



# **E-retail factors for customer activation and retention**

Submitted by:

**ANKIT DADARWALA**

## **ACKNOWLEDGMENT**

This includes mentioning of all the references, research papers, data sources, professionals and other resources that helped you and guided you in completion of the project.

- ❖ <https://www.kaggle.com/harshjain123/feature-engineering-from-scratch> using this website for Features selection Assumption, Statistical analysis.
- ❖ <https://www.analyticssteps.com/blogs/introduction-statistical-data-analysis> used this website for statistics theory concept and study about data set.
- ❖ <https://biznewske.com/hedonic-and-utilitarian-value-examples/> for understanding of Hedonic and Utilitarian values of E-commerce Era.
- ❖ Use Some Google.com, YouTube.com channels and Stack overflow for coding.

# INTRODUCTION

## ❖ Business Problem Framing

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

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.

## ❖ Conceptual Background of the Domain Problem

E commerce is one of the biggest market in today's era, but it was not the same before some years, Before some years ago Online markets have to struggle to retain or activate the customer's account, because customers were not ready to trust online things, they are afraid of getting cheated or not exact products received which they have seen in the photo also they are afraid of Money fraud as any online business requires the bank details and confidential information, so due to this customers are not ready to go with the online business rather than they prefer market shopping to feel the product and decrease the fear of fraudulent

But since last 2 to 3 years e commerce has drastically changed and made many changes related to the fear of the customers, E retailers have started to examine the products personally where the customers can able to see assured products due to this different products problems can reduced, also they are giving exchange option so that if the products were not good customers can exchanged, extra security for payment transaction Accordingly there are many advanced level changes were made to retain a customers and motivate new customers to activate their account.

Though the e commerce has now been in the peak level we have some benefits and drawbacks as given below:

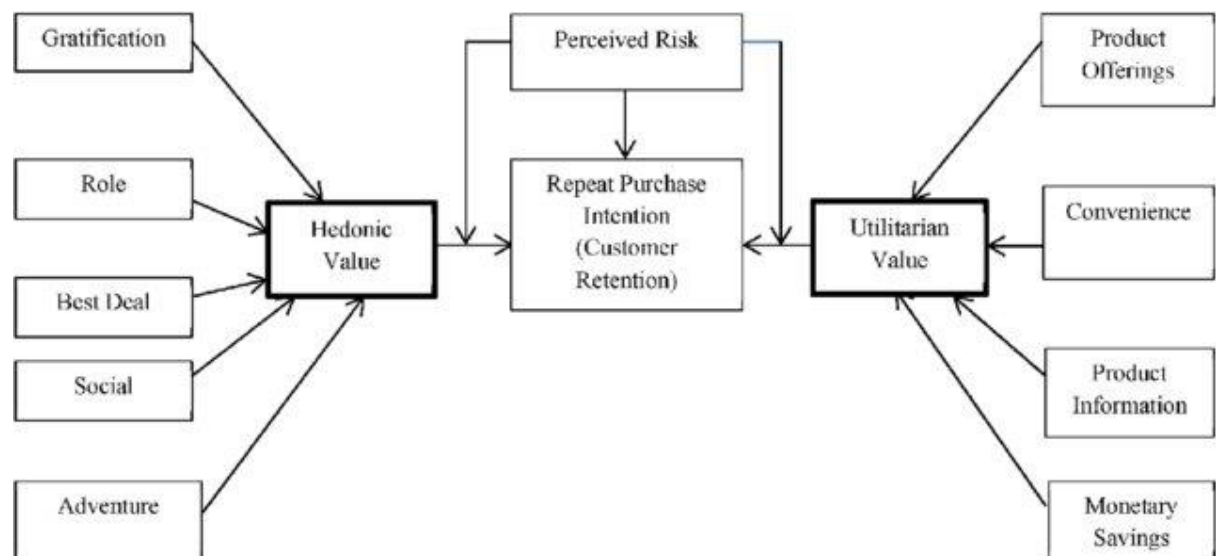
## ❖ Review of Literature

### **What is Utilitarian Value?**

Utilitarian value can be called as functional value and it associated with functional benefits of the products, Ex. Suppose someone buy Car and, in this product, utilitarian value is functions of car that satisfied consumers' need like go one place to another place.

## What is Hedonic Value?

Hedonic values define as immediate psychological gratification that comes from consumption of product. The value received is derived from an emotion and actual experience associated with consumption, Ex. Suppose that Person who buy car that give Happiness or feel good in gratification in mind.



## Analytical Problem Framing

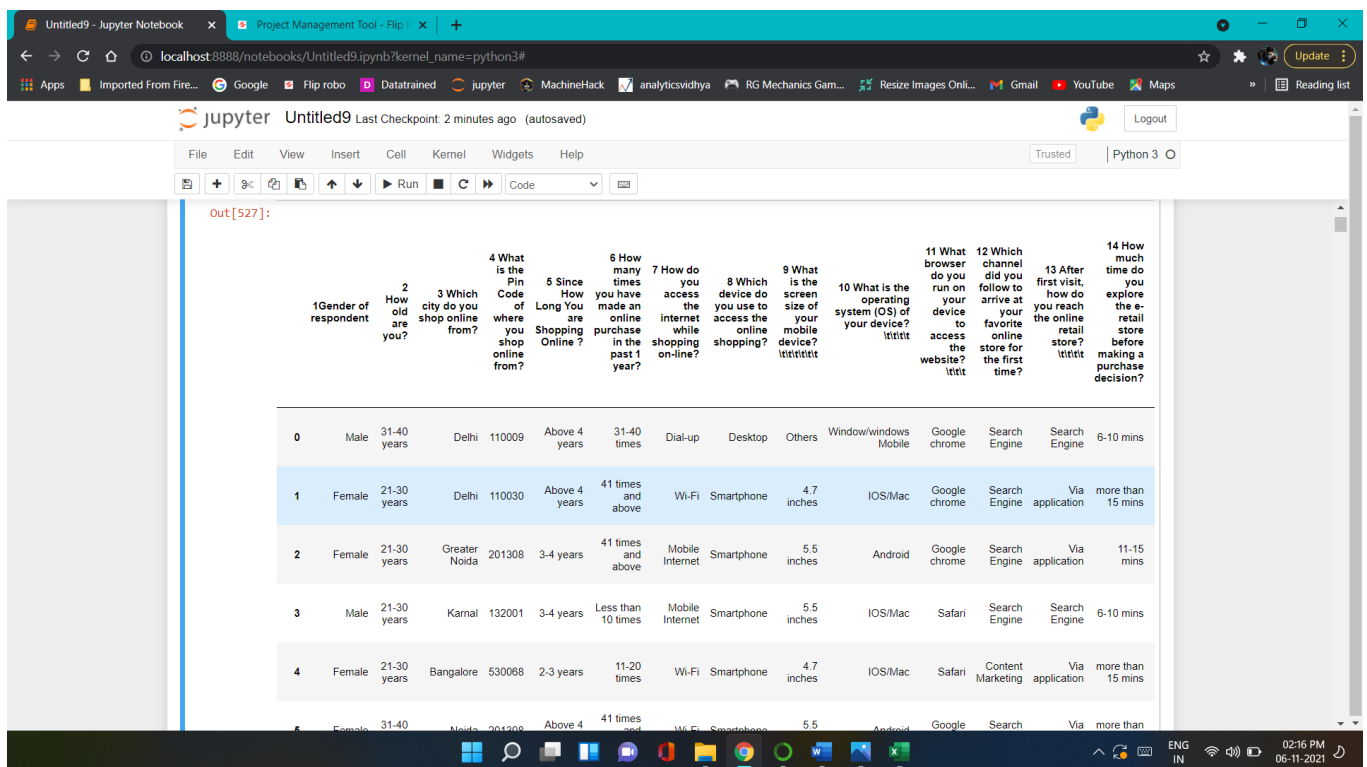
### ❖ Mathematical/ Analytical Modelling of the Problem

In our model analytical can be done we use Chi Square test for select features that are importance for E-retailers to understand behaviour of customers.

### ❖ Data Sources and their formats

In given problem two datasets provided for Training and Testing in csv format. Load data set into Pandas Data frame format, present here

Types of features as below given codes



`pd.crosstab(df.columns,df.dtypes)`

col\_0 int64 object

row\_0

10 What is the operating system (OS) of your device? 0 1

11 What browser do you run on your device to access the website? 0 1

12 Which channel did you follow to arrive at your favorite online store for the first time? 0 1

13 After first visit, how do you reach the online retail store? 0 1

14 How much time do you explore the e- retail store before making a purchase decision? 0 1

	col_0	int64	object
row_0			
15 What is your preferred payment Option?	0	1	
16 How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?	0	1	
17 Why did you abandon the “Bag”, “Shopping Cart”?	0	1	
18 The content on the website must be easy to read and understand	0	1	
19 Information on similar product to the one highlighted is important for product comparison	0	1	
1Gender of respondent	0	1	
2 How old are you?	0	1	
20 Complete information on listed seller and product being offered is important for purchase decision.	0	1	
21 All relevant information on listed products must be stated clearly	0	1	
22 Ease of navigation in website	0	1	
23 Loading and processing speed	0	1	
24 User friendly Interface of the website	0	1	
25 Convenient Payment methods	0	1	
26 Trust that the online retail store will fulfill its part of the transaction at the stipulated time	0	1	
27 Empathy (readiness to assist with queries) towards the customers	0	1	

	col_0	int64	object
row_0			
28 Being able to guarantee the privacy of the customer	0	1	
29 Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)	0	1	
3 Which city do you shop online from?	0	1	
30 Online shopping gives monetary benefit and discounts	0	1	
31 Enjoyment is derived from shopping online	0	1	
32 Shopping online is convenient and flexible	0	1	
33 Return and replacement policy of the e-tailer is important for purchase decision	0	1	
34 Gaining access to loyalty programs is a benefit of shopping online	0	1	
35 Displaying quality Information on the website improves satisfaction of customers	0	1	
36 User derive satisfaction while shopping on a good quality website or application	0	1	
37 Net Benefit derived from shopping online can lead to users satisfaction	0	1	
38 User satisfaction cannot exist without trust	0	1	
39 Offering a wide variety of listed product in several category	0	1	
4 What is the Pin Code of where you shop online from?	1	0	
40 Provision of complete and relevant product information	0	1	

	col_0	int64	object
row_0			
41 Monetary savings	0	1	
42 The Convenience of patronizing the online retailer	0	1	
43 Shopping on the website gives you the sense of adventure	0	1	
44 Shopping on your preferred e-tailer enhances your social status	0	1	
45 You feel gratification shopping on your favorite e-tailer	0	1	
46 Shopping on the website helps you fulfill certain roles	0	1	
47 Getting value for money spent	0	1	
5 Since How Long You are Shopping Online ?	0	1	
6 How many times you have made an online purchase in the past 1 year?	0	1	
7 How do you access the internet while shopping on-line?	0	1	
8 Which device do you use to access the online shopping?	0	1	
9 What is the screen size of your mobile device?	0	1	
Availability of several payment options	0	1	
Change in website/Application design	0	1	
Complete, relevant description information of products	0	1	
Easy to use website or application	0	1	

	col_0	int64	object
row_0			
Fast loading website speed of website and application	0	1	
Frequent disruption when moving from one page to another	0	1	
From the following, tick any (or all) of the online retailers you have shopped from;	0	1	
Late declaration of price (promotion, sales period)	0	1	
Limited mode of payment on most products (promotion, sales period)	0	1	
Longer delivery period	0	1	
Longer page loading time (promotion, sales period)	0	1	
Longer time in displaying graphics and photos (promotion, sales period)	0	1	
Longer time to get logged in (promotion, sales period)	0	1	
Perceived Trustworthiness	0	1	
Presence of online assistance through multi-channel	0	1	
Privacy of customers' information	0	1	
Quickness to complete purchase	0	1	
Reliability of the website or application	0	1	
Security of customer financial information	0	1	
Speedy order delivery	0	1	



	col_0	int64	object
	row_0		
Visual appealing web-page layout	0	1	
Website is as efficient as before	0	1	
Which of the Indian online retailer would you recommend to a friend?	0	1	
Wild variety of product on offer	0	1	

## df.nunique()

- Gender of respondent  
2
- How old are you?  
5
- Which city do you shop online from?  
11
- What is the Pin Code of where you shop online from?  
39
- Since How Long You are Shopping Online?  
5
- How many times you have made an online purchase in the past 1 year?  
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- After first visit, how do you reach the online retail store?  
5
- How much time do you explore the e- retail store before making a purchase decision?  
5

15. What is your preferred payment Option?  
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46. Shopping on the website helps you fulfil certain roles  
5
47. Getting value for money spent  
3
48. From the following, tick any (or all) of the online retailers you have shopped from;  
9
49. Easy to use website or application  
10
50. Visual appealing web-page layout  
10
51. Wild variety of product on offer  
9
52. Complete, relevant description information of products  
11
53. Fast loading website speed of website and application  
10
54. Reliability of the website or application  
10
55. Quickness to complete purchase  
9
56. Availability of several payment options  
11
57. Speedy order delivery  
6
58. Privacy of customers' information  
11
59. Security of customer financial information  
11
60. Perceived Trustworthiness  
9
61. Presence of online assistance through multi-channel  
10
62. Longer time to get logged in (promotion, sales period)  
10

63. Longer time in displaying graphics and photos (promotion, sales period)  
10
64. Late declaration of price (promotion, sales period)  
8
65. Longer page loading time (promotion, sales period)  
11
66. Limited mode of payment on most products (promotion, sales period)  
8
67. Longer delivery period  
6
68. Change in website/Application design  
7
69. Frequent disruption when moving from one page to another  
8
70. Website is as efficient as before  
8
71. Which of the Indian online retailer would you recommend to a friend?  
8

## ❖ Data Preprocessing Done

**df.columns =df.columns.str.strip()** using this code modify the features so that remove extra spaces and commas from features name,

Split data into X and Y in that X have all Input features and Y have target feature that include How u approach other persons to use e-retailer for shopping

Then use Ordinal encoders for target columns and Label encoders for Target columns

Use MINMAX Scaler is one of the simplest scalers to understand. It just scales all the data between 0 and 1. FORMULA:  $x\_scaled = (x - x\_min) / (x\_max - x\_min)$

## ❖ Data Inputs- Logic- Output Relationships

### Feature Selection Methods:

Univariate Selection

Feature Importance

Correlation Matrix with Heatmap

We use Univariate selection as Chi Square test for X input feature selection

### What is Chi-square Test?

Chi-square formula is used to compare two or more statistical data sets. The chi-square formula is used in data that consist of variables distributed across various categories and helps us to know whether that distribution is different from what one would expect by chance. The chi-squared test checks the difference between the observed value and the expected value. Chi-Square shows or in a way check the relationship between two categorical variables which can be can be calculated by using the given observed frequency and expected frequency.

The Chi-Square is denoted by  $\chi^2$ . The chi-square formula is:

$$\chi^2 = \sum (O_i - E_i)^2 / E_i$$

where

$O_i$  = observed value (actual value)

$E_i$  = expected value.

The Chi-Square test gives a P-value to help you know the correlation if any!

A hypothesis is in consideration, that a given condition or statement might be true, which we can test later. For example

A very small Chi-Square test statistic indicates that the collected data matches the expected data extremely well.

A very large Chi-Square test statistic indicates that the data does not match very well. If the chi-square value is large, the null hypothesis is rejected.

Chi-Square test statistic is called P-value. The P-value is short for probability value. It defines the probability of getting a result that is either the same or more extreme than the other actual observations. The P-value represents the probability of occurrence of the given event. The P-value is used as an alternative to the rejection point to provide the least significance for which the null hypothesis would be rejected. The smaller the P-value, the stronger is the evidence in favor of the alternative hypothesis given observed frequency and expected frequency.

P-value	Description	Hypothesis Interpretation
P-value $\leq$ 0.05	It indicates the null hypothesis is very unlikely.	Rejected
P-value > 0.05	It indicates the null hypothesis is very likely.	Accepted or it "fails to reject".
P-value > 0.05	The P-value is near the cut-off. It is considered as marginal	The hypothesis needs more attention.

**Application Of Chi Square Test:**

- used by Biologists to determine if there is a significant association between the two variables, such as the association between two species in a community.
- used by Genetic analysts to interpret the numbers in various phenotypic classes.
- used in various statistical procedures to help to decide if to hold onto or reject the hypothesis.
- used in the medical literature to compare the incidence of the same characteristics in two or more groups.

## ❖ Device and Library Use

### Hardware and Software Requirements and Tools Used

- Device name: HP Pavilion
- Processor: AMD Ryzen 5 3550H with Radeon Vega Mobile Gfx 2.10 GHz
- RAM: 8.00 GB
- System type: 64-bit operating system, x64-based processor
- Edition: Windows 10 Home Single Language
- Version: 21H1
- OS build: 19043.1288
- Jupyter NoteBooks Version : 6.4.3
- Python3 version : 3.8.8

### Required Libraries Used For Dataset

- `import pandas as pd`
- `import numpy as np`
- `import matplotlib.pyplot as plt`
- `%matplotlib inline`
- `import seaborn as sns`
- `import pandas_profiling as ProfileReport`
- `import IPython.display as display`
- `import warnings`
- `warnings.filterwarnings('ignore')`
- `from sklearn.preprocessing import OrdinalEncoder,MinMaxScaler`
- `from sklearn.feature_selection import SelectKBest,chi2`

## Model/s Development and Evaluation

### ❖ models:

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localhost:8888/notebooks/Untitled9.ipynb?kernel\_name=python3#

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File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [576]: # select most importance features using Chi-square test  
from sklearn.feature\_selection import SelectKBest,chi2

In [579]: features=SelectKBest(score\_func=chi2)  
fit=features.fit(x,y)

In [587]: scores=pd.DataFrame({'Scores':fit.scores\_, 'Features':x.columns})  
scores

Out[587]:

	Scores	Features
0	18.728207	1 Gender of respondent
1	4.974567	2 How old are you?
2	5.867908	3 Which city do you shop online from?
3	4.026787	4 What is the Pin Code of where you shop online...
4	3.257564	5 Since How Long You are Shopping Online ?
5	4.776077	6 How many times you have made an online purch...
6	2.846808	7 How do you access the internet while shoppin...
7	11.665447	8 Which device do you use to access the online...
8	26.759974	9 What is the screen size of your mobile device?
9	31.419637	10 What is the operating system (OS) of your d...
10	57.171099	11 What browser do you run on your device to a...
11	9.030522	12 Which channel did you follow to arrive at y...
12	47.489017	13 After first visit, how do you reach the onli...
13	21.040036	14 How much time do you explore the e-retail ...
14	32.955991	15 What is your preferred payment Option?

Untitled9 - Jupyter Notebook x Project Management Tool - Flip x Untitled9 x +

localhost:8888/notebooks/Untitled9.ipynb?kernel\_name=python3#

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64 19.783847 Longer page loading time (promotion, sales per...

65 53.269266 Limited mode of payment on most products (prom...

66 25.500366 Longer delivery period

67 55.301526 Change in website/Application design

68 26.581914 Frequent disruption when moving from one page ...

69 38.615872 Website is as efficient as before

In [596]: # Best 10 import features that affect e-tailers for their positive as well negative of perspectives  
print(scores.nlargest(10,'scores'))

Scores Features

16 75.754028 17 Why did you abandon the "Bag", "shopping Ca...

22 59.810983 23 Loading and processing speed

42 59.253569 43 Shopping on the website gives you the sense...

10 57.171099 11 What browser do you run on your device to a...

