In [1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px

import warnings
warnings.filterwarnings("ignore")
```

In [2]:
```
#Setting the display for our graph display

sns.set_style('darkgrid')
plt.rcParams['font.size'] = 15
plt.rcParams ['figure.figsize'] = (10, 7)
plt.rcParams ['figure.facecolor'] = '#FFE5B4'
```

In [3]:
```
df=pd.read_excel("customer_retention_dataset.xlsx")
df
```

Out[3]:

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	4 What is the Pin Code of where you shop online from?	5 Since How Long You are Shopping Online ?	6 How many times you have made an online purchase in the past 1 year?	7 How do you access the internet while shopping on-line?	8 Which device do you use to access the online shopping?	9 What is the screen size of your mobile device? \t\t\t\t\t\t	10 What is operat system (OS your devi \t\t
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window/wind Mo
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	Wi-Fi	Smartphone	4.7 inches	IOS/I
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobile Internet	Smartphone	5.5 inches	Andı
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	IOS/I
4	Female	21-30 years	Bangalore	530068	2-3 years	11-20 times	Wi-Fi	Smartphone	4.7 inches	IOS/I
...	...	...	...	...	...	...	...	...	...	
264	Female	21-30 years	Solan	173212	1-2 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	Andı
265	Female	31-40 years	Ghaziabad	201008	1-2 years	31-40 times	Mobile Internet	Smartphone	Others	Andı
266	Female	41-50 yaers	Bangalore	560010	2-3 years	Less than 10 times	Mobile internet	Laptop	Others	Window/wind Mo

267	Female	Less than 20 years	Solan	173229	2-3 years	Less than 10 times	Wi-Fi	Smartphone	5.5 inches		Andı
268	Female	41-50 yaers	Ghaziabad	201009	2-3 years	31-40 times	Mobile Internet	Smartphone	5.5 inches		Andı

269 rows × 71 columns

In [4]:
```
pd.set_option('display.max_columns',None) #  This will enable us to see truncated column
df.head()
```

Out[4]:

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	4 What is the Pin Code of where you shop online from?	5 Since How Long You are Shopping Online ?	6 How many times you have made an online purchase in the past 1 year?	7 How do you access the internet while shopping on-line?	8 Which device do you use to access the online shopping?	9 What is the screen size of your mobile device? \t\t\t\t\t\t	10 What is the operating system (OS) of your device? \t\t\t\
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window/windows Mobile
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	Wi-Fi	Smartphone	4.7 inches	IOS/Mac
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobile Internet	Smartphone	5.5 inches	Androic
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	IOS/Mac
4	Female	21-30 years	Bangalore	530068	2-3 years	11-20 times	Wi-Fi	Smartphone	4.7 inches	IOS/Mac

In [5]:
```
df.columns
```

Out[5]:
```
Index(['1Gender of respondent', '2 How old are you? ',
       '3 Which city do you shop online from?',
       '4 What is the Pin Code of where you shop online from?',
       '5 Since How Long You are Shopping Online ?',
       '6 How many times you have made an online purchase in the past 1 year?',
       '7 How do you access the internet while shopping on-line?',
       '8 Which device do you use to access the online shopping?',
       '9 What is the screen size of your mobile device?\t\t\t\t\t\t
                  ',
```

```
       '10 What is the operating system (OS) of your device?\t\t\t\t
                        ',
       '11 What browser do you run on your device to access the website?\t\t\t
                                                ',
       '12 Which channel did you follow to arrive at your favorite online store for the
first time?                                                                    ',
       '13 After first visit, how do you reach the online retail store?\t\t\t\t
                                             ',
       '14 How much time do you explore the e- retail store before making a purchase dec
ision?                                                                         ',
       '15 What is your preferred payment Option?\t\t\t\t\t

          ',
       '16 How frequently do you abandon (selecting an items and leaving without making
payment) your shopping cart?\t\t\t\t\t\t\t
     ',
       '17 Why did you abandon the "Bag", "Shopping Cart"?\t\t\t\t\t

                                              ',
       '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 produ
ct 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 a
t 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 decis
ion',
       '34 Gaining access to loyalty programs is a benefit of shopping online',
       '35 Displaying quality Information on the website improves satisfaction of custom
ers',
       '36 User derive satisfaction while shopping on a good quality website or applicat
ion',
       '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',
       '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',
       'From the following, tick any (or all) of the online retailers you have shopped f
rom;                                                                           ',
       'Easy to use website or application',
       'Visual appealing web-page layout', 'Wild variety of product on offer',
       'Complete, relevant description information of products',
       'Fast loading website speed of website and application',
       'Reliability of the website or application',
       'Quickness to complete purchase',
       'Availability of several payment options', 'Speedy order delivery ',
       'Privacy of customers' information',
       'Security of customer financial information',
```

```
       'Perceived Trustworthiness',
       'Presence of online assistance through multi-channel',
       'Longer time to get logged in (promotion, sales period)',
       'Longer time in displaying graphics and photos (promotion, sales period)',
       'Late declaration of price (promotion, sales period)',
       'Longer page loading time (promotion, sales period)',
       'Limited mode of payment on most products (promotion, sales period)',
       'Longer delivery period', 'Change in website/Application design',
       'Frequent disruption when moving from one page to another',
       'Website is as efficient as before',
       'Which of the Indian online retailer would you recommend to a friend?'],
      dtype='object')
```

In [6]:
```
# Data information
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 269 entries, 0 to 268
Data columns (total 71 columns):
 #   Column

                                     Non-Null Count  Dtype
---  ------

                                     --------------  -----
 0   1Gender of respondent

                                     269 non-null    object
 1   2 How old are you?

                                     269 non-null    object
 2   3 Which city do you shop online from?

                                     269 non-null    object
 3   4 What is the Pin Code of where you shop online from?

                                     269 non-null    int64
 4   5 Since How Long You are Shopping Online ?

                                     269 non-null    object
 5   6 How many times you have made an online purchase in the past 1 year?

                                     269 non-null    object
 6   7 How do you access the internet while shopping on-line?

                                     269 non-null    object
 7   8 Which device do you use to access the online shopping?

                                     269 non-null    object
 8   9 What is the screen size of your mobile device?

                                                                    269 non-null
  object
 9   10 What is the operating system (OS) of your device?

                                                                269 non-null    object
 10  11 What browser do you run on your device to access the website?

                                                        269 non-null    object
 11  12 Which channel did you follow to arrive at your favorite online store for the fir
st time?
                                     269 non-null    object
 12  13 After first visit, how do you reach the online retail store?

                                                            269 non-null    object
 13  14 How much time do you explore the e- retail store before making a purchase decisi
```

on?
269 non-null object
14 15 What is your preferred payment Option?

269 non-null object
15 16 How frequently do you abandon (selecting an items and leaving without making pay
ment) your shopping cart?

269
non-null object
16 17 Why did you abandon the “Bag”, “Shopping Cart”?

269 non-null object
17 18 The content on the website must be easy to read and understand

269 non-null object
18 19 Information on similar product to the one highlighted is important for product
comparison
269 non-null object
19 20 Complete information on listed seller and product being offered is important for
purchase decision.
269 non-null object
20 21 All relevant information on listed products must be stated clearly

269 non-null object
21 22 Ease of navigation in website

269 non-null object
22 23 Loading and processing speed

269 non-null object
23 24 User friendly Interface of the website

269 non-null object
24 25 Convenient Payment methods

269 non-null object
25 26 Trust that the online retail store will fulfill its part of the transaction at t
he stipulated time
269 non-null object
26 27 Empathy (readiness to assist with queries) towards the customers

269 non-null object
27 28 Being able to guarantee the privacy of the customer

269 non-null object
28 29 Responsiveness, availability of several communication channels (email, online re
p, twitter, phone etc.)
269 non-null object
29 30 Online shopping gives monetary benefit and discounts

269 non-null object
30 31 Enjoyment is derived from shopping online

269 non-null object
31 32 Shopping online is convenient and flexible

269 non-null object
32 33 Return and replacement policy of the e-tailer is important for purchase decision

269 non-null object
33 34 Gaining access to loyalty programs is a benefit of shopping online

269 non-null object
34 35 Displaying quality Information on the website improves satisfaction of customers

269 non-null object

```
 35  36 User derive satisfaction while shopping on a good quality website or application

                                     269 non-null    object
 36  37 Net Benefit derived from shopping online can lead to users satisfaction

                                     269 non-null    object
 37  38 User satisfaction cannot exist without trust

                                     269 non-null    object
 38  39 Offering a wide variety of listed product in several category

                                     269 non-null    object
 39  40 Provision of complete and relevant product information

                                     269 non-null    object
 40  41 Monetary savings

                                     269 non-null    object
 41  42 The Convenience of patronizing the online retailer

                                     269 non-null    object
 42  43 Shopping on the website gives you the sense of adventure

                                     269 non-null    object
 43  44 Shopping on your preferred e-tailer enhances your social status

                                     269 non-null    object
 44  45 You feel gratification shopping on your favorite e-tailer

                                     269 non-null    object
 45  46 Shopping on the website helps you fulfill certain roles

                                     269 non-null    object
 46  47 Getting value for money spent

                                     269 non-null    object
 47  From the following, tick any (or all) of the online retailers you have shopped fro
m;
                                      269 non-null    object
 48  Easy to use website or application

                                     269 non-null    object
 49  Visual appealing web-page layout

                                     269 non-null    object
 50  Wild variety of product on offer

                                     269 non-null    object
 51  Complete, relevant description information of products

                                     269 non-null    object
 52  Fast loading website speed of website and application

                                     269 non-null    object
 53  Reliability of the website or application

                                     269 non-null    object
 54  Quickness to complete purchase

                                     269 non-null    object
 55  Availability of several payment options

                                     269 non-null    object
 56  Speedy order delivery

                                     269 non-null    object
```

```
 57  Privacy of customers' information                                  269 non-null    object
 58  Security of customer financial information                         269 non-null    object
 59  Perceived Trustworthiness                                          269 non-null    object
 60  Presence of online assistance through multi-channel                269 non-null    object
 61  Longer time to get logged in (promotion, sales period)             269 non-null    object
 62  Longer time in displaying graphics and photos (promotion, sales period)  269 non-null    object
 63  Late declaration of price (promotion, sales period)                269 non-null    object
 64  Longer page loading time (promotion, sales period)                 269 non-null    object
 65  Limited mode of payment on most products (promotion, sales period)  269 non-null    object
 66  Longer delivery period                                             269 non-null    object
 67  Change in website/Application design                               269 non-null    object
 68  Frequent disruption when moving from one page to another           269 non-null    object
 69  Website is as efficient as before                                  269 non-null    object
 70  Which of the Indian online retailer would you recommend to a friend?  269 non-null    object
dtypes: int64(1), object(70)
memory usage: 149.3+ KB
```

In [7]:
```
df.duplicated().sum()
```

Out[7]:
```
166
```

In [8]:
```
df.drop_duplicates(inplace=True)
```

In [9]:
```
# Reset the index after removing duplicates
df=df.reset_index(drop=True)
```

In [10]:
```
df.isin(['NAN','NA','N/A','-',' ','?',np.nan]).sum().any()
```

Out[10]:
```
False
```

In [11]:
```
# Retype data columns to be standard
df.columns=df.columns.str.replace('[0-9]',' ').str.strip()
```

In [12]:
```
# Check columns after retyping
df.columns
```

Out[12]:
```
Index(['Gender of respondent', 'How old are you?',
       'Which city do you shop online from?',
       'What is the Pin Code of where you shop online from?',
       'Since How Long You are Shopping Online ?',
       'How many times you have made an online purchase in the past   year?',
       'How do you access the internet while shopping on-line?',
       'Which device do you use to access the online shopping?',
       'What is the screen size of your mobile device?',
       'What is the operating system (OS) of your device?',
       'What browser do you run on your device to access the website?',
       'Which channel did you follow to arrive at your favorite online store for the fir
st time?',
       'After first visit, how do you reach the online retail store?',
       'How much time do you explore the e- retail store before making a purchase decisi
on?',
       'What is your preferred payment Option?',
       'How frequently do you abandon (selecting an items and leaving without making pay
ment) your shopping cart?',
       'Why did you abandon the “Bag”, “Shopping Cart”?',
       'The content on the website must be easy to read and understand',
       'Information on similar product to the one highlighted  is important for product
comparison',
       'Complete information on listed seller and product being offered is important for
purchase decision.',
       'All relevant information on listed products must be stated clearly',
       'Ease of navigation in website', 'Loading and processing speed',
       'User friendly Interface of the website', 'Convenient Payment methods',
       'Trust that the online retail store will fulfill its part of the transaction at t
he stipulated time',
       'Empathy (readiness to assist with queries) towards the customers',
       'Being able to guarantee the privacy of the customer',
       'Responsiveness, availability of several communication channels (email, online re
p, twitter, phone etc.)',
       'Online shopping gives monetary benefit and discounts',
       'Enjoyment is derived from shopping online',
       'Shopping online is convenient and flexible',
       'Return and replacement policy of the e-tailer is important for purchase decisio
n',
       'Gaining access to loyalty programs is a benefit of shopping online',
       'Displaying quality Information on the website improves satisfaction of customer
s',
       'User derive satisfaction while shopping on a good quality website or applicatio
n',
       'Net Benefit derived from shopping online can lead to users satisfaction',
       'User satisfaction cannot exist without trust',
       'Offering a wide variety of listed product in several category',
       'Provision of complete and relevant product information',
       'Monetary savings',
       'The Convenience of patronizing the online retailer',
       'Shopping on the website gives you the sense of adventure',
       'Shopping on your preferred e-tailer enhances your social status',
       'You feel gratification shopping on your favorite e-tailer',
       'Shopping on the website helps you fulfill certain roles',
       'Getting value for money spent',
       'From the following, tick any (or all) of the online retailers you have shopped f
rom;',
       'Easy to use website or application',
       'Visual appealing web-page layout', 'Wild variety of product on offer',
       'Complete, relevant description information of products',
       'Fast loading website speed of website and application',
       'Reliability of the website or application',
       'Quickness to complete purchase',
       'Availability of several payment options', 'Speedy order delivery',
       'Privacy of customers’ information',
       'Security of customer financial information',
       'Perceived Trustworthiness',
```

```
       'Presence of online assistance through multi-channel',
       'Longer time to get logged in (promotion, sales period)',
       'Longer time in displaying graphics and photos (promotion, sales period)',
       'Late declaration of price (promotion, sales period)',
       'Longer page loading time (promotion, sales period)',
       'Limited mode of payment on most products (promotion, sales period)',
       'Longer delivery period', 'Change in website/Application design',
       'Frequent disruption when moving from one page to another',
       'Website is as efficient as before',
       'Which of the Indian online retailer would you recommend to a friend?'],
      dtype='object')
```

In [13]:
```
# Value counts for each feature data
for i in df.columns:
    print(df[i].value_counts())
    print('*****************')
```

```
Female    66
Male      37
Name: Gender of respondent, dtype: int64
*****************
21-30 years           32
31-40 years           30
41-50 yaers           29
Less than 20 years     6
51 years and above     6
Name: How old are you?, dtype: int64
*****************
Delhi            22
Greater Noida    17
Bangalore        17
Noida            17
Karnal           11
Merrut            5
Ghaziabad         5
Solan             4
Gurgaon           3
Moradabad         1
Bulandshahr       1
Name: Which city do you shop online from?, dtype: int64
*****************
201308    13
132001     7
110044     7
201310     6
250001     5
132036     4
560037     4
201305     3
110008     3
201306     3
560010     3
201312     3
110011     3
110042     2
201303     2
560018     2
173212     2
201304     2
560002     2
201005     2
110014     2
122018     2
173229     2
110018     2
530068     2
```

```
560003     2
122009     1
201009     1
201008     1
201001     1
560013     1
110009     1
560001     1
203202     1
110030     1
203207     1
244001     1
110039     1
203001     1
Name: What is the Pin Code of where you shop online from?, dtype: int64
**********
Above 4 years       39
2-3 years           23
Less than 1 year    18
3-4 years           16
1-2 years            7
Name: Since How Long You are Shopping Online ?, dtype: int64
**********
Less than 10 times    39
31-40 times           24
41 times and above    22
11-20 times           12
21-30 times            4
42 times and above     2
Name: How many times you have made an online purchase in the past   year?, dtype: int64
**********
Mobile internet    70
Wi-Fi              21
Mobile Internet    11
Dial-up             1
Name: How do you access the internet while shopping on-line?, dtype: int64
**********
Smartphone    52
Laptop        32
Desktop       13
Tablet         6
Name: Which device do you use to access the online shopping?, dtype: int64
**********
Others        51
5.5 inches    35
4.7 inches    13
5 inches       4
Name: What is the screen size of your mobile device?, dtype: int64
**********
Window/windows Mobile    46
Android                  30
IOS/Mac                  27
Name: What is the operating system (OS) of your device?, dtype: int64
**********
Google chrome      80
Safari             19
Opera               2
Mozilla Firefox     2
Name: What browser do you run on your device to access the website?, dtype: int64
**********
Search Engine        86
Content Marketing    10
Display Adverts       7
Name: Which channel did you follow to arrive at your favorite online store for the first
time?, dtype: int64
**********
```

```
Via application    34
Search Engine      33
Direct URL         26
E-mail              8
Social Media        2
Name: After first visit, how do you reach the online retail store?, dtype: int64
**********
more than 15 mins    48
6-10 mins            31
11-15 mins           15
1-5 mins              5
Less than 1 min       4
Name: How much time do you explore the e- retail store before making a purchase decisio
n?, dtype: int64
**********
Credit/Debit cards                    59
Cash on delivery (CoD)                25
E-wallets (Paytm, Freecharge etc.)    19
Name: What is your preferred payment Option?, dtype: int64
**********
Sometimes          64
Never              17
Frequently         16
Very frequently     6
Name: How frequently do you abandon (selecting an items and leaving without making payme
nt) your shopping cart?, dtype: int64
**********
Better alternative offer        49
Promo code not applicable       21
Change in price                 15
Lack of trust                   13
No preferred mode of payment     5
Name: Why did you abandon the “Bag”, “Shopping Cart”?, dtype: int64
**********
Strongly agree (5)       60
Agree (4)                33
Strongly disagree (1)     8
Indifferent (3)           2
Name: The content on the website must be easy to read and understand, dtype: int64
**********
Strongly agree (5)    40
Agree (4)             35
Indifferent (3)       20
Dis-agree (2)          8
Name: Information on similar product to the one highlighted  is important for product co
mparison, dtype: int64
**********
Agree (4)                38
Strongly agree (5)       30
Indifferent (3)          24
Dis-agree (2)             8
Strongly disagree (1)     3
Name: Complete information on listed seller and product being offered is important for p
urchase decision., dtype: int64
**********
Agree (4)                54
Strongly agree (5)       37
Strongly disagree (1)     8
Dis-agree (2)             4
Name: All relevant information on listed products must be stated clearly, dtype: int64
**********
Strongly agree (5)       51
Agree (4)                42
Strongly disagree (1)     8
Dis-agree (2)             2
Name: Ease of navigation in website, dtype: int64
```

```
**********
Strongly agree (5)       45
Agree (4)                41
Dis-agree (2)             8
Strongly disagree (1)     5
Indifferent (3)           4
Name: Loading and processing speed, dtype: int64
**********
Strongly agree (5)       72
Agree (4)                16
Strongly disagree (1)     8
Dis-agree (2)             5
Indifferent (3)           2
Name: User friendly Interface of the website, dtype: int64
**********
Strongly agree (5)    60
Agree (4)             30
Dis-agree (2)         13
Name: Convenient Payment methods, dtype: int64
**********
Strongly agree (5)    52
Agree (4)             34
Disagree (2)          13
indifferent  (3)       4
Name: Trust that the online retail store will fulfill its part of the transaction at the
stipulated time, dtype: int64
**********
Strongly agree (5)       75
Agree (4)                16
Strongly disagree (1)     8
indifferent (3)           4
Name: Empathy (readiness to assist with queries) towards the customers, dtype: int64
**********
Strongly agree (5)    69
Agree (4)             24
indifferent (3)       10
Name: Being able to guarantee the privacy of the customer, dtype: int64
**********
Strongly agree (5)       59
Agree (4)                36
indifferent (3)           5
Strongly disagree (1)     3
Name: Responsiveness, availability of several communication channels (email, online rep,
twitter, phone etc.), dtype: int64
**********
Strongly agree (5)       41
Agree (4)                33
indifferent (3)          16
Strongly disagree (1)     8
Dis-agree (2)             5
Name: Online shopping gives monetary benefit and discounts, dtype: int64
**********
Strongly agree (5)       34
indifferent (3)          27
Agree (4)                23
Strongly disagree (1)    13
Dis-agree (2)             6
Name: Enjoyment is derived from shopping online, dtype: int64
**********
Strongly agree (5)    56
Agree (4)             29
indifferent (3)       13
Dis-agree (2)          5
Name: Shopping online is convenient and flexible, dtype: int64
**********
Strongly agree (5)    76
```

