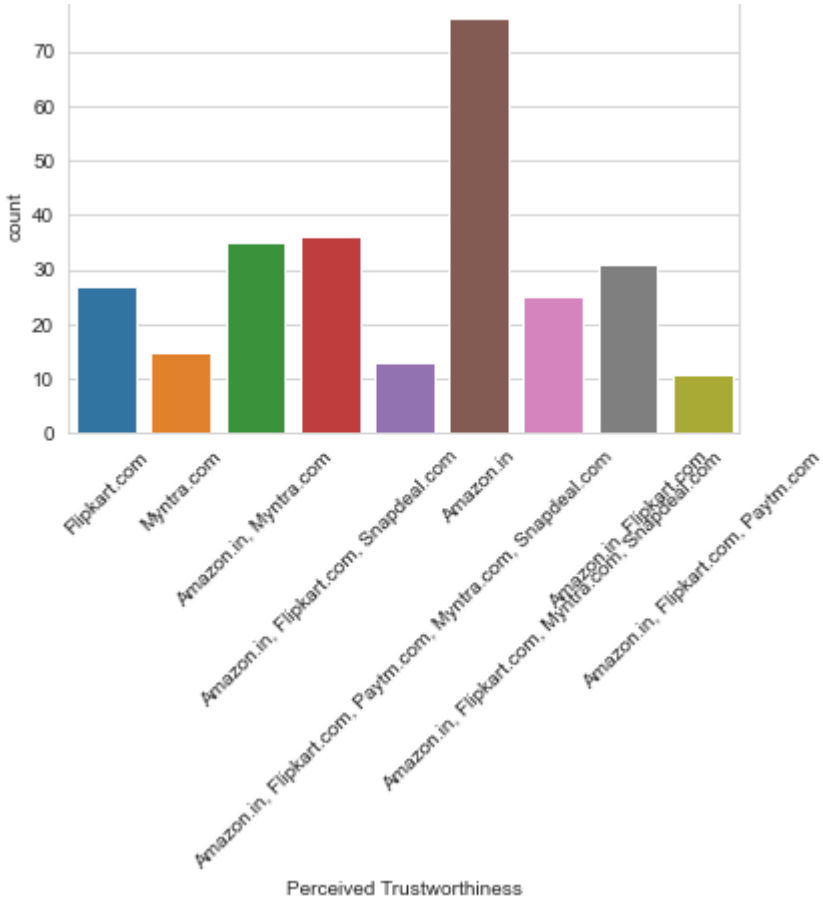
Amazon.in, Snapdeal.com
Security of customer financial information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Amazon.in, Flipkart.com, Snapdeal.com
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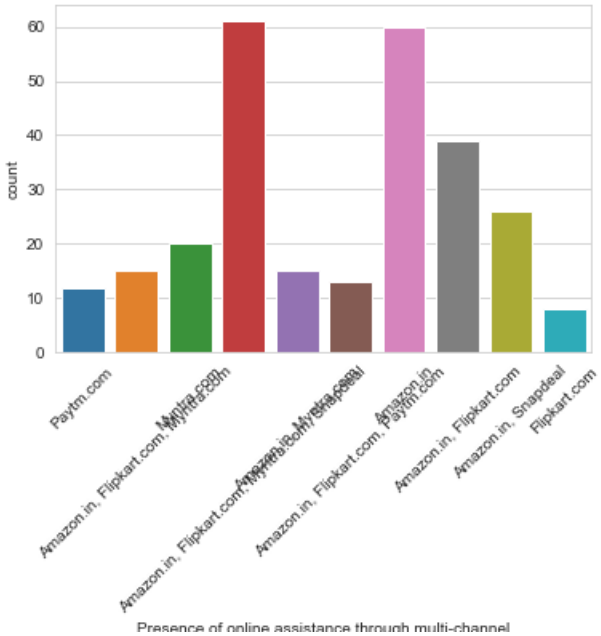
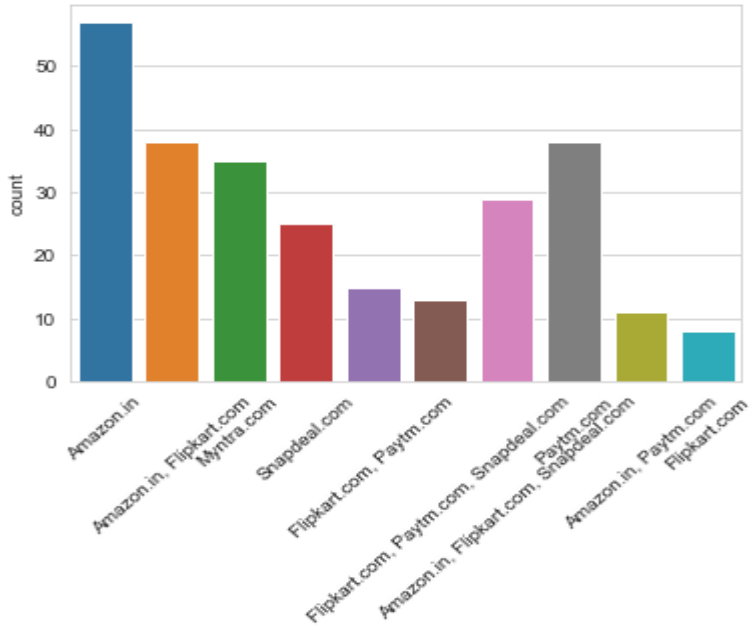
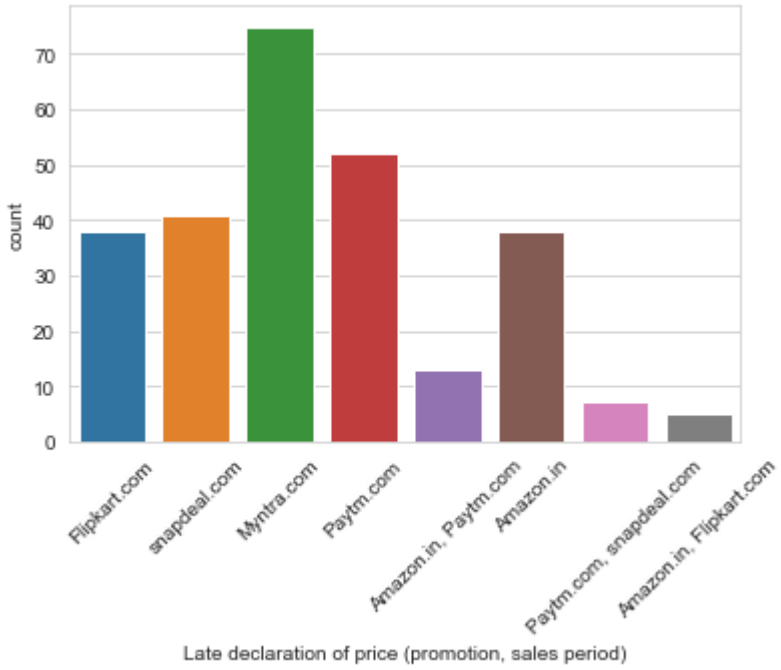
Amazon.in, Flipkart.com, Paytm.com
Perceived Trustworthiness



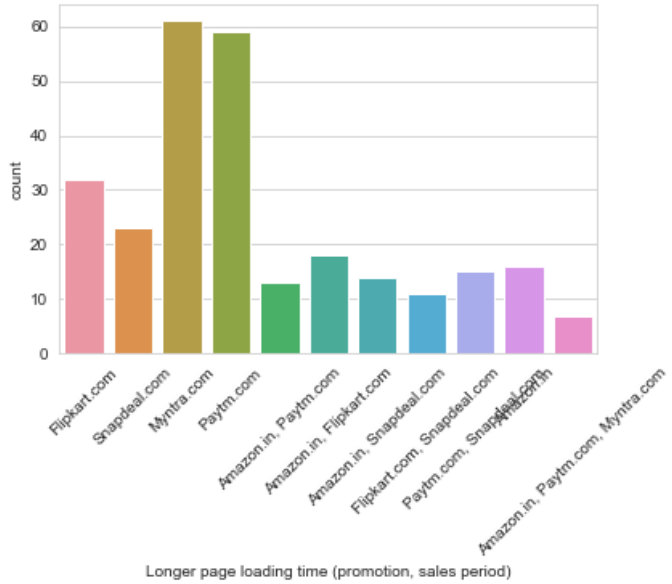
Presence of online assistance through multi-channel



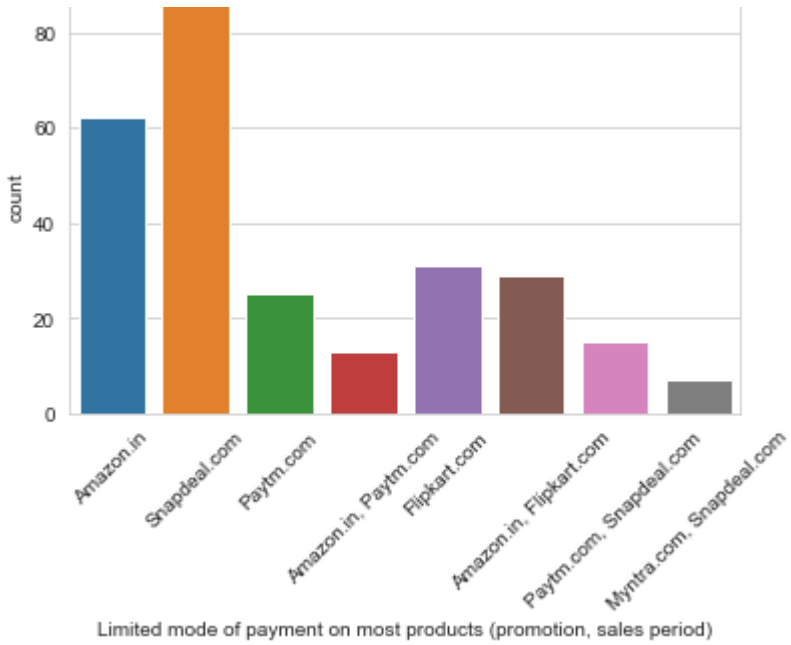
Longer time to get logged in (promotion, sales period)



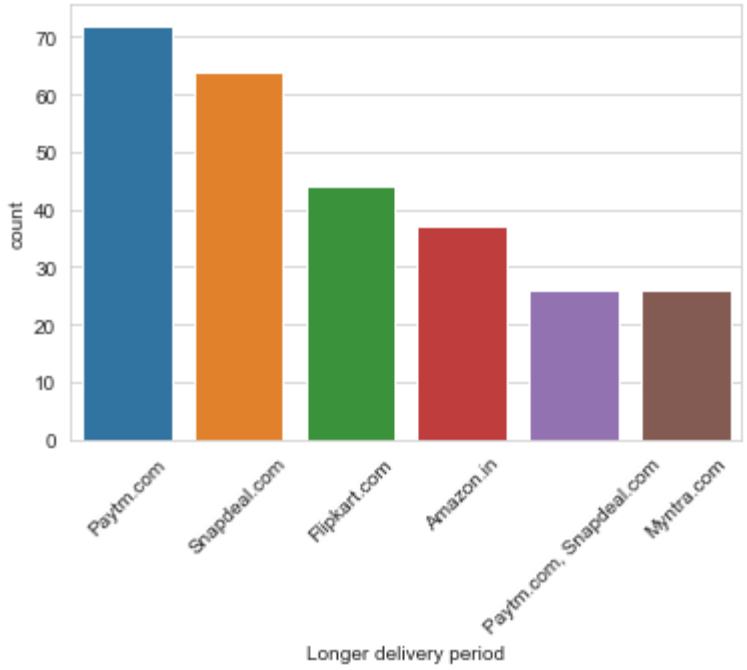
Late declaration of price (promotion, sales period)



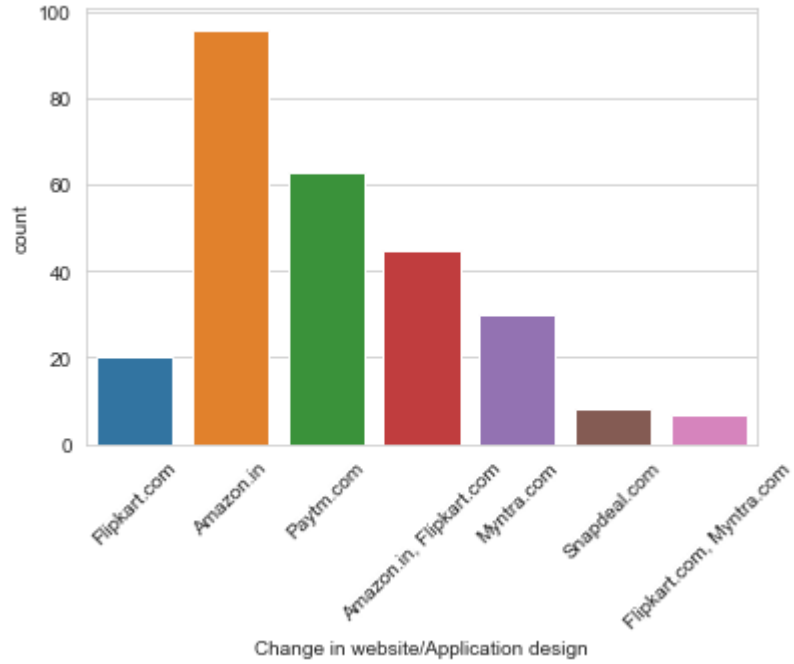
Longer page loading time (promotion, sales period)



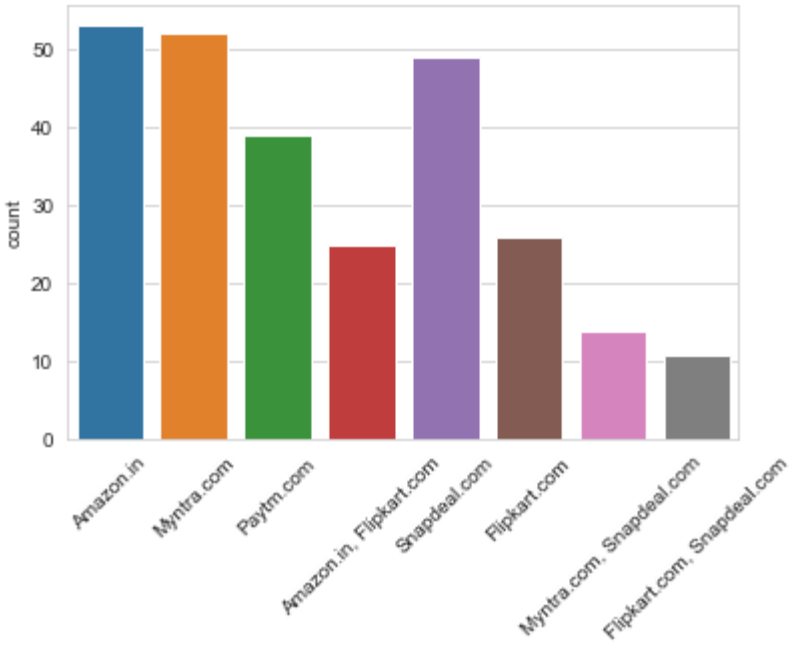
Limited mode of payment on most products (promotion, sales period)



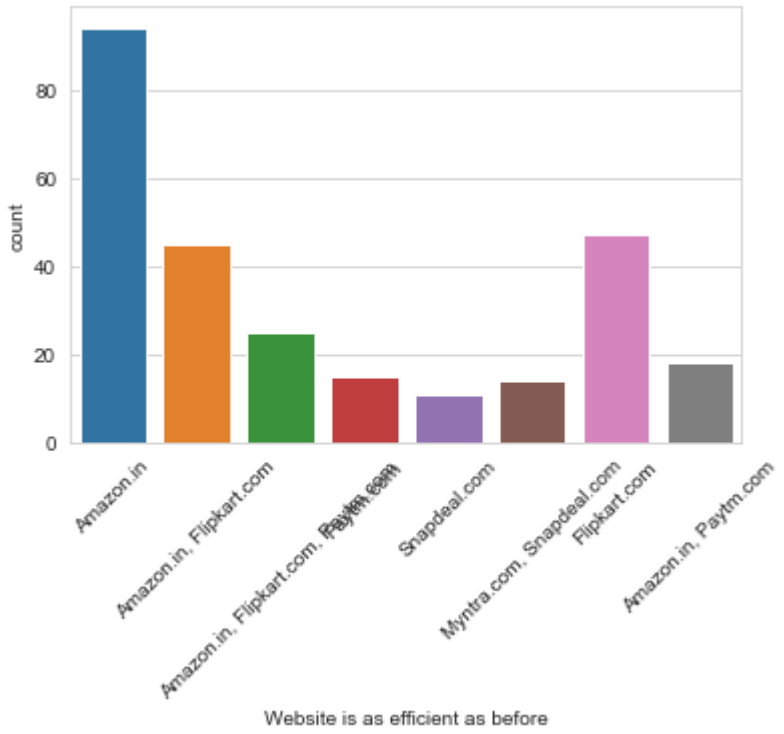
Longer delivery period



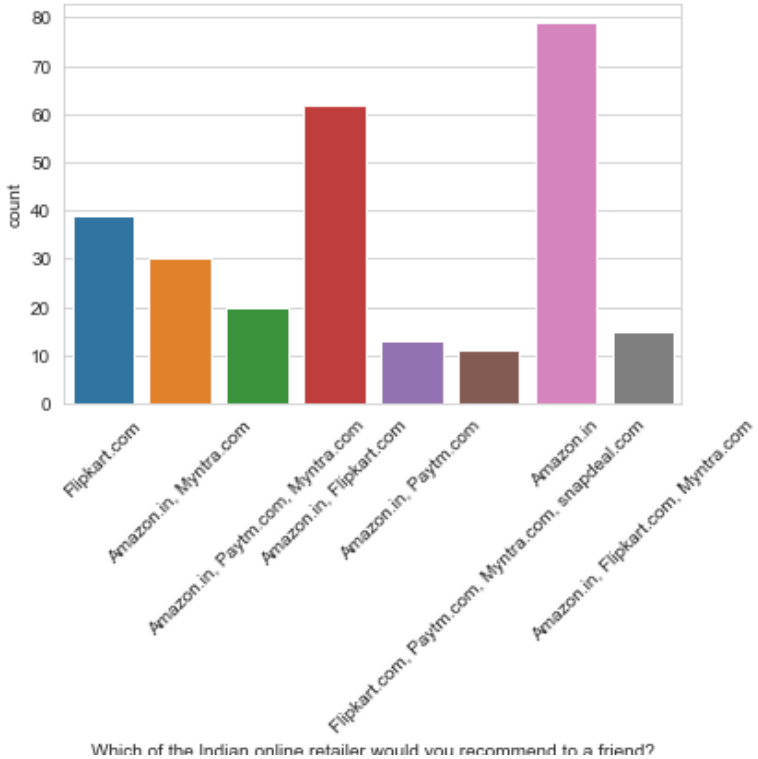
Change in website/Application design



Frequent disruption when moving from one page to another



Website is as efficient as before



Which of the Indian online retailer would you recommend to a friend?