67 55.301526 Change in website/Application design

49 54.245760 Visual appealing web-page layout

65 53.269266 Limited mode of payment on most products (prom...

61 48.226555 Longer time to get logged in (promotion, sales...

62 48.130643 Longer time in displaying graphics and photos ...

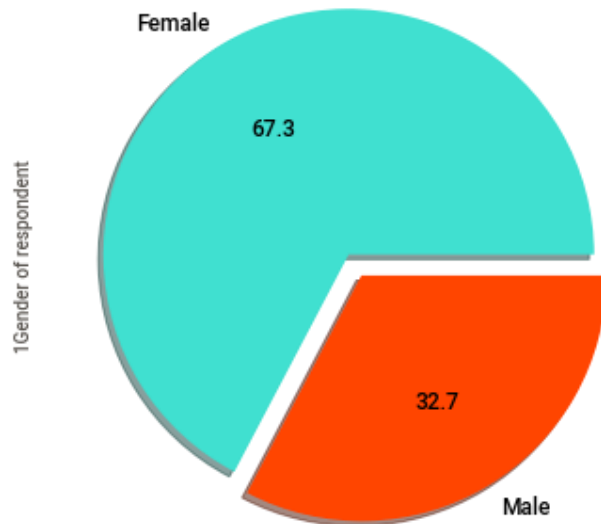
50 47.605973 Wild variety of product on offer

In [ ]:

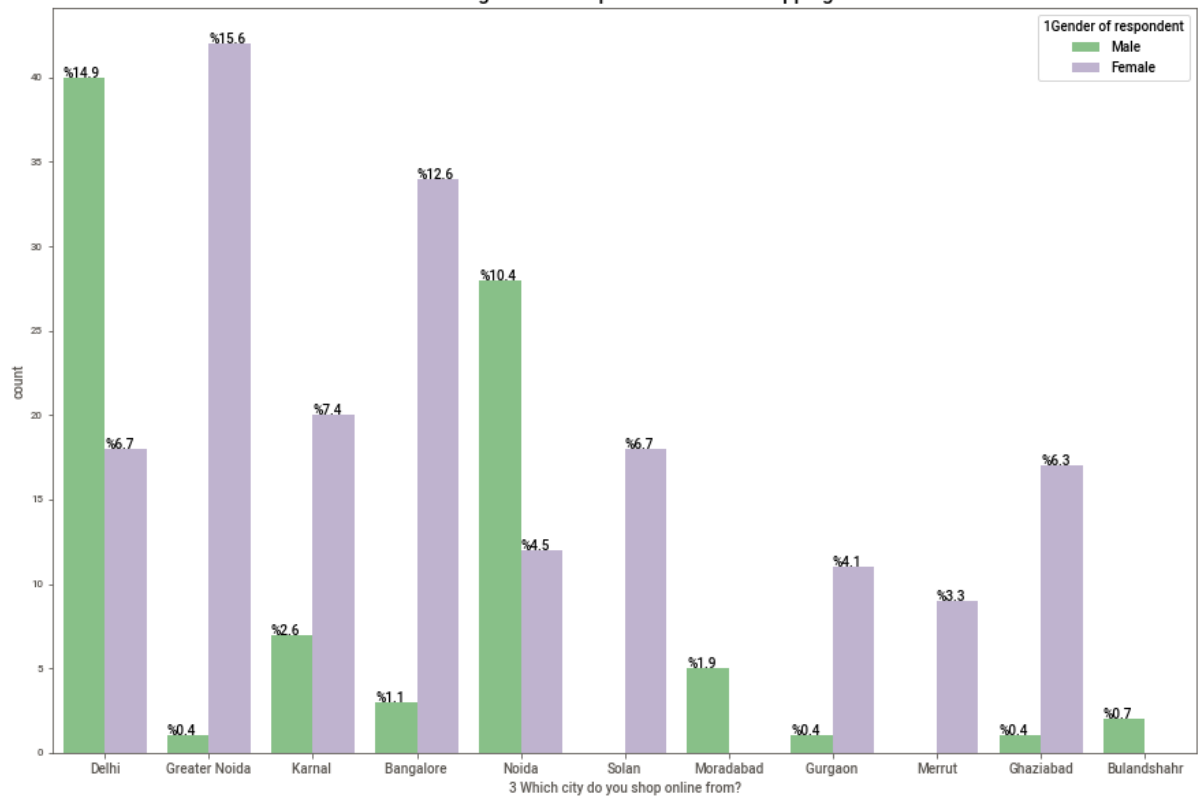
## ❖ Visualizations

- Count plot
- Bar plot
- Line Plot

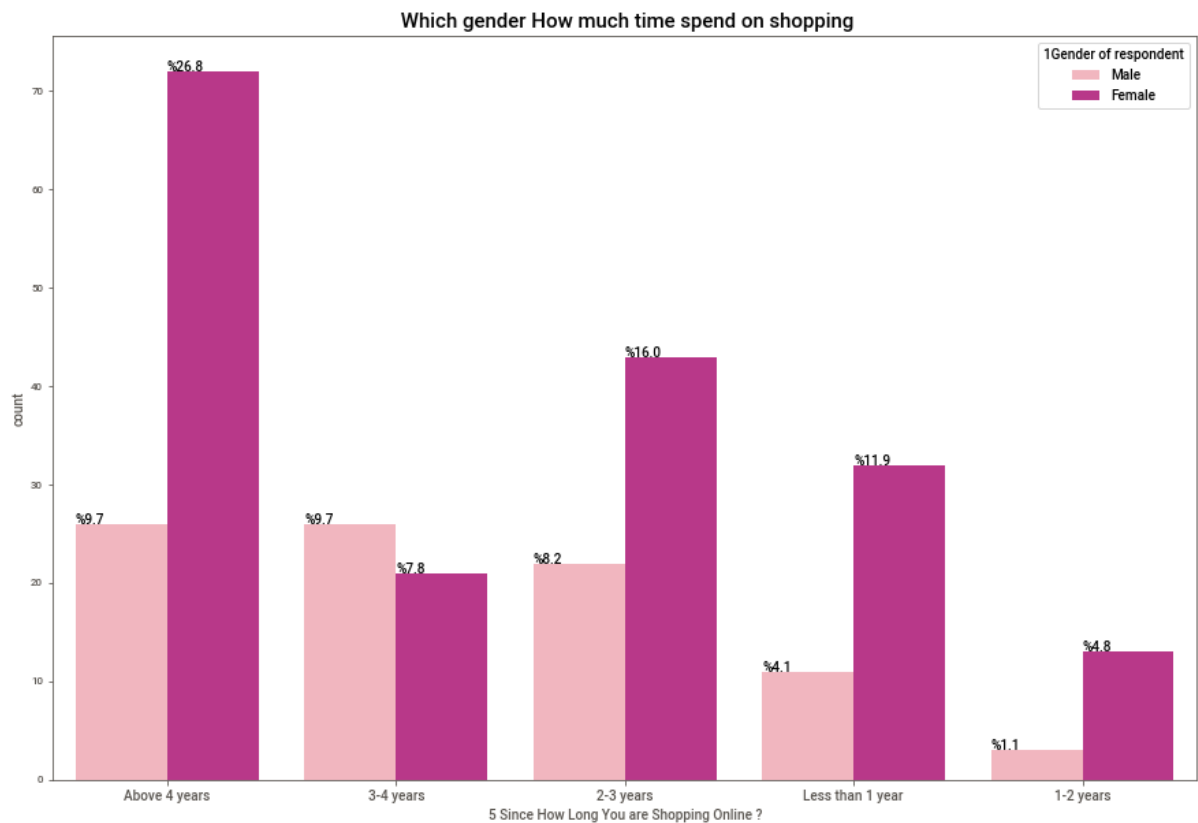
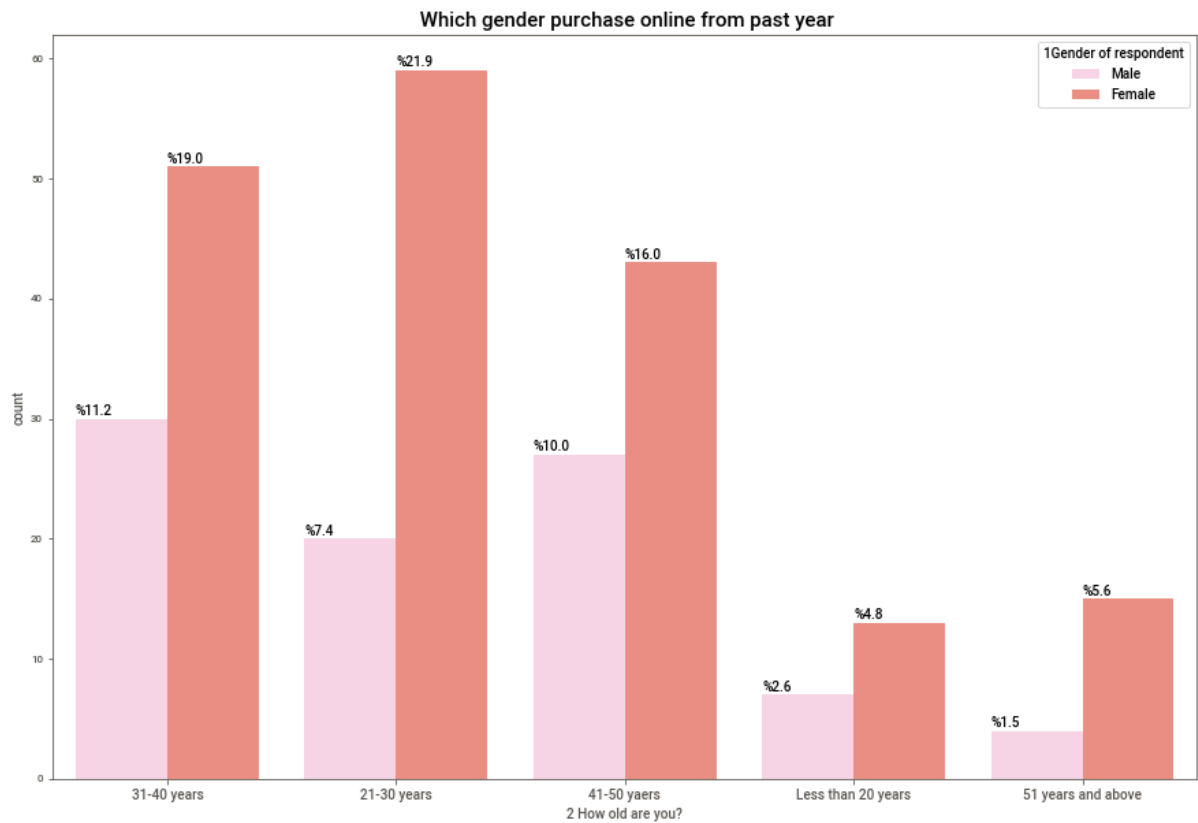
Gender respondent ratio

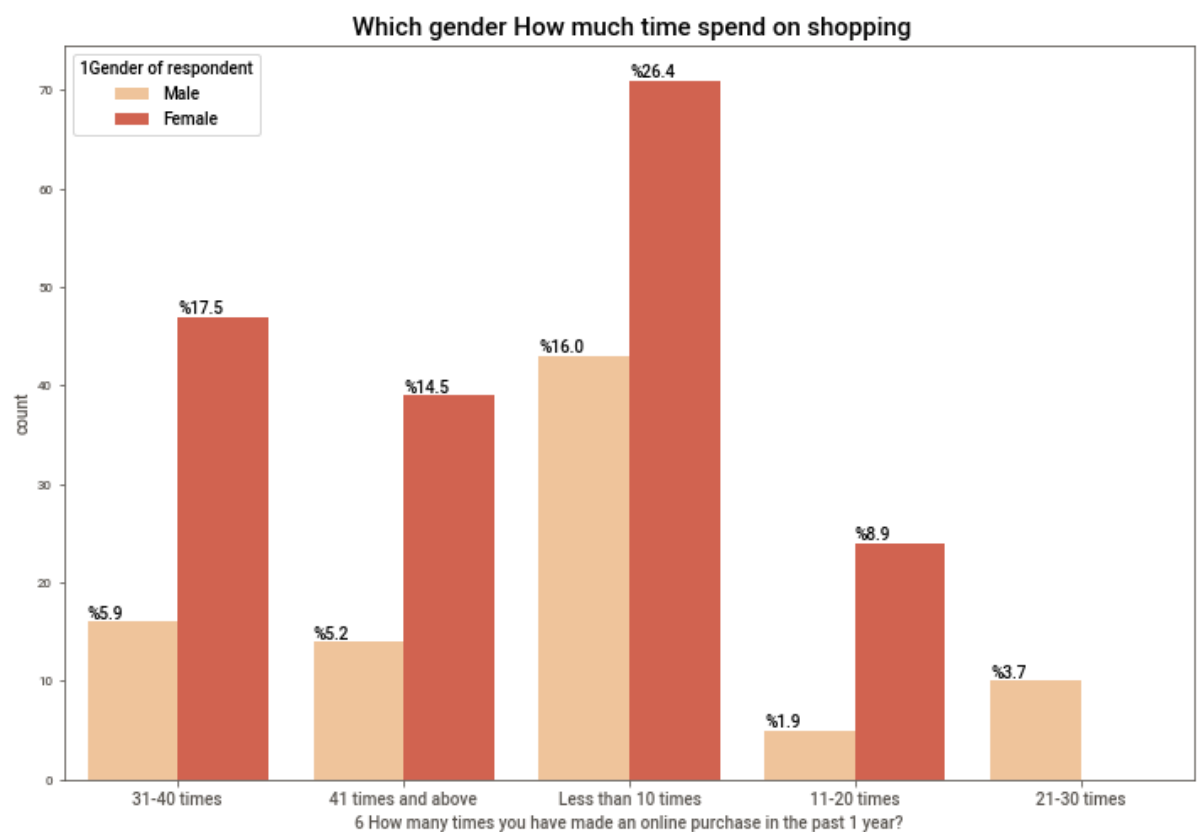
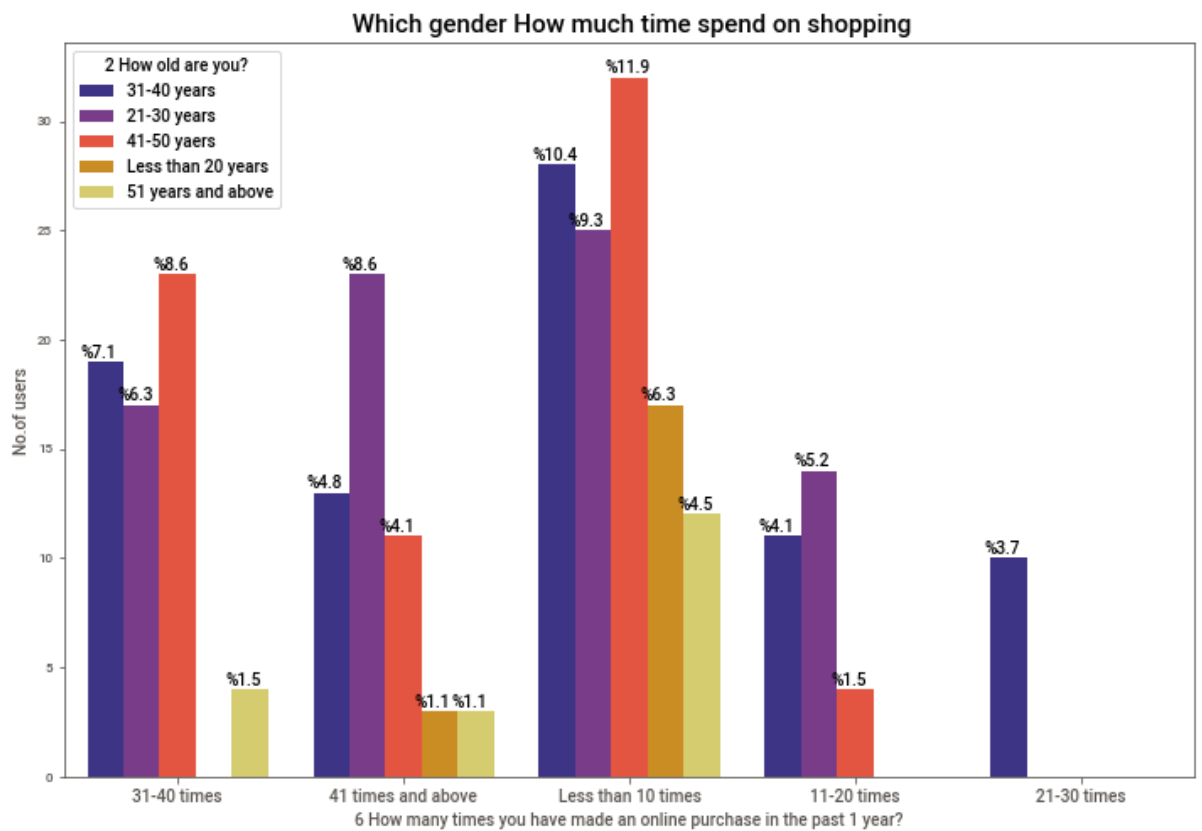


