

# Customer retention Project

## Problem statement :

### 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.

## Let us study more about the dataset :

The dataset has 2 files – Original data (data in this is in the original format) and Coded data (data in this which has categorical form is encoded). Both the data sets has equal number of rows and columns - (269, 71) .

From the original dataset we can see that 45 columns are encoded which has categorical data, If we do EDA on encoded data we will not get appropriate analytics, hence we can do EDA on Original data

71 columns in the given dataset are :

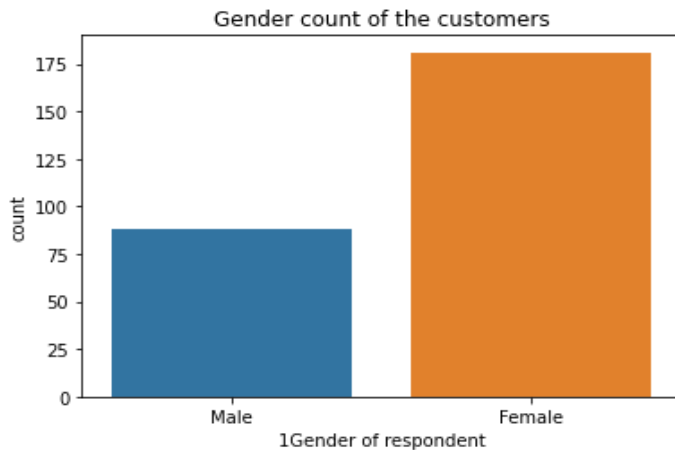
1. 1 Gender of respondent
2. 2 How old are you?
3. 3 Which cities do you shop online from?
4. 4 What is the Pin Code of where you shop online from?
5. 5 Since How Long You are Shopping Online?
6. 6 How many times you have made an online purchase in the past 1 year?
7. 7 How do you access the internet while shopping on-line?
8. 8 Which devices do you use to access the online shopping?
9. 9 What is the screen size of your mobile device?
10. 10 What is the operating system (OS) of your device?
11. 11 What browsers do you run on your device to access the website?
12. 12 Which channels did you follow to arrive at your favourite online store for the first time?
13. 13 After first visit, how do you reach the online retail store?
14. 14 How much time do you explore the e- retail store before making a purchase decision?
15. 15 What is your preferred payment Option?
16. 16 How frequently do you abandon (selecting an item and leaving without making payment) your shopping cart?
17. 17 Why did you abandon the “Bag”, “Shopping Cart”?
18. 18 The content on the website must be easy to read and understand
19. 19 Information on similar product to the one highlighted is important for product comparison
20. 20 Complete information on listed seller and product being offered is important for purchase decision.

21. 21 All relevant information on listed products must be stated clearly
22. 22 Ease of navigation in website
23. 23 Loading and processing speed
24. 24 User friendly Interface of the website
25. 25 Convenient Payment methods
26. 26 Trust that the online retail store will fulfil its part of the transaction at the stipulated time
27. 27 Empathy (readiness to assist with queries) towards the customers
28. 28 Being able to guarantee the privacy of the customer
29. 29 Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
30. 30 Online shopping gives monetary benefit and discounts
31. 31 Enjoyment is derived from shopping online
32. 32 Shopping online is convenient and flexible
33. 33 Return and replacement policy of the e-tailer is important for purchase decision
34. 34 Gaining access to loyalty programs is a benefit of shopping online
35. 35 Displaying quality Information on the website improves satisfaction of customers
36. 36 User derive satisfaction while shopping on a good quality website or application
37. 37 Net Benefit derived from shopping online can lead to users' satisfaction
38. 38 User satisfaction cannot exist without trust
39. 39 Offering a wide variety of listed product in several category
40. 40 Provision of complete and relevant product information
41. 41 Monetary savings
42. 42 The Convenience of patronizing the online retailer
43. 43 Shopping on the website gives you the sense of adventure
44. 44 Shopping on your preferred e-tailer enhances your social status
45. 45 You feel gratification shopping on your favourite e-tailer
46. 46 Shopping on the website helps you fulfil certain roles
47. 47 Getting value for money spent
48. From the following, tick any (or all) of the online retailers you have shopped from
49. Easy to use website or application
50. Visual appealing web-page layout
51. Wide variety of product on offer
52. Complete, relevant description information of products
53. Fast loading website speed of website and application
54. Reliability of the website or application
55. Quickness to complete purchase
56. Availability of several payment options
57. Speedy order delivery
58. Privacy of customers' information
59. Security of customer financial information
60. Perceived Trustworthiness
61. Presence of online assistance through multi-channel
62. Longer time to get logged in (promotion, sales period)
63. Longer time in displaying graphics and photos (promotion, sales period)
64. Late declaration of price (promotion, sales period)
65. Longer page loading time (promotion, sales period)
66. Limited mode of payment on most products (promotion, sales period)
67. Longer delivery period
68. Change in website/Application design
69. Frequent disruption when moving from one page to another
70. Website is as efficient as before
71. Which of the Indian online retailer would you recommend to a friend

**We can now explore the data in each column and check for their uniqueness, value counts and visualization**

**Column 1 :**

The column '1Gender of respondent' tells us about the gender details of the customer, It has 2 unique value (Male and Female), Number of female customers are 181 and number of male customers are 88

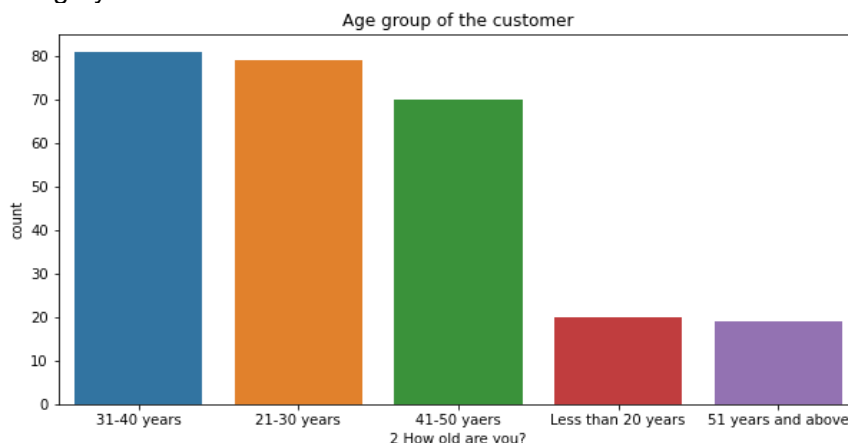


**Column 2 :**

From the above data table and graph we can observe that the data in 'How old are you?' column is categorized into 5 different age which is as following with the number of customers in that respective age group

- 31-40 years - 81
- 21-30 years - 79
- 41-50 yaers - 70
- Less than 20 years - 20
- 51 years and above - 19

The plot also tells that maximum number of customers fall under 31-40 years and 21-30 years category

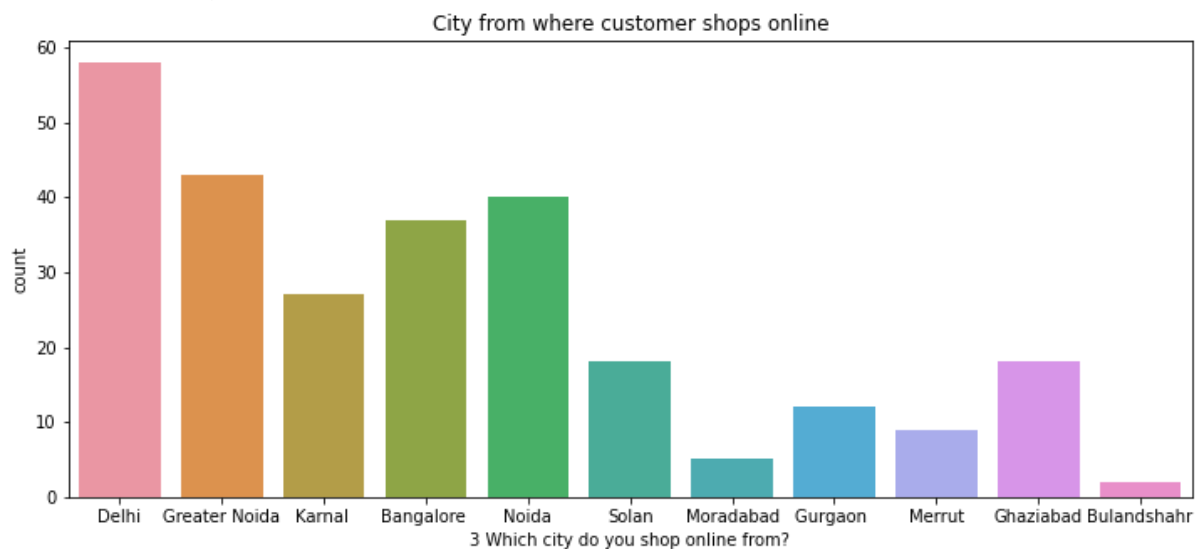


**Column 3 :**

The column 'Which city do you shop online from?' gives us details about from which city the customer is doing online shopping, there are 11 different cities in the column from where customers shop, below value tells us about which are those cities and how many customers shop from each city

1. Delhi - 58
2. Greater Noida - 43
3. Noida - 40
4. Bangalore - 37
5. Karnal - 27
6. Solan - 18
7. Ghaziabad - 18
8. Gurgaon - 12
9. Merrut - 9
10. Moradabad - 5
11. Bulandshahr - 2

From the above plot we can also observe that highest number of customers are in Delhi, Greater Noida and Noida, Least number of customers are in Bulandshahr



#### Column 4 :

The column '4 What is the Pin Code of where you shop online from?' gives us details about the pncodes of the locations from where the customers are shopping online, it has 39 unique pincodes and value count of each pincode is as below

201308-38	132001-19	201310-18	110044-16	250001-9
173229-9	173212-9	560010-8	132036-8	122018-8
560037-8	110008-7	110011-7	201306-7	110014-6
110018-6	201305-5	201008-5	201009-5	201312-5
244001-5	530068-5	122009-4	201001-4	560003-4
201304-4	110009-4	201303-4	560002-4	560018-4
110042-4	110030-4	201005-4	110039-4	560013-3
203001-2	203202-1	560001-1	203207-1	

#### Column5 :

The column '5 Since How Long You are Shopping Online ?' gives us the details about since how long the customer is doing online shopping, the data in this column has 5 categories which is shows as below along with number of customers in each respective category.

1. Above 4 years - 98
2. 2-3 years - 65
3. 3-4 years - 47
4. Less than 1 year - 43
5. 1-2 years - 16

We can also observe that the maximum number of customers fall in the category 'Above 4 years', which tells that most of customers are doing online shopping for more than 4 years

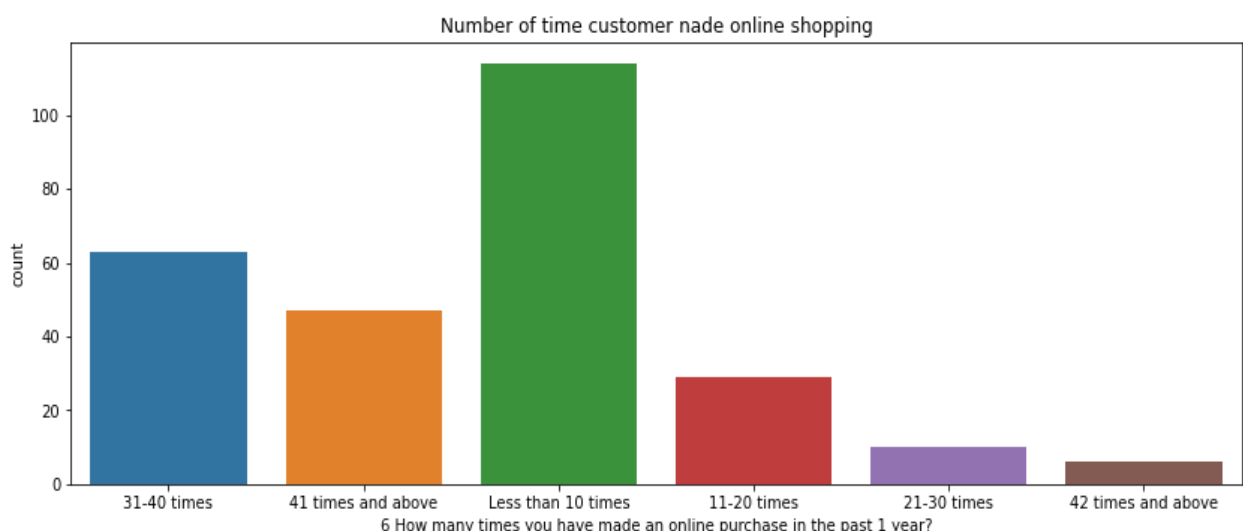


#### Column 6 :

In the column '6 How many times you have made an online purchase in the past 1 year?' we can observe that the data gives us details about how many time each customer did online shopping, that data in this column is catogorized into 6 categories which are as following along with the number of customers falling under each cateryory

1. Less than 10 times - 114
2. 31-40 times - 63
3. 41 times and above - 47
4. 11-20 times - 29
5. 21-30 times - 10
6. 42 times and above - 6

Also we can observe that maximum number of customers (114 members) did online shopping less than 10 times and minimum number of customers (6 members) did 42 times or above times.



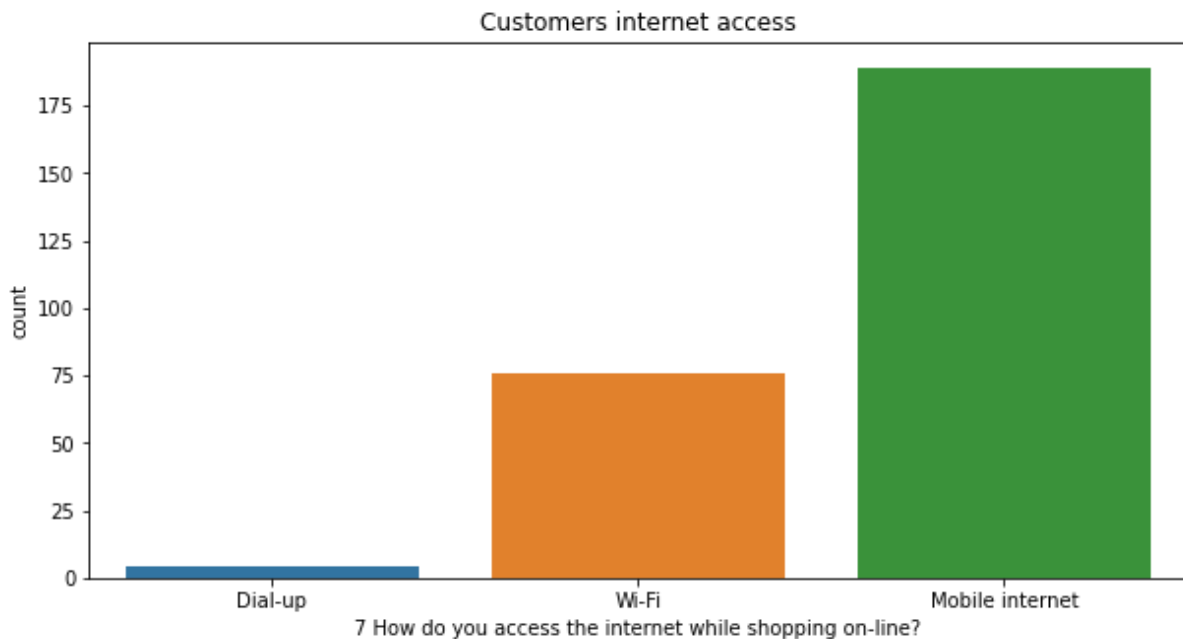
#### Column 7 :

Now from the '7 How do you access the internet while shopping on-line?' column we can see the details of how the customers accessed internet while doing the online shopping, again the data

here is categories into 3 different categories, the below table gives us the details about which are the categories and how many customers fall under each category

1. Mobile internet - 189
2. Wi-Fi - 76
3. Dial-up - 4

Maximum number of customers (189 members) accessed internet through Mobile internet while doing online shopping and minimum number of customer accessed through Dial-up and shopped online

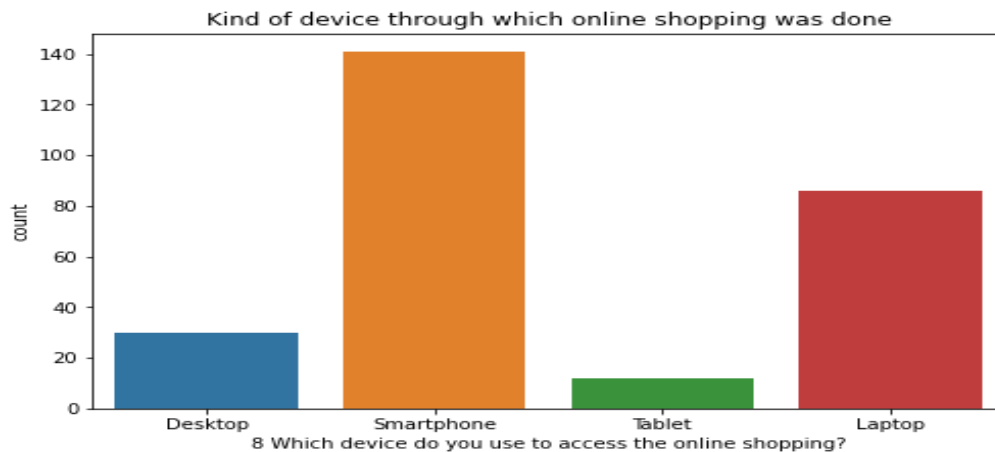


**Column 8 :**

The column '8 Which device do you use to access the online shopping?' tell us details about through which kind of device the customer made online shopping, the data in this column is categorised into 4 different categories as follow which gives the number of customers falling in each category

1. Smartphone - 141
2. Laptop - 86
3. Desktop - 30
4. Tablet - 12

From the above count plot we can observe that maximum number of customers (141) shopped through Smartphones and minimum number of customers (12) shopped through Tablet.