Based on seaborn.countplot,following observations are made:

1.Gender: female respondent were maximum in number than male.

2.Age: Age-group of 31-40yrs are maximum may be due to the fact that they belong to working class and they don't get time visit mart/shopping area so they order mostly online followed by 21-30yrs group then 41-50years and there is least response from 51 years and above may be due to fact of less usage of online shopping and needs education of learning online shopping by 51yrs and above.

3.City:The respondents are residing in cities like Delhi, Greater Noida, Karnal, Bangalore, Noida and least from Bulandshahr.

4.Maximum customers have been shopping online for more than 4 years and some are shopping since less than for 1 years. So we can see new customers are entering into the online shopping mode.

5.We can see that many people have shopped less than 10 times in the past year.

6.Maximum respondent using Mobile internet, followed by wifi and least is Dial-up.

7.Max respondent uses smartphone for online shopping which is portable, quite handy and least is tablet.

8.Screen size of the others devices using is maximum.

9.maximum customers uses windows/windows mobile as operating system.

10.Customers has been using google chrome the most to access the online shopping website and least is mozilla firefox.

11.Search engine is voted for maximum by customers and least is display advertisements. So companies should spend more on advertising on search engines.

12.After first visit , customers prefer search engine followed by application and direct url than the email and social media.

13.customers have been exploring more than 15mins before making a purchase decision followed by 6-10minutes.

14.Customers uses credit/debit card as the most preferred payment option than e-wallets and COD.

15.Customers 171 times(sometimes) abandon the shopping cart -that is selecting an items and leaving without making payment than 15 times very frequently. People have mentioned that sometimes they would leave the cart without purchasing and reason they have mentioned is that they are finding some better alternative offer. It means that people are comparing from many online websites before making any purchase.

16.Site Design (Information Quality): Customer strongly agree that the content on the website must be readable and understandable.

17.Merchandising: Majority wants that the information regarding similar products should be highlighted for product comparison, complete information on listed seller and product being offered for purchase decision, all the relevant information should be stated clearly.

18.Convience: Majority wants Ease of navigation in website, high Loading and processing speed, User friendly Interface of the website. Convenient Payment methods should be focussed, Shopping online should be convenient and flexible.

19.Security:Customer strongly agree that online retail store should fulfil its part of the transaction at the stipulated time, They should protect the privacy of the customer.

20.Serviceability: Majority of the customers think that online retailers should be empathetic (readiness to assist with queries) towards the customers, responsiveness, availability of several communication channels (email, online rep, twitter, phone et.c.), replacement policy of the e-tailer is important for purchase decision.

21.Net Benefits: Customer strongly agrees that Online shopping gives monetary benefit and discounts, Enjoyment is derived from shopping online, return and Gaining access to loyalty programs and monetary savings.

22.Charater: we see that some are agreeable and some are indifferent to the fact that shopping on the website gives the sense of adventure, preferred e-tailer enhances the social status, feeling of gratification, helps fulfil certain roles.

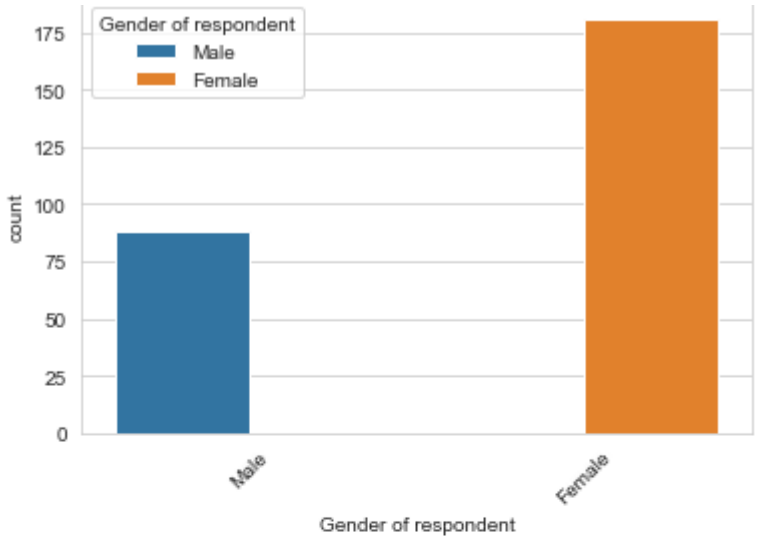
24.Choice: Majority believes that online shopping offers a wide variety of listed product in several category.

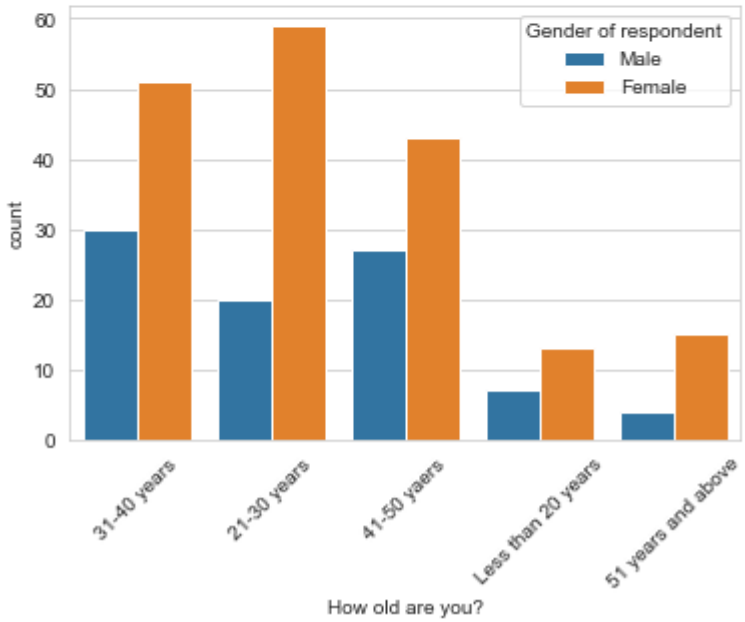
25.We can also see customers were asked to give feedbacks for five retailers namely Amazon, Flipkart,myntra,paytm,snapdeal regarding their services/products/usability etc. they expressed both positive and negative views on the same.

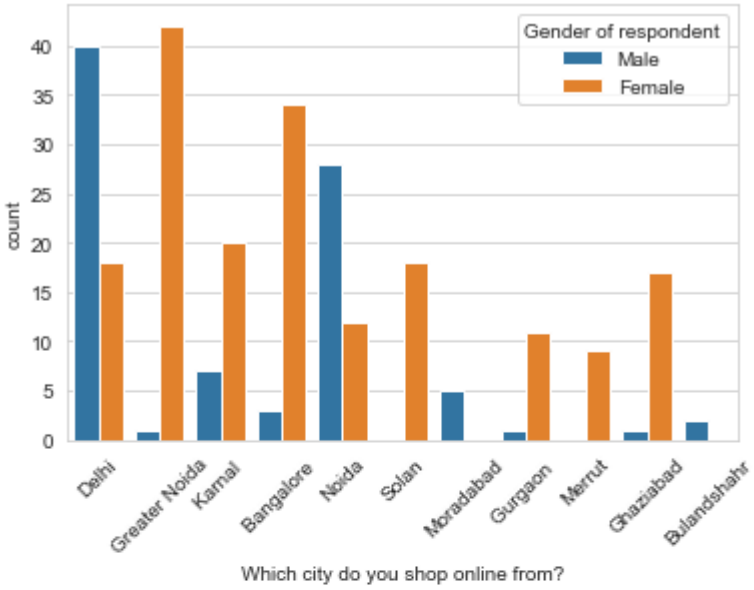
I used sns.countplot to check respondent response based on gender with the following code:

```
#checking respodents anwers based on gender
sns.set_style('whitegrid')
for i in df.columns:
    plt.figure(i)
    sns.countplot(df[i],hue=df['Gender of respondent'])
    plt.xticks(rotation=45)
    print("\n")
plt.show()
```

Some of the graphs are enclosed below;






Gender of respondent
Male
Female
count
40
35
30
25
20
15
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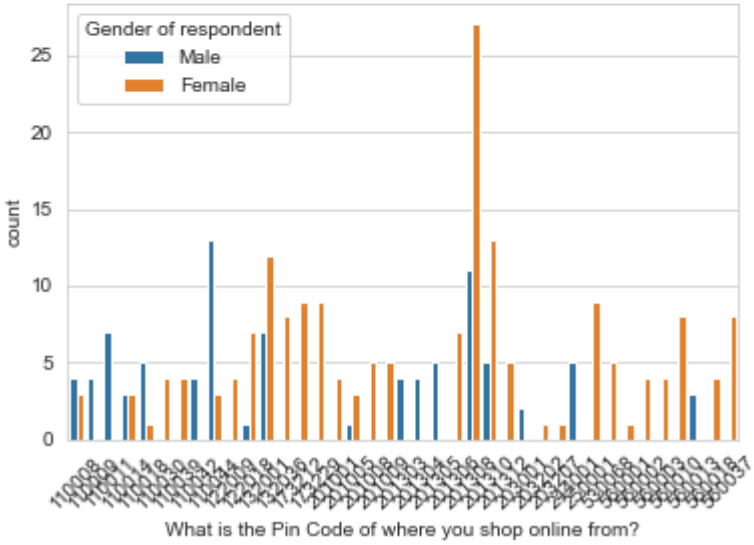
Delhi
Greater Noida
Karnal
Bangalore
Noida
Solan
Moradabad
Gurgaon
Merrut
Ghaziabad
Bulandshahr
Which city do you shop online from?


Gender of respondent
Male
Female
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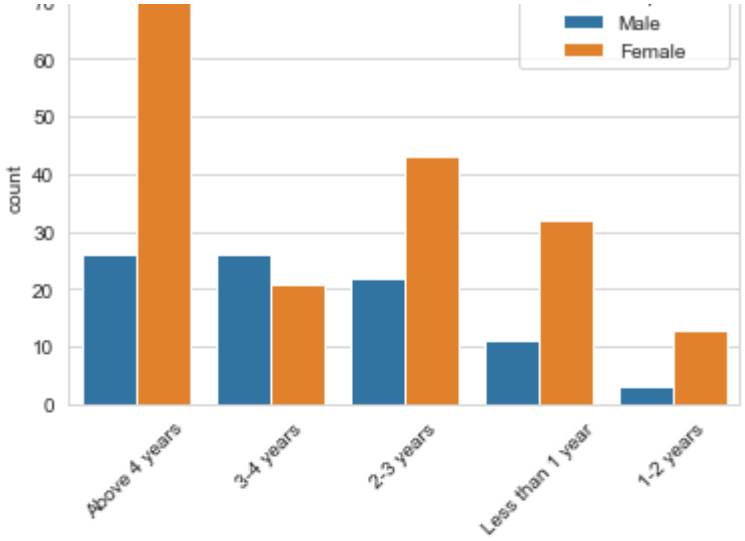
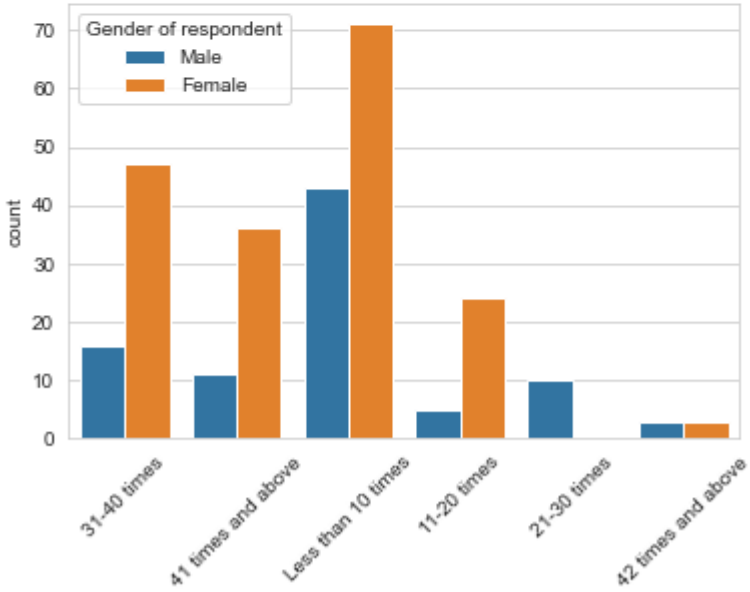
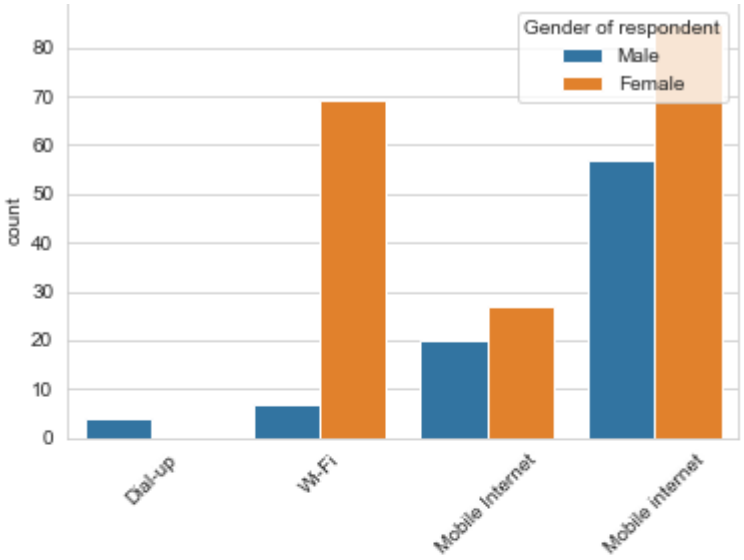
What is the Pin Code of where you shop online from?



