

# **CUSTOMER RETENTION PROJECT**

Submitted by:

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# INTRODUCTION

- Objective

Understand and analyze the various factors that affect the success of online store.

- Conceptual Background of the problem

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.

It has been seen from various comprehensive review of literature, theories and models that five major factors that contribute to the success of an e-commerce store are: **service quality, system quality, information quality, trust and net benefit.**

In this project we try to analyze customer responses to a survey based on the parameters mentioned above.

## THE DATASET

- Data source and format

1. The data is collected from the Indian online shoppers.
2. The dataset contains 269 rows and 71 columns.
3. All the columns are of categorical data-type.

- Information about the columns

1. According to the data-type and purpose, the columns can be divided into three parts.
2. The first 17 columns contain data to know about the customer, their online shopping methods, their location, devices they use, etc.
3. Column 18 to 47 tries to know the customer's viewpoint on various parameters like information quality, service quality, etc. Data in these columns has 5 unique values: 'Strongly agree (5)', 'Agree (4)', 'Indifferent (3)', 'Dis-agree (2)', 'Strongly disagree (1)'.
4. Column 48 to 71 takes the customer's feedback for different e-commerce websites on various parameters. The e-commerce websites are amazon, flipkart, myntra, snapdeal and paytm.

- Data preprocessing

1. No null values found in any of the columns.
2. Since the objective of the project is to just understand and analyze hence numeric-encoding of the data for model-understanding is not necessary. Categorical data in unencoded form is infact helpful for visualization purposes.

3. strip() function was used to get rid of escape characters in the names of the columns.
4. The column '*7 How do you access the internet while shopping on-line?*' had two unique values of '*Mobile Internet*' and '*Mobile internet*'. One of them is replaced with the other with the help of replace() function.
5. Column 1 to 47 is kept as it is. In column 48 to 71 the respondents may choose one or more among the 5 e-commerce sites. Data in this format can't be visualized. Hence we made a new dataframe which contains the count (of each of the 5 e-commerce sites) of being chosen by the respondents for each query(column). This is done mainly for visualization purpose.

[illegible]

After:

	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	Wide 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	...	Longer time to get logged in (promotion, sales period)	Longer time in displaying graphics and photos (promotion, sales period)	declar of (promc : pe
amazon	269	249	227	220	238	249	227	215	215	240	...	135	126	
flipkart	221	201	175	184	194	162	146	158	203	162	...	103	94	
paytm	150	125	67	20	59	99	96	107	0	0	...	77	28	
myntra	146	147	115	64	64	74	64	79	132	29	...	35	74	
snapdeal	182	130	61	14	59	81	45	0	90	50	...	67	92	

5 rows × 24 columns

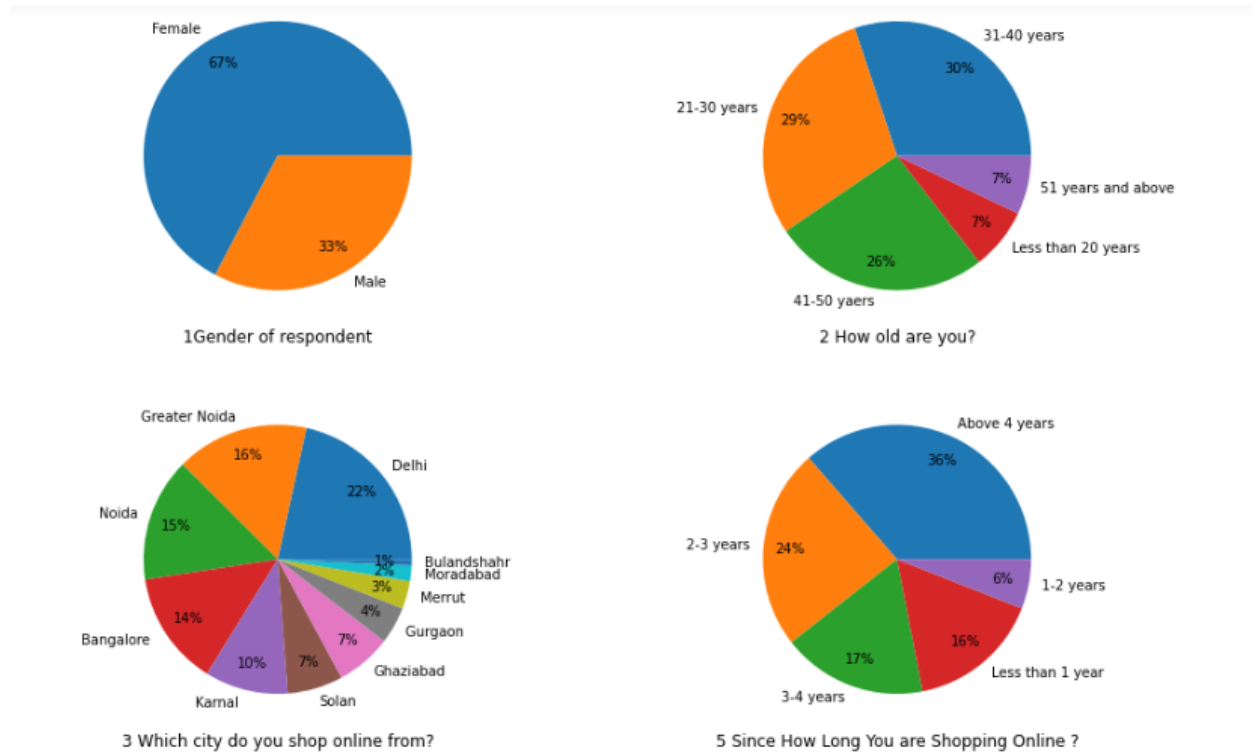
6. For columns 48-71 a function is used to make separate columns for each of the 5 e-commerce sites which captures the data of whether an e-commerce site is chosen by the respondent or not. 1 denotes chosen and 0 denotes not chosen. The function takes a column name as input and returns a dataframe with encoded values for that column. We use it when we want to do some visualization with respect to other columns. Below is an example of the output dataframe for 48<sup>th</sup> column.

	amazon	flipkart	paytm	myntra	snapdeal
0	1	0	1	0	0
1	1	1	0	1	1
2	1	0	1	1	0
3	1	1	1	1	1
4	1	1	1	1	1
...	...	...	...	...	...
264	1	0	0	0	0
265	1	1	0	0	0
266	1	1	0	0	1
267	1	1	0	1	1
268	1	0	0	0	0

269 rows × 5 columns

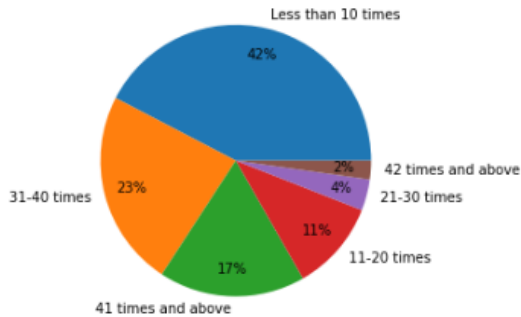
# VISUALIZATION AND OBSERVATIONS

*At first let's see some plots to know about the respondents.*

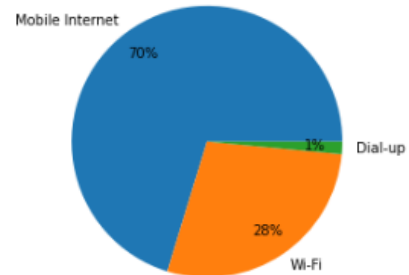


- Observations:
  1. Majority of respondents are female.
  2. 85% of the respondents belong to 21-50 years age category.
  3. A high majority(84%) of the respondents have been shopping online since at least 1 year.
  4. Majority of respondents are from tier-1 cities.

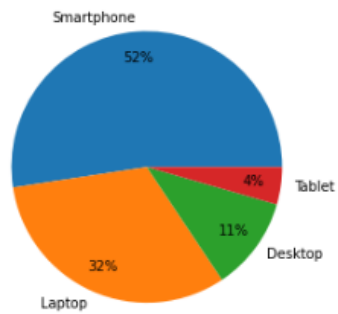
- Pie plots:



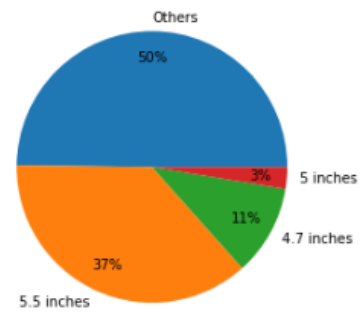
6 How many times you have made an online purchase in the past 1 year?



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



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

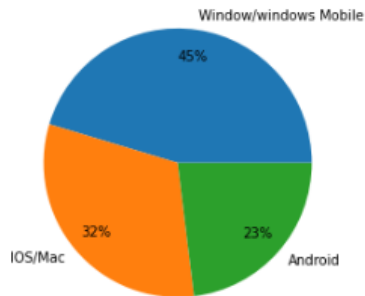


9 What is the screen size of your mobile device?

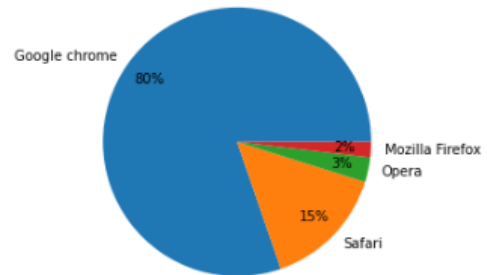
- Observations:

1. 42% of the respondents have purchased online at least 30 times in the past 1 year. 42% have purchased less than 10 times.
2. 70% of the respondents use mobile internet connection.
3. More than half the respondents use smart-phone to do online purchasing.

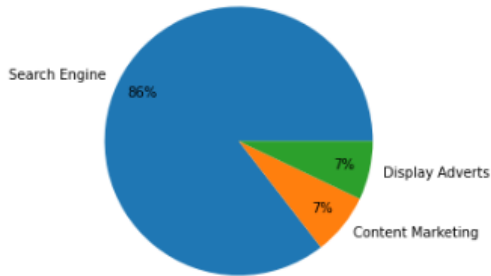
- Pie plots:



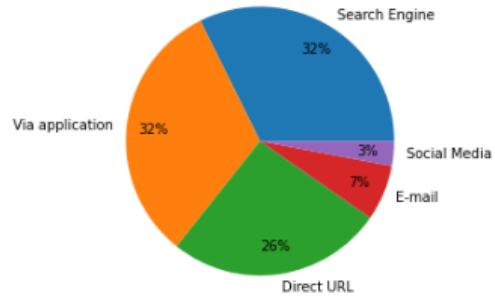
10 What is the operating system (OS) of your device?



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



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



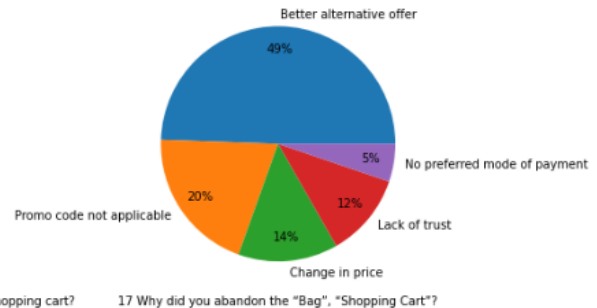
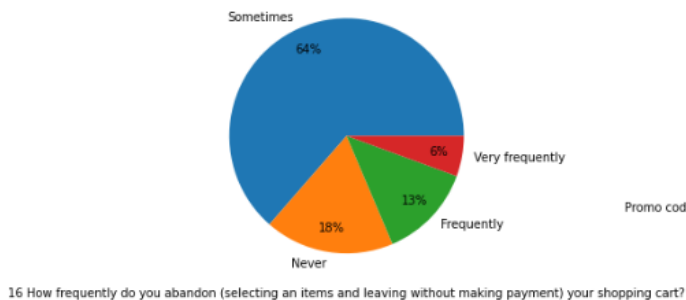
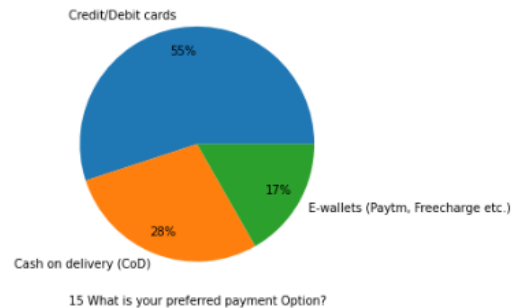
13 After first visit, how do you reach the online retail store?

- Observations:

1. Majority of the respondents use windows operating system.
2. Google Chrome is the most preferred browser(80%)
3. Use of search engine is highest(86%) to arrive at the e-commerce site for the first time.



- Pie plots:

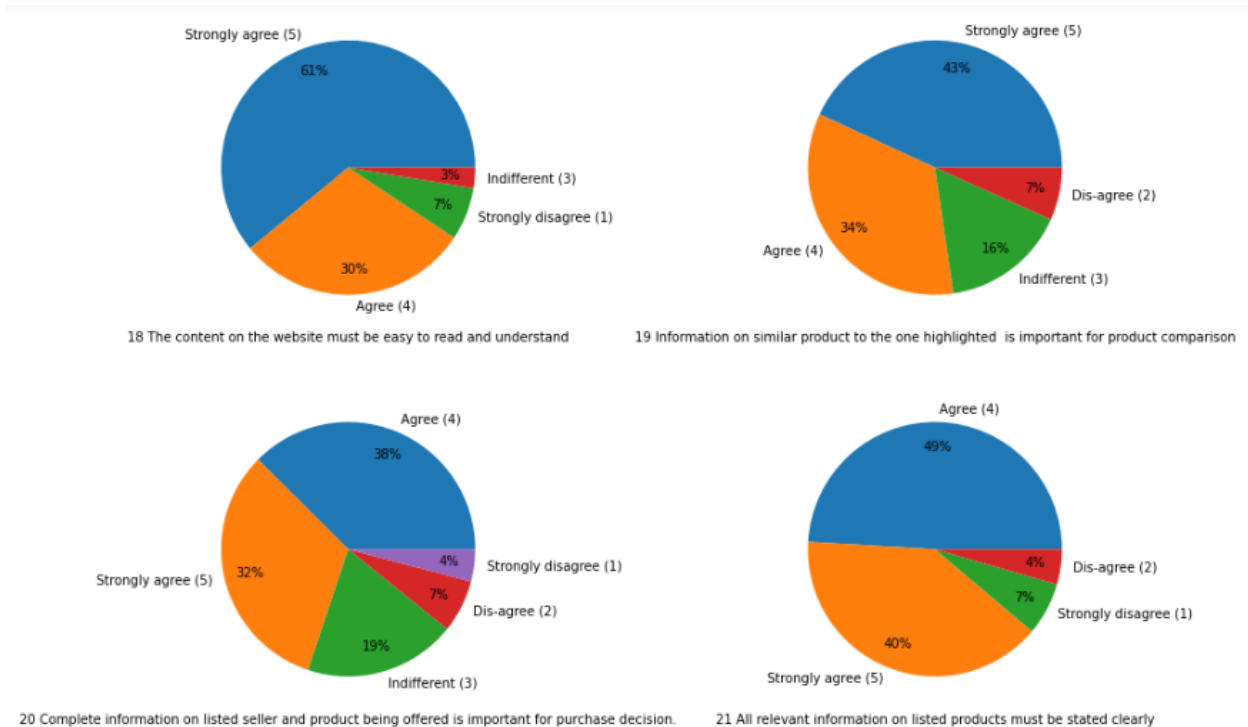


- Observations:

1. Almost 9 out of 10 people explore the e-commerce site for at least 6 minutes before making a purchase.
2. More than 50% people prefer credit/debit cards for payment.
3. Almost half the respondents think that they get better alternative offer and hence abandon the shopping cart.

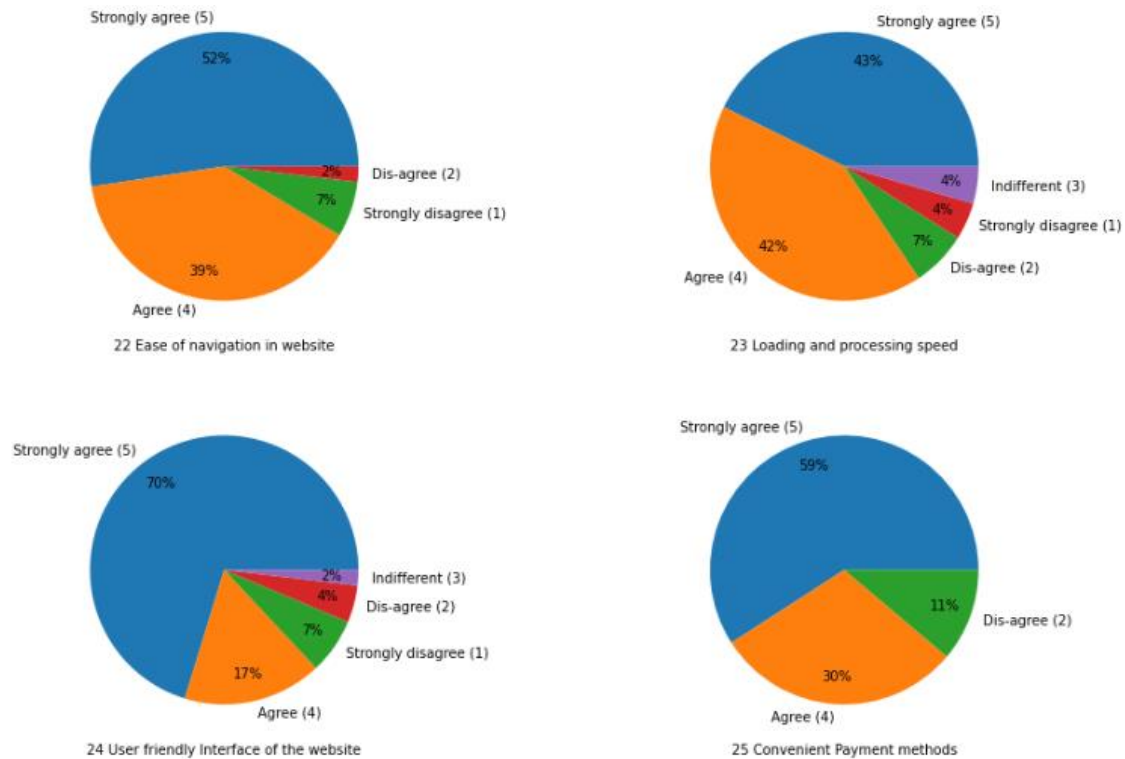
***Now let's analyze customer's viewpoint on various parameters of e-commerce using pie-plots.***

- Pie plots on **information quality**:



- Observations:
  1. More than 90% of the respondents agree that the content on the site must be easy to read and understand.
  2. More than 75% agree that similar product comparison is important.
  3. 70% of the respondents think that it is important to mention seller's information.
  4. Almost 90% of the respondents think that product's relevant information should be stated clearly.