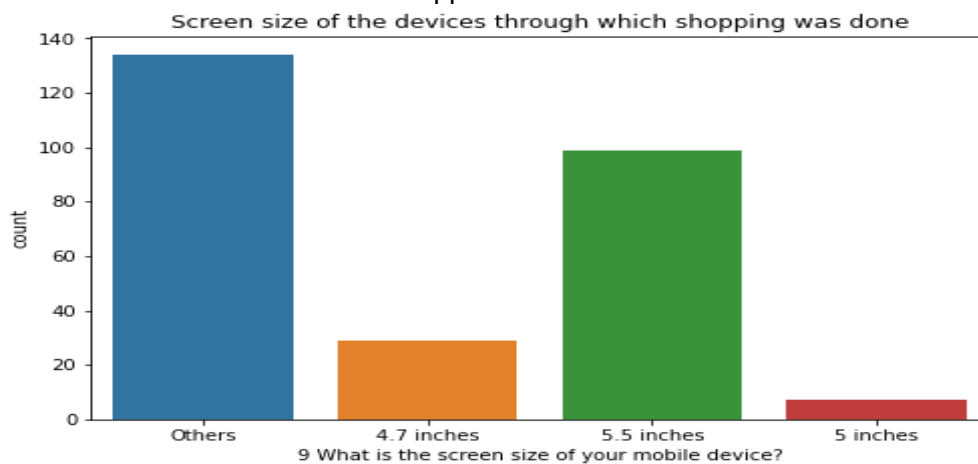


#### Column 9 :

The column '9 What is the screen size of your mobile device?' gives us the details about the size of the screens of devices through which customers did online shopping, the data in this is categorised into 4 different categories as 4.7, 5.5, 5 inches and other sizes falls under 'Others' category. The table below tells about the number of customers in each category

1. Others - 134
2. 5.5 inches - 99
3. 4.7 inches - 29
4. 5 inches - 7

From the above count plot we can observe that Most of the customers fall under 'Other' category and least number of customers shopped from the device whose screen size is 5 inches

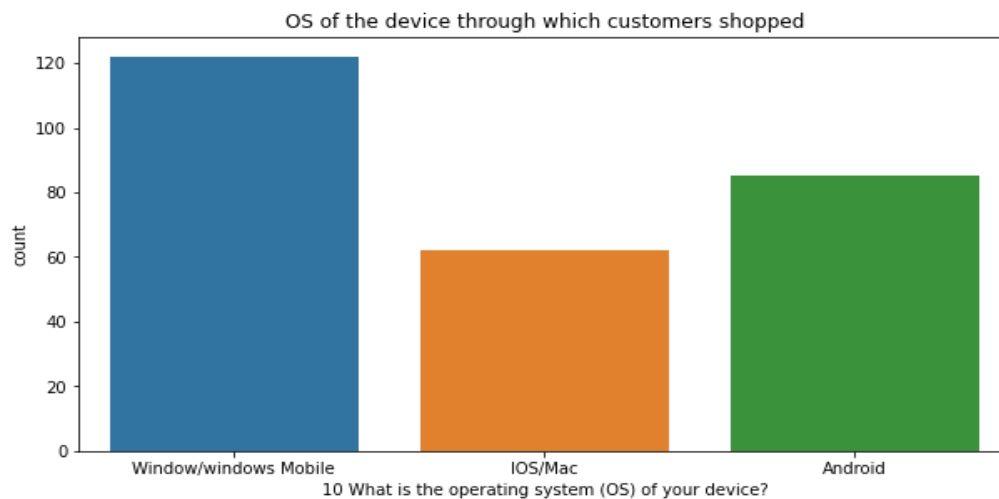


#### Column 10 :

The column '10 What is the operating system (OS) of your device?' tell us the details about OS of the devices through which customers did online shopping, the data in this is categorized into 3 different categories which are as mentioned below along with the count of customers in each category

1. Window/windows Mobile - 122
2. Android - 85
3. IOS/Mac - 62

From the above count plot we can observe that maximum number of customers (122) shopped from Window/windows Mobile and least (62) shopped from IOS/Mac.

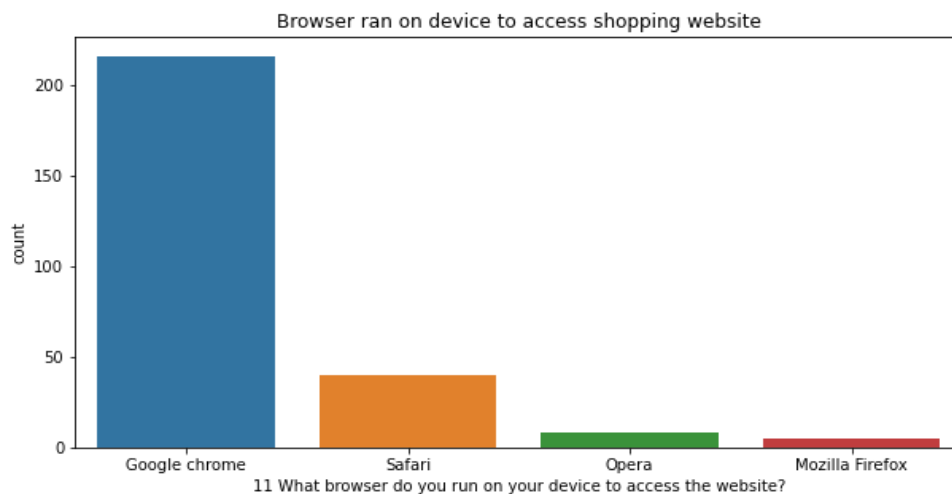


#### Column 11 :

The column '11 What browser do you run on your device to access the website?' tell us details about which browser customers used in their device to access the shopping website, the data in this is categorized into 4 categories and it is as following along with the count of customers falling in each category

1. Google chrome - 216
2. Safari - 40
3. Opera - 8
4. Mozilla Firefox - 5

From the above table and countplot we can observe that maximum number of customers (216) accessed the website through Google chrome and minimum number of customers (5) accessed from Mozilla Firefox



#### Column 12 :

The column '12 Which channel did you follow to arrive at your favorite online store for the first time?' tells us details about what inspired the customer to do online shopping for the first time, the data data here is categorized into 3 categories which and gives the count of customers in each category as following

1. Search Engine - 230
2. Content Marketing - 20
3. Display Adverts - 19



From the above count plot we can observe that maximum number of customers (230) shopped online for the first time through 'search Engine' and least (19) shopped online for the first time getting inspired by 'Display Advertisements'

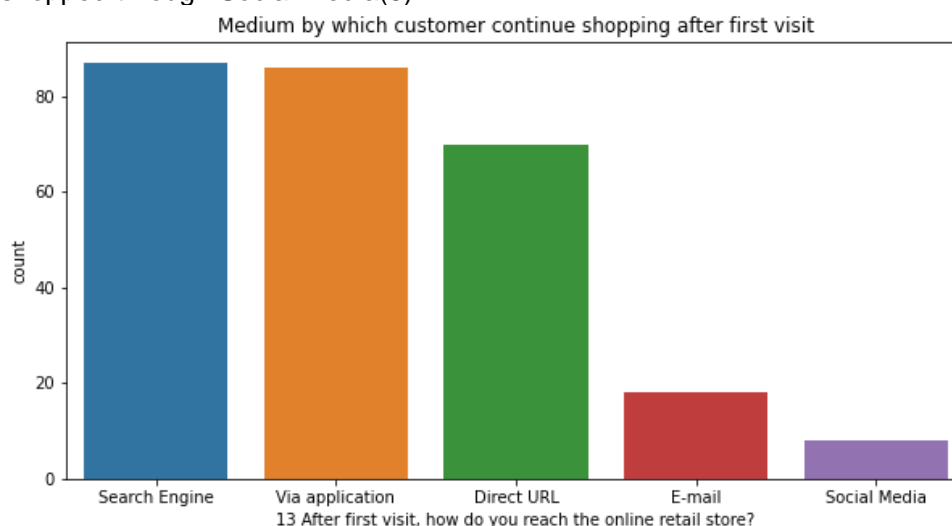


#### Column 13 :

The column '13 After first visit, how do you reach the online retail store?' tells us details about how the customers continued shopping after visiting the website first, this data is categorized into 5 different categories as shown below also tells us about how many customers fall in each category

1. Search Engine - 87
2. Via application - 86
3. Direct URL - 70
4. E-mail - 18
5. Social Media - 8

From the above count plot we can observe that maximum number of customers continued their shopping through Search engine (87) and Application (86) and least number of customers shopped through Social media(8)



#### Column 14 :

The column '14 How much time do you explore the e- retail store before making a purchase decision?' tells us details about how much time each customer spends on e-retail store before making a decision of shopping any online product, the data in this column is categorized into 5 different categories along with number of customers falling under each category more than 15 mins - 123

1. 6-10 mins - 71
2. 11-15 mins - 46
3. Less than 1 min - 15
4. 1-5 mins - 14

From the above count plot we can observe that maximum number customers (123) spend more than 15 minutes on the e-retail store before making a choice of shopping online and minimum number of customers fall in the category of spending 1-5 min (14) or less than 1 min (15)

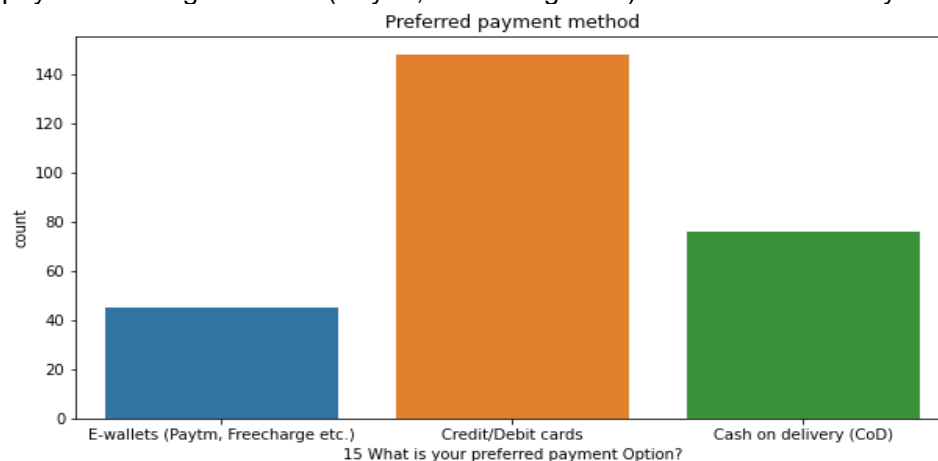


#### Column 15 :

The column '15 What is your preferred payment Option?' tells us details about what method customers use for doing payment, the data in this is categorized into 3 different categories along with number of customers falling under each category as below

1. Credit/Debit cards - 148
2. Cash on delivery (CoD) - 76
3. E-wallets (Paytm, Freecharge etc.) - 45

From the above countplot we can observe that maximum number of customers (148) do their payments through Credit/Debit cards and where as minimum number of customers (45) do payments using E-wallets (Paytm, Freecharge etc.) and COD is done by 76 customers



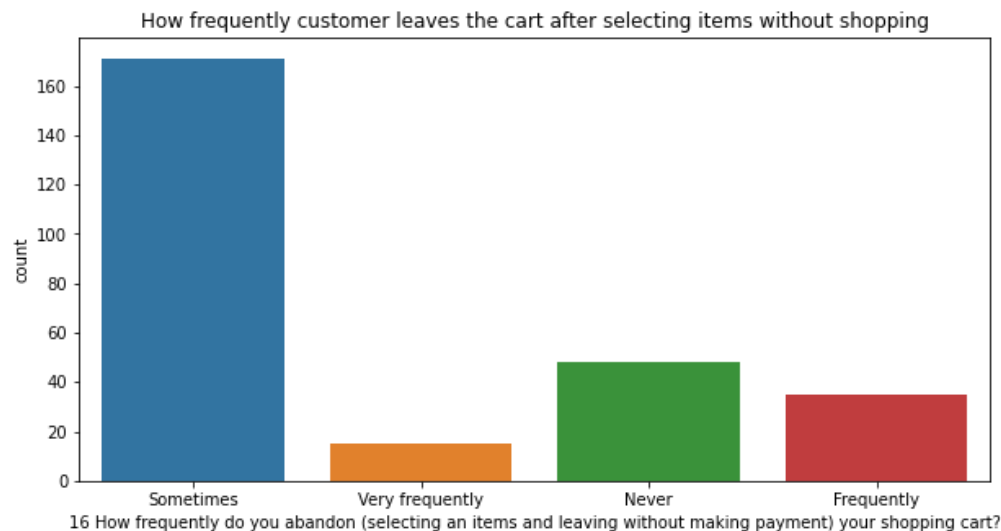
#### Column 16 :

The column '16 How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?' tells us details about how frequently customer leaves the cart

without shopping after adding items in, the data in this is categorised in 4 categories, below is the data which tells us about how many customers fall under each category

1. Sometimes - 171
2. Never - 48
3. Frequently - 35
4. Very frequently - 15

From the above countplot we can observe that the maximum number of customers (171) leave the cart unshopped sometimes and least number of customers (35) leave the cart unshopped after adding items to cart very frequently

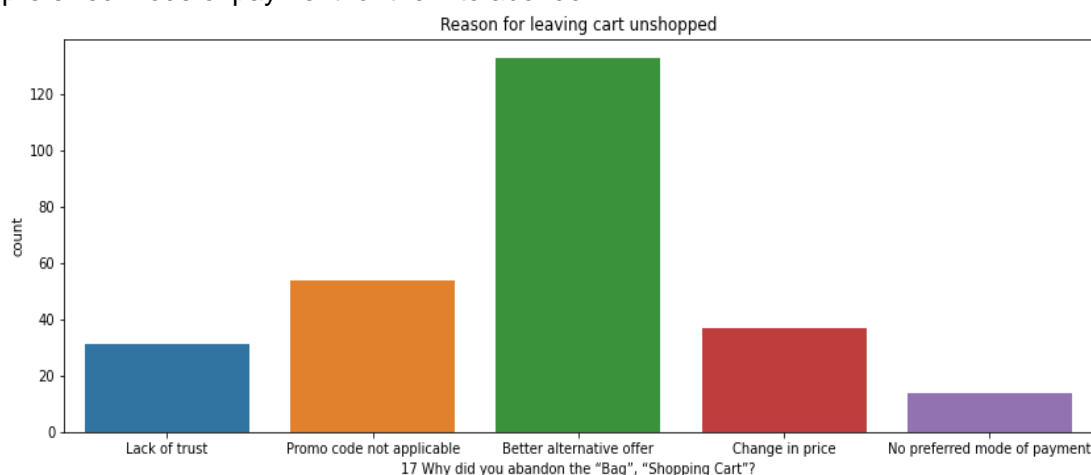


#### Column 17 :

The column '17 Why did you abandon the "Bag", "Shopping Cart"?' tells us details about the reasons why customer is leaving the cart without shopping after adding items to cart

1. Better alternative offer - 133
2. Promo code not applicable - 54
3. Change in price - 37
4. Lack of trust - 31
5. No preferred mode of payment - 14

From the above countplot we can observe that 133 customers give reason that they got better alternative offer on the item for their abandonment, 14 customers give reason that they had no preferred mode of payment for them to abandon



The data in columns 1 to 17 gave us description about how customers did the online shopping, i.e, it discussed about the device used, OS of the device, internet access, payment mode, how frequently customer shopped online, locations from where the customer shopped online.

**In the similar way the columns from 19 to 47 gives us details about customers feedbacks on different parameters, we can see the feedback response of each parameter by plotting countplot.**

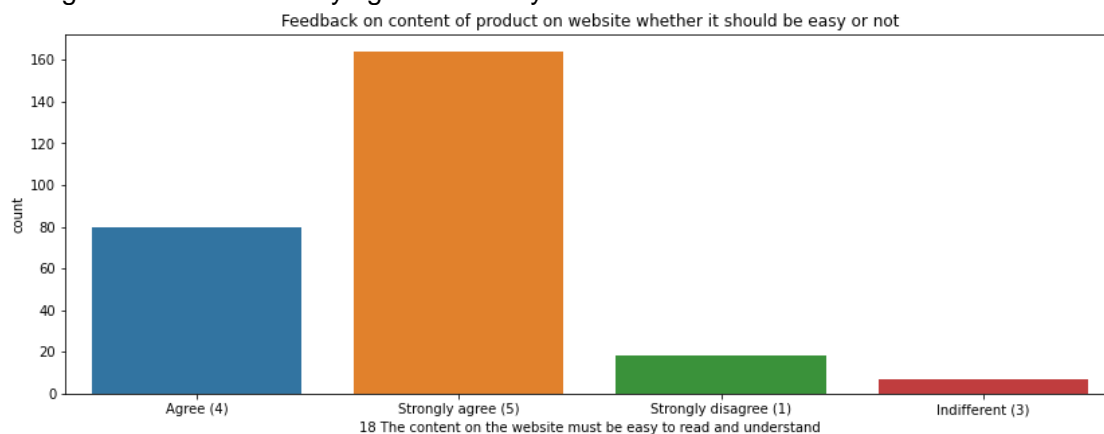
#### **Column 18 :**

The column '18 The content on the website must be easy to read and understand' tells us about customers opinion about content on website which tells them about the product. this data is categorised into 4 categories as show below

1. Strongly agree (5) - 164
2. Agree (4) - 80
3. Strongly disagree (1) - 18
4. Indifferent (3) - 7

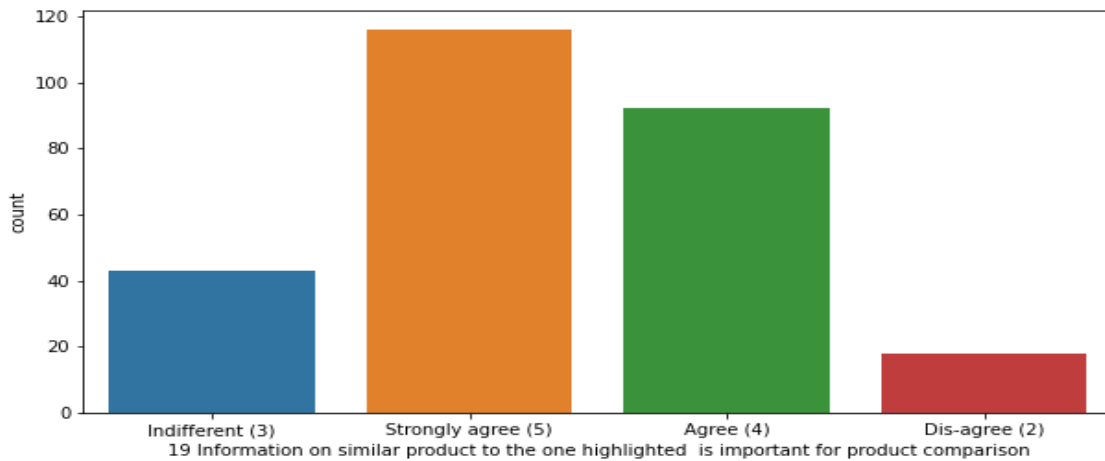
From the above count plot we can observe that 164 customers strongly agree that the product details on the website should be easy to read and understand

In the similar way the columns from 19 to 47 gives us details about customers feedbacks on different parameters, we can see the feedback response of each parameter by plotting pie chart all together instead of studying them one by one



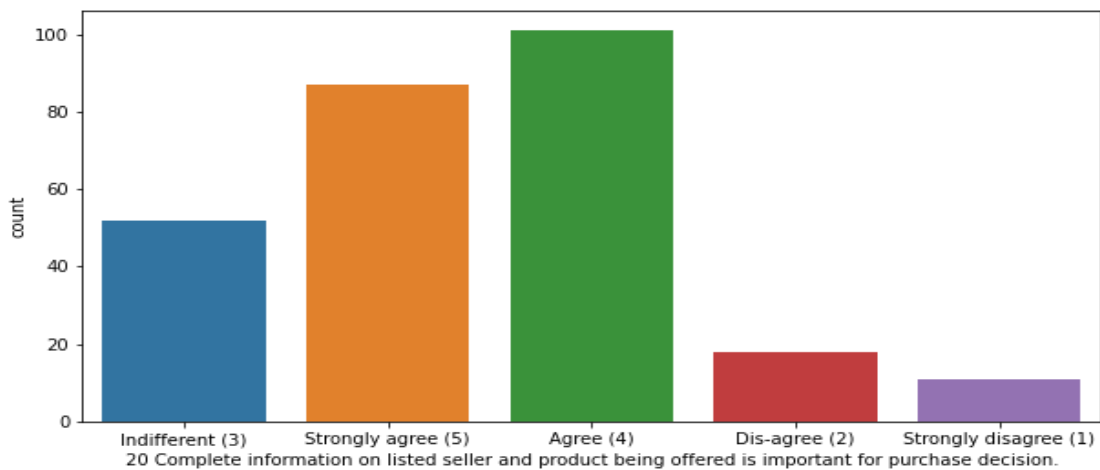
#### **Column 19 :**

- Column 19 : This column tells us about how satisfied customers are with the information on similar product which would be helpful for comparison, Most of the customers strongly agree with importance of information on similar products