```
Agree (4)             20
Dis-agree (2)          7
Name: Return and replacement policy of the e-tailer is important for purchase decision,
dtype: int64
*****************
Strongly agree (5)       44
Agree (4)                24
indifferent (3)          22
Dis-agree (2)             8
Strongly disagree (1)     5
Name: Gaining access to loyalty programs is a benefit of shopping online, dtype: int64
*****************
Strongly agree (5)    49
Agree (4)             31
indifferent (3)       23
Name: Displaying quality Information on the website improves satisfaction of customers,
dtype: int64
*****************
Strongly agree (5)    66
Agree (4)             35
Dis-agree (2)          2
Name: User derive satisfaction while shopping on a good quality website or application,
dtype: int64
*****************
Strongly agree (5)    61
Agree (4)             22
indifferent (3)       15
Dis-agree (2)          5
Name: Net Benefit derived from shopping online can lead to users satisfaction, dtype: in
t64
*****************
Strongly agree (5)       47
Agree (4)                44
Strongly disagree (1)     8
Dis-agree (2)             2
indifferent (3)           2
Name: User satisfaction cannot exist without trust, dtype: int64
*****************
Strongly agree (5)    42
Agree (4)             39
indifferent (3)       20
Dis-agree (2)          2
Name: Offering a wide variety of listed product in several category, dtype: int64
*****************
Strongly agree (5)    48
Agree (4)             41
indifferent (3)       12
Disagree (2)           2
Name: Provision of complete and relevant product information, dtype: int64
*****************
Strongly agree (5)    59
Agree (4)             27
Disagree (2)          12
indifferent (3)        5
Name: Monetary savings, dtype: int64
*****************
Agree (4)             55
indifferent (3)       28
Strongly agree (5)    20
Name: The Convenience of patronizing the online retailer, dtype: int64
*****************
Agree (4)                42
indifferent (3)          24
Strongly agree (5)       20
Dis-agree (2)            15
Strongly disagree (1)     2
```

```
Name: Shopping on the website gives you the sense of adventure, dtype: int64
**********
indifferent (3)          39
Agree (4)                21
Strongly agree (5)       17
Strongly disagree (1)    16
Dis-agree (2)            10
Name: Shopping on your preferred e-tailer enhances your social status, dtype: int64
**********
indifferent (3)          38
Strongly agree (5)       25
Agree (4)                24
Strongly disagree (1)     8
Disagree (2)              8
Name: You feel gratification shopping on your favorite e-tailer, dtype: int64
**********
indifferent (3)          35
Agree (4)                33
Strongly disagree (1)    16
Strongly agree (5)       12
Dis-agree (2)             7
Name: Shopping on the website helps you fulfill certain roles, dtype: int64
**********
Agree (4)             57
Strongly agree (5)    32
indifferent (3)       14
Name: Getting value for money spent, dtype: int64
**********
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    36
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               16
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                12
Amazon.in, Flipkart.com                                         12
Amazon.in, Paytm.com, Myntra.com                                 8
Amazon.in, Flipkart.com, Snapdeal.com                            8
Amazon.in, Paytm.com                                             5
Amazon.in                                                        4
Amazon.in, Flipkart.com, Paytm.com                               2
Name: From the following, tick any (or all) of the online retailers you have shopped fro
m;, dtype: int64
**********
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    28
Amazon.in, Flipkart.com                                         18
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               16
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                10
Amazon.in, Paytm.com, Myntra.com                                 8
Amazon.in                                                        8
Amazon.in, Flipkart.com, Myntra.com                              6
Paytm.com                                                        5
Amazon.in, Paytm.com                                             2
Flipkart.com                                                     2
Name: Easy to use website or application, dtype: int64
**********
Amazon.in, Flipkart.com                                         33
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    16
Amazon.in                                                       12
Amazon.in, Paytm.com, Myntra.com                                 8
Myntra.com                                                       8
Amazon.in, Myntra.com                                            6
Flipkart.com                                                     5
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                5
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com                 5
Flipkart.com, Myntra.com                                         5
Name: Visual appealing web-page layout, dtype: int64
**********
Amazon.in, Flipkart.com                                 50
Amazon.in                                               13
```

```
Amazon.in, Myntra.com                                  8
Myntra.com                                             8
Flipkart.com, Myntra.com                               6
Amazon.in, Flipkart.com, Paytm.com                     6
Flipkart.com                                           5
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com      5
Paytm.com                                              2
Name: Wild variety of product on offer, dtype: int64
**********
Amazon.in, Flipkart.com                                                39
Amazon.in                                                              12
Amazon.in, Flipkart.com, Paytm.com                                     11
Amazon.in, Paytm.com, Myntra.com                                        8
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com            8
Amazon.in, Flipkart.com, Myntra.com                                     6
Snapdeal.com                                                            5
Flipkart.com, Snapdeal.com                                              5
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                       5
Amazon.in, Flipkart.com, Snapdeal.com                                   2
Flipkart.com                                                            2
Name: Complete, relevant description information of products, dtype: int64
**********
Amazon.in, Paytm.com                                                   19
Amazon.in                                                              18
Amazon.in, Flipkart.com, Myntra.com                                    11
Amazon.in, Flipkart.com, Snapdeal.com                                  11
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com           11
Amazon.in, Flipkart.com                                                11
Amazon.in, Flipkart.com, Paytm.com                                     10
Snapdeal.com                                                            5
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                       5
Flipkart.com                                                            2
Name: Fast loading website speed of website and application, dtype: int64
**********
Amazon.in                                              20
Amazon.in, Flipkart.com                                18
Amazon.in, Paytm.com, Myntra.com                       16
Amazon.in, Flipkart.com, Paytm.com                     16
Amazon.in, Flipkart.com, Snapdeal.com                   7
Myntra.com                                              6
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com        6
Paytm.com                                               5
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com       5
Flipkart.com                                            4
Name: Reliability of the website or application, dtype: int64
**********
Amazon.com                                                     22
Amazon.com, Flipkart.com, Paytm.com                            21
Amazon.com, Flipkart.com                                       13
Paytm.com                                                      11
Amazon.com, Flipkart.com, Myntra.com                           11
Amazon.com, Paytm.com, Myntra.com                               8
Amazon.com, Flipkart.com, Paytm.com, Myntra.com, Snapdeal       8
Flipkart.com, Myntra.com, Snapdeal                              5
Flipkart.com                                                    4
Name: Quickness to complete purchase, dtype: int64
**********
Amazon.in, Flipkart.com                                        25
Amazon.in, Flipkart.com, Myntra.com                            17
Amazon.in, Flipkart.com, Patym.com, Myntra.com, Snapdeal.com   17
Patym.com, Myntra.com                                           8
Amazon.in, Flipkart.com, Snapdeal.com                           7
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com               6
Amazon.in                                                       6
Patym.com                                                       5
Flipkart.com, Myntra.com, Snapdeal.com                          5
```

```
Amazon.in, Patym.com                                                  5
Flipkart.com                                                          2
Name: Availability of several payment options, dtype: int64
**********
Amazon.in                                    43
Amazon.in, Flipkart.com                      30
Amazon.in, Flipkart.com, Snapdeal.com        16
Flipkart.com, Myntra.com, Snapdeal.com        5
Amazon.in, Flipkart.com, Myntra.com           5
Flipkart.com                                  4
Name: Speedy order delivery, dtype: int64
**********
Amazon.in                                                            24
Amazon.in, Flipkart.com                                              19
Amazon.in, Flipkart.com, Myntra.com                                  11
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com         11
Amazon.in, Paytm.com                                                  8
Paytm.com                                                             8
Myntra.com                                                            6
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                     5
Amazon.in, Flipkart.com, Paytm.com                                    5
Flipkart.com                                                          4
Amazon.in, Flipkart.com, Snapdeal.com                                 2
Name: Privacy of customers' information, dtype: int64
**********
Amazon.in                                                            16
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com         16
Flipkart.com                                                         12
Amazon.in, Flipkart.com, Snapdeal.com                                11
Amazon.in, Flipkart.com                                              10
Amazon.in, Paytm.com, Myntra.com                                      8
Paytm.com                                                             8
Myntra.com                                                            6
Amazon.in, Snapdeal.com                                               6
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                     5
Amazon.in, Flipkart.com, Paytm.com                                    5
Name: Security of customer financial information, dtype: int64
**********
Amazon.in                                                            25
Amazon.in, Myntra.com                                                16
Amazon.in, Flipkart.com, Snapdeal.com                                16
Amazon.in, Flipkart.com                                              12
Flipkart.com                                                          9
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com                     8
Myntra.com                                                            6
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com          6
Amazon.in, Flipkart.com, Paytm.com                                    5
Name: Perceived Trustworthiness, dtype: int64
**********
Amazon.in, Flipkart.com, Myntra.com, Snapdeal    24
Amazon.in                                        21
Amazon.in, Flipkart.com                          15
Myntra.com                                        8
Amazon.in, Myntra.com                             8
Amazon.in, Snapdeal                               8
Amazon.in, Flipkart.com, Myntra.com               6
Amazon.in, Flipkart.com, Paytm.com                6
Paytm.com                                         5
Flipkart.com                                      2
Name: Presence of online assistance through multi-channel, dtype: int64
**********
Amazon.in                                    18
Amazon.in, Flipkart.com                      16
Paytm.com                                    14
Myntra.com                                   13
Snapdeal.com                                 11
```

```
Amazon.in, Flipkart.com, Snapdeal.com    10
Flipkart.com, Paytm.com                   8
Flipkart.com, Paytm.com, Snapdeal.com     6
Amazon.in, Paytm.com                      5
Flipkart.com                              2
Name: Longer time to get logged in (promotion, sales period), dtype: int64
*****************
Amazon.in, Flipkart.com               25
Amazon.in                             14
Myntra.com                            14
Myntra.com, Snapdeal.com              11
Snapdeal.com                          10
Paytm.com                              8
Amazon.in, Paytm.com                   6
Flipkart.com, Snapdeal.com             6
Amazon.in, Myntra.com, Snapdeal.com    5
Flipkart.com                           4
Name: Longer time in displaying graphics and photos (promotion, sales period), dtype: in
t64
*****************
Myntra.com                30
Paytm.com                 24
Flipkart.com              14
snapdeal.com              14
Amazon.in                 11
Amazon.in, Paytm.com       6
Paytm.com, snapdeal.com    2
Amazon.in, Flipkart.com    2
Name: Late declaration of price (promotion, sales period), dtype: int64
*****************
Paytm.com                          27
Myntra.com                         22
Flipkart.com                       11
Snapdeal.com                        8
Amazon.in, Flipkart.com             8
Amazon.in, Paytm.com                6
Amazon.in, Snapdeal.com             5
Flipkart.com, Snapdeal.com          5
Paytm.com, Snapdeal.com             5
Amazon.in                           4
Amazon.in, Paytm.com, Myntra.com    2
Name: Longer page loading time (promotion, sales period), dtype: int64
*****************
Snapdeal.com               33
Amazon.in                  22
Amazon.in, Flipkart.com    13
Paytm.com                  11
Flipkart.com               11
Amazon.in, Paytm.com        6
Paytm.com, Snapdeal.com     5
Myntra.com, Snapdeal.com    2
Name: Limited mode of payment on most products (promotion, sales period), dtype: int64
*****************
Paytm.com                 32
Snapdeal.com              24
Flipkart.com              18
Amazon.in                 11
Paytm.com, Snapdeal.com   10
Myntra.com                 8
Name: Longer delivery period, dtype: int64
*****************
Amazon.in                  38
Paytm.com                  23
Amazon.in, Flipkart.com    18
Myntra.com                 13
Flipkart.com                7
```

```
Snapdeal.com                  2
Flipkart.com, Myntra.com      2
Name: Change in website/Application design, dtype: int64
*****************
Myntra.com                    21
Amazon.in                     19
Snapdeal.com                  18
Paytm.com                     14
Amazon.in, Flipkart.com       11
Flipkart.com                  10
Myntra.com, Snapdeal.com       5
Flipkart.com, Snapdeal.com     5
Name: Frequent disruption when moving from one page to another, dtype: int64
*****************
Amazon.in                             35
Flipkart.com                          17
Amazon.in, Flipkart.com               15
Amazon.in, Flipkart.com, Paytm.com    11
Paytm.com                              8
Amazon.in, Paytm.com                   7
Snapdeal.com                           5
Myntra.com, Snapdeal.com               5
Name: Website is as efficient as before, dtype: int64
*****************
Amazon.in                                           28
Amazon.in, Flipkart.com                             22
Flipkart.com                                        15
Amazon.in, Myntra.com                               14
Amazon.in, Paytm.com, Myntra.com                     8
Amazon.in, Paytm.com                                 6
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com    5
Amazon.in, Flipkart.com, Myntra.com                  5
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64
*****************
```

Upon checking the above data, we found out that there are two sections mobile internet in "How do you access the internet while shopping on-line?" column

And sections "41 and above" & "42 and above" in column "Since How Long You are Shopping Online ?"

So we will merge both the sections.

In [14]:
```
df[df.iloc[:,5]=='42 times and above'].index
```

Out[14]:
```
Int64Index([68, 76], dtype='int64')
```

In [15]:
```
df[df.iloc[:,6]=='Mobile Internet'].index
```

Out[15]:
```
Int64Index([2, 3, 7, 10, 15, 16, 95, 96, 98, 99, 101], dtype='int64')
```

In [16]:
```
# make Corrections
df.iloc[68,5]='41 times and above'
df.iloc[76,5]='41 times and above'
df.iloc[[2, 3, 7, 10, 15, 16, 95, 96, 98, 99, 101],6]='Mobile internet'
```

EDA

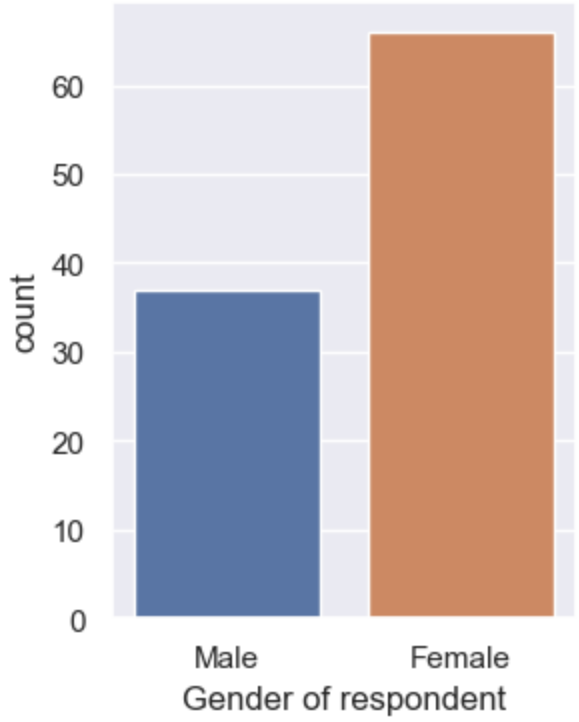
Univariate Analysis

In [17]:
```
sns.set(rc={"figure.figsize":(3, 4)}) #width=3, #height=4
```

Gender

In [18]:
```
sns.countplot(df["Gender of respondent"])
print(df.iloc[:,0].value_counts())
```