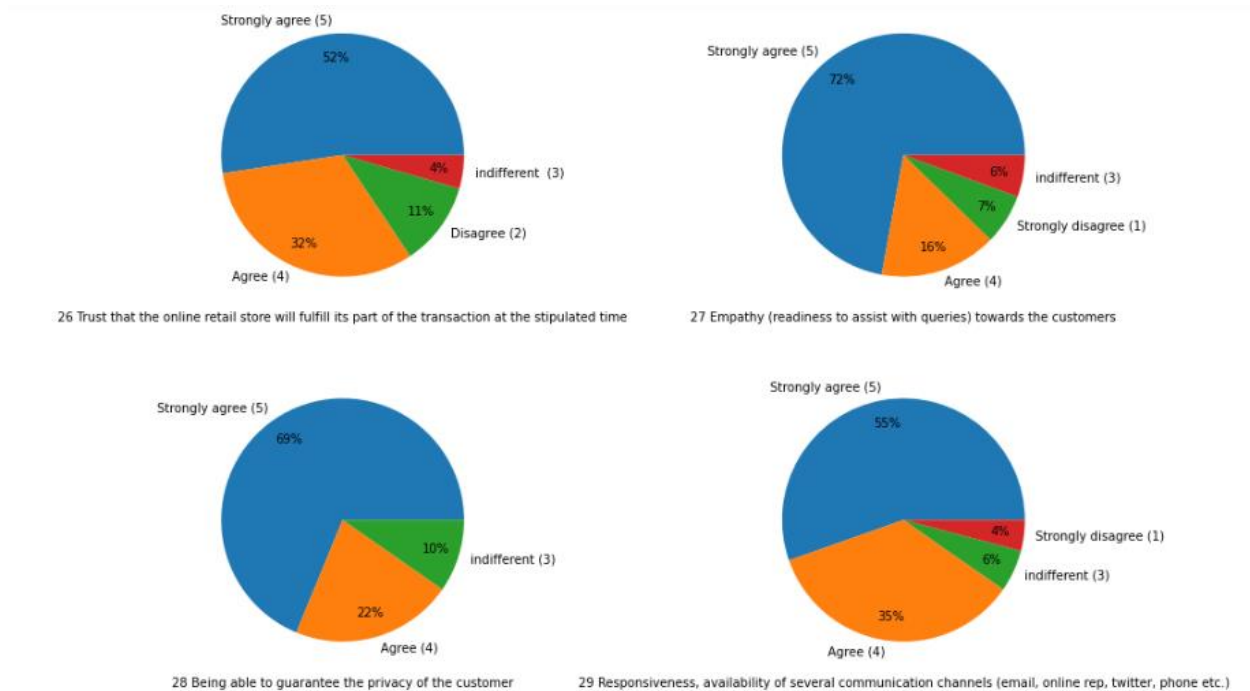
- Pie plots on **system quality**:



- Observations:

1. Ease of website navigation is important according to more than 90% of the respondents.
2. 85% of the respondents think that loading and processing speed is important.
3. More than 85% agree that the user friendliness of the website is important.
4. Almost 90% of the people think that convenient payment methods is important.

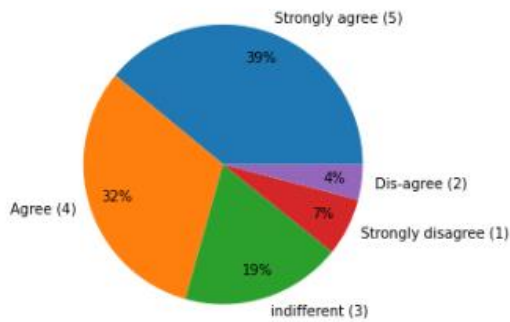
- Pie plots on **trust and response**:



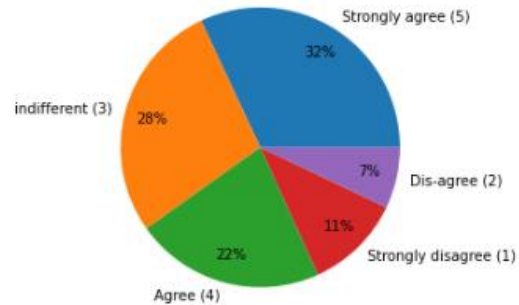
- Observations:

1. Almost 90% of the respondents believe that responsiveness with query and availability of multiple channels to communicate is important.
2. More than 90% of the respondents believe that privacy policy is an important factor.

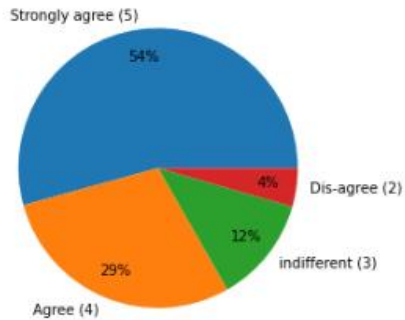
- Pie plots:



30 Online shopping gives monetary benefit and discounts



31 Enjoyment is derived from shopping online

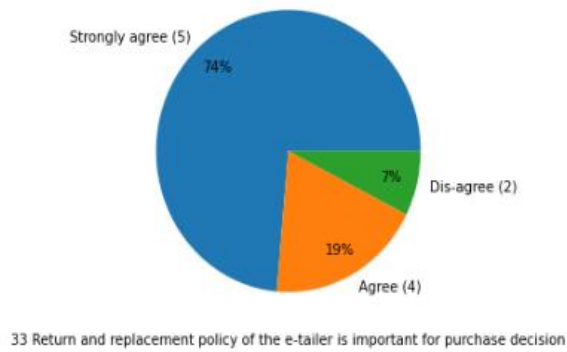


32 Shopping online is convenient and flexible

- Observations:

1. More than 70% of the respondents believe that online shopping gives monetary benefits and discounts.
2. More than half the people consider online shopping enjoyable.
3. More than 80% of the people think that online shopping is convenient and flexible.

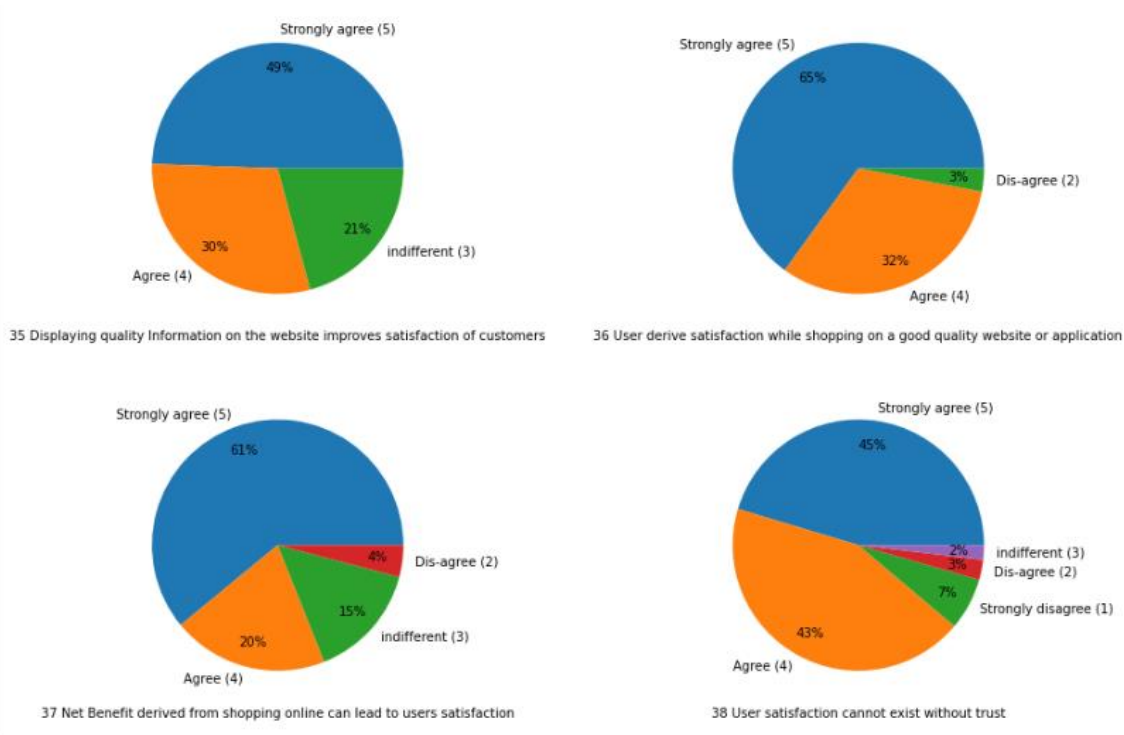
- Pie plots:



- Observations:

1. More than 90% of the respondents believe that return or replacement policy is important in purchase decisions.
2. Two-third of the respondents believe that loyalty programs is one of the benefits of online shopping online.

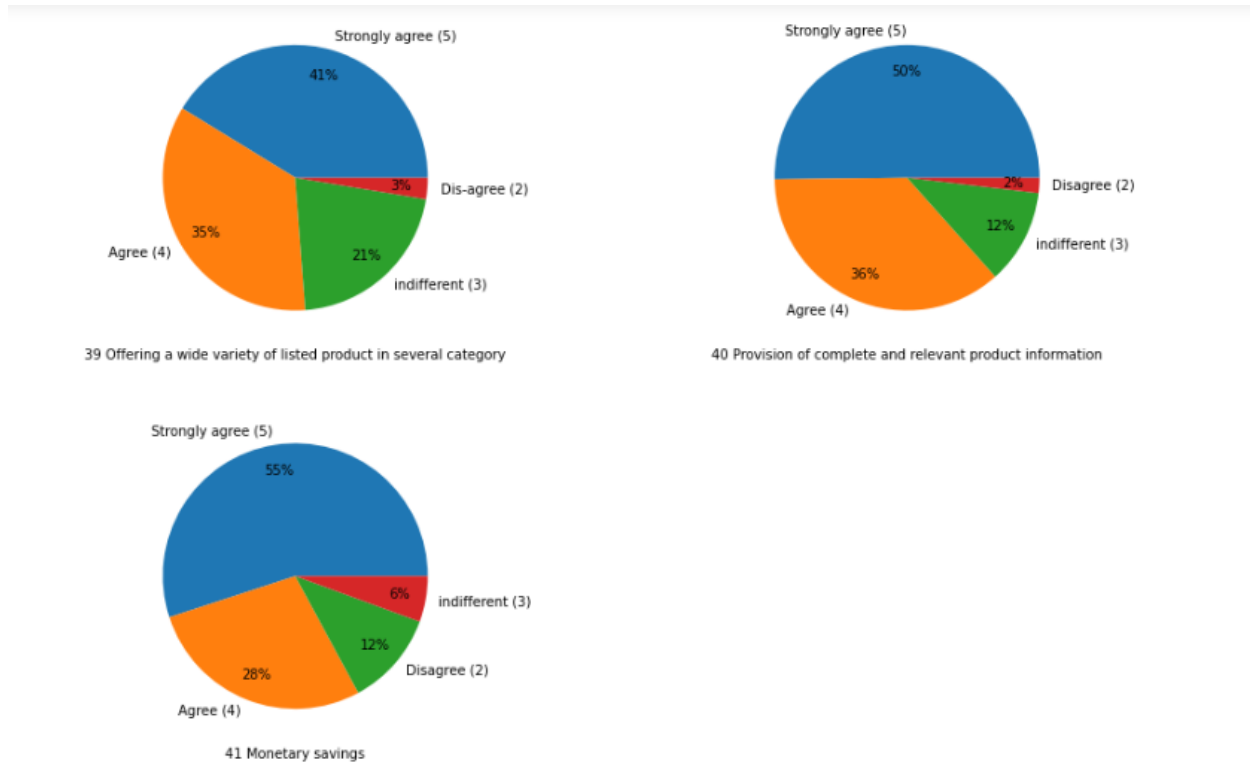
- Pie plots on **user satisfaction**:



- Observations:

1. Almost 80% of the respondents believe that quality information is important for customer satisfaction.
2. More than 90% people believe that quality of website/application is important for customer satisfaction.
3. More than 80% respondents believe that net benefit is important for customer satisfaction.
4. A very high majority(88%) of people think that without trust a customer satisfaction can't exist.

- Pie plots:

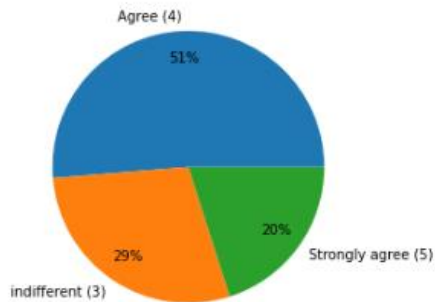


- Observations:

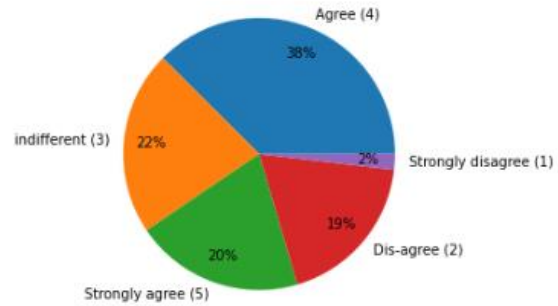
1. More than 75% of the respondents believe that online shopping offers a wide variety of products in several category.
2. More than 80% of the respondents believe that online shopping help in monetary savings.



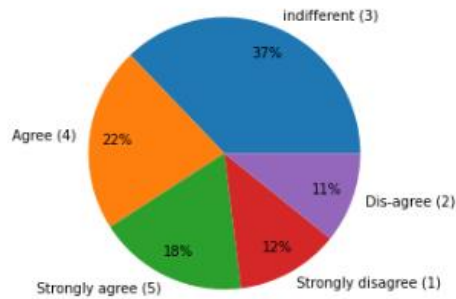
- Pie plots:



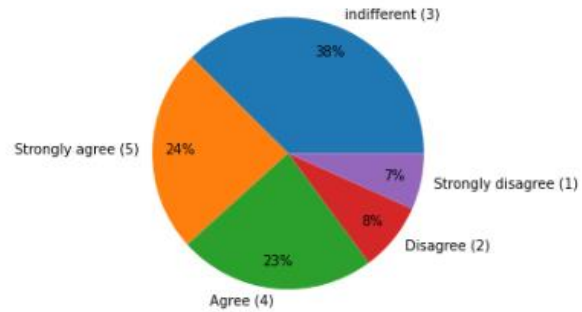
42 The Convenience of patronizing the online retailer



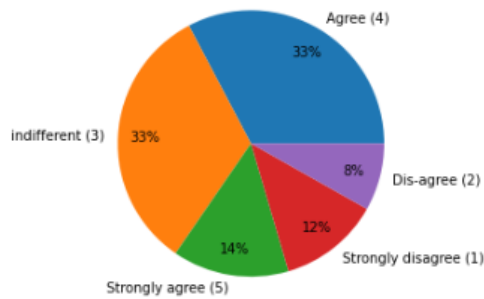
43 Shopping on the website gives you the sense of adventure



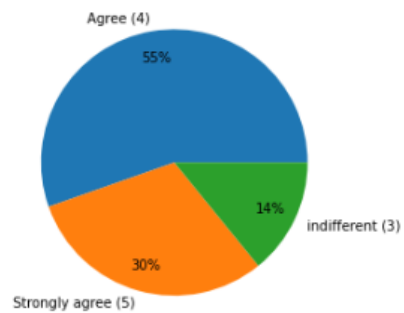
44 Shopping on your preferred e-tailer enhances your social status



45 You feel gratification shopping on your favorite e-tailer



46 Shopping on the website helps you fulfill certain roles



47 Getting value for money spent

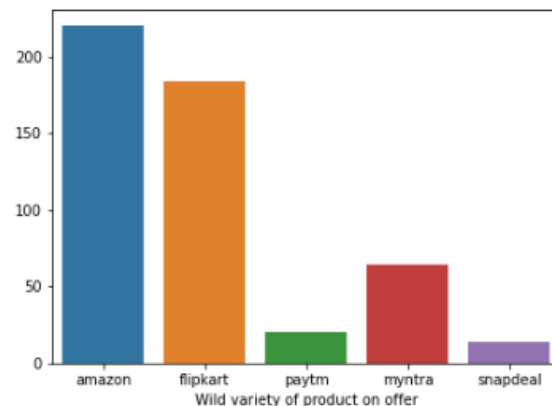
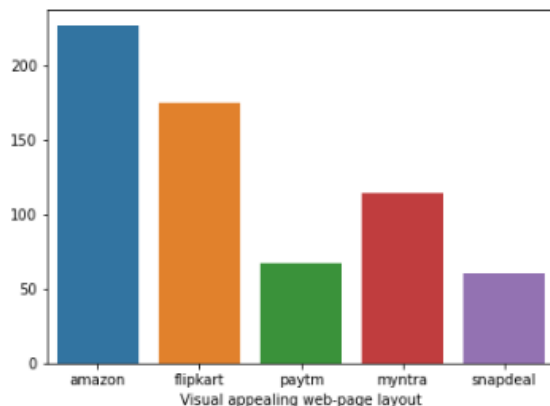
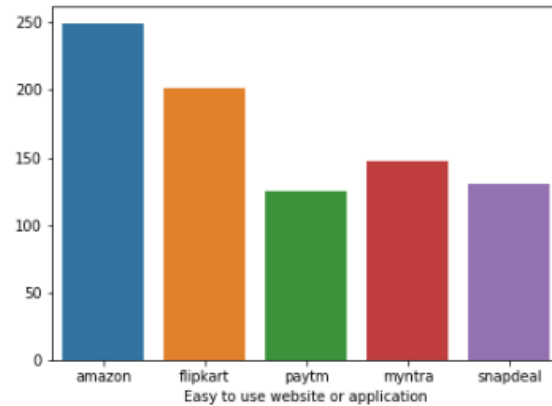
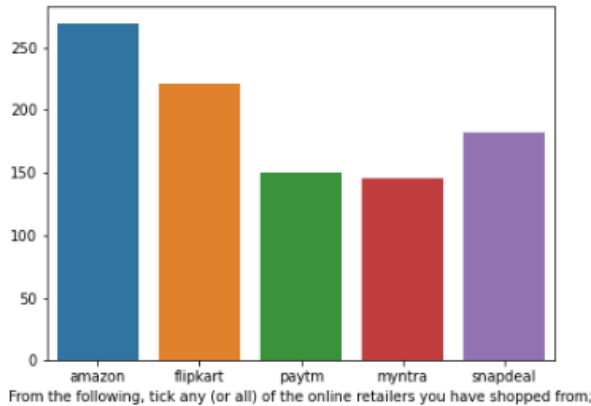
- Observations:

1. More than 70% of the respondents believe that patronizing online retailers is convenient.

2. More than half the respondents consider that online shopping gives them a sense of adventure.
3. 40% of the respondents believe that purchases from their preferred e-retailer enhances their social status.
4. 47% of the respondents feel gratification by shopping from their favorite e-commerce website.
5. 47% of the respondents believe that online shopping helps them fulfill certain roles.
6. A high majority(85%) believes that online shopping helps them get value for their money.