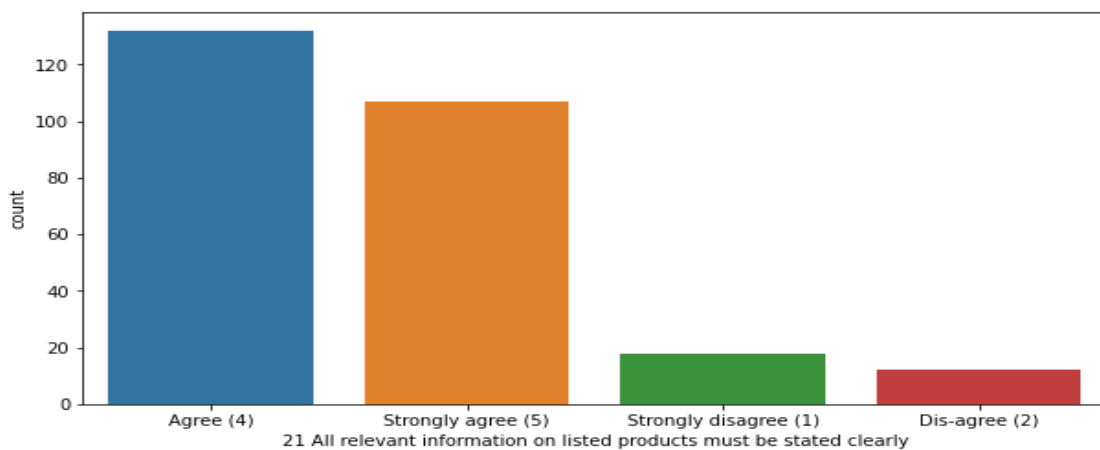


#### Column 20 :

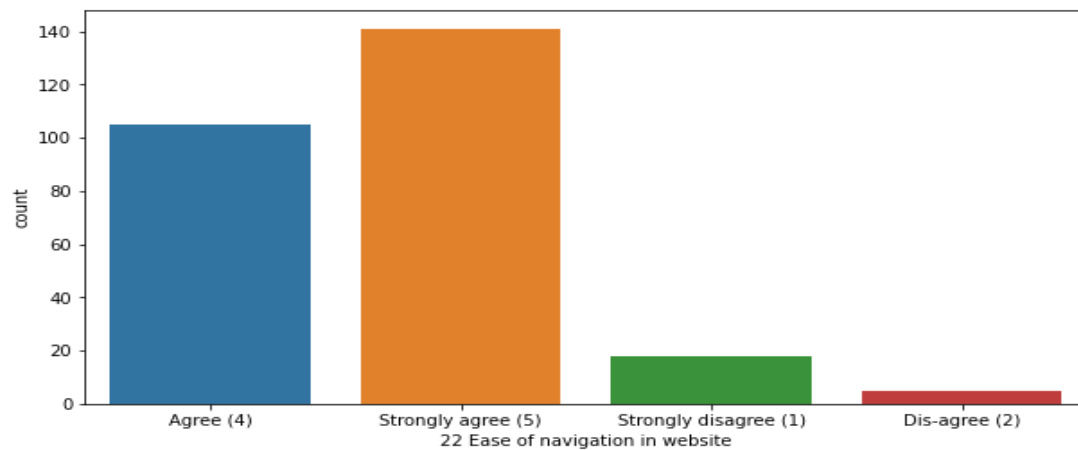
This column tells us about how strongly customers agree that the information on listed seller and product being offered is important for purchase decision, here most of the customers strongly agree that complete information of product is important to make decision for purchase



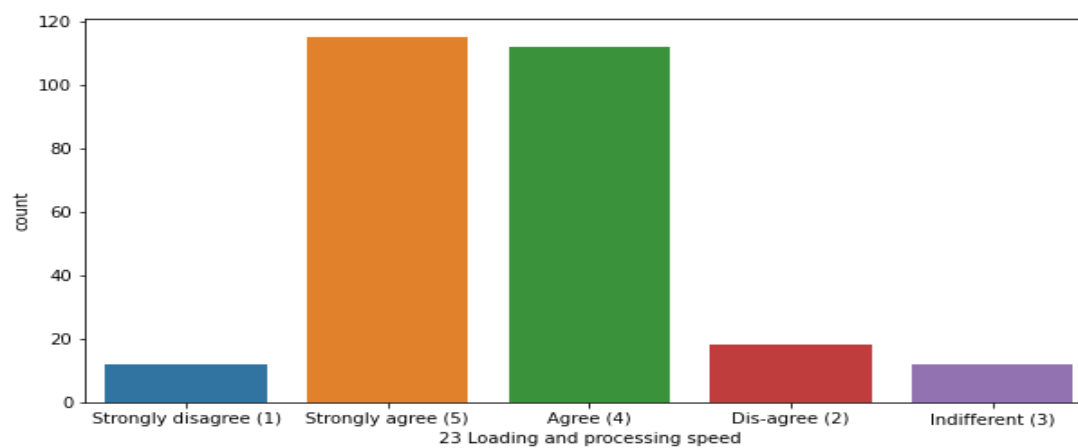
**Column 21 :** This column tells us about how important it is to give relevant information on listed products must be stated clearly, in this most of the customers agree for the aspect.



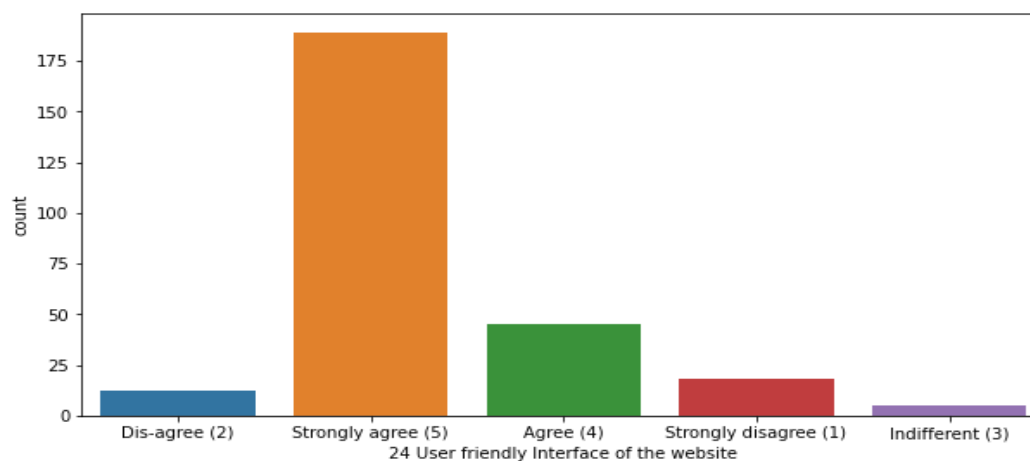
**Column 22 :** This column tells us about how friendly the website is for the customers to navigate, Maximum number of customers strongly agree that the websites are easy to navigate.



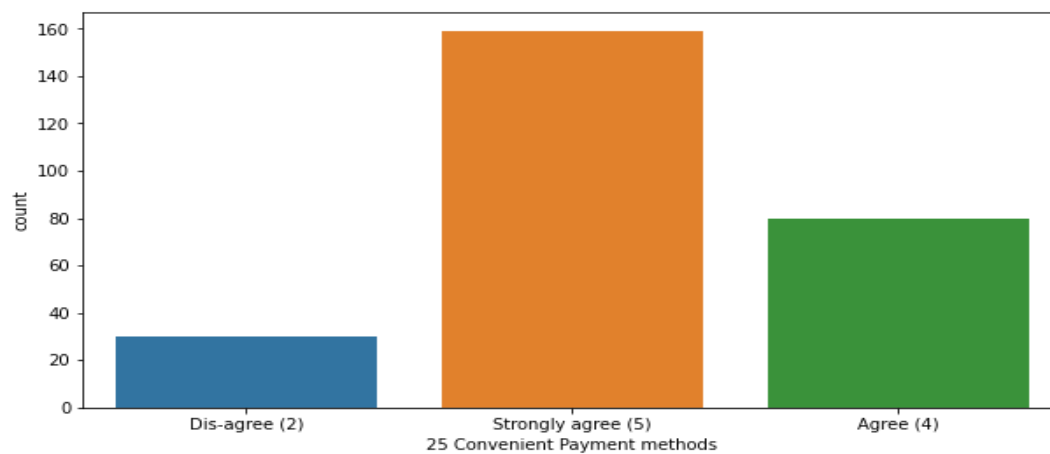
**Column 23 :** This column tells us about how satisfied the customers are with loading and processing speed, Maximum customers Strongly agree and agree with that loading and processing speed is good in the websites



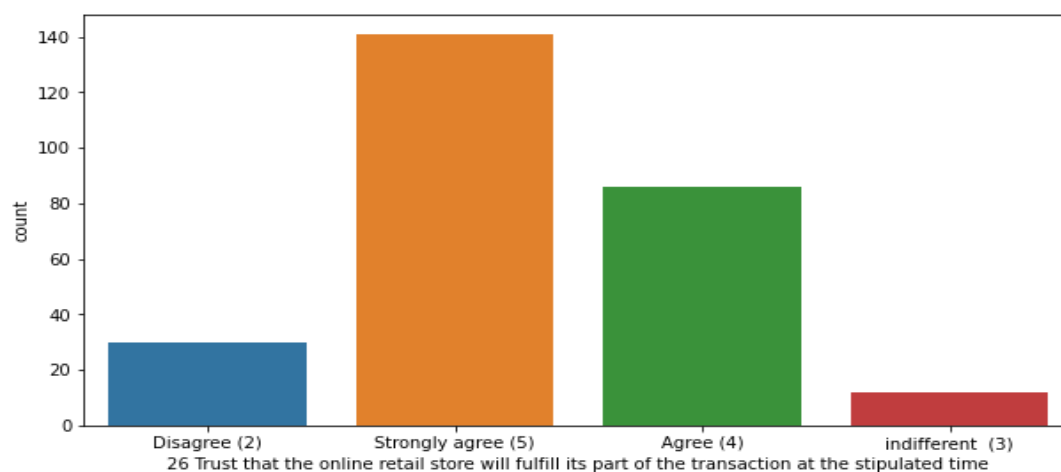
**Column 24 :** This column tells us about how satisfied the customers are with user friendly interface of the website, Maximum number of customers strongly agree with this aspet



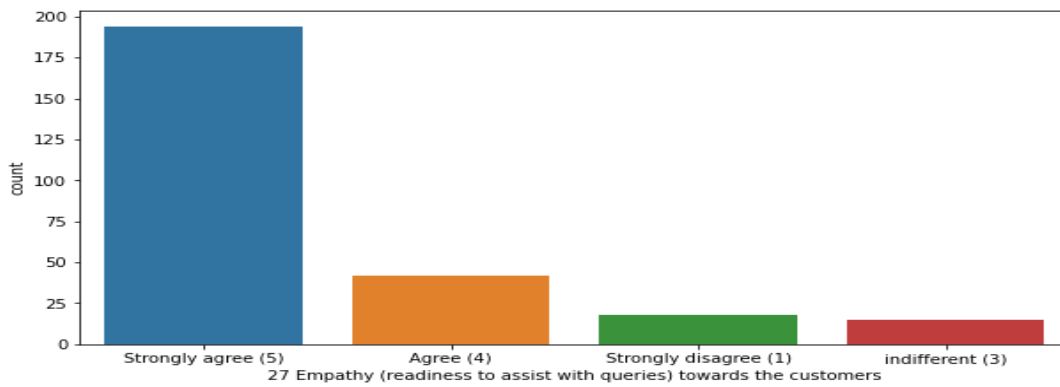
**Column 25 :** This column tells us about the convenience of payment methods, Maximum number of customers strongly agree that the payment methods are convenient enough



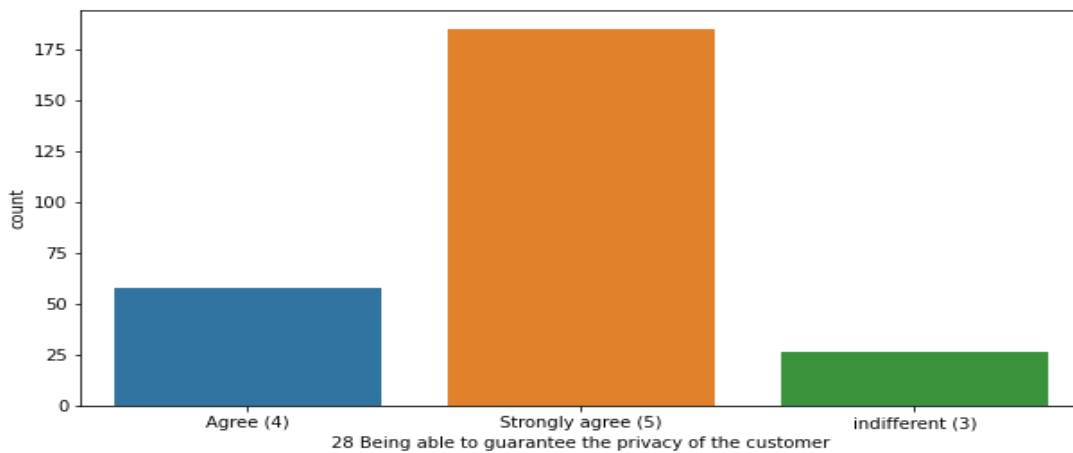
**Column 26 :** This column tells us about whether the transactions are made at the stipulated time or not, Maximum number of customers strongly agree that the transactions are made at the stipulated time



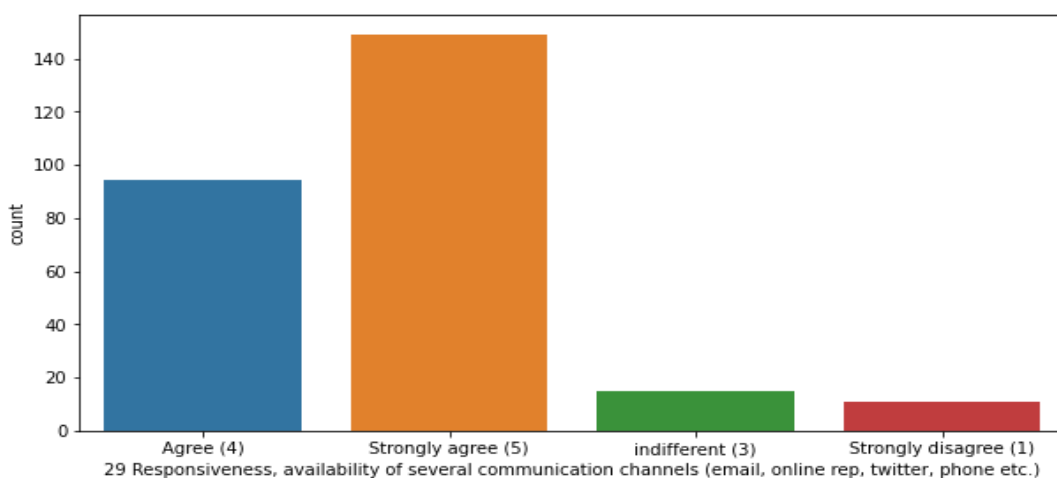
**Column 27 :** This column tells us about how empathetically the customers were treated and assisted with their queries, maximum number of customers strongly agree that they were treated empathetically and assisted with their queries



**Column 28 :** This column tells us about how satisfied the customers are with the privacy of their data, maximum number of customers strongly agree that their information was kept confidential

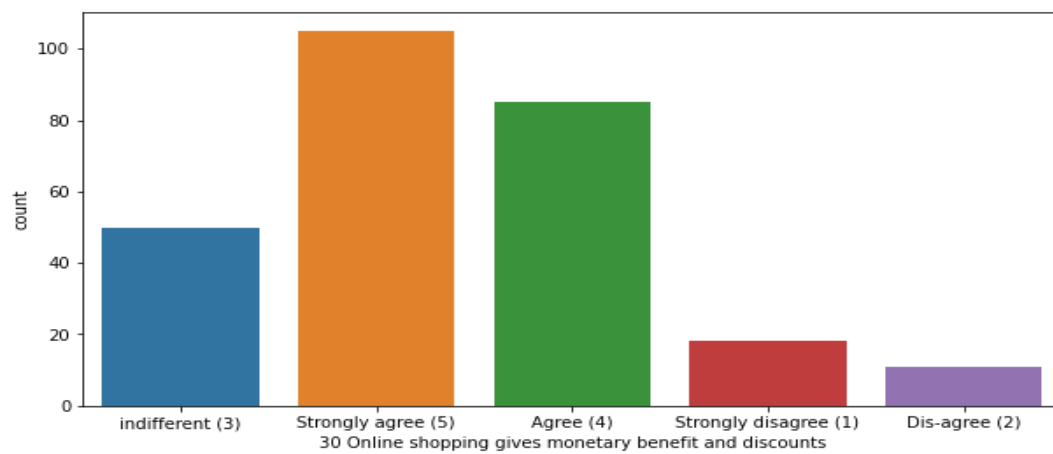


- Column 29 : This column tells us about how satisfied the customers are with responsiveness, availability of several communication channels(email, online rep, teitter, phone etc.), maximum number of customers strongly agree that communication channels are responsive and available

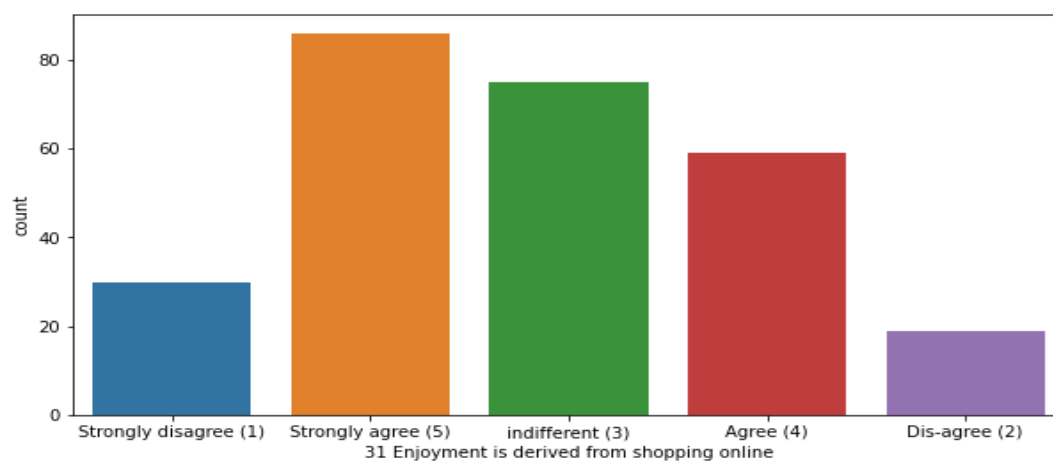




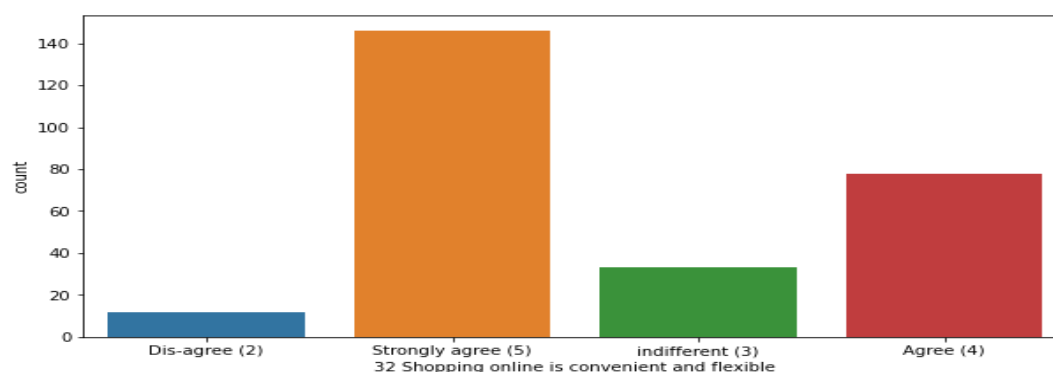
**Column 30 :** This column tells us about how satisfied customers are with monetary benefits and discounts on online shopping, maximum number of customers strongly agree that they get good monetary benefits discounts on online shopping