```
Female    66
Male      37
Name: Gender of respondent, dtype: int64
```



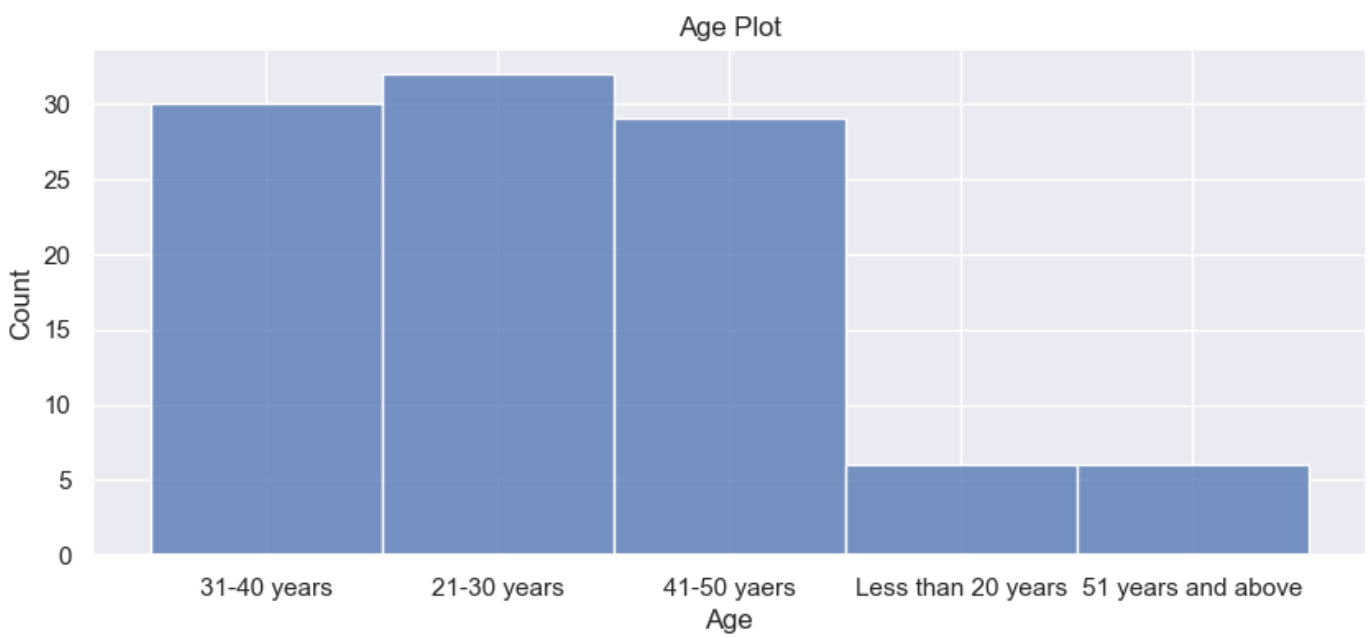
Number of females is more than the number of males as respondents

Which tells us that women are more shopping oriented than men.

Age

In [19]:
```
sns.set(rc={"figure.figsize":(10, 4)})
ax=sns.histplot(df["How old are you?"])
ax.set(ylabel='Count', xlabel='Age', title="Age Plot")
```

Out[19]:
```
[Text(0, 0.5, 'Count'), Text(0.5, 0, 'Age'), Text(0.5, 1.0, 'Age Plot')]
```



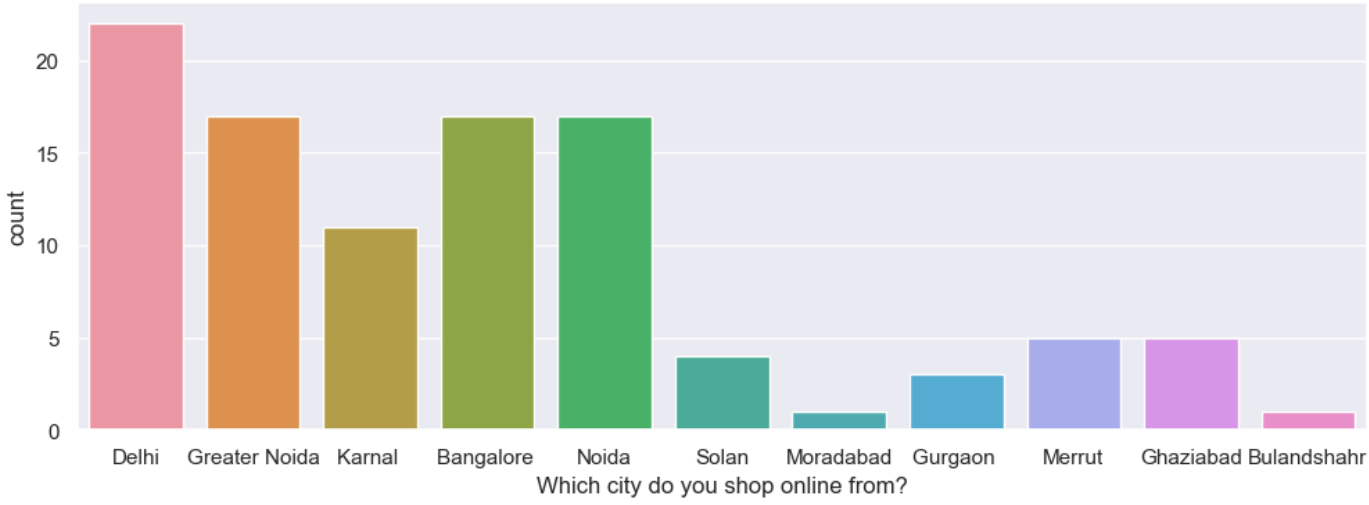
Most of the people in survey are from age group 21 to 50 years. While maximum population is of age group 31 to 40 years. People of age group 51 and above have the least participation.

It is to be noted that numbers for respondent with age<20 years is quite low.

City

In [20]:
```
sns.set(rc={"figure.figsize":(12, 4)})
sns.countplot(df["Which city do you shop online from?"])
ax.set(ylabel='Count', xlabel='City', title="Shopping City")
```

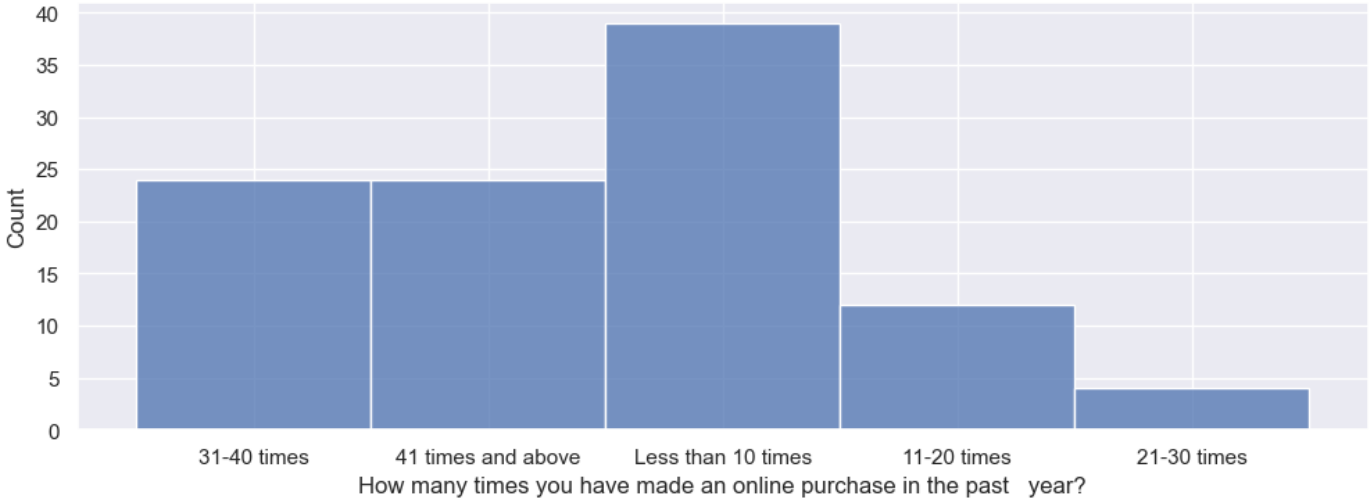
Out[20]:
```
[Text(25.0, 0.5, 'Count'),
 Text(0.5, 25.0, 'City'),
 Text(0.5, 1.0, 'Shopping City')]
```



Most shoppers are from Delhi while the least are from Bulandshahar and Moradabad. This shows that small towns have very less exposure and thus very less online customers.

Purchasing times/year

In [21]:
```
ax=sns.histplot(df["How many times you have made an online purchase in the past   year?"
```

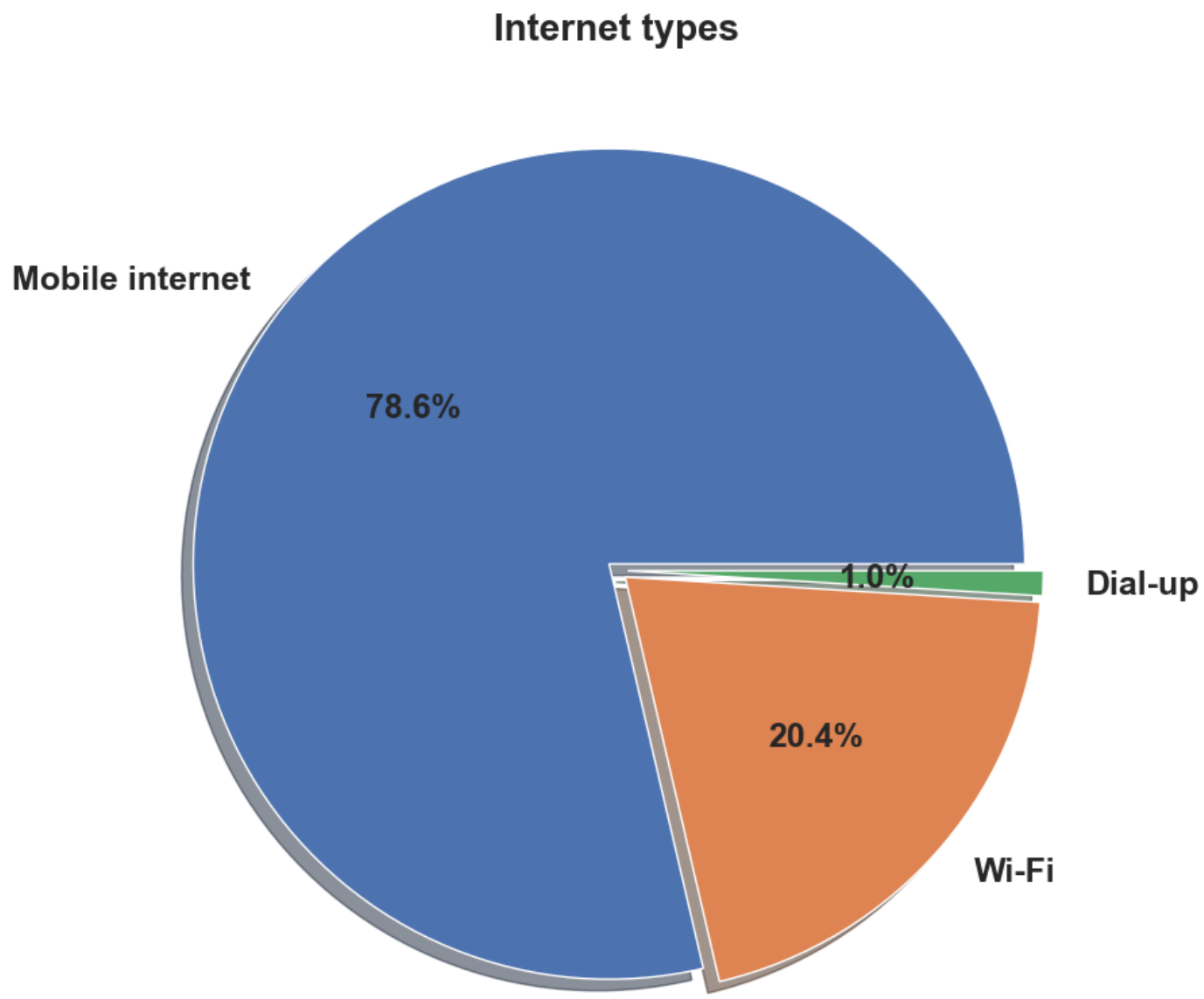


Most people are purchasing less than 10 times in a year

Mode of Internet access

In [22]:
```
f,ax=plt.subplots(1,1,figsize=(16,10))
df["How do you access the internet while shopping on-line?"].value_counts().plot.pie(exp
                                                textprops ={ 'fontweight': 'bold','fontsize':1
ax.set_title('Internet types', fontsize=20,fontweight ='bold')
ax.set_ylabel('')
```

Out[22]:
```
Text(0, 0.5, '')
```

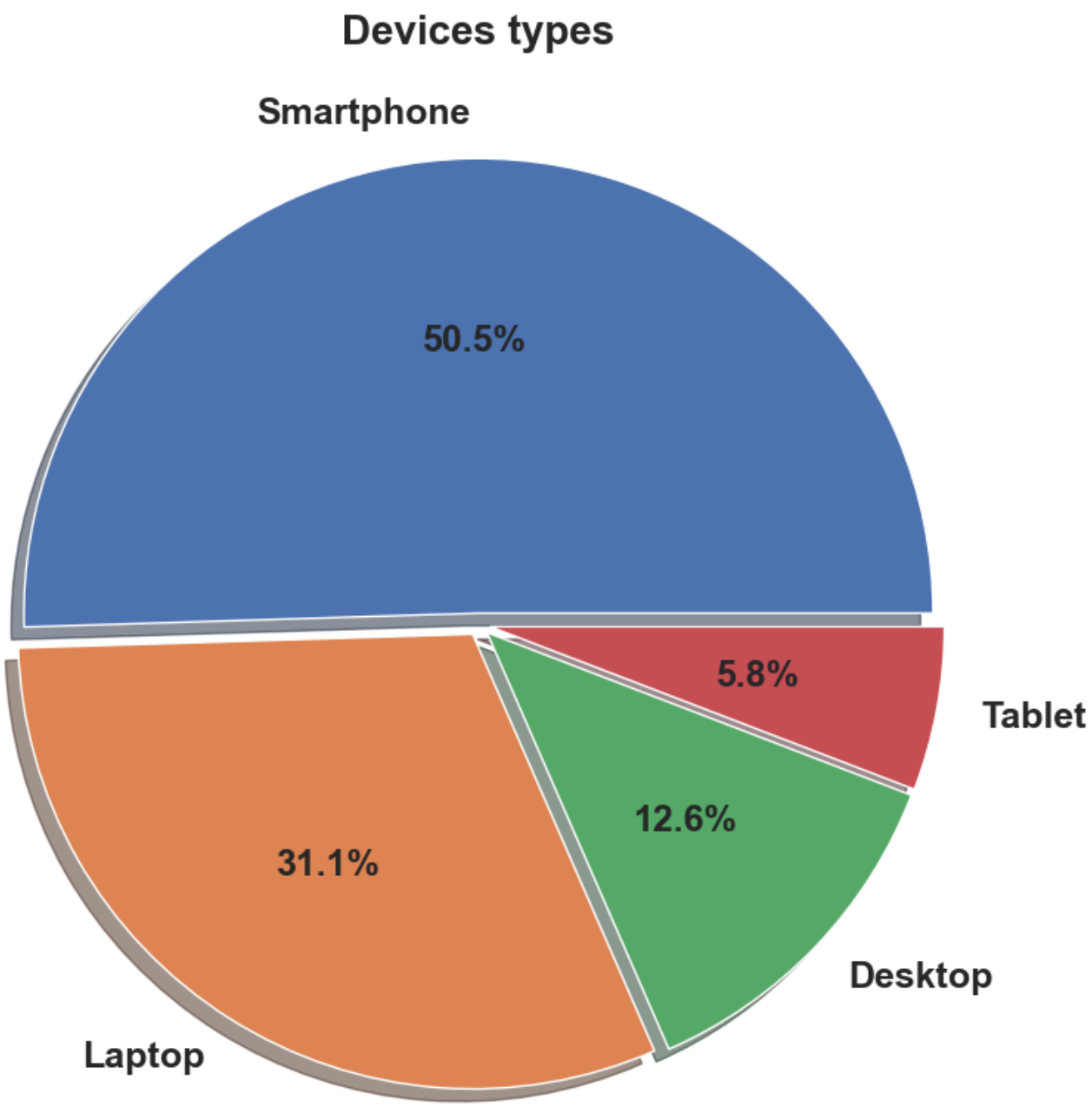


Most shoppers are using Mobile internet for shopping (78.6%)

Device being used for shopping

In [23]:
```
# Devices
f,ax=plt.subplots(1,1,figsize=(16,10))
df.iloc[:,7].value_counts().plot.pie(explode=[0.025,0.025,0.025,0.025],autopct='%3.1f%%'
                                     textprops ={ 'fontweight': 'bold','fontsize':1
ax.set_title('Devices types', fontsize=20,fontweight ='bold')
ax.set_ylabel('')

plt.xticks(fontsize=18,fontweight ='bold')
plt.show()
print(df.iloc[:,7].value_counts())
```




```
Smartphone     52
Laptop         32
Desktop        13
Tablet          6
Name: Which device do you use to access the online shopping?, dtype: int64
```

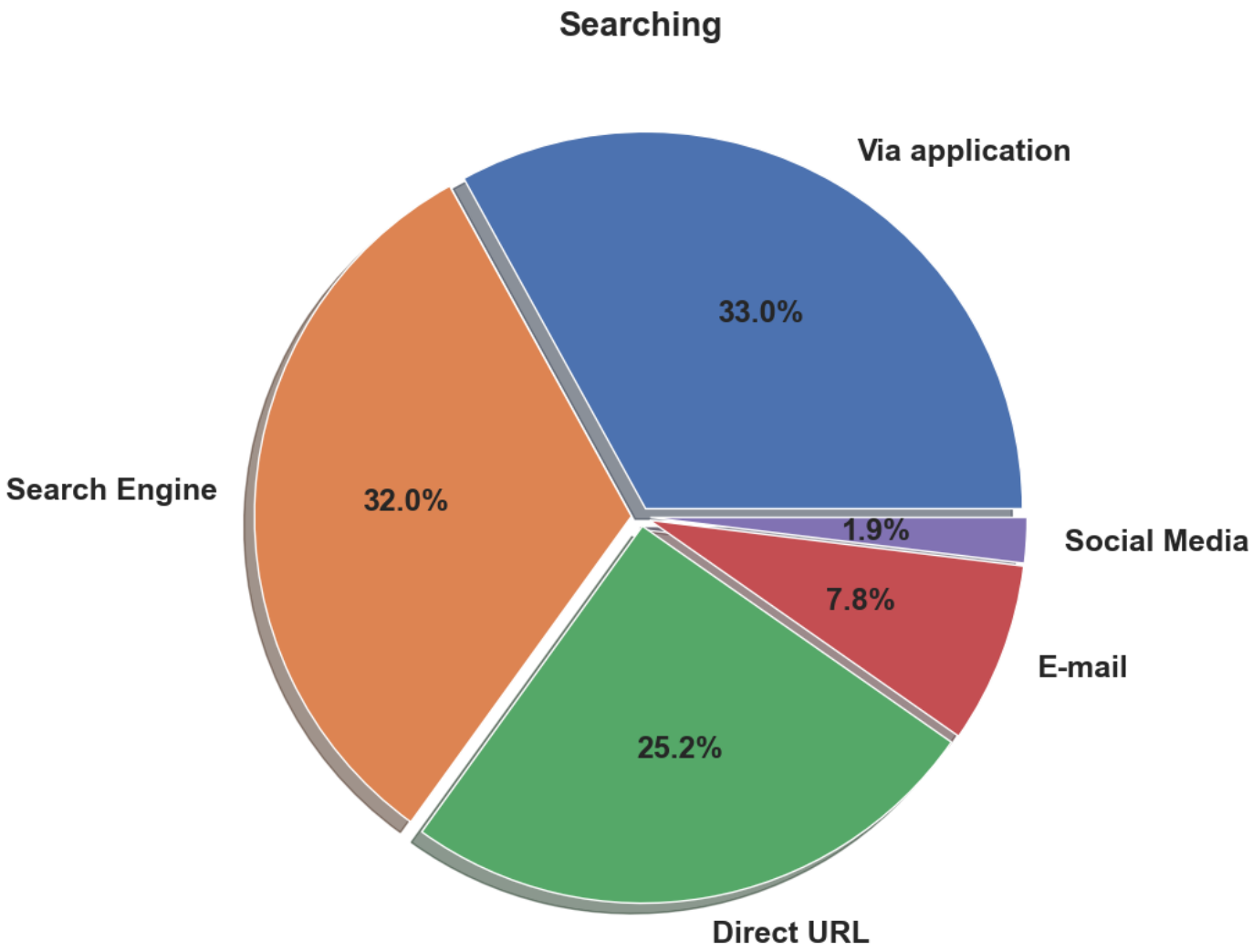
Most people are using Smartphones while shopping online.

how people searched online retail store

In [24]:

```
f,ax=plt.subplots(1,1,figsize=(16,10))
df.iloc[:,12].value_counts().plot.pie(explode=[0.025,0.025,0.025,0.025,0.025],autopct='%
                                      textprops ={ 'fontweight': 'bold','fontsize':1
ax.set_title('Searching', fontsize=20,fontweight ='bold')
ax.set_ylabel('')

plt.xticks(fontsize=18,fontweight ='bold')
plt.show()
print(df.iloc[:,12].value_counts())
```

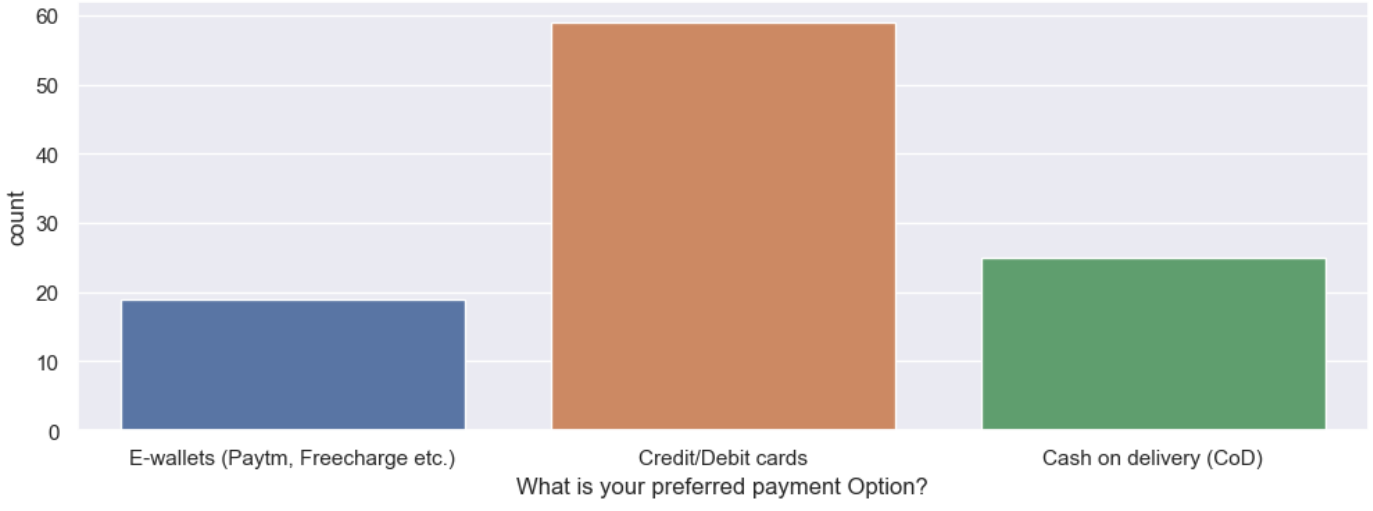