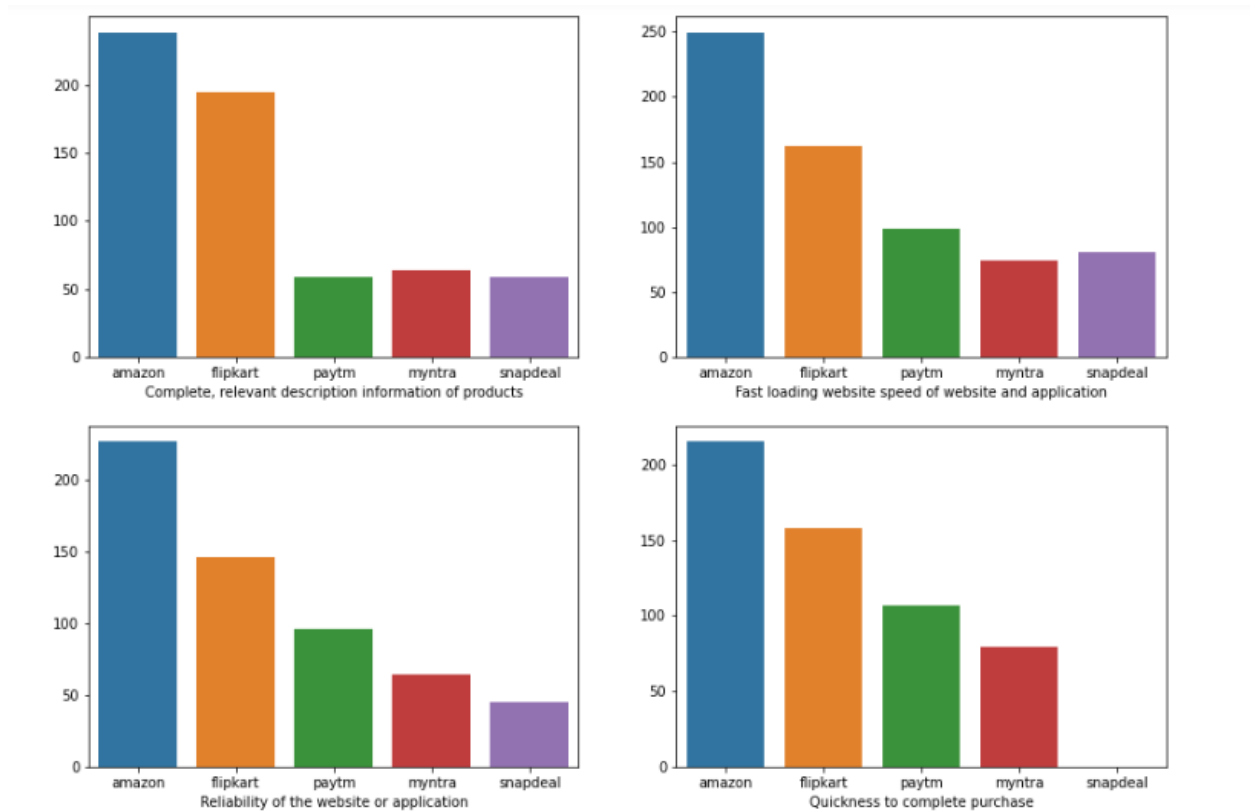
***Now let's analyze customer's feedback for different e-commerce websites on various parameters. The e-commerce websites are amazon, flipkart, myntra, snapdeal and paytm.***

Bar plots:



- Observations:
  1. All the respondents have made purchases from amazon.in.
  2. Out of 269 more than 200 respondents have shopped from flipkart. The numbers for snapdeal, paytm and myntra are below 200.
  3. Amazon performs best in terms of ease to use, visual appeal and product variety followed by flipkart.

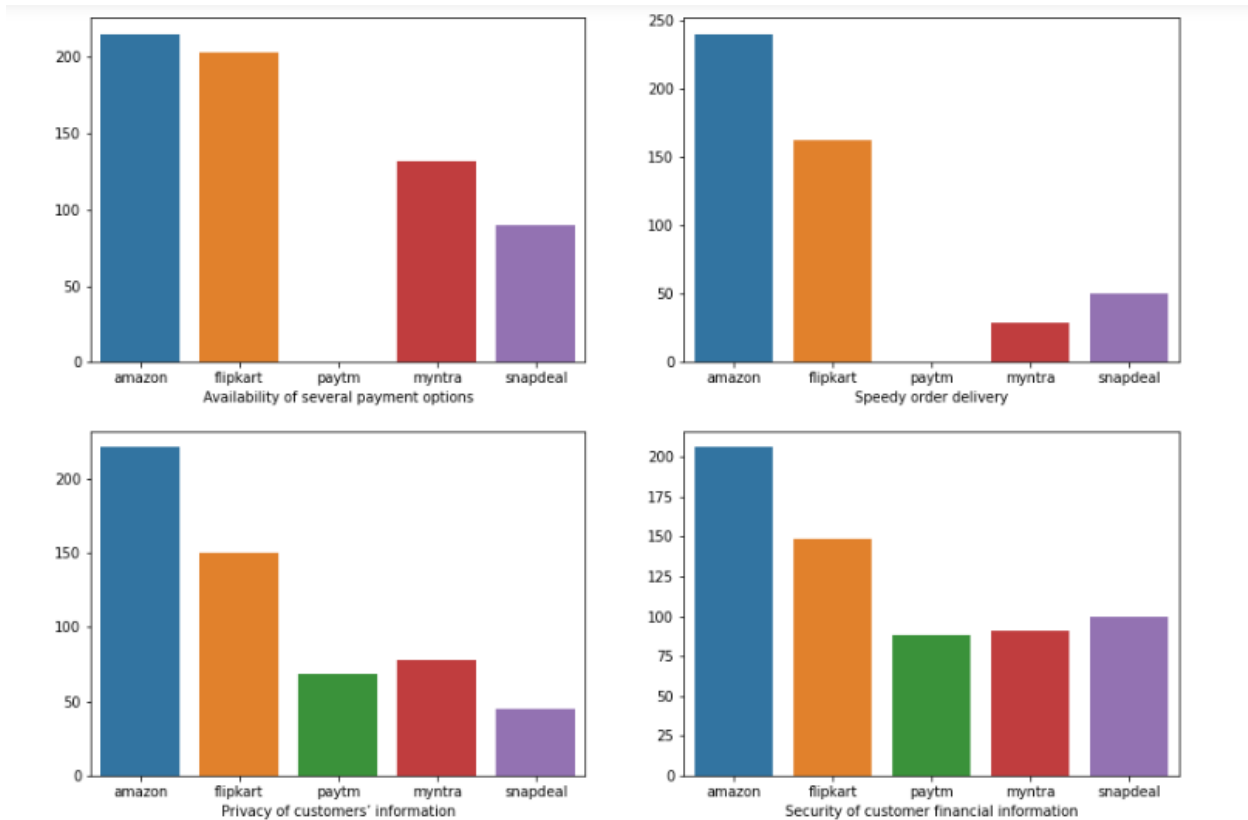
- Bar plots:



- Observations:

1. Amazon performs best in terms of relevant product information, website loading speed, reliability, and quickness to complete purchase.
2. Flipkart seems to be the second choice for these above parameters.
3. The response for paytm, myntra and snapdeal seems to be quite low as compared to amazon.
4. snapdeal has zero respondents in 'quickness to complete purchase' criteria.

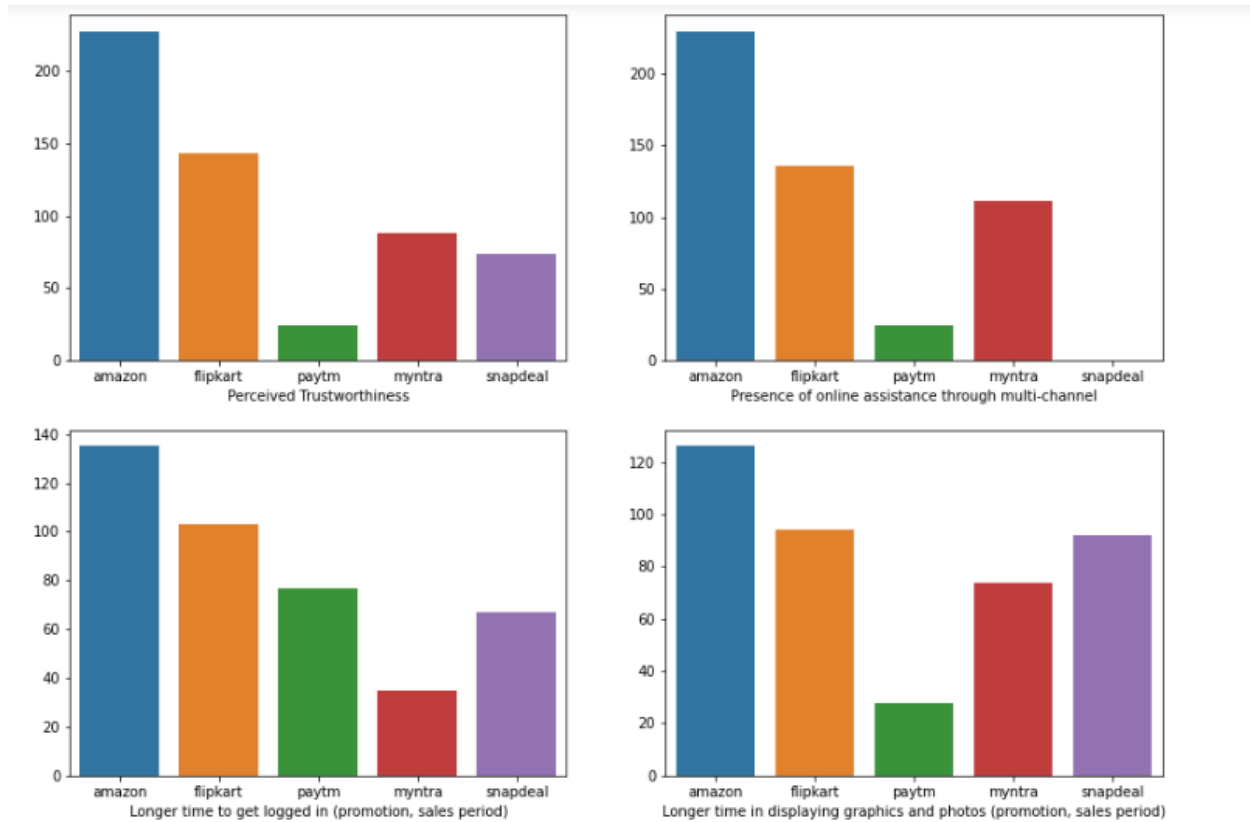
- Bar plots:



- Observations:

1. Amazon performs best in terms of payment options, speedy delivery, privacy of customer's info and security of financial info.
2. Flipkart seems to be the second choice for these above parameters.
3. Paytm performs poorly in payments options and speedy delivery criteria.
4. The response for paytm, myntra and snapdeal seems to be quite low as compared to amazon.

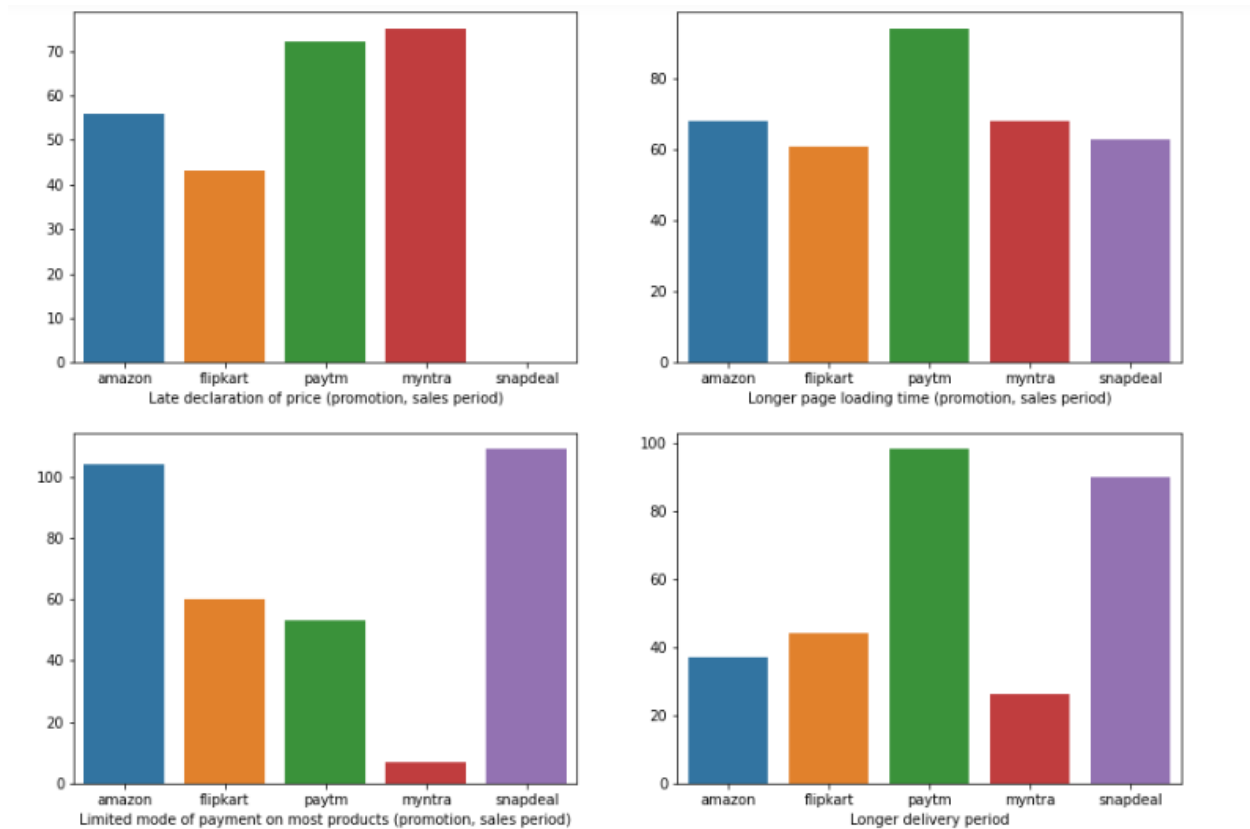
- Bar plots:



- Observations:

1. Amazon performs best in terms of trustworthiness and online assistance. Flipkart seems to be the second choice.
2. Paytm performs poorly in trustworthiness and also online assistance.
3. Snapdeal performs poorly in online assistance criteria.
4. During promotion or sales period, it takes longer time in amazon to login and display graphics/photos.

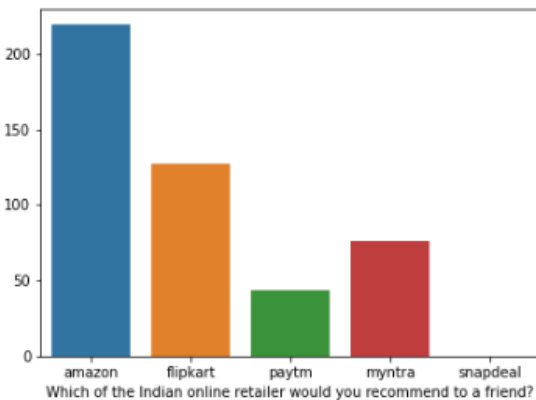
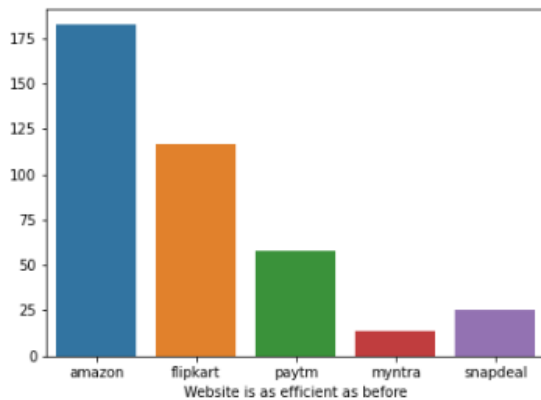
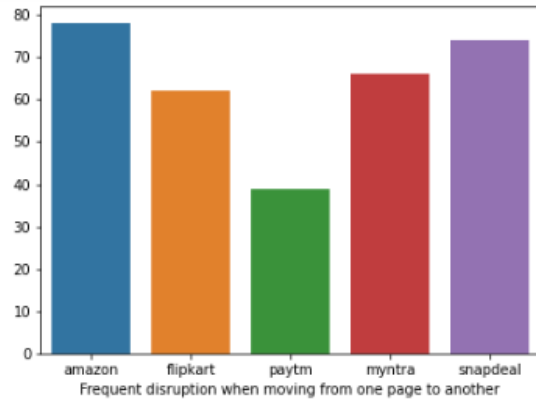
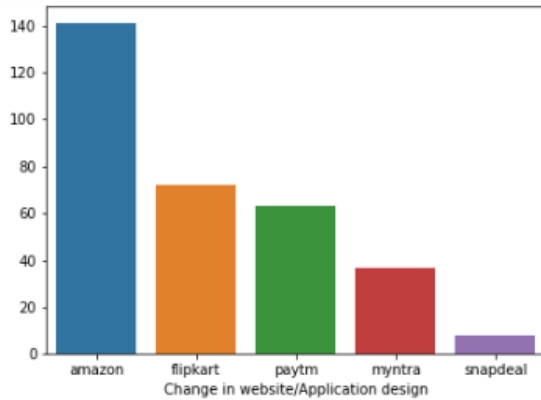
- Bar plots:



- Observations:

1. During promotion or sales period, myntra and paytm declares price lately.
2. During promotion or sales period, paytm takes longer time in page loading. We have a fairly mixed response in this criteria.
3. During promotion or sales period, snapdeal and amazon have limited mode of payments for most products. Myntra performs well in this.
4. Paytm and snapdeal have longer delivery period.

- Bar plots:



- Observations:

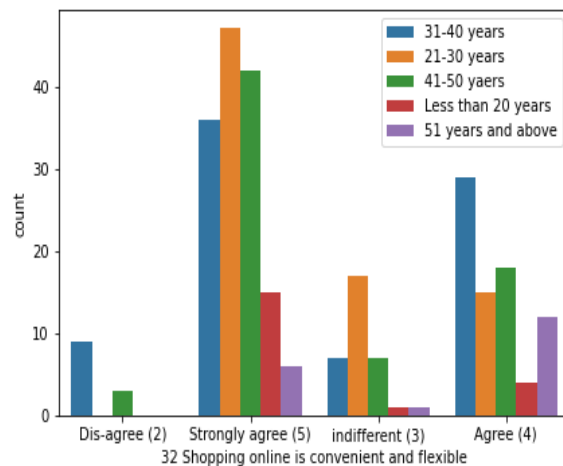
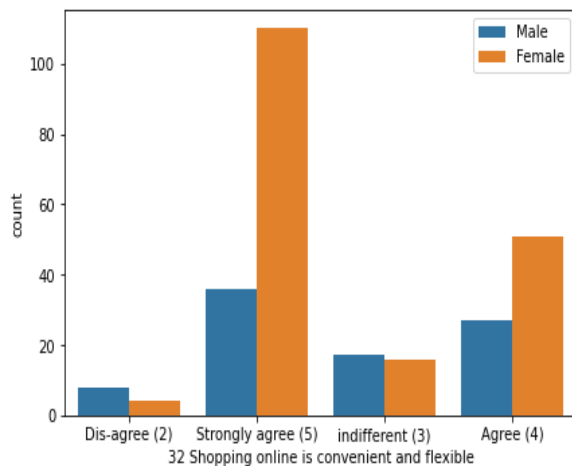
1. Majority of respondents believe that a change in website/application design is needed in amazon.
2. There are frequent disruptions when moving from one page to another in all of them. Paytm performs best in this criteria.
3. Majority of respondents believe that amazon website is as efficient as before.
4. Amazon is most likely to be recommended to others by our respondents followed by flipkart, myntra and paytm.
5. None of the respondents is likely to recommend snapdeal to any of their friends.