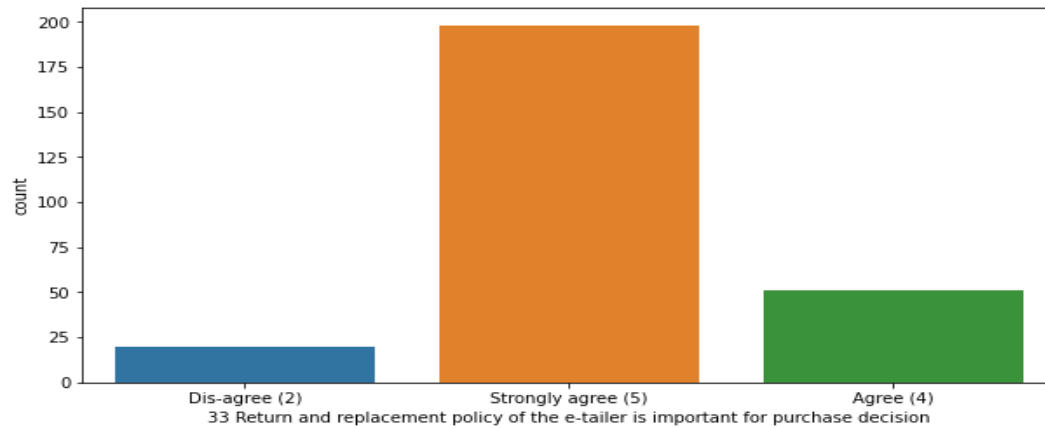
**Column 31 :** This column tells us about how enjoyable the online shopping is for customers, maximum number of customers strongly agree that they the enjoyment is derived from online shopping



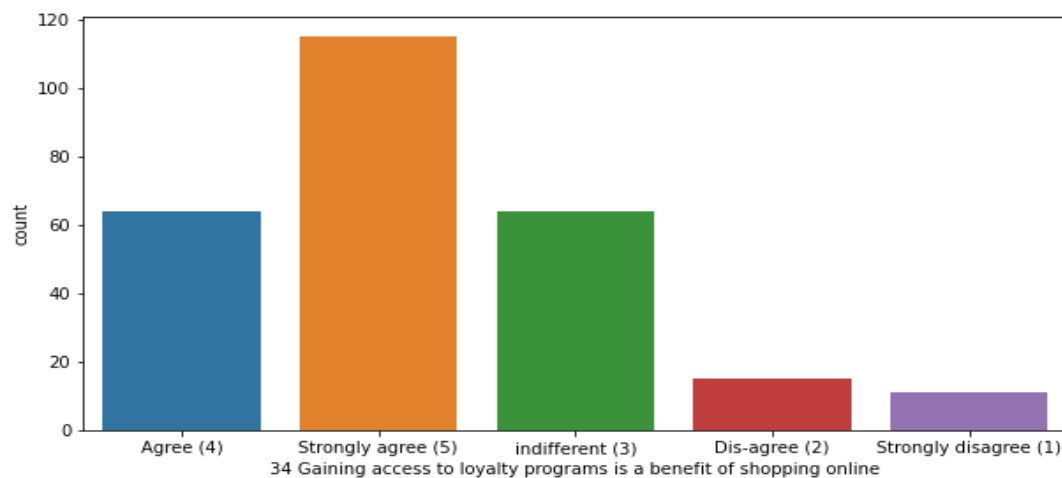
**Column 32 :** This column tells us about how convenient and flexible online shopping is, maximum number of customers strongly agree that shopping online is convenient and flexible



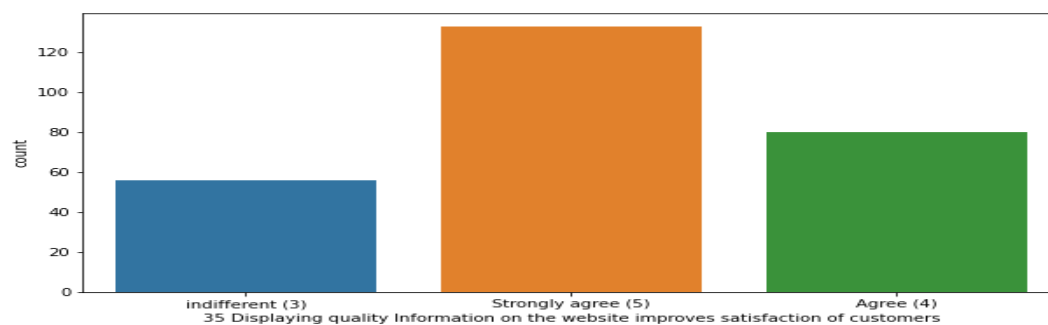
**Column 33 :** This column tells us about how important return and replacement policy is to make a purchase decision, maximum number of customers strongly agree that return and replacement policy is important to make purchase decision



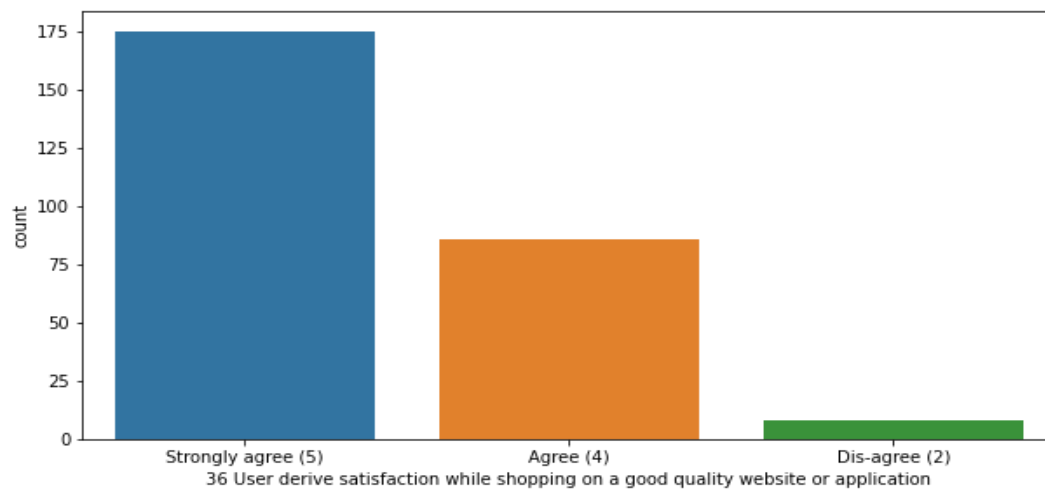
**Column 34 :** This column tells us about how important it is to gain access to loyalty programs that benefit online shopping, maximum number of customers strongly agree with this aspect



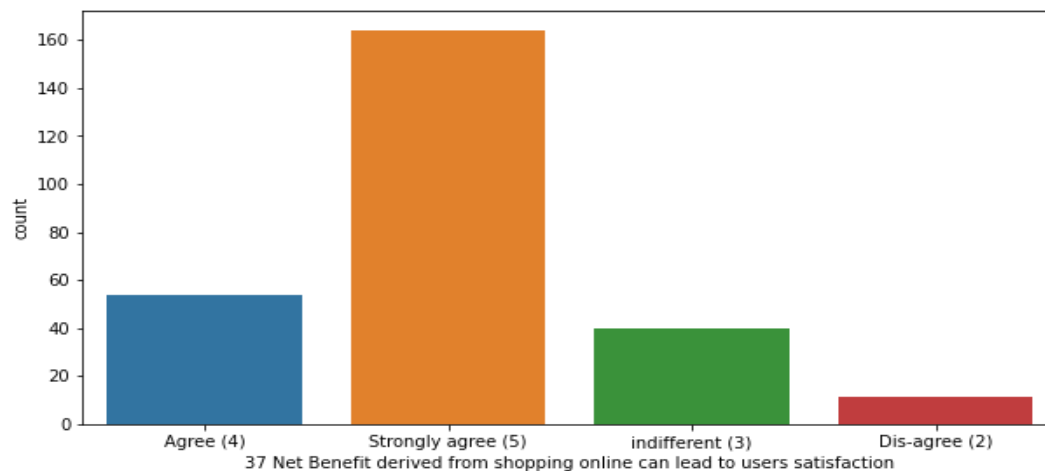
**Column 35 :** This column tells us about how important it is to display quality information on the website to improve satisfaction of customers, maximum number of customers strongly agree that it is important to display quality information on website improves satisfaction of customers



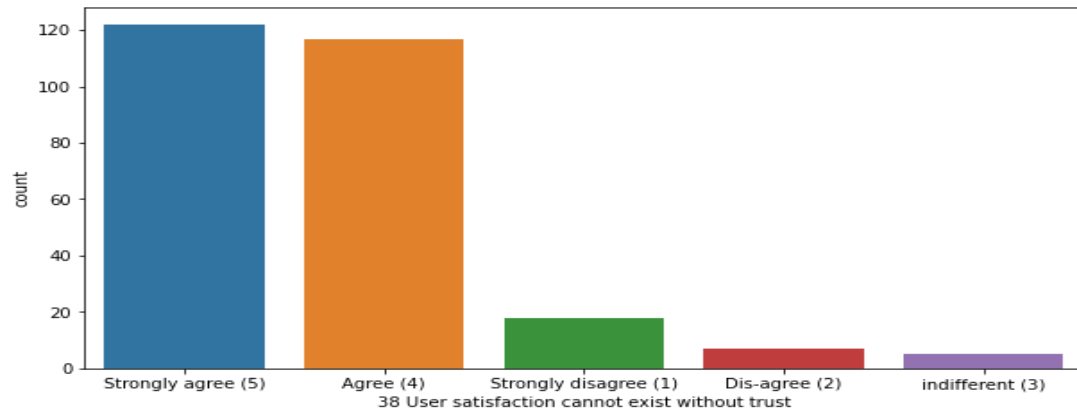
**Column 36 :** This column tells us about how important it is to have a good quality website or application to satisfy users while shopping online, maximum number of customers strongly agree that it is important to have a good quality website and application to satisfy users while shopping online



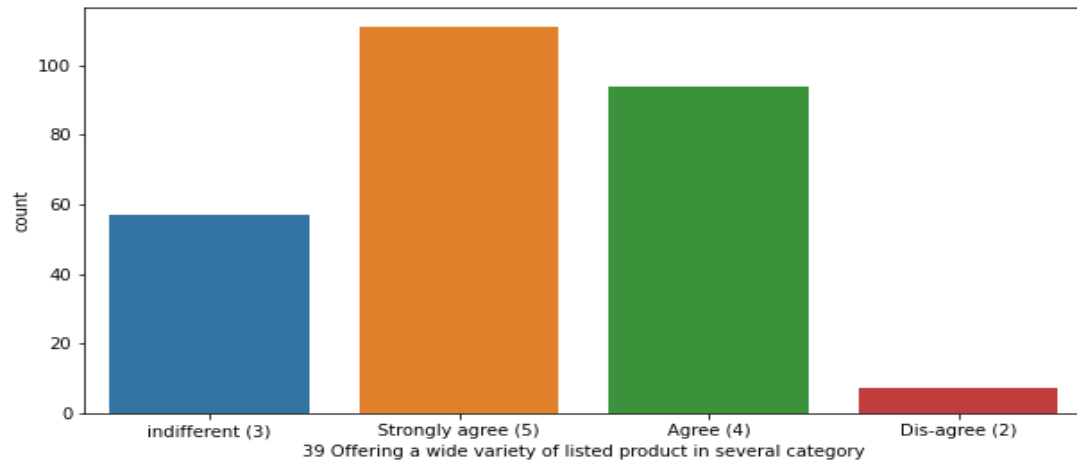
**Column 37 :** This column tells us about how important it is to create net benefit from shopping online which leads to user satisfaction, maximum number of customers strongly agree that net benefit derived from online shopping leads to user satisfaction



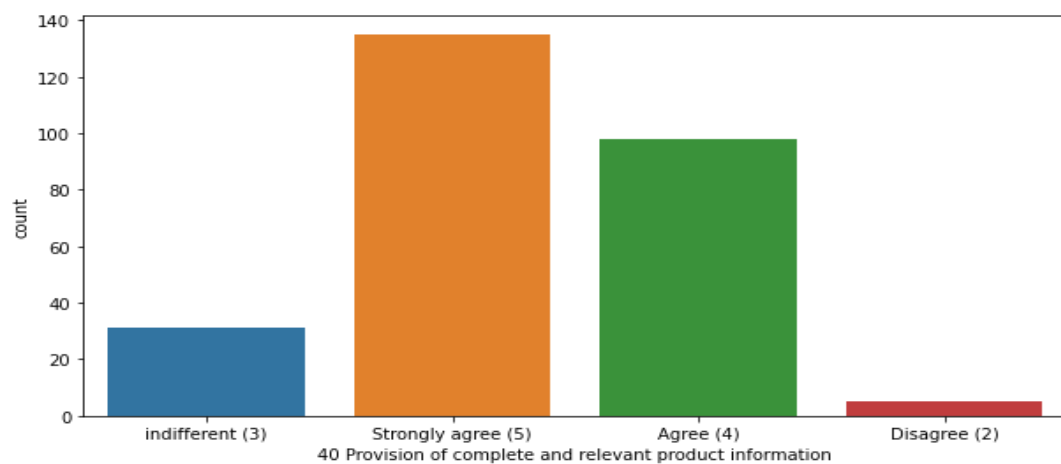
**Column 38 :** This column tells us about how important trust is to create user satisfaction, maximum number of customers strongly agree that trust is important to create user satisfaction in customers



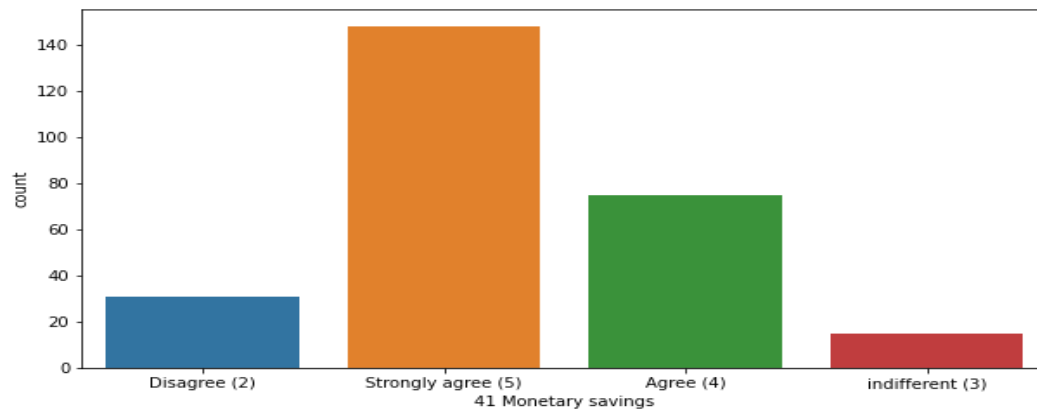
**Column 39 :** This column tells us about how important it is to provide a wide variety of products in different categories, maximum customers strongly agree that it is important to provide wide variety of listed products in all categories to attract customers



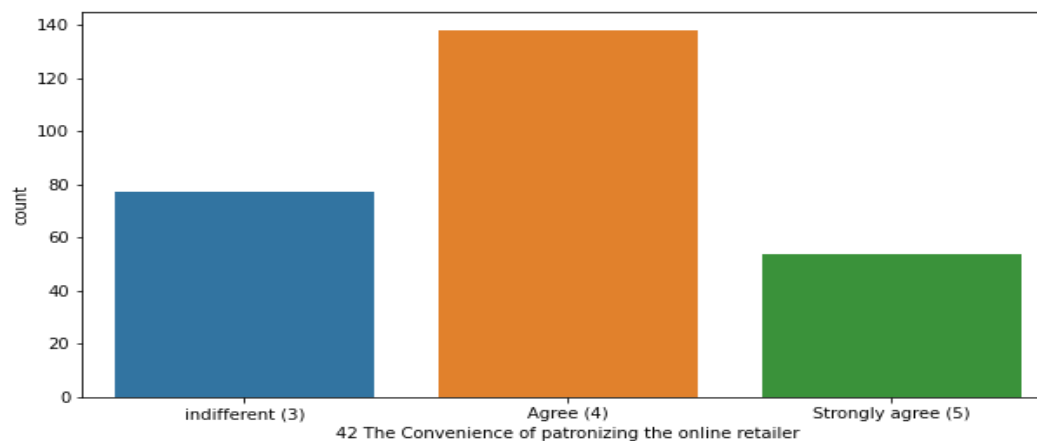
**Column 40 :** This column tells us about how important it is to provide provision of complete and relevant product information, maximum number of customers strongly agree that provision of complete and relevant product information is important



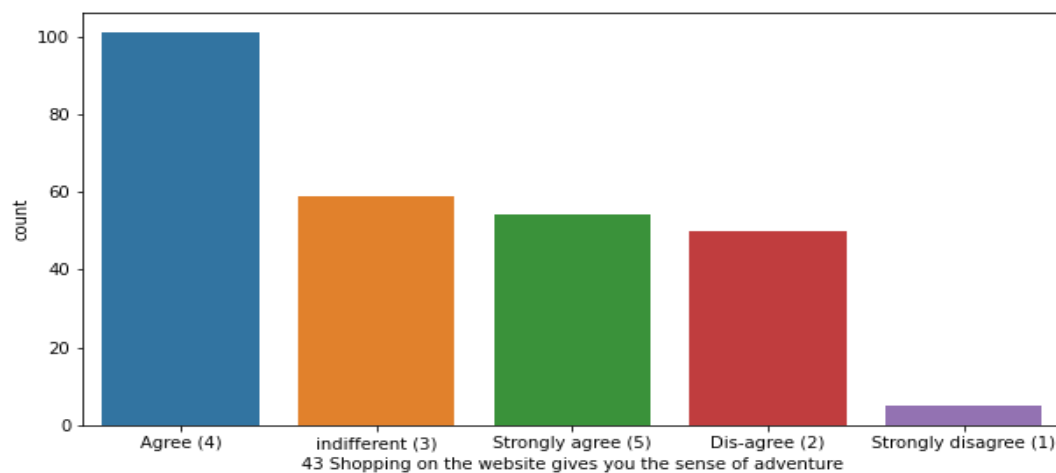
**Column 41 :** This column tells us about Monetary savings done by online shopping, maximum number of customers strongly agree that monetary saving is done by shopping online