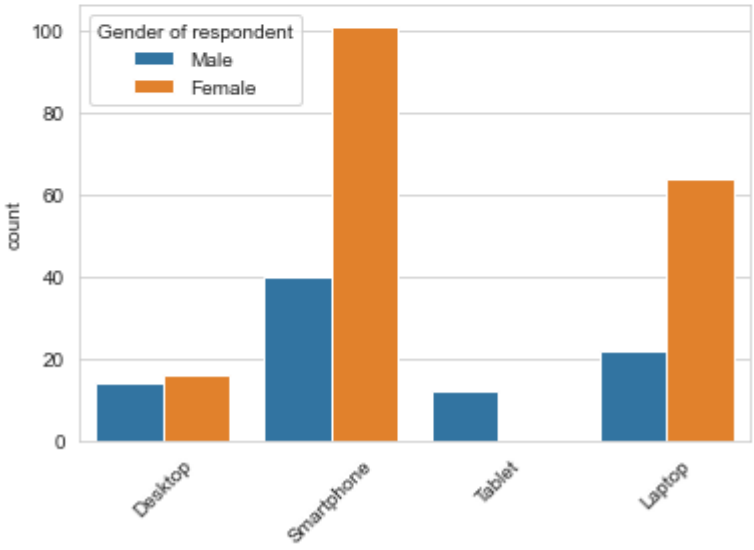
Since How Long You are Shopping Online ?



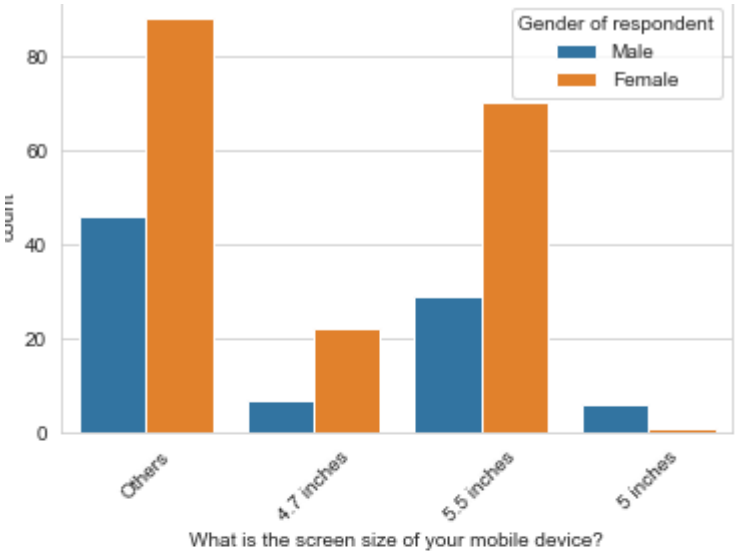
How many times you have made an online purchase in the past year?



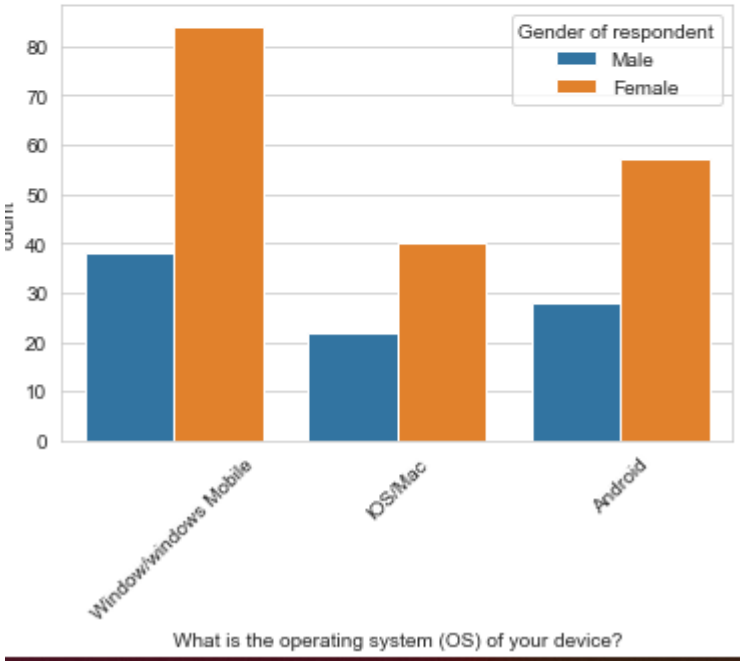
How do you access the internet while shopping on-line?



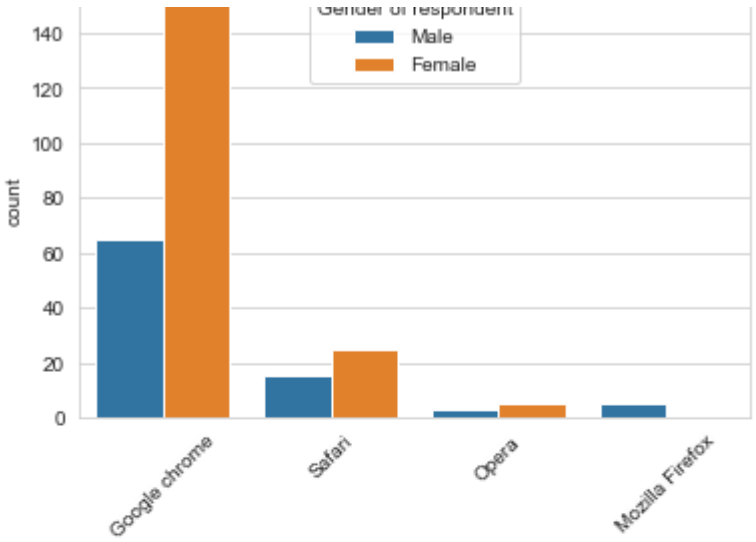
Which device do you use to access the online shopping?



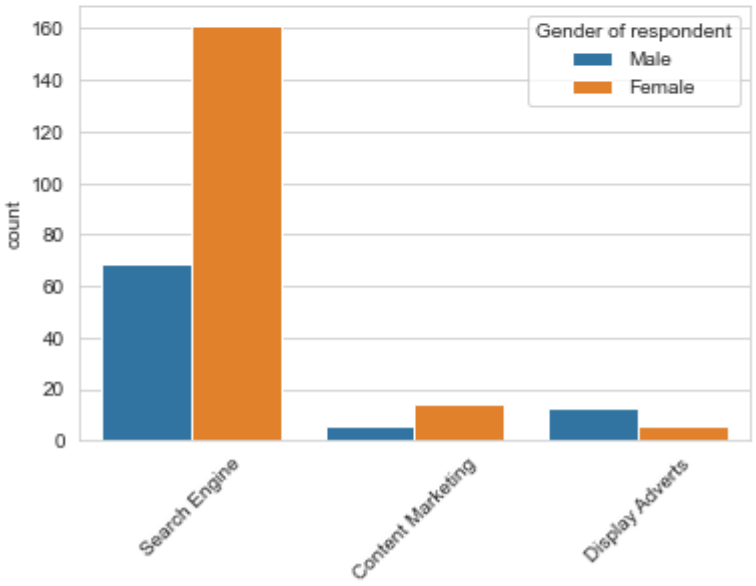
What is the screen size of your mobile device?



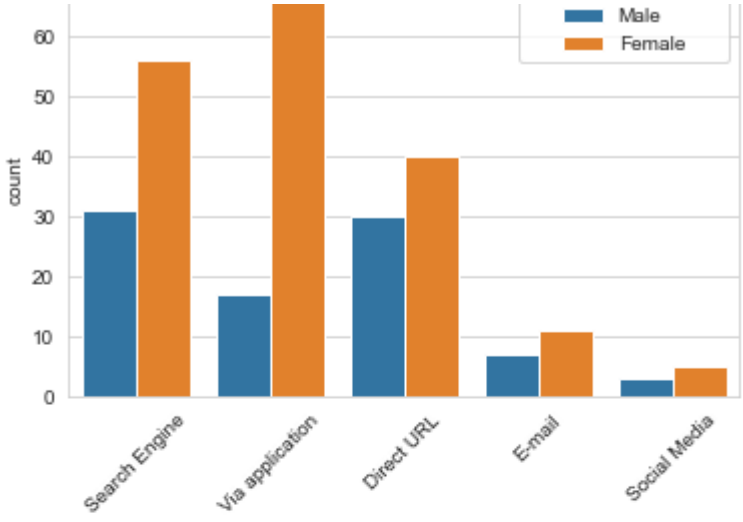
What is the operating system (OS) of your device?



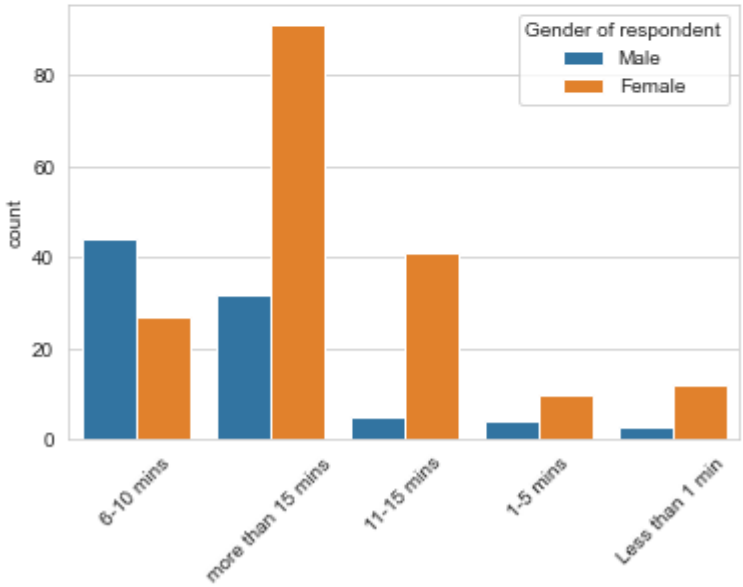
What browser do you run on your device to access the website?



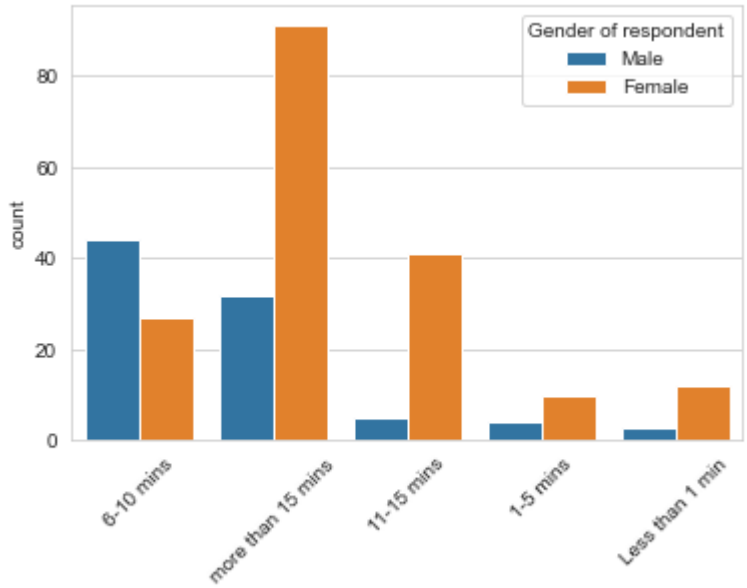
Which channel did you follow to arrive at your favorite online store for the first time?



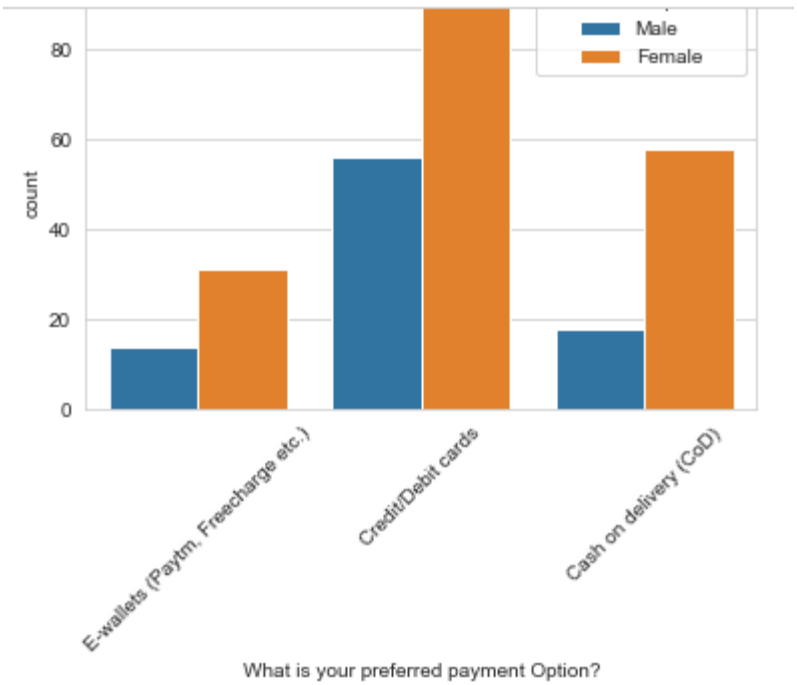
After first visit, how do you reach the online retail store?



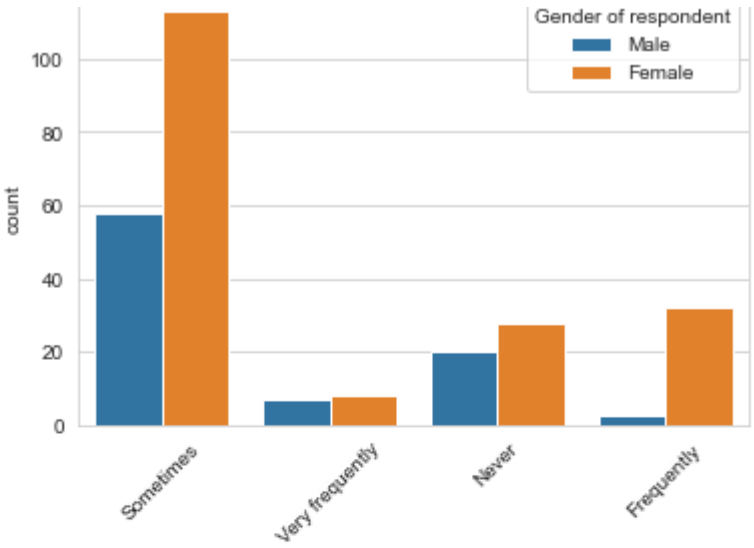
How much time do you explore the e- retail store before making a purchase decision?



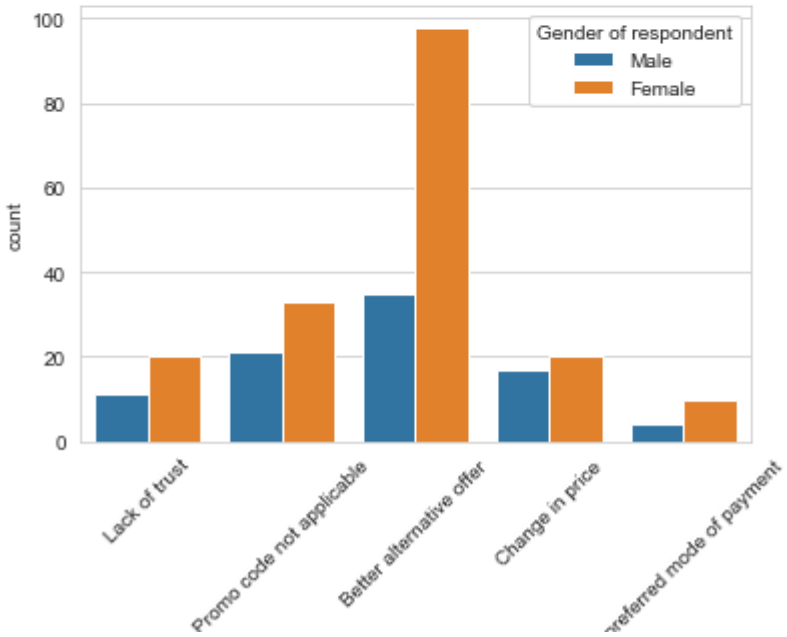
How much time do you explore the e- retail store before making a purchase decision?

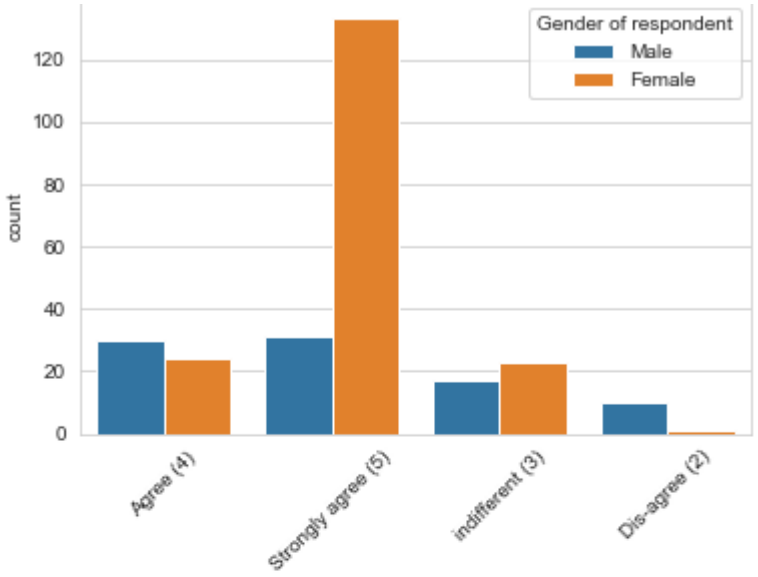


What is your preferred payment Option?