***Till now we analyzed the data distribution in various columns. Now let us see some plots which shows the relation among various columns.***

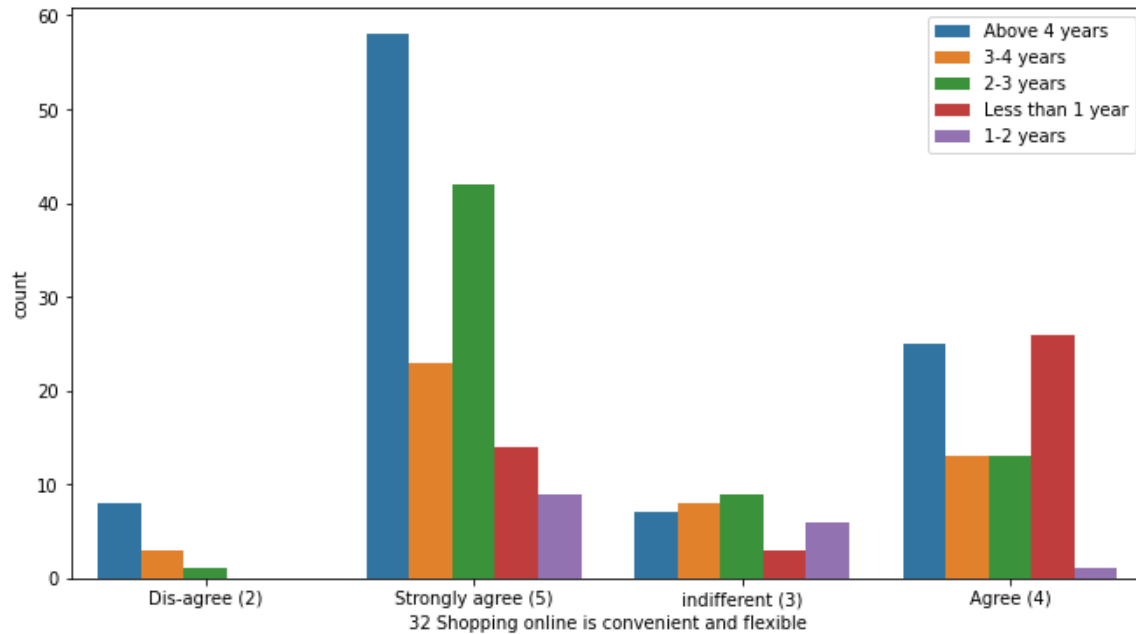
**Analyzing the responses for 'Shopping online is convenient and flexible' column with respect to other columns.**

- We saw the pie-plot for the overall response on 'Shopping online is convenient and flexible' statement.
- 224 people out of 269 agree or strongly-agree that shopping online is convenient and flexible.
- Let's see the plots with respect to gender and age.



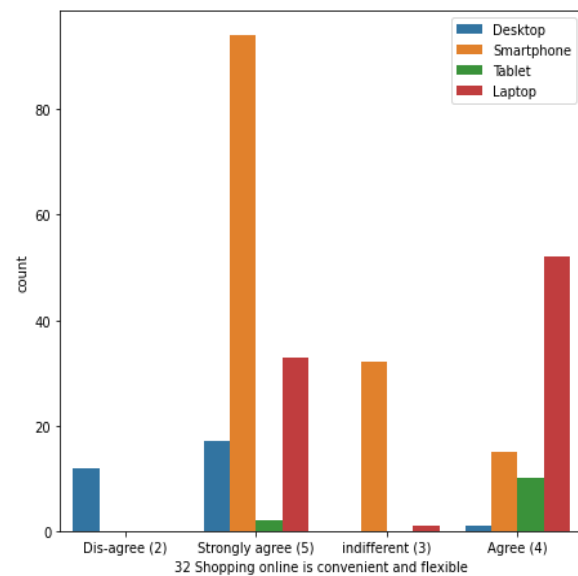
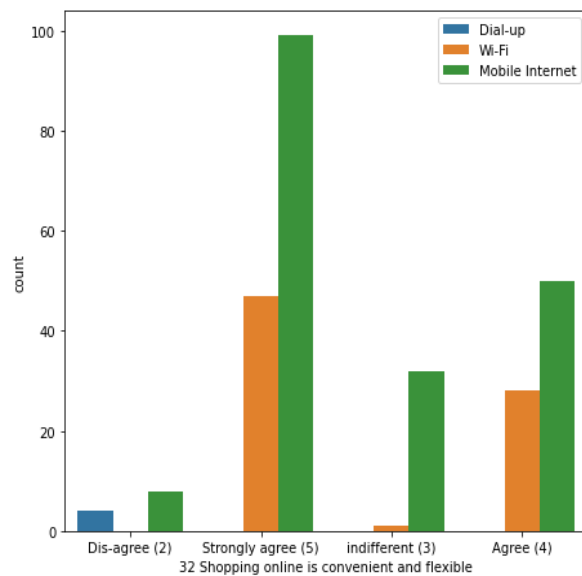
- Observations:
  1. Out of the people who strongly-agree or agree that shopping online is convenient and flexible, majority are female.

- Plot with respect to how long a person has been shopping online:



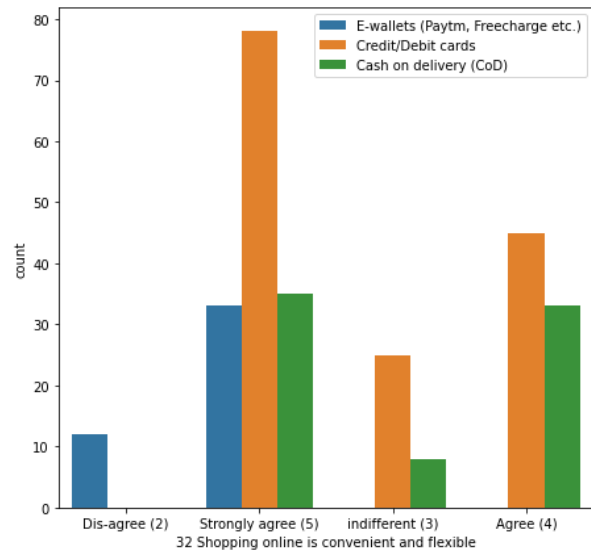
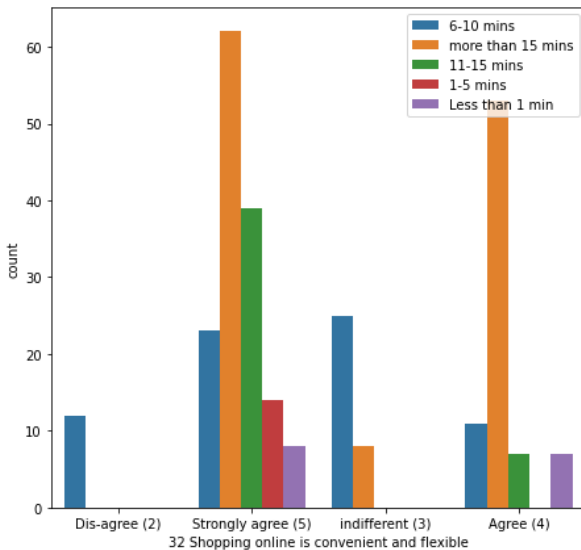
- Observations:
  1. Out of the people who strongly-agree that shopping online is convenient and flexible, majority have been shopping online for more than 4 years.

- Plots with respect to internet connection type and device used:



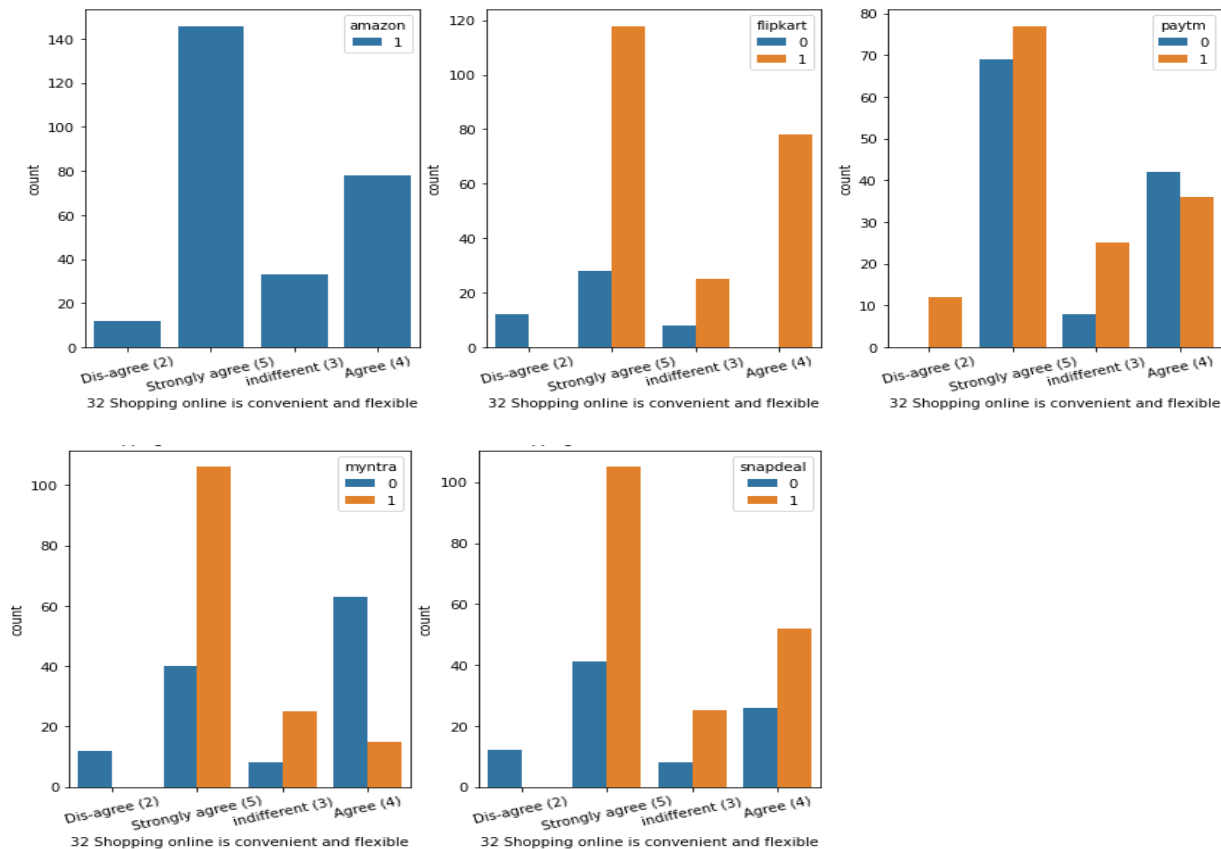
- Observations:
  - Out of the people who strongly-agree or agree that shopping online is convenient and flexible, majority are mobile internet users followed by Wi-Fi users.
  - They mainly use smart-phone and laptop.

- Plots with respect to time taken to explore before purchase and preferred payment options:



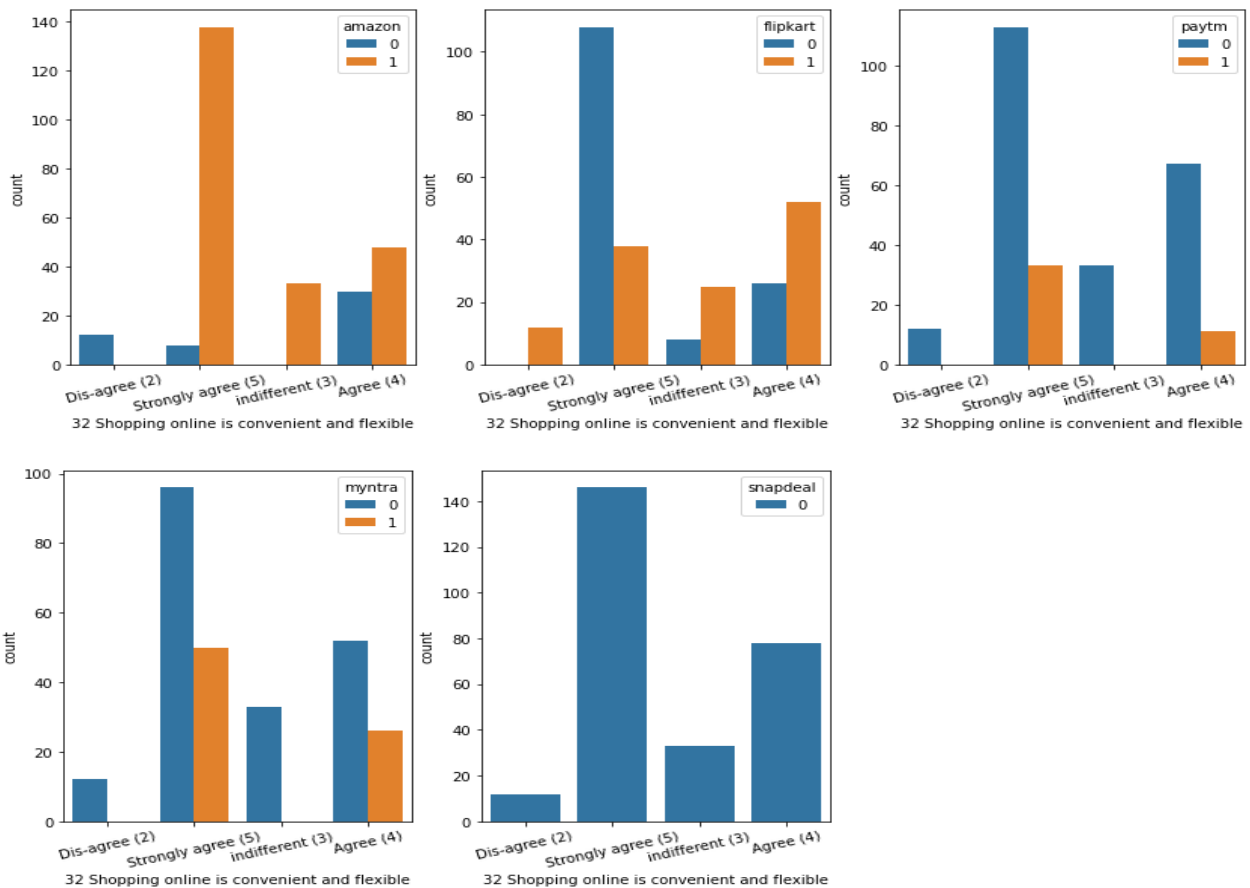
- Observations:
  - Out of the people who strongly-agree or agree that shopping online is convenient and flexible, a high majority of people spend at least 11 minutes before purchasing
  - They mainly prefer credit/debit cards for payment option followed by cash on delivery.

- Plots with respect to which of the Indian online retailers they have shopped from:



- Observations:
  - All the respondents have shopping experience from amazon.
  - Out of the 224 people, a very high majority(around 200) have shopping experience from flipkart.( 224 people agree or strongly agree that shopping online is beneficial )
  - Out of the 224 people, around half the people have shopping experience from paytm.
  - Out of the 224 people, around 130 people have shopping experience with myntra and around 150 with snapdeal.

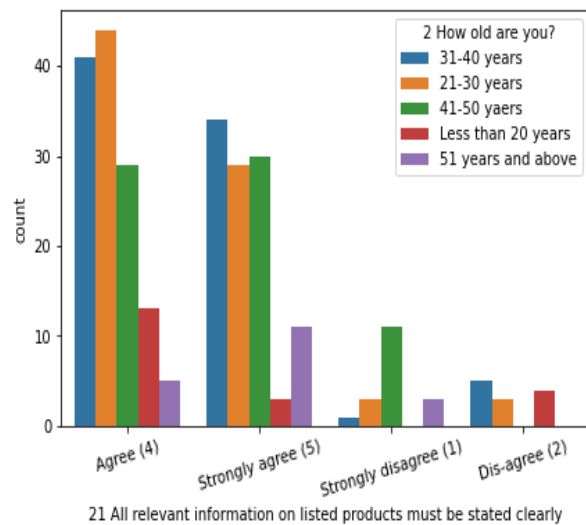
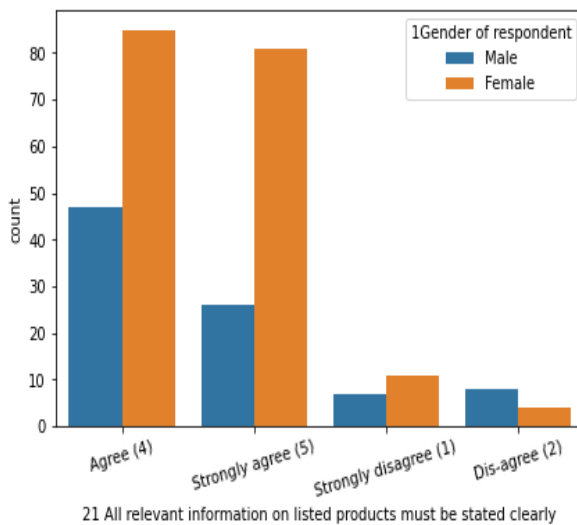
- Plots with respect to which of the Indian online retailers they are likely to recommend a friend:



- Observations:
  - Out of the 224 people who strongly-agree or agree that shopping online is convenient and flexible, around 180 people recommends amazon to a friend.
  - In case of flipkart, out of those 224 people, around 100 recommend it to friends.
  - In case of myntra, out of those 224 people, around 80 recommend it to friends.
  - In case of paytm, less than 50.
  - It seems that no one is likely to recommend snapdeal to their friends.