Which gender most preferred online shopping



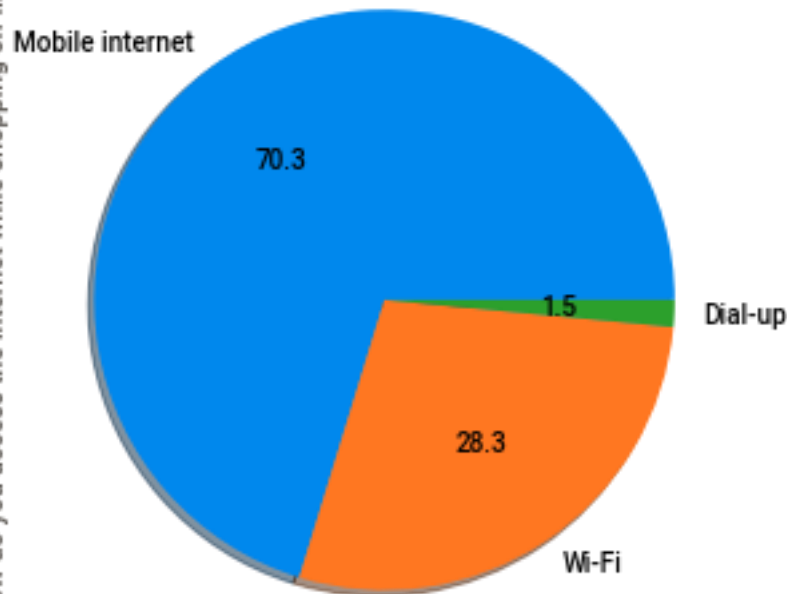




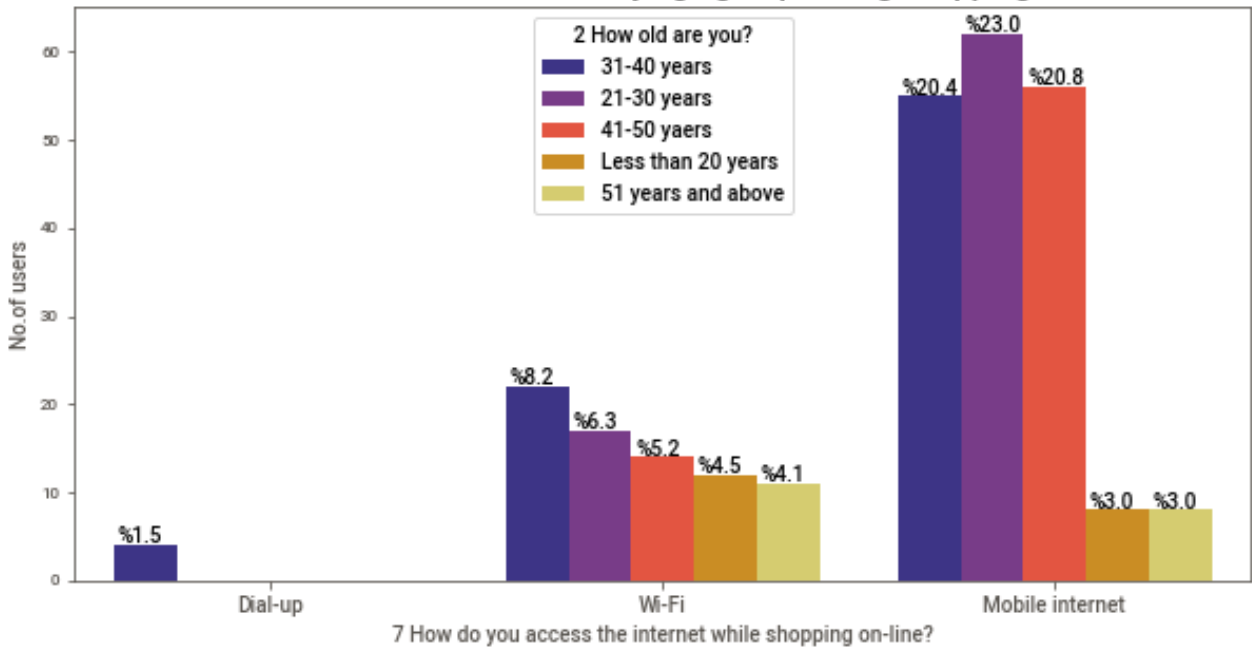


## Internet used for shopping

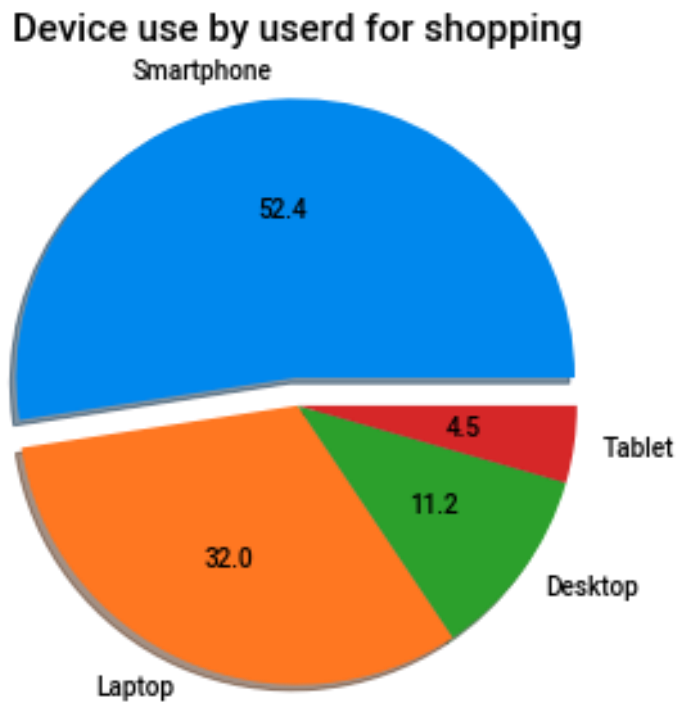
7 How do you access the internet while shopping on-line?



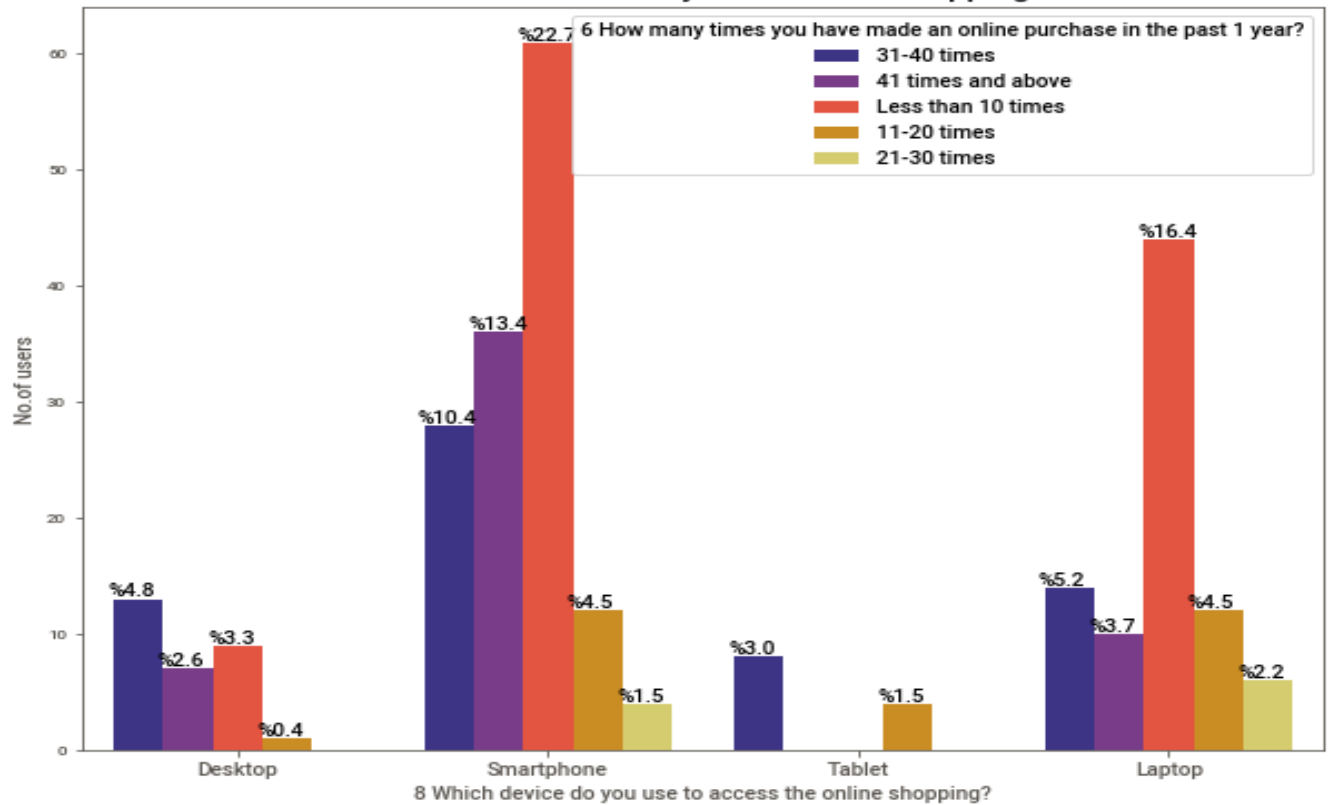
## Which internet access by age group during shopping



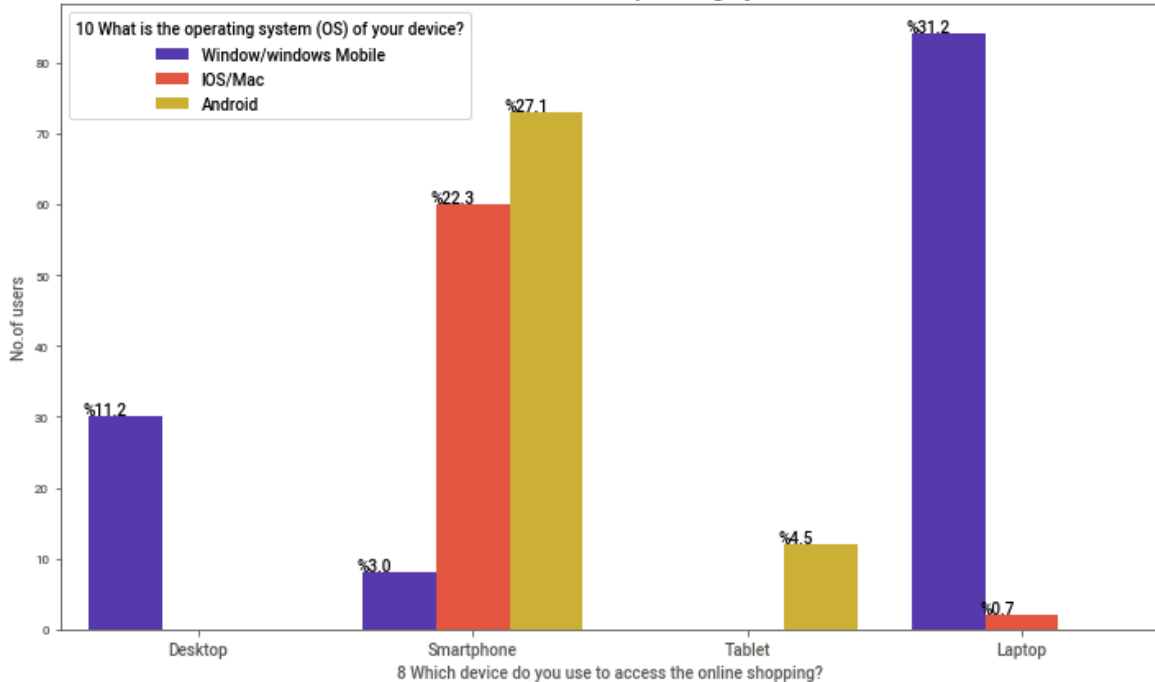
8 Which device do you use to access the online shopping?



### Which device and how many time use for shopping online

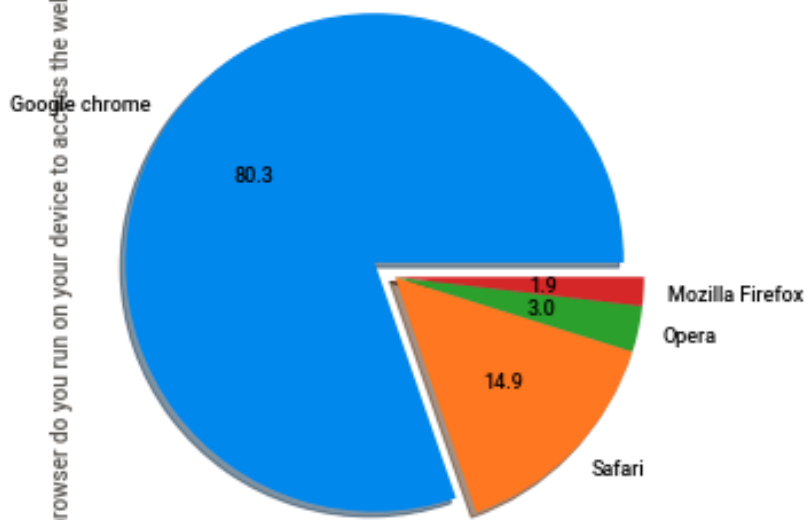


### Which device and which operating system used

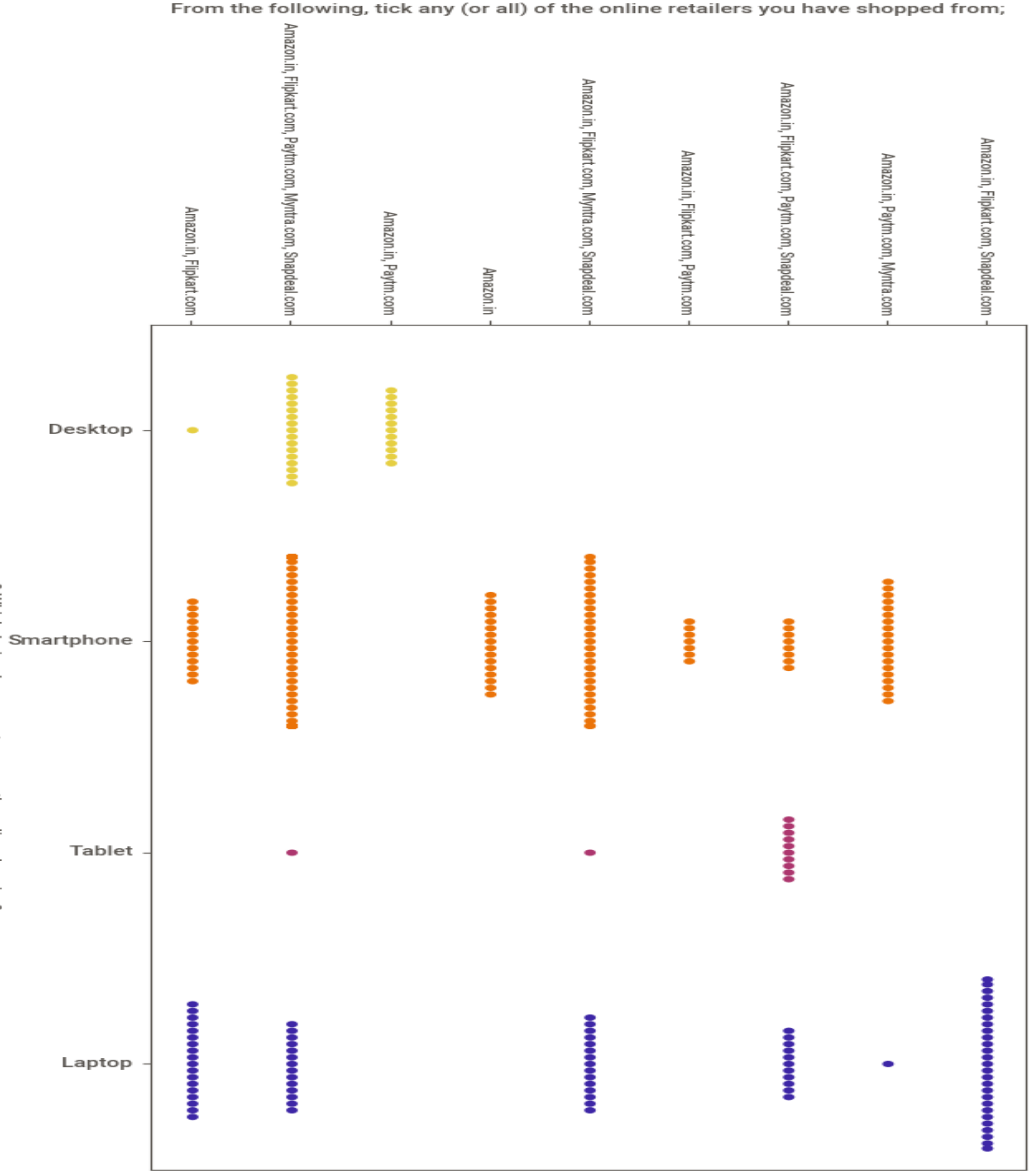


11 What browser do you run on your device to access the website?

Name of browsers used for shopping



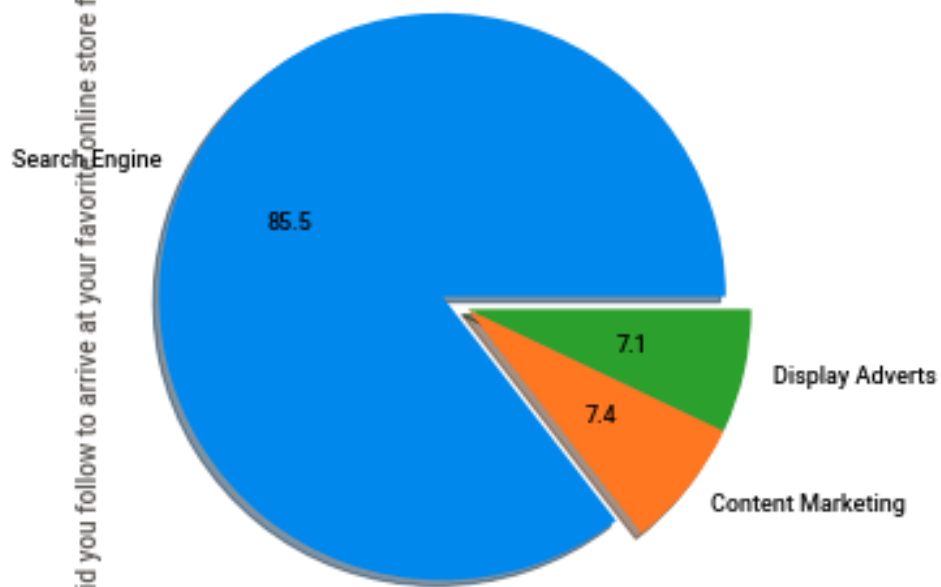
e-tailers websites operate in different Devices



8 Which device do you use to access the online shopping?

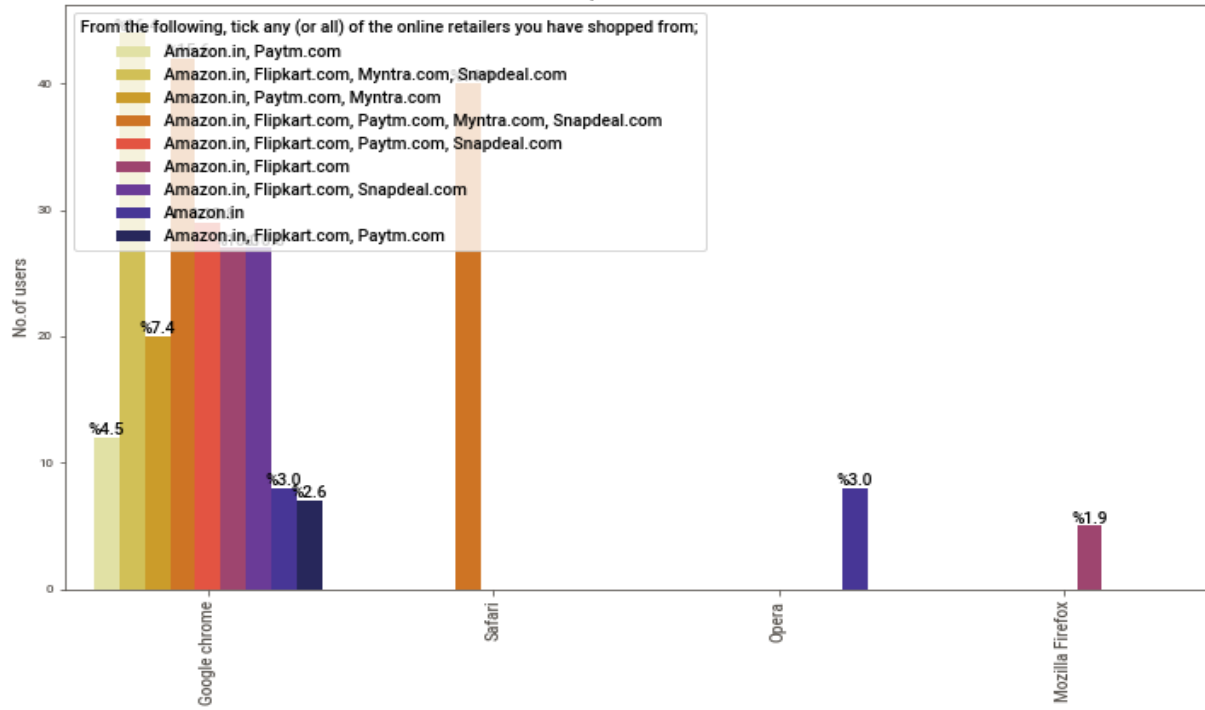
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Name of channels used for shopping