```
Via application    34
Search Engine      33
Direct URL         26
E-mail              8
Social Media        2
Name: After first visit, how do you reach the online retail store?, dtype: int64
```

Most Dominant searching techniques are via Application or Search Engine.

In [25]:
```
sns.countplot(df["What is your preferred payment Option?"])
```

Out[25]:
```
<AxesSubplot:xlabel='What is your preferred payment Option?', ylabel='count'>
```

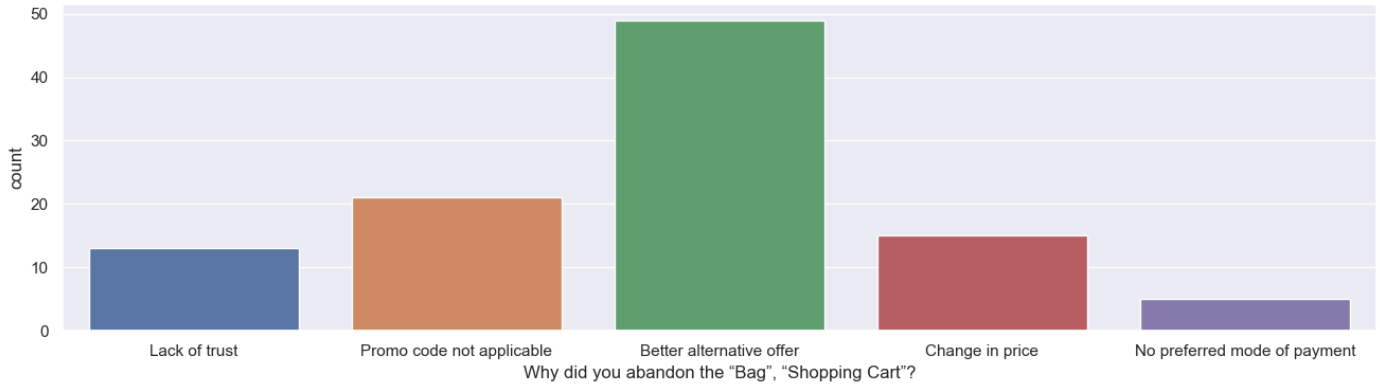


The most dominant payment method is Credit/Debit cards, that may be because card offers available to customers.

How do people abandon shopping cart without making payment?

In [26]:
```
sns.set(rc={"figure.figsize":(16, 4)})
sns.countplot(df["Why did you abandon the "Bag", "Shopping Cart"?"])
```

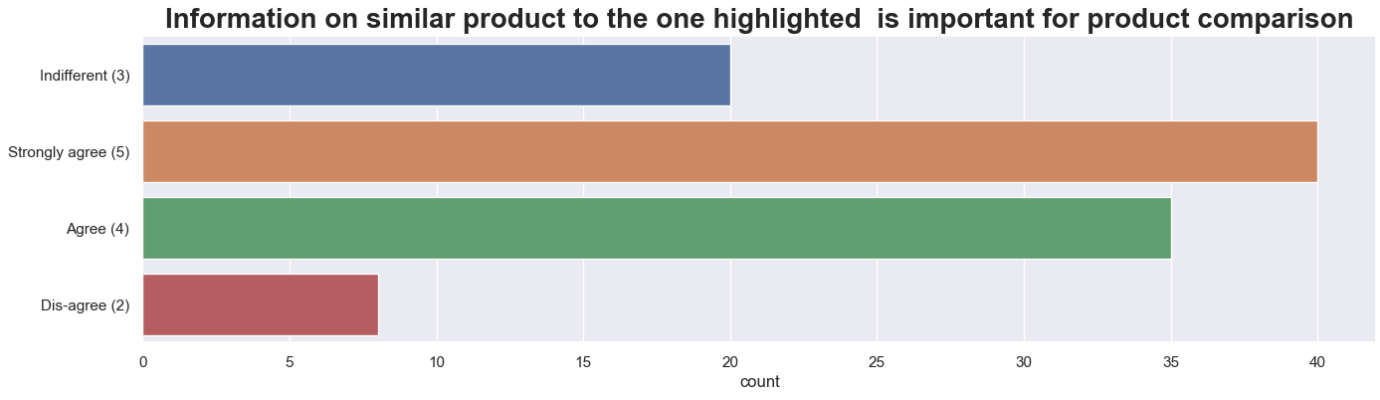
Out[26]:
```
<AxesSubplot:xlabel='Why did you abandon the "Bag", "Shopping Cart"?', ylabel='count'>
```

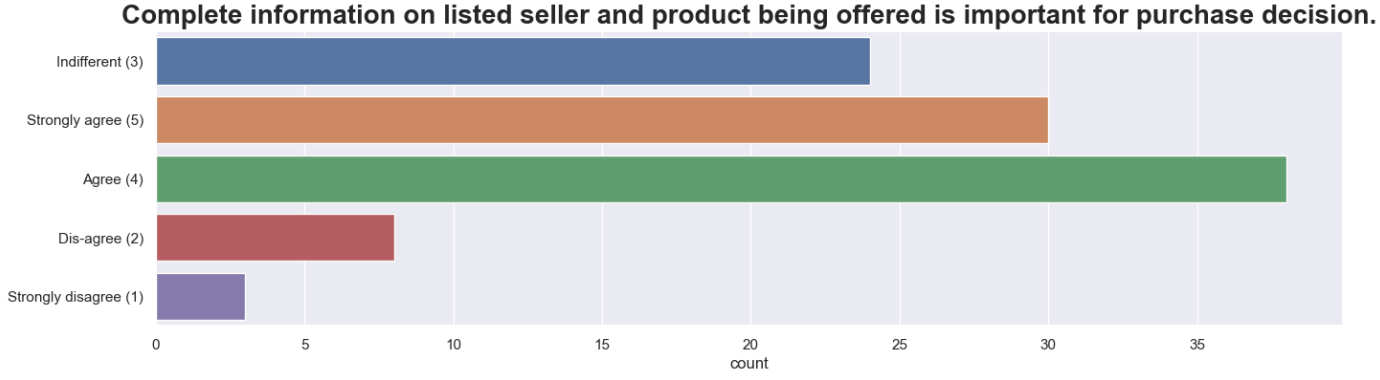


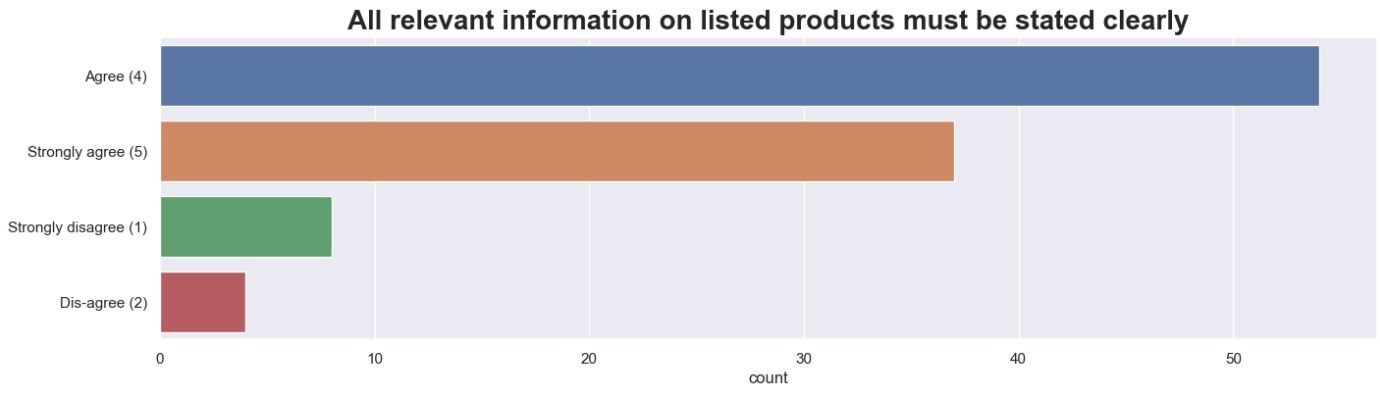
Most of people selecting the bag cart abandon when they find better alternative offers.

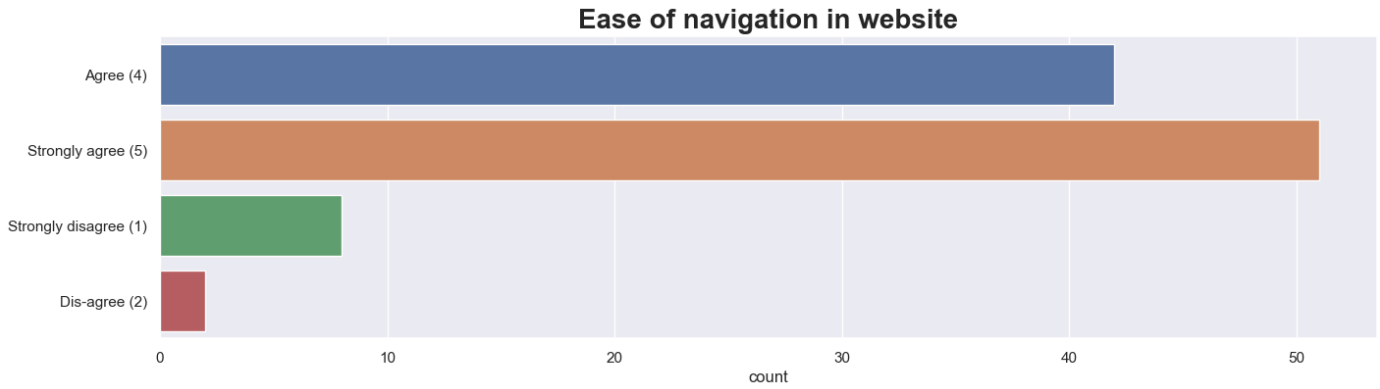
Poll Questions

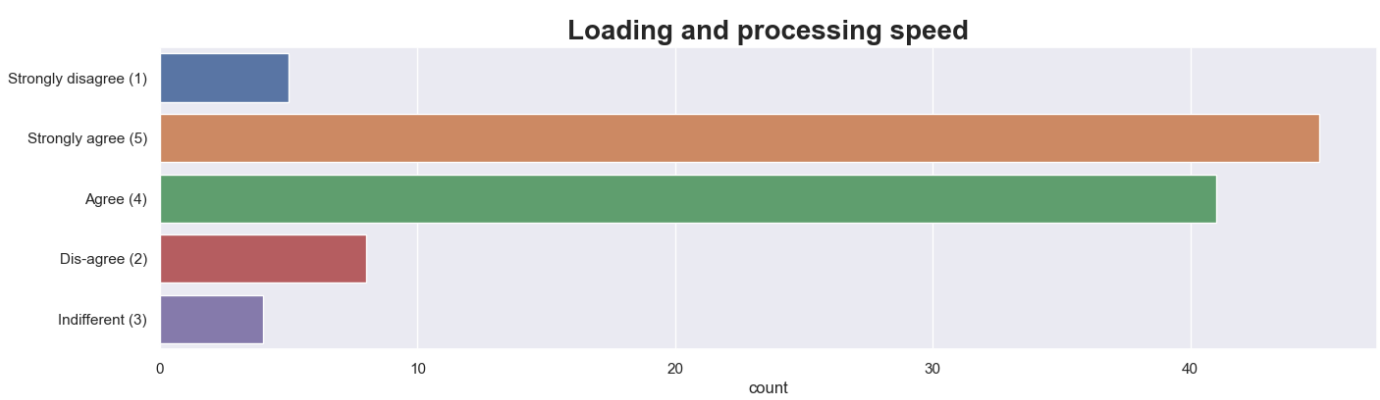
In [27]:
```
for i in df.columns[18:47]:
    a=sns.countplot(data=df,y=i)
    a.set_title(i,fontsize=20,fontweight ='bold')
    a.set_ylabel("")
    plt.show()
```

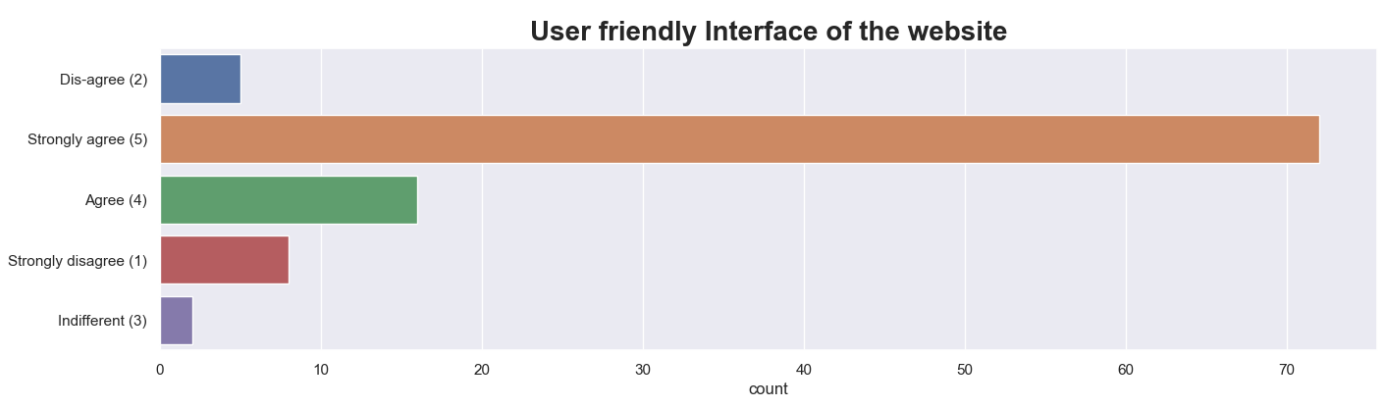


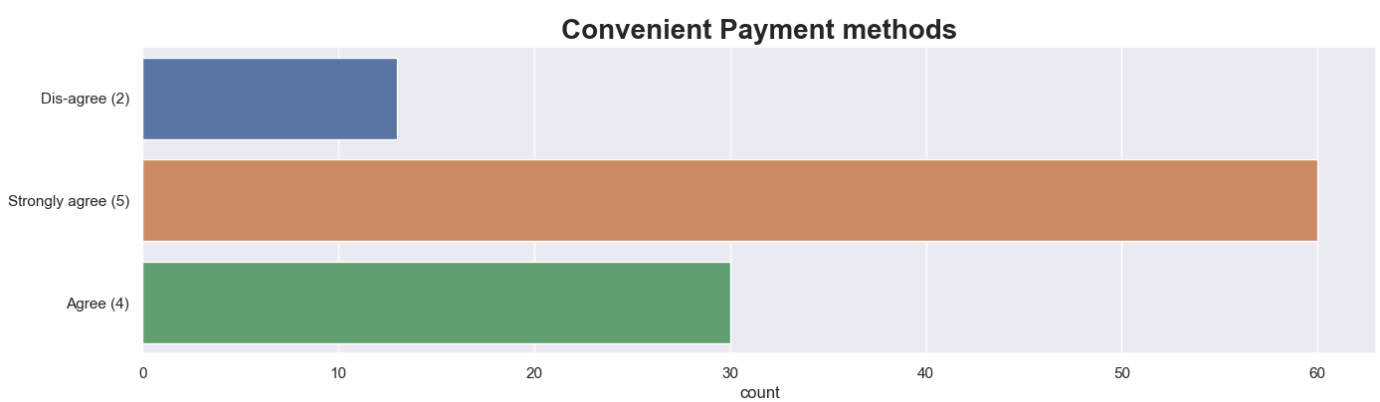


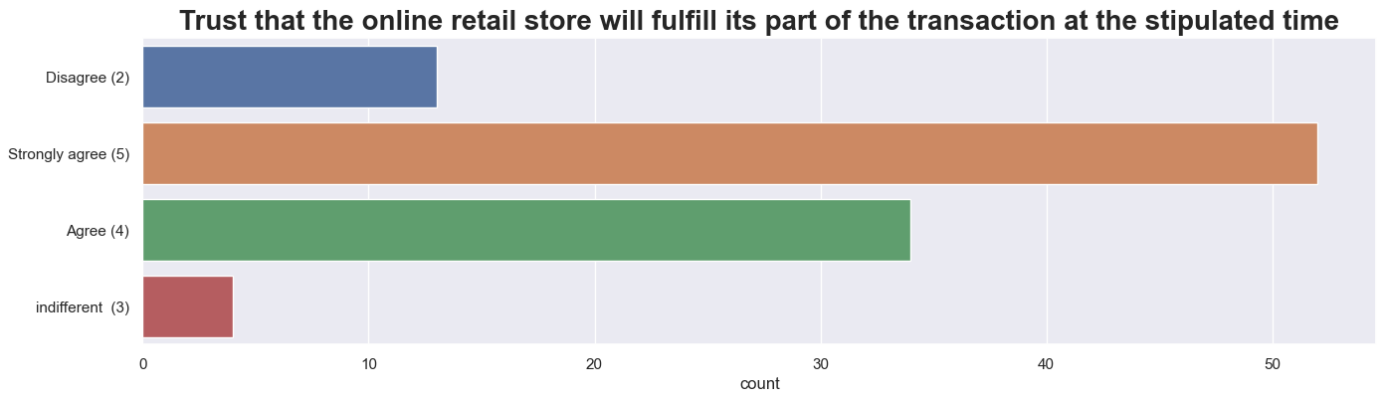

All relevant information on listed products must be stated clearly
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
0
10
20
30
40
50
count

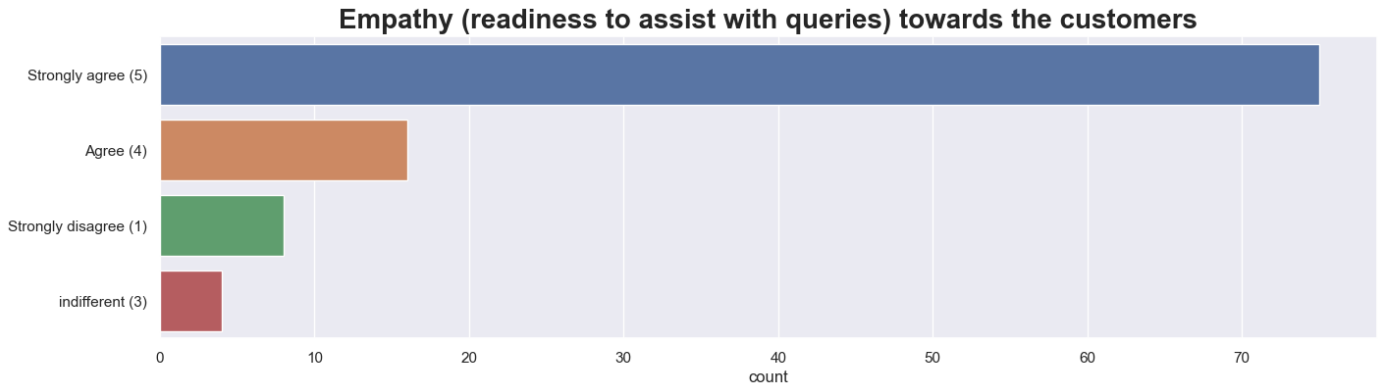

Ease of navigation in website
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
0
10
20
30
40
50
count

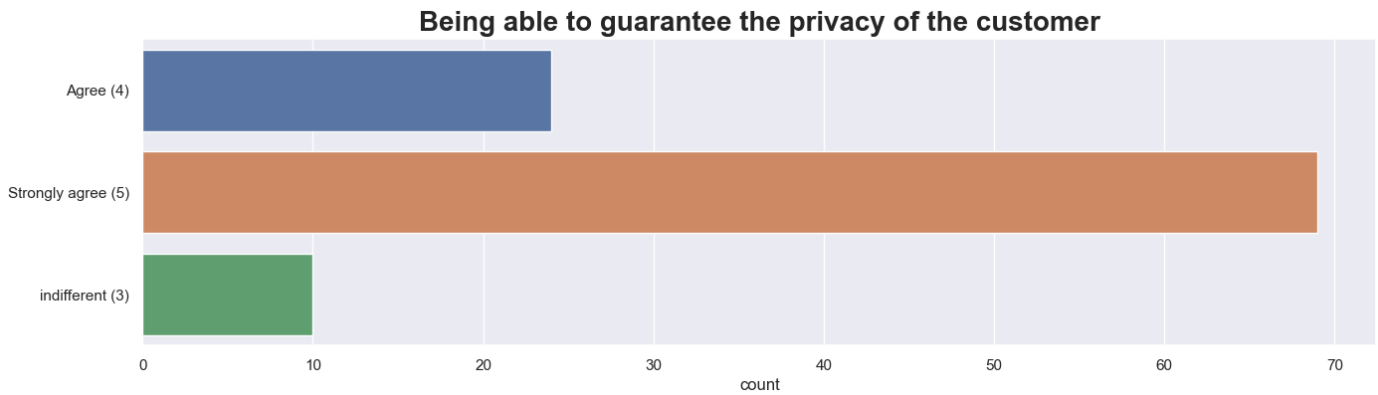

Loading and processing speed
Strongly disagree (1)
Strongly agree (5)
Agree (4)
Dis-agree (2)
Indifferent (3)
0
10
20
30
40
count

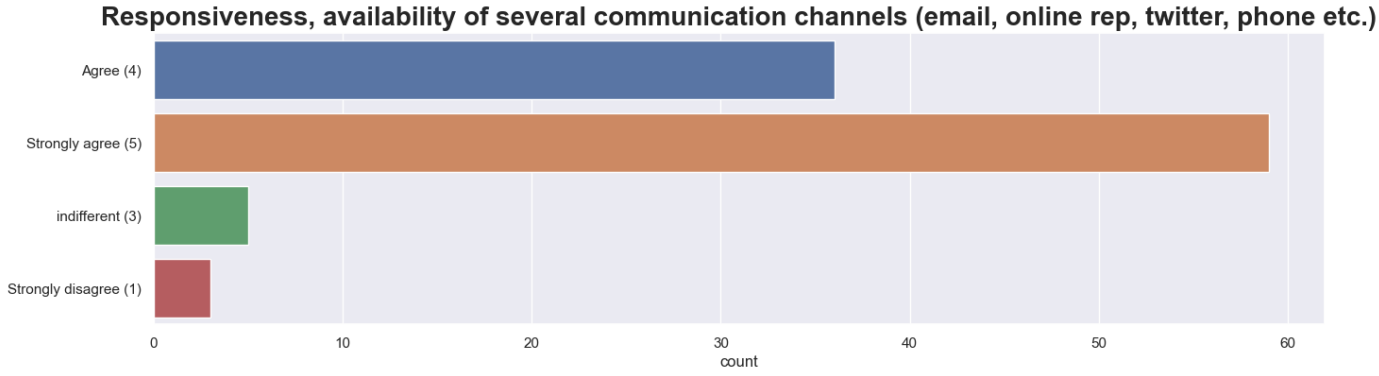

User friendly Interface of the website
Dis-agree (2)
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Indifferent (3)
0
10
20
30
40
50
60
70
count

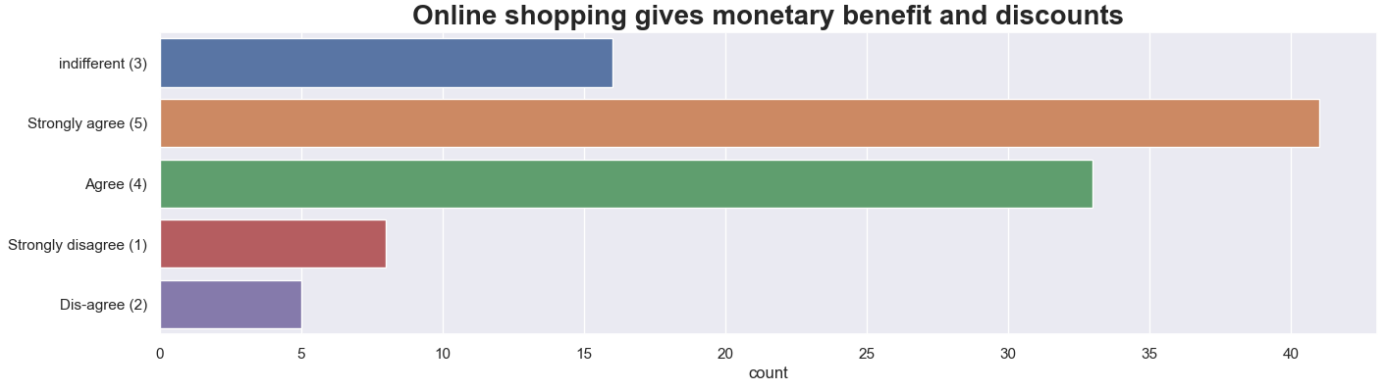

Convenient Payment methods
Dis-agree (2)
Strongly agree (5)
Agree (4)
0
10
20
30
40
50
60
count

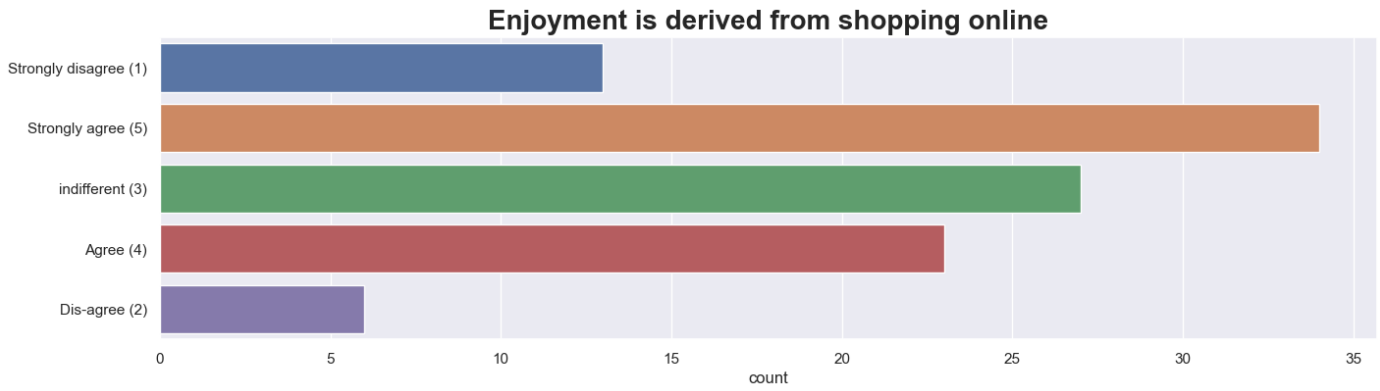

Trust that the online retail store will fulfill its part of the transaction at the stipulated time
Disagree (2)
Strongly agree (5)
Agree (4)
indifferent (3)
0
10
20
30
40
50
count


Empathy (readiness to assist with queries) towards the customers
Strongly agree (5)
Agree (4)
Strongly disagree (1)
indifferent (3)
0
10
20
30
40
50
60
70
count