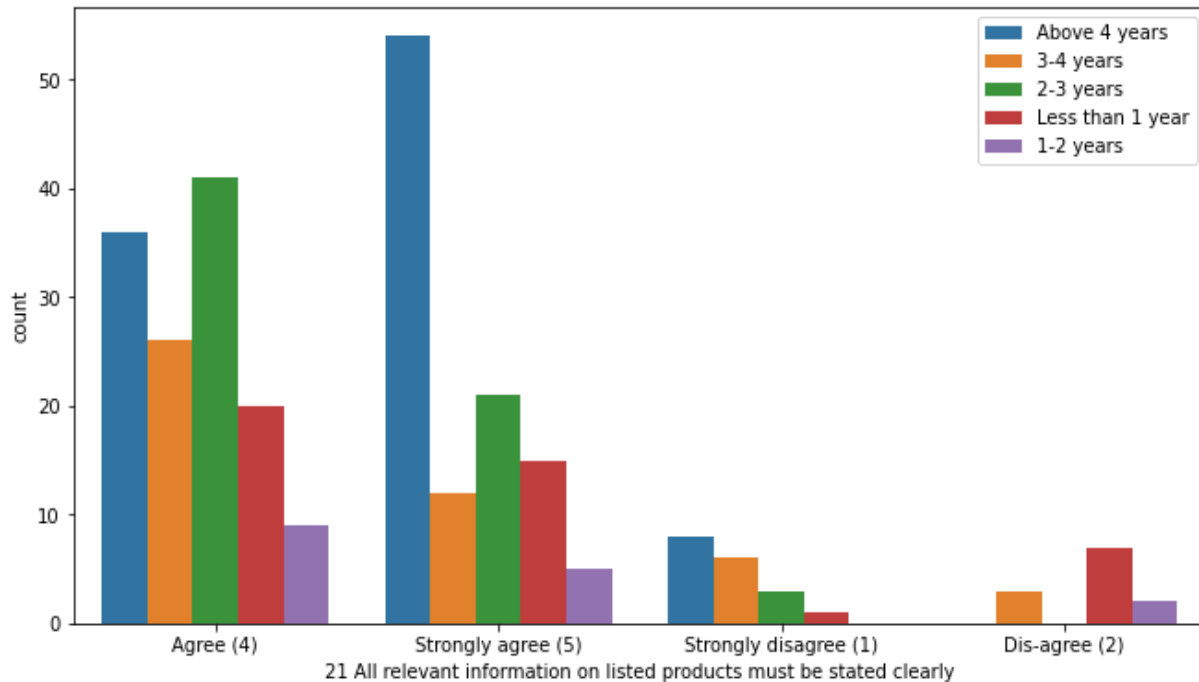
**Analyzing the responses for 'All relevant information on listed products must be stated clearly' column with respect to other columns.**

- We saw the pie-plot for the overall response on 'All relevant information on listed products must be stated clearly' statement.
- 239 people out of 269 agree or strongly-agree that shopping online is convenient and flexible.
- Let's see the plots with respect to gender and age.



- Observations:
  1. Out of the people who strongly-agree or agree that all relevant information on listed products must be stated clearly, majority are women.

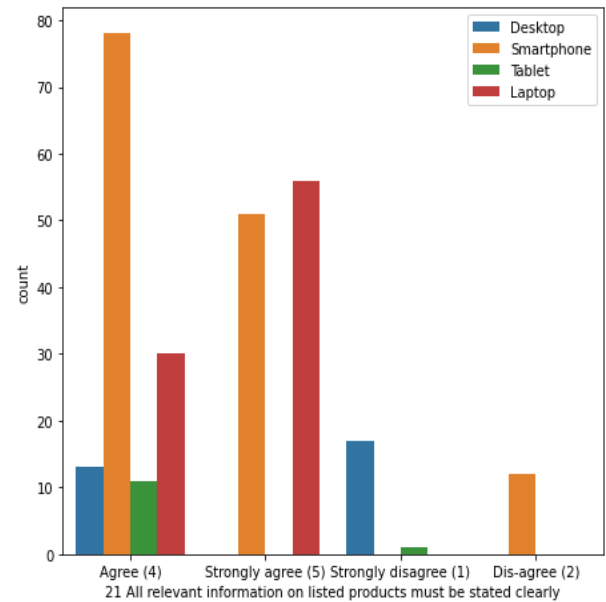
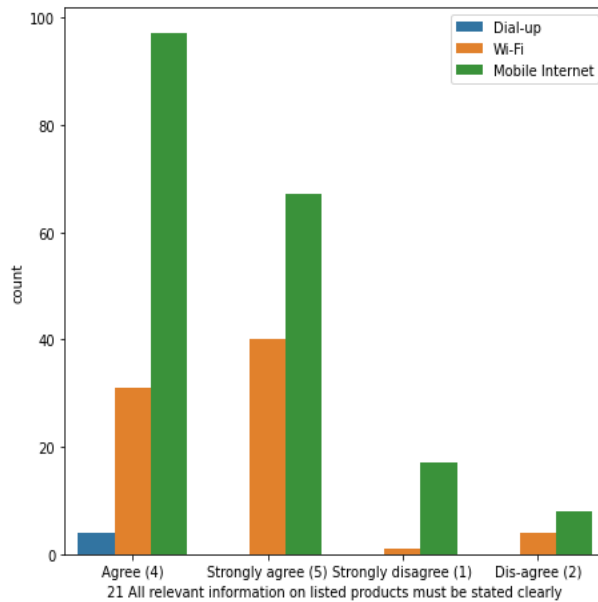
- Plot with respect to how long a person has been shopping online:



- Observations:
  1. Out of the people who strongly-agree or agree that all relevant information on listed products must be stated clearly, a high majority have been shopping online for at least 2 years.



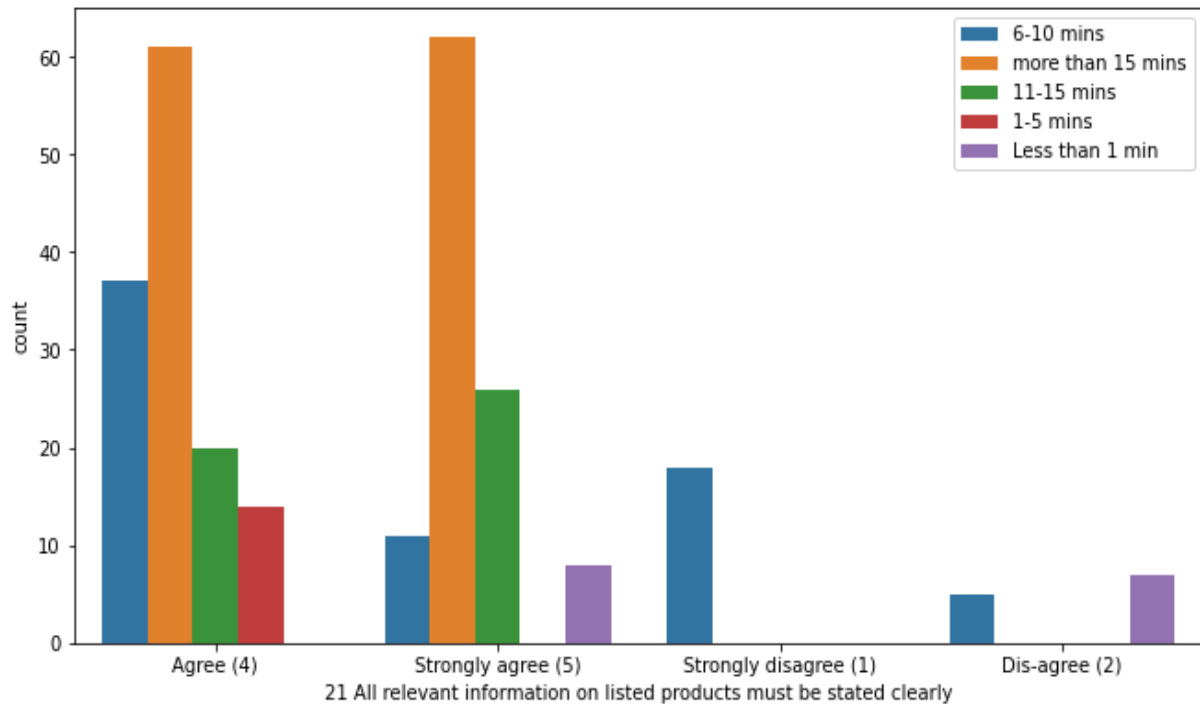
- Plots with respect to internet connection type and device used:



- Observations:

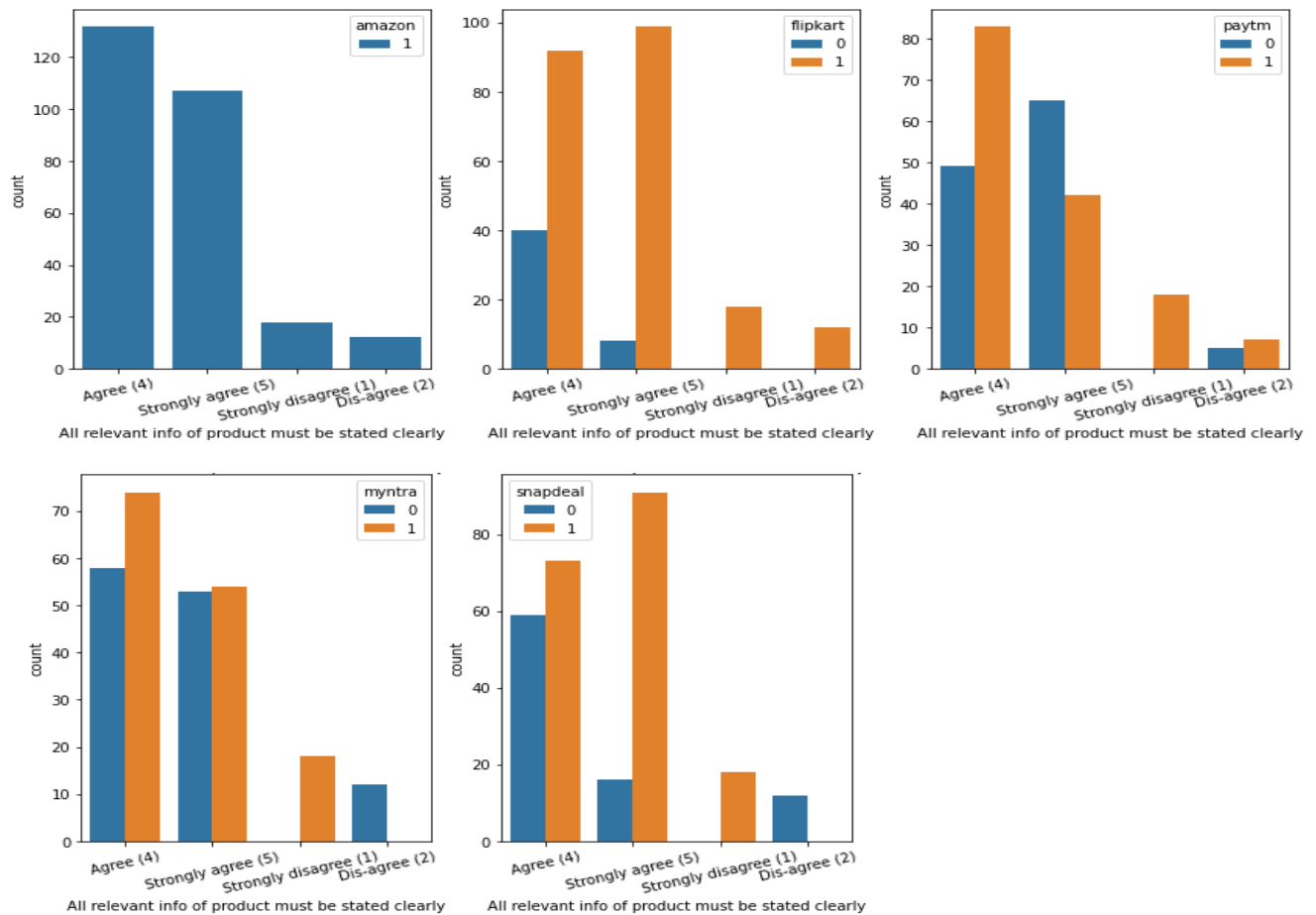
- Out of the people who strongly-agree or agree that all relevant information on listed products must be stated clearly, majority are mobile internet users followed by Wi-Fi users. They mainly use smart-phone and laptop.

- Plot with respect to time taken to explore before purchase:



- Observations:
  1. Out of the people who strongly-agree or agree that all relevant information on listed products must be stated clearly, majority of people spend more than 15 minutes before making a purchase.

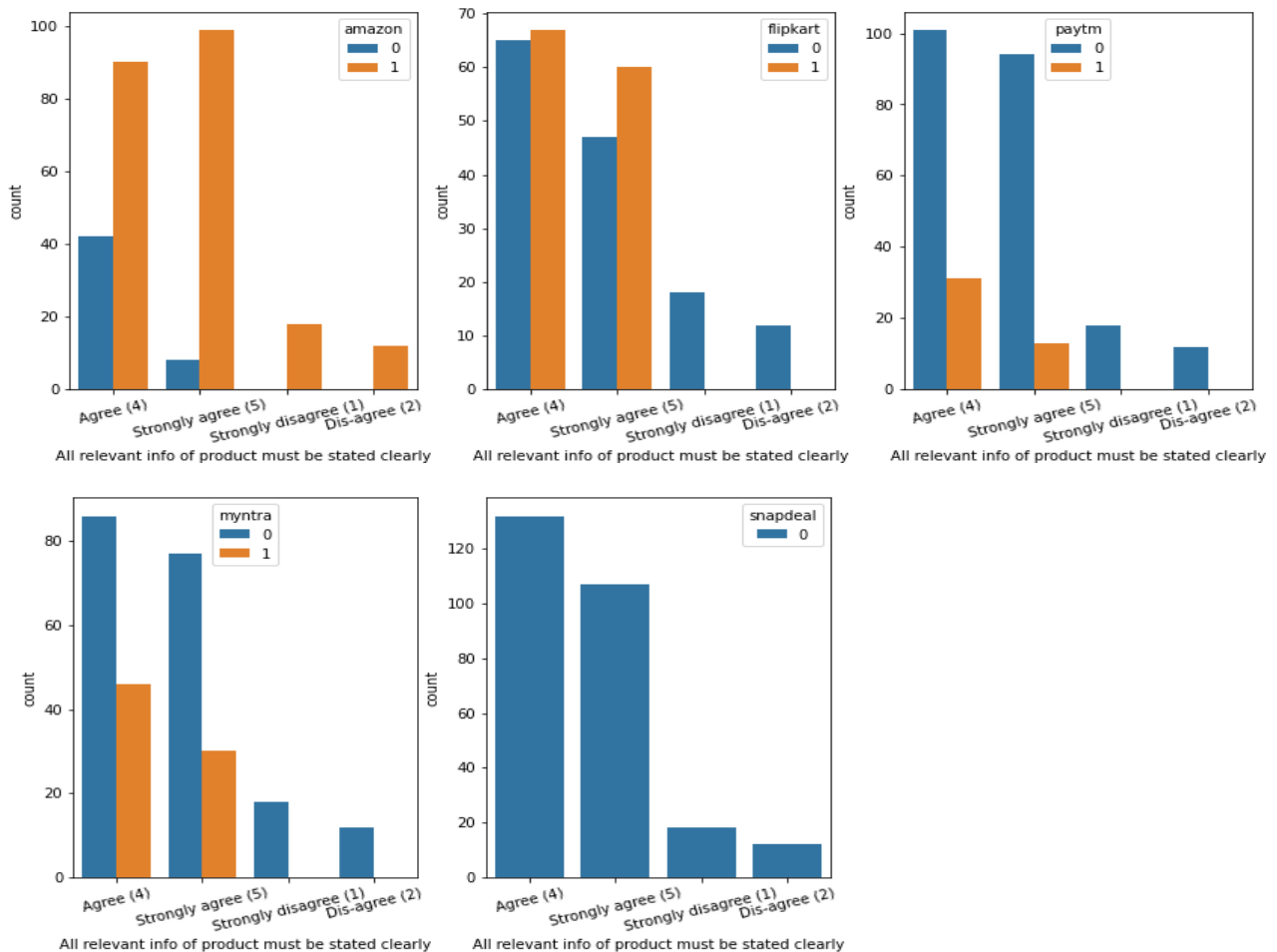
- Plots with respect to which of the Indian online retailers they have shopped from:



- Observations:

- All the respondents have shopping experience from amazon.
- Out of the 239 people, a high majority(around 190) have shopping experience from flipkart. (239 people agree or strongly agree that all relevant info of product must be stated clearly)
- Out of the 239 people, around half the people have shopping experience from paytm.
- Out of the 239 people, around 130 people have shopping experience with myntra and around 160 with snapdeal.

- Plots with respect to which of the Indian online retailers they are likely to recommend a friend:

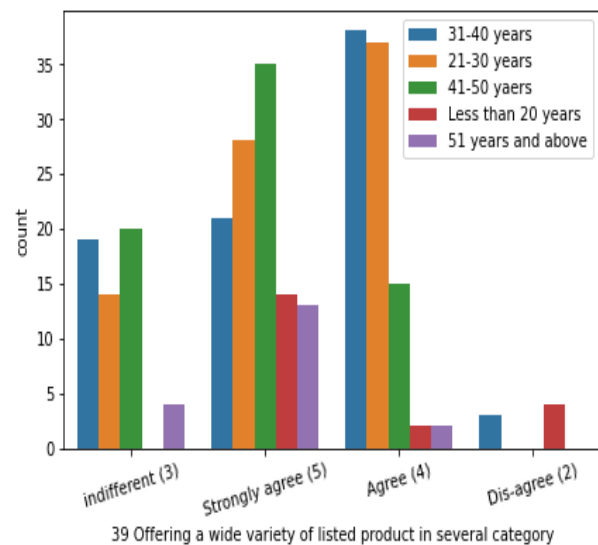
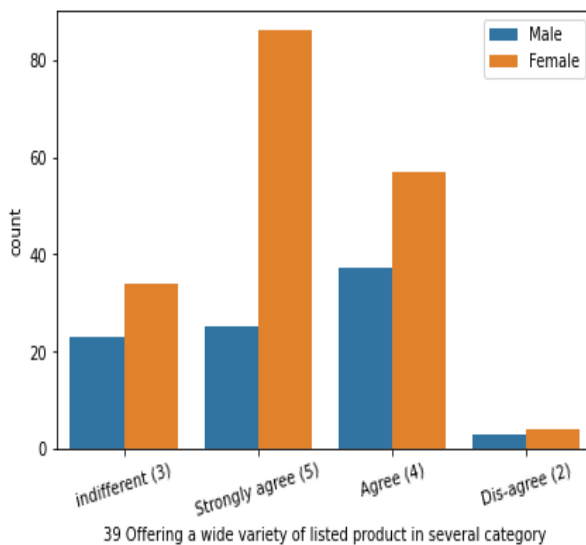


- Observations:

- Out of the 239 people who strongly-agree or agree that all relevant info of product must be stated clearly, around 190 people recommends amazon to a friend.
- In case of flipkart, out of those 239 people, around 125 recommend it to friends.
- In case of myntra, out of those 239 people, around 80 recommend it to friends.
- In case of paytm, less than 50. And in case of snapdeal no one is likely to recommend it to their friends.