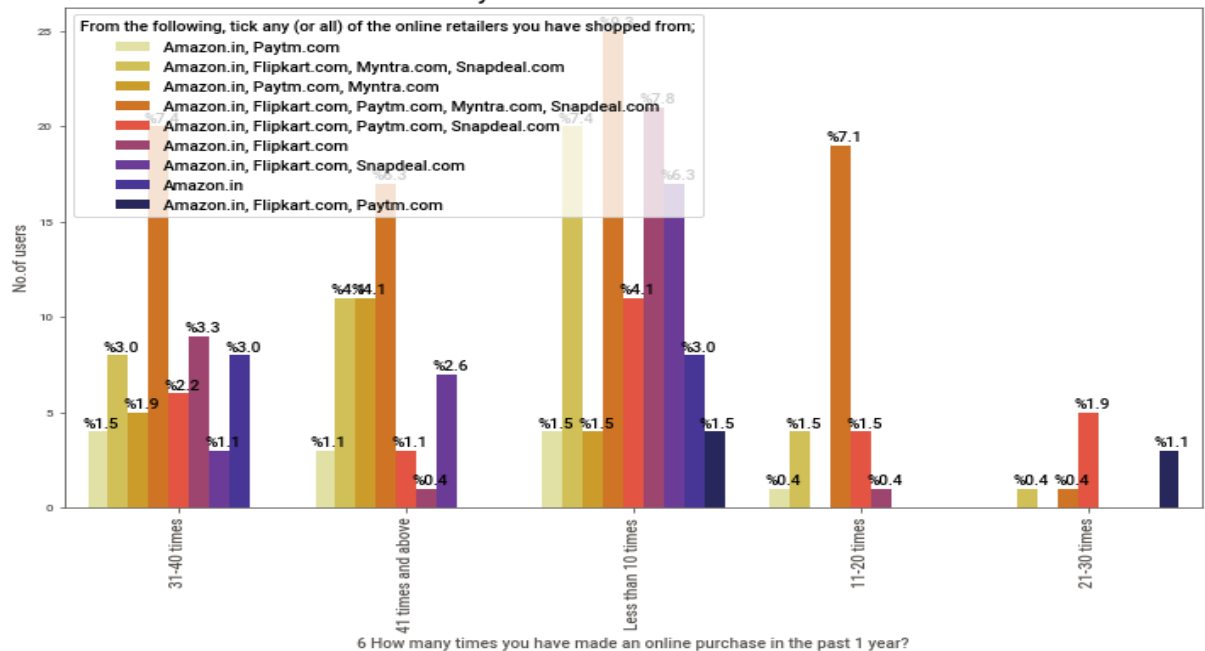




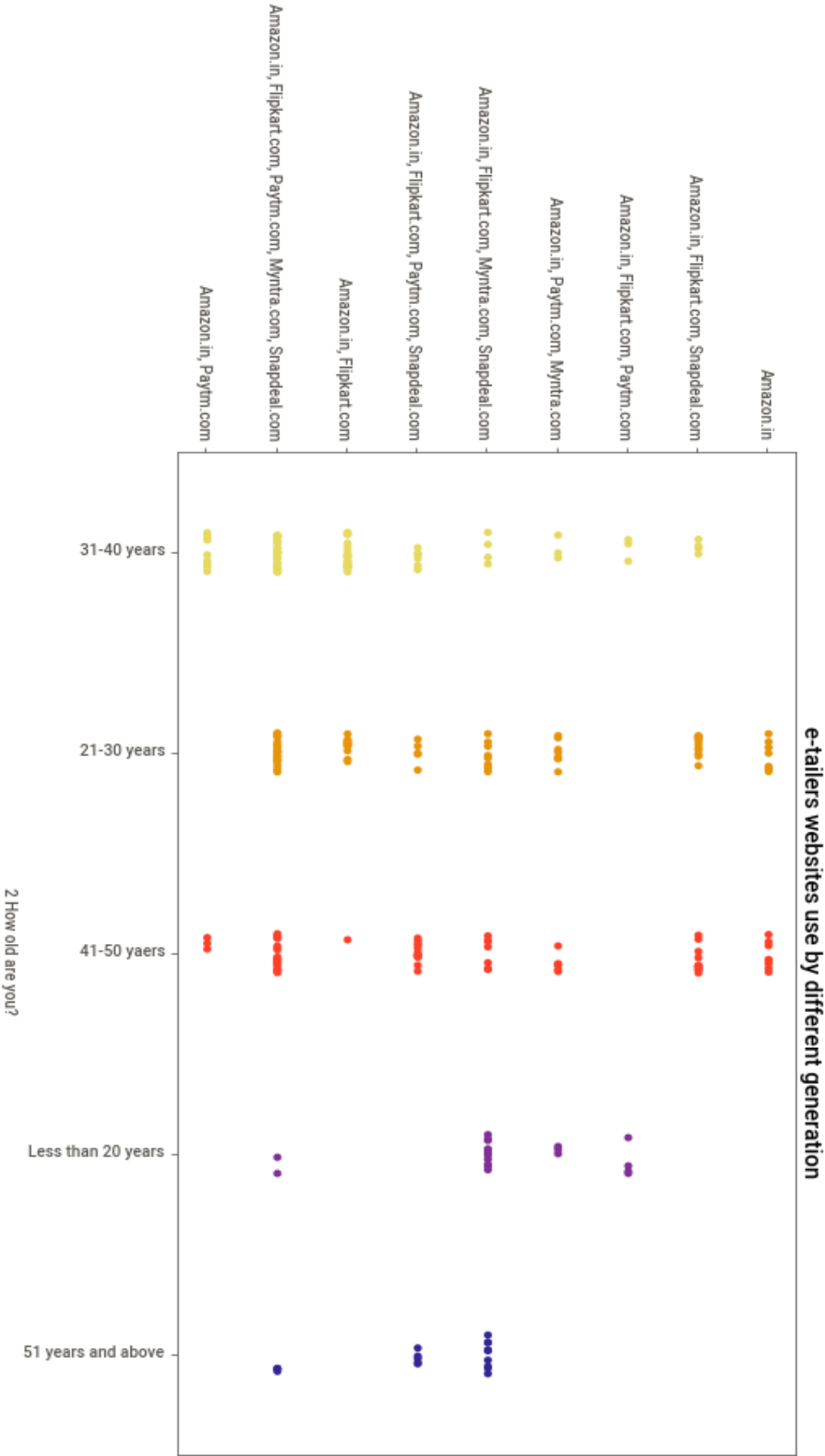
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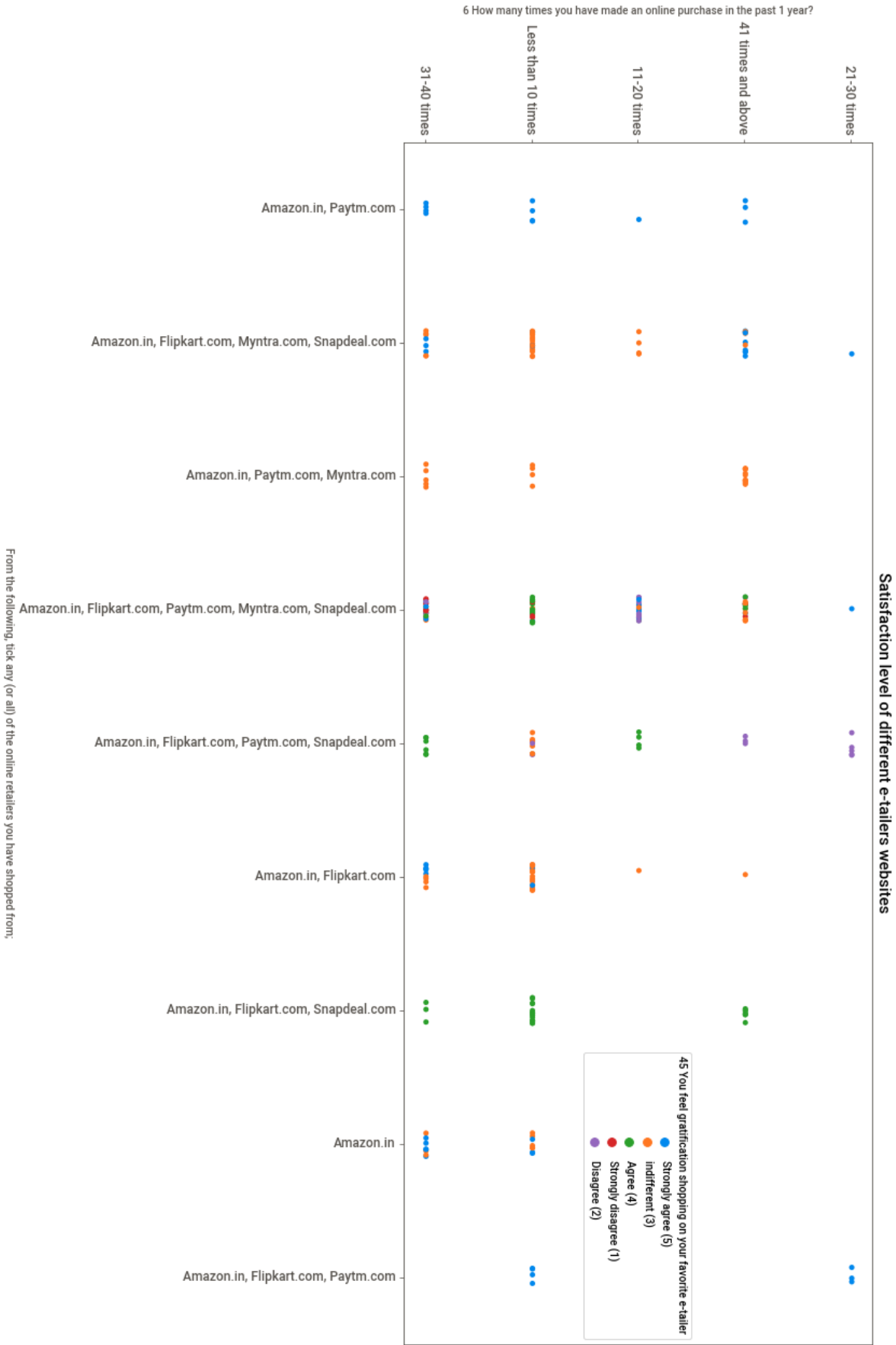


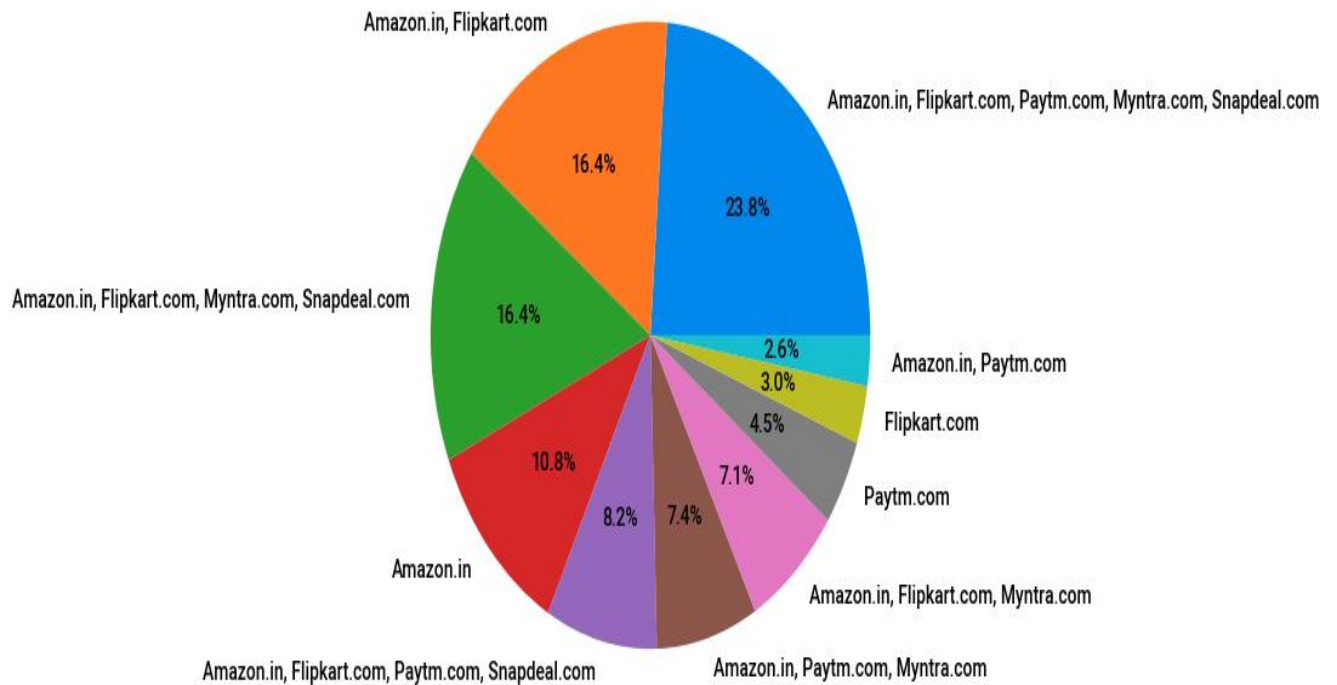
### how many times which e-tailers websites use



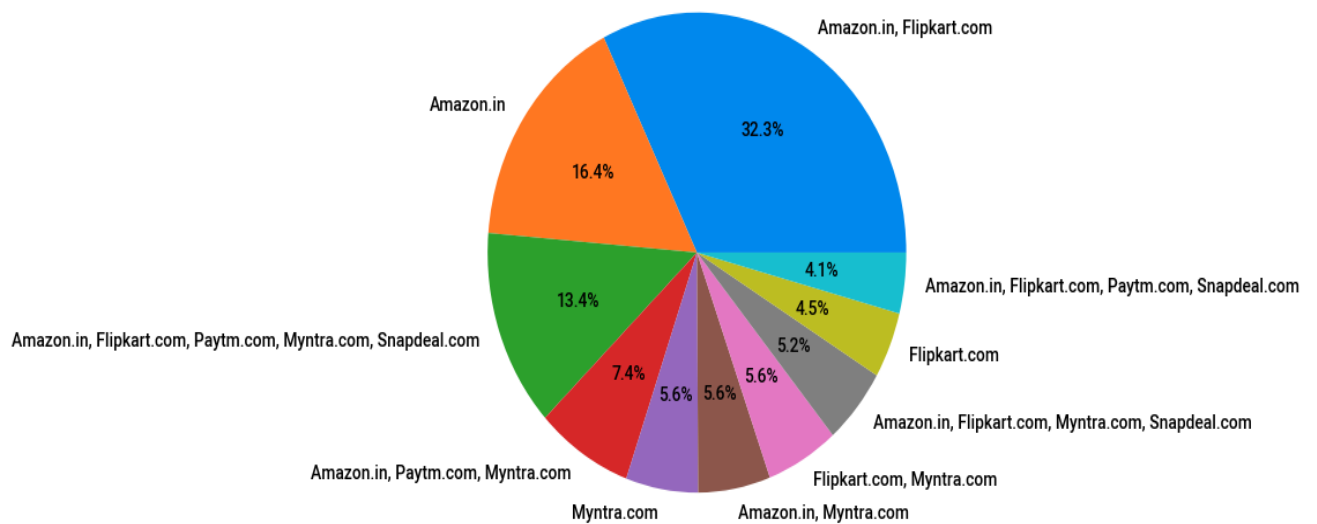
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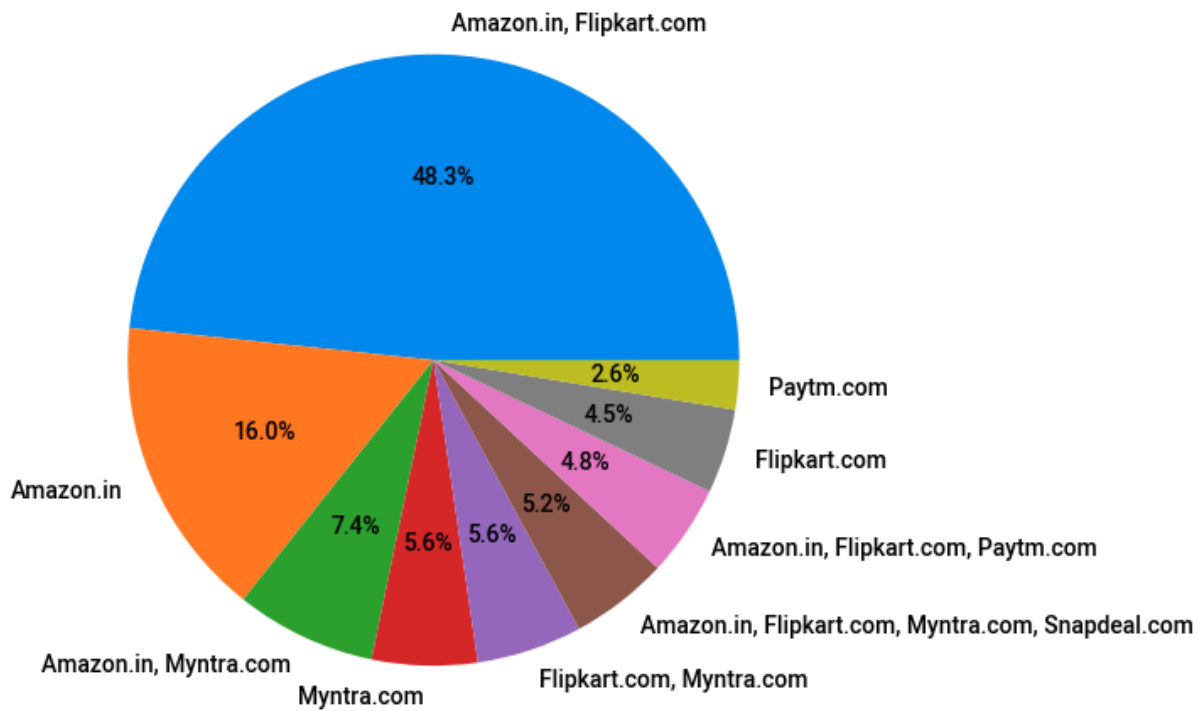