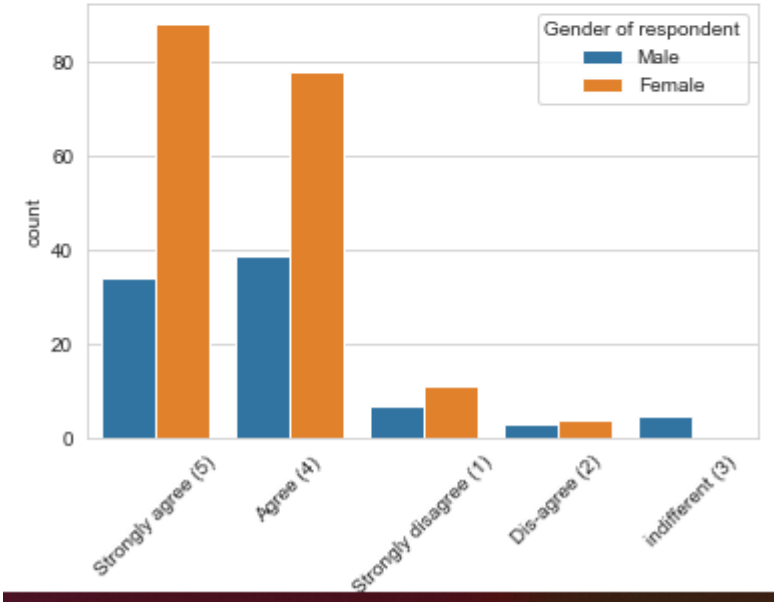


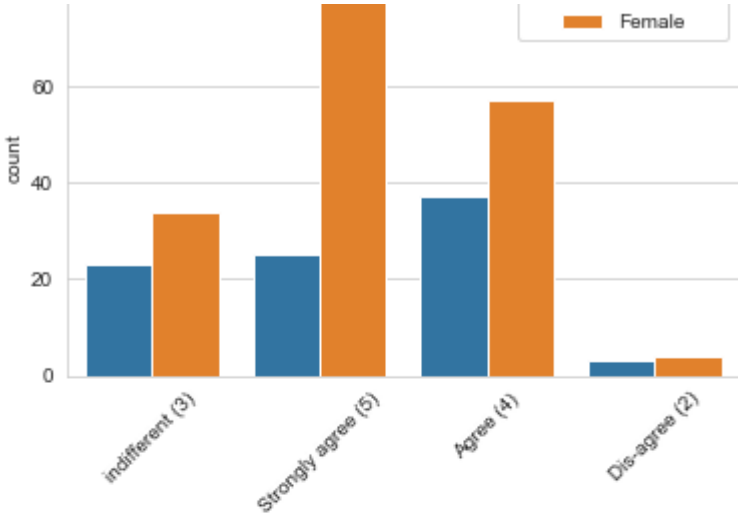
How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart'



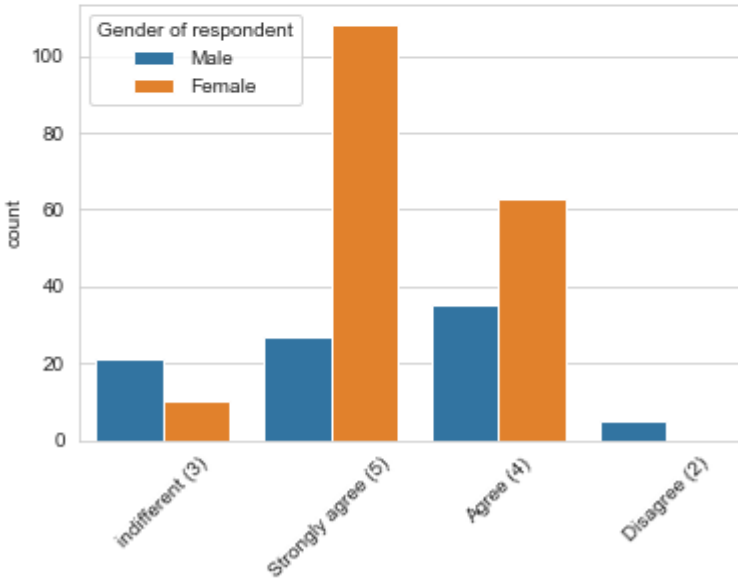


Net Benefit derived from shopping online can lead to users satisfaction

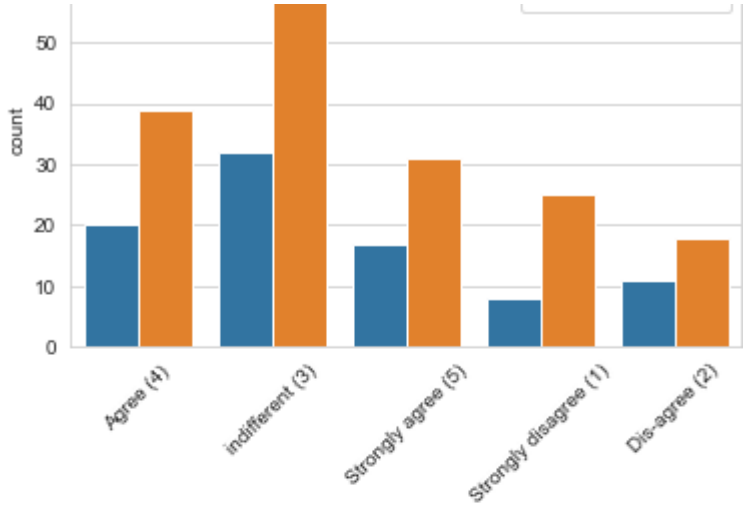




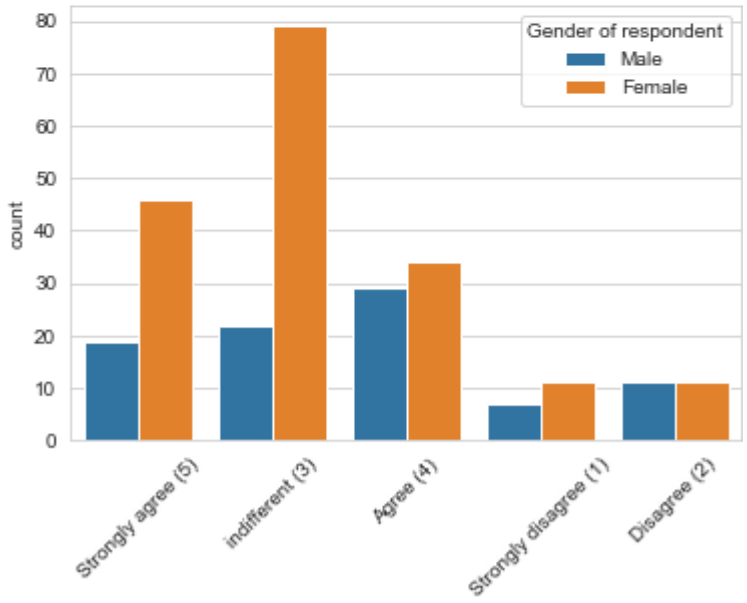
Offering a wide variety of listed product in several category



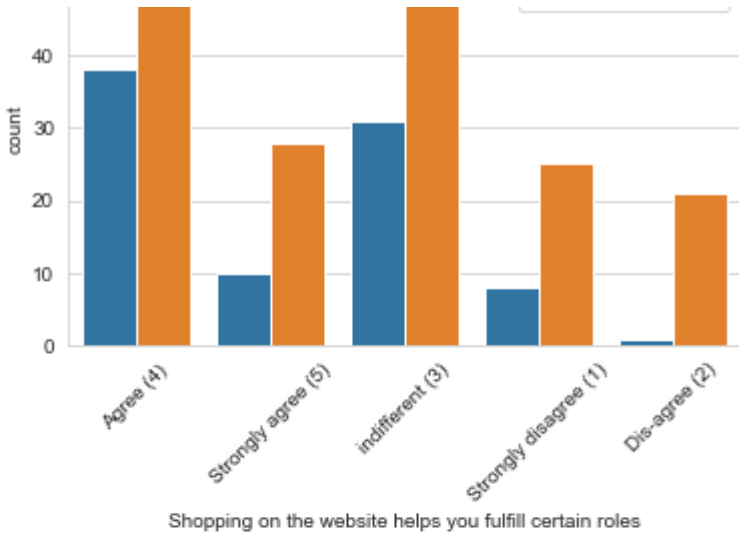
Provision of complete and relevant product information



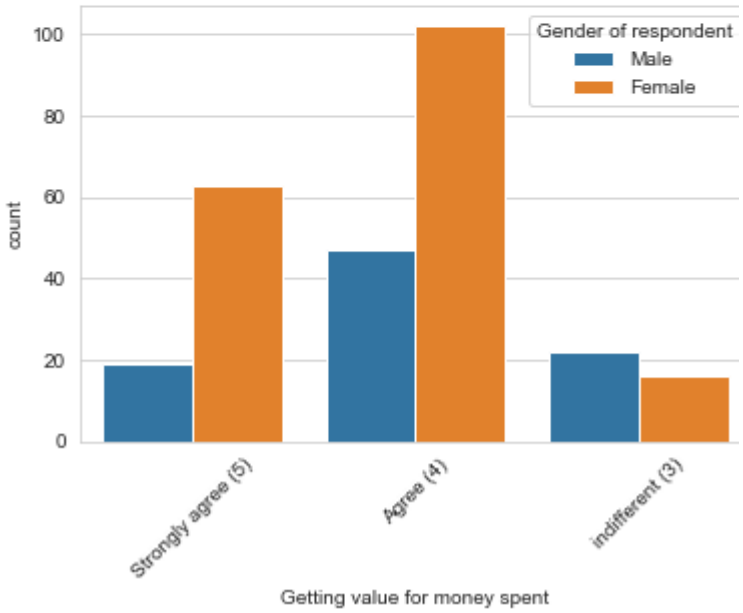
Shopping on your preferred e-tailer enhances your social status



You feel gratification shopping on your favorite e-tailer



Shopping on the website helps you fulfill certain roles



Getting value for money spent

OBSERVATION:

1.We can see that women respondent are more as per the different age group, may be data collection focussed on woman groups.

2.Female respondents are more from Greater Noida and bangalore.It is covering more on the northern part.

3.Male respondents are more from Delhi and Noida.

4.Female respondent are shopping online for more than 4 years.

5.Female respondents are using mobile internet and wifi the most. They are using smartphone and laptop the most. They use more debits/credits for payment option. They prefer to use search engine or app rather than url.

6.Women spend more time than men during online shopping and the time is mostly more than 15 mins.

7.Women too compare the products with other websites and is one of the reasons to abandon the cart without shopping.

8.Woman strongly belief that site design,merchandising,conviniece,security,responsiveness,trust,serviceability,choice should be taken care of for better prospective of online shopping.

9.More women disagree that online shopping is a kind of adventure,fulfills certain roles,feeling of social status. So websites need to work towards giving real time experience as this can be a big marketing strategy.

10.Feedbacks will be analysed later.

Bivariate Analysis

Bivariate analysis is one of the statistical analysis where two variables are observed. One variable here is dependent while the other is independent. we can mention the types of bivariate data analysis:

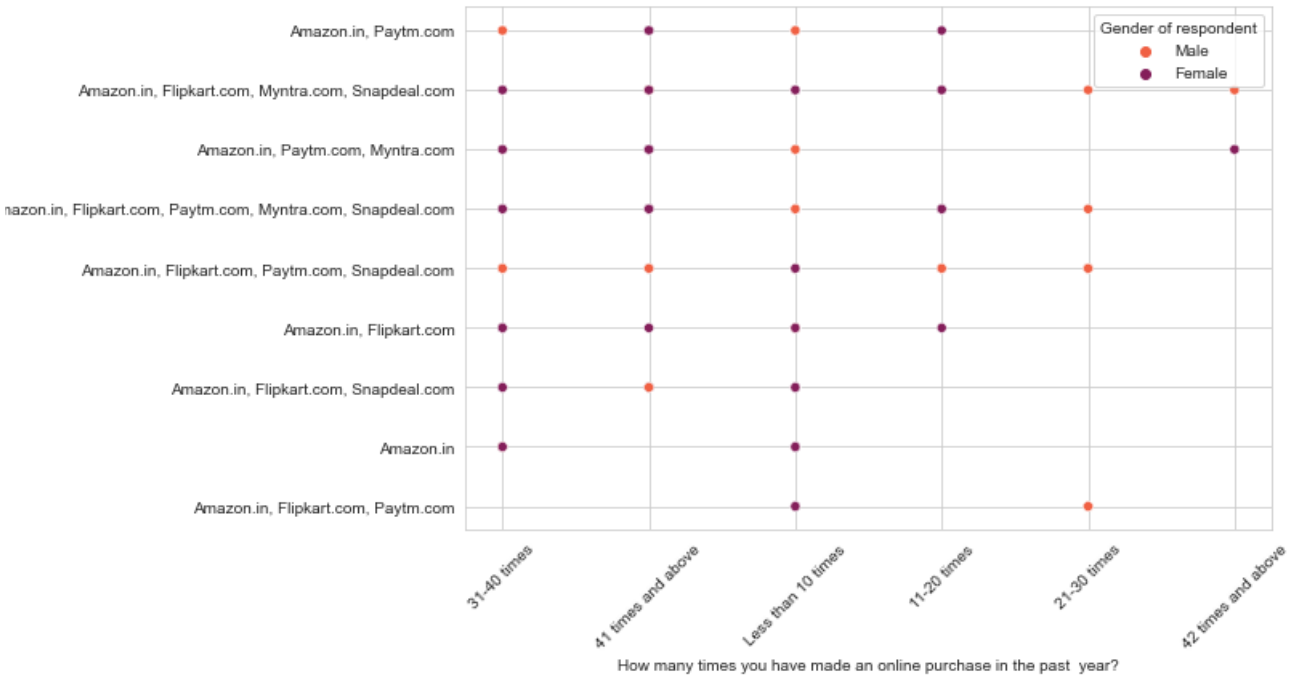
1. **Numerical and Numerical** – In this type, both the variables of bivariate data, independent and dependent, are having numerical values.
2. **Categorical and Categorical** – When both the variables are categorical.
3. **Numerical and Categorical** – When one variable is numerical and one is categorical.

So I have used stripplot ,scatterplot to analyse the relationship between variable.Below is the code snippets.

```
plt.figure(figsize=(10,3))
sns.stripplot(df['Why did you abandon the "Bag", "Shopping Cart"?'],
              df['From the following, tick any (or all) of the online retailers you have shopped from;'])
```

Comments: Thus we see that flipkart,amazon and paytm customers abondon the bag/shopping cart due to better alternative offer or promo code not applicable.So this can result in mistrust.So we need to retain the customers by introducing some cashback/offers.

```
plt.figure(figsize=(9,6))
sns.scatterplot(df['How many times you have made an online purchase in the past  year?'],
                df['From the following, tick any (or all) of the online retailers you have shopped from;'],hue='Gender of respondent',data=df,palette
plt.xticks(rotation=45)
```



Comments:

Thus we can see that woman respondent are more interested for repeat purchase than men respondent. They have been doing repeat purchase for more than 31-40 times from all the retailers. some of the woman respondent who shop for 21-30 times and 11-20 times a year seem to exclude myntra.

Now I have divide positive feedback and negative feedback into separate dataframe and analyse the same based on different retailers.