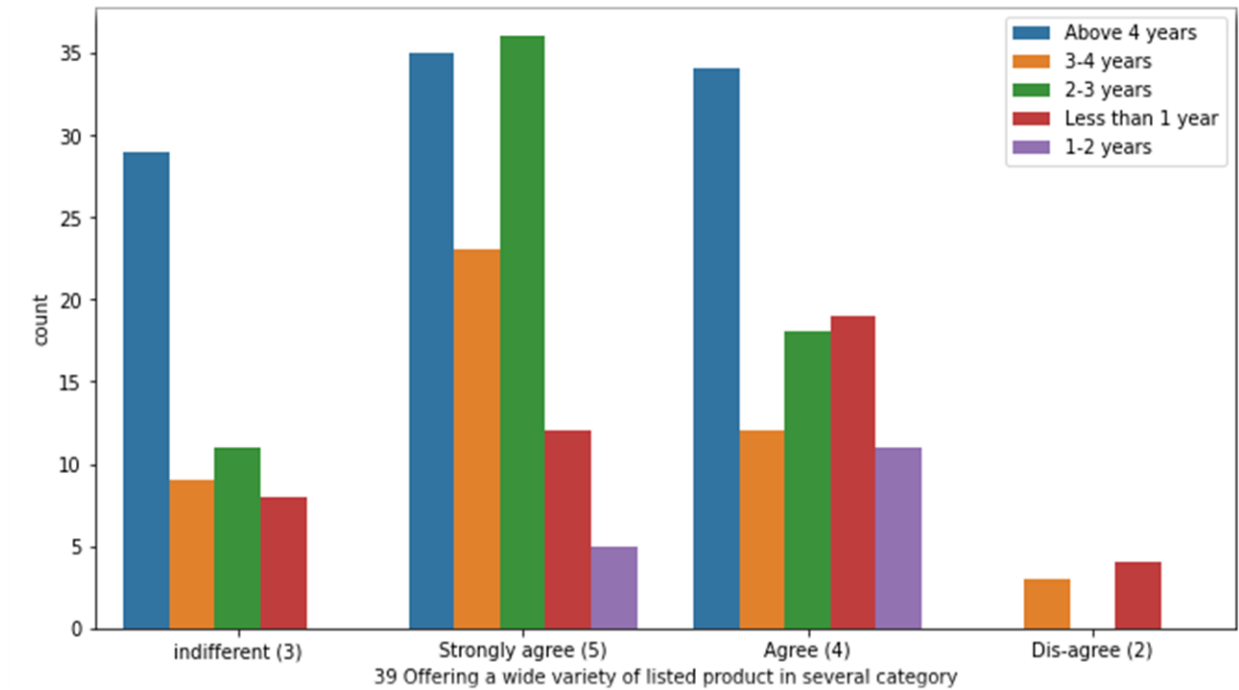
**Analyzing the responses for 'Offering a wide variety of listed product in several category' column with respect to other columns.**

- We saw the pie-plot for the overall response on 'Offering a wide variety of listed product in several category' statement.
- 205 people out of 269 agree or strongly-agree that e-retailer should offer a wide variety of listed product in several category.
- Let's see the plots with respect to gender and age.



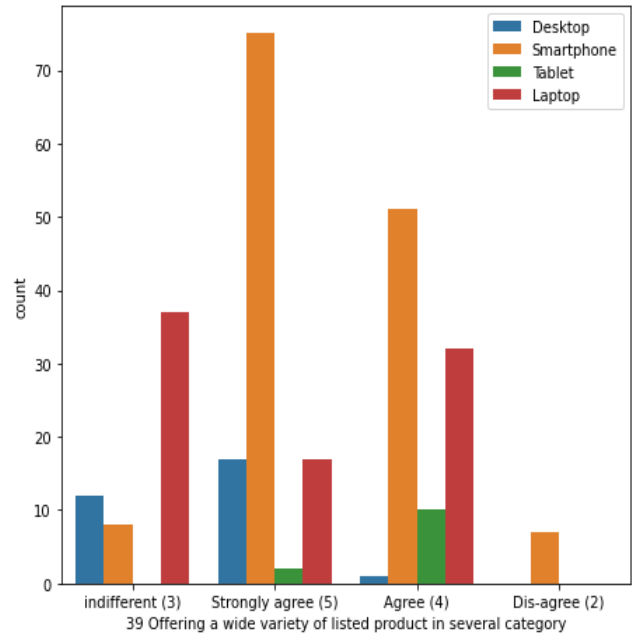
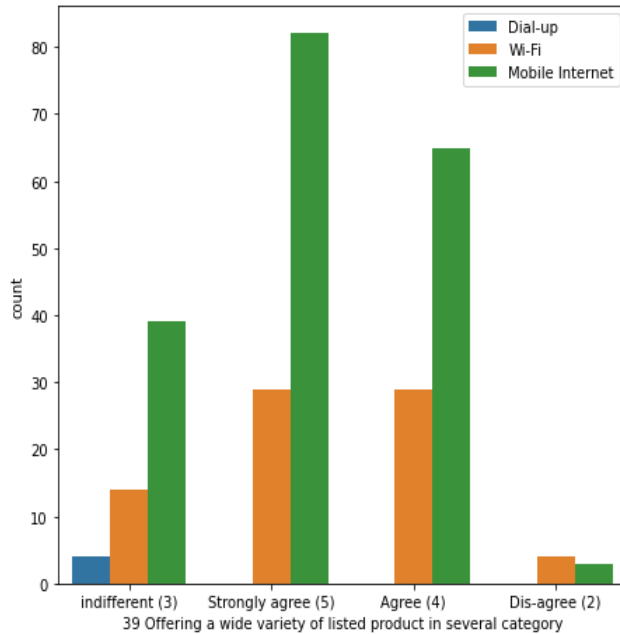
- Observations:
  1. Out of the people who strongly-agree or agree that e-retailer should offer a wide variety of listed product in several category, majority are female.

- Plot with respect to how long a person has been shopping online:



- Observations:
  1. Out of the people who strongly-agree or agree that e-retailer should offer a wide variety of listed product in several category, a high majority have been shopping online for atleast 2 years.

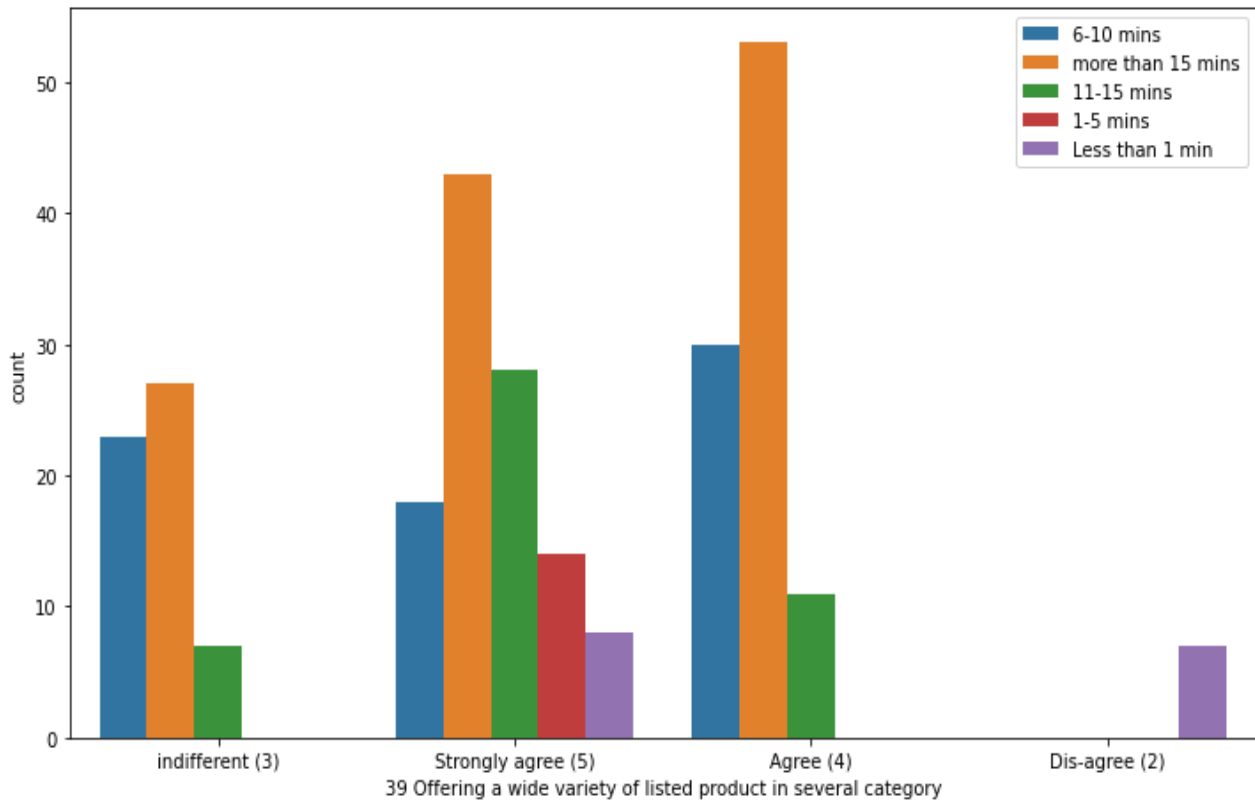
- Plots with respect to internet connection type and device used:



- Observations:

- Out of the people who strongly-agree or agree that e-retailer should offer a wide variety of listed product in several category, majority are mobile internet users followed by wifi users. They mainly use smartphone and laptop.

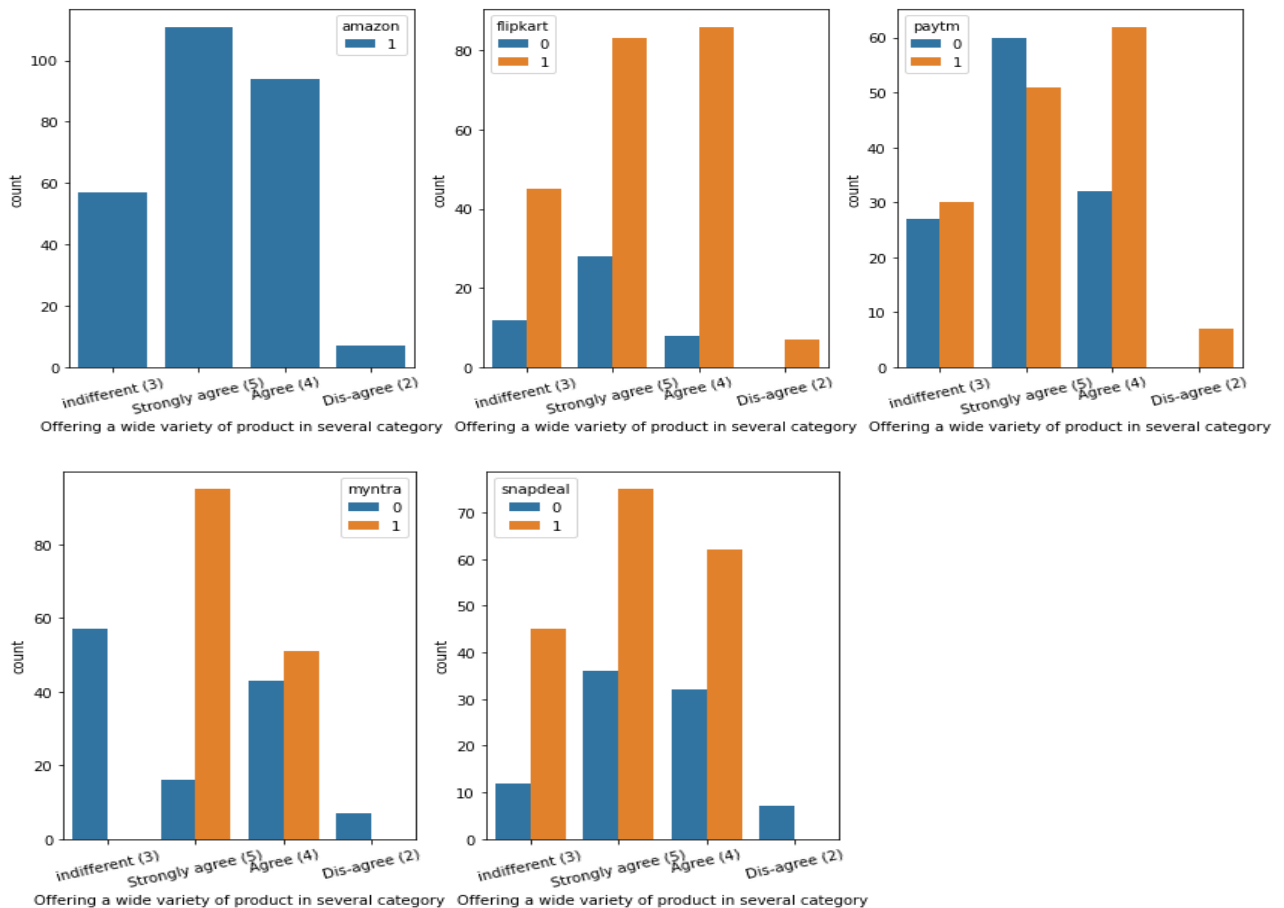
- Plot with respect to time taken to explore before purchase:



- Observations:
  1. Out of the people who strongly-agree or agree that e-retailer should offer a wide variety of listed product in several category, majority of people spend more than 15 minutes before making a purchase.



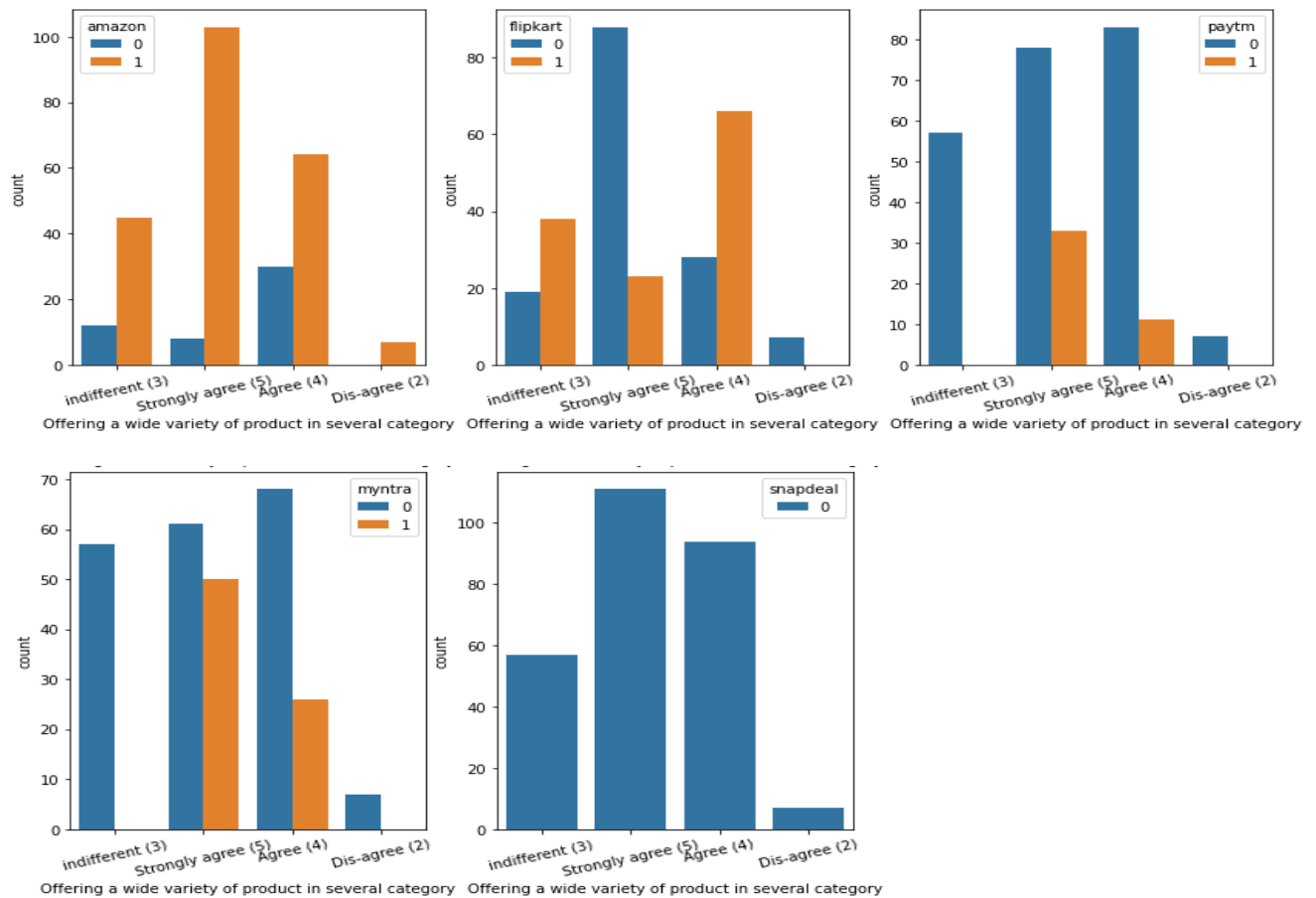
- Plots with respect to which of the Indian online retailers they have shopped from:



- Observations:

- All the respondents have shopping experience from amazon.
- Out of the 205 people, a high majority(around 170) have shopping experience from flipkart.(205 people agree or strongly agree that e-retailer should offer a wide variety of listed product in several category)
- Out of the 205 people,around half the people have shopping experience from paytm.
- Out of the 205 people, around 150 people have shopping experience with myntra and around 130 with snapdeal.

- Plots with respect to which of the Indian online retailers they are likely to recommend a friend:

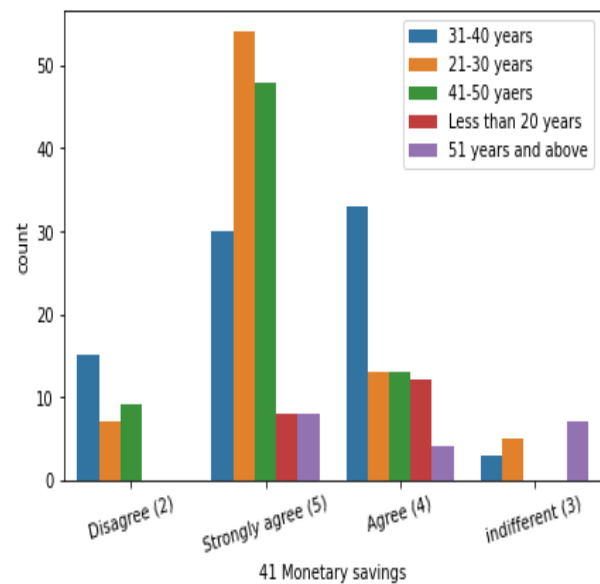
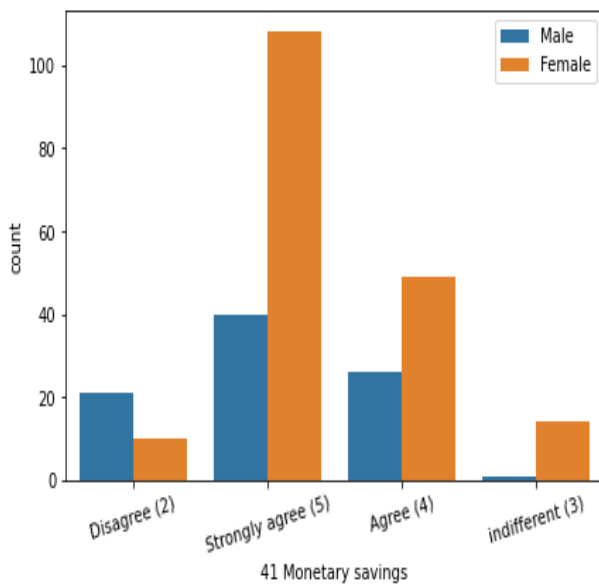


- Observations:

- Out of the 205 people who strongly-agree or agree that e-retailer should offer a wide variety of listed product in several category, around 165 people recommends amazon to a friend. A majority of people with indifferent view also likely to recommend amazon.
- In case of flipkart, out of those 205 people, around 100 people recommend it to friends.
- In case of myntra, out of those 205 people, around 75 recommend it to friends.
- In case of paytm, less than 50. And in case of snapdeal no one is likely to recommend it to their friends.