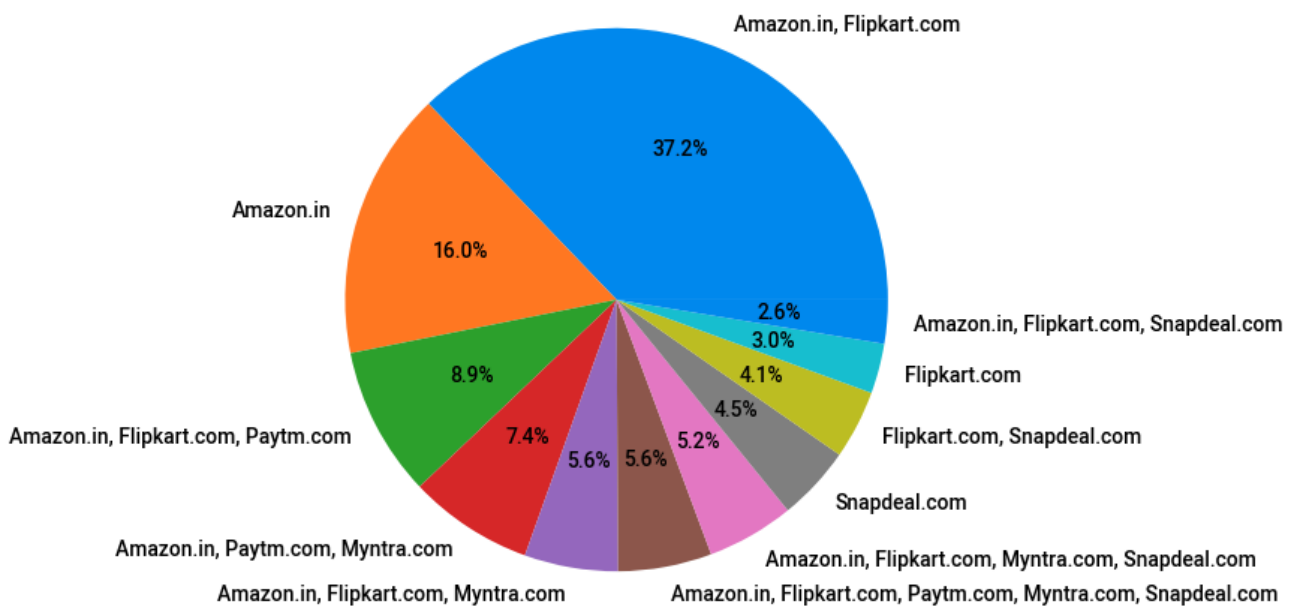
## Easy to use website or application



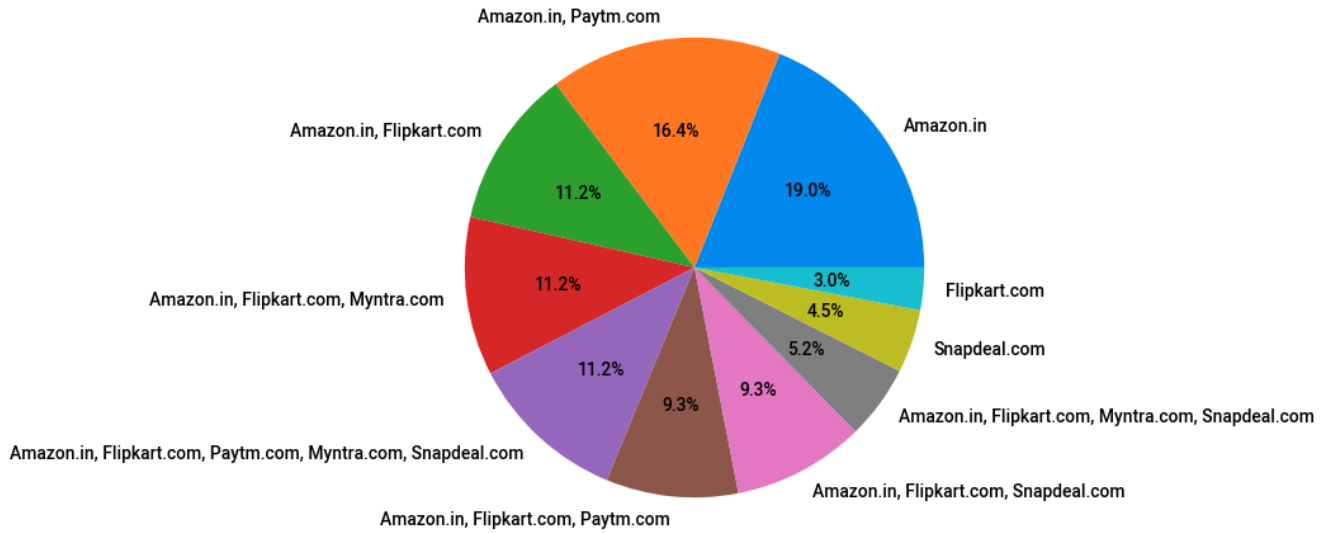
## Visual appealing web-page layout



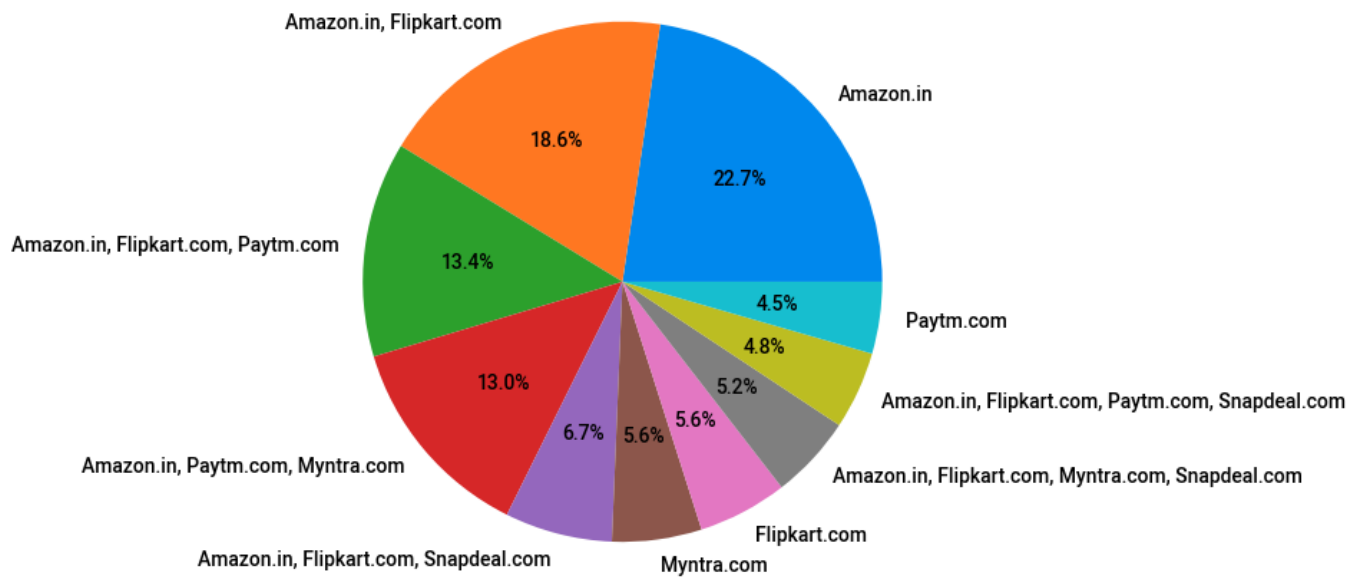
Wild variety of product on offer



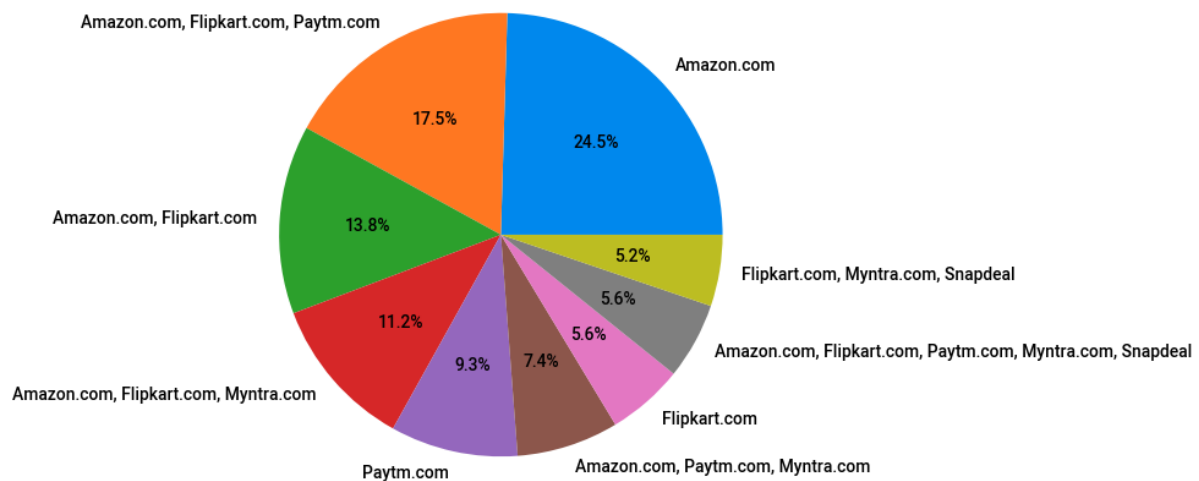
Complete, relevant description information of products



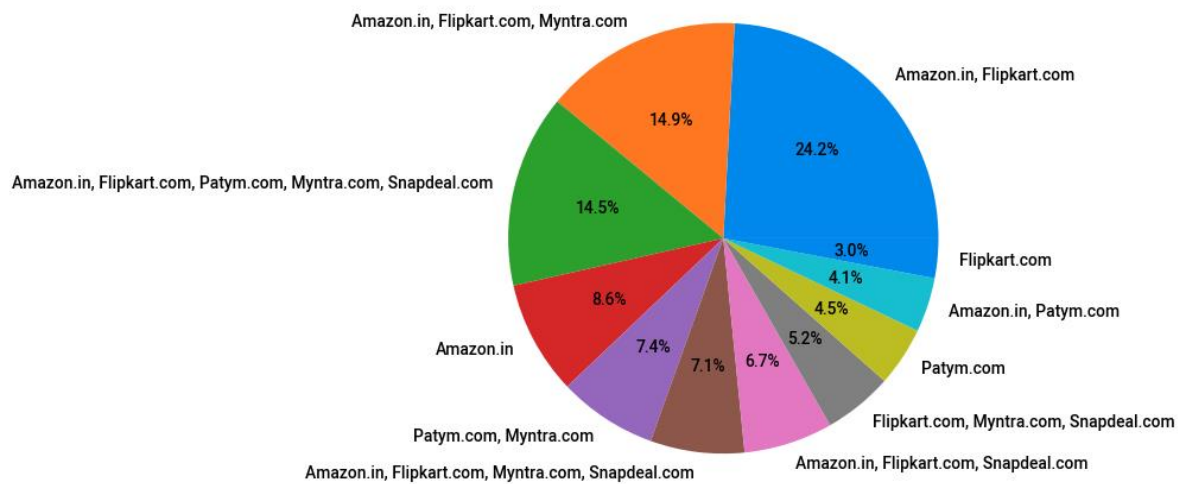
## Fast loading website speed of website and application



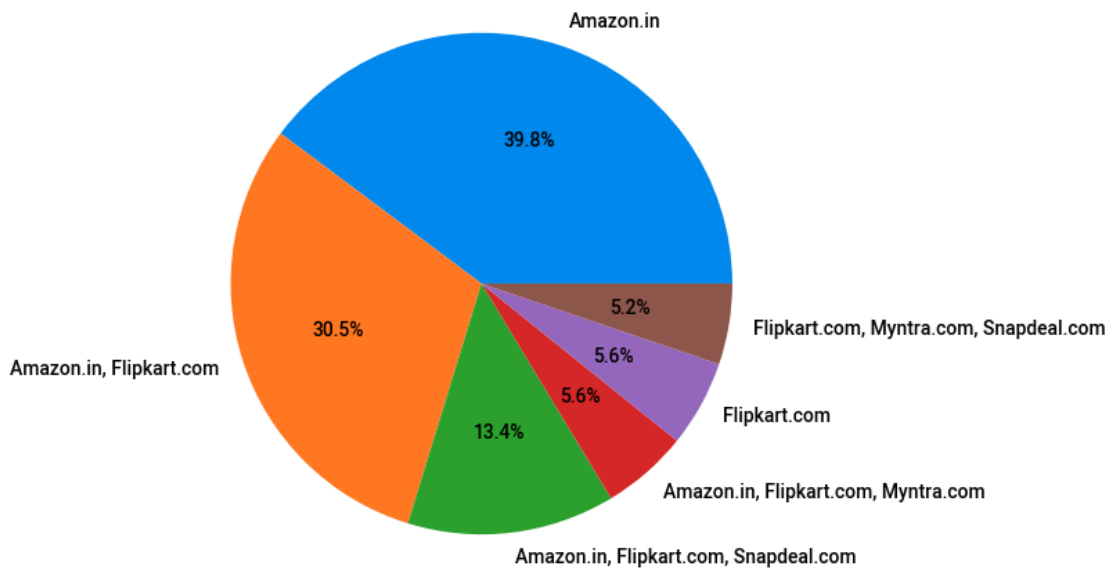
## Reliability of the website or application