We can see that after column 47, there are both positive and negative feedbacks of the websites, which are given by the respondents.We will be assesed those data by using iloc function.

```
#using iloc function to extract the positive and negative feedbacks
feedback=df.iloc[:,47:]
feedback
```

	From the following, tick any (or all) of the online retailers you have shopped from;	Easy to use website or application	Visual appealing web-page layout	Wild variety of product on offer	Complete, relevant description information of products	Fast loading website speed of website and application	Reliability of the website or application	Quickness to complete purchase	Availability of several payment options	Speedy order delivery	Privacy of customers' information	Security of customer financial information	Trus
0	Amazon.in, Paytm.com	Paytm.com	Flipkart.com	Flipkart.com	Snapdeal.com	Snapdeal.com	Paytm.com	Paytm.com	Patym.com	Amazon.in	Amazon.in	Amazon.in	

Positive Feedback:

```
#dropping the negative feedbacks and creating dataframe positive feedbacks.
#A separate dataframe for displaying the positive feedback
df_positive=feedback.drop(["Longer time to get logged in (promotion, sales period)",
                   "Longer time in displaying graphics and photos (promotion, sales period)",
                   "Late declaration of price (promotion, sales period)",
                   "Longer page loading time (promotion, sales period)",
                   "Limited mode of payment on most products (promotion, sales period)",
                   "Longer delivery period", "Frequent disruption when moving from one page to another"], axis=1)
df_positive
```

	From the following, tick any (or all) of the online retailers you have shopped from;	Easy to use website or application	Visual appealing web-page layout	Wild variety of product on offer	Complete, relevant description information of products	Fast loading website speed of website and application	Reliability of the website or application	Quickness to complete purchase	Availability of several payment options	Speedy order delivery	Privacy of customers' information	Security of customer financial information	Trus
0	Amazon.in, Paytm.com	Paytm.com	Flipkart.com	Flipkart.com	Snapdeal.com	Snapdeal.com	Paytm.com	Paytm.com	Patym.com	Amazon.in	Amazon.in	Amazon.in	
	Amazon.in,	Amazon.in,			Amazon.in,	Amazon.in,		Amazon.com,	Amazon.in,				

Thus we see positive feedback have been separated out and shape of positive feedback is 269 rows and 17 columns. Also used value_counts for positive feedback ,some of are mentioned below:-

```
: df_positive.shape

: (269, 17)

: for i in df_positive.columns:
      print(i)
      print(df_positive[i].value_counts())
      print("\n")
```

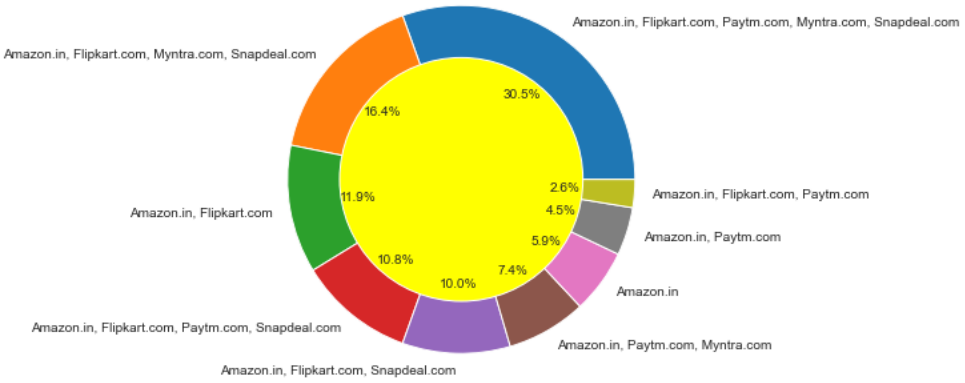
```
Easy to use website or application
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    64
Amazon.in, Flipkart.com                                         44
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               44
Amazon.in                                                       29
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                22
Amazon.in, Paytm.com, Myntra.com                                20
Amazon.in, Flipkart.com, Myntra.com                             19
Paytm.com                                                       12
Flipkart.com                                                     8
Amazon.in, Paytm.com                                             7
Name: Easy to use website or application, dtype: int64


Visual appealing web-page layout
Amazon.in, Flipkart.com                                         87
Amazon.in                                                       44
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    36
Amazon.in, Paytm.com, Myntra.com                                20
Amazon.in, Myntra.com                                           15
Myntra.com                                                      15
Flipkart.com, Myntra.com                                        15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               14
Flipkart.com                                                    12
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                11
Name: Visual appealing web-page layout, dtype: int64


Wild variety of product on offer
Amazon.in, Flipkart.com                                 130
Amazon.in                                                43
Amazon.in, Myntra.com                                    20
Myntra.com                                               15
Flipkart.com, Myntra.com                                 15
```

```
Wild variety of product on offer
Amazon.in, Flipkart.com                                 130
Amazon.in                                                43
Amazon.in, Myntra.com                                    20
Myntra.com                                               15
Flipkart.com, Myntra.com                                 15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com        14
Amazon.in, Flipkart.com, Paytm.com                       13
Flipkart.com                                             12
Paytm.com                                                 7
Name: Wild variety of product on offer, dtype: int64


Complete, relevant description information of products
Amazon.in, Flipkart.com                                          100
Amazon.in                                                         43
Amazon.in, Flipkart.com, Paytm.com                                24
Amazon.in, Paytm.com, Myntra.com                                  20
Amazon.in, Flipkart.com, Myntra.com                               15
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com      15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                 14
Snapdeal.com                                                      12
Flipkart.com, Snapdeal.com                                        11
Flipkart.com                                                       8
Amazon.in, Flipkart.com, Snapdeal.com                              7
Name: Complete, relevant description information of products, dtype: int


Fast loading website speed of website and application
Amazon.in                                                        51
Amazon.in, Paytm.com                                             44
Amazon.in, Flipkart.com, Myntra.com                              30
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com     30
Amazon.in, Flipkart.com                                          30
Amazon.in, Flipkart.com, Snapdeal.com                            25
Amazon.in, Flipkart.com, Paytm.com                               25
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                14
Snapdeal.com                                                     12
```

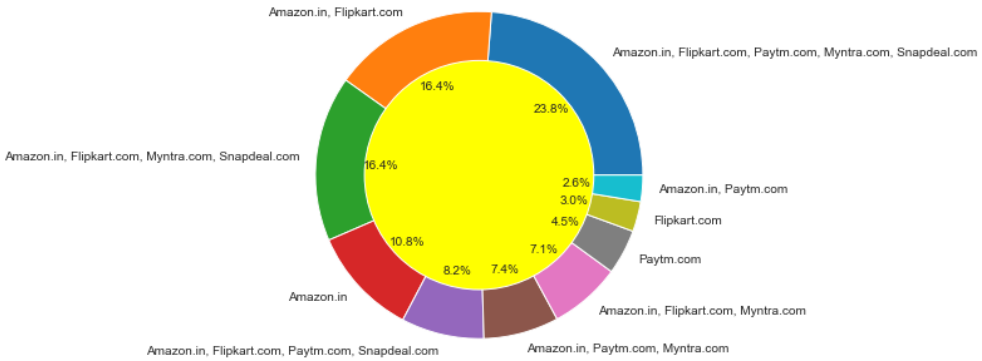
```
Reliability of the website or application
Amazon.in                                              61
Amazon.in, Flipkart.com                                50
Amazon.in, Flipkart.com, Paytm.com                     36
Amazon.in, Paytm.com, Myntra.com                       35
Amazon.in, Flipkart.com, Snapdeal.com                  18
Flipkart.com                                           15
Myntra.com                                             15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com      14
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com       13
Paytm.com                                              12
Name: Reliability of the website or application, dtype: int64


Quickness to complete purchase
Amazon.com                                                    66
Amazon.com, Flipkart.com, Paytm.com                           47
Amazon.com, Flipkart.com                                      37
Amazon.com, Flipkart.com, Myntra.com                          30
Paytm.com                                                     25
Amazon.com, Paytm.com, Myntra.com                             20
Amazon.com, Flipkart.com, Paytm.com, Myntra.com, Snapdeal     15
Flipkart.com                                                  15
Flipkart.com, Myntra.com, Snapdeal                            14
Name: Quickness to complete purchase, dtype: int64


Availability of several payment options
Amazon.in, Flipkart.com                                         65
Amazon.in, Flipkart.com, Myntra.com                             40
Amazon.in, Flipkart.com, Patym.com, Myntra.com, Snapdeal.com    39
Amazon.in                                                       23
Patym.com, Myntra.com                                           20
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               19
Amazon.in, Flipkart.com, Snapdeal.com                           18
Flipkart.com, Myntra.com, Snapdeal.com                          14
Patym.com                                                       12
```

Next I have used pie-plot to analyse the positive feedback ,codes used as below:

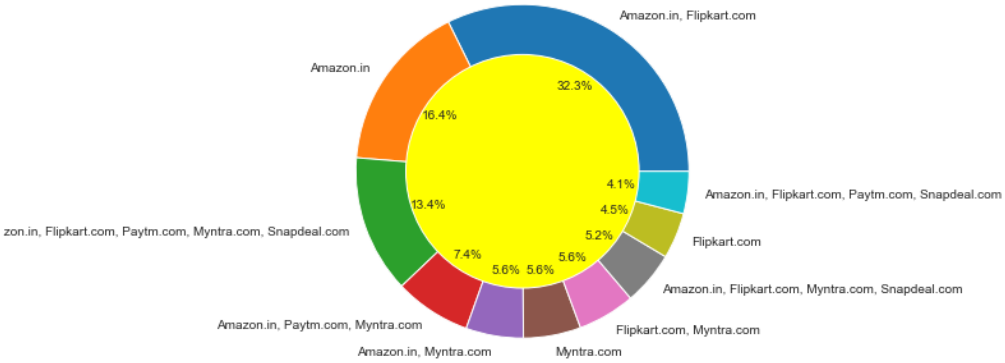
```
for i in df_positive:
        plt.figure(figsize=(8,6))
        df[i].value_counts().plot.pie(autopct='%1.1f%%')
        centre=plt.Circle((0,0),0.7,fc='yellow')
        fig=plt.gcf()
        fig.gca().add_artist(centre)
        plt.xlabel(i)
        plt.ylabel('')
        plt.figure()
```



From the following, tick any (or all) of the online retailers you have shopped from;

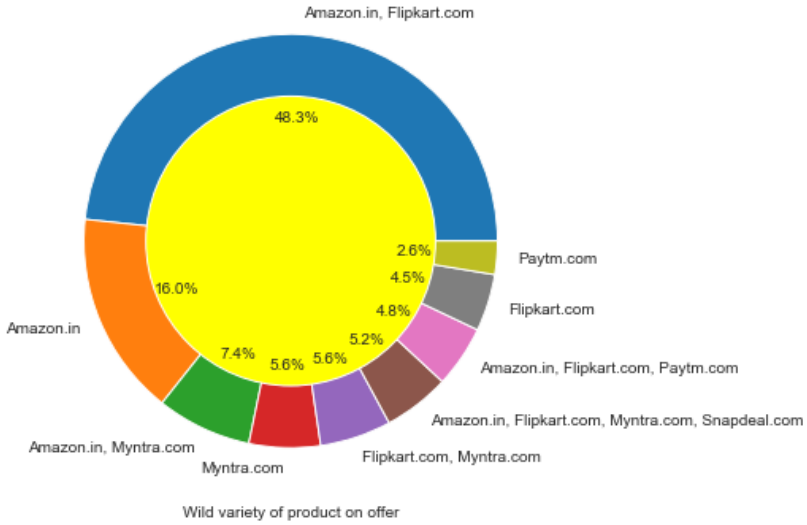


Easy to use website or application

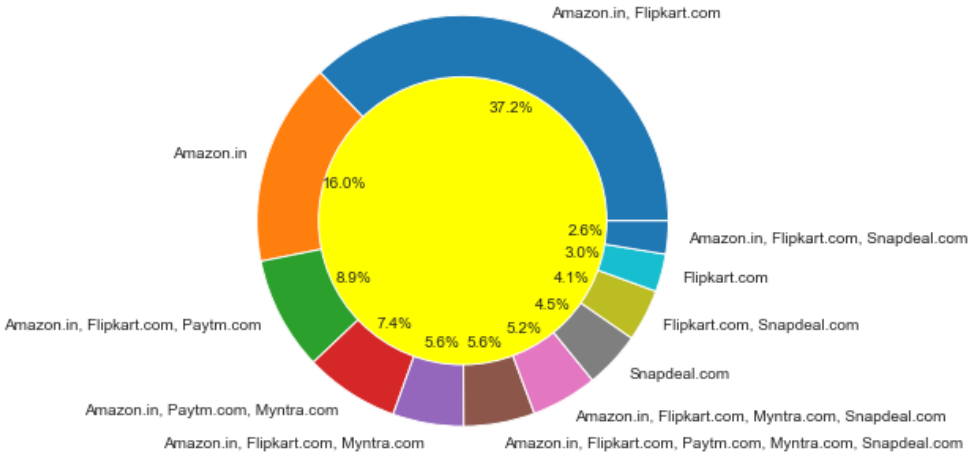


Visual appealing web-page layout

```
gure size 432x288 with 0 Axes>
```

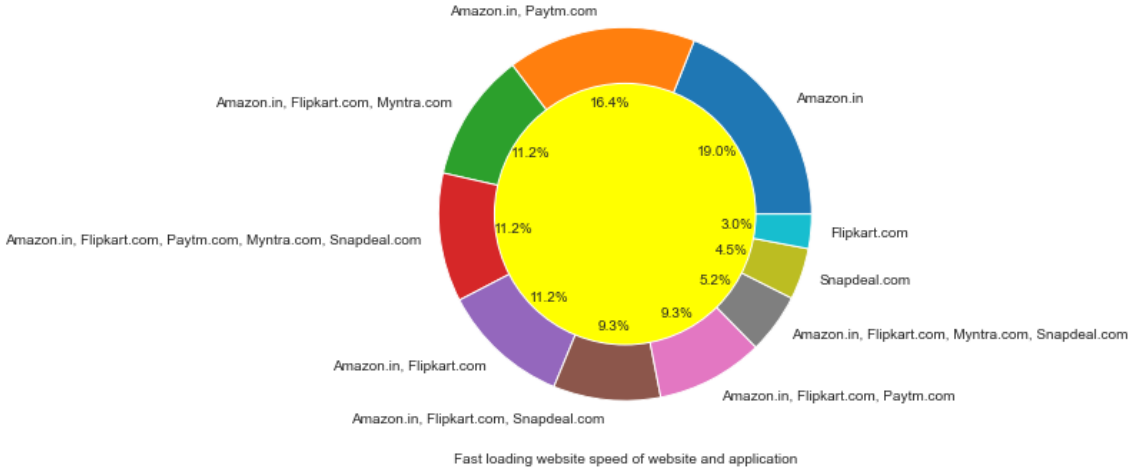


Wild variety of product on offer

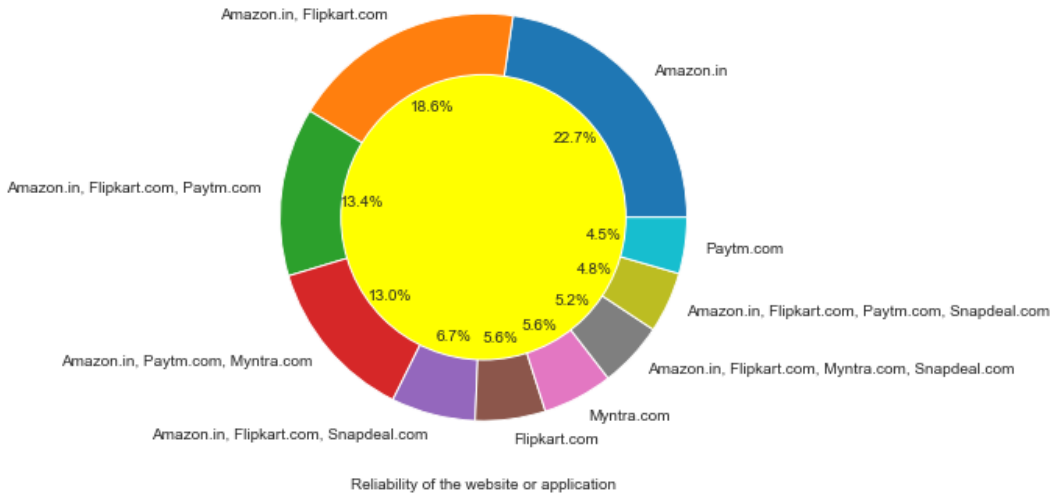


Complete, relevant description information of products

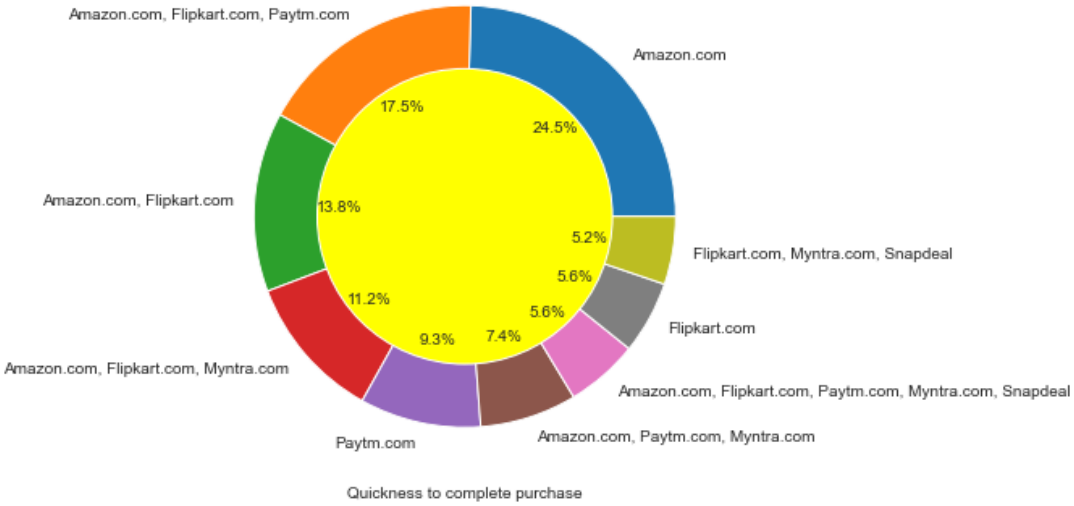
```
<Figure size 432x288 with 0 Axes>
```