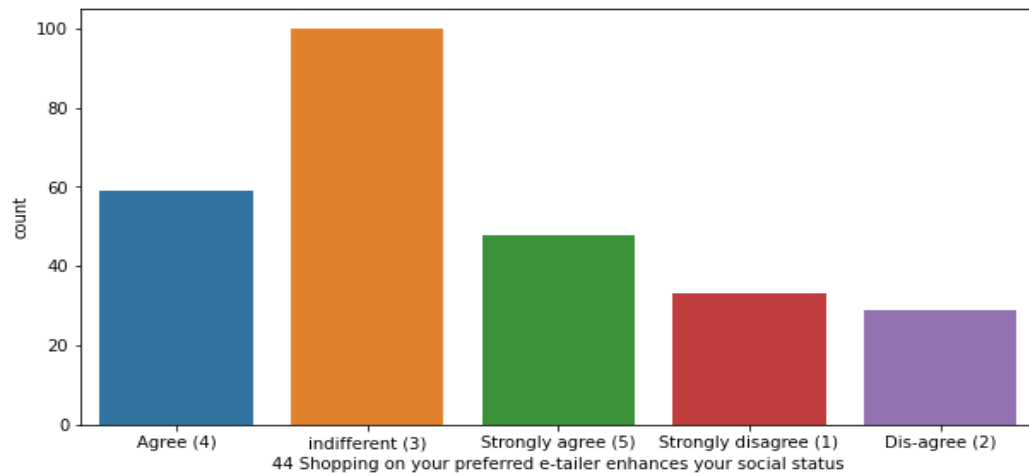
**Column 42 :** This column tells us about the convenience in patronizing the online retailer, maximum number of customers strongly agree with the patronizing the online retailer is important for user satisfaction



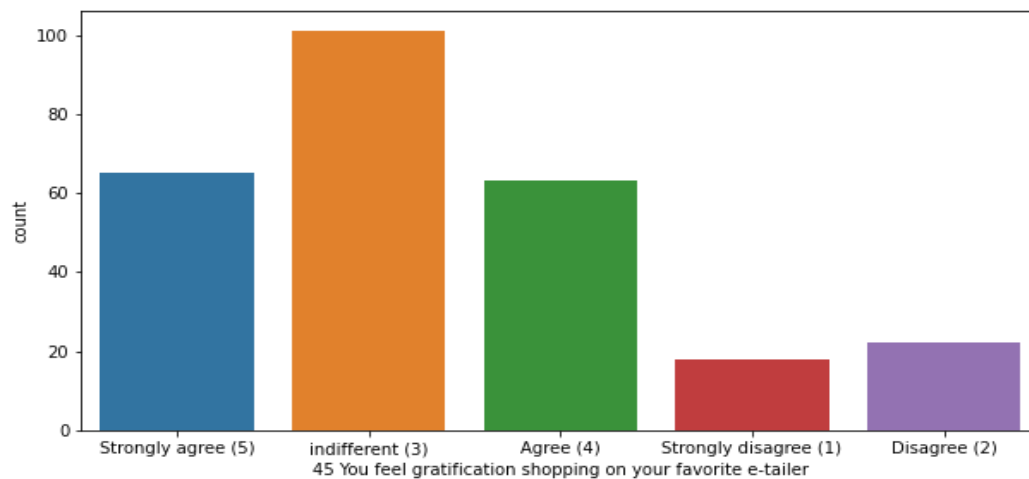
**Column 43 :** This column tells us about how adventurous it is to shop online, maximum number of customers agree that it is adventurous to shop online



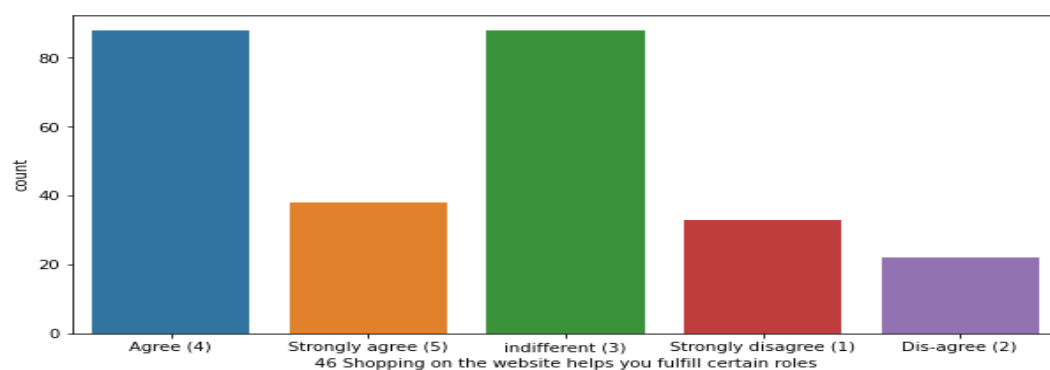
**Column 44 :** This column tells us about if customers social status is enhanced by shopping on preferred e-retail store, maximum number of customers tell that it is indifferent to this aspect



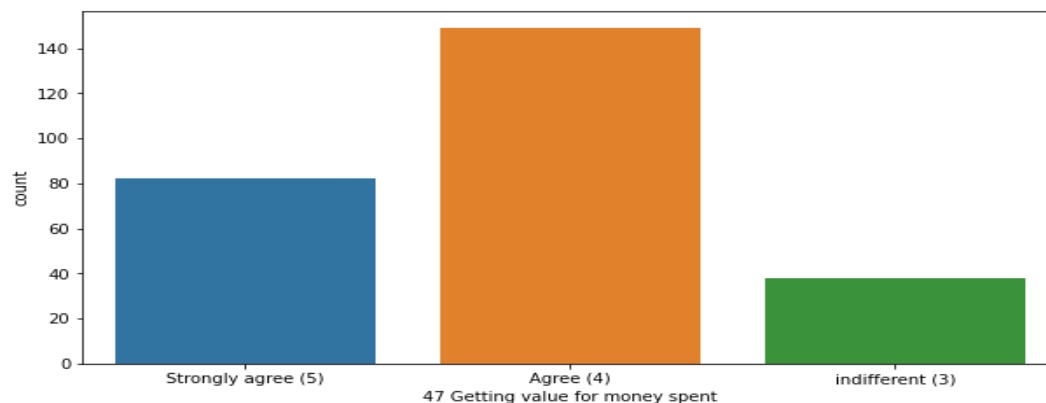
**Column 45 :** This column tells us about whether customer feels gratified by shopping on their preferred e-retail store, maximum customers tell it is indifferent to this aspect



**Column 46 :** This column tells us about whether certain roles are improved in customers by shopping online, maximum number of customers tell that they agree and indifferent with this aspect



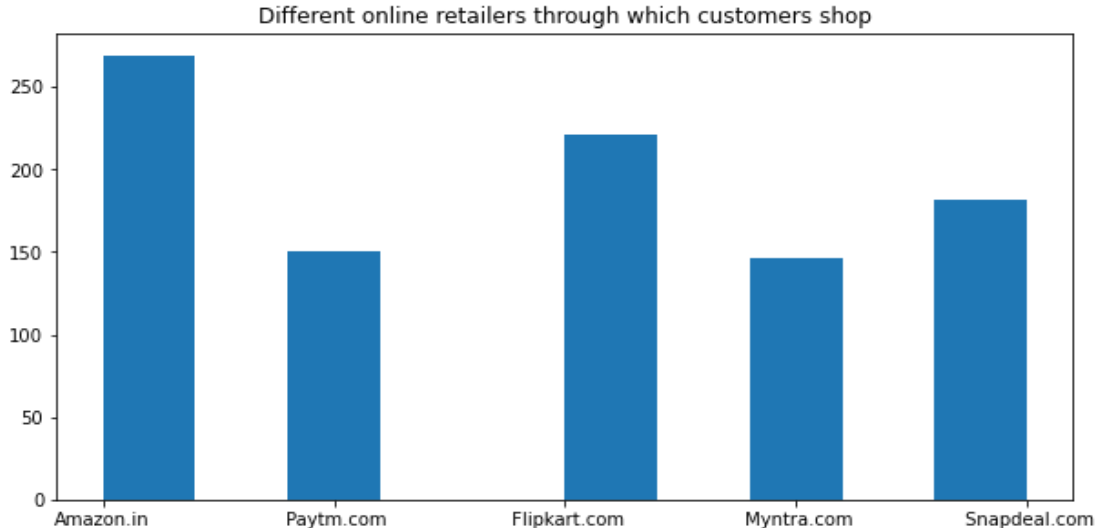
**Column 47 :** This column tells us about whether customers money spent on shopping is valued or not, maximum number of customers strongly agree that their money spent on shopping is valued



## Understanding further 24 columns and what details they explain

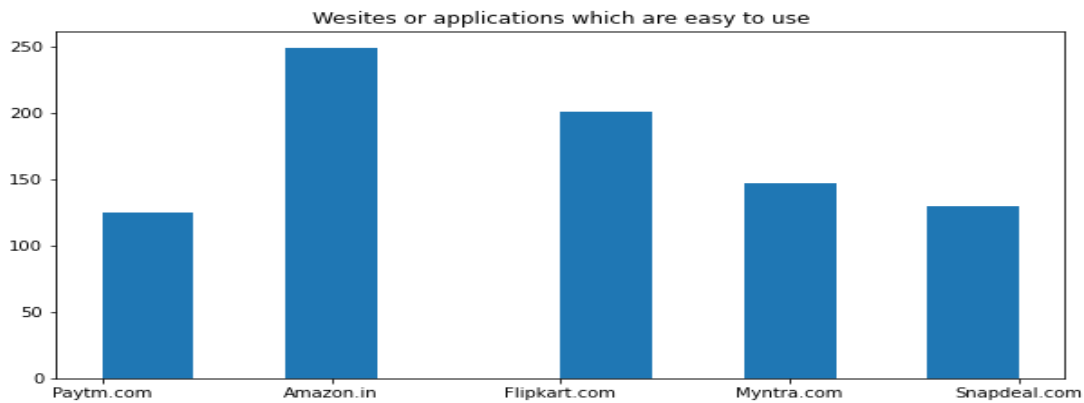
**Column 48 :** The column 'From the following, tick any (or all) of the online retailers you have shop ped from;' tell us details about which online retails customers use for shopping online, and from t he above plot we can observe that most pf the customers shop from Amazon and Flipkart

Counter({'Amazon.in': 269, ' Flipkart.com': 221, ' Snapdeal.com': 182, ' Paytm.com': 150, ' Myntra.com': 146})



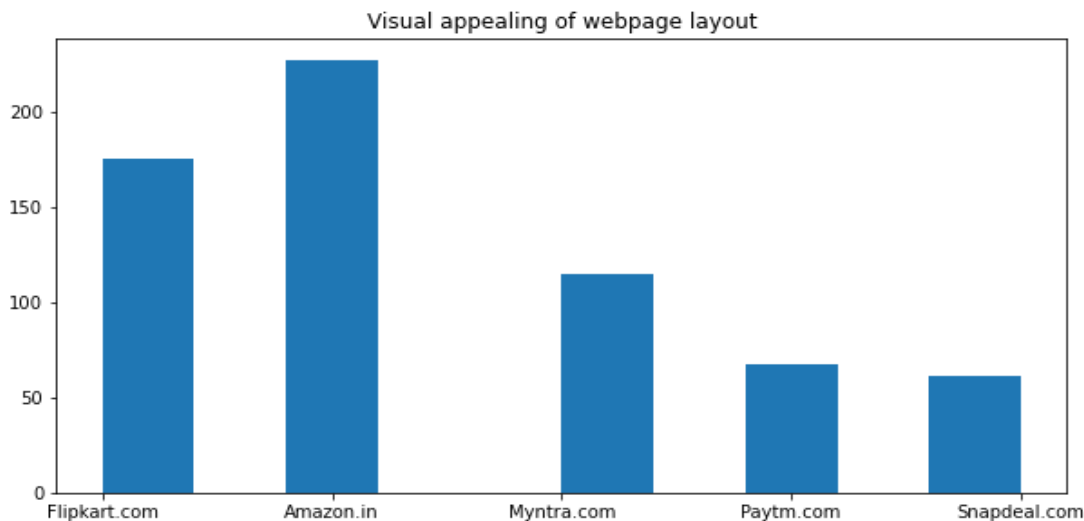
**Column 49 :** The column 'Easy to use website or application' tells us about customers' opinion on which application or website is easy to use, Customers gave maximum vote for amazon and flipkart

Counter({'Amazon.in': 249, ' Flipkart.com': 193, ' Myntra.com': 147, ' Snapdeal.com': 130, ' Paytm.com': 113, 'Paytm.com': 12, 'Flipkart.com': 8})



**Column 50 :** The column 'Visual appealing web-page layout' gives us details about which online shopping site gives us a better visual appearance, from the above plot we can analyse that maximum votes is given for Amazon and least votes are given for Snapdeal.com

Counter({'Amazon.in': 227, ' Flipkart.com': 148, ' Myntra.com': 100, ' Paytm.com': 67, ' Snapdeal.com': 61, 'Flipkart.com': 27, 'Myntra.com': 15})



**Column 51 :** The column 'Wild variety of product on offer' tells us details about which e-retail site gives wide variety of offers on the products, Customers have shared their opinion that Amazon gives the best offers on the products and least voting is given for snapdeal.com

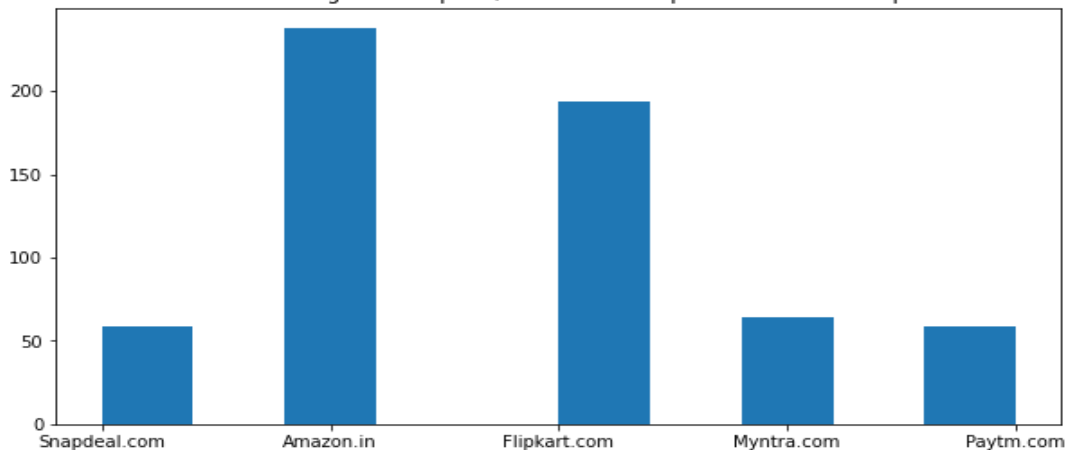
Counter({'Amazon.in': 220, 'Flipkart.com': 184, 'Myntra.com': 64, 'Paytm.com': 20, 'Snapdeal.com': 14})





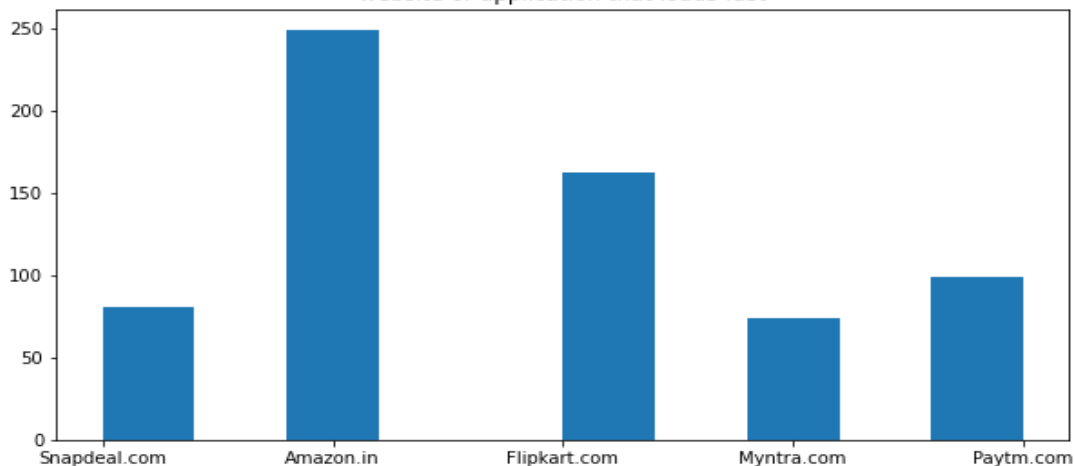
**Column 52 :** The column 'Complete, relevant description information of products' gives us details about which e-retail store gives the complete, relevant description information of products, Maximum number of customers (238) have voted to Amazon.com that they give relevant and complete description information of products and least votes (59) are given for Paytm and snapdeal.com

Counter({'Amazon.in': 238, 'Flipkart.com': 194, 'Myntra.com': 64, 'Snapdeal.com': 59, 'Paytm.com': 59})  
e-retail store that given complete, relevant description information of products



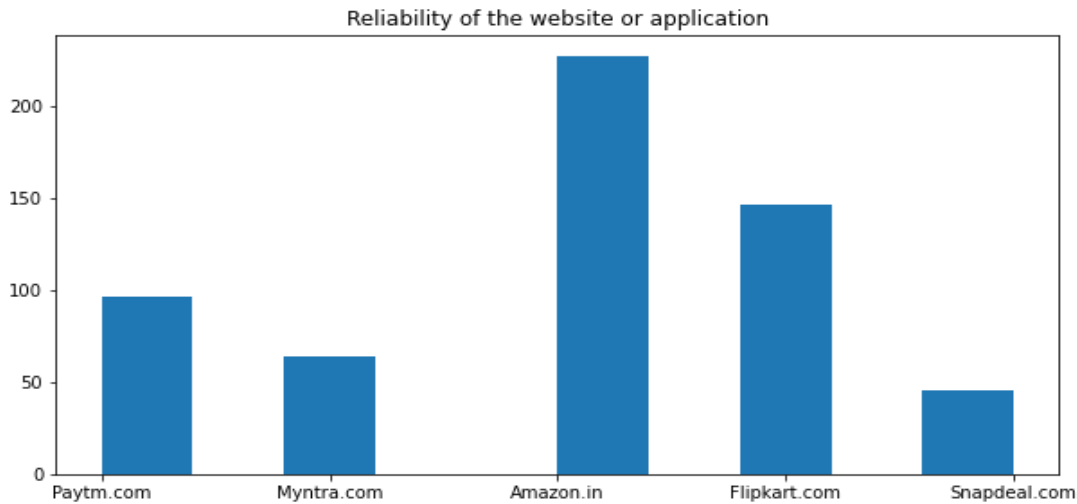
**Column 53 :** The column 'Fast loading website speed of website and application' tells us about which e-retail store's website or application loads or works fast, Customers have given maximum voting for Amazon.com (249) and minimum votes are given for Myntra (74)