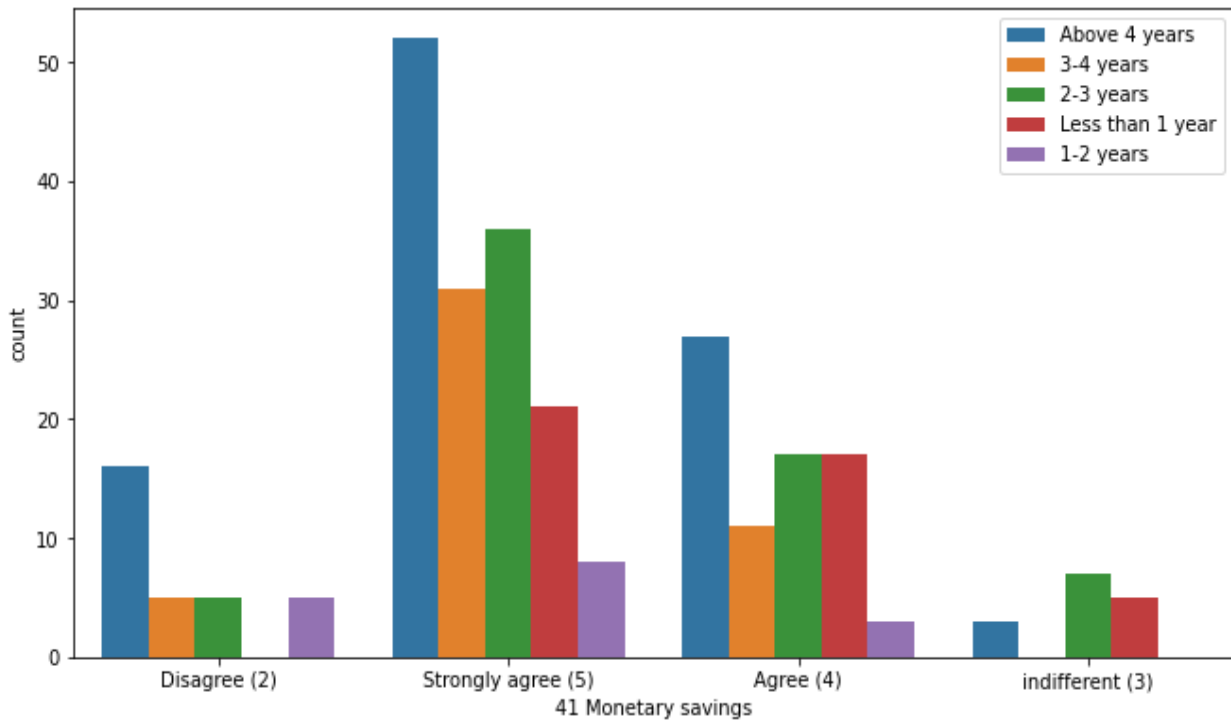
## Analyzing the responses for '*Monetary savings*' column with respect to other columns.

- We saw the pie-plot for the overall response on '*Monetary savings*' statement.
- 223 people out of 269 agree or strongly-agree that online shopping leads to monetary savings.
- Let's see the plots with respect to gender and age.



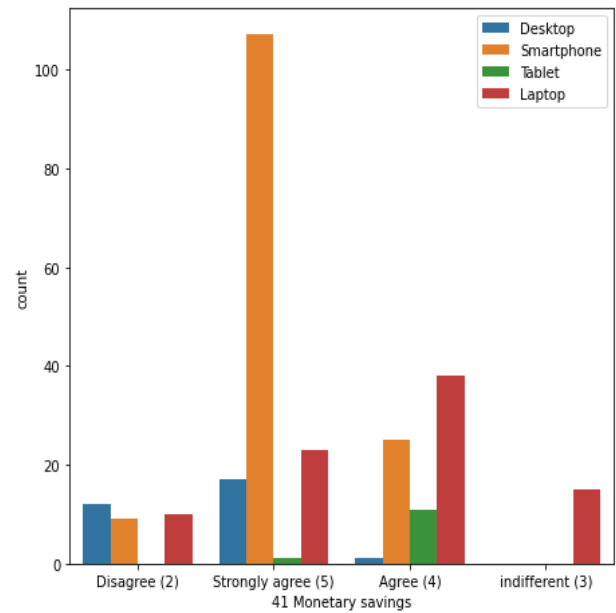
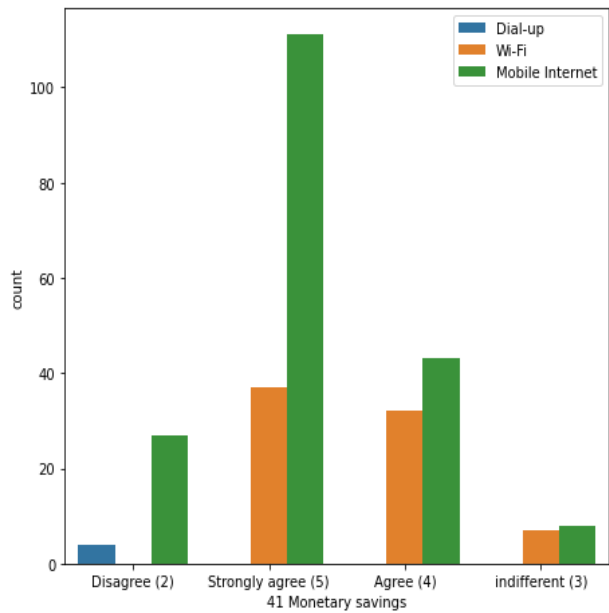
- Observations:
  1. Out of the people who strongly-agree or agree that online shopping leads to monetary savings, majority are female.

- Plot with respect to how long a person has been shopping online:



- Observations:
  1. Out of the people who strongly-agree or agree that online shopping leads to monetary savings, a high majority have been shopping online for atleast 2 years.

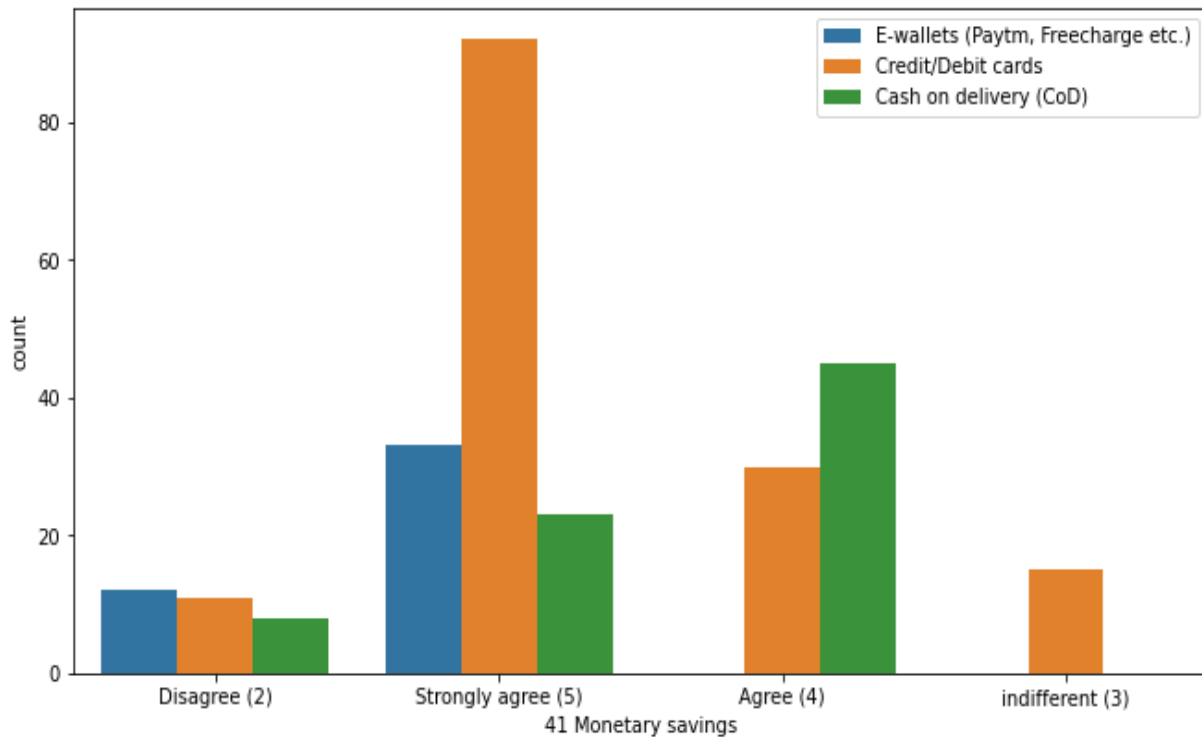
- Plots with respect to internet connection type and device used:



- Observations:

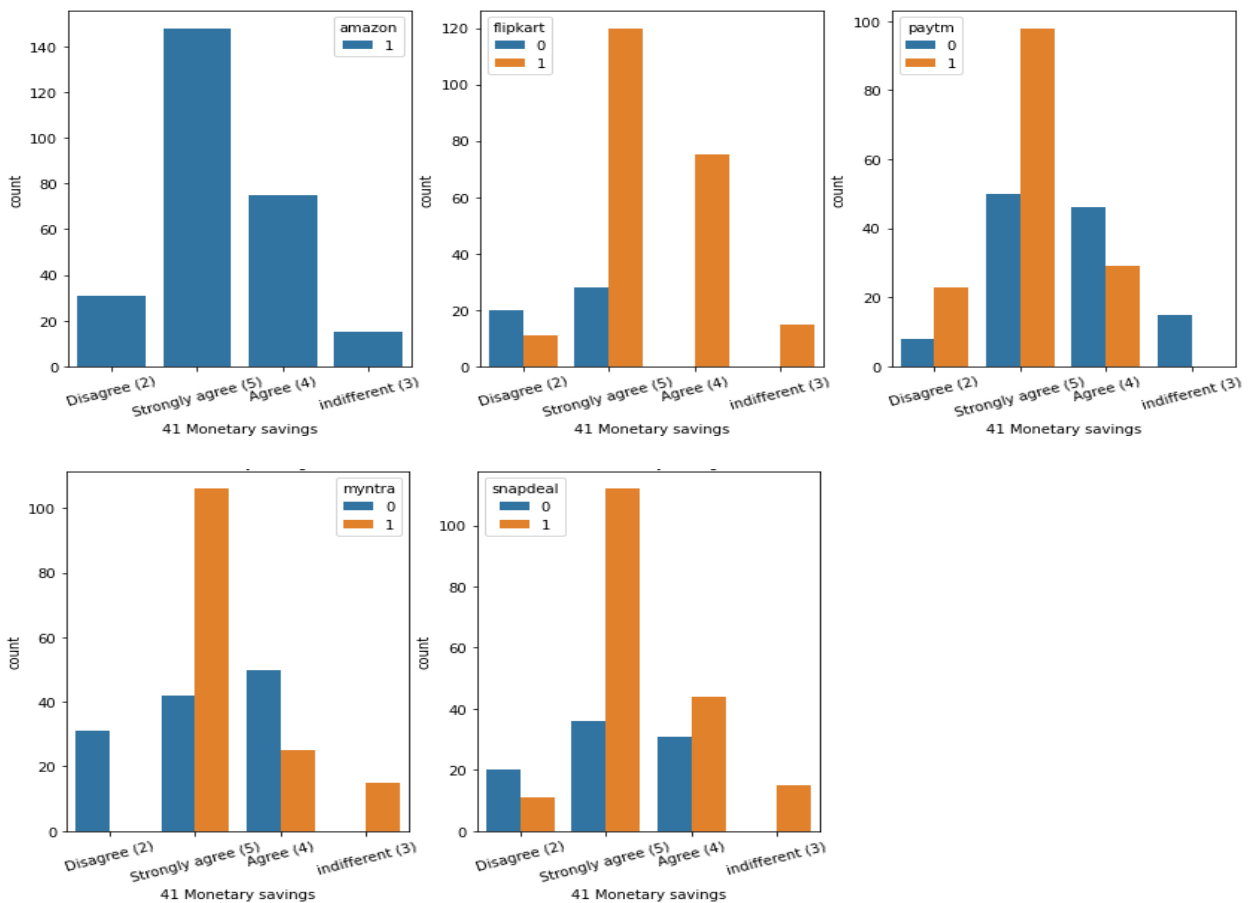
- Out of the people who strongly-agree or agree online shopping leads to monetary savings, majority are mobile internet users followed by wifi users. They mainly use smartphone and laptop.

- Plot with respect to preferred payment options:



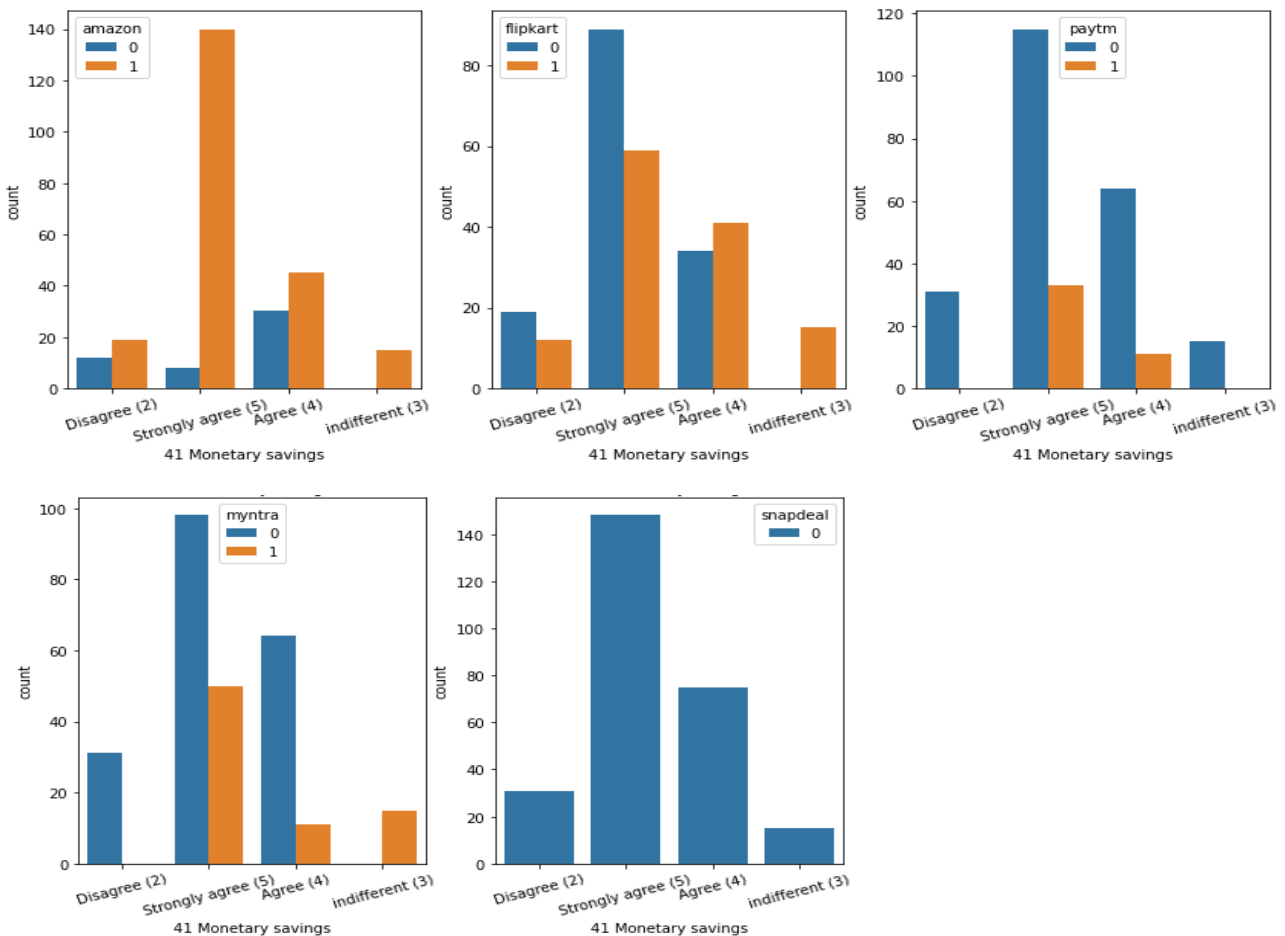
- Observations:
  1. Out of the 223 people who strongly-agree or agree that online shopping leads to monetary savings, around 130 prefer credit/debit cards.
  2. Around 70 prefer cash on delivery and less than 50 prefer e-wallets.

- Plots with respect to which of the Indian online retailers they have shopped from:



- Observations:
  - All the respondents have shopping experience from amazon.
  - Out of the 223 people, a high majority(around 190) have shopping experience from flipkart.(223 people agree or strongly agree that online shopping leads to monetary savings)
  - Out of the 223 people,around 130 people have shopping experience from paytm.
  - Out of the 223 people, around 130 people have shopping experience with myntra and around 150 with snapdeal.

- Plots with respect to which of the Indian online retailers they are likely to recommend a friend:

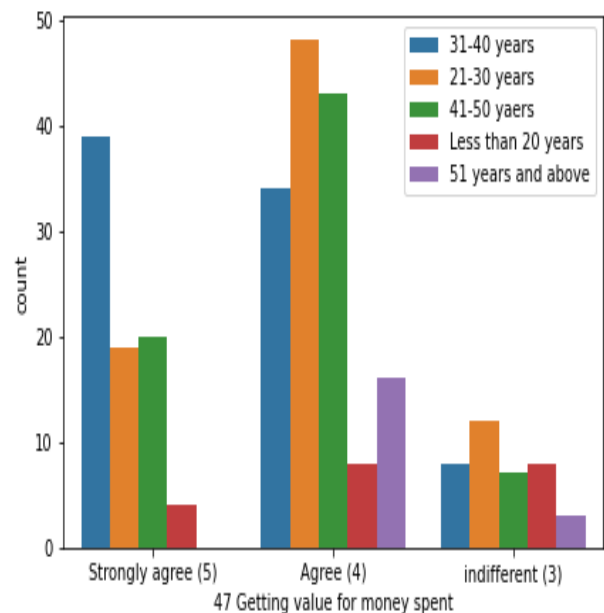
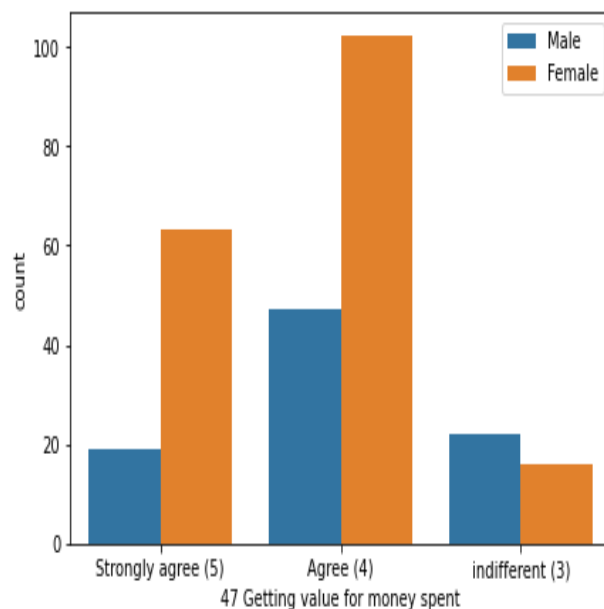


- Observations:
  - Out of the 223 people who strongly-agree or agree that online shopping leads to monetary savings, around 180 people recommends amazon to a friend.
  - In case of flipkart, out of those 223 people, around 100 people recommend it to friends.
  - In case of myntra, out of those 205 people, around 60 recommend it to friends.
  - In case of paytm, less than 50. And in case of snapdeal no one is likely to recommend it to their friends.