<Figure size 432x288 with 0 Axes>



<Figure size 432x288 with 0 Axes>

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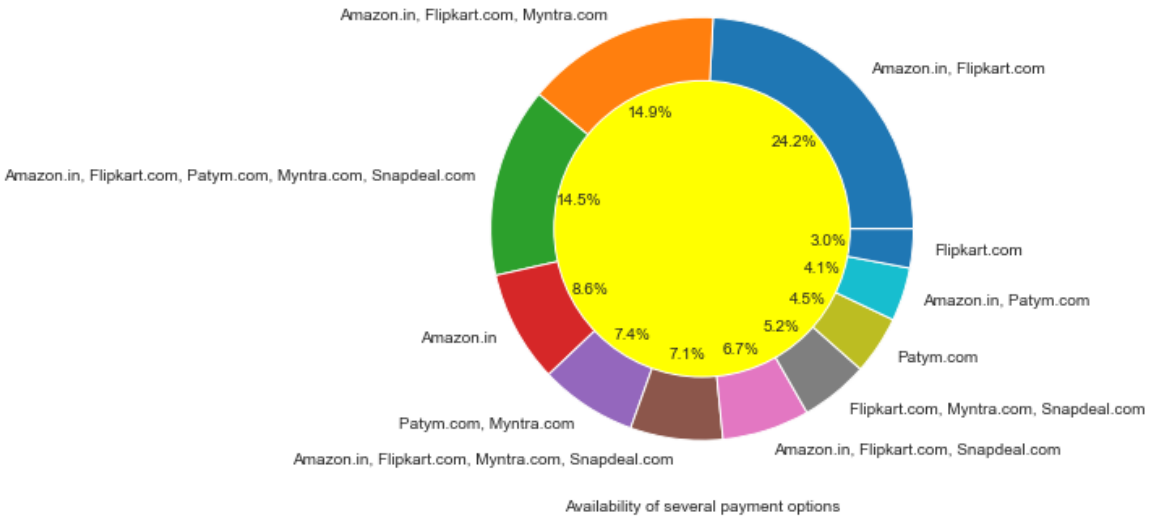
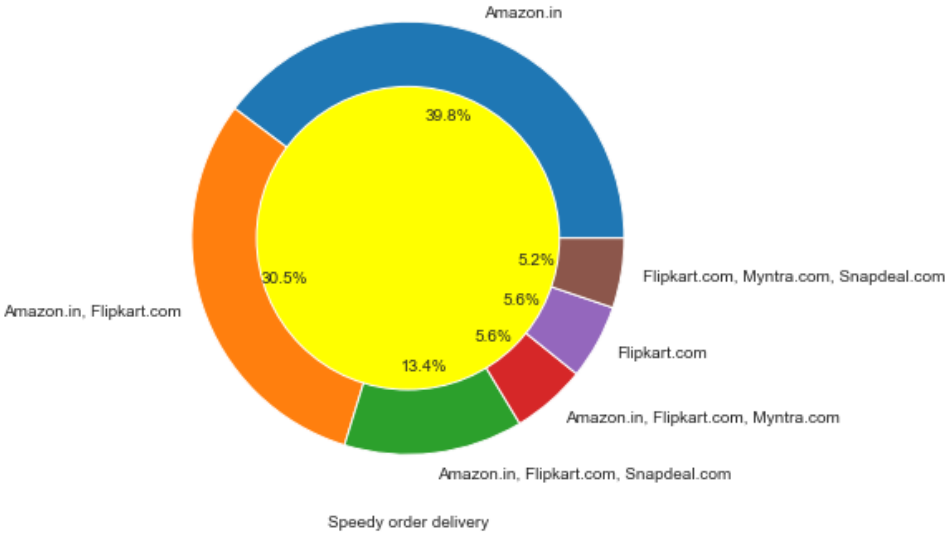
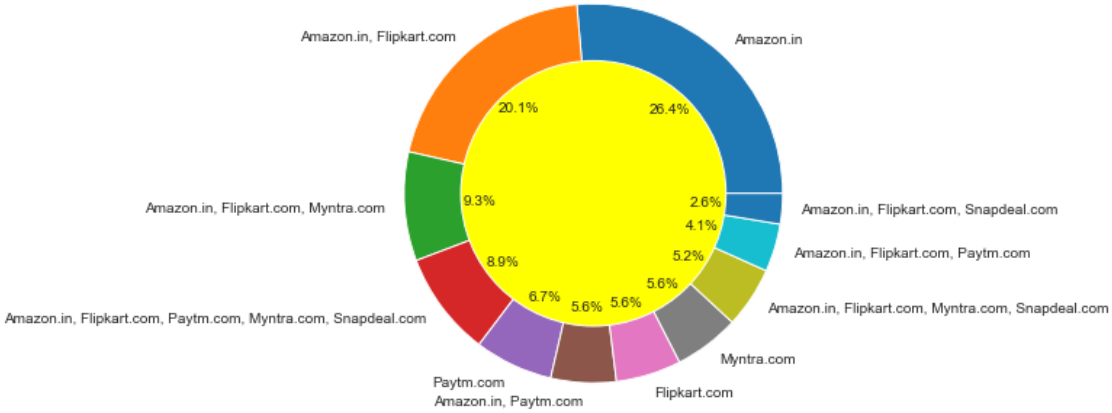


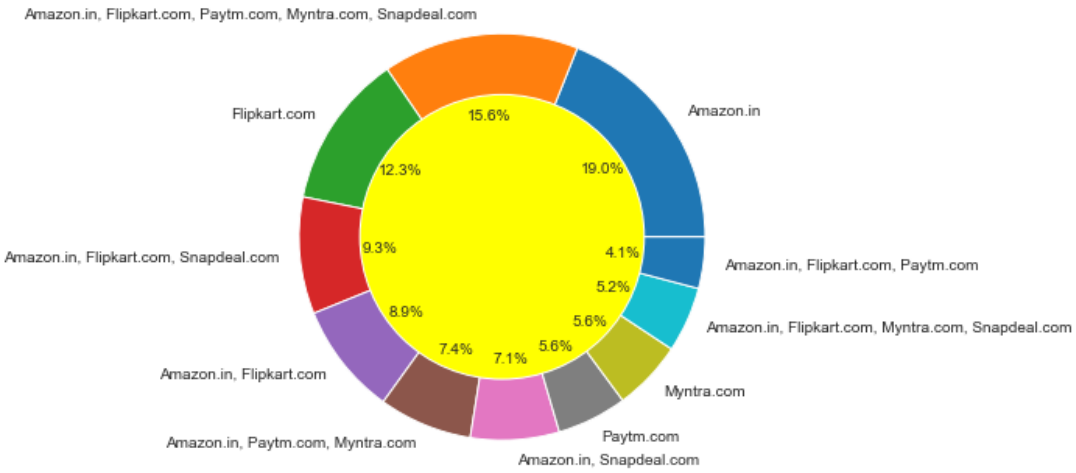


Speedy order delivery

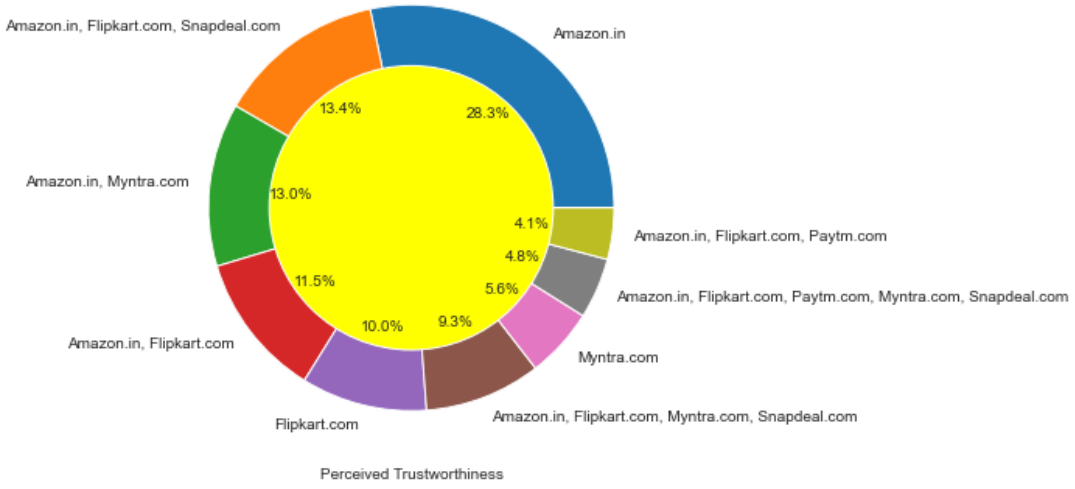


Privacy of customers' information

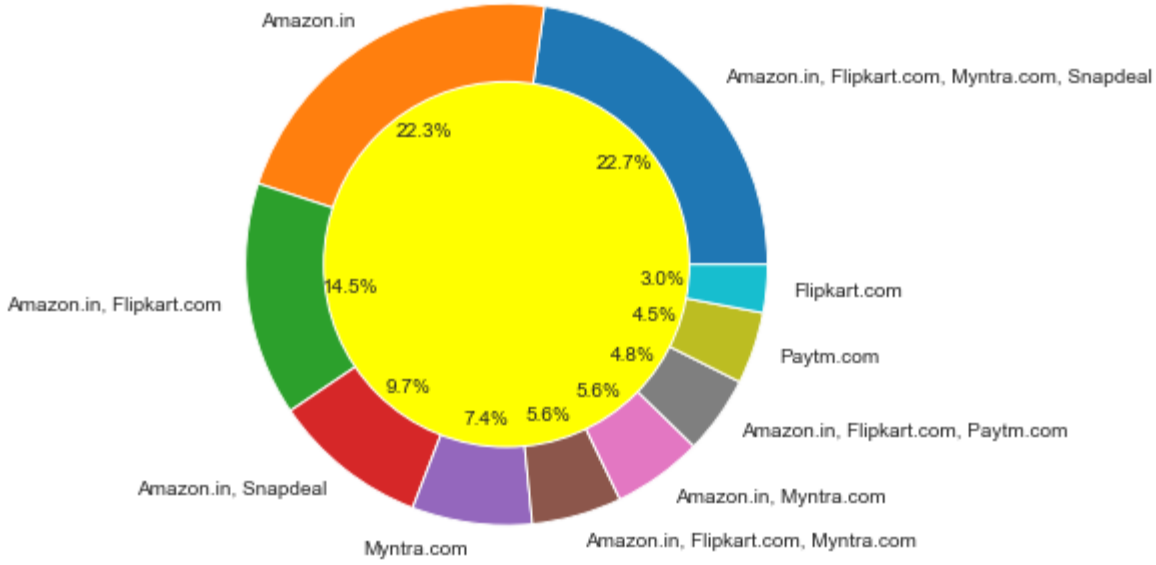
```
<Figure size 432x288 with 0 Axes>
```



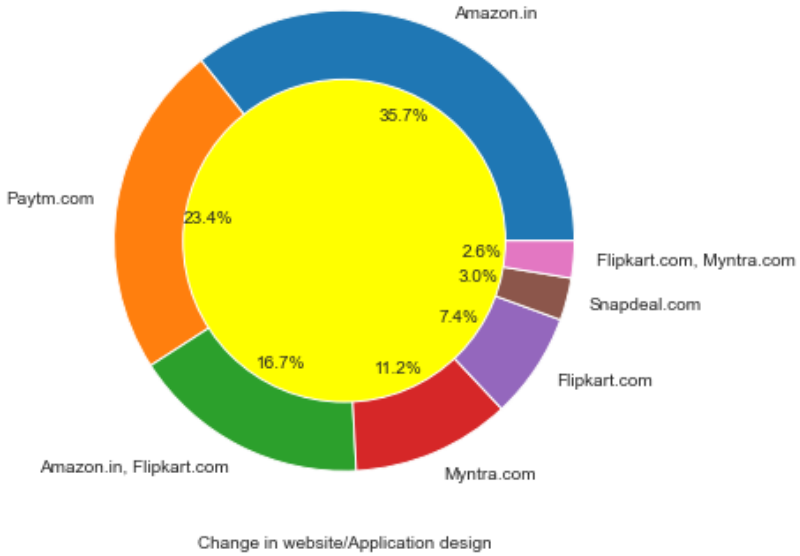
Security of customer financial information



Perceived Trustworthiness

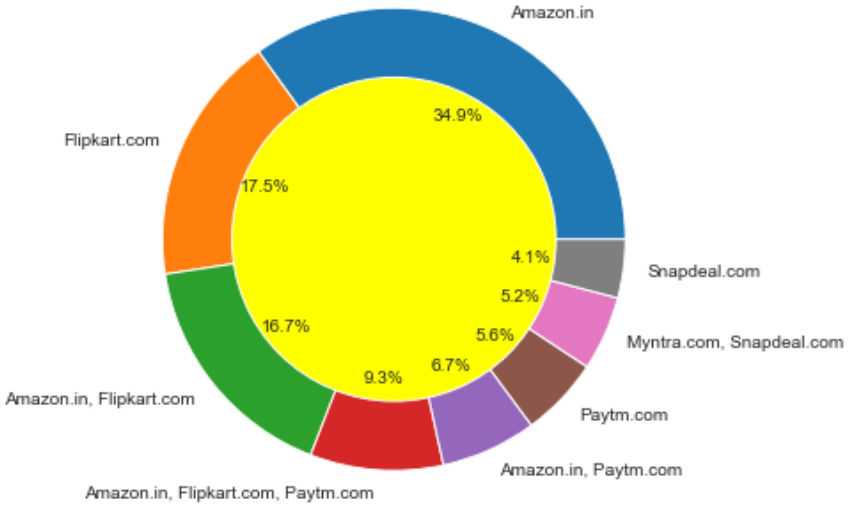


Presence of online assistance through multi-channel

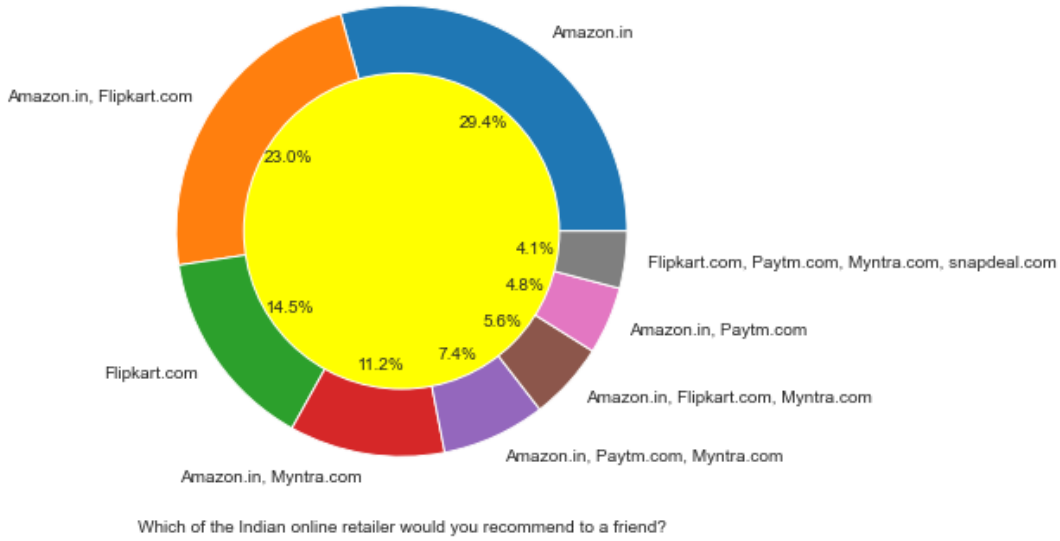


Change in website/Application design

<Figure size 432x288 with 0 Axes>



Website is as efficient as before



OBSERVATION: Thus we see that Amazon, Flipkart scored the highest votes for having all the positive points and have maintained a very good brand image followed by paytm and the myntra.