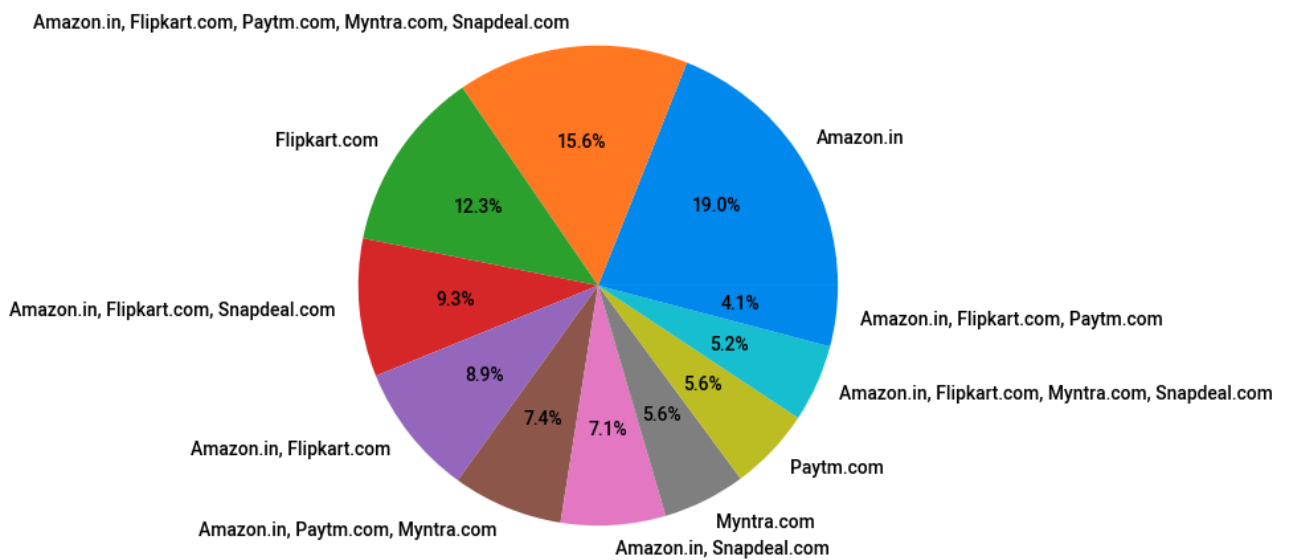
### Quickness to complete purchase



### Availability of several payment options

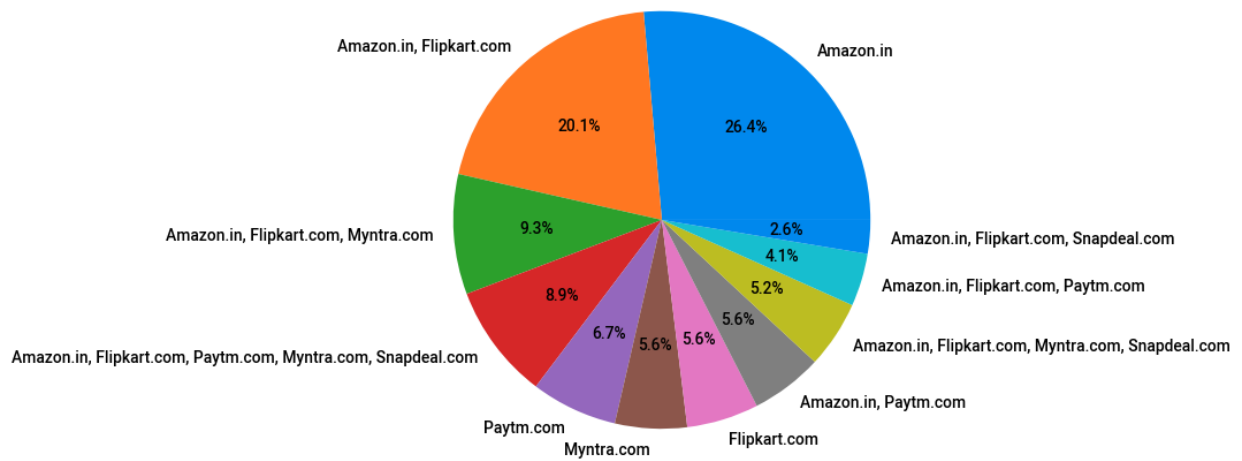


## Speedy order delivery

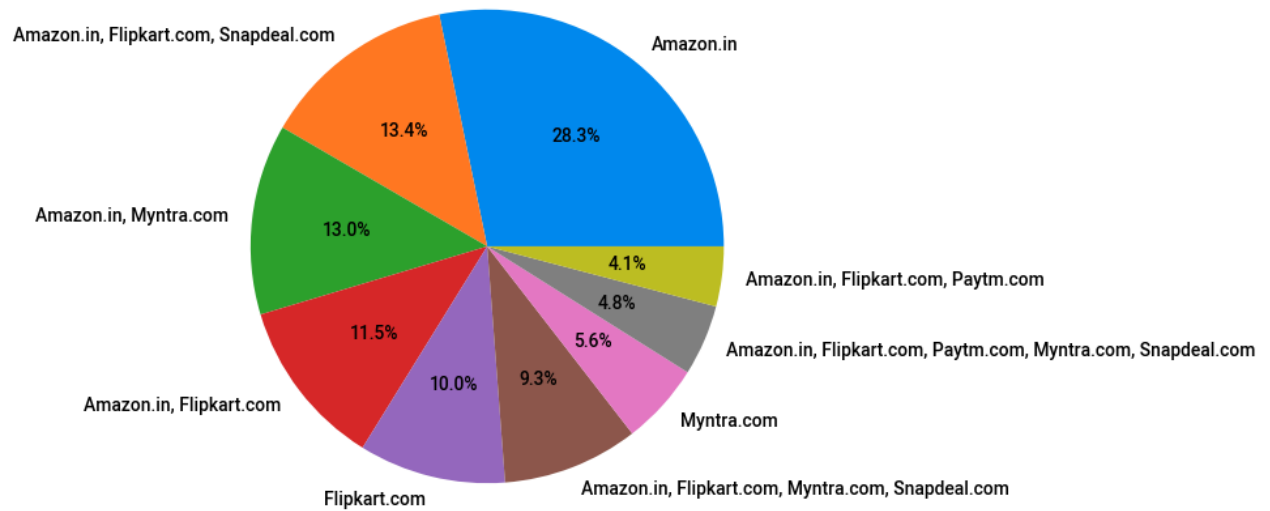


## Security of customer financial information

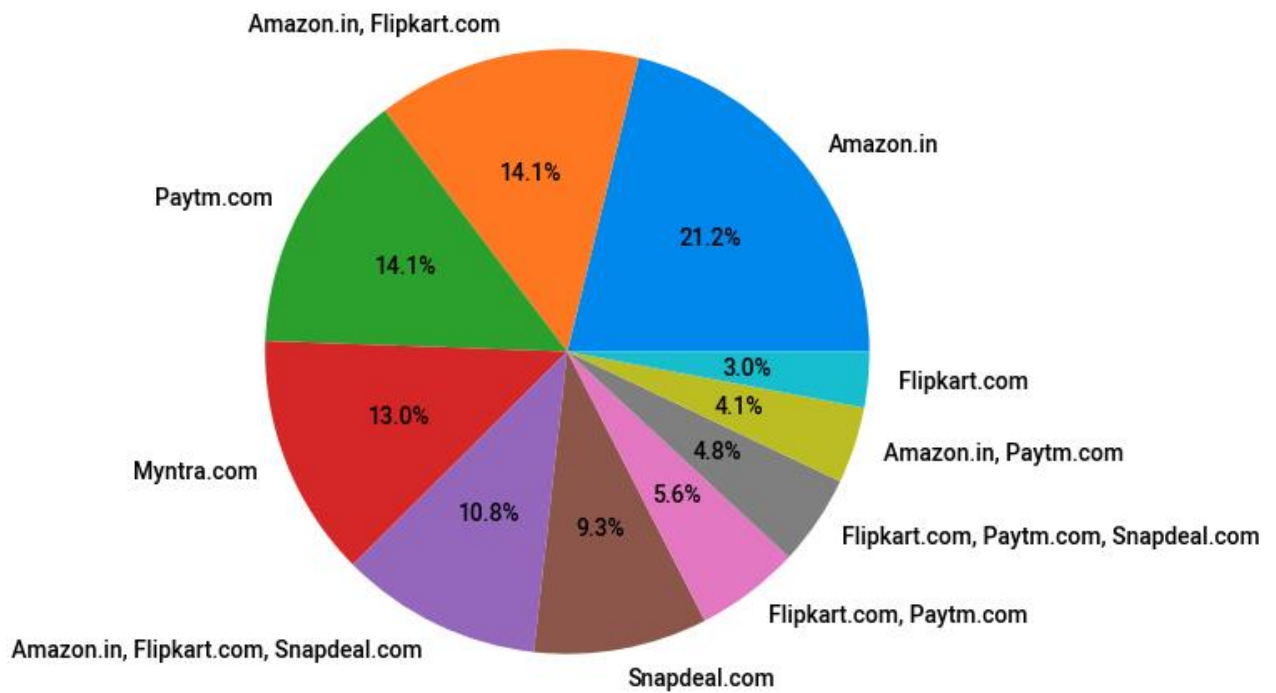




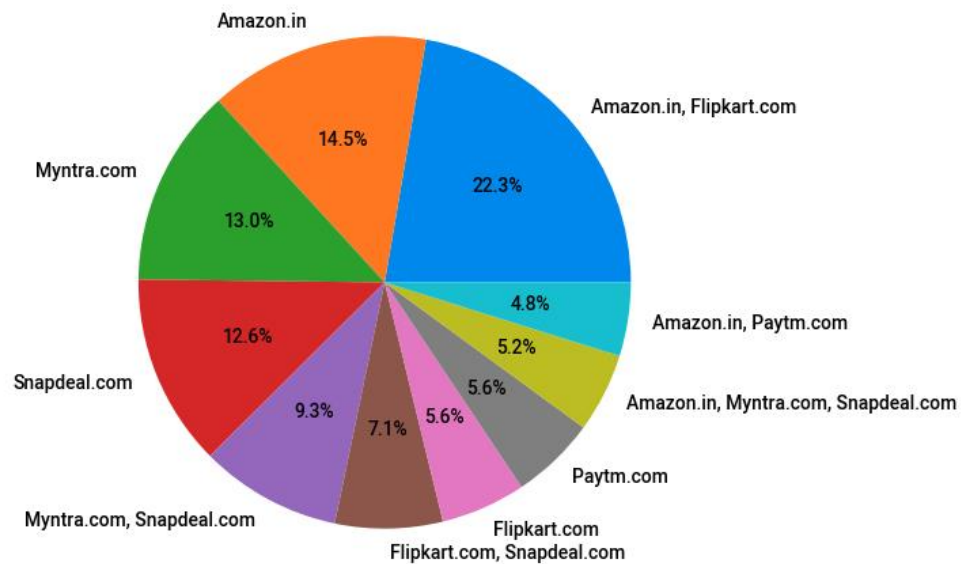
### Privacy of customers' information



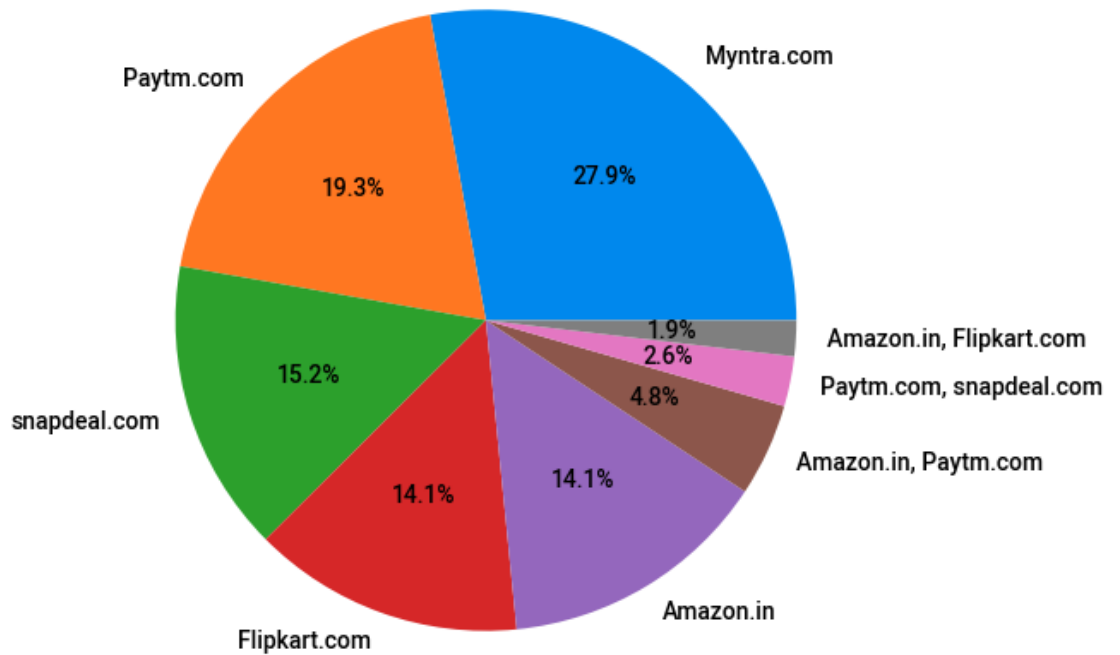
### Perceived Trustworthiness



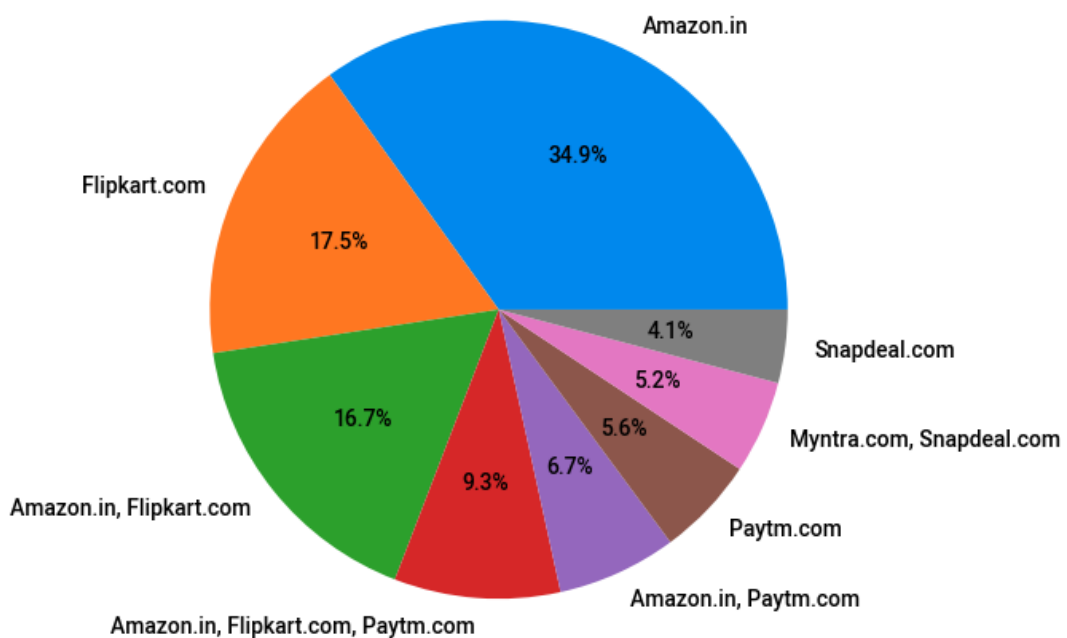
Longer time to get logged in (promotion, sales period)



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

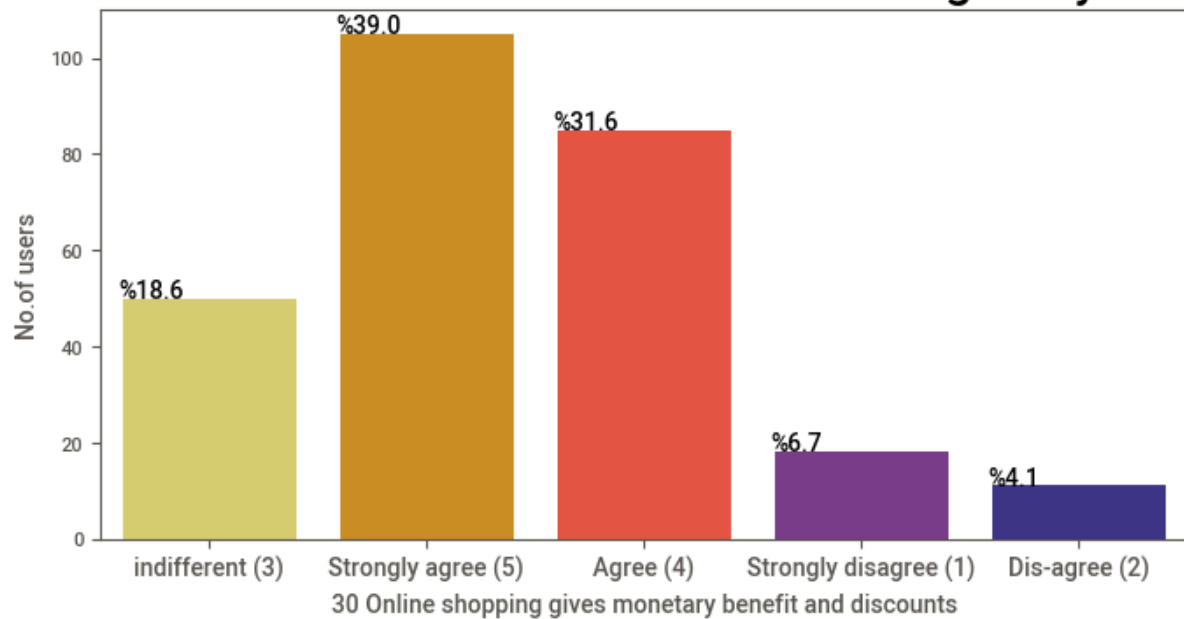


Late declaration of price (promotion, sales period)

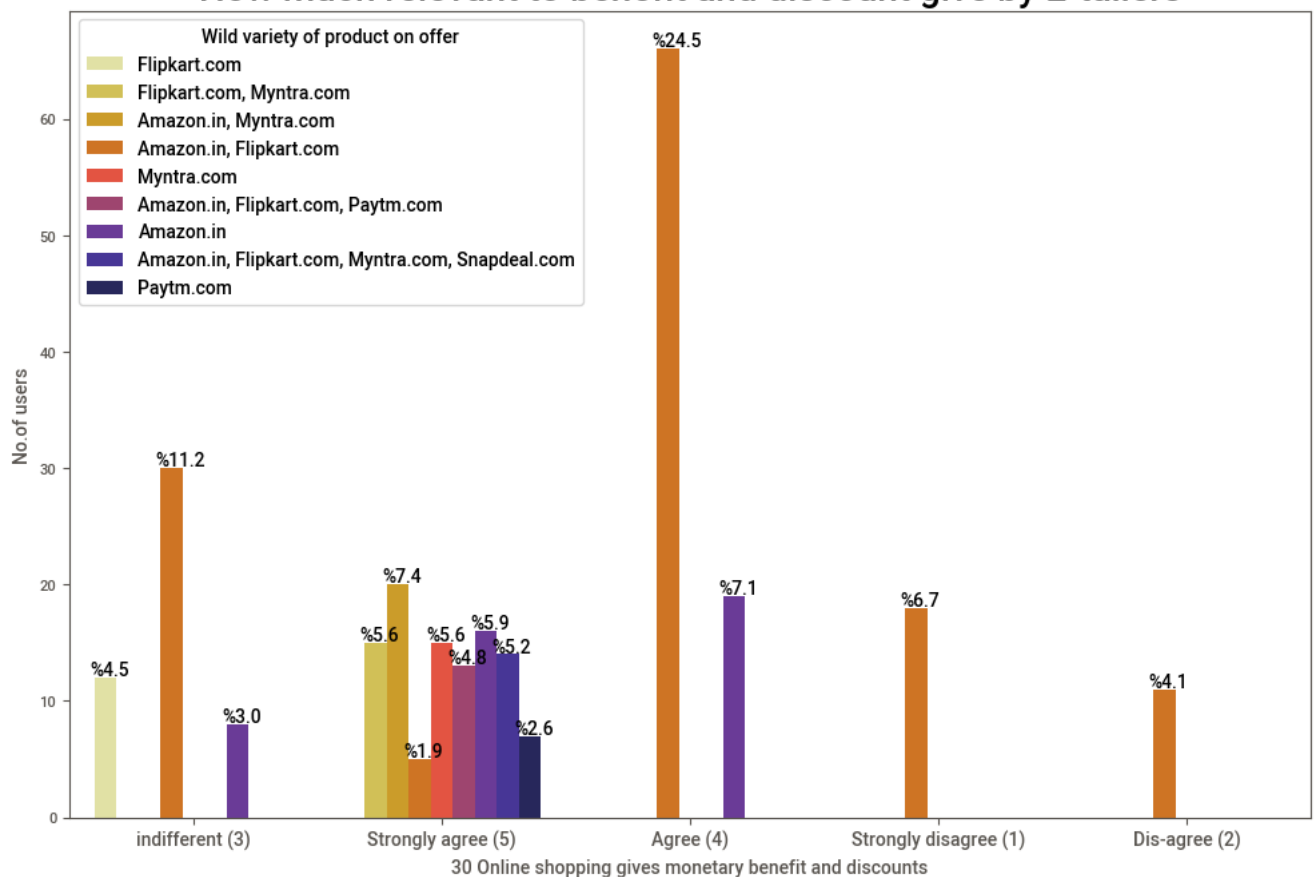


Website is as efficient as before

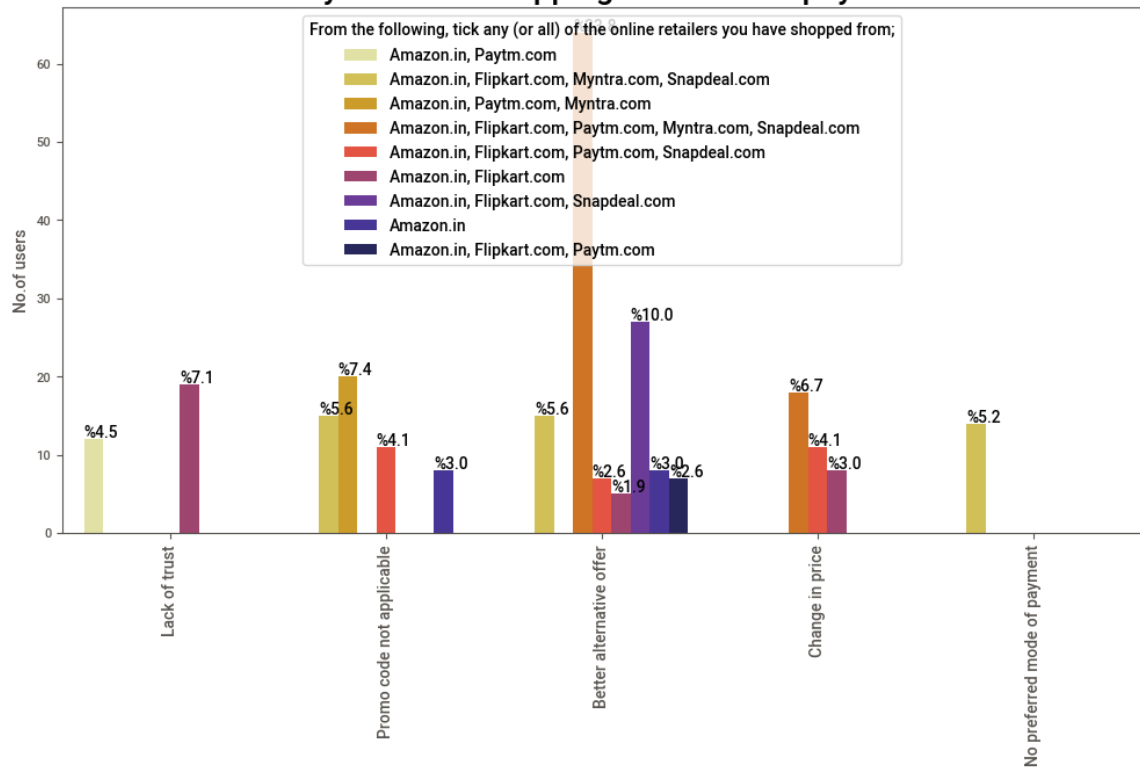
## How much relevant to benefit and discount give by E-tailers



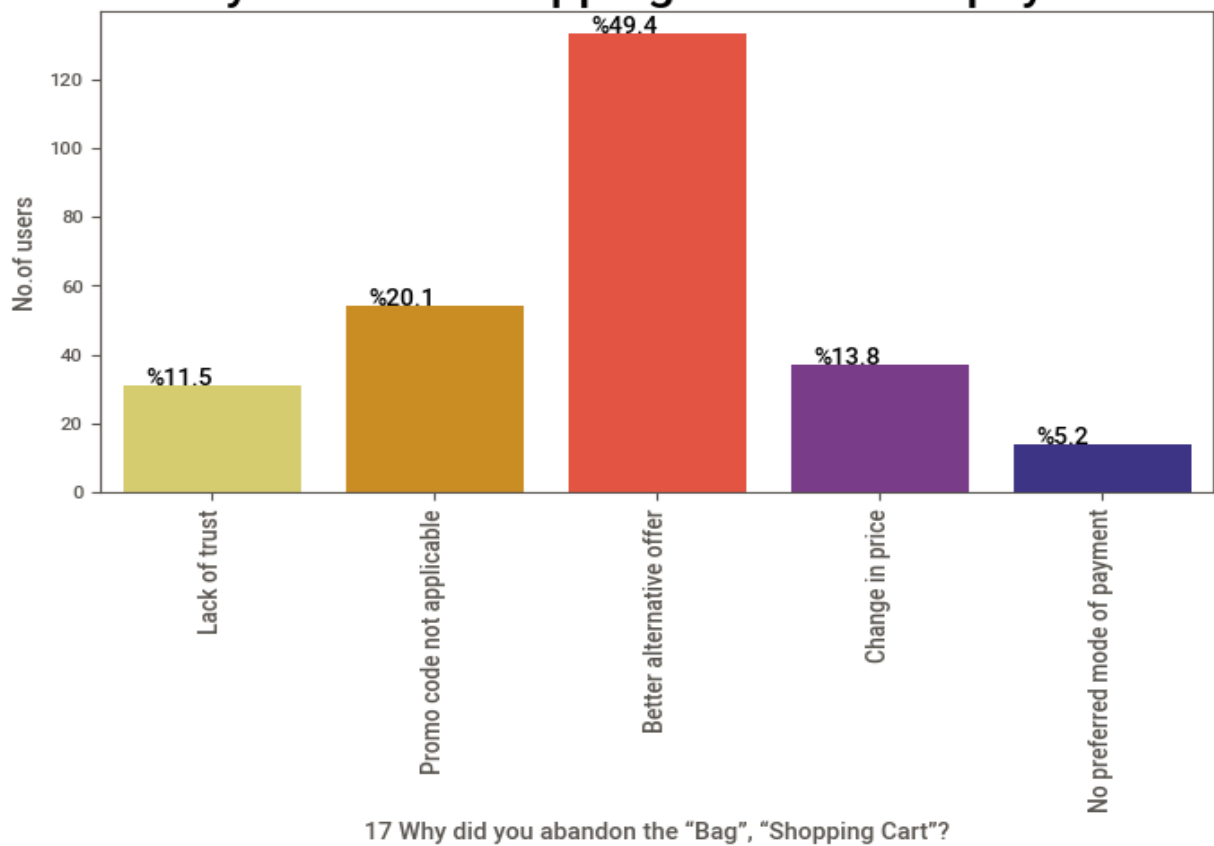
## How much relevant to benefit and discount give by E-tailers