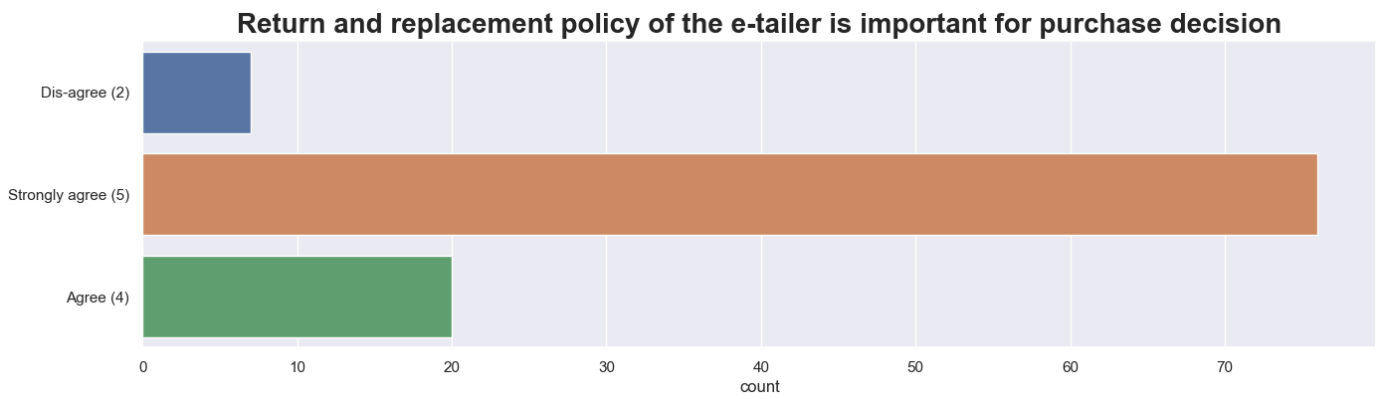

Being able to guarantee the privacy of the customer
Agree (4)
Strongly agree (5)
indifferent (3)
0
10
20
30
40
50
60
70
count

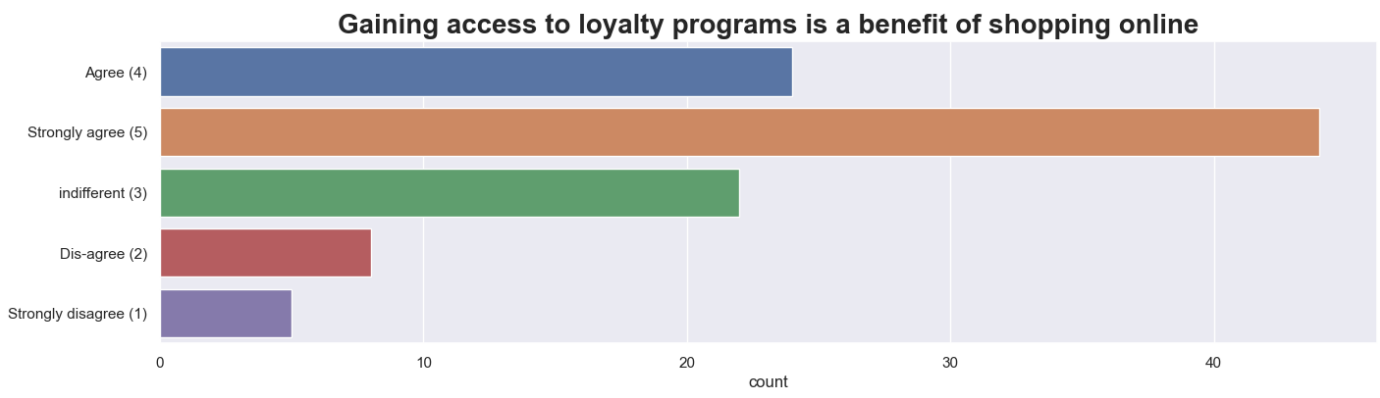

Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
Agree (4)
Strongly agree (5)
indifferent (3)
Strongly disagree (1)
0
10
20
30
40
50
60
count

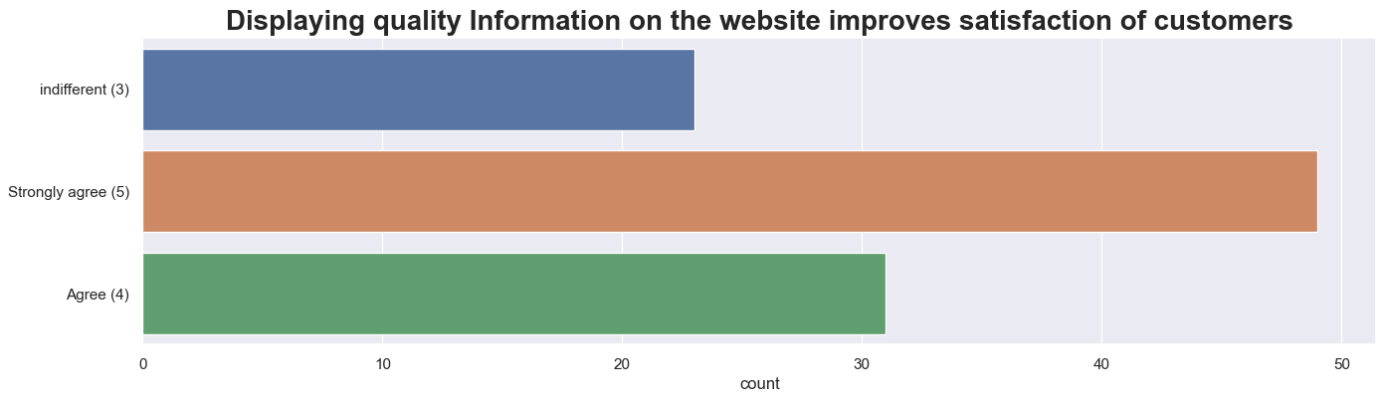

Online shopping gives monetary benefit and discounts
indifferent (3)
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Dis-agree (2)
0
5
10
15
20
25
30
35
40
count

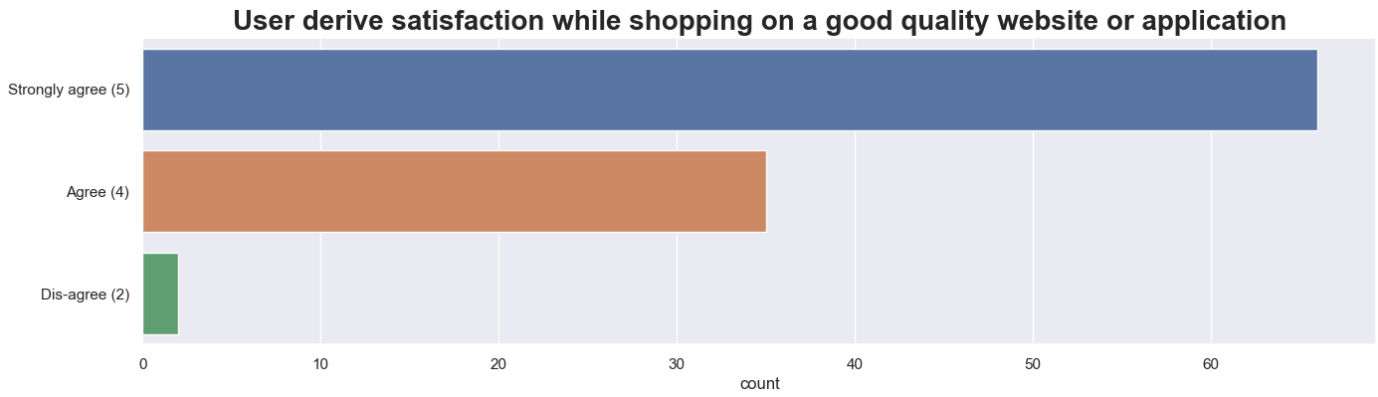

Enjoyment is derived from shopping online
Strongly disagree (1)
Strongly agree (5)
indifferent (3)
Agree (4)
Dis-agree (2)
0
5
10
15
20
25
30
35
count

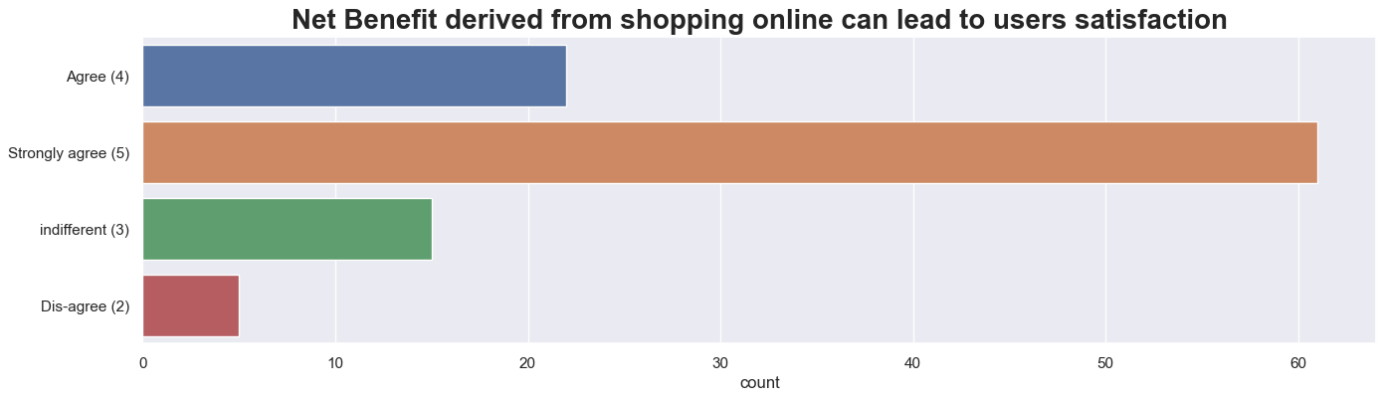
Shopping online is convenient and flexible
Dis-agree (2)
Strongly agree (5)
indifferent (3)
Agree (4)
0
10
20
30
40
50
count

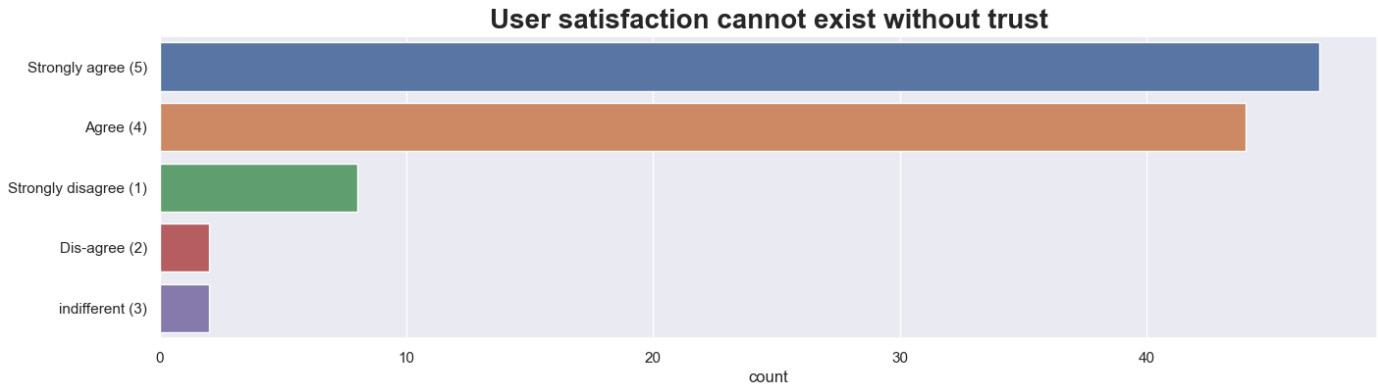

Return and replacement policy of the e-tailer is important for purchase decision
Dis-agree (2)
Strongly agree (5)
Agree (4)
0
10
20
30
40
50
60
70
count

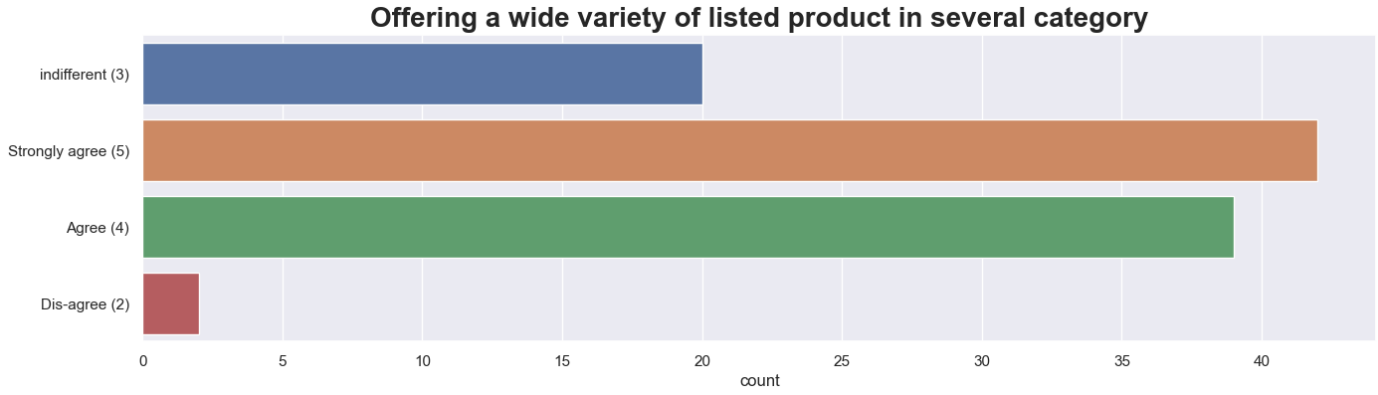

Gaining access to loyalty programs is a benefit of shopping online
Agree (4)
Strongly agree (5)
indifferent (3)
Dis-agree (2)
Strongly disagree (1)
0
10
20
30
40
count

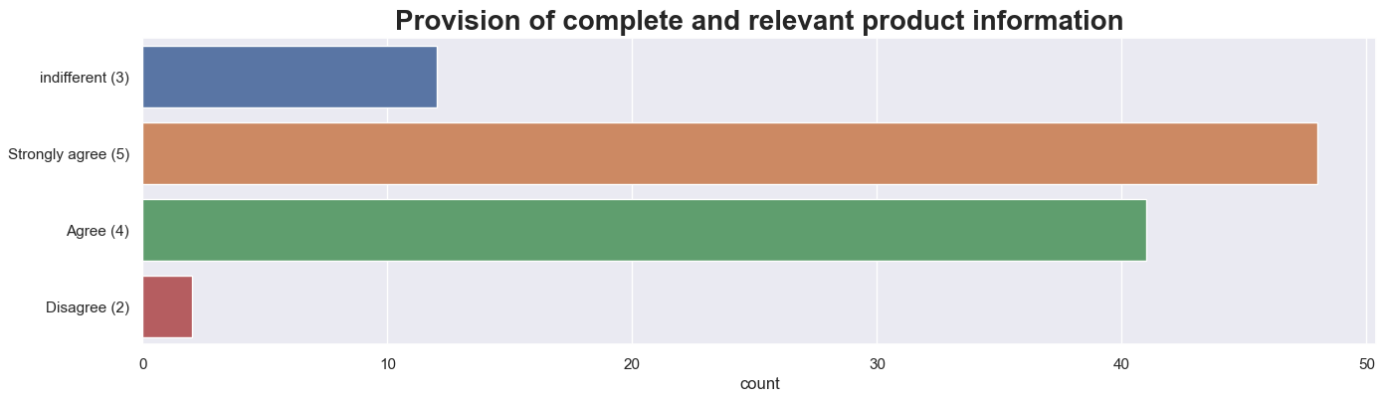

Displaying quality Information on the website improves satisfaction of customers
indifferent (3)
Strongly agree (5)
Agree (4)
0
10
20
30
40
50
count

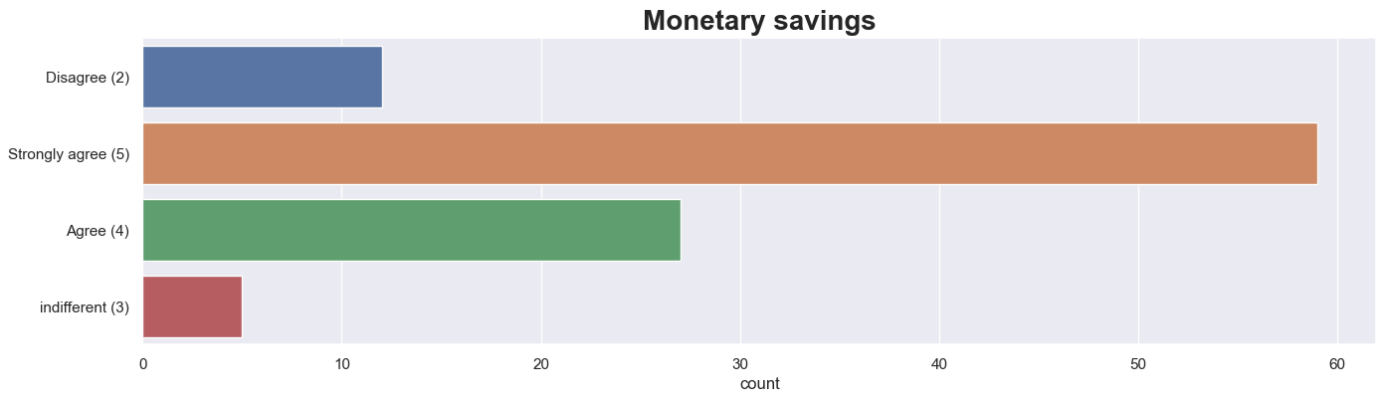

User derive satisfaction while shopping on a good quality website or application
Strongly agree (5)
Agree (4)
Dis-agree (2)
0
10
20
30
40
50
60
count

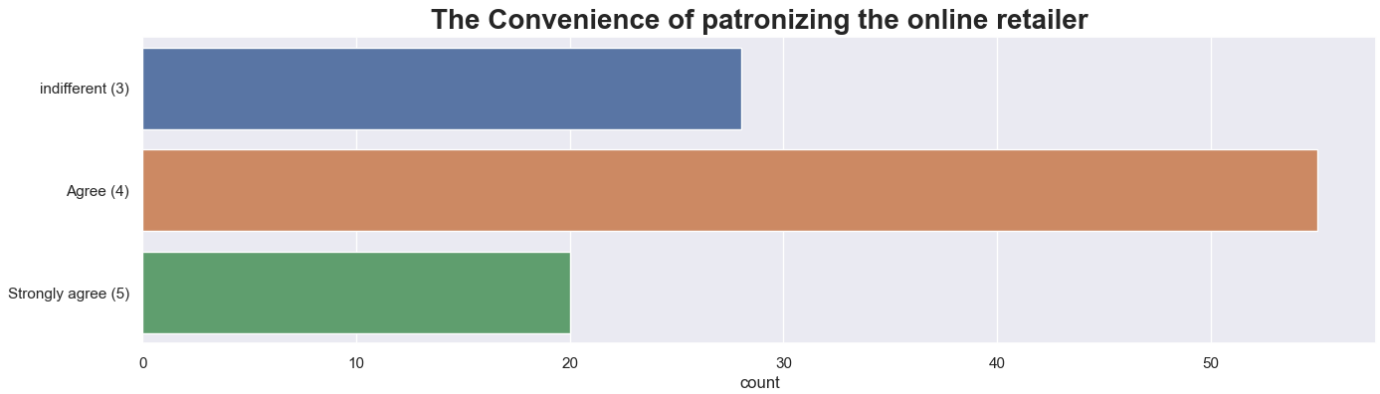

Net Benefit derived from shopping online can lead to users satisfaction
Agree (4)
Strongly agree (5)
indifferent (3)
Dis-agree (2)
0
10
20
30
40
50
60
count

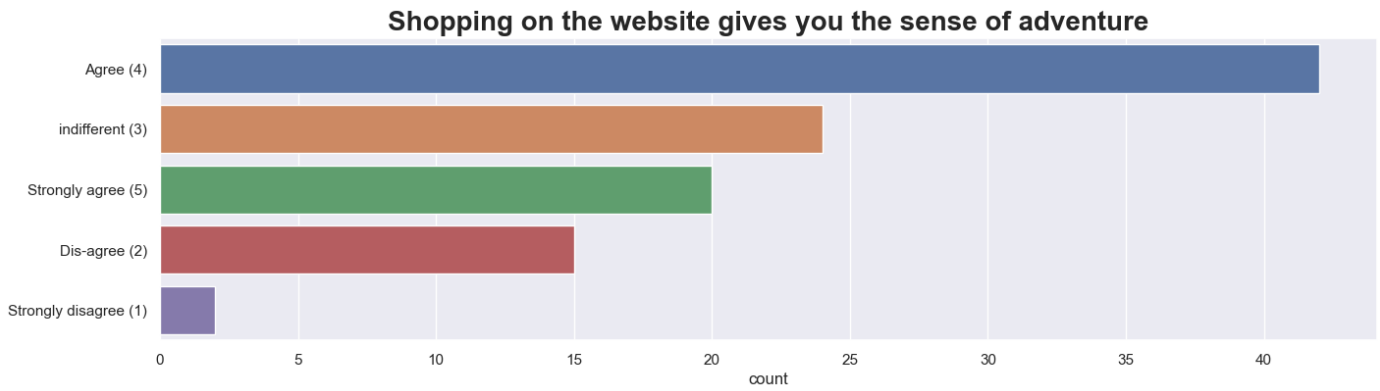

User satisfaction cannot exist without trust
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Dis-agree (2)
indifferent (3)
0
10
20
30
40
count

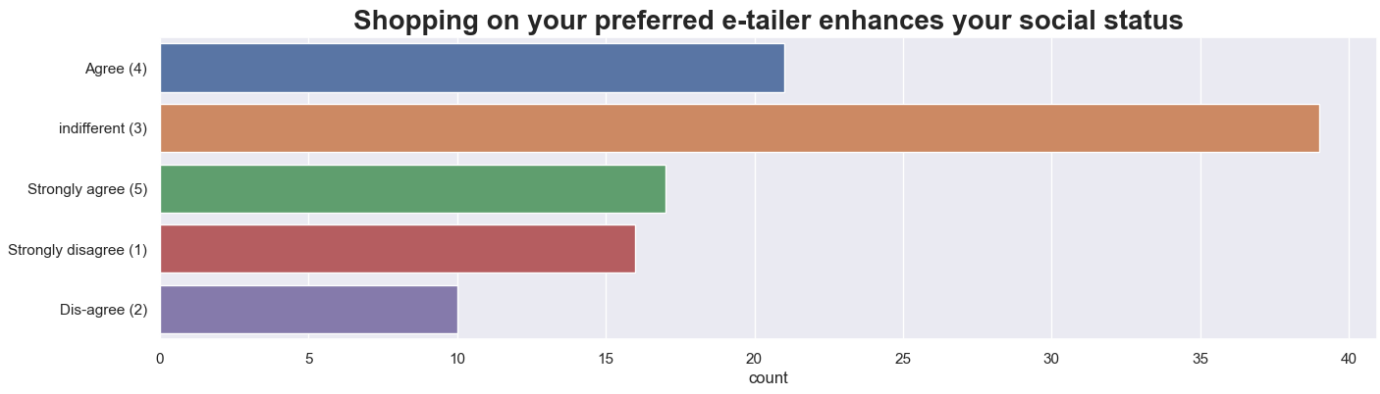

Offering a wide variety of listed product in several category
indifferent (3)
Strongly agree (5)
Agree (4)
Dis-agree (2)
0
5
10
15
20
25
30
35
40
count

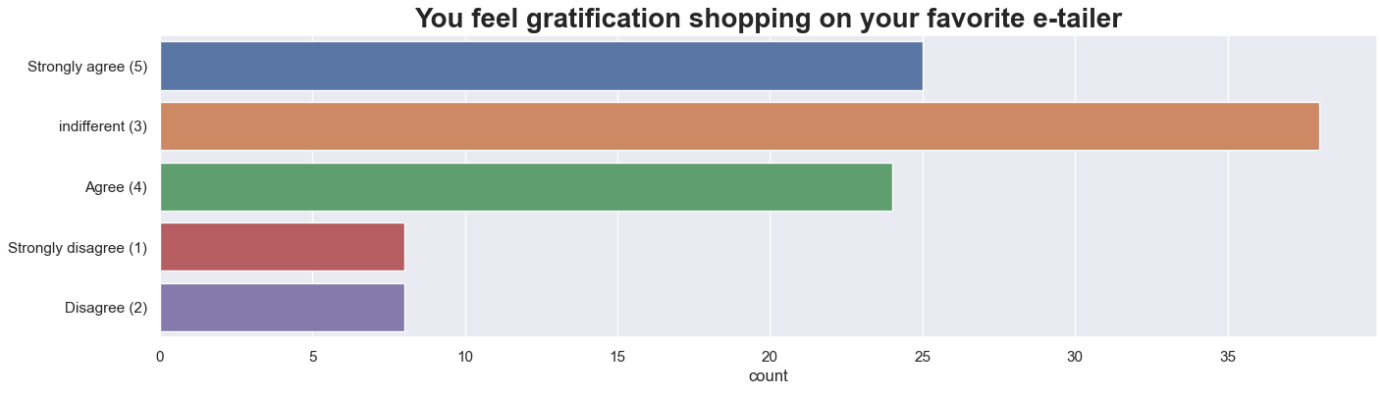

Provision of complete and relevant product information
indifferent (3)
Strongly agree (5)
Agree (4)
Disagree (2)
0
10
20
30
40
50
count

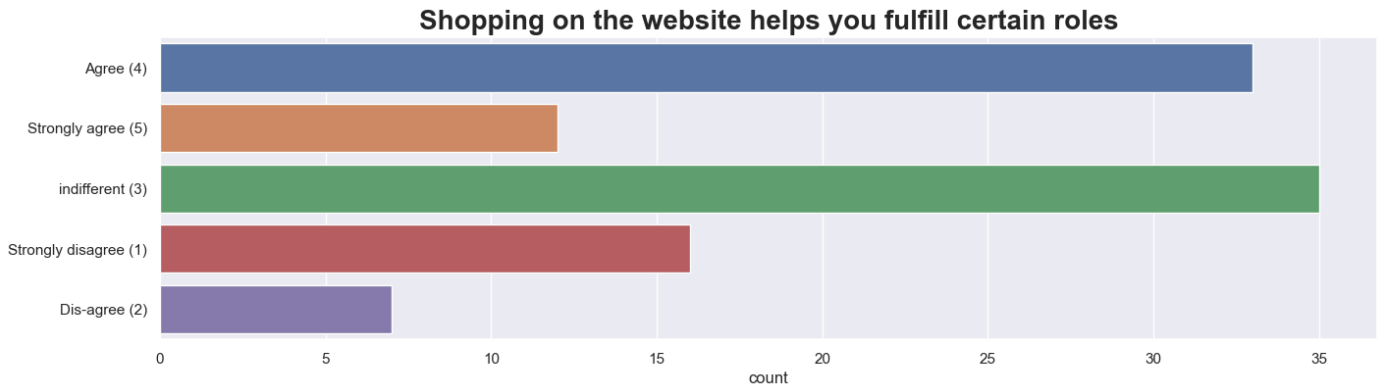

Monetary savings
Disagree (2)
Strongly agree (5)
Agree (4)
indifferent (3)
0
10
20
30
40
50
60
count

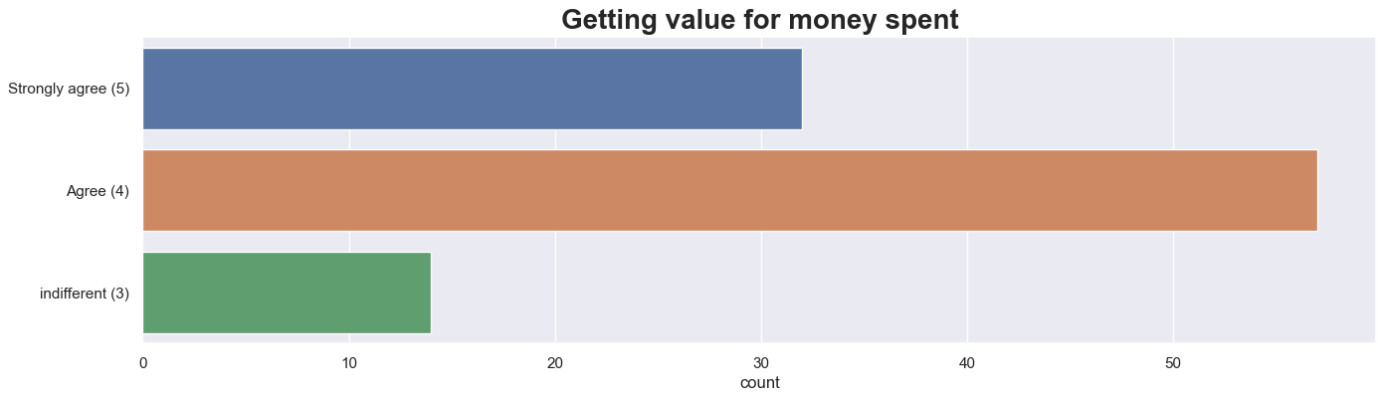

The Convenience of patronizing the online retailer