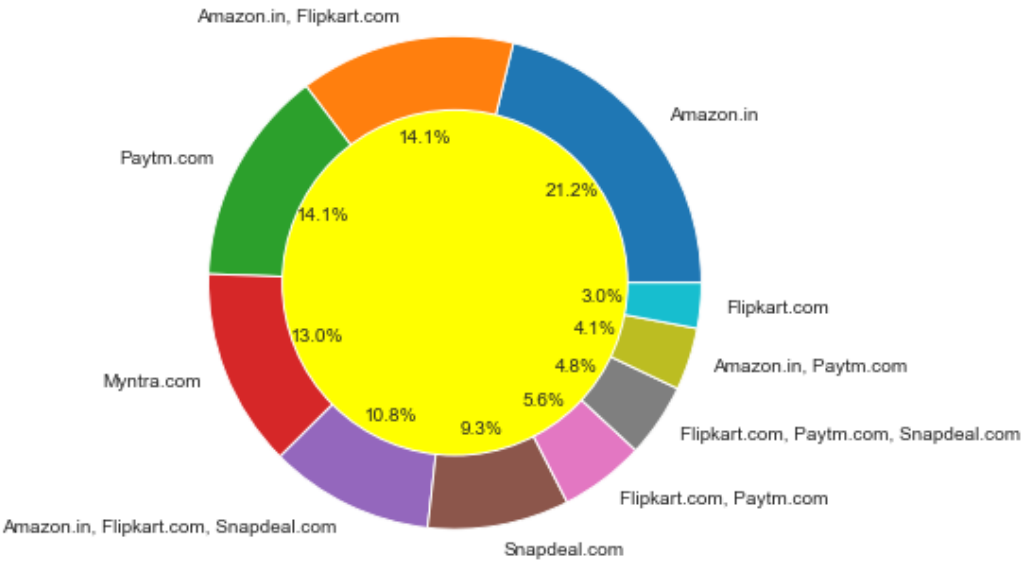
Similary ,I am analyzing the negative feedback by count value and pie plot using code as below :

```
for i in df_negative.columns:
    print(i)
    print(df_negative[i].value_counts())
    print("\n")
```

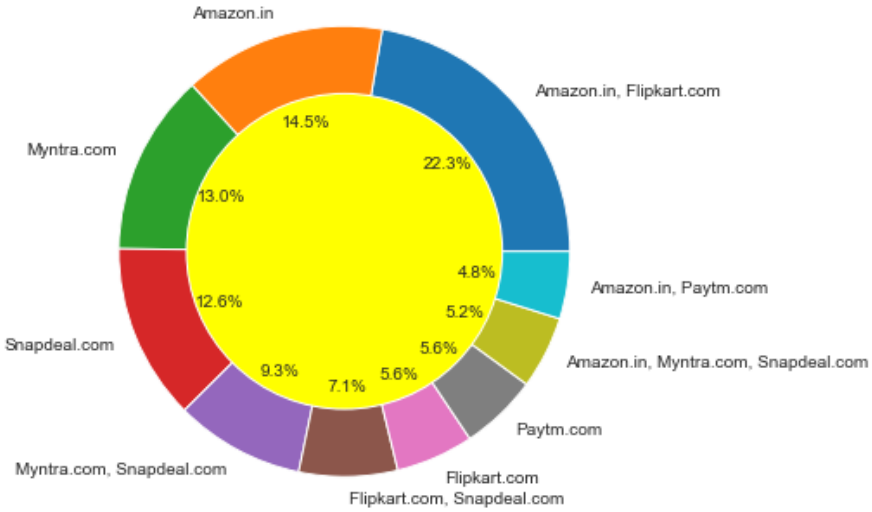
We see there are 297 rows and 7 columns of negative feedback**.**

```
for i in df_negative:
        plt.figure(figsize=(8,6))
        df[i].value_counts().plot.pie(autopct='%1.1f%%')
        centre=plt.Circle((0,0),0.7,fc='yellow')
        fig=plt.gcf()
        fig.gca().add_artist(centre)
        plt.xlabel(i)
        plt.ylabel('')
        plt.figure()
```

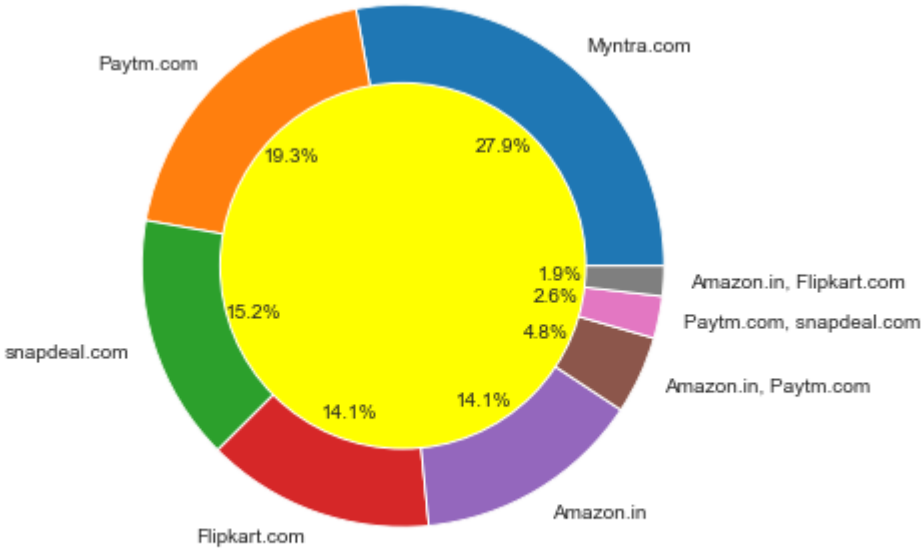
Graphs as below for pie_plot having negative feedback:



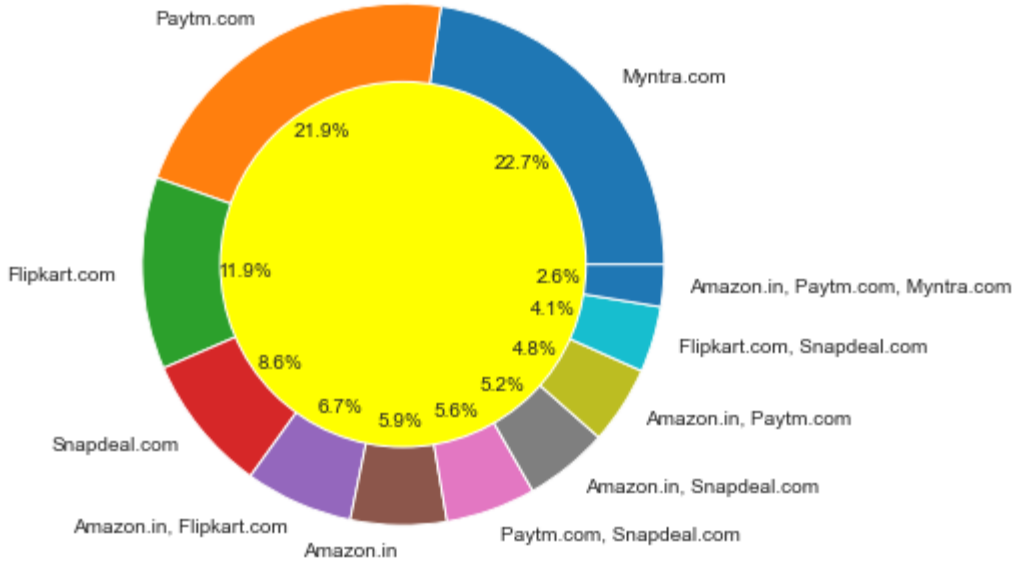
Longer time to get logged in (promotion, sales period)



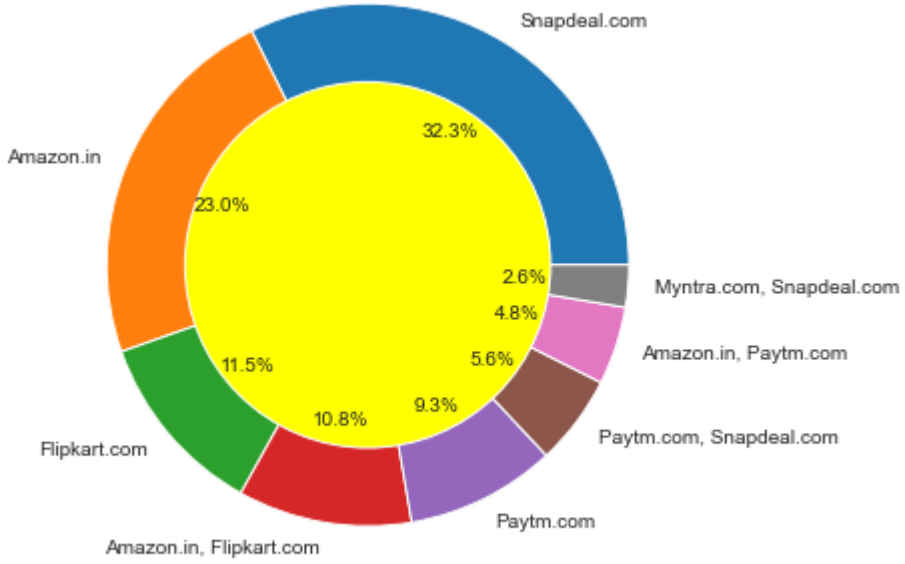
Longer time in displaying graphics and photos (promotion, sales period)



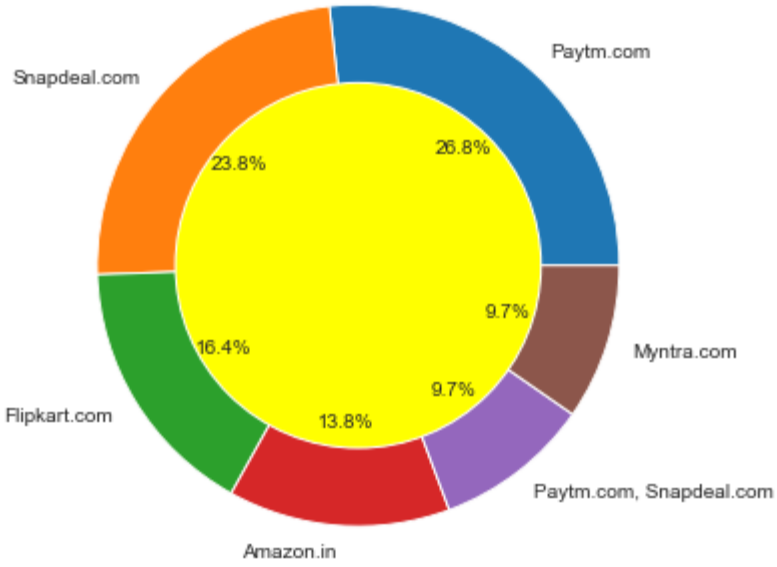
Late declaration of price (promotion, sales period)



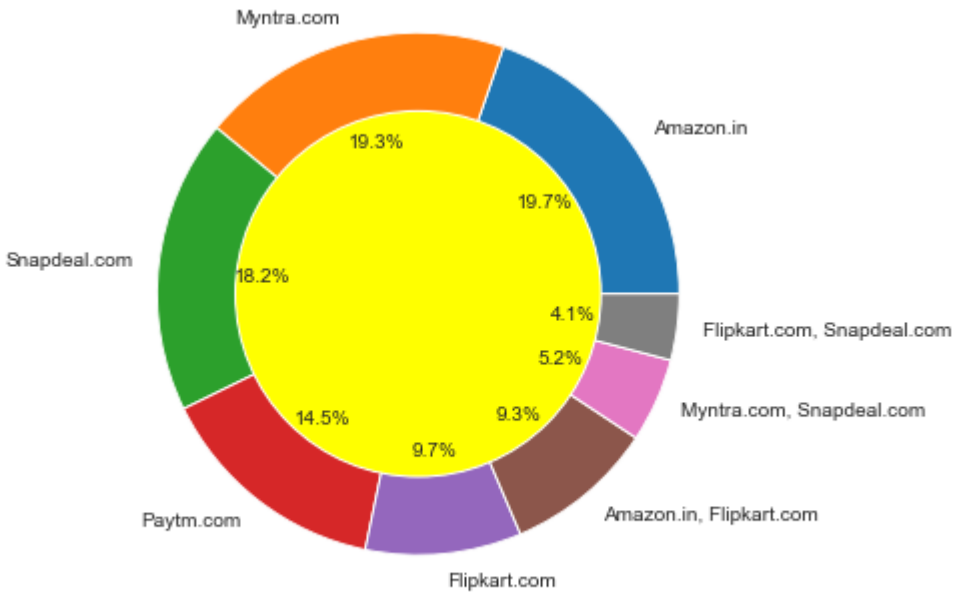
Longer page loading time (promotion, sales period)



Limited mode of payment on most products (promotion, sales period)



Longer delivery period



Frequent disruption when moving from one page to another

COMMENTS:

1.Respondents have voted 21.2 % to Amazon for longer time to get logged in followed by Paytm.

2.Respondents have voted 22.35 %to amazon and flipkart for longer time in displaying graphics and photos.

3.Respondents have voted 27.9% to Myntra for late declaration of price followed by Paytm.

4.Respondents have voted 22.7% to Myntra for longer page loading time followed by Paytm.

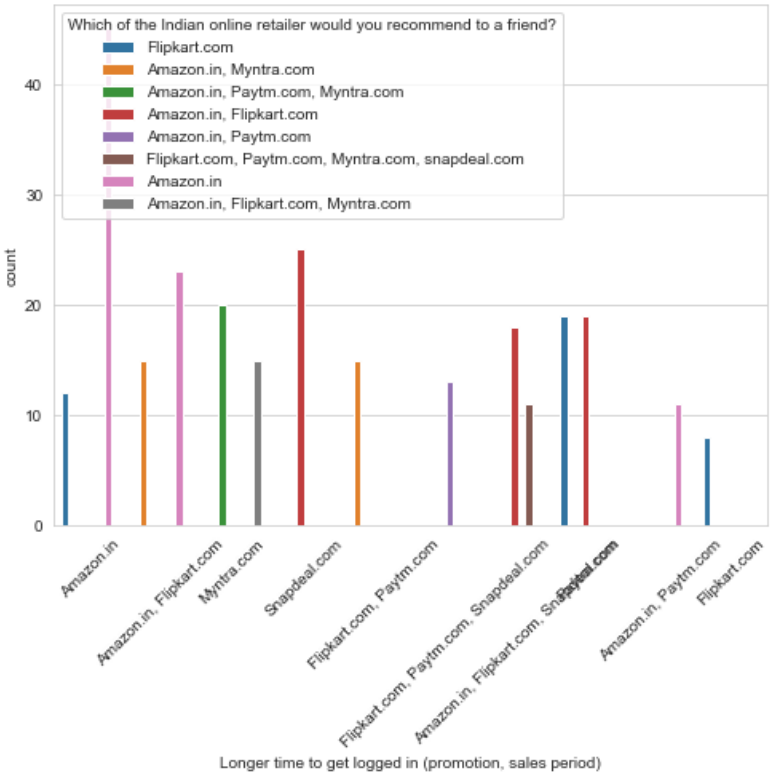
5.respondents have voted 32.3% to Snapdeal for limited mode of payment on most products.

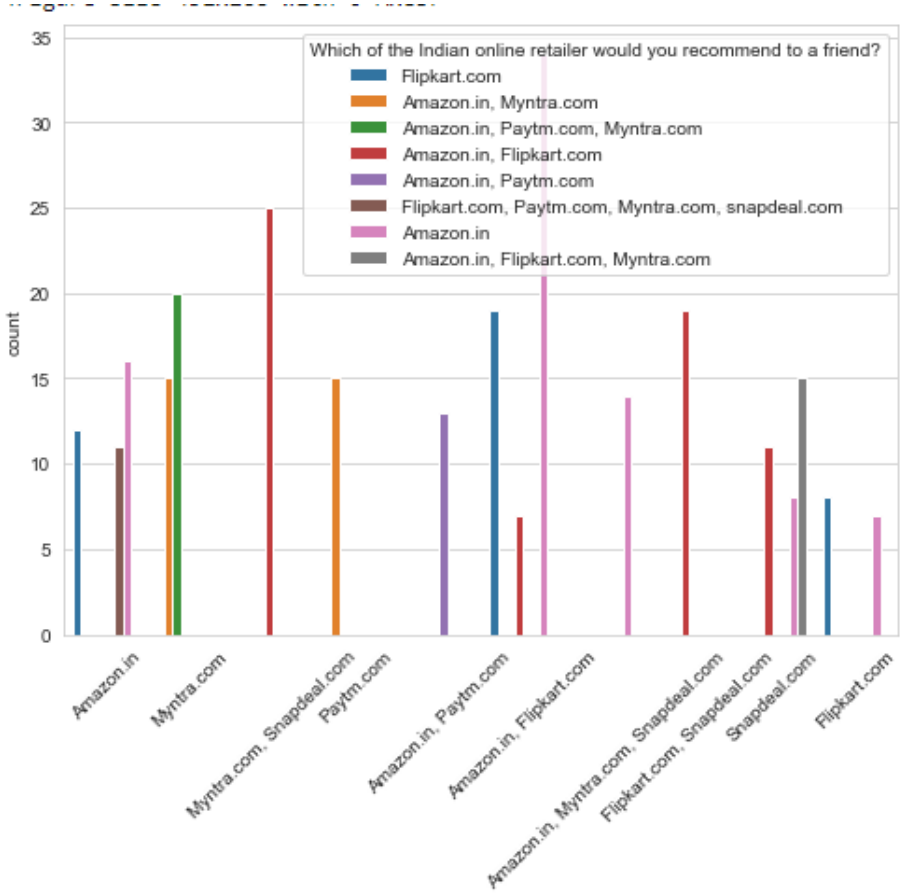
6.Respondents have voted 26% to Paytm followed by Snapdeal at 23.8% for longer delivery period.