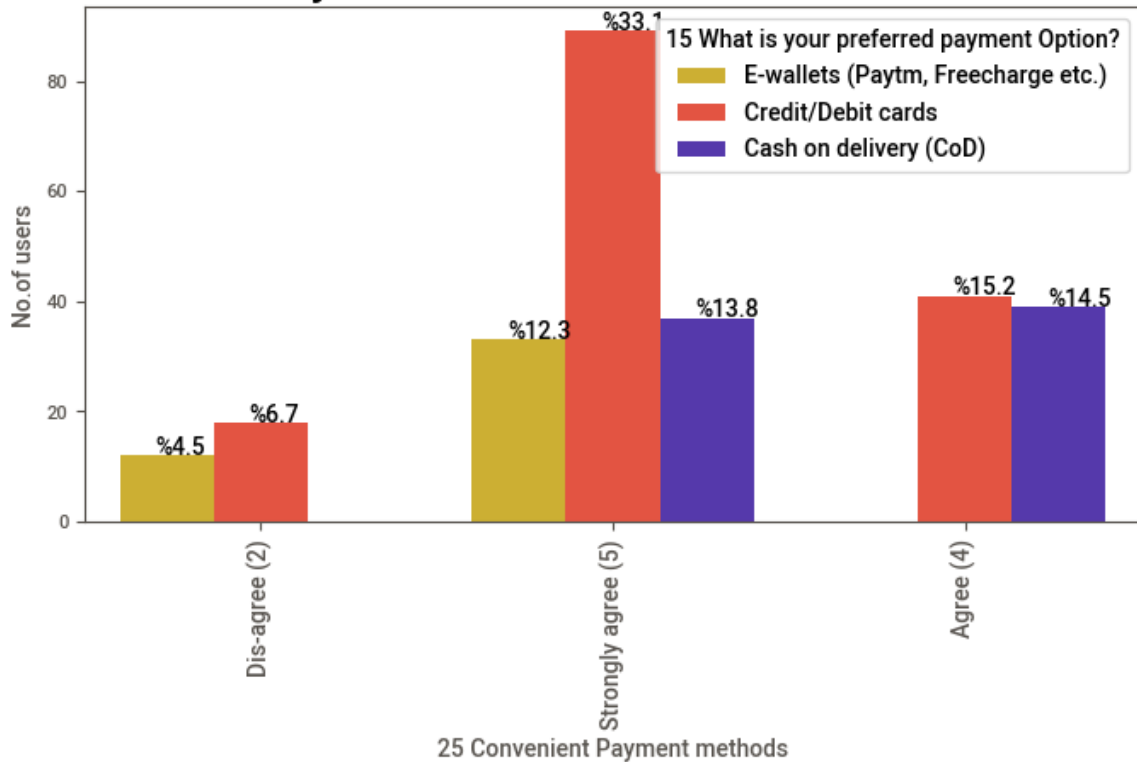
## Why abandon shopping cart without payment



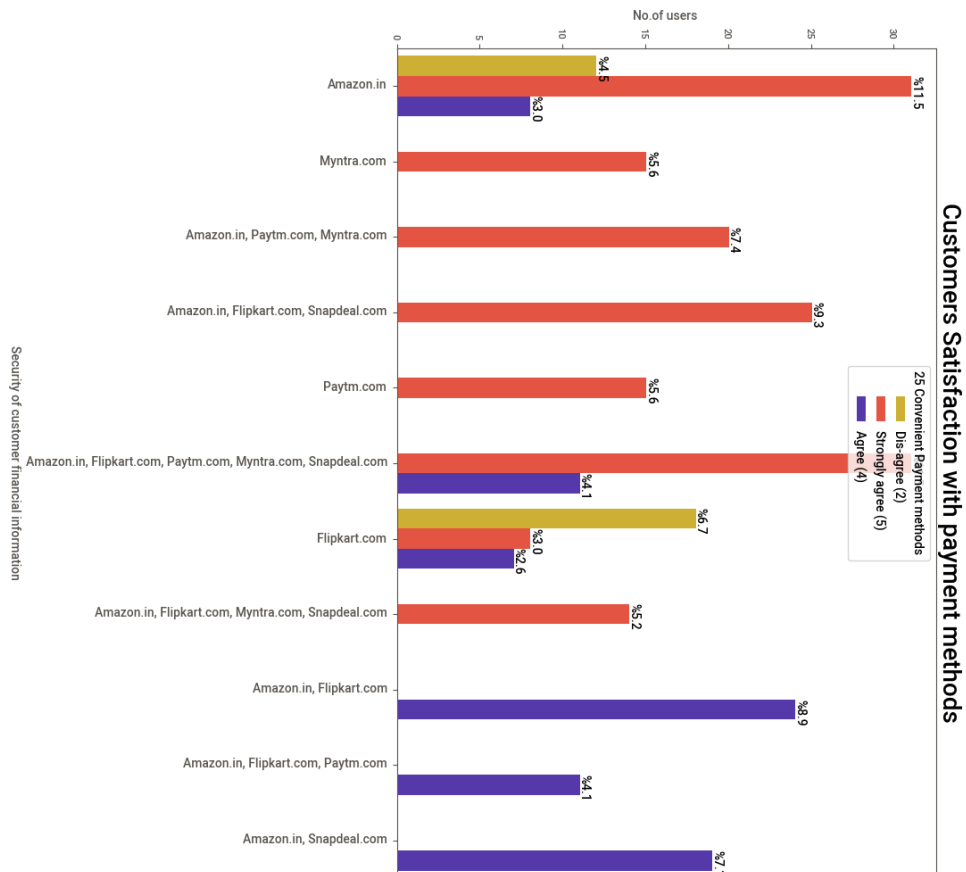
## Why abandon shopping cart without payment

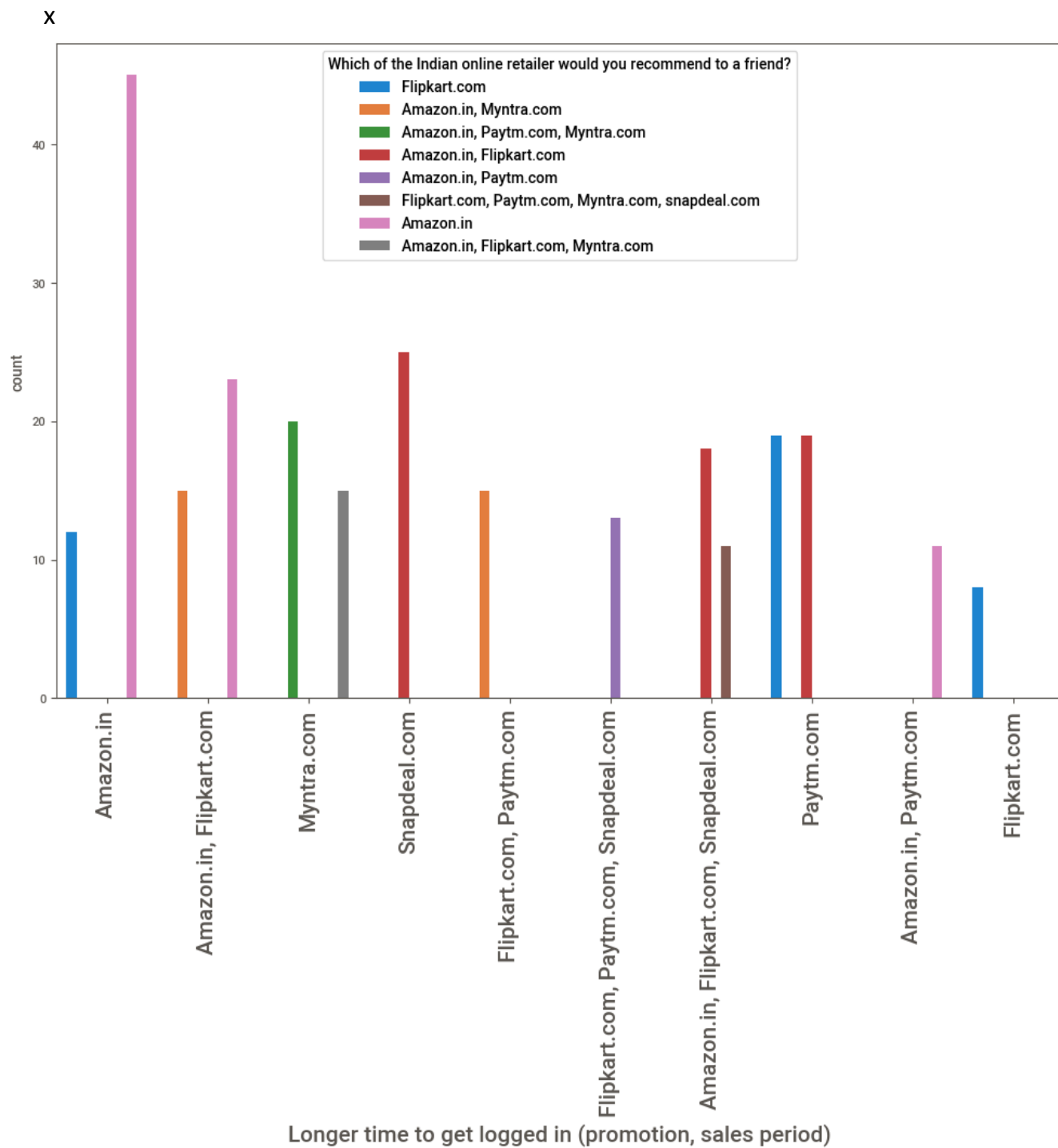


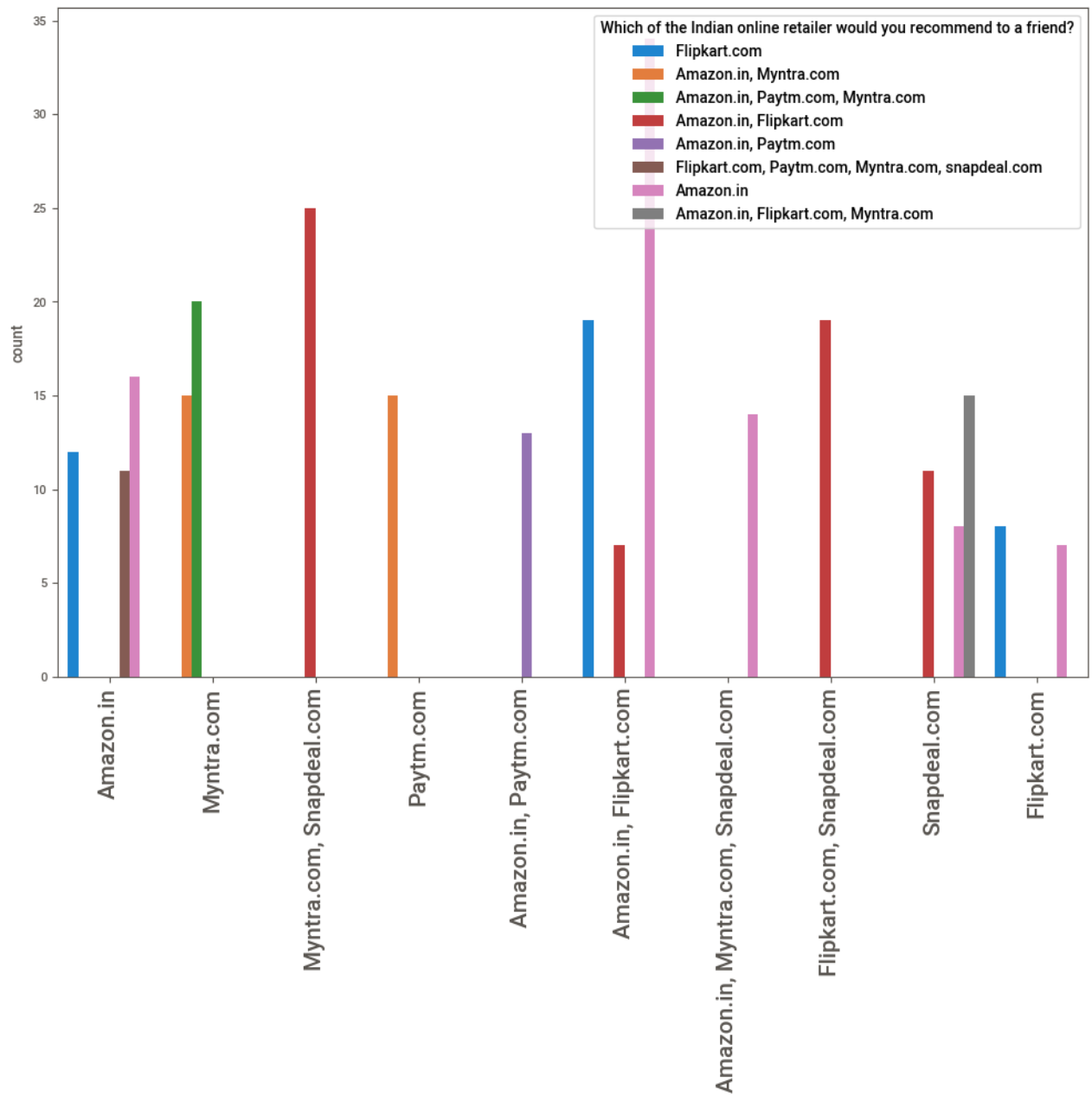
## Which Payment methods relevant to customers