Counter({'Amazon.in': 249, 'Flipkart.com': 162, 'Paytm.com': 99, 'Snapdeal.com': 81, 'Myntra.com': 74})  
website or application that loads fast



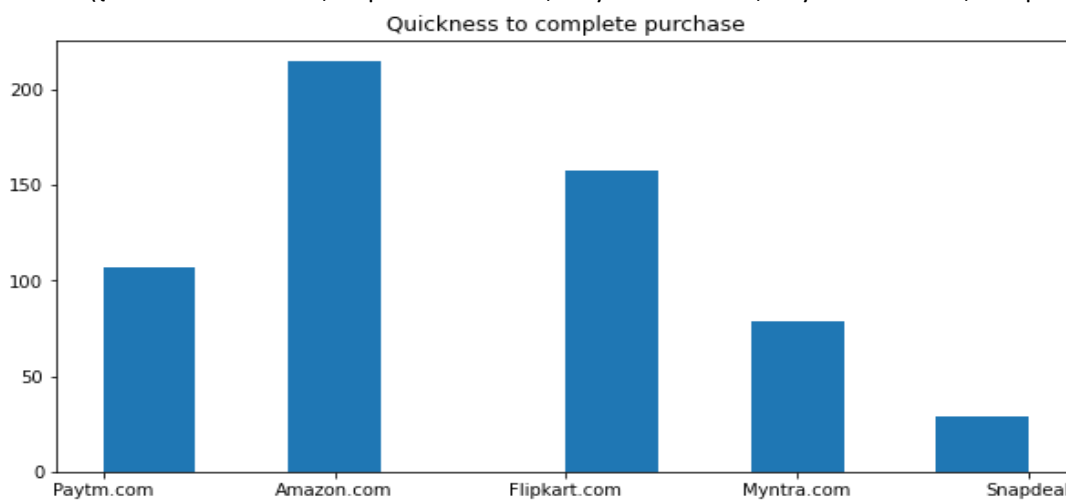
**Column 54 :** The column 'Reliability of the website or application' tells us about which application or website has high reliability, customers have voted that Amazon.com's application or website is highly reliable and least votes are given for Snapdeal.com (45)

Counter({'Amazon.in': 227, 'Flipkart.com': 146, 'Paytm.com': 96, 'Myntra.com': 64, 'Snapdeal.com': 45})



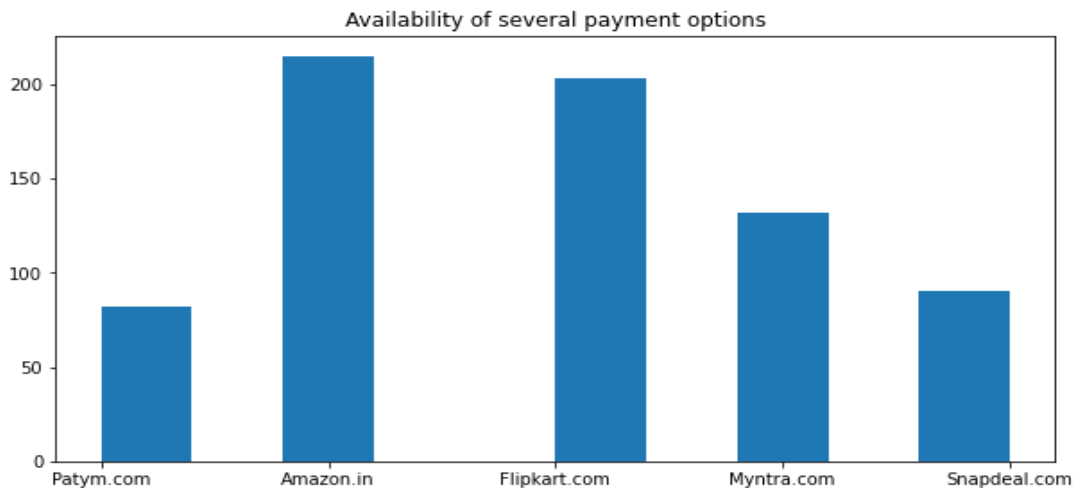
**Column 55 :** The column 'Quickness to complete purchase' tells us about customers voting on Quickness to complete purchase, Maximum number of customers voted that Amazon.com (215) is quick to complete the purchase and minimum voting is given for Snapdeal (29)

Counter({'Amazon.com': 215, 'Flipkart.com': 158, 'Paytm.com': 107, 'Myntra.com': 79, 'Snapdeal': 29})



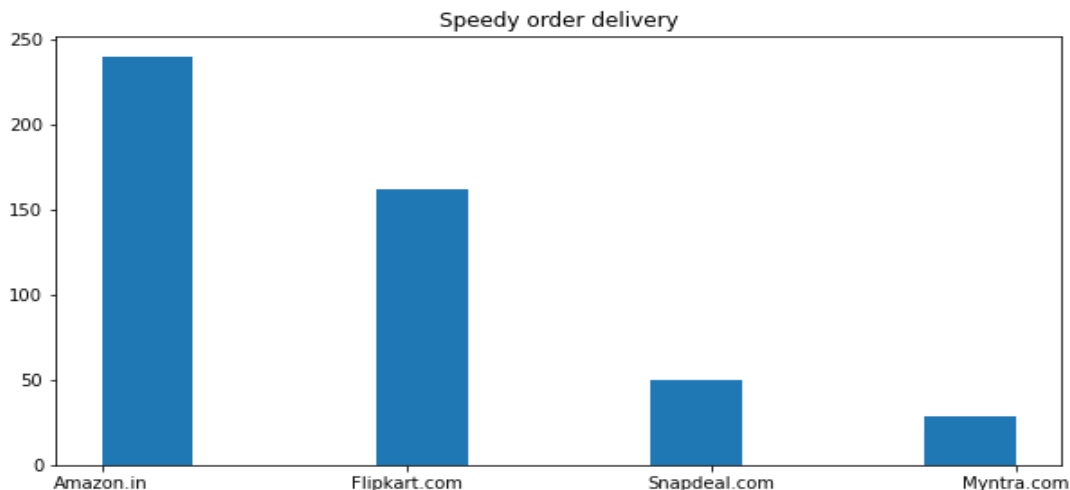
**Column 56 :** The column 'Availability of several payment options' tells us customers opinion on availability of several payment options in e-retail stores, Maximum voting is given for Amazon.com (215) and Flipkart.com (203), Minimum voting is given for Paytm.com (82)

Counter({'Amazon.in': 215, 'Flipkart.com': 203, 'Myntra.com': 132, 'Snapdeal.com': 90, 'Patym.com': 82})



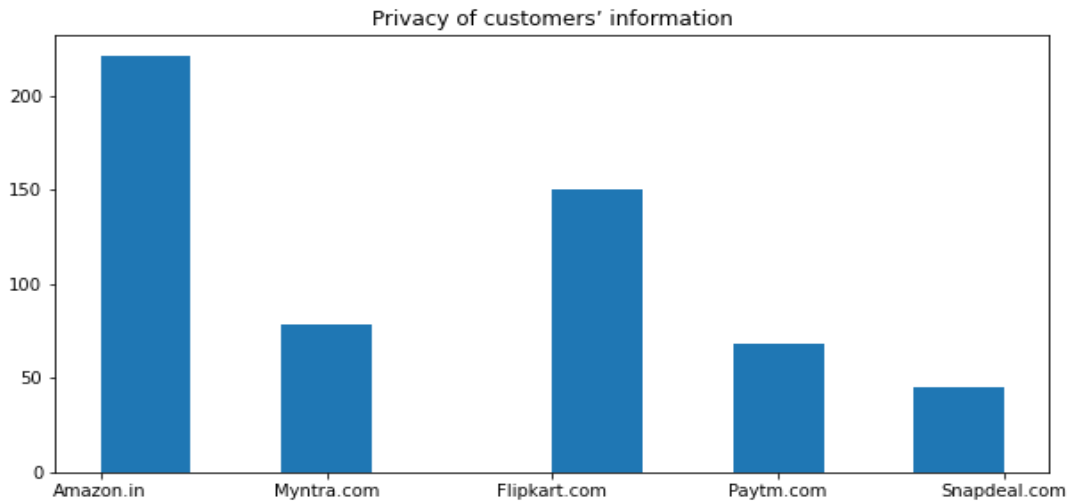
**Column 57 :** The column 'Speedy order delivery' tells us about customers opinion on which e-retail store gives speedy deliver of products, from the above plot we can observe that customers have given maximum voting for Amazon.com (240) that speedy delivery is given and minimum votes are given for Myntra (29)

```
counter({'Amazon.in': 240, 'Flipkart.com': 162, 'Snapdeal.com': 50, 'Myntra.com': 29})
```



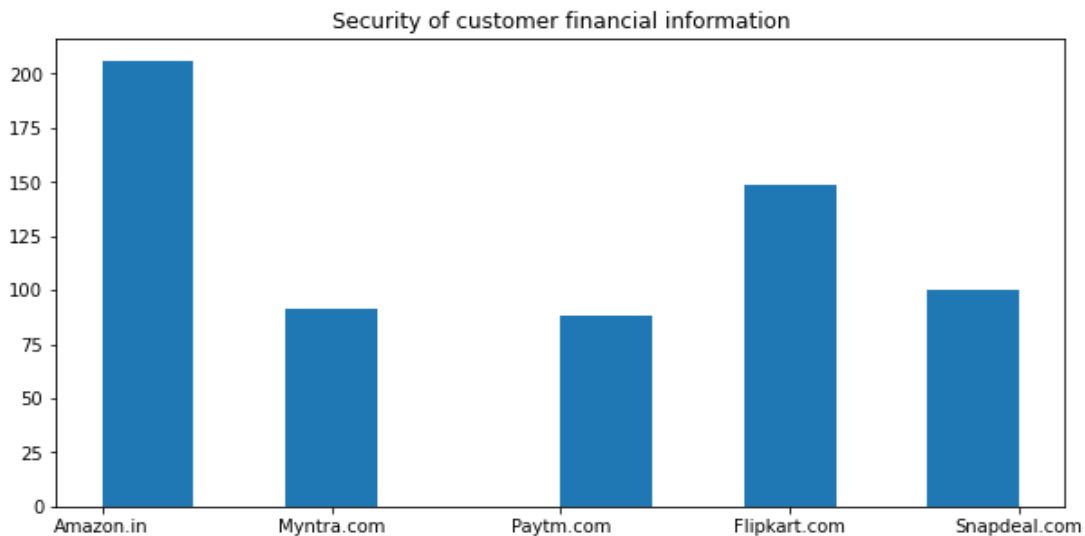
**Column 58 :** The column 'Privacy of customers' information' tells us about customers' opinion on which e-retail store gives strong privacy on customers' information, Maximum customers voted that Amazon.in (221) maintains strong privacy on customers' information, least votes are given for snapdeal.com (45)

```
Counter({'Amazon.in': 221, 'Flipkart.com': 150, 'Myntra.com': 78, 'Paytm.com': 68, 'Snapdeal.com': 45})
```



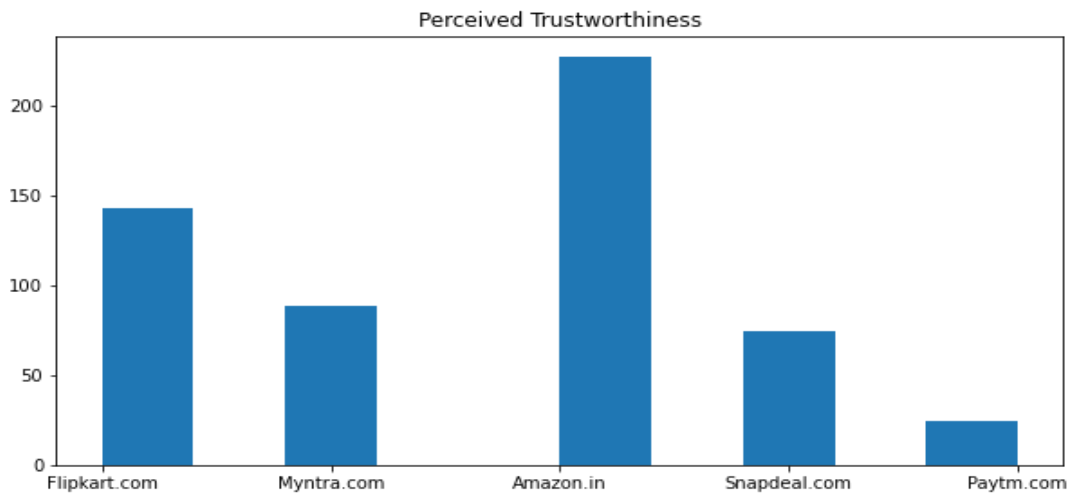
**Column 59 :** The column 'Security of customer financial information' tells us about customers opinion on which application or website gives strong security of customer financial information, from the about plot we can observe that customers voted maximum for Amazon.in (206) that they provide strong security on customers financial information and least voting are given for paytm.com (88)

Counter({'Amazon.in': 206, 'Flipkart.com': 149, 'Snapdeal.com': 100, 'Myntra.com': 91, 'Paytm.com': 88})



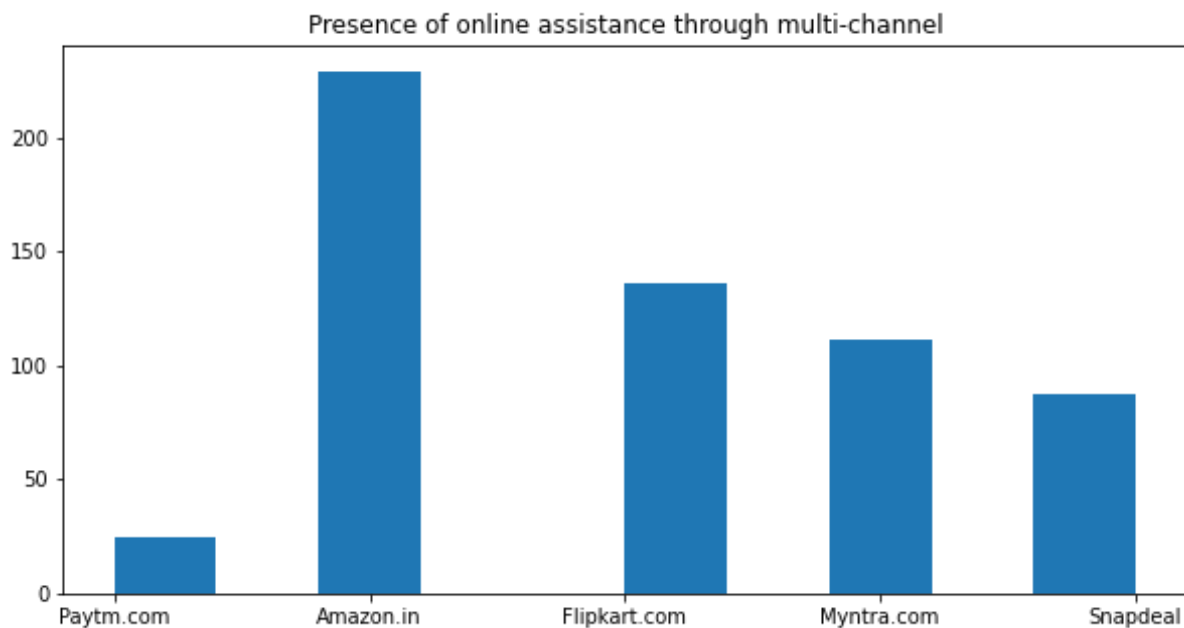
**Column 60 :** The column 'Perceived Trustworthiness' tells us about customers opinion on which e-retail app or website is trustworthy, customers have voted that Amazon.in (227) is trustworthy and least votes are given for paytm.com (24)

Counter({'Amazon.in': 227, 'Flipkart.com': 143, 'Myntra.com': 88, 'Snapdeal.com': 74, 'Paytm.com': 24})



**Column 60 :** The column 'Presence of online assistance through multi-channel' tells us about which app or website has the better presence of online assistance through multi-channel, customers voted that better presence of online assistance through multi-channel is given by Amazon.in (229) and least votes are given for Paytm.com (25)

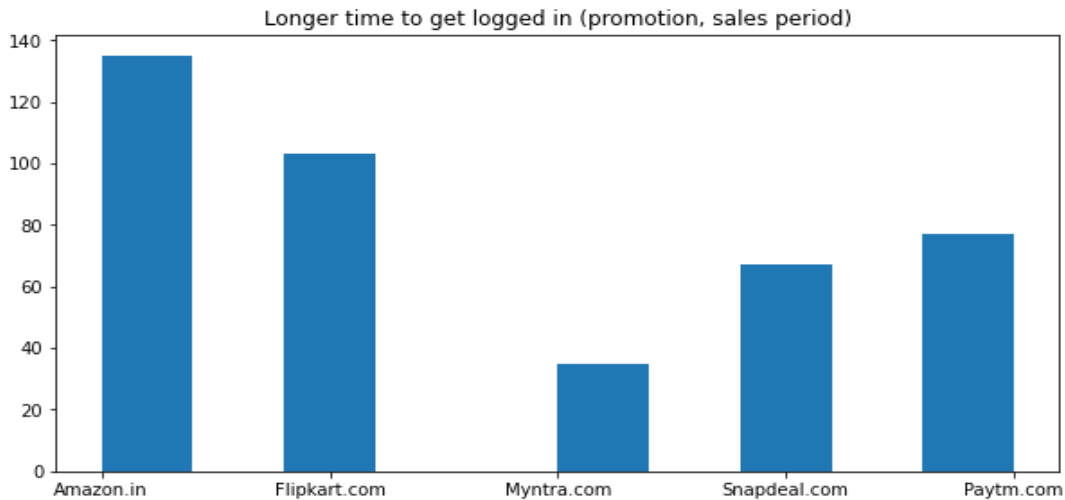
Counter({'Amazon.in': 229, 'Flipkart.com': 136, 'Myntra.com': 111, 'Snapdeal': 87, 'Paytm.com': 25})



## The upcoming columns is to discuss about the negative characteristics of the e-retail store's website or Application

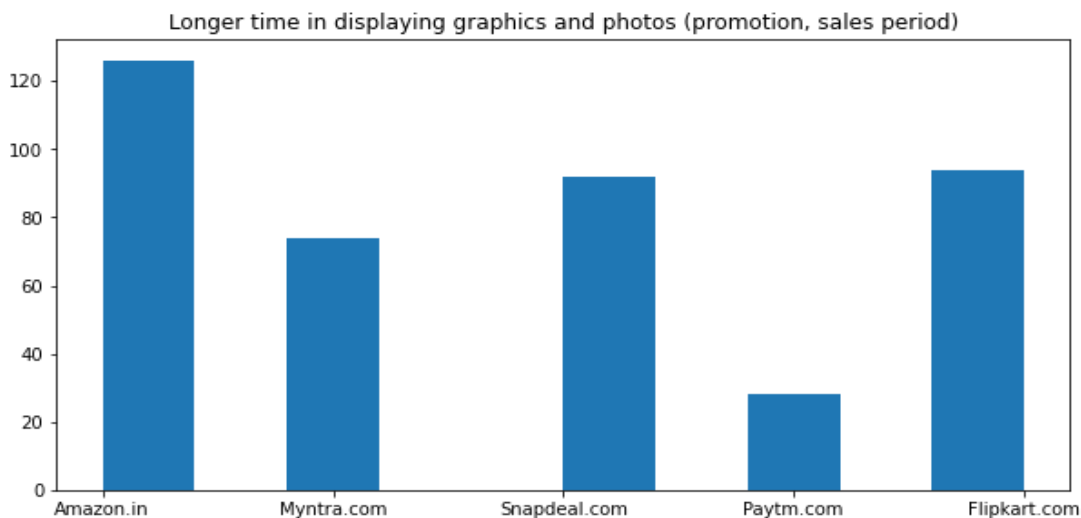
**Column 61 :** The column 'Longer time to get logged in (promotion, sales period)' tells us about customers opinion on which e-retails' app or website takes longer time to get logged in, Customers have voted that Amazon.in (135) takes longer time to login due to promotions, sales period etc. least votes are given for Myntra.com (35)