7.Respondnets have voted 19.7% to amazon followed by 19.3% to Myntra and Snapdeal at 18.2% for frequent disruption when moving from one page to another.

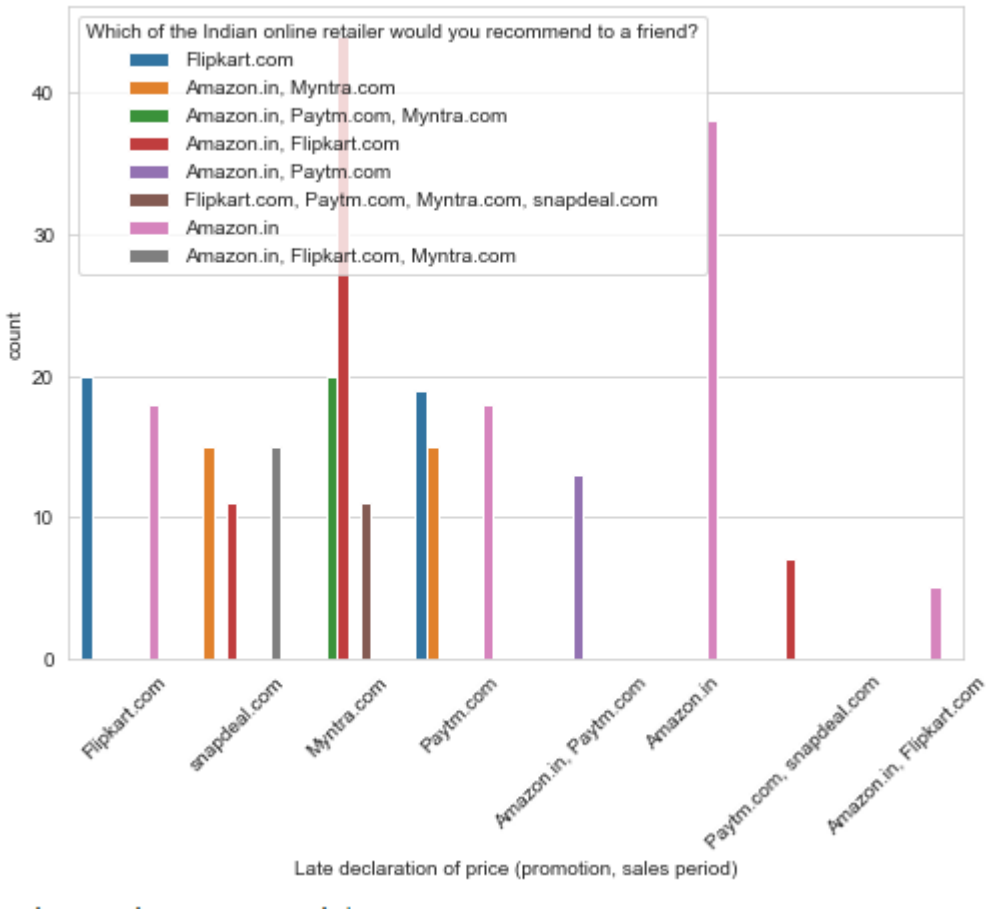
I have also used countplot based on the respondent recommendation to their friend as using below codes and graph therein :

```
for i in df_negative:
    plt.figure(figsize=(8,6))
    sns.countplot(df[i],hue=df['Which of the Indian online retailer would you recommend to a friend?'])
    plt.xticks(rotation=45)
    plt.figure()
```


Which of the Indian online retailer would you recommend to a friend?
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
count
0
10
20
30
40
Amazon.in
Amazon.in, Flipkart.com
Myntra.com
Snapdeal.com
Flipkart.com, Paytm.com
Flipkart.com, Paytm.com, Snapdeal.com
Amazon.in, Paytm.com
Flipkart.com
Longer time to get logged in (promotion, sales period)



Longer time in displaying graphics and photos (promotion, sales period)


Which of the Indian online retailer would you recommend to a friend?
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
count
0
10
20
30
40
Flipkart.com
snapdeal.com
Myntra.com
Paytm.com
Amazon.in, Paytm.com
Amazon.in
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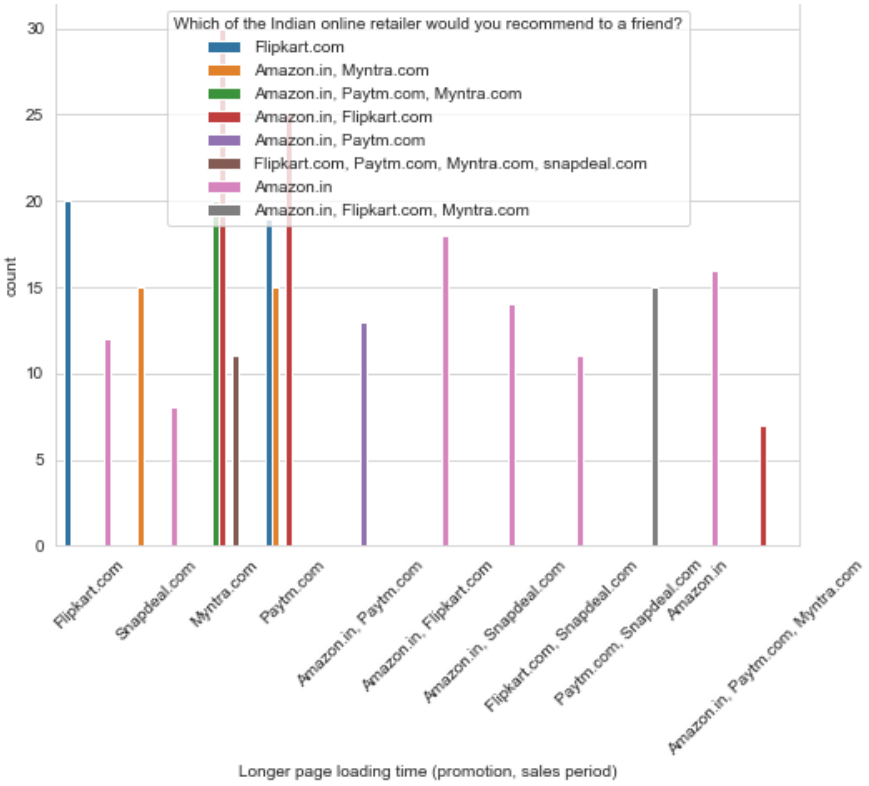
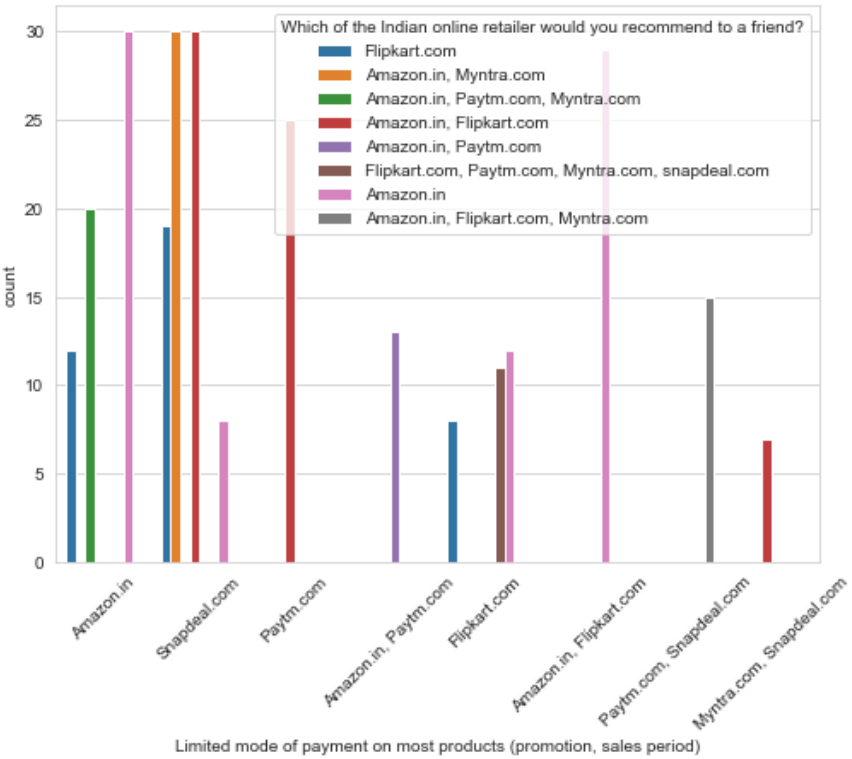
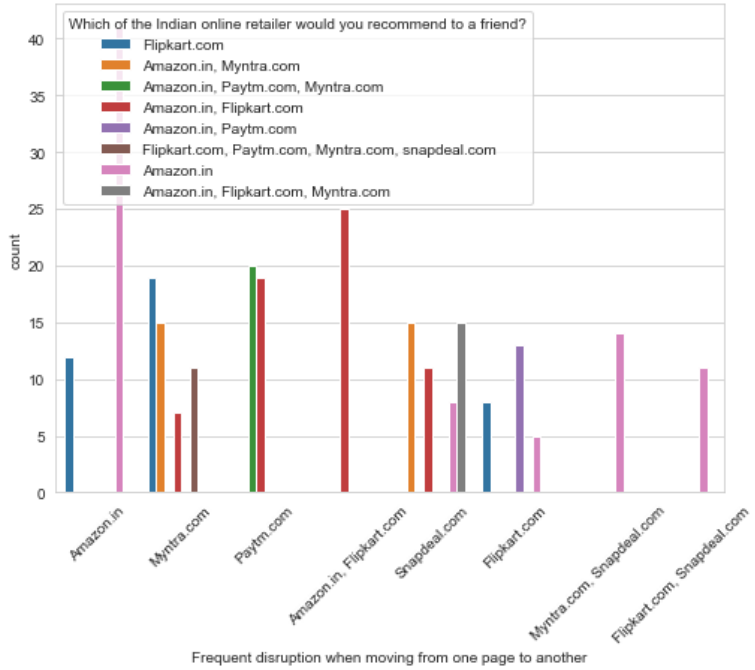
Amazon.in, Flipkart.com
Late declaration of price (promotion, sales period)



Longer page loading time (promotion, sales period)



Limited mode of payment on most products (promotion, sales period)



Customers seem to be more loyal to amazon, flipkart and paytm as even though many of them have given negative remarks about them still they would prefer and recommend these platforms to their friend.

Conclusion :

Recommendation and Suggestion

1. Amazon.com

<u>Suggestion for improvement</u>

a)Load Time for website & longer time for displaying graphics: The faster the website's load time is, the happier the customers/visitors will be. when we optimize the web page's load time, then we can expect to see improvements in user experience (UX),conversion rates, and ultimately, sales revenue.So there are online tools available which allow to test website's page speed timely and necessary steps can be taken as website load times impact conversion rates and, as a result, the business as a whole.

b)There should be timely declaration of price during promotion/sales else in no time customers can switch to other brands. Remember if you don't promote it properly in time, you're likely to miss out on opportunities.

c)Reduce the delivery time of the products: Fast and affordable shipping options is a must. By implementing a distributed inventory model, retailers can easily reduce shipping costs and transit times in order to meet customer expectations.

d)Finding ways to offer free shipping has been proven to improve sales conversations and reduce cart abandonment.

Positive feedback summary:

- Easy to use website/application.
- wide variety of product offering.
- complete and relevant description of product,
- reliability of website and perceived trust worthiness,
- several payment options and enhanced security
- Fast delivery of products.
- Presence of online assistance through multi-channels.

2. Flipkart.com

Suggestion for improvement:

a)Load time for website and longer time for displaying graphics should be decreased as explained above.

b)Declaration of prices during sales promotion should be timely and not hidden as customers will take no time to switch to other brands. Retailer can also introduce introductory price offer on releasing new product

c)Availability of more payment options to customers as this will give customers wider options for payment.

d)Reduce the delivery time of the products by improving logistic .

Positive feedback summary:

- Easy to use website/application.
- wide variety of product offering.
- complete and relevant description of product,
- reliability of website and perceived trust worthiness,
- several payment options and enhanced security
- Fast delivery of products.
- Presence of online assistance through multi-channels
- Wide variety of products to offer.

3. Myntra.com

Suggestion for improvement:

1)Longer page loading :Retailers should try to improve website loading speed by checking with online tools available and optimise the webpage speed.

2)Frequent disruption when moving from one page to another :This can cause users to bounce or leave the site and drops cu customer base massively.

3)Declaration of price should be upfront and in time.

Positive feedback summary:

- Convenient and a good website.
- Availability of several payment options.
- Faster products delivery.
- Complete information of products available.
- Reliable website or app, perceived trustworthiness and good Security.
- Wide variety of product to offer

4. Paytm.com

Suggestion for improvement:

1.Reduce the delivery time of the products during promotions by introducing variety of delivery options like same day delivery, two day delivery and choosing a good logistic company.They can also offer free delivery.

2.Retailers should avoid late declaration of prises and may follow by introducing early Bird Pricing Strategy .Early bird pricing provides savings for attendees who are willing to shop your products early, sometimes even before plans are finalized.

3.Website page loading and longer time to display graphics should be improved and taken care of.

4.Frequent disturbance is occurring while moving from one page to another.

Positive feedback summary

- Convenient to use and a good website
- Quickness to complete a purchase.
- customers feel that either web or app is reliable.
- wild variety of products on offer.
- Reliability

5. Snapdeal.com

Suggestion For Improvement

1)Reduce the delivery time of the products during promotions as expalined above.

2)Avoid giving late declaration of prices.

3)Website page loading should be improved.

4)Longer delivery period should be curtailed and improved.

5)No one has expressed to recommend snapdeal to a contact as it has the most negative feedbacks among all other websites.

Positive feedback summary:

- Convenient to use.
- financial information security.
- Presence of online assistance through multi-channels

Recommendations for e-commerce websites:E-commerce retailers may look on these parameters for improvement of their products/services which can retain their customers and attract new customers.

Information Quality: Improve e-commerce website design by optimise the product imagery, enable your customers to easily find what they need, ensure the product information is accurate, include customer remarks.

service quality: Excellence in service quality include personalized service, good return policies, complaints desks and hotlines, responsiveness. We need to take care of it as customer is king. The core task of a business is to ensure that customers come back, which can be done by delivering excellent service quality. Personalized service is a key way to retain customers, because you show them that they are more than just a source of income to you

system quality: There should not be errors in the website pages, slow loading pages as web shoppers have become more sophisticated in the knowledge of online purchasing alternatives, and more importantly, they have become less patience in with websites that are difficult to understand and used. Users expect to process the information efficiently and with little effort. Ecommerce website if ignores these facts may face risk in losing the valuable customers base. There is also the need to provide quality services free of interruptions and hindrances.

Trust : It is key factor for any retailers .If trust is there ,then the customers will repurchase a particular product or set of products in a routinized or habitual fashion.

Net benefit: Web shopping provides with the opportunity to reach more and new customers and retaining the existing ones by introducing schemes like discount offers, special deals, early bird price strategies, by inviting them to special trial for personalised experience, by giving them cashback etc

Majority of the customers are working class women and their age is between 20-40. Always bring variety of products targeting them.

Provide more customer friendly approach like fast delivery, complaint resolution, etc.

Future Scope

We recommended some suggestions for the websites to improve further in the future by analysing the dataset by using data analysis approach. We can further build models like classification models e.g Random forest classifier,Adaboost classifier,Descission Tree Classifier etc to predict the accuracy of brand recommendation by customers as the target variable and can do hyper tuning through GridsearchCV and simultaneously can do features importance.