indifferent (3)
Agree (4)
Strongly agree (5)
0
10
20
30
40
50
count


Shopping on the website gives you the sense of adventure
Agree (4)
indifferent (3)
Strongly agree (5)
Dis-agree (2)
Strongly disagree (1)
0
5
10
15
20
25
30
35
40
count


Shopping on your preferred e-tailer enhances your social status
Agree (4)
indifferent (3)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
0
5
10
15
20
25
30
35
40
count


You feel gratification shopping on your favorite e-tailer
Strongly agree (5)
indifferent (3)
Agree (4)
Strongly disagree (1)
Disagree (2)
0
5
10
15
20
25
30
35
count





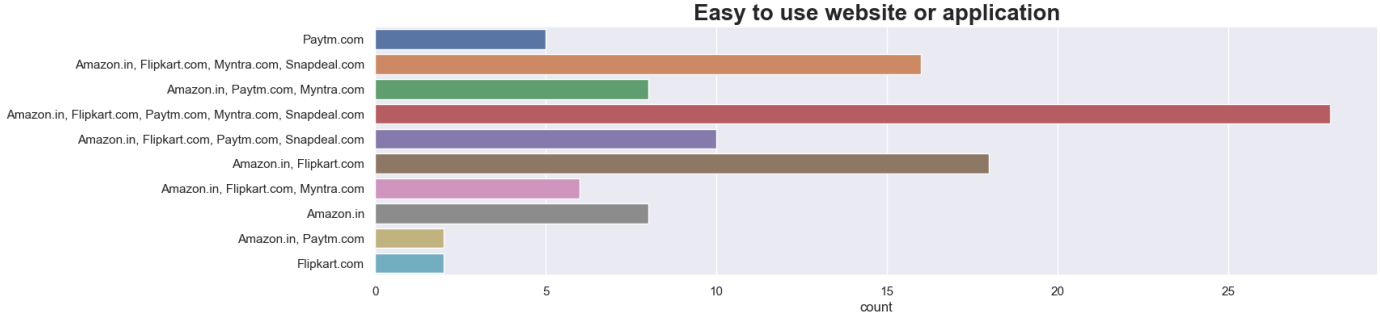
Conclusions

1. Most people agree that comparision of similar products is a importnat feature.
2. Clearly stated and Complete information of product and seller is important for people.
3. It is a fact that ease of navigation and speedy processing is one of the necessary features for any platform as no one wants to waste their valuable time waiting or researching.
4. User friendly interface and conveninent payment method is very important for people.
5. Most of the customers agree that trust and Customer servce is very important.
6. 75% people agree that online shopping gives them monetary benefits and discounts and is very convenient while more than 50% people shop online for enjoyment and adventure.
7. 80% coustomers derive satisfaction shopping on a good quality website which gives them monetory benefits.
8. 90% customers prefer a product with good return and replacement policy.
9. Most people are indifferent with the feeling of gratification or sense of preference for their favourite e tailor.
10. Value for money is a very important parameter for most of the customers.

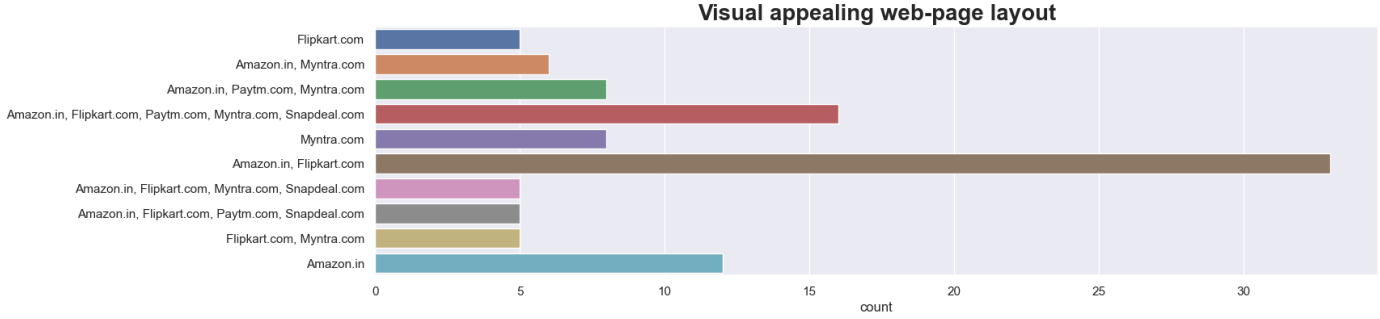
Site related Polls

In [28]:
```
for i in df.columns[48:]:
    a=sns.countplot(data=df,y=i)
    a.set_title(i,fontsize=20,fontweight ='bold')
    a.set_ylabel("")
    plt.show()
```

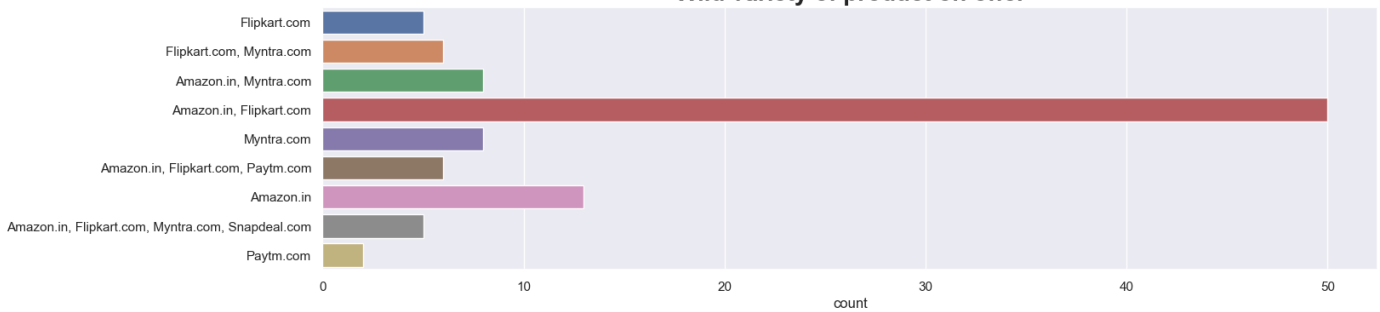
Easy to use website or application



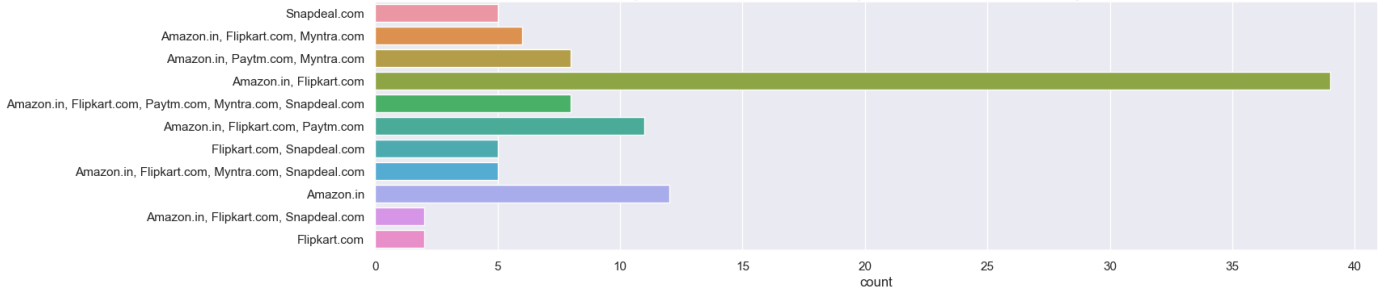
Visual appealing web-page layout



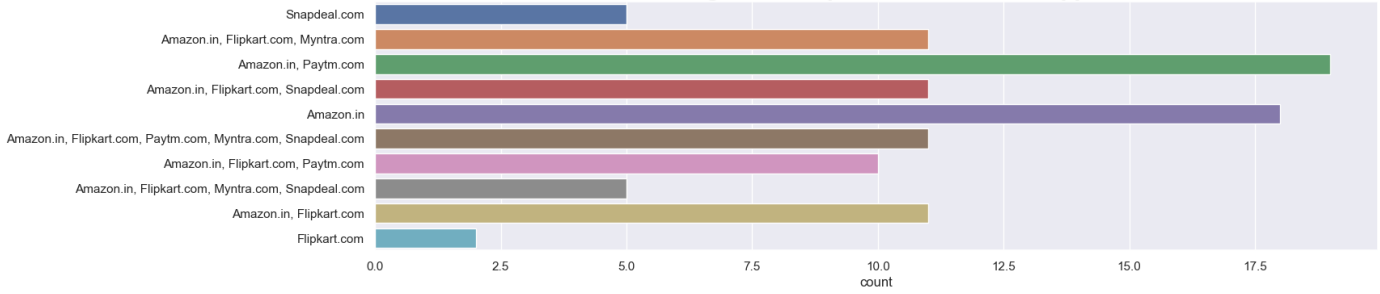
Wild variety of product on offer



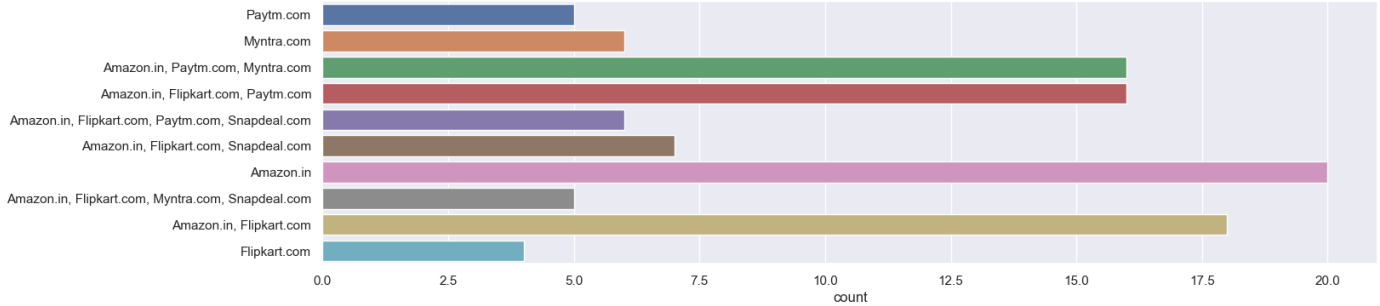
Complete, relevant description information of products



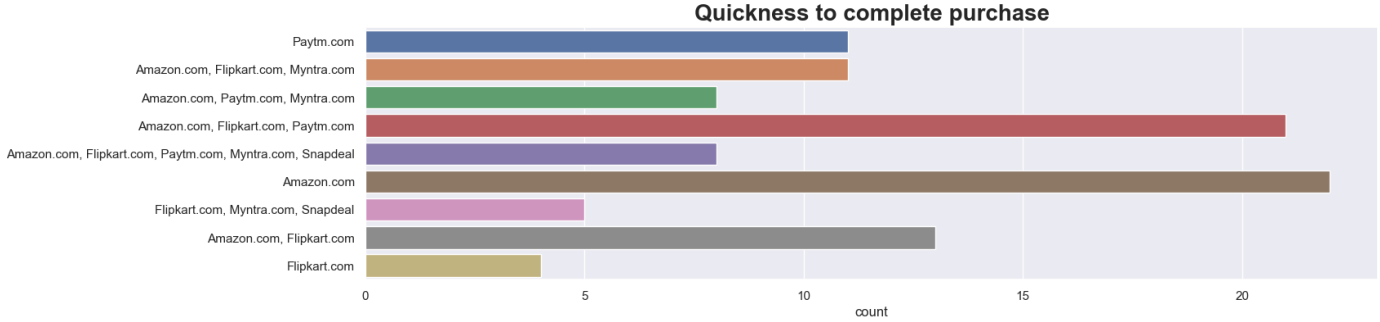
Fast loading website speed of website and application



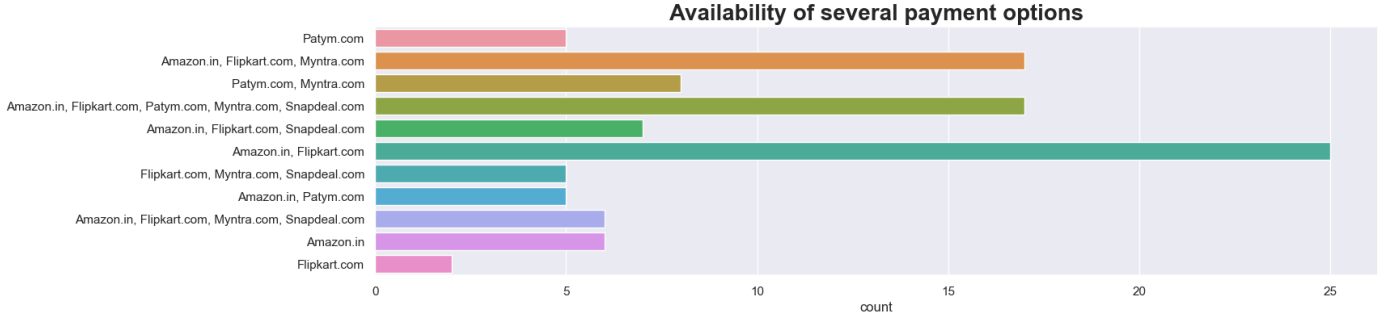
Reliability of the website or application



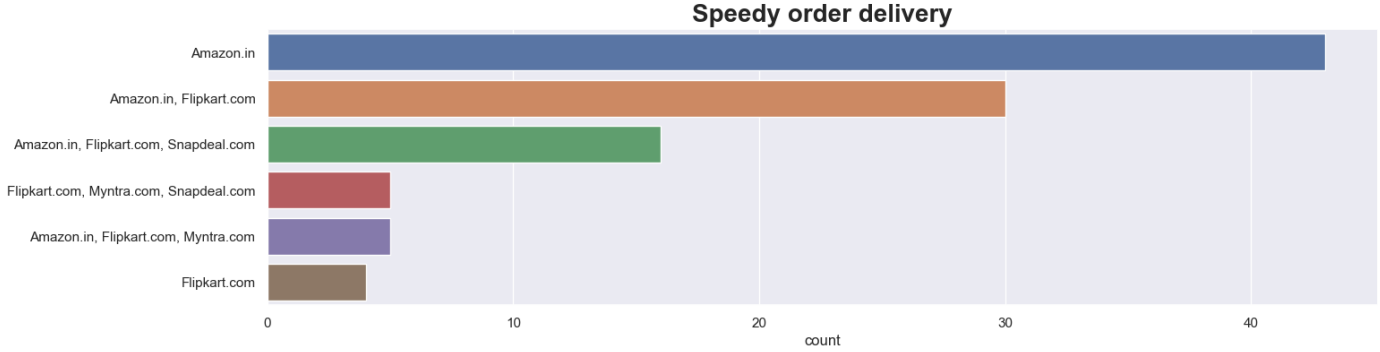
Quickness to complete purchase



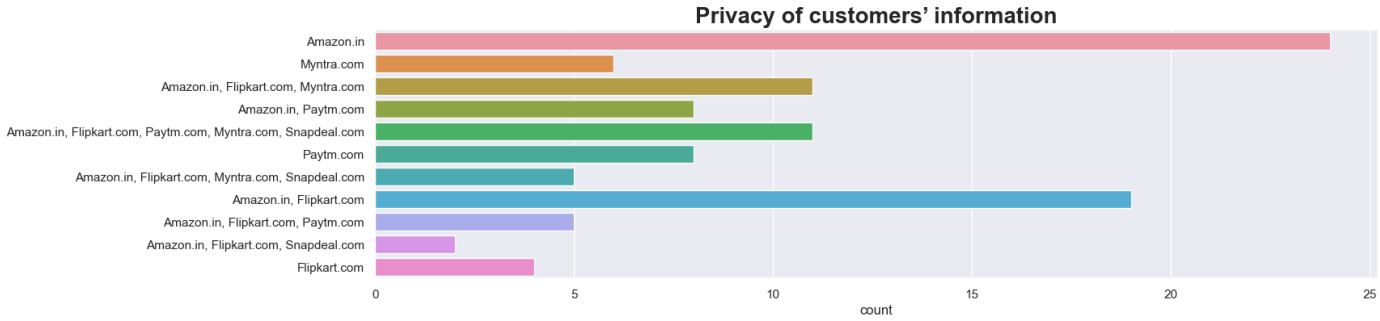
Availability of several payment options



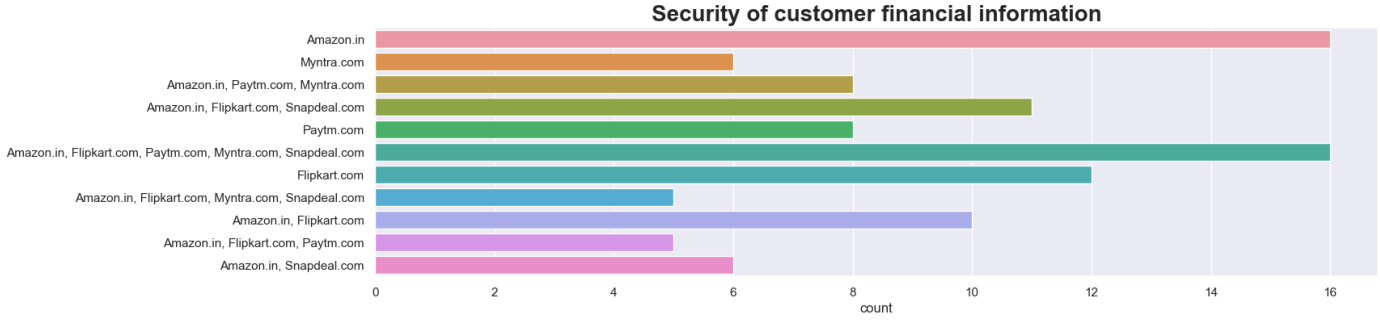
Speedy order delivery