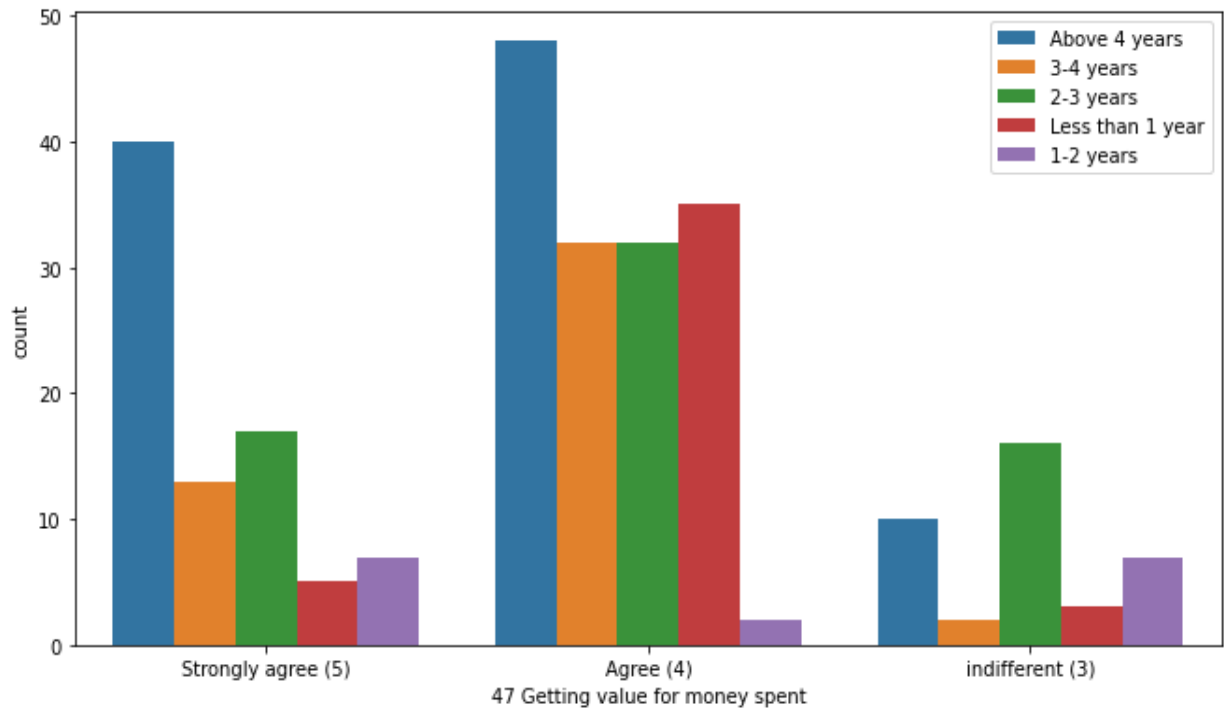
## Analyzing the responses for 'Getting value for money spent' column with respect to other columns.

- We saw the pie-plot for the overall response on 'Getting value for money spent' statement.
- 231 people out of 269 agree or strongly-agree that online shopping helps them get value for money spent.
- Let's see the plots with respect to gender and age.



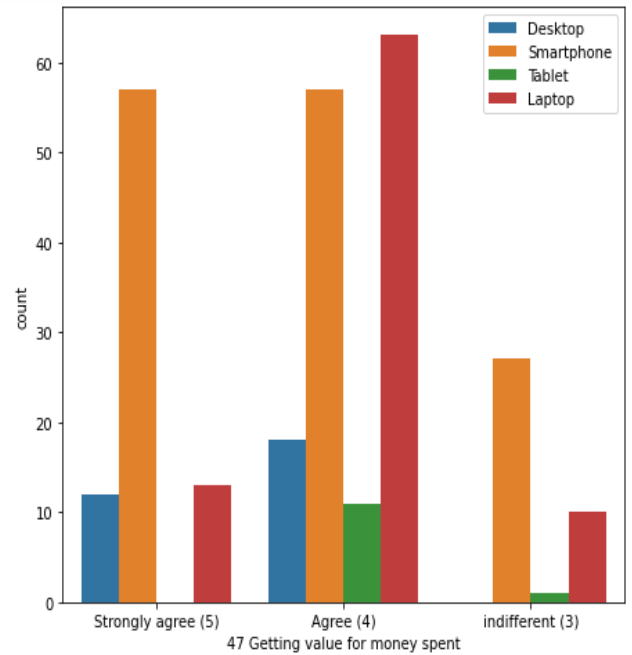
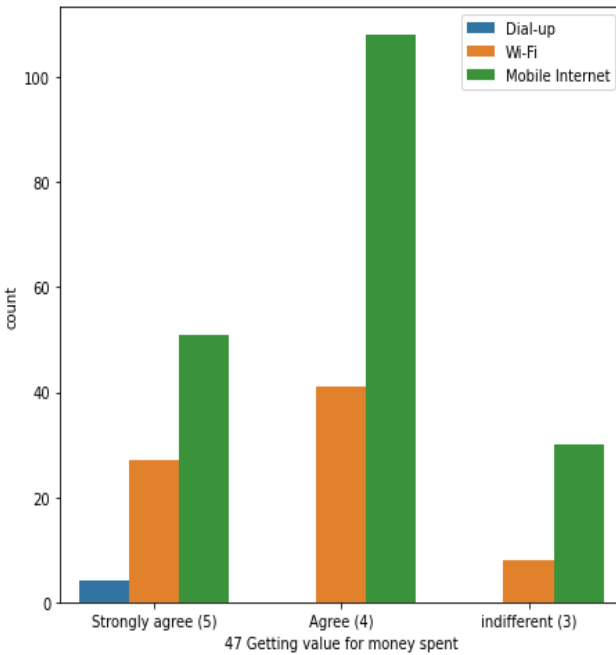
- Observations:
  1. Out of the people who strongly-agree or agree that online shopping helps them get value for money spent, majority are female.

- Plot with respect to how long a person has been shopping online:



- Observations:
  1. Out of the people who strongly-agree or agree that online shopping helps them get value for money spent, a high majority have been shopping online for at least 2 years.

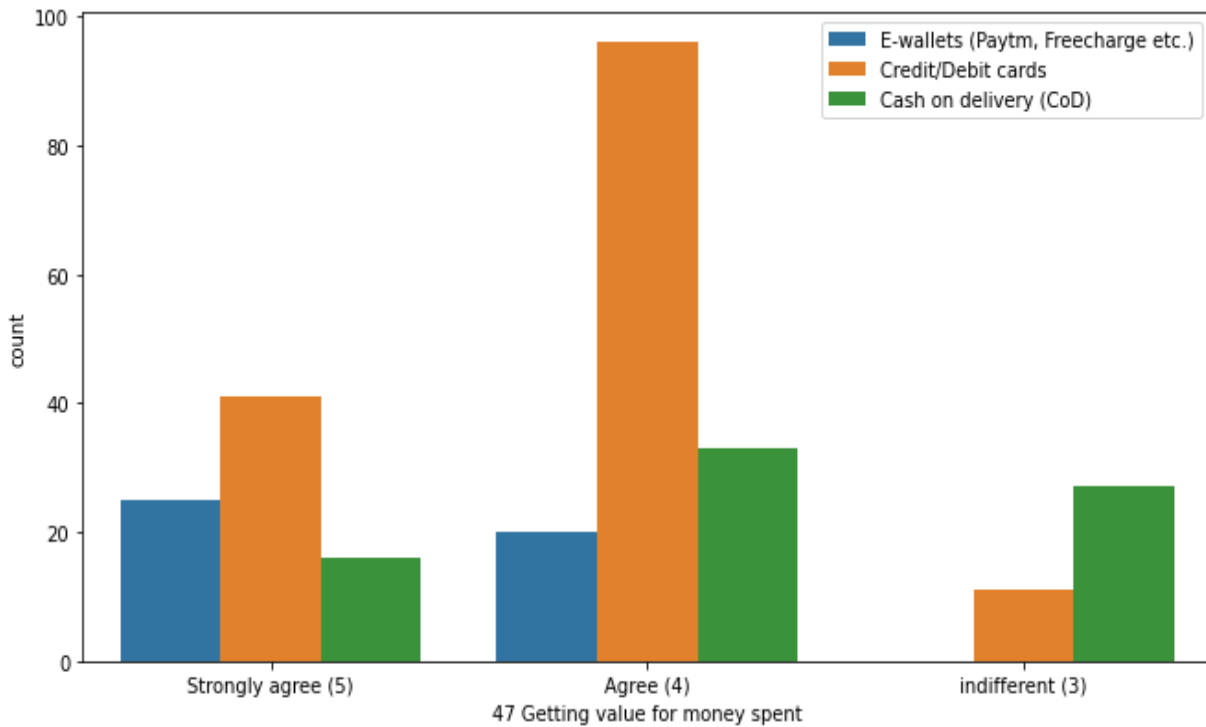
- Plots with respect to internet connection type and device used:



- Observations:

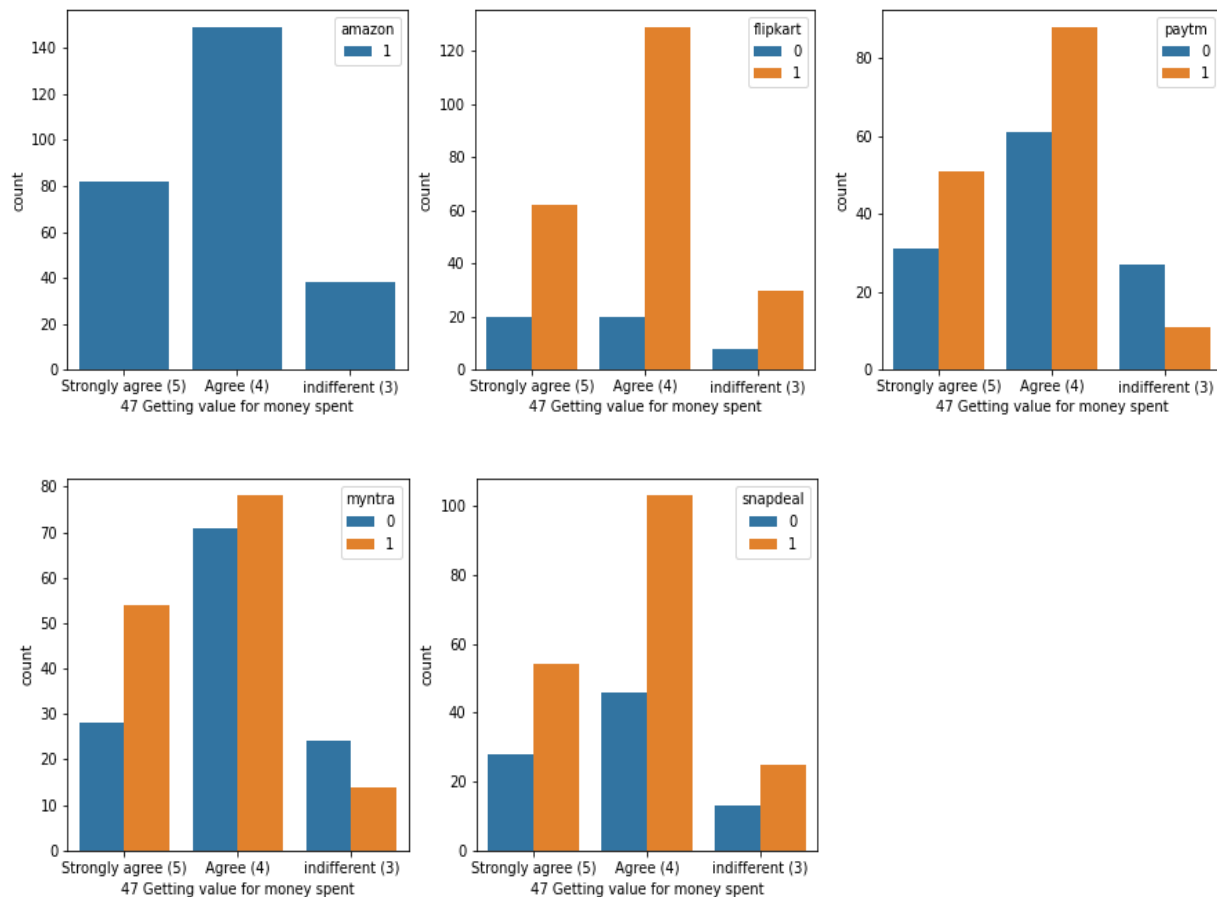
- Out of the people who strongly-agree or agree online shopping helps them get value for money spent, majority are mobile internet users followed by wifi users. They mainly use smartphone and laptop.

- Plot with respect to preferred payment options:



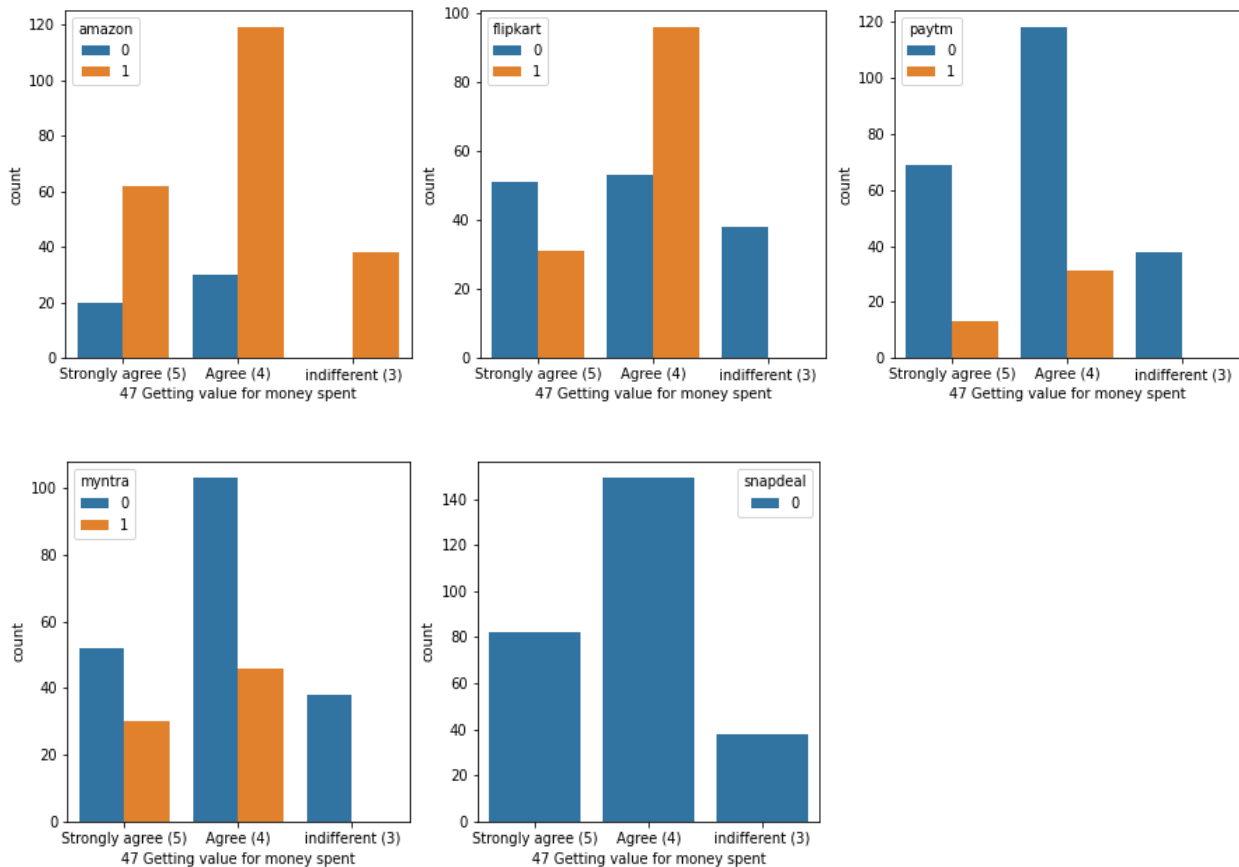
- Observations:
  1. Out of the 231 people who strongly-agree or agree that online shopping helps them get value for money spent, around 135 prefer credit/debit cards.
  2. Around 50 prefer cash on delivery and less than 50 prefer e-wallets.

- Plots with respect to which of the Indian online retailers they have shopped from:



- Observations:
  - All the respondents have shopping experience from amazon.
  - Out of the 231 people, a high majority(around 180) have shopping experience from flipkart.(231 people agree or strongly agree that online shopping helps them get value for money spent)
  - Out of the 231 people,around 130 people have shopping experience from paytm.
  - Out of the 231 people, around 130 people have shopping experience with myntra and around 150 with snapdeal.

- Plots with respect to which of the Indian online retailers they are likely to recommend a friend:



- Observations:
  - Out of the 231 people who strongly-agree or agree that online shopping helps them get value for money spent, around 180 people recommends amazon to a friend.
  - In case of flipkart, out of those 231 people, around 125 people recommend it to friends.
  - In case of myntra, out of those 231 people, around 70 recommend it to friends.
  - In case of paytm, less than 50.
  - It seems that no one is likely to recommend snapdeal to their friends.

## CONCLUSION

- **Key findings:**

1. From the various visualizations and corresponding observations it can be said that '*amazon.in*' is the most trusted and used e-commerce website followed by '*flipkart.com*'.
2. Since none of the customers is likely to recommend '*snapdeal.com*' to their friends hence it can be said that '*snapdeal.com*' is the least trusted website among the five we have analyzed.
3. More than 80% of the customers consider that online shopping is convenient and flexible, helps them in saving money, and also get value out of the money they spend.
4. Customer satisfaction depends on a lot of factors which includes quality information, quality website/application, net benefit, trust, privacy, and return policy.
5. More than half the customers enjoy shopping online and it also gives them a sense of adventure.

- **Limitation of this work:**

This is a very small dataset of only 269 entries. The results or findings cannot be generalized.