### 25 Convenient Payment methods

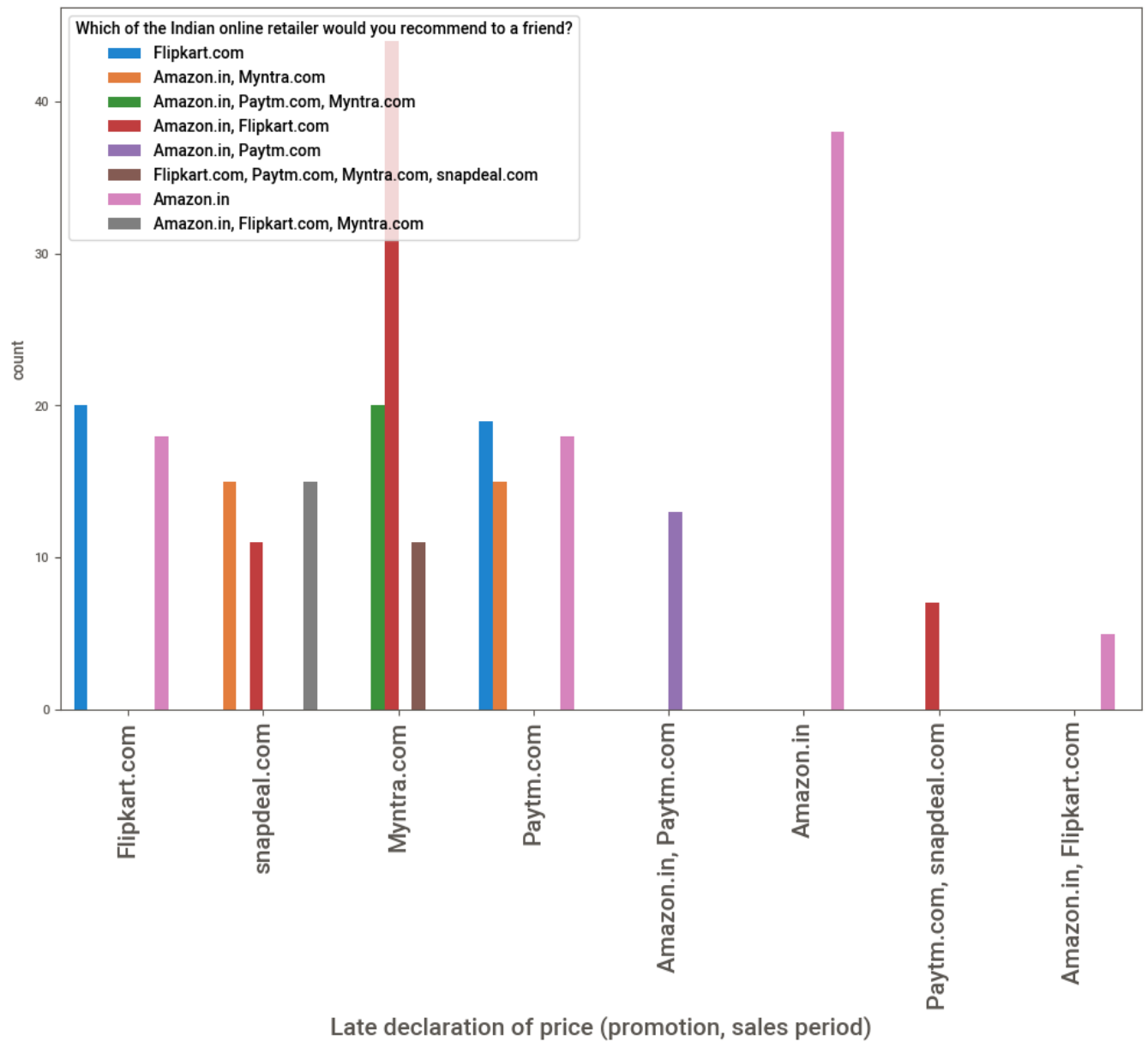


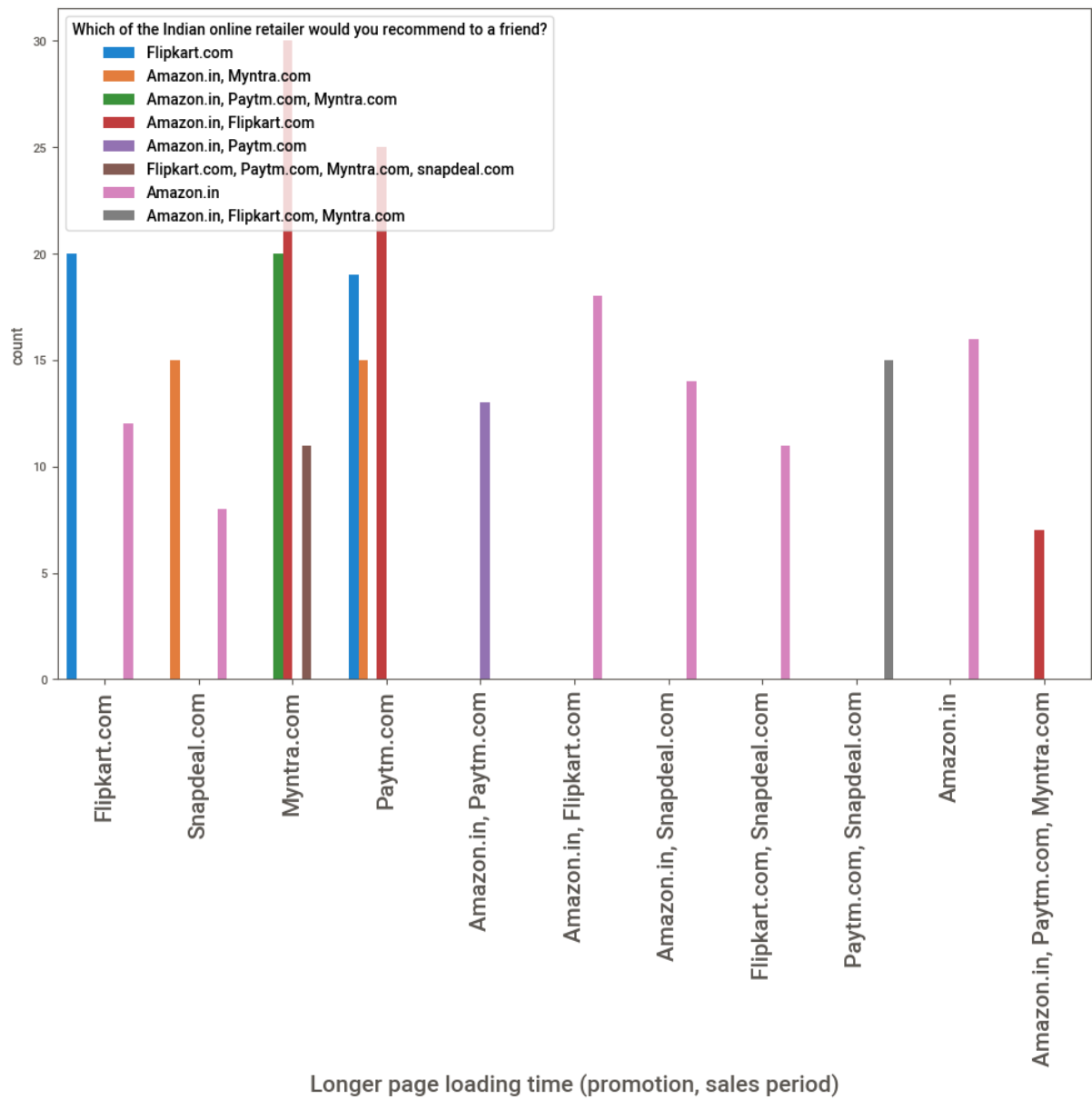


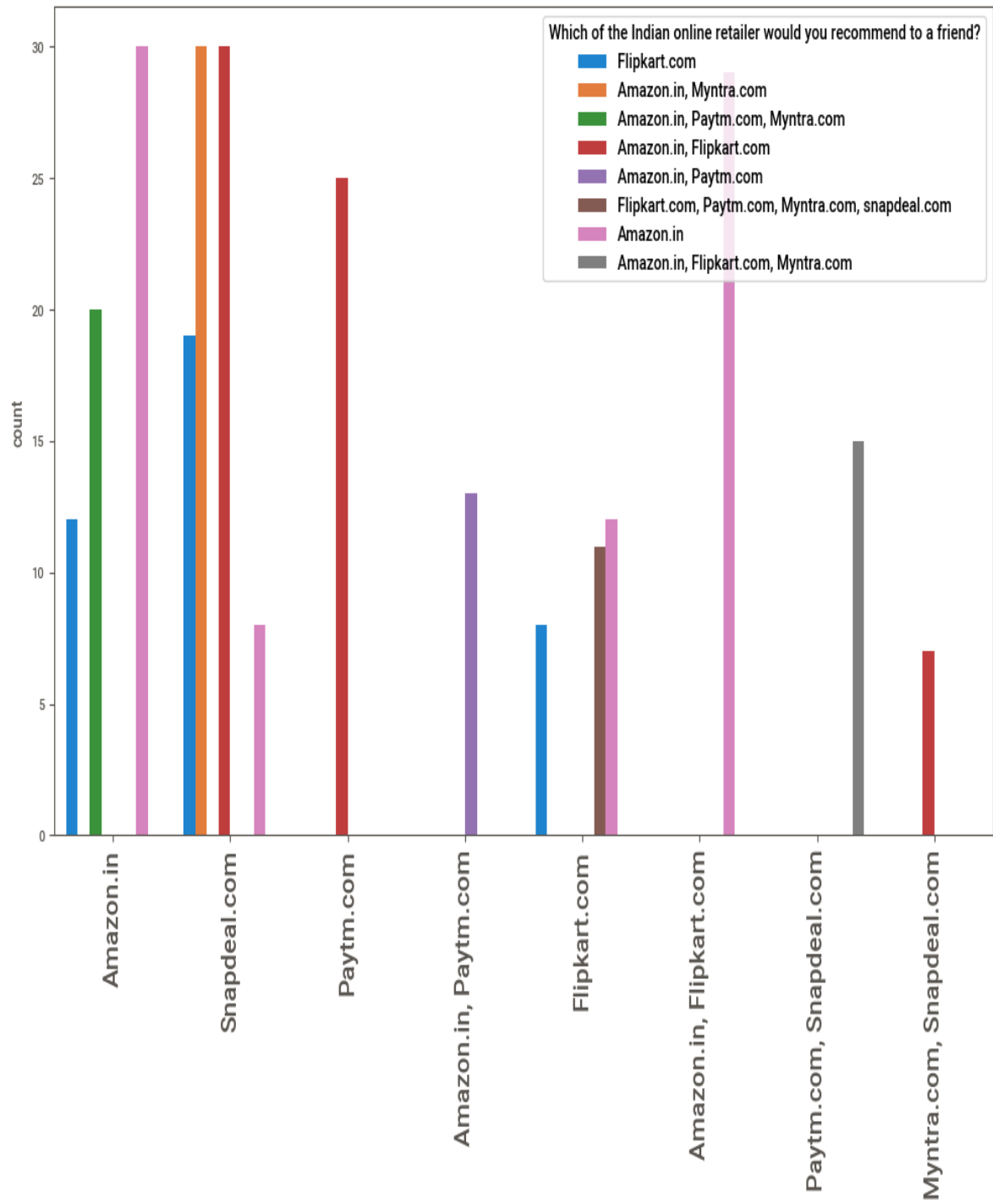


Longer time in displaying graphics and photos (promotion, sales period)

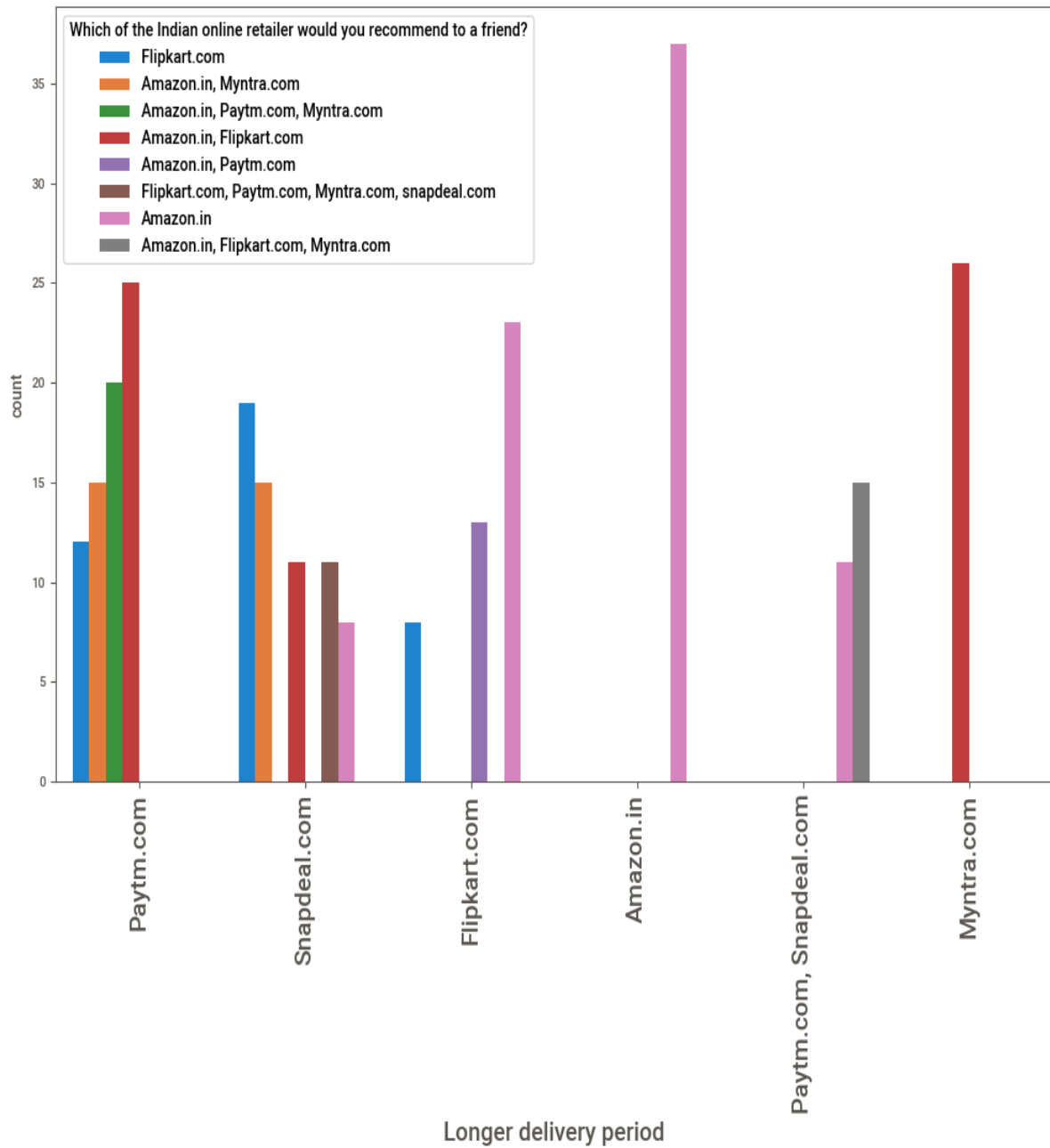


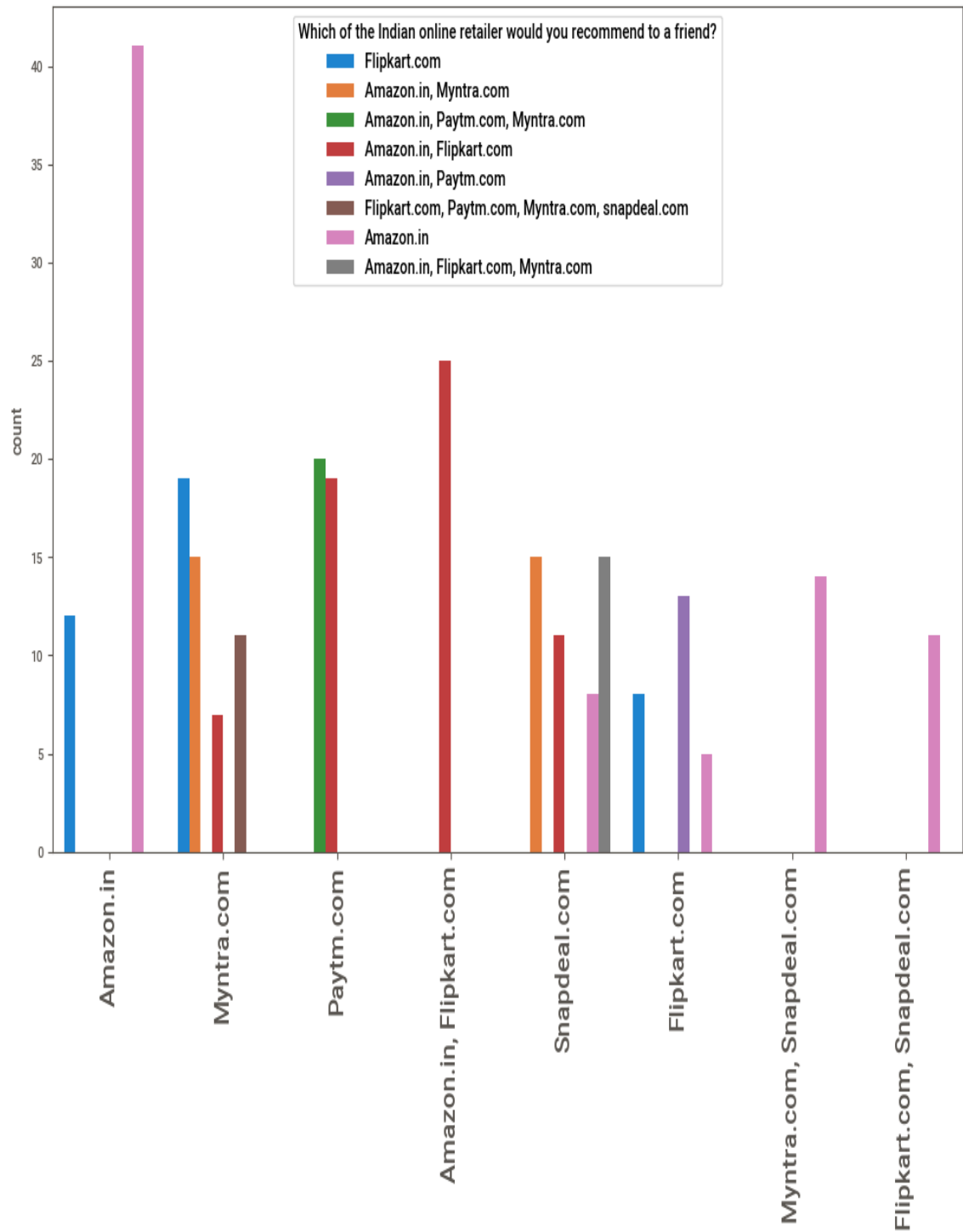






Limited mode of payment on most products (promotion, sales period)





Frequent disruption when moving from one page to another

## Analysis

- ❖ Above graph we can say that Female ratio is more than male in online shopping. 67% female to 33% male.
- ❖ From above plot in Delhi and Noida Online purchases by men is more than female respectively to 15% and 10% we say that men are more interested than women in online shopping or say that it can also save time of shopping in working professional.
- ❖ Rather than Delhi and Noida other cities women ratio are more in online shopping highest shopping count in Greater Noida 15.6%.
- ❖ In other cities also women ratio is high in online purchases as they getting sufficient time and getting all thing at one place with benefits.
- ❖ In Moradabad and Bulandshahr only males are interested for online shopping.
- ❖ In Merrut only females are responding for online shopping.
- ❖ Also, Cities like Delhi, Grater Noida, Bangalore, Noida highest rate of online shopping users.
- ❖ 21 to 50 year's people in that mostly female are preferred online shopping.
- ❖ Using website less than 10 min is most frequently because of just show new deals or best offers on product or searching something new for relevant uses
- ❖ On average more time spend on e-tails are mostly women.
- ❖ More than 40 min time spend on shopping websites are youth generation age between 21-30 years
- ❖ Age of 41-50 years mostly spend time of less than 10 min for check best deals or offers on particular product or 30-40 min of day on while during shopping.
- ❖ Most of people use Mobile internet for online shopping about to 70%
- ❖ Rest of people use Wi-Fi 28%
- ❖ very few people use Dial-up mode which very old technique for internet.
- ❖ Mostly mobile internet used by young as well middle age generation during shopping because of that they can do shopping at any time or any place
- ❖ Wi-Fi used is less because of they can only access while Wi-Fi is available at that place so it may be office place or home place or any public place
- ❖ As mobile internet used most from that Smartphone app or websites use most for shopping
- ❖ As well as Laptop and Desktop also preferred by users for better wide screening options.
- ❖ In smart phone mostly android/iOS and in Laptop window O/S used.
- ❖ Most of Android as well in iOS Google chrome use for shopping 80%
- ❖ In iOS device safari use for shopping 15%.
- ❖ Most of website or app are find by search engines rather than adds or marketing.
- ❖ All websites open in google chrome and safari so that mostly preferable

- ❖ In opera browser only Amazon.in support or say that another website can't take load
- ❖ Same as Mozilla Firefox Amazon.in, Flipkart.com are supported or both sites take less load for opening.
- ❖ Most of use devices are smartphone and laptops that are easily too operable and handle for everyone.
- ❖ All website opens at least Less than 10 min time period in a day for showing best deal or best offers on product
- ❖ Most of demanding websites are Amazon, Flipkart, Paytm, Myntra, Snapdeal for shopping.
- ❖ Amazon and Flipkart both websites have positive reviews from customers
- ❖ Only for amazon have 50-50 reviews of satisfaction
- ❖ Amazon, Flipkart, Myntra, Snapdeal are time consuming website because shopping in less time like 10-20 min they have indifferent review and for above 20min shopping have positive reviews.
- ❖ 35% customers observed improve in Amazon as before as they only use Amazon for shopping
- ❖ 18% customers observed improvement in Flipkart as they only use Flipkart for shopping
- ❖ 17% customer observed Amazon, Flipkart as they show improvement as before
- ❖ 4% to 6 % customers observed changes in Paytm, Snapdeal, Myntra as per their uses.
- ❖ About of 60% customers notice that Myntra, Snapdeal, Paytm are Weak in Promoting, Sales deals
- ❖ 23% customers Observed that Amazon, Flipkart are Take more time to display graphics and Photos
- ❖ 25% notice that Myntra and Snapdeal also take longer time for Graphics and photos
- ❖ 28% customers Trust on Amazon for shopping
- ❖ For individual Very less Trust site in Myntra as only 6%
- ❖ 5 to 7% customer's review that Myntra and Paytm have less security of customer's financial and privacy information
- ❖ Most of customers review that Amazon and Flipkart are more efficient for their customer's privacy information
- ❖ Also, some customer review that All E-trailers are efficient for their customer's privacy information as depend on uses.
- ❖ 70% customer's review that Amazon and Flipkart are Fastest delivery options in their shopping.
- ❖ Also 5% customer review that Flipkart delivery is slow as per their experience of uses.
- ❖ Most of customer said that Amazon, Flipkart, Myntra, Snapdeal, Paytm are easy to handle, in that Flipkart and Amazon both are most relevant,
- ❖ But also, some customer review that individual 3% flip kart 5% Paytm for Easy use.
- ❖ 48% customer's review that Amazon are have wild variety of products on offers, but individual use of 5-6% customer review Flipkart, Myntra, 3% customer review Paytm for variety of offers.
- ❖ 37% customer's review Amazon and Flipkart both have complete information about all products on site.

## CONCLUSION

### ❖ Key Findings and Conclusions of the Study

#### Scores

75.754028  
59.810983  
59.253569  
57.171099  
55.301526  
54.245760  
53.269266  
48.222655  
48.130643  
47.605973

#### Features

Why did you abandon the “Bag”, “Shopping Ca...  
Loading and processing speed  
Shopping on the website gives you the sense...  
What browser do you run on your device to a...  
Change in website/Application design  
Visual appealing web-page layout  
Limited mode of payment on most products (prom...  
Longer time to get logged in (promotion, sales...  
Longer time in displaying graphics and photos ...  
Wild variety of product on offer



Above features are important to know about customer purchase behaviours and retention to Online Shopping. From the observation we conclude that **Amazon and Flipkart** both are most reliable and Trustworthiness e-commerce websites for shopping and customers mostly use of this.

- **Benefits:**

- Wide range of products
- Saves money
- Saves time
- Exchange benefits
- Adequate Information
- Convenience

- **Drawbacks:**

- Delay in delivery. ...
- Lack of significant discounts in online shops. ...
- Lack of touch and feel of merchandise in online shopping. ...
- Lack of interactivity in online shopping. ...
- Lack of shopping experience. ...
- Lack of close examination in online shopping. ...
- Frauds in online shopping.