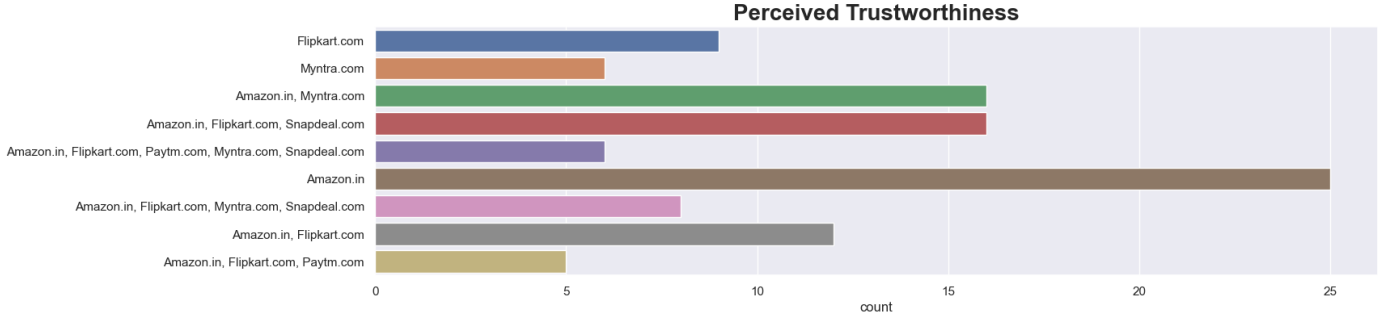
Privacy of customers' information

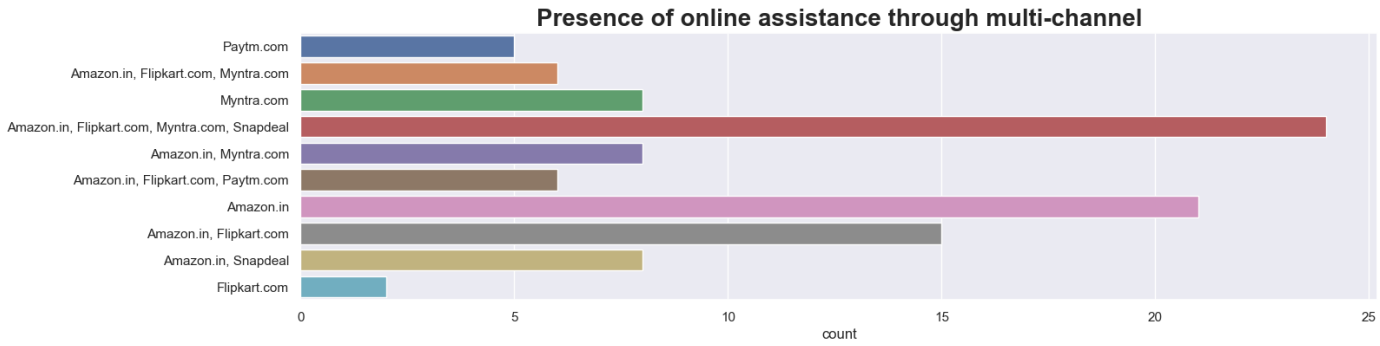


Security of customer financial information



Perceived Trustworthiness




Presence of online assistance through multi-channel
Paytm.com
Amazon.in, Flipkart.com, Myntra.com
Myntra.com
Amazon.in, Flipkart.com, Myntra.com, Snapdeal
Amazon.in, Myntra.com
Amazon.in, Flipkart.com, Paytm.com
Amazon.in
Amazon.in, Flipkart.com
Amazon.in, Snapdeal
Flipkart.com
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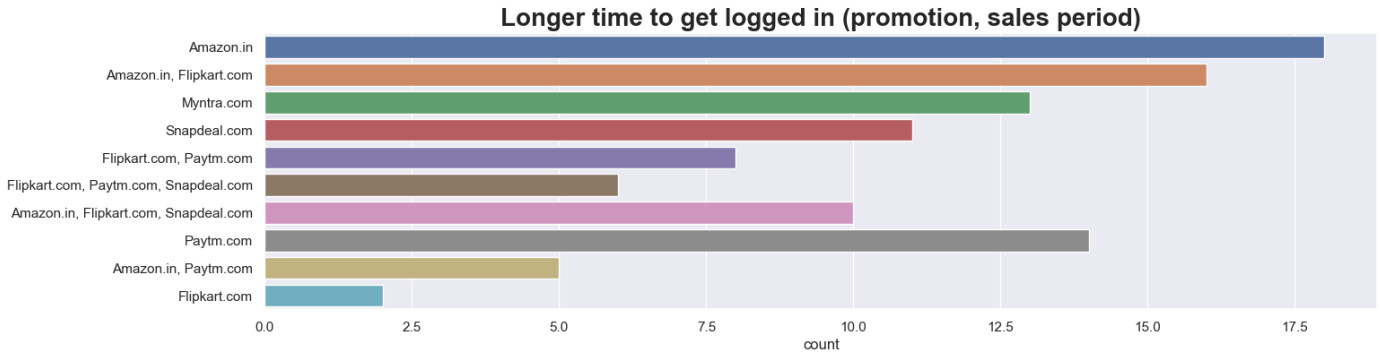
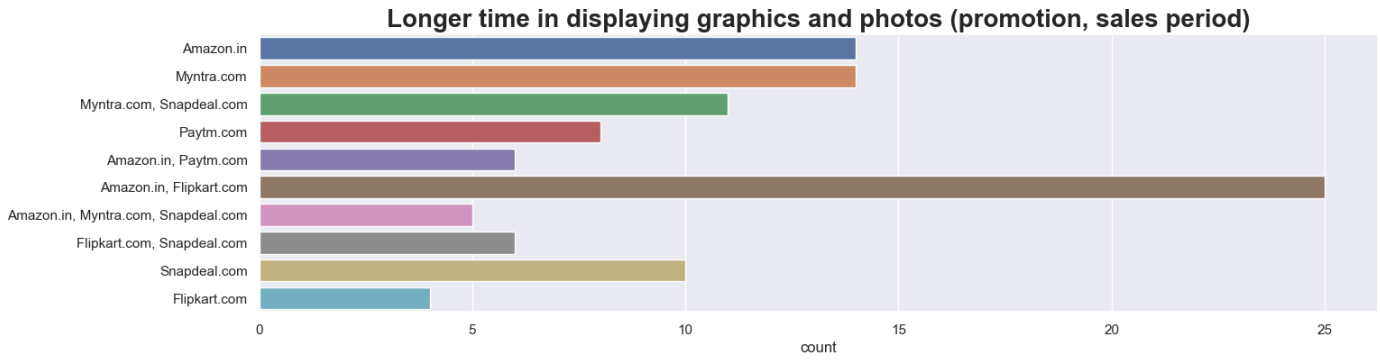
25
count


Longer time to get logged in (promotion, sales period)
Amazon.in
Amazon.in, Flipkart.com
Myntra.com
Snapdeal.com
Flipkart.com, Paytm.com
Flipkart.com, Paytm.com, Snapdeal.com
Amazon.in, Flipkart.com, Snapdeal.com
Paytm.com
Amazon.in, Paytm.com
Flipkart.com
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
count


Longer time in displaying graphics and photos (promotion, sales period)
Amazon.in
Myntra.com
Myntra.com, Snapdeal.com
Paytm.com
Amazon.in, Paytm.com
Amazon.in, Flipkart.com
Amazon.in, Myntra.com, Snapdeal.com
Flipkart.com, Snapdeal.com
Snapdeal.com
Flipkart.com
0
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15
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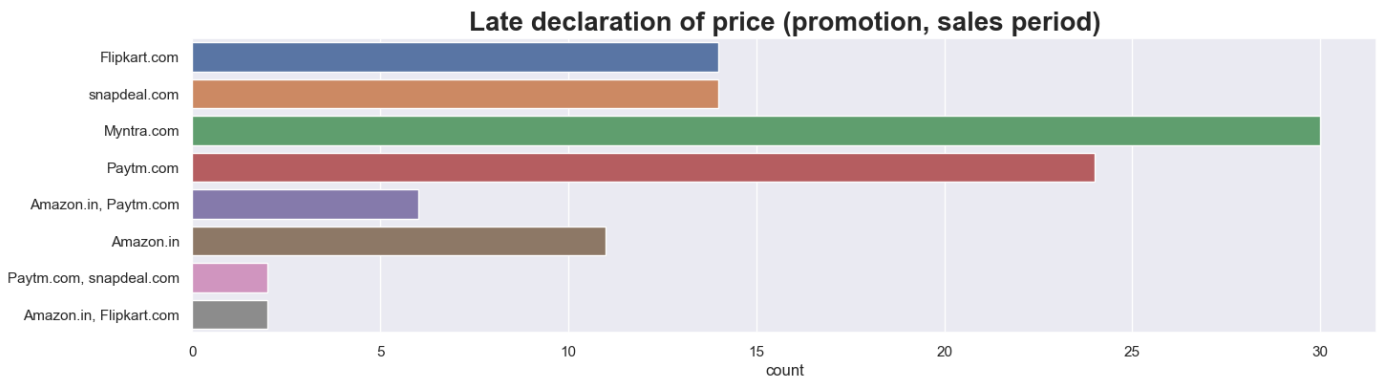
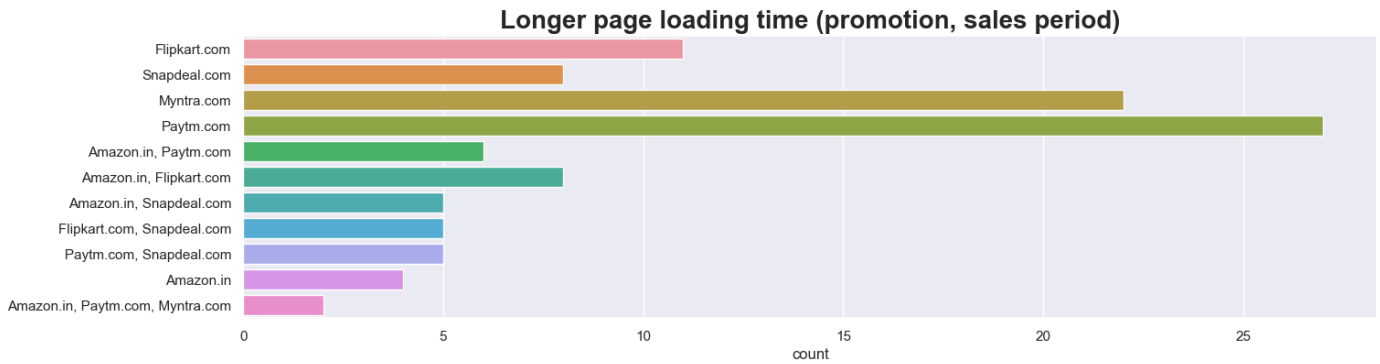
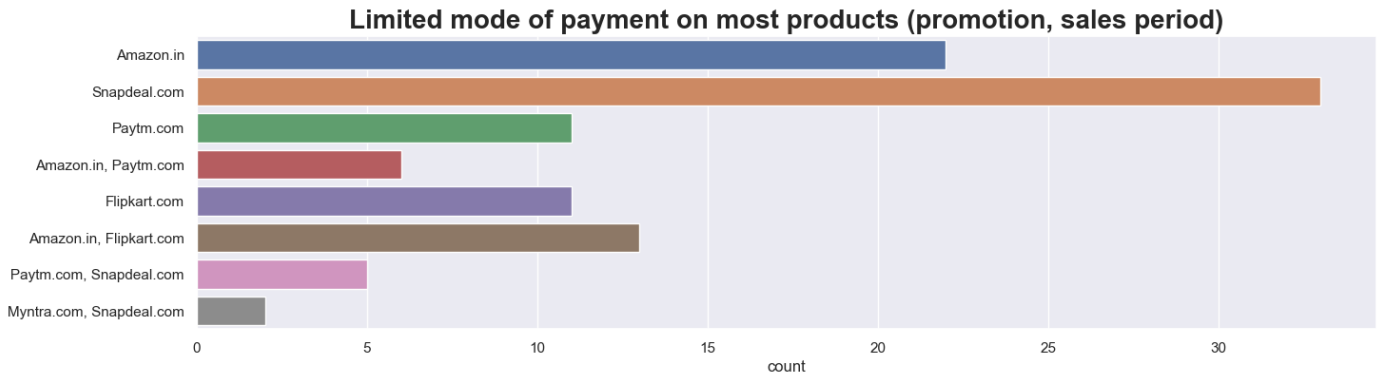
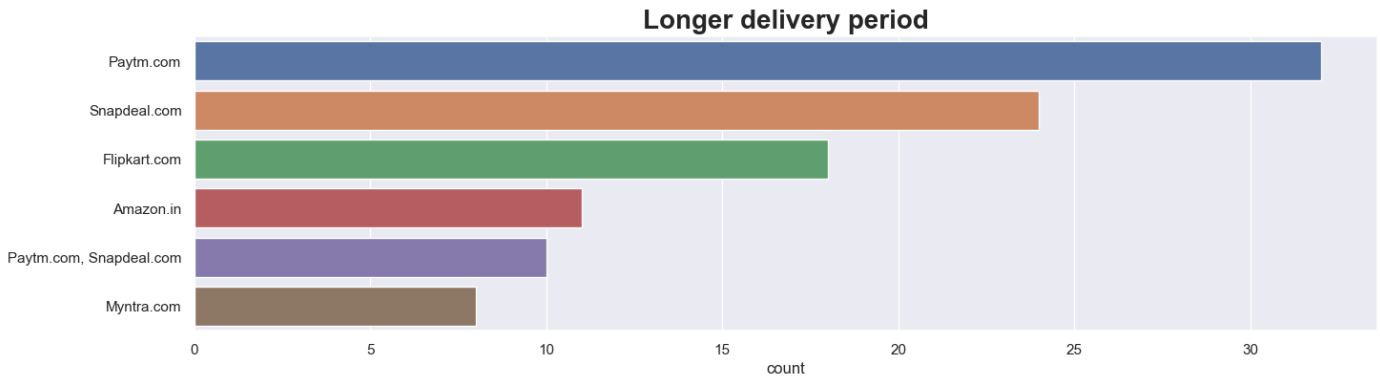
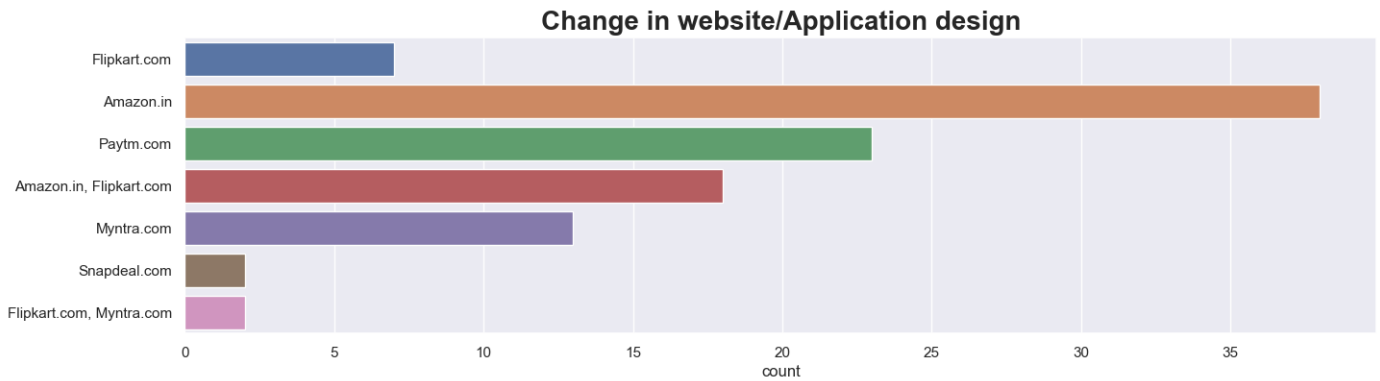
25
count

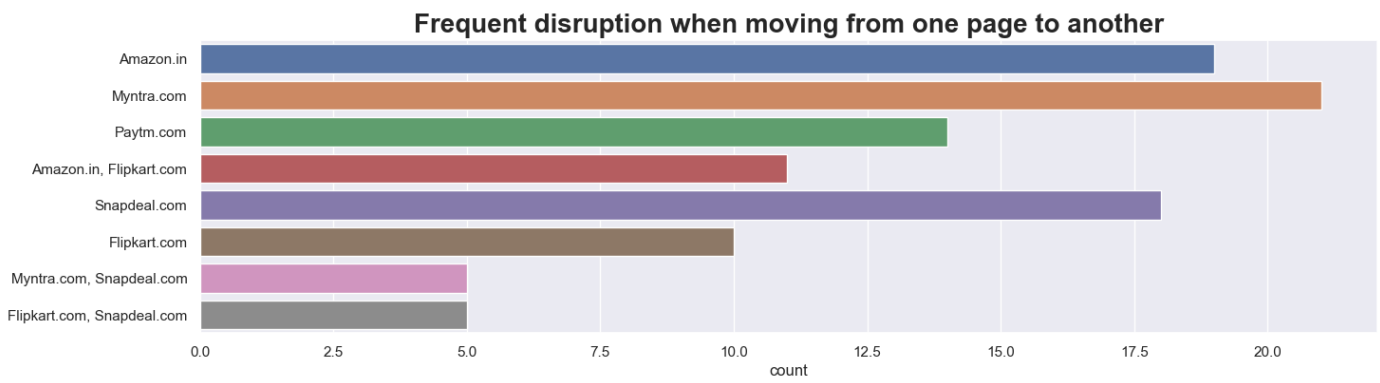

Late declaration of price (promotion, sales period)
Flipkart.com
snapdeal.com
Myntra.com
Paytm.com
Amazon.in, Paytm.com
Amazon.in
Paytm.com, snapdeal.com
Amazon.in, Flipkart.com
0
5
10
15
20
25
30
count

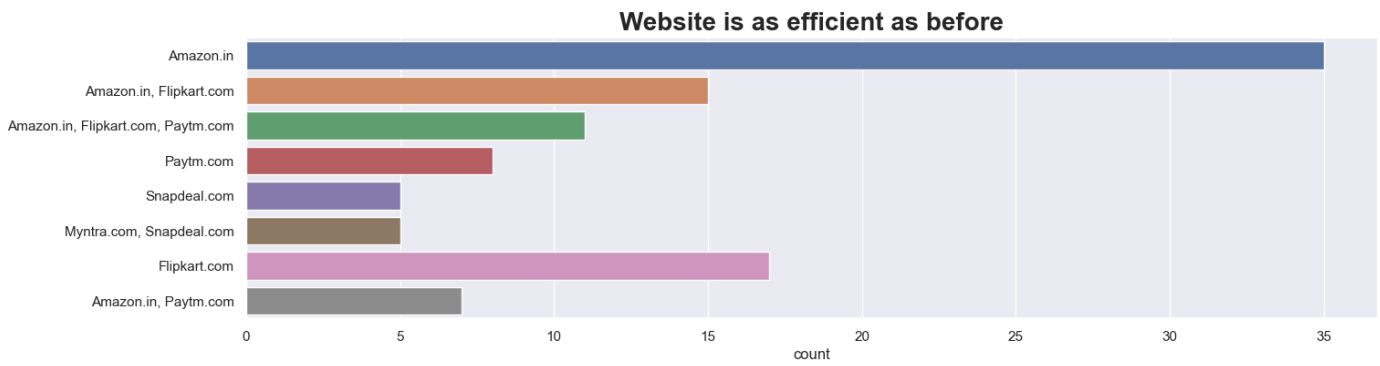

Longer page loading time (promotion, sales period)
Flipkart.com
Snapdeal.com
Myntra.com
Paytm.com
Amazon.in, Paytm.com
Amazon.in, Flipkart.com
Amazon.in, Snapdeal.com
Flipkart.com, Snapdeal.com
Paytm.com, Snapdeal.com
Amazon.in
Amazon.in, Paytm.com, Myntra.com
0
5
10
15
20
25
count

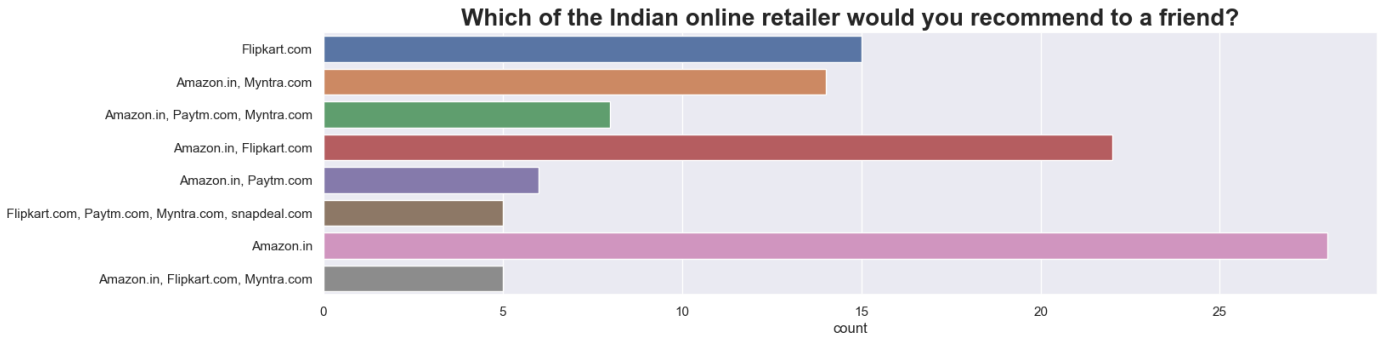

Limited mode of payment on most products (promotion, sales period)
Amazon.in
Snapdeal.com
Paytm.com
Amazon.in, Paytm.com
Flipkart.com
Amazon.in, Flipkart.com
Paytm.com, Snapdeal.com
Myntra.com, Snapdeal.com
0
5
10
15
20
25
30
count


Longer delivery period
Paytm.com
Snapdeal.com
Flipkart.com
Amazon.in
Paytm.com, Snapdeal.com
Myntra.com
0
5
10
15
20
25
30
count


Change in website/Application design
Flipkart.com
Amazon.in
Paytm.com
Amazon.in, Flipkart.com
Myntra.com
Snapdeal.com
Flipkart.com, Myntra.com
0
5
10
15
20
25
30
35
count