Counter({'Amazon.in': 135, 'Flipkart.com': 103, 'Paytm.com': 77, 'Snapdeal.com': 67, 'Myntra.com': 35})



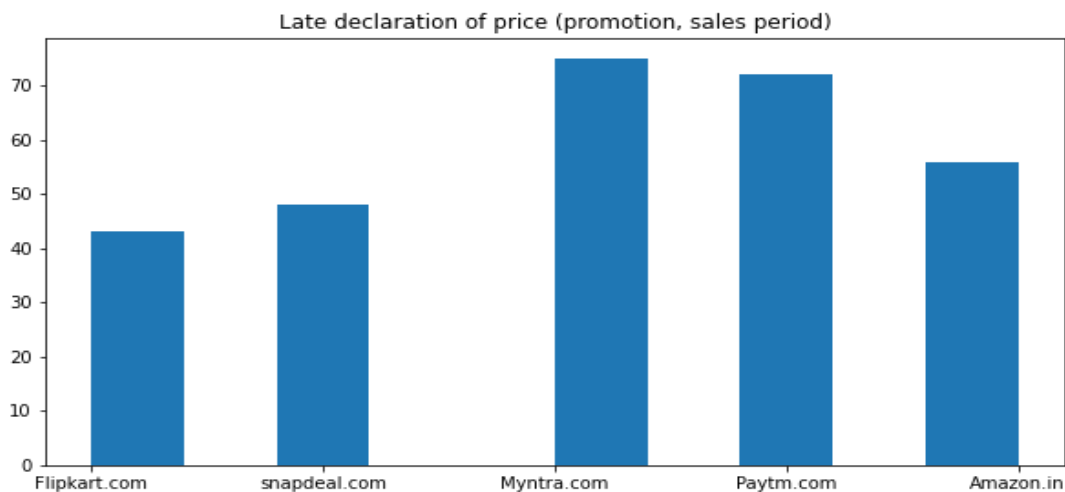
**Column 62 :** The column 'Longer time in displaying graphics and photos (promotion, sales period)' tells us about opinion of customers on which app or website takes longer time to display the graphics and photos, From the above plot we can observe that maximum number of customers have voted that Amazon.in (126) takes longer time to display the graphics and photos, next stands Flipkart.com (94) and Snapdeal.com (92), the least votes are given for Paytm.com(28)

Counter({'Amazon.in': 126, 'Flipkart.com': 94, 'Snapdeal.com': 92, 'Myntra.com': 74, 'Paytm.com': 28})



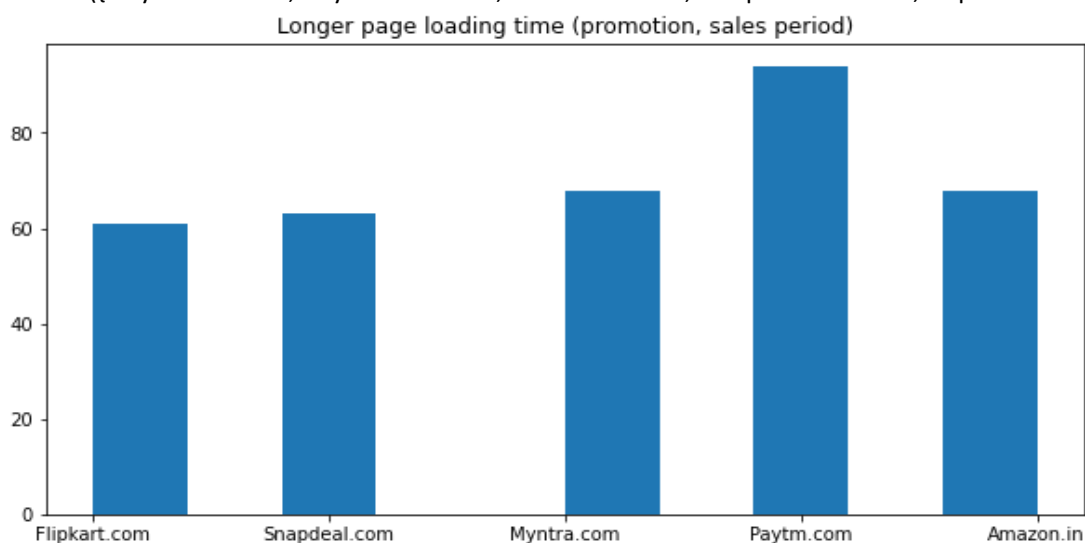
**Column 63 :** The column 'Late declaration of price (promotion, sales period)' tells us about customers opinion on which r-retail's app or website declares the price lately, customers have voted that Myntra.com (75) delays in declaring the price, least votes are given for Flipkart.com (43).

Counter({'Myntra.com': 75, 'Paytm.com': 72, 'Amazon.in': 56, 'snapdeal.com': 48, 'Flipkart.com': 43})



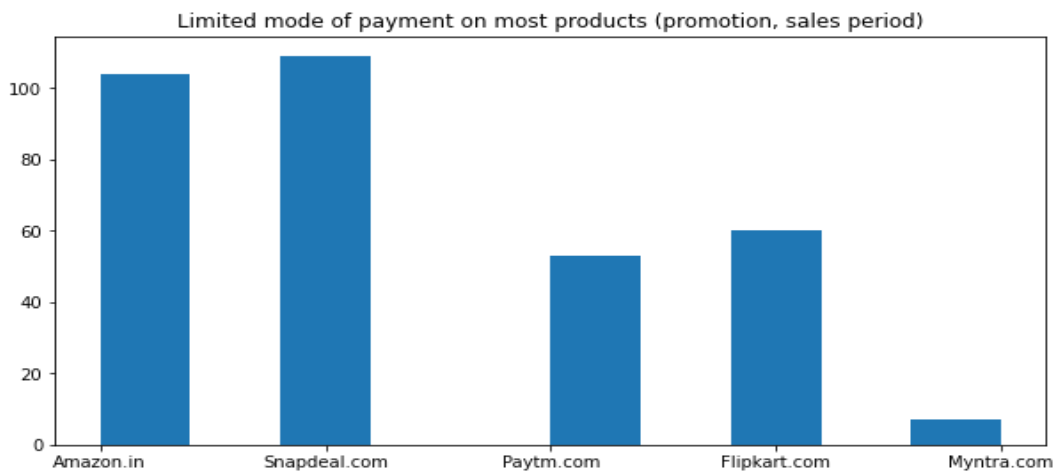
**Column 64 :** The column 'Longer page loading time (promotion, sales period)' tells us about customers opinion on which app or website takes longer time for loading the page, from the above plot we can observe that maximum customers have voted for Paytm.com (94) that it takes longer time to load the page, the votes are almost evenly distributed for Myntra, Amazon, Snapdeal and Flipkart

Counter({'Paytm.com': 94, 'Myntra.com': 68, 'Amazon.in': 68, 'Snapdeal.com': 63, 'Flipkart.com': 61})



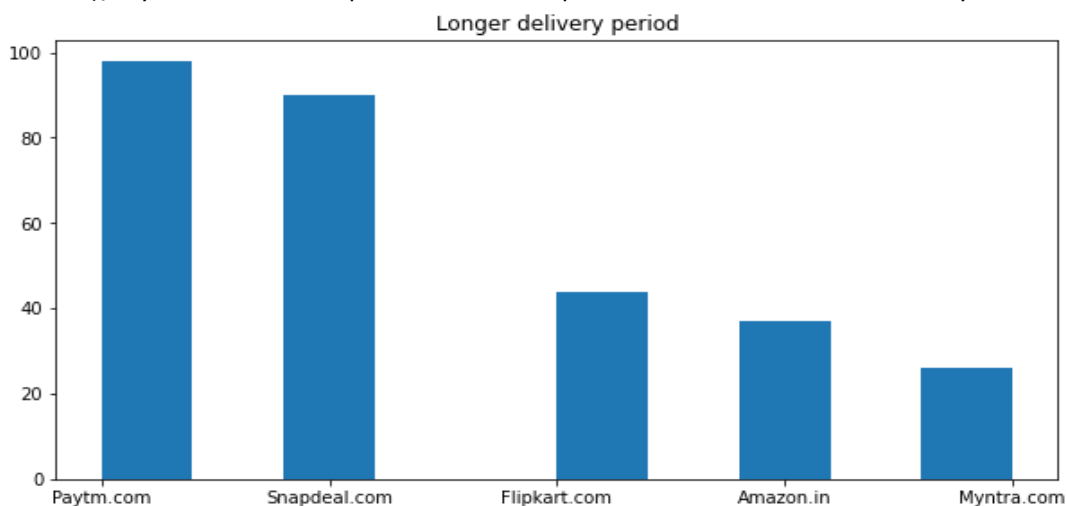
**Column 65 :** The column 'Limited mode of payment on most products (promotion, sales period)' tells us about customers opinion on which app or website gives limited mode of payment on most of the products, from the plot about we can observe that most of the customers say that snapdeal.com (109) gives limited mode of payment on most of the products, Amzon.in stand almost near by with 104 votes, Myntra.com get the least votes in this aspect

Counter({'Snapdeal.com': 109, 'Amazon.in': 104, 'Flipkart.com': 60, 'Paytm.com': 53, 'Myntra.com': 7})



**Column 66 :** The column 'Longer delivery period' tells us about according to customers who takes a longer time to deliver the products, from the above plot we can observe that most of the customers have voted to paytm.com (98) that they take more time to deliver the product compared to others, least votes are given for Myntra.com (26)

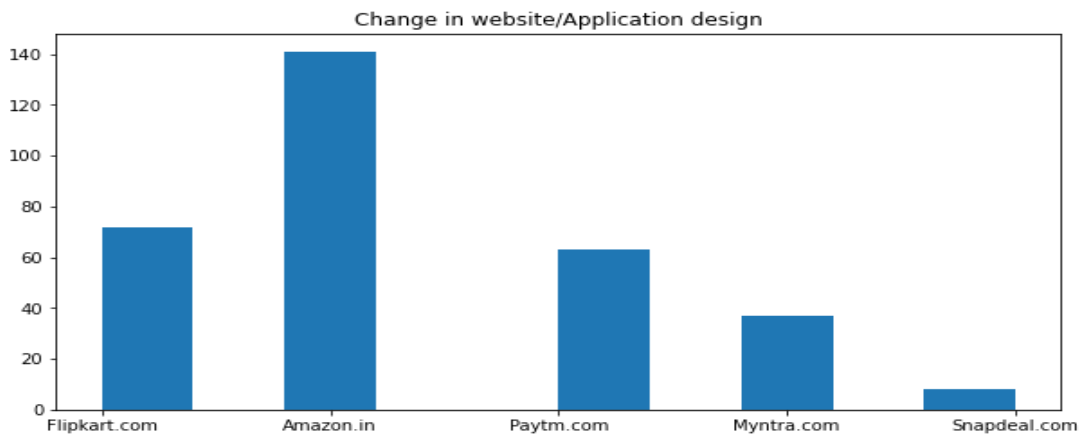
Counter({'Paytm.com': 98, 'Snapdeal.com': 90, 'Flipkart.com': 44, 'Amazon.in': 37, 'Myntra.com': 26})



**Column 67 :** The column 'Change in website/Application design' tells us about which e-retail store does changes in websites/Application frequently, from the above plot we can observe that customers have voted that Amzon.in (141) makes changes in website/Application designs frequently, least votes are given for Snapdeal.com (8)

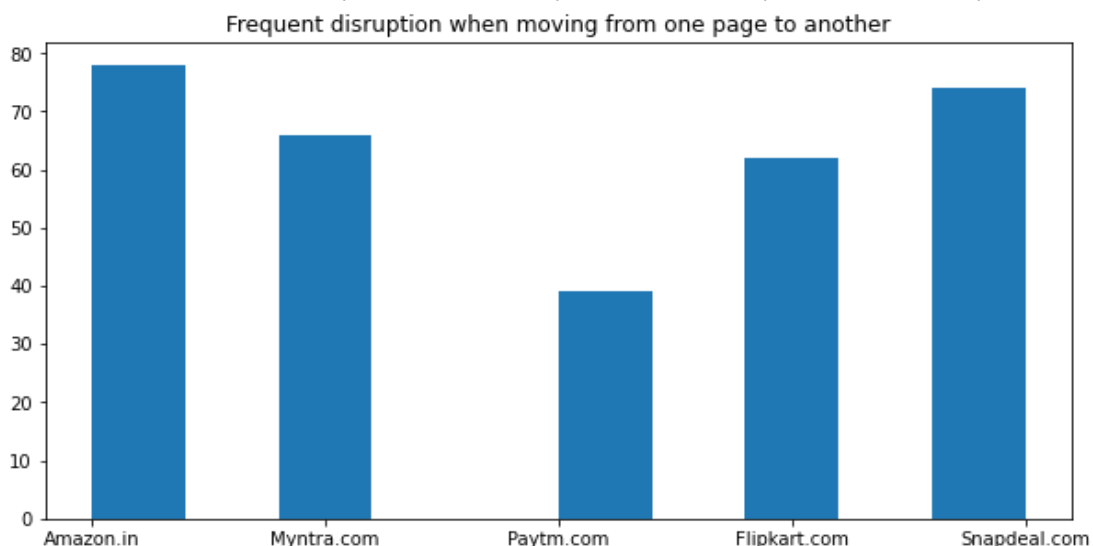
Counter({'Amazon.in': 141, 'Flipkart.com': 72, 'Paytm.com': 63, 'Myntra.com': 37, 'Snapdeal.com': 8})





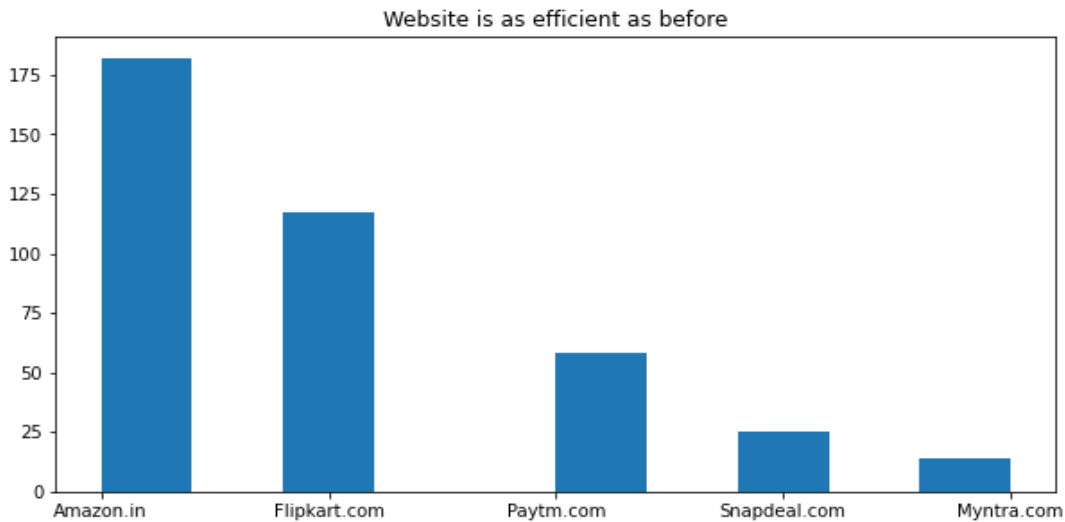
**Column 68 :** The column 'Frequent disruption when moving from one page to another' tells us about according to customers which App or website creates disruptions frequently while moving from one page to another, from the above plot we can observe that customers have given almost equal votes to Amzon.in (78) and Snapdeal.com (74) that they create frequent disruptions while moving from one page to another, least votes are given for Paytem.com (39)

Counter({'Amazon.in': 78, 'Snapdeal.com': 74, 'Myntra.com': 66, 'Flipkart.com': 62, 'Paytm.com': 39})



**Column 69 :** The column 'Website is as efficient as before' tells us about according to customers which website is working efficiently as it was before, from the above plot we can observe that customers gave maximum votes to Amazon.in (182) that it works efficiently as before and least votes are given to Myntra (14)

Counter({'Amazon.in': 182, 'Flipkart.com': 117, 'Paytm.com': 58, 'Snapdeal.com': 25, 'Myntra.com': 14})



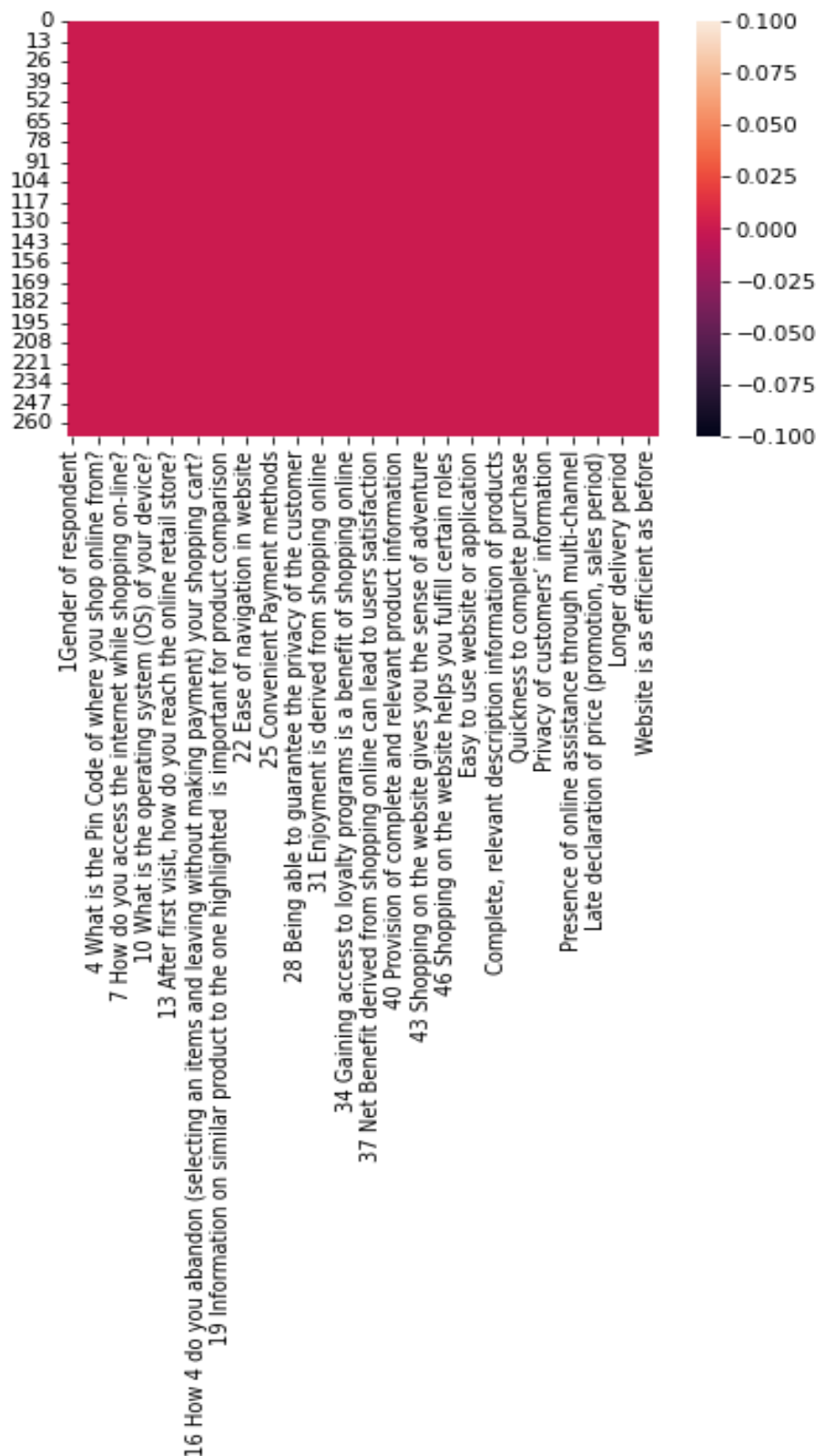
**Column 70 :** The column 'Which of the Indian online retailer would you recommend to a friend?' tells us about which online retailer customer would recommend to their friends, Maximum number of customers are telling that they would recommend Amazon.in (219) to their friends and least votes are given to Snapdeal.com (11)

Counter({'Amazon.in': 219, 'Flipkart.com': 127, 'Myntra.com': 76, 'Paytm.com': 44, 'snapdeal.com': 11})



## We can do further EDA considering Coded data

Checking for missing values in the data :

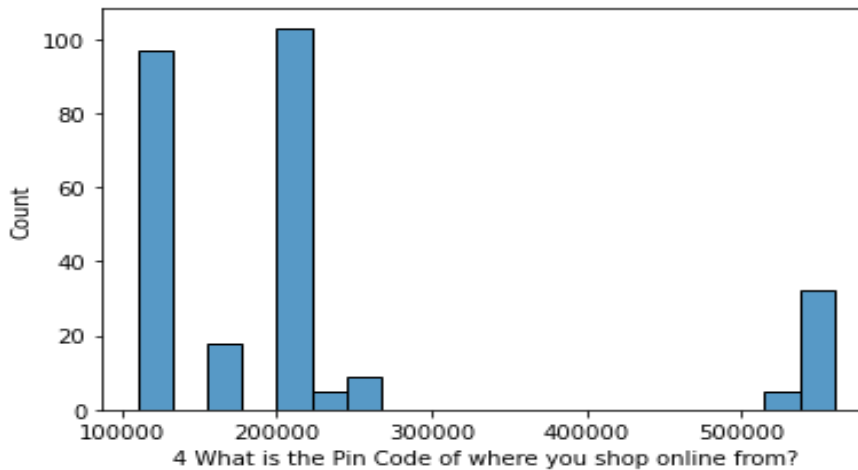


From the above plot we can observe that there are no missing values in the dataset.

**Discussing on details description on the data :**

**Key Observations :**

1. We can see that mean is greater than median (50th percentile) in the columns
  - 4 What is the Pin Code of where you shop online from?
  - 8 Which device do you use to access the online shopping?
  - 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?
  - 15 What is your preferred payment Option?
  - 17 Why did you abandon the “Bag”, “Shopping Cart”? Hence right skewness is present in these columns, The same we can observe from the below data as well

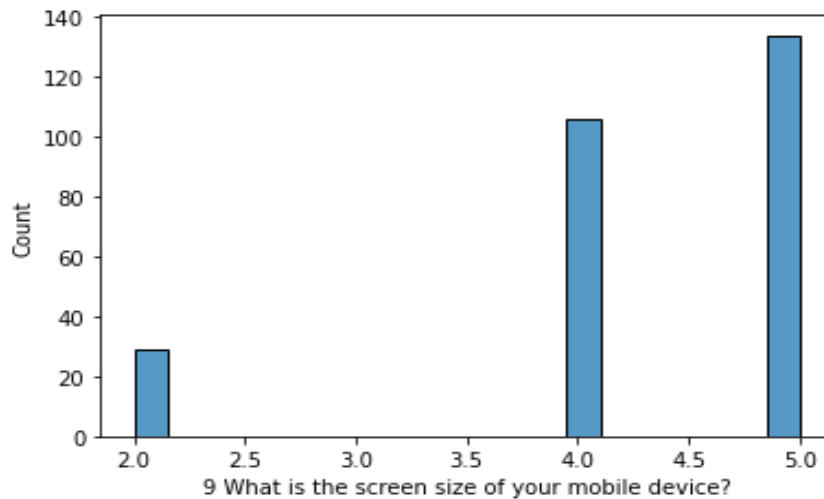


We can observe that mean is less than median (50th percentile) in the columns

- 1 Gender of respondent
- 5 Since How Long You are Shopping Online ?
- 9 What is the screen size of your mobile device?
- 14 How much time do you explore the e- retail store before making a purchase decision?
- 18 The content on the website must be easy to read and understand
- 19 Information on similar product to the one highlighted is important for product comparison
- 20 Complete information on listed seller and product being offered is important for purchase decision.
- 21 All relevant information on listed products must be stated clearly
- 22 Ease of navigation in website
- 23 Loading and processing speed
- 24 User friendly Interface of the website
- 25 Convenient Payment methods
- 26 Trust that the online retail store will fulfill its part of the transaction at the stipulated time
- 27 Empathy (readiness to assist with queries) towards the customers
- 28 Being able to guarantee the privacy of the customer
- 29 Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
- 30 Online shopping gives monetary benefit and discounts
- 31 Enjoyment is derived from shopping online
- 32 Shopping online is convenient and flexible
- 33 Return and replacement policy of the e-tailer is important for purchase decision
- 34 Gaining access to loyalty programs is a benefit of shopping online
- 35 Displaying quality Information on the website improves satisfaction of customers
- 36 User derive satisfaction while shopping on a good quality website or application
- 37 Net Benefit derived from shopping online can lead to users satisfaction
- 38 User satisfaction cannot exist without trust

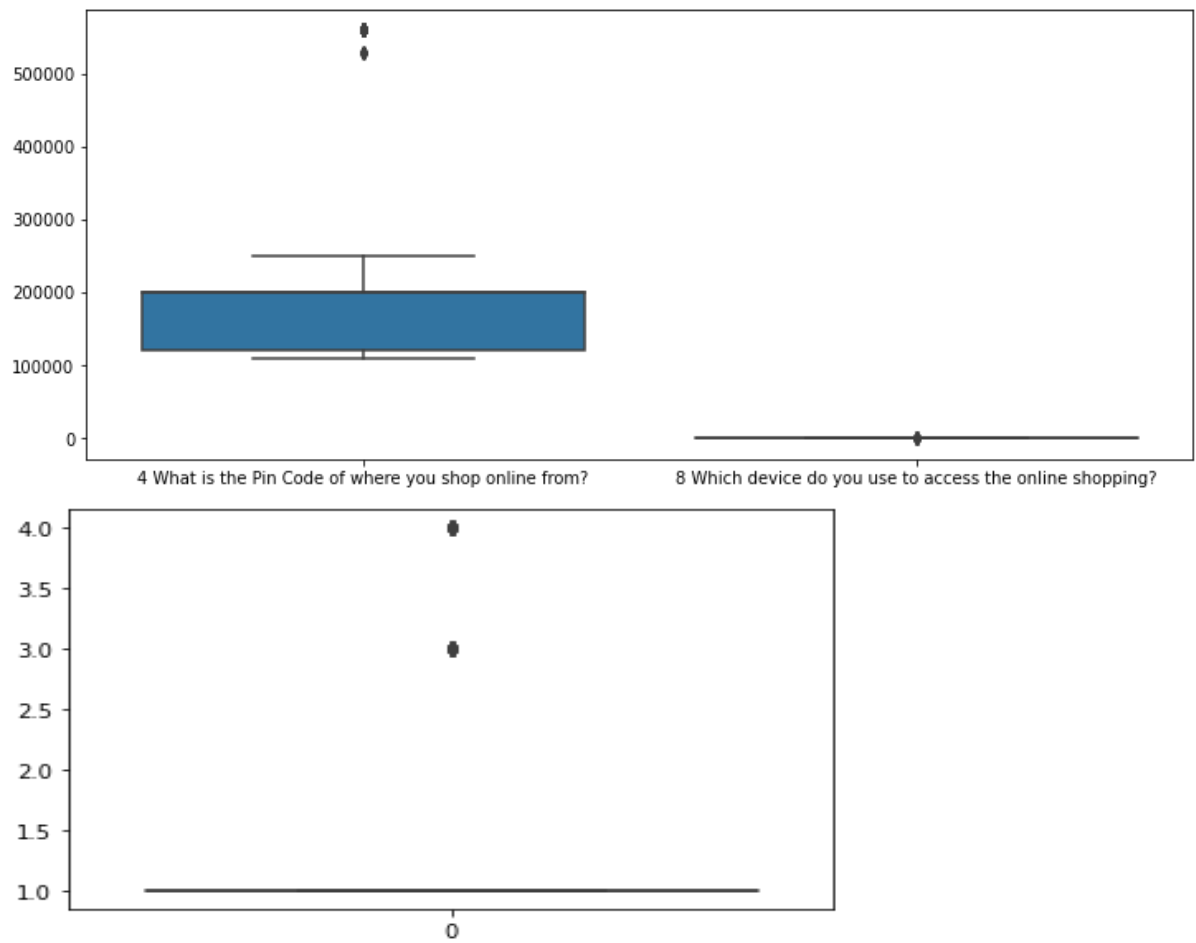
- 39 Offering a wide variety of listed product in several category
- 40 Provision of complete and relevant product information
- 41 Monetary savings
- 46 Shopping on the website helps you fulfill certain roles

Hence we there is left skewness present in these respective columns

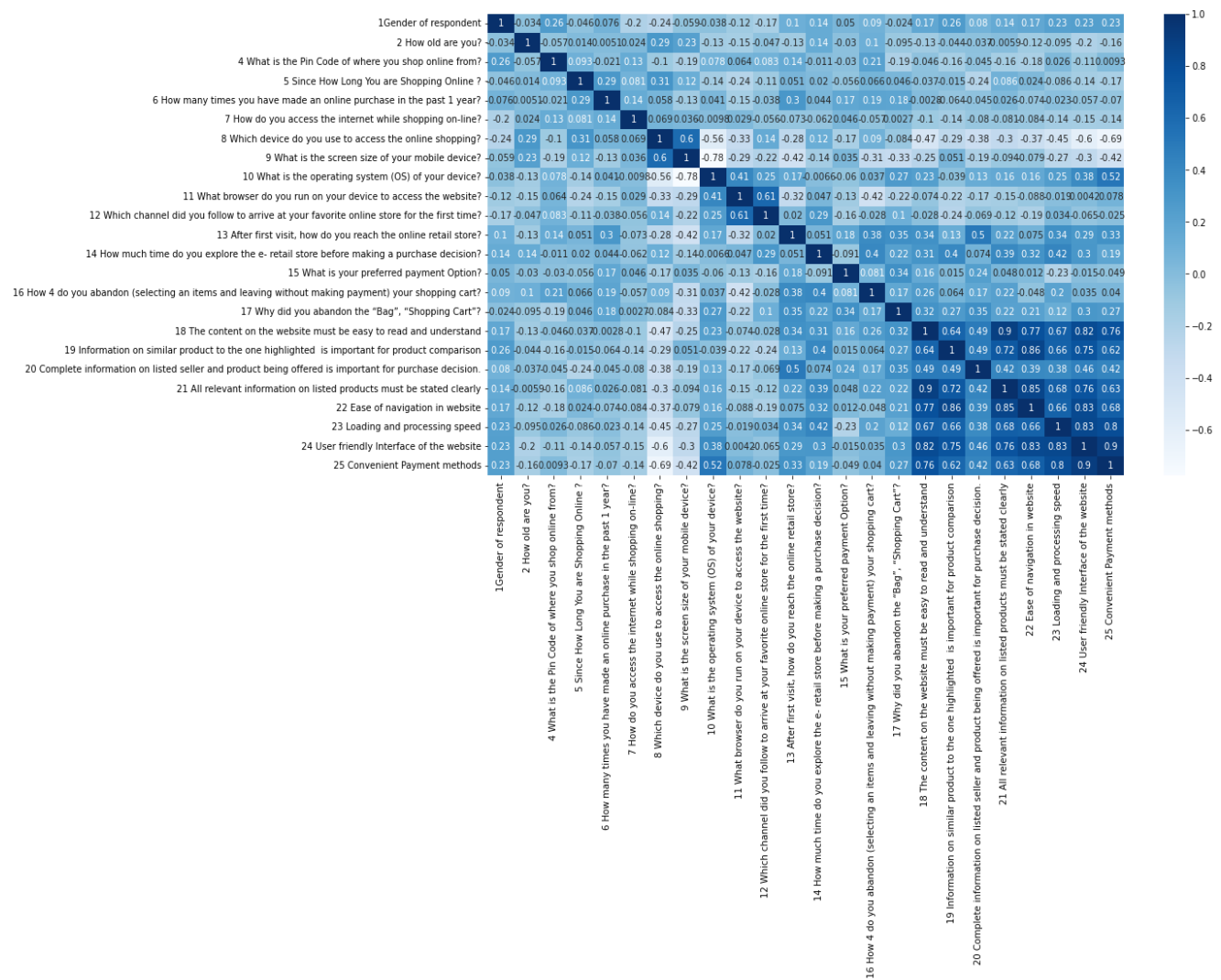


2. We can observe that there is a huge gap between 75th percentile and max in the columns
  - 4 What is the Pin Code of where you shop online from?
  - 8 Which device do you use to access the online shopping?
  - 11 What browser do you run on your device to access the website?
  - 12 Which channel did you follow to arrive at your favorite online store for the first time?
  - 16 How 4 do you abandon (selecting an items and leaving without making payment) your shopping cart?

Hence there are outliers present in those columns data, the same we can observe from the below plots as well

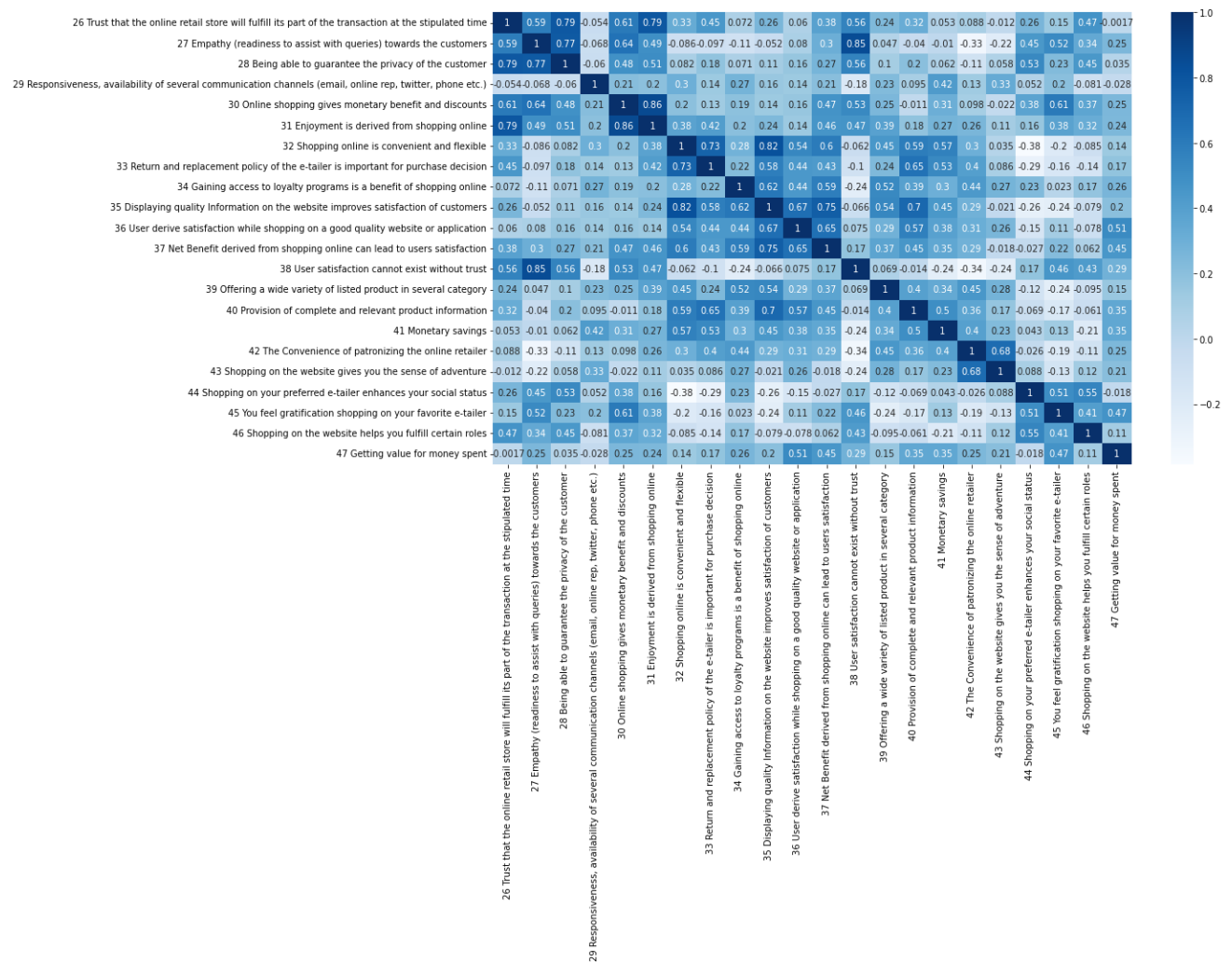


**Checking for Correlation of columns by plotting correlation heat map :**



From the above heat map we can observe that :

- 'Convenient payment method' has a good correlation with 'user friendly interface of the website', 'Loading and processing speed' and 'The content on the website must be easy to read and understand'
- '21 All relevant information on listed products must be stated clearly' has good correlation with '18 The content on the website must be easy to read and understand'



From the above heatmap we can observe that :

- '28 Being able to guarantee the privacy of the customer' has good correlation with '26 Trust that the online retail store will fulfil its part of the transaction at the stipulated time' and '27 Empathy (readiness to assist with queries) towards the customers'
- '27 Empathy (readiness to assist with queries) towards the customers' has a good correlation with '38 User satisfaction cannot exist without trust'

## Conclusion :

- From the graphs we have plotted in the file we can observe that we have 3 different categories of data.

First set of data gives clarity on customers' device and the mode of operations they use in case of online shopping.

Second set of data gives clarity on customers' view on why the parameter is been implemented in the app or website

Thirst set of data gives us details about e-retails stores operations and which app or site operates well according to them, it also tells us about which app e-retails store gives wide range of collections, offers, monetary rewards, speedy delivery, assistance on any



issues. This also includes data on some negative aspects which app or website take longer time to load the pages, visual display, adds on more promotions etc.

2. From all things mentioned above we can observe that Amazon.com stands as top performer and next stands Flipkart. Least votes are given by the customers to Myntra, Paytm and Snapdeal.
3. Over all Customers are happy to recommend Amzon.in to their friends to shop online.