Frequent disruption when moving from one page to another
Amazon.in
Myntra.com
Paytm.com
Amazon.in, Flipkart.com
Snapdeal.com
Flipkart.com
Myntra.com, Snapdeal.com
Flipkart.com, Snapdeal.com
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
count


Website is as efficient as before
Amazon.in
Amazon.in, Flipkart.com
Amazon.in, Flipkart.com, Paytm.com
Paytm.com
Snapdeal.com
Myntra.com, Snapdeal.com
Flipkart.com
Amazon.in, Paytm.com
0
5
10
15
20
25
30
35
count



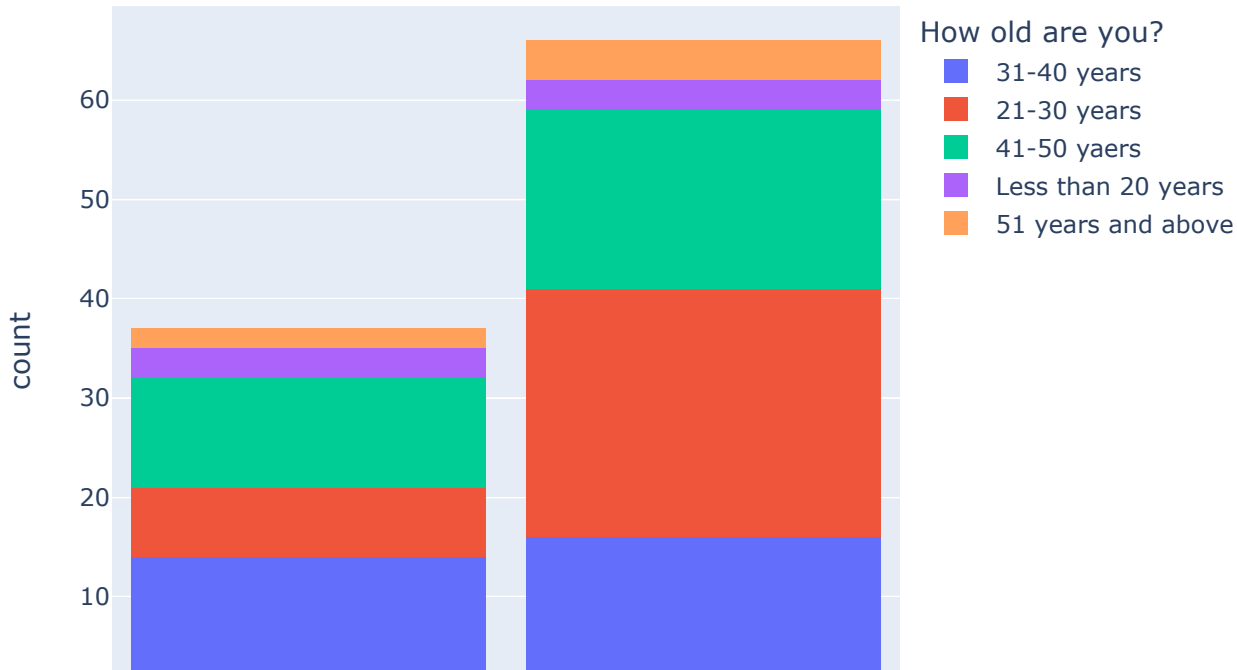
Colclusions

1. Easiest and most attractive online shopping websites/applications are Amazon.in, Flipkart.com and Myntra.com
2. Late declaration of price and more pege loading time : Myntra , Snapdeal and Paytm
3. Limited mode of payment : Snapdeal.com and Amazon.in (need to check it)
4. Longer delivery period: Paytm.com ,Snapdeal and FlipKart.com
5. Frequent disruption when moving to another page: Myntra and Snapdeal

Bivariate Analysis

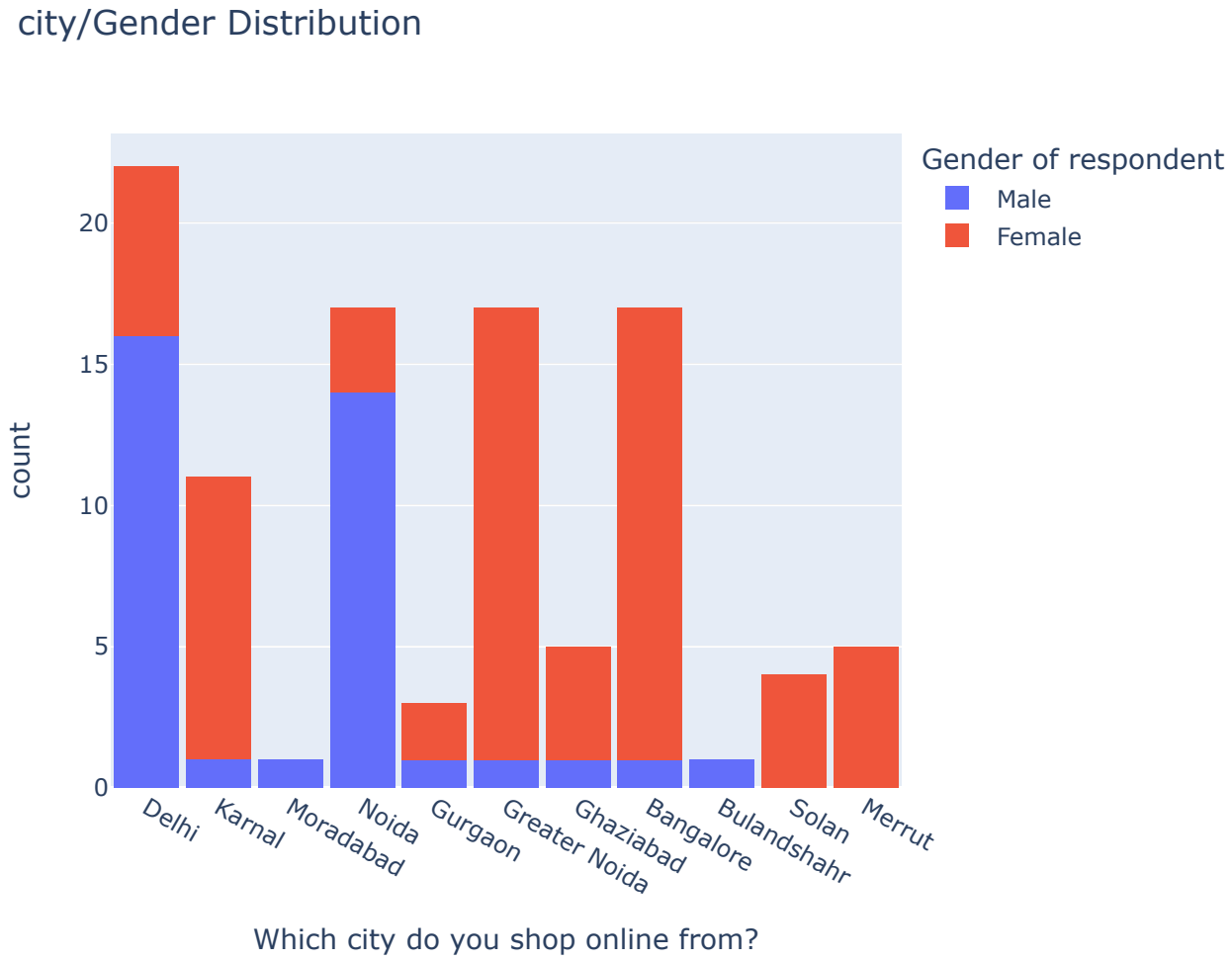
Gender and Age

In [29]:
```
fig=px.histogram(df,x='Gender of respondent',color='How old are you?',title='Gendr/Age D
fig.update_layout(bargap=0.1)
fig.show()
```



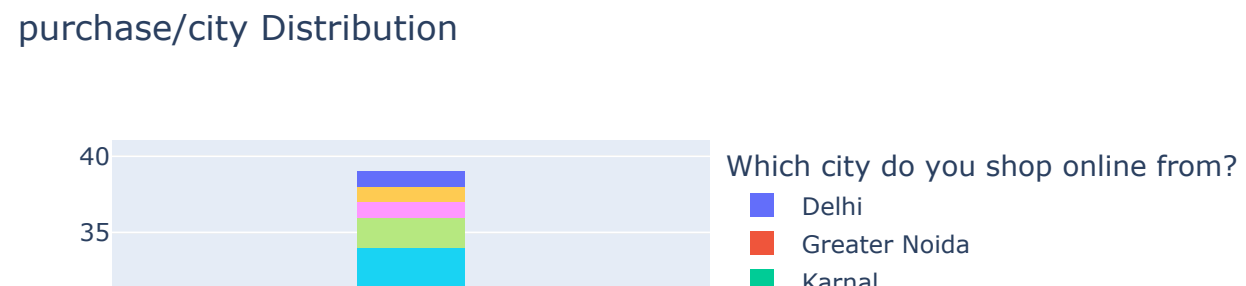
Gender and city

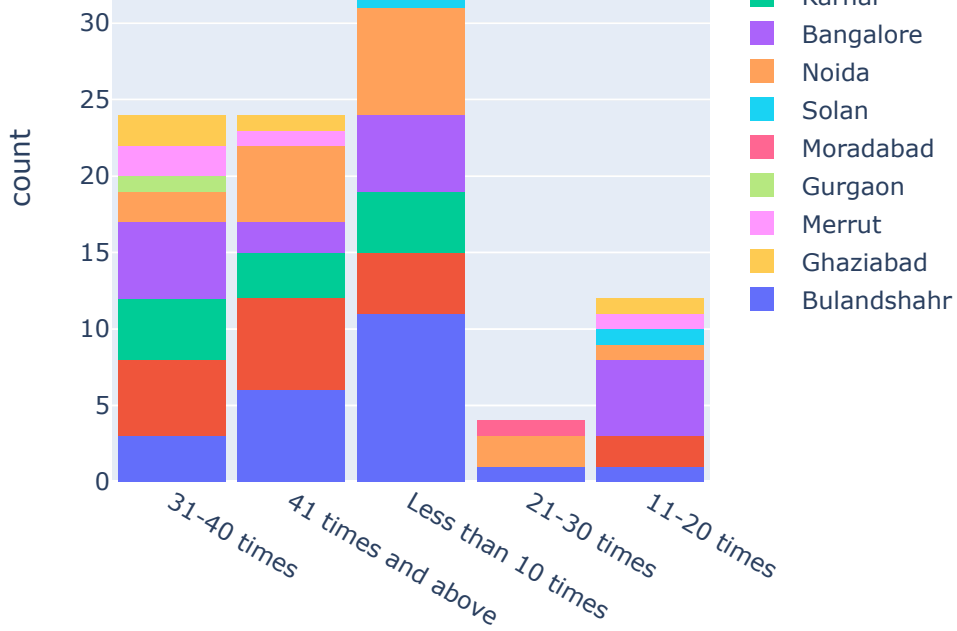
In [30]:
```
fig=px.histogram(df,x='Which city do you shop online from?',color='Gender of respondent'
fig.update_layout(bargap=0.1)
fig.show()
```



purchase last year and city

In [31]:
```
fig=px.histogram(df,x='How many times you have made an online purchase in the past   yea
fig.update_layout(bargap=0.1)
fig.show()
```





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

Observation :

As before womens are shopping more than mens.

(21-30) years @ female are most dominant grouping in shopping while (31-40) years grouping @ mens.

For both gender tendency of shopping is less for age greater than 51 years old

City like Delhi, Male have more tendency of online shopping.

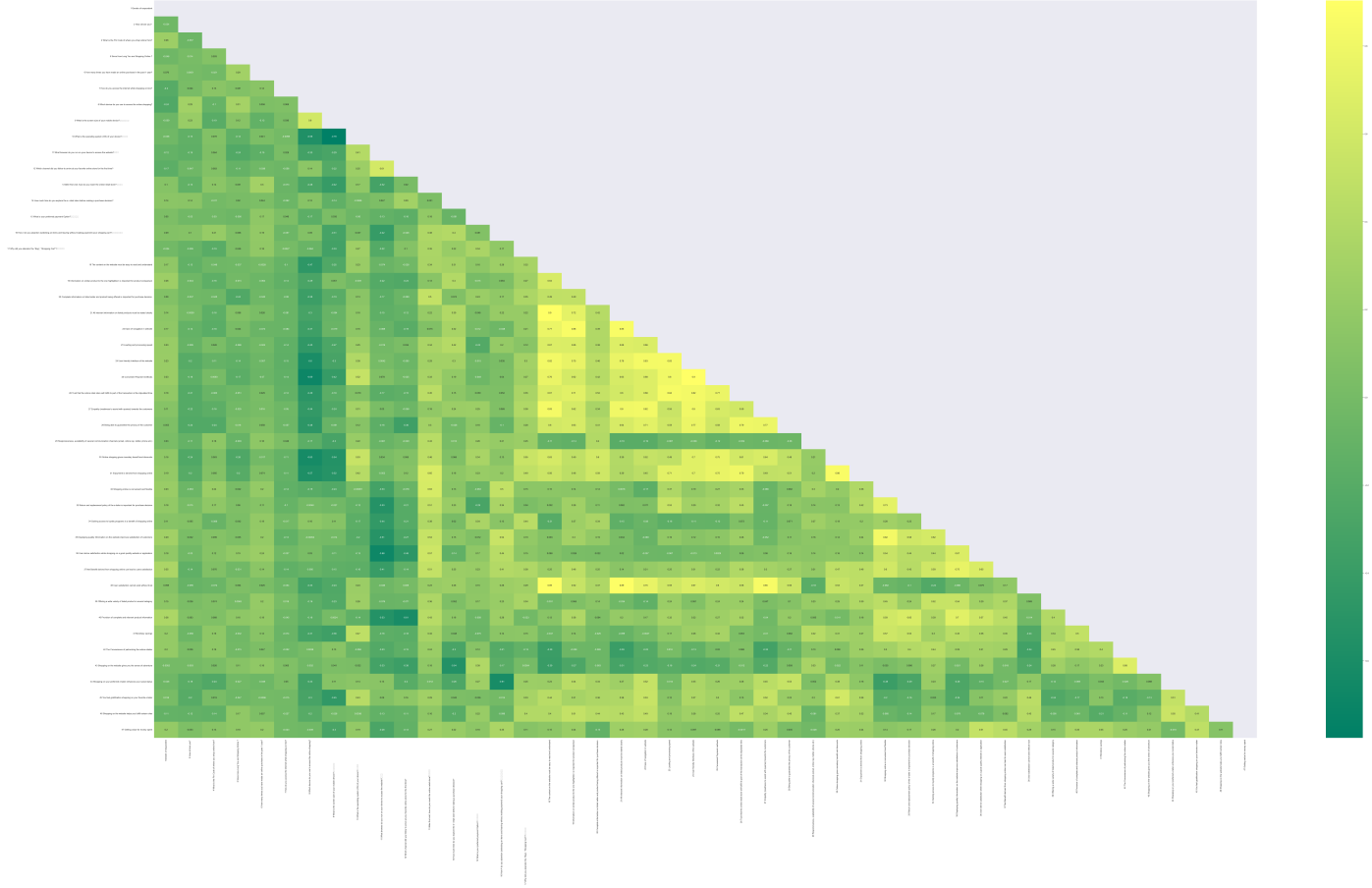
Other Cities Majority of online shopping customers are Females, So can target these customer population in these cities.

Delhi and Nodia cities appear in all the online shopping through the year.

Use this codedsheet file to check correlation

In [32]:
```
df2=pd.read_excel("customer_retention_dataset.xlsx",sheet_name='codedsheet')
```

In [33]:
```
plt.figure(figsize = (130,70))
sns.heatmap(df2.corr(), annot=True,cmap='summer',mask=np.triu(np.ones_like(df2.corr())))
plt.show()
```



It's seems there are alot of Mulicollinarity in the data.

It implies that most of the columns are related to each other and impacts output for each other.

Since all the columns are Categorical features therefor no outliers in the data

In [ ]: