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

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Introduction

Customer satisfaction has emerged as one of the most important factors that guarantee the success of online stores; 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.

Executive Summary:

In this project, a dataset was provided containing the details of the participants of a survey, along with their online shopping experiences, preferences, and opinions regarding various ecommerce websites.

The Dataset was first checked for null values, and then the various feature columns were analysed. Exploratory Data analysis was conducted to investigate the relationships that existed between the columns, using various visualization techniques.

The dataset was worked with to study and understand how various Hedonic values, Utilitarian values in combination with several perceived risks helped to understand Customer retention and loyalty to various ecommerce websites.

About the Dataset:

Loading the dataset

```
In [2]: Df = pd.read_excel('customer_retention_dataset.xlsx')

In [3]: Df.shape
Out[3]: (269, 71)

In [4]: 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\t	...	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)	
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window/windows Mobile	...	Amazon.in	Amazon.in	Flipkart.com	
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	Wi-Fi	Smartphone	4.7 inches	IOS/Mac	...	Amazon.in, Flipkart.com	Myntra.com	snapdeal.com	
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobile Internet	Smartphone	5.5 inches	Android	...	Myntra.com	Myntra.com	Myntra.com	
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	IOS/Mac	...	Snapdeal.com	Myntra.com, Snapdeal.com	Myntra.com	
4	Female	21-30 years	Bangalore	530068	2-3 years	11-20 times	Wi-Fi	Smartphone	4.7 inches	IOS/Mac	...	Flipkart.com, Paytm.com	Paytm.com	Paytm.com	

5 rows × 71 columns

The given dataset consists of 71 columns and 269 rows

The Featured columns are:

'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 1 year?',

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

'Which device do you use to access the online shopping?',

'What is the screen size of your mobile device?',

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

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

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

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

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

' What is your preferred payment Option?',

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

' Why did you abandon the "Bag", "Shopping Cart"?',

' The content on the website must be easy to read and understand',

' Information on similar product to the one highlighted 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 the stipulated time',

' Empathy (readiness to assist with queries) towards the customers',

' Being able to guarantee the privacy of the customer',

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

' Online shopping gives monetary benefit and discounts',

' Enjoyment is derived from shopping online',

' Shopping online is convenient and flexible',

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

' Gaining access to loyalty programs is a benefit of shopping online',

' Displaying quality Information on the website improves satisfaction of customers',

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

' Net Benefit derived from shopping online can lead to users satisfaction',

' User satisfaction cannot exist without trust',

' Offering a wide variety of listed product in several category',

' Provision of complete and relevant product information',

' 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 from',

'Easy to use website or application',

'Visual appealing web-page layout', 'Wild variety of product on offer',

'Complete, relevant description information of products',

'Fast loading website speed of website and application',

'Reliability of the website or application',

'Quickness to complete purchase',

'Availability of several payment options',

'Speedy order delivery ',

'Privacy of customers' information',

'Security of customer financial information',

'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?'

Data Cleaning:

Upon inspecting all the columns in the dataframe, it is observed that none of the columns appear to have any NaN values.

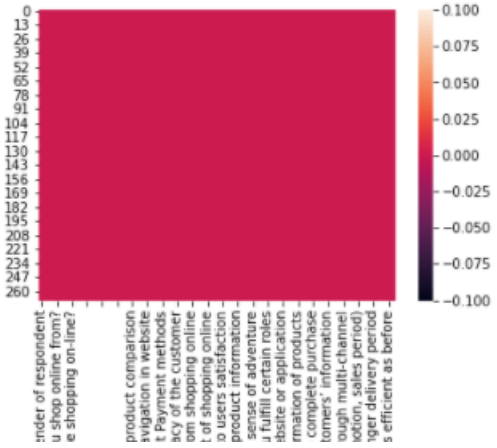
Lets check for the null values

```
In [5]: Df.isnull().sum()
```

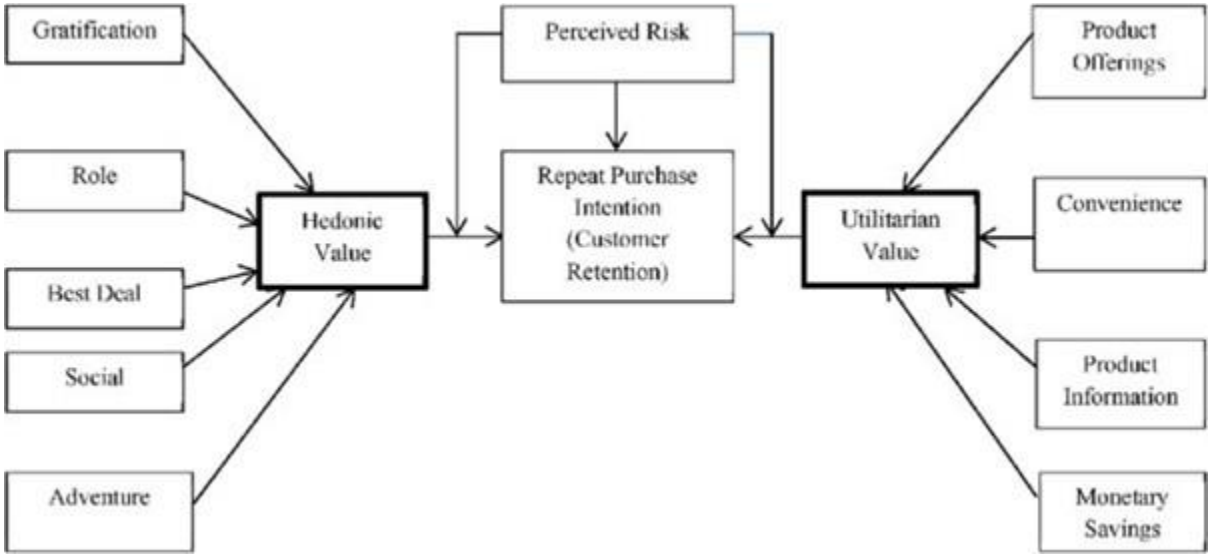
```
Out[5]: 1Gender of respondent                                          0
        2 How old are you?                                            0
        3 Which city do you shop online from?                         0
        4 What is the Pin Code of where you shop online from?         0
        5 Since How Long You are Shopping Online ?                    0
                                                                     ..
        Longer delivery period                                        0
        Change in website/Application design                          0
        Frequent disruption when moving from one page to another      0
        Website is as efficient as before                             0
        Which of the Indian online retailer would you recommend to a friend?    0
        Length: 71, dtype: int64
```

```
In [6]: sns.heatmap(Df.isnull())
```

```
Out[6]: <AxesSubplot:>
```



Exploratory Data Analysis



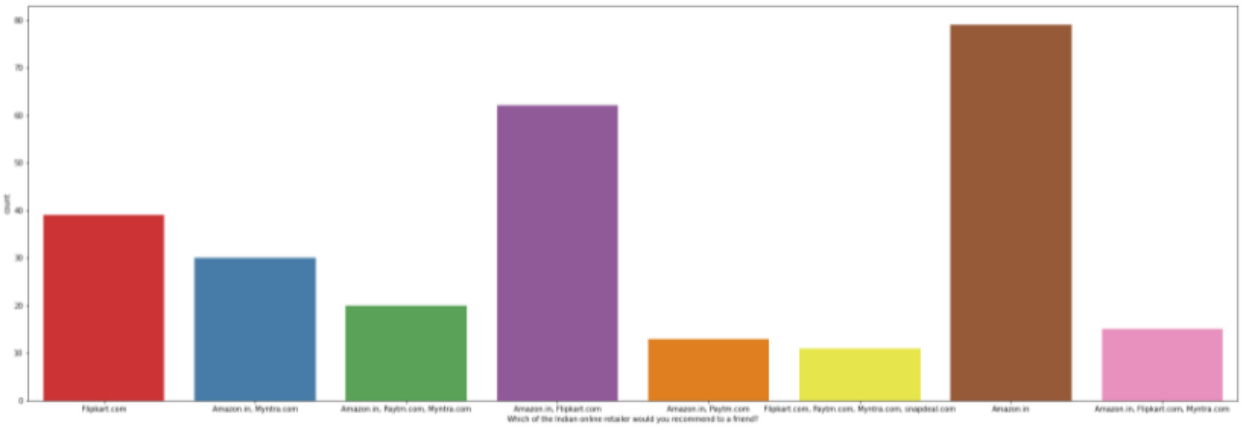
The individual columns of the dataframe were first analysed to study their composition and then, with reference to the diagram above, the relationship between various columns was understood through data visualization using Countplots.

Univariate Analysis

Analyzing the Target Class

Column: 'Which of the Indian online retailer would you recommend to a friend?' can be regarded as a representation of customer Loyalty / Retention since customers who recommend the services of an ecommerce are very highly likely to buy from those websites again

```
In [169]: Df['Which of the Indian online retailer would you recommend to a friend?'].value_counts()

Out[169]: Amazon.in                                          79
          Amazon.in, Flipkart.com                            62
          Flipkart.com                                       39
          Amazon.in, Myntra.com                              30
          Amazon.in, Paytm.com, Myntra.com                   20
          Amazon.in, Flipkart.com, Myntra.com                15
          Amazon.in, Paytm.com                               13
          Flipkart.com, Paytm.com, Myntra.com, snapdeal.com  11
          Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64

In [170]: plt.figure(figsize=(30,10),facecolor='white')
          sns.countplot(Df['Which of the Indian online retailer would you recommend to a friend?'], palette="Set1")

Out[170]: <AxesSubplot:xlabel='Which of the Indian online retailer would you recommend to a friend?', ylabel='count'>
```



It is observed that Amazon is the most popular E commerce website followed by Flipkart.

Consumer Demographics

Columns which contained details regarding the demographics of the participants (age, gender, location) were visualized and analyzed.

Lets check for the Consumer Demographics

In [14]:
```
Df['Gender of respondent'].unique()
```

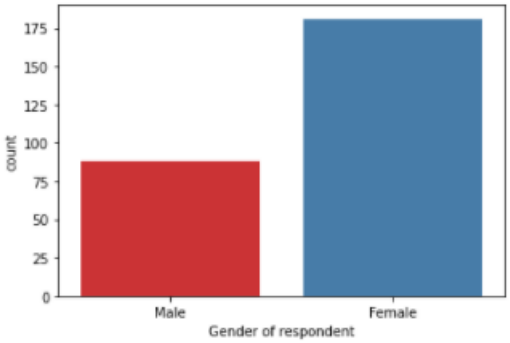
Out[14]:
```
array(['Male', 'Female'], dtype=object)
```

In [15]:
```
Df['Gender of respondent'].value_counts()
```

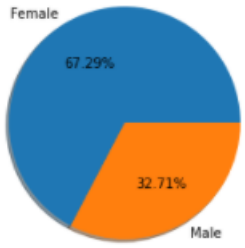
Out[15]:
```
Female    181
Male       88
Name: Gender of respondent, dtype: int64
```

In [16]:
```
sns.countplot(Df['Gender of respondent'], palette="Set1")
```

Out[16]:
```
<AxesSubplot:xlabel='Gender of respondent', ylabel='count'>
```



In [17]:
```
labels = 'Female','Male'
fig, ax = plt.subplots()
ax.pie(Df['Gender of respondent'].value_counts(),labels = labels,radius =1,autopct = '%1.2f%%', shadow=True,)
plt.show()
```



In [18]:
```
Df['How old are you?'].unique()
```

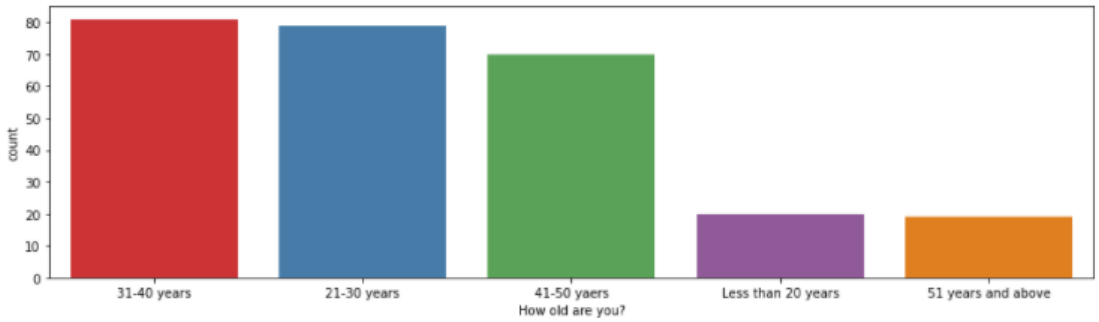
Out[18]:
```
array(['31-40 years', '21-30 years', '41-50 yaers', 'Less than 20 years',
       '51 years and above'], dtype=object)
```

In [19]:
```
Df['How old are you?'].value_counts()
```

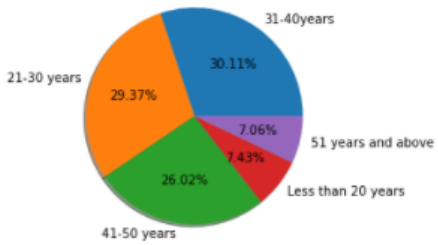
Out[19]:
```
31-40 years           81
21-30 years           79
41-50 yaers           70
Less than 20 years    20
51 years and above    19
Name: How old are you?, dtype: int64
```

In [21]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['How old are you?'], palette="Set1")
```

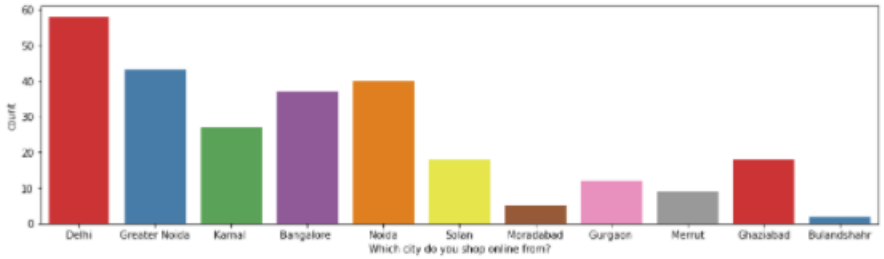
Out[21]:
```
<AxesSubplot:xlabel='How old are you?', ylabel='count'>
```



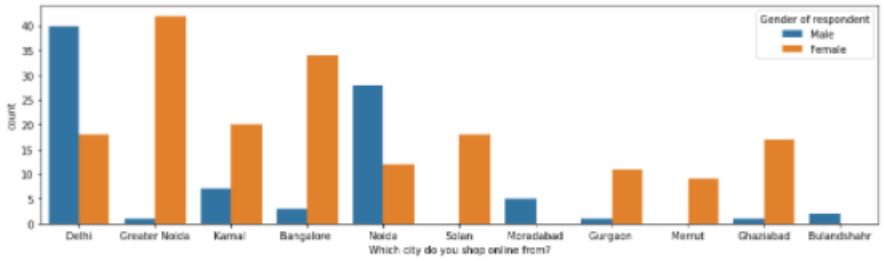
In [22]:
```
labels = '31-40years','21-30 years','41-50 years','Less than 20 years','51 years and above'
fig, ax = plt.subplots()
ax.pie(Df['How old are you?'].value_counts(),labels = labels,radius =1,autopct = '%1.2f%%', shadow=True,)
plt.show()
```



```
In [23]: Df['Which city do you shop online from?'].unique()

Out[23]: array(['Delhi', 'Greater Noida', 'Karnal ', 'Bangalore ', 'Noida',
                'Solan', 'Moradabad', 'Gurgaon ', 'Merrut', 'Ghaziabad',
                'Bulandshahr'], dtype=object)

In [24]: Df['Which city do you shop online from?'].value_counts()

Out[24]: Delhi            58
         Greater Noida    43
         Noida            40
         Bangalore        37
         Karnal           27
         Solan            18
         Ghaziabad        18
         Gurgaon          12
         Merrut            9
         Moradabad         5
         Bulandshahr       2
         Name: Which city do you shop online from?, dtype: int64

In [25]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['Which city do you shop online from?'], palette="Set1")

Out[25]: <AxesSubplot:xlabel='Which city do you shop online from?', ylabel='count'>
```




```
In [27]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['Which city do you shop online from?'], hue=Df['Gender of respondent'])

Out[27]: <AxesSubplot:xlabel='Which city do you shop online from?', ylabel='count'>
```



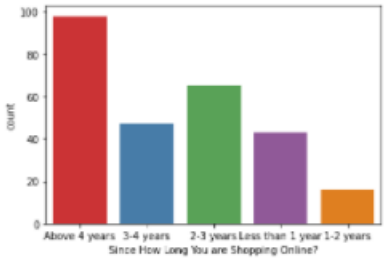
Based on the above graphs it is observed that:

- Majority of the participants are female, comprising 67.29% of the total participants of the survey.
- Most of the participants hail from Delhi,Greater Noida,Noida, and Bangalore.
- Of those who hailed from Delhi and Noida, the majority were Male. While of those who hailed from Greater Noida,Bangalore and Karnal, Ghaziabad and Solan the majority were Female

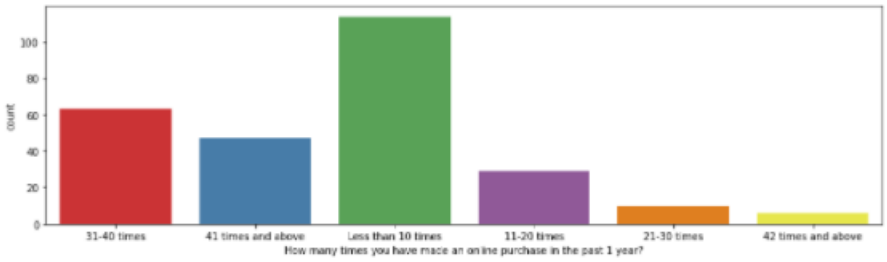
- The age distribution of the majority of the participants lies in the range of 21-40 years,with 59.48% of the total participants falling within that age range, while 26.02% of the participants belong to the age range of 41-50 years.

Consumer online shopping activities and preferences

```
In [29]: Df['Since How Long You are Shopping Online?'].value_counts()

Out[29]: Above 4 years      98
         2-3 years          65
         3-4 years          47
         Less than 1 year   43
         1-2 years          16
         Name: Since How Long You are Shopping Online?, dtype: int64

In [30]: sns.countplot(Df['Since How Long You are Shopping Online?'], palette="Set1")

Out[30]: <AxesSubplot:xlabel='Since How Long You are Shopping Online?', ylabel='count'>
```




```
In [31]: Df['How many times you have made an online purchase in the past 1 year?'].value_counts()

Out[31]: Less than 10 times    114
         31-40 times            63
         41 times and above     47
         11-20 times            29
         21-30 times            10
         42 times and above      6
         Name: How many times you have made an online purchase in the past 1 year?, dtype: int64

In [32]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['How many times you have made an online purchase in the past 1 year?'], palette="Set1")

Out[32]: <AxesSubplot:xlabel='How many times you have made an online purchase in the past 1 year?', ylabel='count'>
```

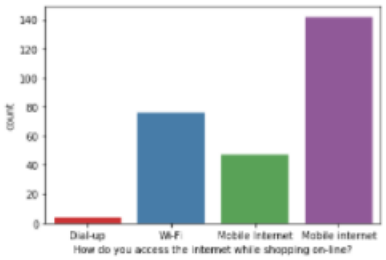


In [33]:
```
Df['How do you access the internet while shopping on-line?'].value_counts()
```

Out[33]:
```
Mobile internet    142
Wi-Fi               76
Mobile Internet     47
Dial-up              4
Name: How do you access the internet while shopping on-line?, dtype: int64
```

In [34]:
```
sns.countplot(Df['How do you access the internet while shopping on-line?'], palette="Set1")
```

Out[34]:
```
<AxesSubplot:xlabel='How do you access the internet while shopping on-line?', ylabel='count'>
```

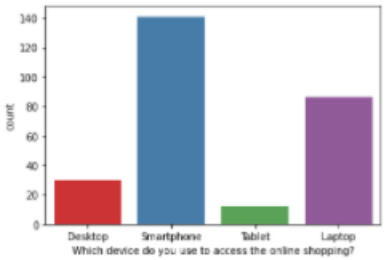


In [35]:
```
Df['Which device do you use to access the online shopping?'].value_counts()
```

Out[35]:
```
Smartphone    141
Laptop         86
Desktop        30
Tablet         12
Name: Which device do you use to access the online shopping?, dtype: int64
```

In [36]:
```
sns.countplot(Df['Which device do you use to access the online shopping?'], palette="Set1")
```

Out[36]:
```
<AxesSubplot:xlabel='Which device do you use to access the online shopping?', ylabel='count'>
```

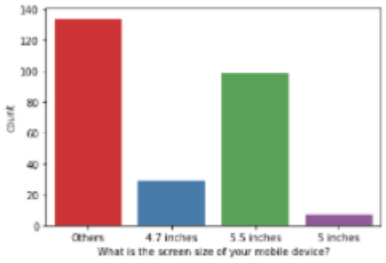


In [37]:
```
Df['What is the screen size of your mobile device?'].value_counts()
```

Out[37]:
```
Others        134
5.5 inches     99
4.7 inches     29
5 inches        7
Name: What is the screen size of your mobile device?, dtype: int64
```

In [38]:
```
sns.countplot(Df['What is the screen size of your mobile device?'], palette="Set1")
```

Out[38]:
```
<AxesSubplot:xlabel='What is the screen size of your mobile device?', ylabel='count'>
```

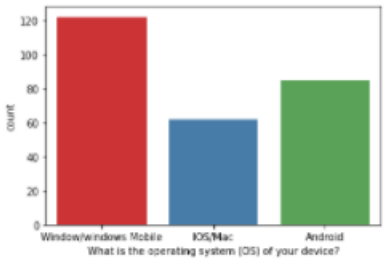


In [39]:
```
Df['What is the operating system (OS) of your device?'].value_counts()
```

Out[39]:
```
Window/windows Mobile    122
Android                   85
IOS/Mac                   62
Name: What is the operating system (OS) of your device?, dtype: int64
```

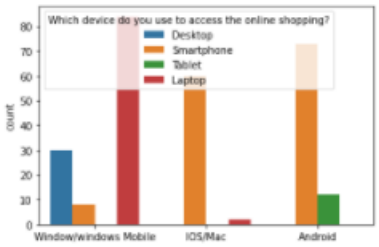
In [40]:
```
sns.countplot(Df['What is the operating system (OS) of your device?'], palette="Set1")
```

Out[40]:
```
<AxesSubplot:xlabel='What is the operating system (OS) of your device?', ylabel='count'>
```



In [41]:
```
sns.countplot(Df['What is the operating system (OS) of your device?'], hue=Df['Which device do you use to access the online
```

Out[41]:
```
<AxesSubplot:xlabel='What is the operating system (OS) of your device?', ylabel='count'>
```

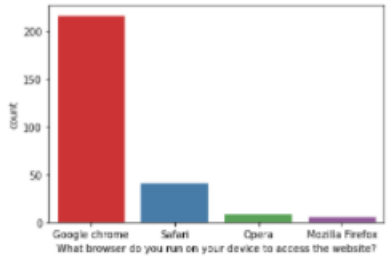


In [42]:
```
Df['What browser do you run on your device to access the website?'].value_counts()
```

Out[42]:
```
Google chrome      216
Safari              40
Opera                8
Mozilla Firefox      5
Name: What browser do you run on your device to access the website?, dtype: int64
```

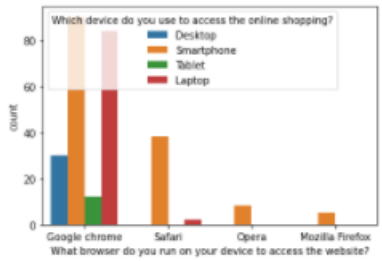
In [43]:
```
sns.countplot(Df['What browser do you run on your device to access the website?'], palette="Set1")
```

Out[43]:
```
<AxesSubplot:xlabel='What browser do you run on your device to access the website?', ylabel='count'>
```



In [44]:
```
sns.countplot(Df['What browser do you run on your device to access the website?'], hue=Df['Which device do you use to access
```

Out[44]:
```
<AxesSubplot:xlabel='What browser do you run on your device to access the website?', ylabel='count'>
```



In [45]:
```
Df['Which channel did you follow to arrive at your favorite online store for the first time?'].value_counts()
```

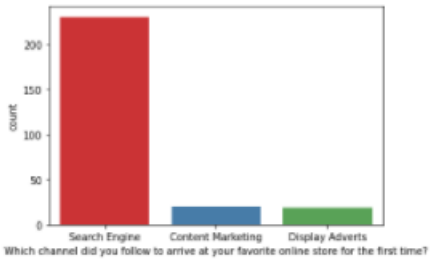
Out[45]:
```
Search Engine        230
Content Marketing     20
Display Adverts       19
Name: Which channel did you follow to arrive at your favorite online store for the first time?, dtype: int64
```

In [45]:
```
Df['Which channel did you follow to arrive at your favorite online store for the first time?'].value_counts()
```

Out[45]:
```
Search Engine        230
Content Marketing     20
Display Adverts       19
Name: Which channel did you follow to arrive at your favorite online store for the first time?, dtype: int64
```

In [46]:
```
sns.countplot(Df['Which channel did you follow to arrive at your favorite online store for the first time?'], palette="Set1"
```

Out[46]:
```
<AxesSubplot:xlabel='Which channel did you follow to arrive at your favorite online store for the first time?', ylabel='count'>
```

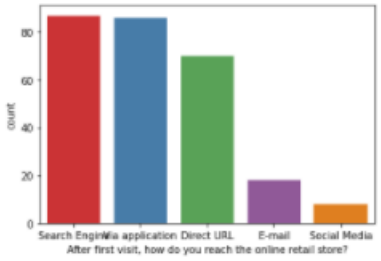


```
In [47]: Df['After first visit, how do you reach the online retail store?'].value_counts()
```

```
Out[47]: Search Engine      87
         Via application    86
         Direct URL         70
         E-mail             18
         Social Media        8
         Name: After first visit, how do you reach the online retail store?, dtype: int64
```

```
In [48]: sns.countplot(Df['After first visit, how do you reach the online retail store?'], palette="Set1")
```

```
Out[48]: <AxesSubplot:xlabel='After first visit, how do you reach the online retail store?', ylabel='count'>
```

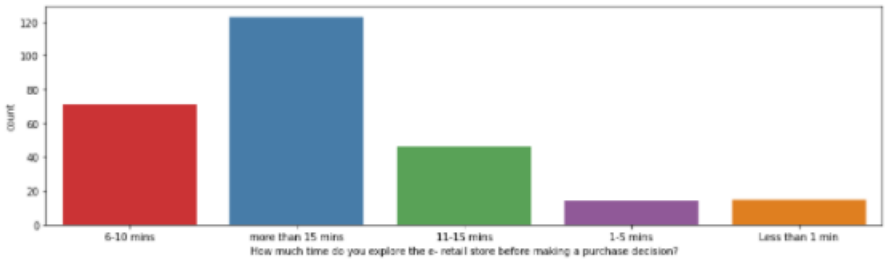



```
In [49]: Df['How much time do you explore the e- retail store before making a purchase decision?'].value_counts()
```

```
Out[49]: more than 15 mins    123
         6-10 mins             71
         11-15 mins            46
         Less than 1 min       15
         1-5 mins              14
         Name: How much time do you explore the e- retail store before making a purchase decision?, dtype: int64
```

```
In [50]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['How much time do you explore the e- retail store before making a purchase decision?'], palette="Set1")
```

```
Out[50]: <AxesSubplot:xlabel='How much time do you explore the e- retail store before making a purchase decision?', ylabel='count'>
```

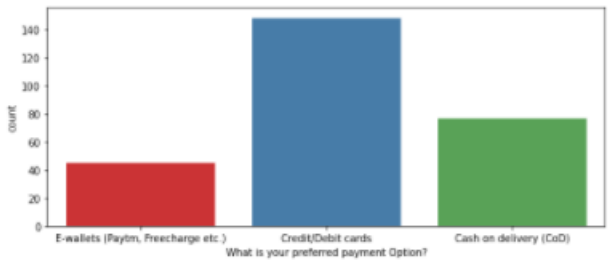



```
In [51]: Df['What is your preferred payment Option?'].value_counts()
```

```
Out[51]: Credit/Debit cards                148
         Cash on delivery (CoD)             76
         E-wallets (Paytm, Freecharge etc.)  45
         Name: What is your preferred payment Option?, dtype: int64
```

```
In [52]: plt.figure(figsize=(10,4),facecolor='white')
         sns.countplot(Df['What is your preferred payment Option?'], palette="Set1")
```

```
Out[52]: <AxesSubplot:xlabel='What is your preferred payment Option?', ylabel='count'>
```



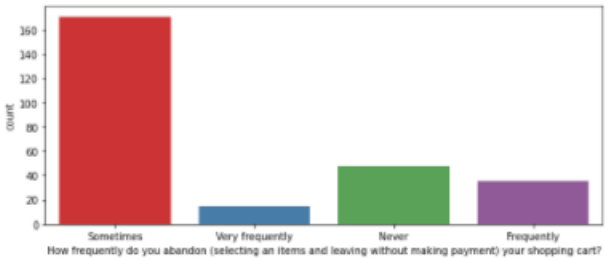
Based on the above graphs it is observed that:

- Majority of the consumers have been shopping for over 4 years and have made less than 10 purchases in the last 1 year.
- Smartphone and mobile internet are the most popular means of accessing ecommerce websites, with most common screen size being 5.5 inches or greater.
- Windows operating system is the most popular on Laptop/Desktop devices while android is the most popular OS on smartphone devices followed by iOS.
- Google Chrome is the most popular web Browser, especially on portable devices, followed by Safari.
- Search Engine is the most common means of arriving at the E commerce websites, followed by Application and Direct URL.
- Most consumers spend over 15 mins browsing an e-commerce website before making a purchase decision.

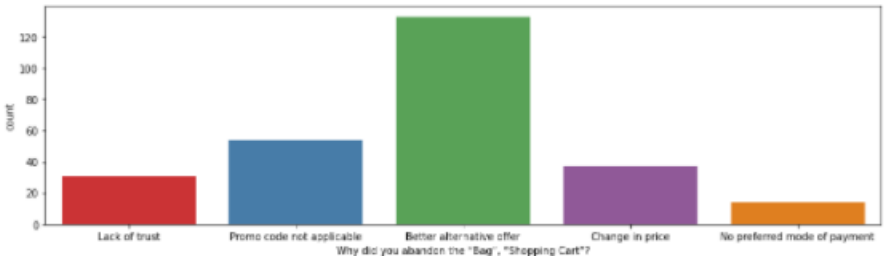
Consumer Hesitation

Various factors/reasons which contributed to consumers' hesitation to complete a purchase online were analysed from the data provided under the columns of the dataframe.

```
In [53]: Df['How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?'].value_counts()

Out[53]: Sometimes          171
         Never               48
         Frequently          35
         Very frequently     15
         Name: How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?, dtype: int64

In [54]: plt.figure(figsize=(10,4),facecolor='white')
         sns.countplot(Df['How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?'], p

Out[54]: <AxesSubplot:xlabel='How frequently do you abandon (selecting an items and leaving without making payment) your shopping car
         t?', ylabel='count'>
```




```
In [55]: Df['Why did you abandon the "Bag", "Shopping Cart"?'].value_counts()

Out[55]: Better alternative offer        133
         Promo code not applicable        54
         Change in price                  37
         Lack of trust                    31
         No preferred mode of payment     14
         Name: Why did you abandon the "Bag", "Shopping Cart"?, dtype: int64

In [56]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['Why did you abandon the "Bag", "Shopping Cart"?'], palette="Set1")

Out[56]: <AxesSubplot:xlabel='Why did you abandon the "Bag", "Shopping Cart"?', ylabel='count'>
```



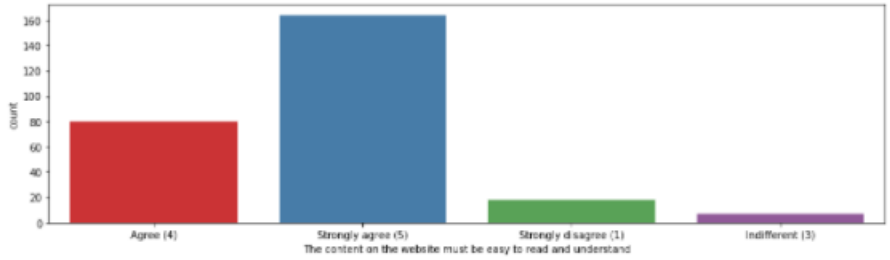
Based on the above graphs it is observed that:

- Consumers sometimes abandon items in shopping cart.
- Finding a better alternative offer is the most common reason behind why consumers abandon items on a particular e commerce website.

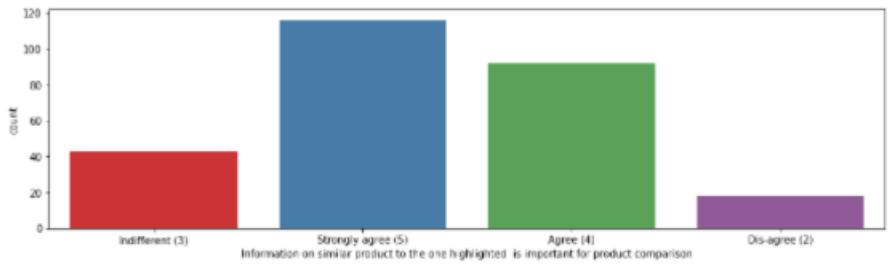
Consumer opinions on Website Features

Analyzing the opinions of the participants on the various features of the e-commerce websites.

```
In [57]: Df['The content on the website must be easy to read and understand'].value_counts()

Out[57]: Strongly agree (5)       164
         Agree (4)                 80
         Strongly disagree (1)     18
         Indifferent (3)            7
         Name: The content on the website must be easy to read and understand, dtype: int64

In [58]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['The content on the website must be easy to read and understand'], palette="Set1")

Out[58]: <AxesSubplot:xlabel='The content on the website must be easy to read and understand', ylabel='count'>
```



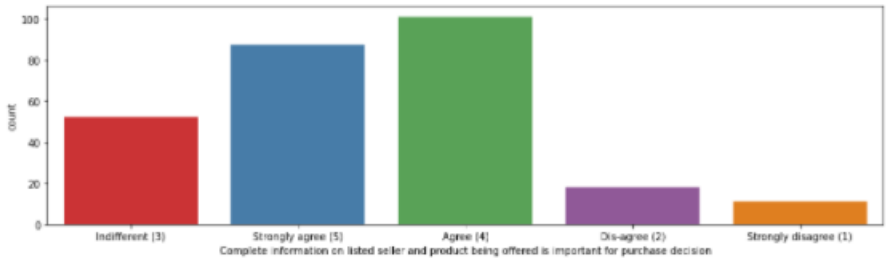

```
In [59]: Df['Information on similar product to the one highlighted  is important for product comparison'].value_counts()

Out[59]: Strongly agree (5)    116
         Agree (4)              92
         Indifferent (3)        43
         Dis-agree (2)          18
         Name: Information on similar product to the one highlighted  is important for product comparison, dtype: int64

In [60]: plt.figure(figsize=(15,4),facecolor='white')
         sns.countplot(Df['Information on similar product to the one highlighted  is important for product comparison'], palette="Set1")

Out[60]: <AxesSubplot:xlabel='Information on similar product to the one highlighted  is important for product comparison', ylabel='coun
         t'>
```




```
In [62]: Df['Complete information on listed seller and product being offered is important for purchase decision'].value_counts()

Out[62]: Agree (4)                101
         Strongly agree (5)        87
         Indifferent (3)           52
         Dis-agree (2)             18
         Strongly disagree (1)     11
         Name: Complete information on listed seller and product being offered is important for purchase decision, dtype: int64
```

In [63]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Complete information on listed seller and product being offered is important for purchase decision'], palette=
```

Out[63]:
```
<AxesSubplot:xlabel='Complete information on listed seller and product being offered is important for purchase decision', ylabe
l='count'>
```

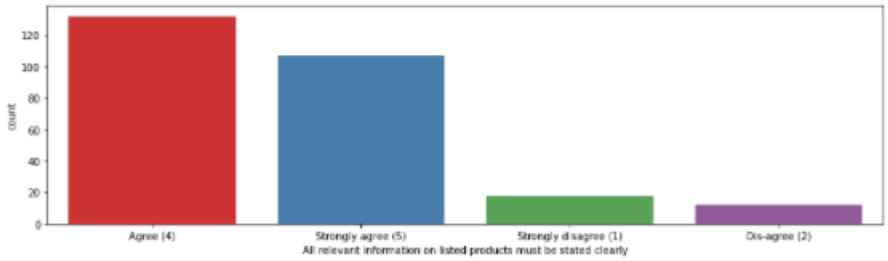


In [64]:
```
Df['All relevant information on listed products must be stated clearly'].value_counts()
```

Out[64]:
```
Agree (4)                132
Strongly agree (5)       107
Strongly disagree (1)     18
Dis-agree (2)             12
Name: All relevant information on listed products must be stated clearly, dtype: int64
```

In [65]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['All relevant information on listed products must be stated clearly'], palette="Set1")
```

Out[65]:
```
<AxesSubplot:xlabel='All relevant information on listed products must be stated clearly', ylabel='count'>
```

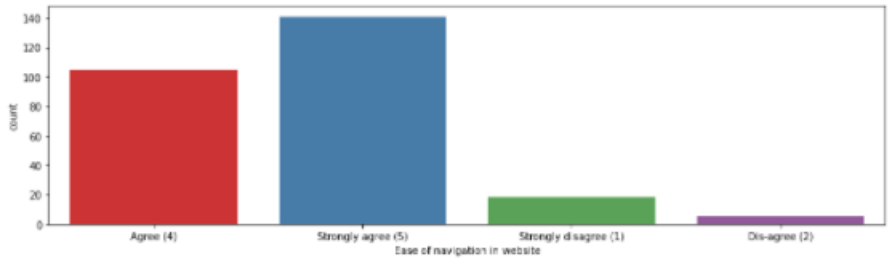


In [66]:
```
Df['Ease of navigation in website'].value_counts()
```

Out[66]:
```
Strongly agree (5)       141
Agree (4)                105
Strongly disagree (1)     18
Dis-agree (2)              5
Name: Ease of navigation in website, dtype: int64
```

In [67]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Ease of navigation in website'], palette="Set1")
```

Out[67]:
```
<AxesSubplot:xlabel='Ease of navigation in website', ylabel='count'>
```

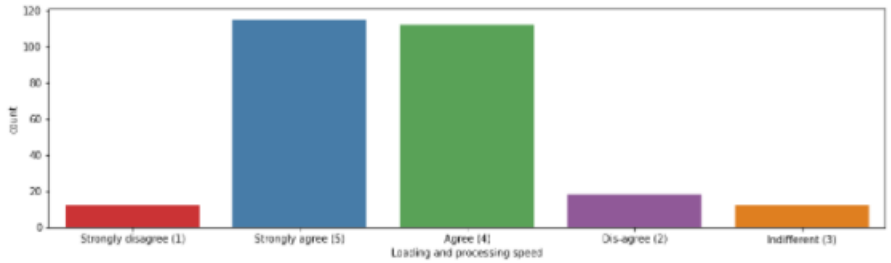


In [70]:
```
Df['Loading and processing speed'].value_counts()
```

Out[70]:
```
Strongly agree (5)       115
Agree (4)                112
Dis-agree (2)             18
Strongly disagree (1)     12
Indifferent (3)           12
Name: Loading and processing speed, dtype: int64
```

In [71]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Loading and processing speed'], palette="Set1")
```

Out[71]:
```
<AxesSubplot:xlabel='Loading and processing speed', ylabel='count'>
```

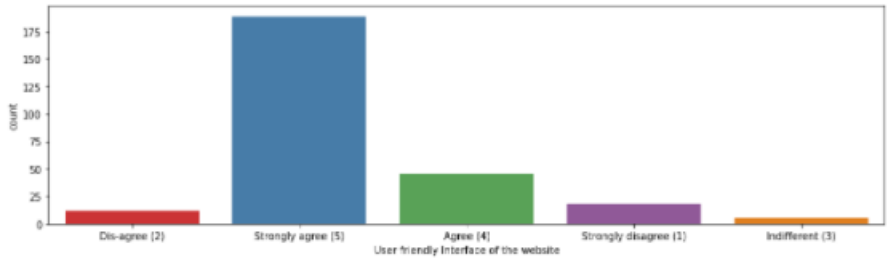


In [72]:
```
Df['User friendly Interface of the website'].value_counts()
```

Out[72]:
```
Strongly agree (5)       189
Agree (4)                 45
Strongly disagree (1)     18
Dis-agree (2)             12
Indifferent (3)            5
Name: User friendly Interface of the website, dtype: int64
```

In [73]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['User friendly Interface of the website'], palette="Set1")
```

Out[73]: <AxesSubplot:xlabel='User friendly Interface of the website', ylabel='count'>

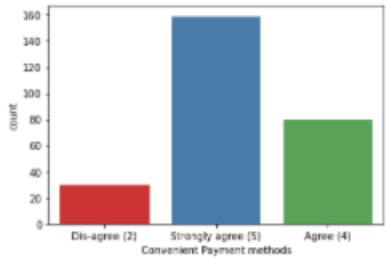


In [74]:
```
Df['Convenient Payment methods'].value_counts()
```

Out[74]:
```
Strongly agree (5)    159
Agree (4)              80
Dis-agree (2)          30
Name: Convenient Payment methods, dtype: int64
```

In [75]:
```
sns.countplot(Df['Convenient Payment methods'], palette="Set1")
```

Out[75]: <AxesSubplot:xlabel='Convenient Payment methods', ylabel='count'>

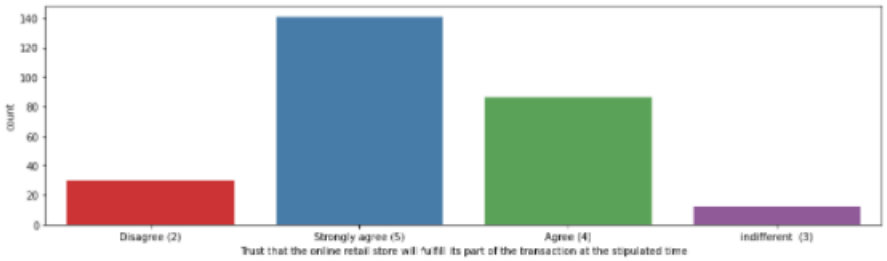


In [76]:
```
Df['Trust that the online retail store will fulfill its part of the transaction at the stipulated time'].value_counts()
```

Out[76]:
```
Strongly agree (5)    141
Agree (4)              86
Disagree (2)           30
indifferent  (3)       12
Name: Trust that the online retail store will fulfill its part of the transaction at the stipulated time, dtype: int64
```

In [77]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Trust that the online retail store will fulfill its part of the transaction at the stipulated time'], palette=
```

Out[77]:
```
<AxesSubplot:xlabel='Trust that the online retail store will fulfill its part of the transaction at the stipulated time', ylabe
l='count'>
```

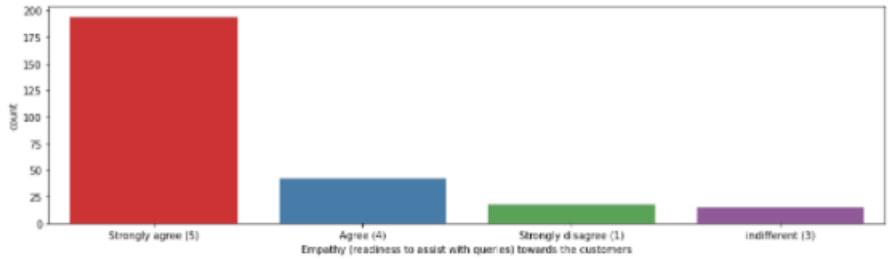


In [78]:
```
Df['Empathy (readiness to assist with queries) towards the customers'].value_counts()
```

Out[78]:
```
Strongly agree (5)       194
Agree (4)                 42
Strongly disagree (1)     18
indifferent (3)           15
Name: Empathy (readiness to assist with queries) towards the customers, dtype: int64
```

In [79]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Empathy (readiness to assist with queries) towards the customers'], palette="Set1")
```

Out[79]:
```
<AxesSubplot:xlabel='Empathy (readiness to assist with queries) towards the customers', ylabel='count'>
```

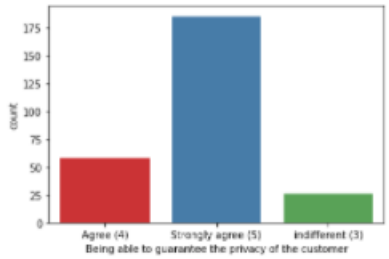


In [80]:
```
Df['Being able to guarantee the privacy of the customer'].value_counts()
```

Out[80]:
```
Strongly agree (5)    185
Agree (4)              58
indifferent (3)        26
Name: Being able to guarantee the privacy of the customer, dtype: int64
```

In [81]:
```
sns.countplot(Df['Being able to guarantee the privacy of the customer'], palette="Set1")
```

Out[81]:
```
<AxesSubplot:xlabel='Being able to guarantee the privacy of the customer', ylabel='count'>
```

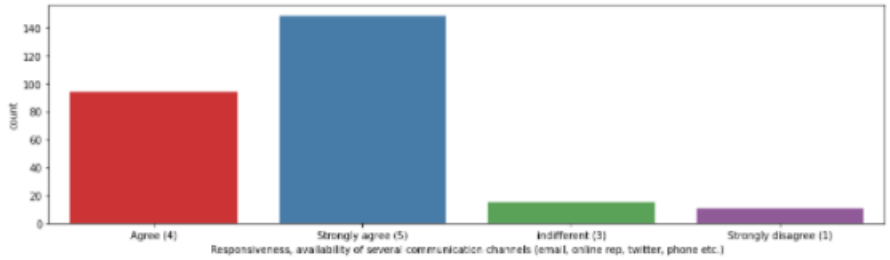


In [82]:
```
Df['Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)'].value_counts()
```

Out[82]:
```
Strongly agree (5)       149
Agree (4)                 94
indifferent (3)           15
Strongly disagree (1)     11
Name: Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.), dtype: int64
```

In [83]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)'], pal
```

Out[83]:
```
<AxesSubplot:xlabel='Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)',
ylabel='count'>
```

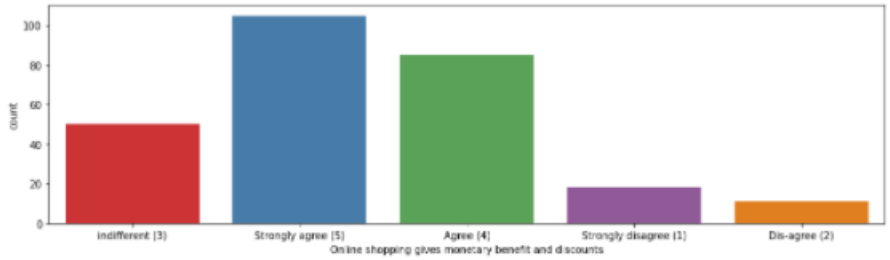


In [84]:
```
Df['Online shopping gives monetary benefit and discounts'].value_counts()
```

Out[84]:
```
Strongly agree (5)       105
Agree (4)                 85
indifferent (3)           50
Strongly disagree (1)     18
Dis-agree (2)             11
Name: Online shopping gives monetary benefit and discounts, dtype: int64
```

In [85]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Online shopping gives monetary benefit and discounts'], palette="Set1")
```

Out[85]:
```
<AxesSubplot:xlabel='Online shopping gives monetary benefit and discounts', ylabel='count'>
```

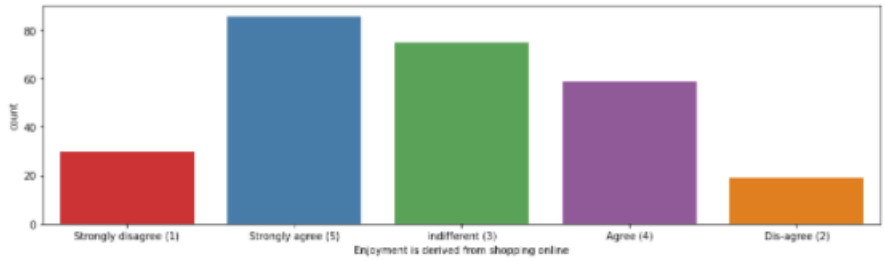


In [86]:
```
Df['Enjoyment is derived from shopping online'].value_counts()
```

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

In [87]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Enjoyment is derived from shopping online'], palette="Set1")
```

Out[87]:
```
<AxesSubplot:xlabel='Enjoyment is derived from shopping online', ylabel='count'>
```

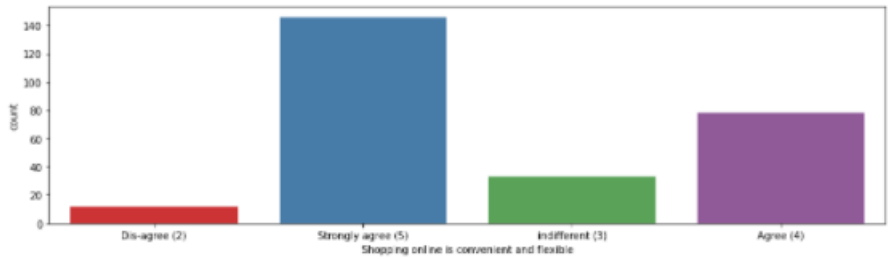


In [88]:
```
Df['Shopping online is convenient and flexible'].value_counts()
```

Out[88]:
```
Strongly agree (5)    146
Agree (4)              78
indifferent (3)        33
Dis-agree (2)          12
Name: Shopping online is convenient and flexible, dtype: int64
```

In [89]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Shopping online is convenient and flexible'], palette="Set1")
```

Out[89]:
```
<AxesSubplot:xlabel='Shopping online is convenient and flexible', ylabel='count'>
```

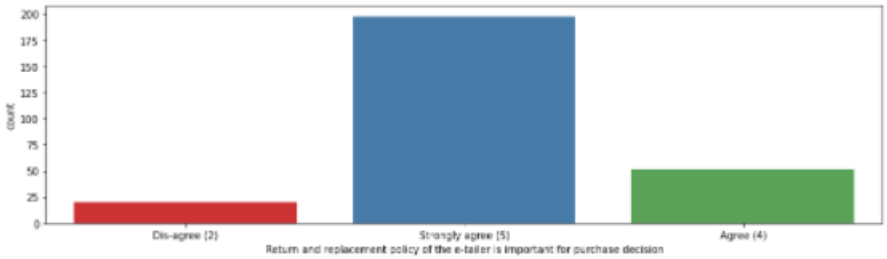


In [90]:
```
Df['Return and replacement policy of the e-tailer is important for purchase decision'].value_counts()
```

Out[90]:
```
Strongly agree (5)    198
Agree (4)              51
Dis-agree (2)          20
Name: Return and replacement policy of the e-tailer is important for purchase decision, dtype: int64
```

In [91]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Return and replacement policy of the e-tailer is important for purchase decision'], palette="Set1")
```

Out[91]:
```
<AxesSubplot:xlabel='Return and replacement policy of the e-tailer is important for purchase decision', ylabel='count'>
```

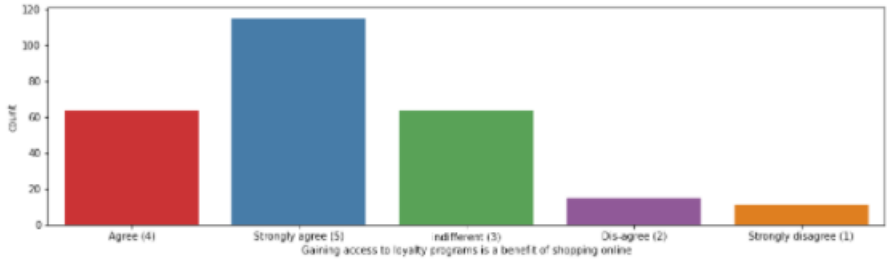


In [92]:
```
Df['Gaining access to loyalty programs is a benefit of shopping online'].value_counts()
```

Out[92]:
```
Strongly agree (5)       115
Agree (4)                 64
Indifferent (3)           64
Dis-agree (2)             15
Strongly disagree (1)     11
Name: Gaining access to loyalty programs is a benefit of shopping online, dtype: int64
```

In [93]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Gaining access to loyalty programs is a benefit of shopping online'], palette="Set1")
```

Out[93]:
```
<AxesSubplot:xlabel='Gaining access to loyalty programs is a benefit of shopping online', ylabel='count'>
```

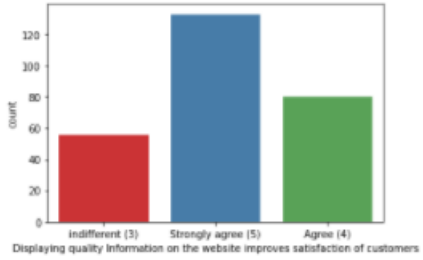


In [94]:
```
Df['Displaying quality Information on the website improves satisfaction of customers'].value_counts()
```

Out[94]:
```
Strongly agree (5)    133
Agree (4)              80
Indifferent (3)        56
Name: Displaying quality Information on the website improves satisfaction of customers, dtype: int64
```

In [95]:
```
sns.countplot(Df['Displaying quality Information on the website improves satisfaction of customers'], palette="Set1")
```

Out[95]:
```
<AxesSubplot:xlabel='Displaying quality Information on the website improves satisfaction of customers', ylabel='count'>
```

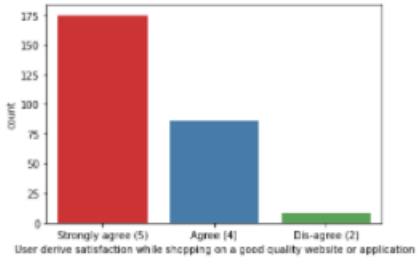


In [96]:
```
Df['User derive satisfaction while shopping on a good quality website or application'].value_counts()
```

Out[96]:
```
Strongly agree (5)    175
Agree (4)              86
Dis-agree (2)           8
Name: User derive satisfaction while shopping on a good quality website or application, dtype: int64
```

In [97]:
```
sns.countplot(Df['User derive satisfaction while shopping on a good quality website or application'], palette="Set1")
```

Out[97]:
```
<AxesSubplot:xlabel='User derive satisfaction while shopping on a good quality website or application', ylabel='count'>
```

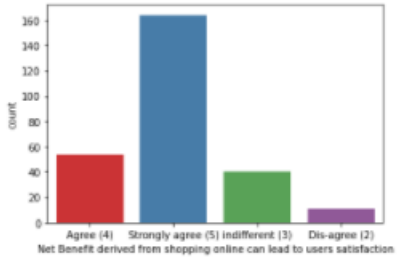


In [98]:
```
Df['Net Benefit derived from shopping online can lead to users satisfaction'].value_counts()
```

Out[98]:
```
Strongly agree (5)    164
Agree (4)              54
Indifferent (3)        40
Dis-agree (2)          11
Name: Net Benefit derived from shopping online can lead to users satisfaction, dtype: int64
```

In [99]:
```
sns.countplot(Df['Net Benefit derived from shopping online can lead to users satisfaction'], palette="Set1")
```

Out[99]:
```
<AxesSubplot:xlabel='Net Benefit derived from shopping online can lead to users satisfaction', ylabel='count'>
```

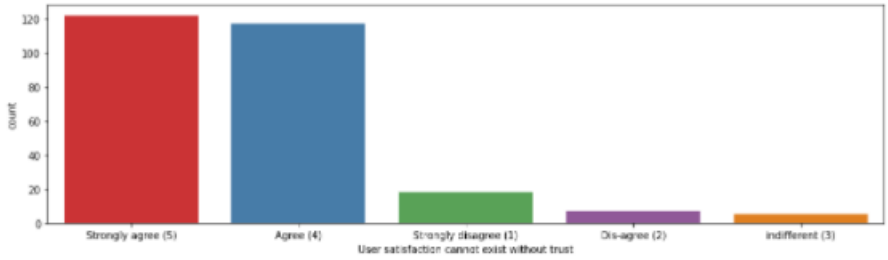


In [100]:
```
Df['User satisfaction cannot exist without trust'].value_counts()
```

Out[100]:
```
Strongly agree (5)       122
Agree (4)                117
Strongly disagree (1)     18
Dis-agree (2)              7
Indifferent (3)            5
Name: User satisfaction cannot exist without trust, dtype: int64
```

In [101]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['User satisfaction cannot exist without trust'], palette="Set1")
```

Out[101]:
```
<AxesSubplot:xlabel='User satisfaction cannot exist without trust', ylabel='count'>
```

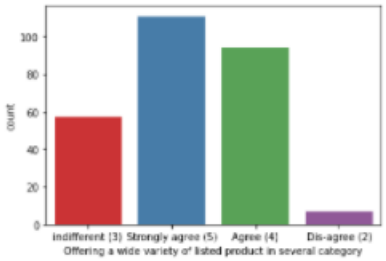


In [102]:
```
Df['Offering a wide variety of listed product in several category'].value_counts()
```

Out[102]:
```
Strongly agree (5)    111
Agree (4)              94
Indifferent (3)        57
Dis-agree (2)           7
Name: Offering a wide variety of listed product in several category, dtype: int64
```

In [103]:
```
sns.countplot(Df['Offering a wide variety of listed product in several category'], palette="Set1")
```

Out[103]:
```
<AxesSubplot:xlabel='Offering a wide variety of listed product in several category', ylabel='count'>
```

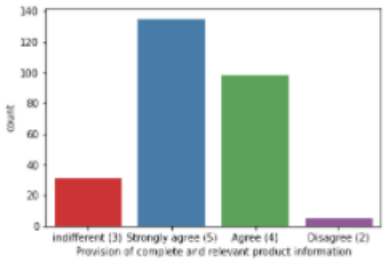


In [104]:
```
Df['Provision of complete and relevant product information'].value_counts()
```

Out[104]:
```
Strongly agree (5)    135
Agree (4)              98
indifferent (3)        31
Disagree (2)            5
Name: Provision of complete and relevant product information, dtype: int64
```

In [105]:
```
sns.countplot(Df['Provision of complete and relevant product information'], palette="Set1")
```

Out[105]:
```
<AxesSubplot:xlabel='Provision of complete and relevant product information', ylabel='count'>
```

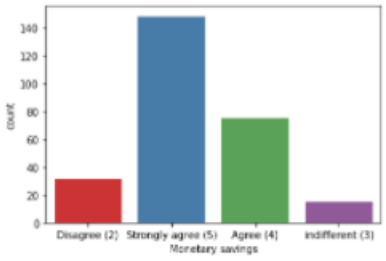


In [106]:
```
Df['Monetary savings'].value_counts()
```

Out[106]:
```
Strongly agree (5)    148
Agree (4)              75
Disagree (2)           31
indifferent (3)        15
Name: Monetary savings, dtype: int64
```

In [107]:
```
sns.countplot(Df['Monetary savings'], palette="Set1")
```

Out[107]:
```
<AxesSubplot:xlabel='Monetary savings', ylabel='count'>
```

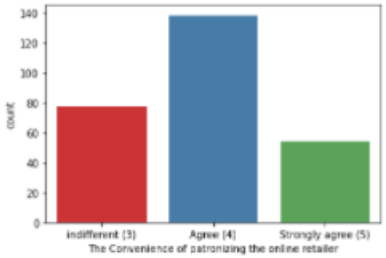


In [108]:
```
Df['The Convenience of patronizing the online retailer'].value_counts()
```

Out[108]:
```
Agree (4)              138
indifferent (3)         77
Strongly agree (5)      54
Name: The Convenience of patronizing the online retailer, dtype: int64
```

In [109]:
```
sns.countplot(Df['The Convenience of patronizing the online retailer'], palette="Set1")
```

Out[109]:
```
<AxesSubplot:xlabel='The Convenience of patronizing the online retailer', ylabel='count'>
```

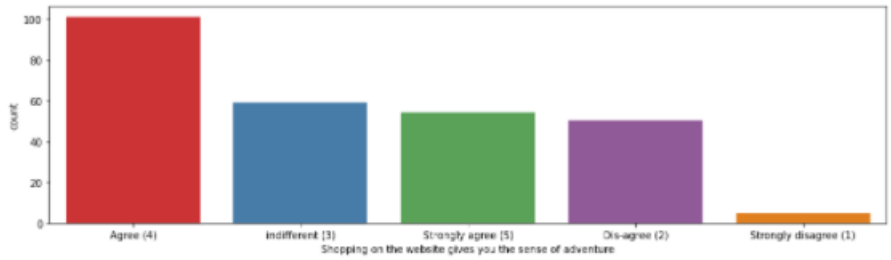


In [110]:
```
Df['Shopping on the website gives you the sense of adventure'].value_counts()
```

Out[110]:
```
Agree (4)                101
indifferent (3)           59
Strongly agree (5)        54
Dis-agree (2)             50
Strongly disagree (1)      5
Name: Shopping on the website gives you the sense of adventure, dtype: int64
```

In [111]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Shopping on the website gives you the sense of adventure'], palette="Set1")
```

Out[111]:
```
<AxesSubplot:xlabel='Shopping on the website gives you the sense of adventure', ylabel='count'>
```

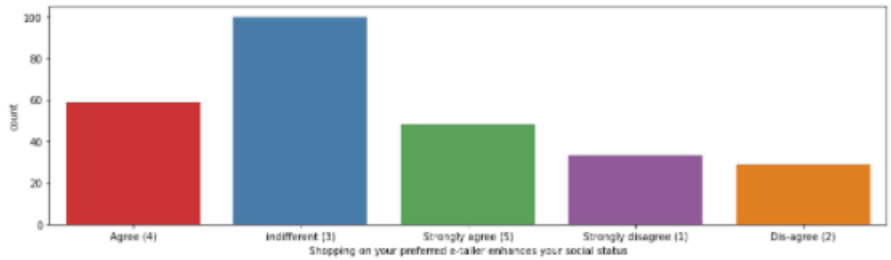


In [112]:
```
Df['Shopping on your preferred e-tailer enhances your social status'].value_counts()
```

Out[112]:
```
indifferent (3)          100
Agree (4)                 59
Strongly agree (5)        48
Strongly disagree (1)     33
Dis-agree (2)             29
Name: Shopping on your preferred e-tailer enhances your social status, dtype: int64
```

In [113]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['Shopping on your preferred e-tailer enhances your social status'], palette="Set1")
```

Out[113]:
```
<AxesSubplot:xlabel='Shopping on your preferred e-tailer enhances your social status', ylabel='count'>
```

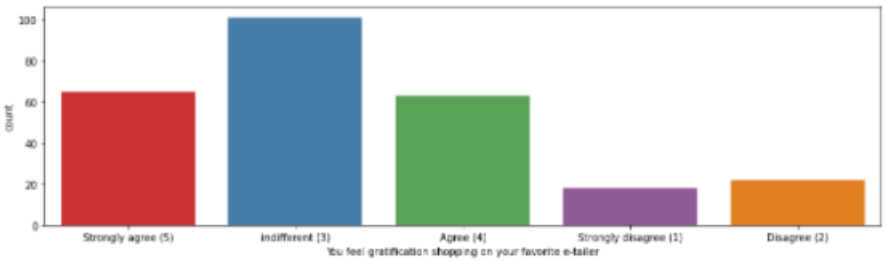


In [114]:
```
Df['You feel gratification shopping on your favorite e-tailer'].value_counts()
```

Out[114]:
```
indifferent (3)          101
Strongly agree (5)        65
Agree (4)                 63
Disagree (2)              22
Strongly disagree (1)     18
Name: You feel gratification shopping on your favorite e-tailer, dtype: int64
```

In [115]:
```
plt.figure(figsize=(15,4),facecolor='white')
sns.countplot(Df['You feel gratification shopping on your favorite e-tailer'], palette="Set1")
```

Out[115]:
```
<AxesSubplot:xlabel='You feel gratification shopping on your favorite e-tailer', ylabel='count'>
```

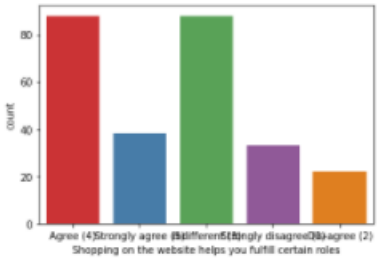


In [116]:
```
Df['Shopping on the website helps you fulfill certain roles'].value_counts()
```

Out[116]:
```
Agree (4)                88
indifferent (3)          88
Strongly agree (5)       38
Strongly disagree (1)    33
Dis-agree (2)            22
Name: Shopping on the website helps you fulfill certain roles, dtype: int64
```

In [117]:
```
sns.countplot(Df['Shopping on the website helps you fulfill certain roles'], palette="Set1")
```

Out[117]:
```
<AxesSubplot:xlabel='Shopping on the website helps you fulfill certain roles', ylabel='count'>
```

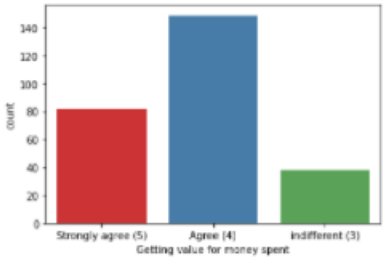


In [118]:
```
Df['Getting value for money spent'].value_counts()
```

Out[118]:
```
Agree (4)              149
Strongly agree (5)      82
indifferent (3)         38
Name: Getting value for money spent, dtype: int64
```

In [119]:
```
sns.countplot(Df['Getting value for money spent'], palette="Set1")
```

Out[119]:
```
<AxesSubplot:xlabel='Getting value for money spent', ylabel='count'>
```



From the graphs above the following observations are made:

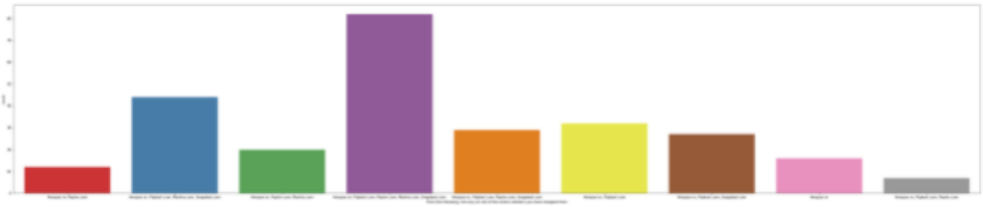
- Majority of the consumers strongly agree that:
  - The content on the website must be easy to read and understand
  - Information on similar product to the one highlighted is important for product comparison
  - Complete information on listed seller and product being offered is important for purchase decision
  - All relevant information on listed products must be stated clearly
  - Navigation in website should be easy
  - Loading and processing should be quick
  - Interface of the website must be user friendly
  - Convenient Payment methods should be available
  - There is trust in the online retail store fulfilling its part of the transaction at the stipulated time
  - There should be Empathy (readiness to assist with queries) towards the customers
  - Online retail store should be able to guarantee the privacy of the customer
  - There should be Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
  - Online shopping gives monetary benefit and discounts
  - Enjoyment is derived from shopping online
  - Shopping online is convenient and flexible
  - Return and replacement policy of the e-tailer is important for purchase decision
  - Gaining access to loyalty programs is a benefit of shopping online
  - Displaying quality Information on the website improves satisfaction of customers
  - User derive satisfaction while shopping on a good quality website or application
  - Net Benefit is derived from shopping online can lead to users satisfaction
  - User satisfaction cannot exist without trust
  - E commerce websites must Offer a wide variety of listed product in several category
  - There should be Provision of complete and relevant product information
  - Monetary savings must be considerable

- 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 is important

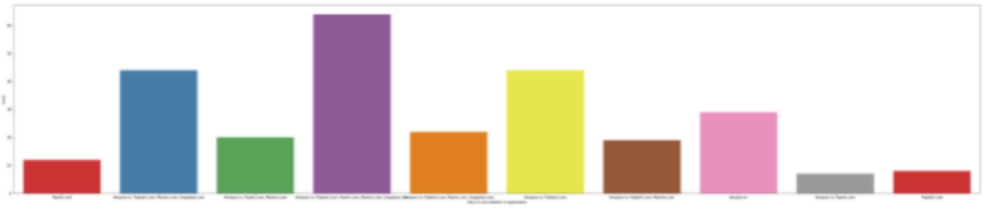
Consumer Ecommerce Website preferences and opinions

Analyzing the Preferences and opinions of the participants regarding the e-commerce websites.

```
In [123]: Df['From the following, tick any (or all) of the online retailers you have shopped from'].value_counts()

Out[123]: Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    82
          Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com              44
          Amazon.in, Flipkart.com                                        32
          Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com               29
          Amazon.in, Flipkart.com, Snapdeal.com                          27
          Amazon.in, Paytm.com, Myntra.com                               20
          Amazon.in                                                      16
          Amazon.in, Paytm.com                                           12
          Amazon.in, Flipkart.com, Paytm.com                              7
          Name: From the following, tick any (or all) of the online retailers you have shopped from, dtype: int64

In [124]: plt.figure(figsize=(50,10),facecolor='white')
          sns.countplot(Df['From the following, tick any (or all) of the online retailers you have shopped from'], palette="Set1")

Out[124]: <AxesSubplot:xlabel='From the following, tick any (or all) of the online retailers you have shopped from', ylabel='count'>
```



```
In [125]: Df['Easy to use website or application'].value_counts()

Out[125]: Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    64
          Amazon.in, Flipkart.com                                        44
          Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com              44
          Amazon.in                                                      29
          Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com               22
          Amazon.in, Paytm.com, Myntra.com                               20
          Amazon.in, Flipkart.com, Myntra.com                            19
          Paytm.com                                                      12
          Flipkart.com                                                    8
          Amazon.in, Paytm.com                                            7
          Name: Easy to use website or application, dtype: int64

In [126]: plt.figure(figsize=(50,10),facecolor='white')
          sns.countplot(Df['Easy to use website or application'], palette="Set1")

Out[126]: <AxesSubplot:xlabel='Easy to use website or application', ylabel='count'>
```

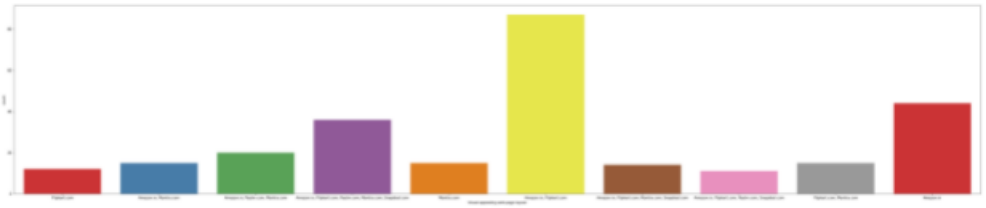


In [127]:
```
Df['Visual appealing web-page layout'].value_counts()
```

Out[127]:
```
Amazon.in, Flipkart.com                                  87
Amazon.in                                                44
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    36
Amazon.in, Paytm.com, Myntra.com                         20
Amazon.in, Myntra.com                                    15
Flipkart.com, Myntra.com                                 15
Myntra.com                                               15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com        14
Flipkart.com                                             12
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com         11
Name: Visual appealing web-page layout, dtype: int64
```

In [128]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Visual appealing web-page layout'], palette="Set1")
```

Out[128]:
```
<AxesSubplot:xlabel='Visual appealing web-page layout', ylabel='count'>
```

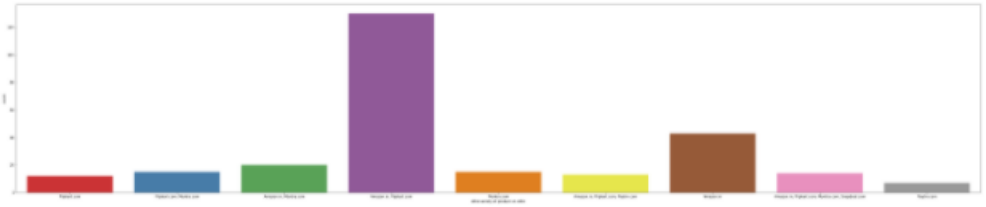


In [129]:
```
Df['Wild variety of product on offer'].value_counts()
```

Out[129]:
```
Amazon.in, Flipkart.com                          130
Amazon.in                                         43
Amazon.in, Myntra.com                             20
Flipkart.com, Myntra.com                          15
Myntra.com                                        15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com    14
Amazon.in, Flipkart.com, Paytm.com                13
Flipkart.com                                      12
Paytm.com                                          7
Name: Wild variety of product on offer, dtype: int64
```

In [130]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Wild variety of product on offer'], palette="Set1")
```

Out[130]:
```
<AxesSubplot:xlabel='Wild variety of product on offer', ylabel='count'>
```

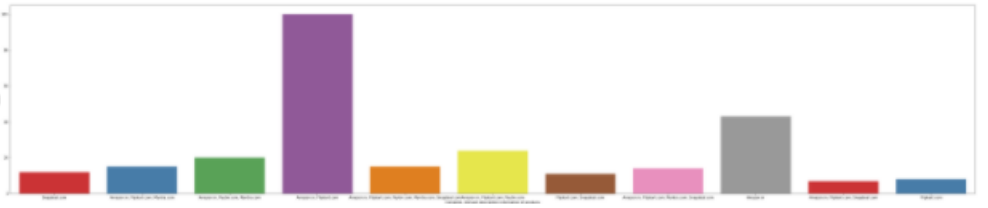


In [131]:
```
Df['Complete, relevant description information of products'].value_counts()
```

Out[131]:
```
Amazon.in, Flipkart.com                                  100
Amazon.in                                                 43
Amazon.in, Flipkart.com, Paytm.com                        24
Amazon.in, Paytm.com, Myntra.com                          20
Amazon.in, Flipkart.com, Myntra.com                       15
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com         14
Snapdeal.com                                              12
Flipkart.com, Snapdeal.com                                11
Flipkart.com                                               8
Amazon.in, Flipkart.com, Snapdeal.com                      7
Name: Complete, relevant description information of products, dtype: int64
```

In [132]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Complete, relevant description information of products'], palette="Set1")
```

Out[132]:
```
<AxesSubplot:xlabel='Complete, relevant description information of products', ylabel='count'>
```

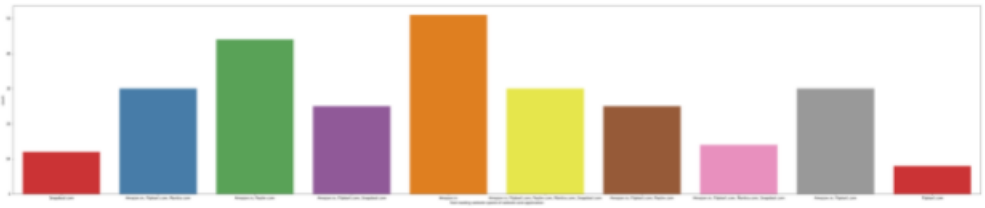


In [133]:
```
Df['Fast loading website speed of website and application'].value_counts()
```

Out[133]:
```
Amazon.in                                                  51
Amazon.in, Paytm.com                                       44
Amazon.in, Flipkart.com, Myntra.com                        30
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    30
Amazon.in, Flipkart.com                                    30
Amazon.in, Flipkart.com, Paytm.com                         25
Amazon.in, Flipkart.com, Snapdeal.com                      25
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com          14
Snapdeal.com                                               12
Flipkart.com                                                8
Name: Fast loading website speed of website and application, dtype: int64
```

In [134]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Fast loading website speed of website and application'], palette="Set1")
```

Out[134]:
```
<AxesSubplot:xlabel='Fast loading website speed of website and application', ylabel='count'>
```

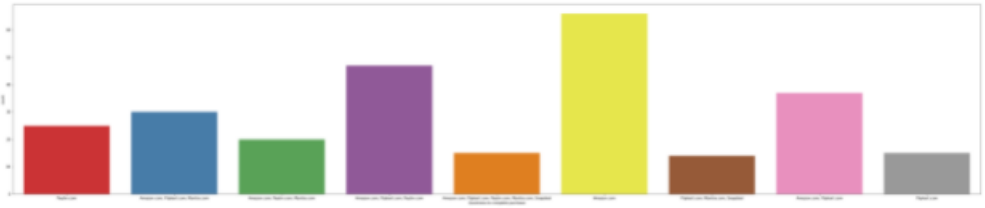


In [135]:
```
Df['Quickness to complete purchase'].value_counts()
```

Out[135]:
```
Amazon.com                                                 66
Amazon.com, Flipkart.com, Paytm.com                        47
Amazon.com, Flipkart.com                                   37
Amazon.com, Flipkart.com, Myntra.com                       30
Paytm.com                                                  25
Amazon.com, Paytm.com, Myntra.com                          20
Amazon.com, Flipkart.com, Paytm.com, Myntra.com, Snapdeal  15
Flipkart.com                                               15
Flipkart.com, Myntra.com, Snapdeal                         14
Name: Quickness to complete purchase, dtype: int64
```

In [136]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Quickness to complete purchase'], palette="Set1")
```

Out[136]:
```
<AxesSubplot:xlabel='Quickness to complete purchase', ylabel='count'>
```

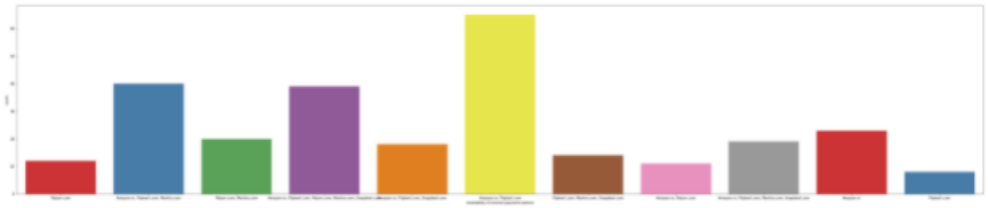


In [137]:
```
Df['Availability of several payment options'].value_counts()
```

Out[137]:
```
Amazon.in, Flipkart.com                                    65
Amazon.in, Flipkart.com, Myntra.com                        40
Amazon.in, Flipkart.com, Patym.com, Myntra.com, Snapdeal.com    39
Amazon.in                                                  23
Patym.com, Myntra.com                                      20
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com          19
Amazon.in, Flipkart.com, Snapdeal.com                      18
Flipkart.com, Myntra.com, Snapdeal.com                     14
Patym.com                                                  12
Amazon.in, Patym.com                                       11
Flipkart.com                                                8
Name: Availability of several payment options, dtype: int64
```

In [138]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Availability of several payment options'], palette="Set1")
```

Out[138]:
```
<AxesSubplot:xlabel='Availability of several payment options', ylabel='count'>
```

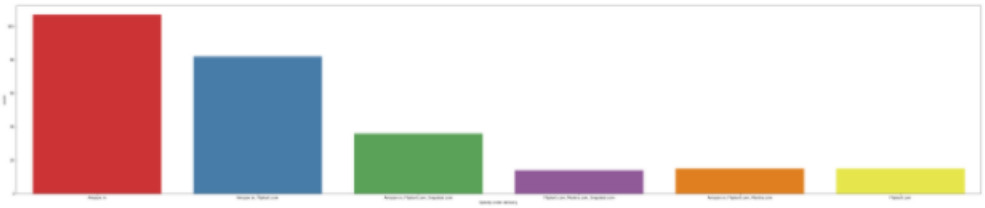


In [139]:
```
Df['Speedy order delivery '].value_counts()
```

Out[139]:
```
Amazon.in                                107
Amazon.in, Flipkart.com                   82
Amazon.in, Flipkart.com, Snapdeal.com     36
Amazon.in, Flipkart.com, Myntra.com       15
Flipkart.com                              15
Flipkart.com, Myntra.com, Snapdeal.com    14
Name: Speedy order delivery , dtype: int64
```

In [140]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Speedy order delivery '], palette="Set1")
```

Out[140]:
```
<AxesSubplot:xlabel='Speedy order delivery ', ylabel='count'>
```

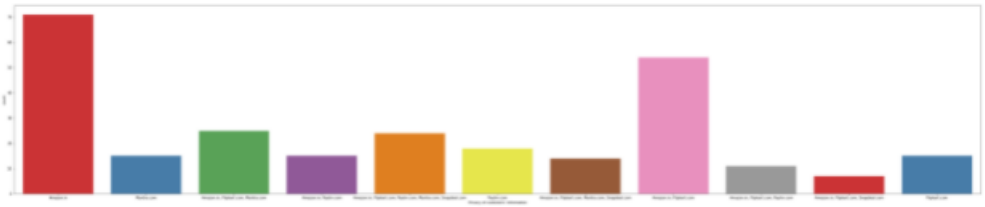


In [141]:
```
Df['Privacy of customers' information'].value_counts()
```

Out[141]:
```
Amazon.in                                                  71
Amazon.in, Flipkart.com                                    54
Amazon.in, Flipkart.com, Myntra.com                        25
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    24
Paytm.com                                                  18
Myntra.com                                                 15
Amazon.in, Paytm.com                                       15
Flipkart.com                                               15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com          14
Amazon.in, Flipkart.com, Paytm.com                         11
Amazon.in, Flipkart.com, Snapdeal.com                       7
Name: Privacy of customers' information, dtype: int64
```

In [142]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Privacy of customers' information'], palette="Set1")
```

Out[142]:
```
<AxesSubplot:xlabel='Privacy of customers' information', ylabel='count'>
```

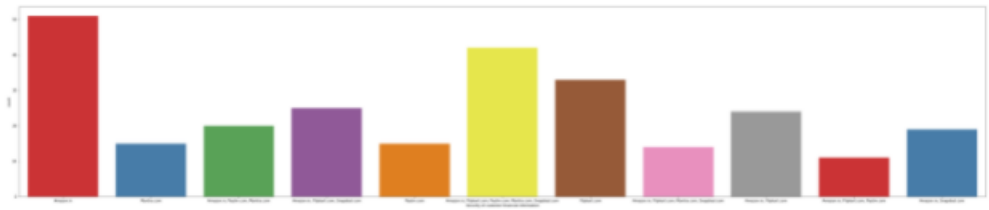


In [143]:
```
Df['Security of customer financial information'].value_counts()
```

Out[143]:
```
Amazon.in                                                  51
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    42
Flipkart.com                                               33
Amazon.in, Flipkart.com, Snapdeal.com                      25
Amazon.in, Flipkart.com                                    24
Amazon.in, Paytm.com, Myntra.com                           20
Amazon.in, Snapdeal.com                                    19
Paytm.com                                                  15
Myntra.com                                                 15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com          14
Amazon.in, Flipkart.com, Paytm.com                         11
Name: Security of customer financial information, dtype: int64
```

In [144]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Security of customer financial information'], palette="Set1")
```

Out[144]:
```
<AxesSubplot:xlabel='Security of customer financial information', ylabel='count'>
```

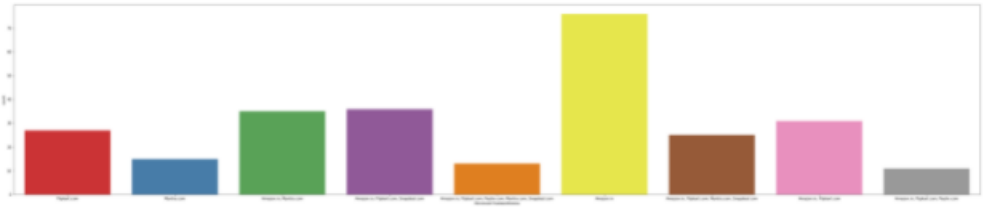


In [145]:
```
Df['Perceived Trustworthiness'].value_counts()
```

Out[145]:
```
Amazon.in                                                  76
Amazon.in, Flipkart.com, Snapdeal.com                      36
Amazon.in, Myntra.com                                      35
Amazon.in, Flipkart.com                                    31
Flipkart.com                                               27
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com          25
Myntra.com                                                 15
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com  13
Amazon.in, Flipkart.com, Paytm.com                         11
Name: Perceived Trustworthiness, dtype: int64
```

In [146]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Perceived Trustworthiness'], palette="Set1")
```

Out[146]:
```
<AxesSubplot:xlabel='Perceived Trustworthiness', ylabel='count'>
```

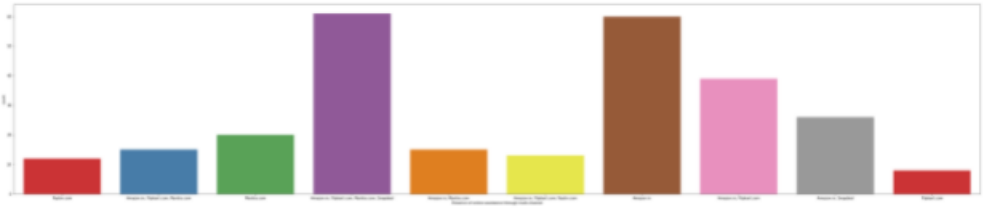


In [147]:
```
Df['Presence of online assistance through multi-channel'].value_counts()
```

Out[147]:
```
Amazon.in, Flipkart.com, Myntra.com, Snapdeal    61
Amazon.in                                        60
Amazon.in, Flipkart.com                          39
Amazon.in, Snapdeal                              26
Myntra.com                                       20
Amazon.in, Myntra.com                            15
Amazon.in, Flipkart.com, Myntra.com              15
Amazon.in, Flipkart.com, Paytm.com               13
Paytm.com                                        12
Flipkart.com                                      8
Name: Presence of online assistance through multi-channel, dtype: int64
```

In [148]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Presence of online assistance through multi-channel'], palette="Set1")
```

Out[148]:
```
<AxesSubplot:xlabel='Presence of online assistance through multi-channel', ylabel='count'>
```

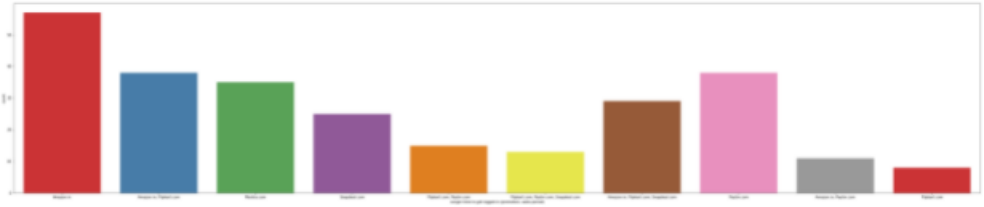


In [149]:
```
Df['Longer time to get logged in (promotion, sales period)'].value_counts()
```

Out[149]:
```
Amazon.in                                57
Paytm.com                                38
Amazon.in, Flipkart.com                  38
Myntra.com                               35
Amazon.in, Flipkart.com, Snapdeal.com    29
Snapdeal.com                             25
Flipkart.com, Paytm.com                  15
Flipkart.com, Paytm.com, Snapdeal.com    13
Amazon.in, Paytm.com                     11
Flipkart.com                              8
Name: Longer time to get logged in (promotion, sales period), dtype: int64
```

In [150]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Longer time to get logged in (promotion, sales period)'], palette="Set1")
```

Out[150]:
```
<AxesSubplot:xlabel='Longer time to get logged in (promotion, sales period)', ylabel='count'>
```

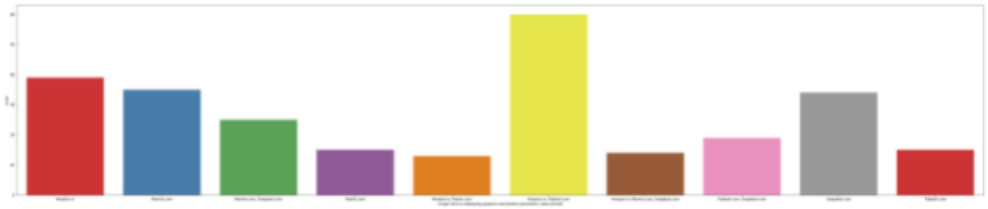


In [151]:
```
Df['Longer time in displaying graphics and photos (promotion, sales period)'].value_counts()
```

Out[151]:
```
Amazon.in, Flipkart.com                60
Amazon.in                              39
Myntra.com                             35
Snapdeal.com                           34
Myntra.com, Snapdeal.com               25
Flipkart.com, Snapdeal.com             19
Paytm.com                              15
Flipkart.com                           15
Amazon.in, Myntra.com, Snapdeal.com    14
Amazon.in, Paytm.com                   13
Name: Longer time in displaying graphics and photos (promotion, sales period), dtype: int64
```

In [152]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Longer time in displaying graphics and photos (promotion, sales period)'], palette="Set1")
```

Out[152]:
```
<AxesSubplot:xlabel='Longer time in displaying graphics and photos (promotion, sales period)', ylabel='count'>
```

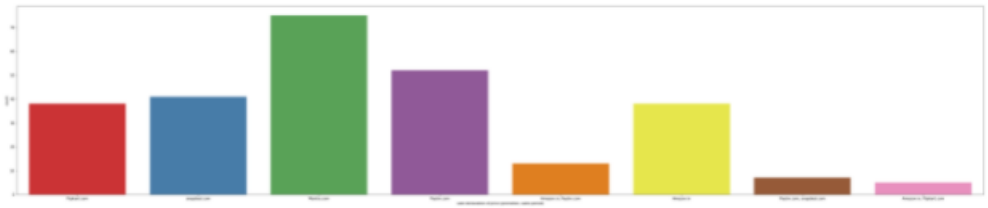


In [153]:
```
Df['Late declaration of price (promotion, sales period)'].value_counts()
```

Out[153]:
```
Myntra.com                75
Paytm.com                 52
snapdeal.com              41
Amazon.in                 38
Flipkart.com              38
Amazon.in, Paytm.com      13
Paytm.com, snapdeal.com    7
Amazon.in, Flipkart.com    5
Name: Late declaration of price (promotion, sales period), dtype: int64
```

In [154]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Late declaration of price (promotion, sales period)'], palette="Set1")
```

Out[154]:
```
<AxesSubplot:xlabel='Late declaration of price (promotion, sales period)', ylabel='count'>
```

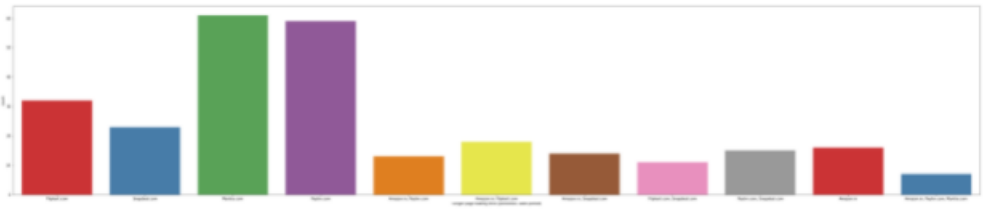


In [155]:
```
Df['Longer page loading time (promotion, sales period)'].value_counts()
```

Out[155]:
```
Myntra.com                        61
Paytm.com                         59
Flipkart.com                      32
Snapdeal.com                      23
Amazon.in, Flipkart.com           18
Amazon.in                         16
Paytm.com, Snapdeal.com           15
Amazon.in, Snapdeal.com           14
Amazon.in, Paytm.com              13
Flipkart.com, Snapdeal.com        11
Amazon.in, Paytm.com, Myntra.com   7
Name: Longer page loading time (promotion, sales period), dtype: int64
```

In [156]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Longer page loading time (promotion, sales period)'], palette="Set1")
```

Out[156]:
```
<AxesSubplot:xlabel='Longer page loading time (promotion, sales period)', ylabel='count'>
```

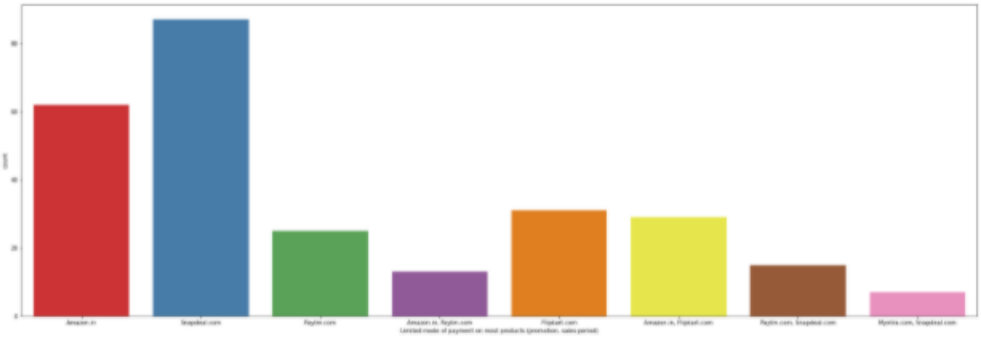


In [157]:
```
Df['Limited mode of payment on most products (promotion, sales period)'].value_counts()
```

Out[157]:
```
Snapdeal.com                87
Amazon.in                   62
Flipkart.com                31
Amazon.in, Flipkart.com     29
Paytm.com                   25
Paytm.com, Snapdeal.com     15
Amazon.in, Paytm.com        13
Myntra.com, Snapdeal.com     7
Name: Limited mode of payment on most products (promotion, sales period), dtype: int64
```

In [158]:
```
plt.figure(figsize=(30,10),facecolor='white')
sns.countplot(Df['Limited mode of payment on most products (promotion, sales period)'], palette="Set1")
```

Out[158]:
```
<AxesSubplot:xlabel='Limited mode of payment on most products (promotion, sales period)', ylabel='count'>
```



In [159]:
```
Df['Longer delivery period'].value_counts()
```

Out[159]:
```
Paytm.com                72
Snapdeal.com             64
Flipkart.com             44
Amazon.in                37
Paytm.com, Snapdeal.com  26
Myntra.com               26
Name: Longer delivery period, dtype: int64
```

In [160]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Longer delivery period'], palette="Set1")
```

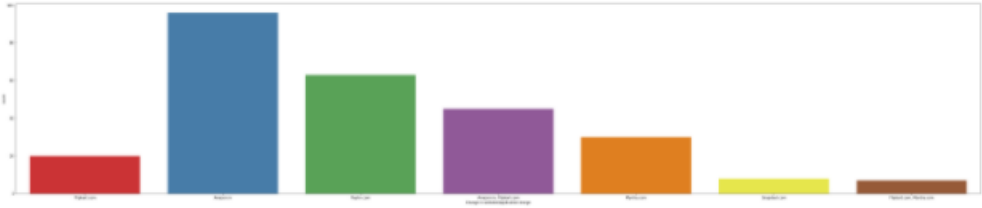
Out[160]:
```
<AxesSubplot:xlabel='Longer delivery period', ylabel='count'>
```

In [161]:
```
Df['Change in website/Application design'].value_counts()
```

Out[161]:
```
Amazon.in                   96
Paytm.com                   63
Amazon.in, Flipkart.com     45
Myntra.com                  30
Flipkart.com                20
Snapdeal.com                 8
Flipkart.com, Myntra.com     7
Name: Change in website/Application design, dtype: int64
```

In [162]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Change in website/Application design'], palette="Set1")
```

Out[162]:
```
<AxesSubplot:xlabel='Change in website/Application design', ylabel='count'>
```

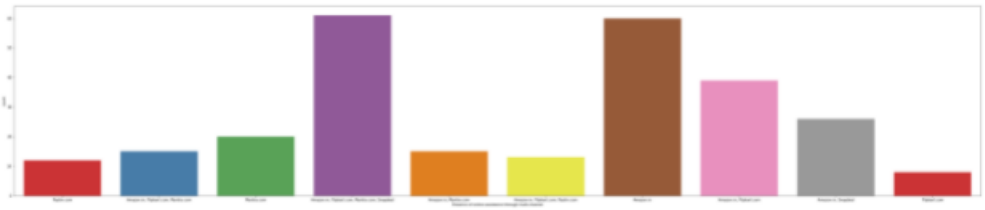


In [163]:
```
Df['Presence of online assistance through multi-channel'].value_counts()
```

Out[163]:
```
Amazon.in, Flipkart.com, Myntra.com, Snapdeal    61
Amazon.in                                        60
Amazon.in, Flipkart.com                          39
Amazon.in, Snapdeal                              26
Myntra.com                                       20
Amazon.in, Myntra.com                            15
Amazon.in, Flipkart.com, Myntra.com              15
Amazon.in, Flipkart.com, Paytm.com               13
Paytm.com                                        12
Flipkart.com                                      8
Name: Presence of online assistance through multi-channel, dtype: int64
```

In [164]:
```
plt.figure(figsize=(50,10),facecolor='white')
sns.countplot(Df['Presence of online assistance through multi-channel'], palette="Set1")
```

Out[164]:
```
<AxesSubplot:xlabel='Presence of online assistance through multi-channel', ylabel='count'>
```

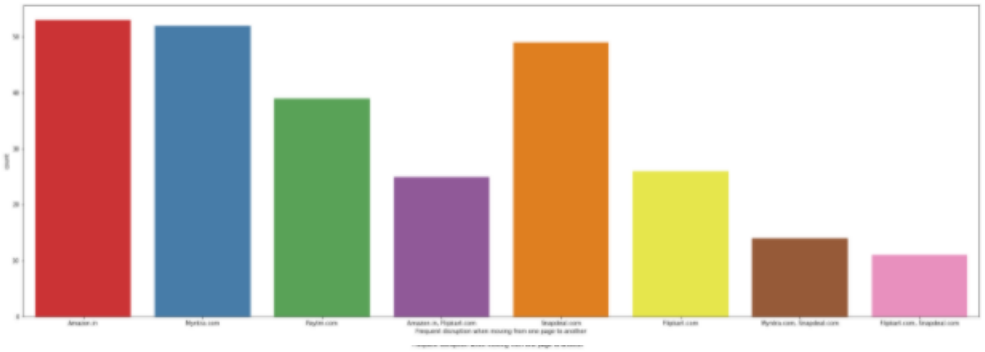


In [165]:
```
Df['Frequent disruption when moving from one page to another'].value_counts()
```

Out[165]:
```
Amazon.in                    53
Myntra.com                   52
Snapdeal.com                 49
Paytm.com                    39
Flipkart.com                 26
Amazon.in, Flipkart.com      25
Myntra.com, Snapdeal.com     14
Flipkart.com, Snapdeal.com   11
Name: Frequent disruption when moving from one page to another, dtype: int64
```

In [166]:
```
plt.figure(figsize=(30,10),facecolor='white')
sns.countplot(Df['Frequent disruption when moving from one page to another'], palette="Set1")
```

Out[166]:
```
<AxesSubplot:xlabel='Frequent disruption when moving from one page to another', ylabel='count'>
```

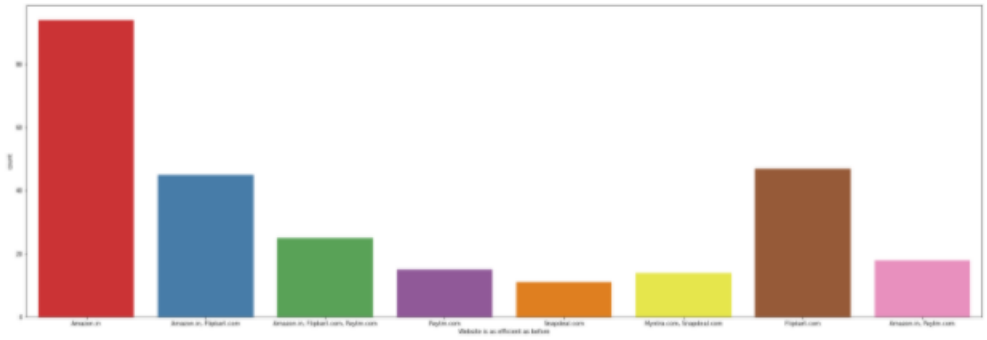


In [167]:
```
Df['Website is as efficient as before'].value_counts()
```

Out[167]:
```
Amazon.in                            94
Flipkart.com                         47
Amazon.in, Flipkart.com              45
Amazon.in, Flipkart.com, Paytm.com   25
Amazon.in, Paytm.com                 18
Paytm.com                            15
Myntra.com, Snapdeal.com             14
Snapdeal.com                         11
Name: Website is as efficient as before, dtype: int64
```

In [168]:
```
plt.figure(figsize=(30,10),facecolor='white')
sns.countplot(Df['Website is as efficient as before'], palette="Set1")
```

Out[168]:
```
<AxesSubplot:xlabel='Website is as efficient as before', ylabel='count'>
```

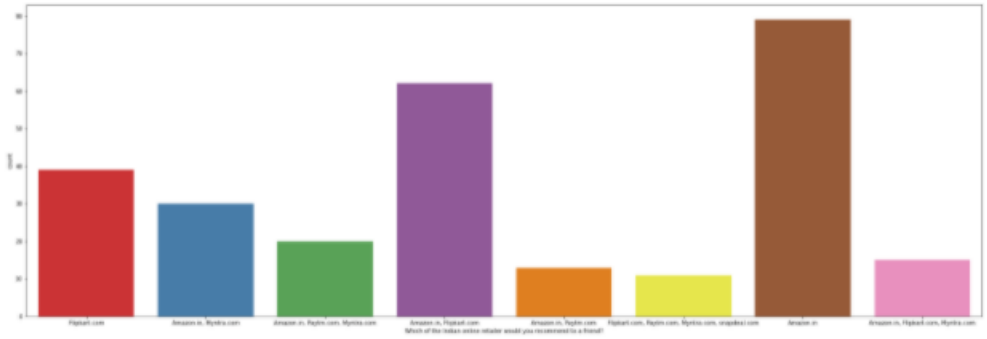


In [169]:
```
Df['Which of the Indian online retailer would you recommend to a friend?'].value_counts()
```

Out[169]:
```
Amazon.in                                          79
Amazon.in, Flipkart.com                            62
Flipkart.com                                       39
Amazon.in, Myntra.com                              30
Amazon.in, Paytm.com, Myntra.com                   20
Amazon.in, Flipkart.com, Myntra.com                15
Amazon.in, Paytm.com                               13
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com  11
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64
```

In [170]:
```
plt.figure(figsize=(30,10),facecolor='white')
sns.countplot(Df['Which of the Indian online retailer would you recommend to a friend?'], palette="Set1")
```

Out[170]:
```
<AxesSubplot:xlabel='Which of the Indian online retailer would you recommend to a friend?', ylabel='count'>
```



From the graphs above the following observations are made:

- Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com are the most popular e-commerce websites.
- Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com are the easiest to use websites and applications
- Amazon.in and Flipkart.com have the most visually appealing web-page layout.
- Amazon.in and Flipkart.com have the widest variety of products on offer
- Amazon.in and Flipkart.com have the most complete, relevant description information of products.
- Amazon.in, and Paytm.com have the fastest loading speed while Flipkart is regarded by very few as being quick to load
- Amazon.com, Flipkart.com, Paytm.com are considered quick to complete purchases.
- Amazon.in, Flipkart.com are regarded by most to have several payment options available
- Amazon.in is regarded to offer speedy order delivery by most.
- Amazon.in offers the most Privacy for customers' information.
- Amazon.in , followed by Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com provide the best security for customer financial information.

- Amazon.in is perceived to be the most trustworthy website by the majority of participants.
- Amazon.in, Flipkart.com, Myntra.com, Snapdeal have the highest presence of online assistance through multi-channel.
- Most people face longer time to get logged in during promotion, sales period on Amazon.in and Flipkart followed by Paytm and Myntra.
- Amazon.in, Flipkart.com take the longest time displaying graphics and photos during promotion, sales period.
- Most people face Late declaration of price on Myntra and Paytm during promotion, sales period.
- Myntra and Paytm take the longest page loading time during promotion, sales period.
- Snapdeal.com and Amazon.in have the most limited modes of payment on most products during promotion, sales period.
- Paytm.com and Snapdeal.com have Longer delivery periods compared to others.
- Amazon.in and Paytm.com have had recent changes in website/Application design, as

observed by the consumers.

- Most consumers face frequent disruption when moving from one page to another on Amazon.in, Myntra.com and Snapdeal.com.
- Most consumers are of the opinion that Amazon.in website is as efficient as before followed by Flipkart.com.
- Most Consumers would recommend Amazon.in to a friend, followed by Flipkart.

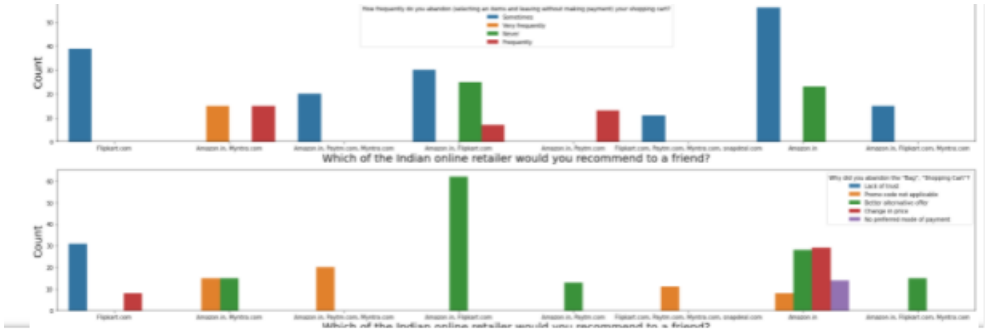
Analysing Relationship between Customer retention and Perceived Risks

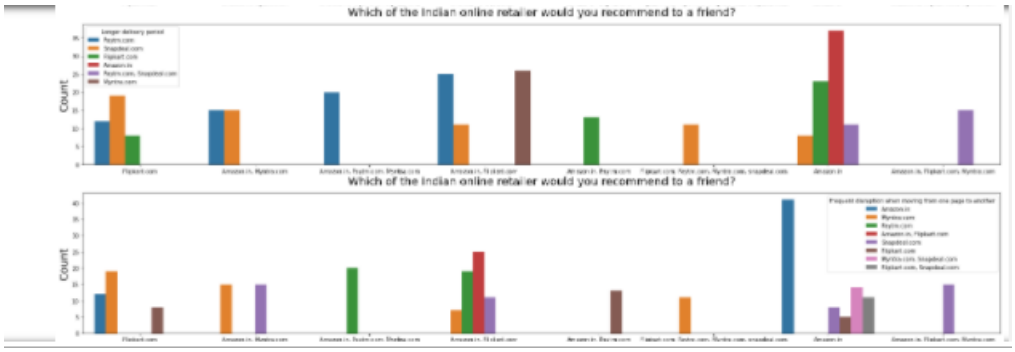
The Columns titled: *' How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?','Why did you abandon the "Bag", "Shopping Cart"?","Longer delivery period','Frequent disruption when moving from one page to another','Longer page loading time (promotion, sales period)','Perceived Trustworthiness','Security of customer financial information','Privacy of customers' information',' User satisfaction cannot exist without trust',' Trust that the online retail store will fulfill its part of the transaction at the stipulated time','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)'* represent the "Perceived Risk" of a customer while shopping online.

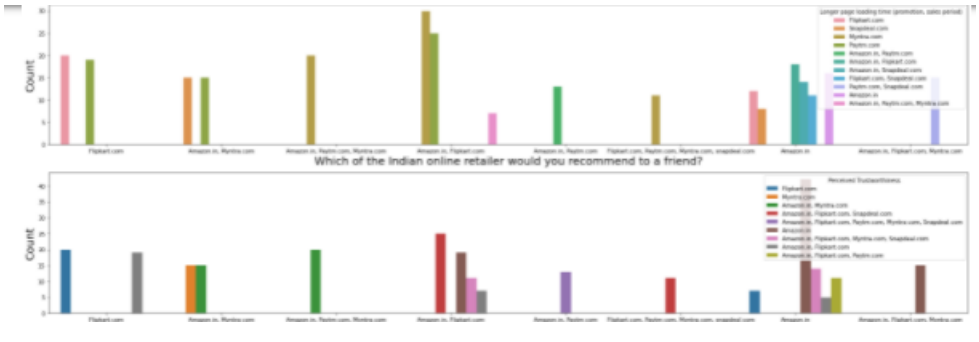
While the column titled : '*Which of the Indian online retailer would you recommend to a friend?'* represents a customer's loyalty to a website and therefore, its customer retention.

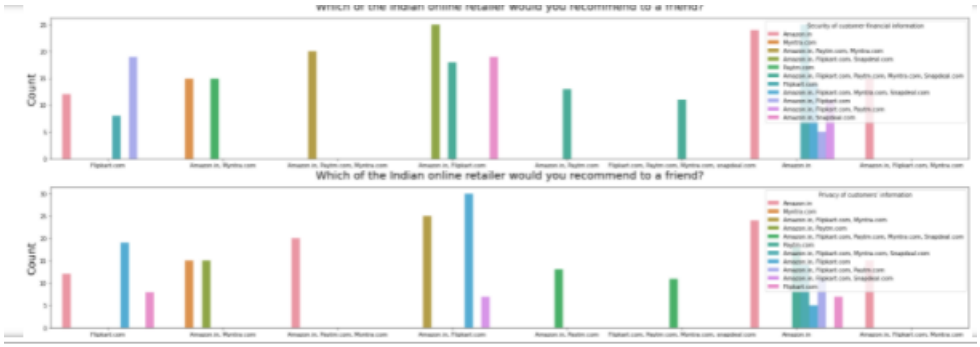
The relationships between the columns representing the perceived risks and the column representing Customer retention were visualized using the code below and observations were made.

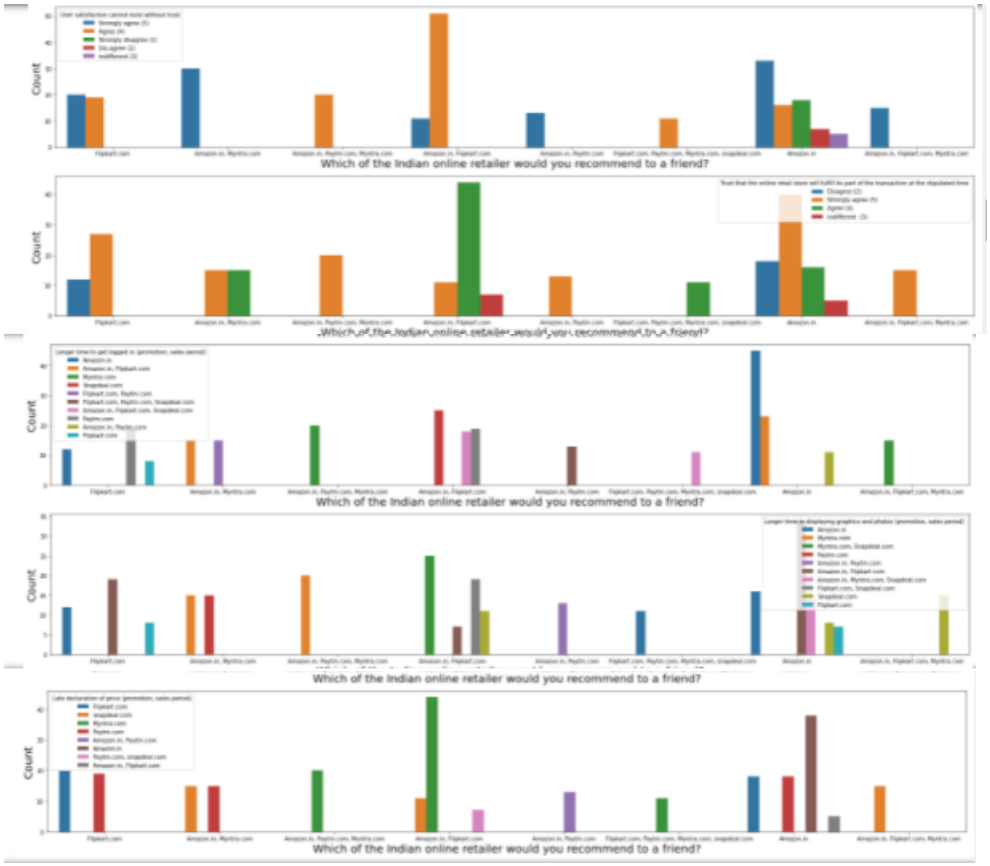
```
In [171]: plt.figure(figsize=(24,55),facecolor='white')
          plotnum=1
          y = D+[['How frequently do you abandon (selecting an items and leaving without making payment) your shopping cart?','Why did you
          X = D+['Which of the Indian online retailer would you recommend to a friend?']
          for col in y:
              if plotnum<=13:
                  plt.subplot(13,1,plotnum)
                  sns.countplot(X,hue =y[col])
                  plt.xlabel('Which of the Indian online retailer would you recommend to a friend?',fontsize=20)
                  plt.ylabel('Count',fontsize=20)
              plotnum+=1
          plt.tight_layout()
```


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


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


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


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



From the graphs above the following observations are made:

- Customers sometimes abandon their shopping carts on Amazon and Flipkart implying there is a low level of perceived risk for those websites. While some people frequently abandon their shopping carts on Amazon.in and Myntra.com and Paytm.com, which may indicate a higher level of perceived risk on those websites.
- Customers usually abandon their shopping carts on Amazon and Flipkart when they find a better alternative offer which implies that there is a greater importance for utilitarian value, While on Flipkart alone they mostly abandon due to lack of trust and on amazon alone, they abandon either due to Promo code not being applicable or Change in price.
- Customers face longest delivery Periods when they purchase on Amazon.in, followed by flipkart.com and paytm, however Amazon.in is still the most preferred shopping website.

- It is observed that those who prefer Flipkart.com,Paytm.com,Myntra.com and Snapdeal.com to Amazon.in do so because they face frequent disruption when moving from page to page on Amazon.in
- Those who prefer Amazon.in and Flipkart.com face longer page loading time during promotion and sales period on snapdeal.com and myntra.com
- Amazon.in has the highest trustworthiness as perceived by most consumers.
- Amazon.in,Flipkart.com,Paytm.com have the highest security for customer financial information.
- Amazon.in,Flipkart.com,Paytm.com maintain the greatest privacy for customer information.
- Customers who believe that user satisfaction can't exist without trust recommend Amazon.in and Flipkart.com
- Those customers who recommend Amazon.in and Flipkart.com the most trust that online retail stores will fulfill their part of the transaction at the stipulated time.
- Customers face the longest time to get logged in on Amazon.in and Flipkart.com the most and yet, recommend those 2 websites the most.
- Customers prefer Amazon.in and Flipkart.com To Myntra.com and Snapdeal.com because Myntra and Snapdeal take longer to display graphics and photos during promotion and sales period.
- Customers prefer Amazon.in and Flipkart.com To Myntra.com and Snapdeal.com because Myntra and Snapdeal take too long to declare prices during promotion and sales period.

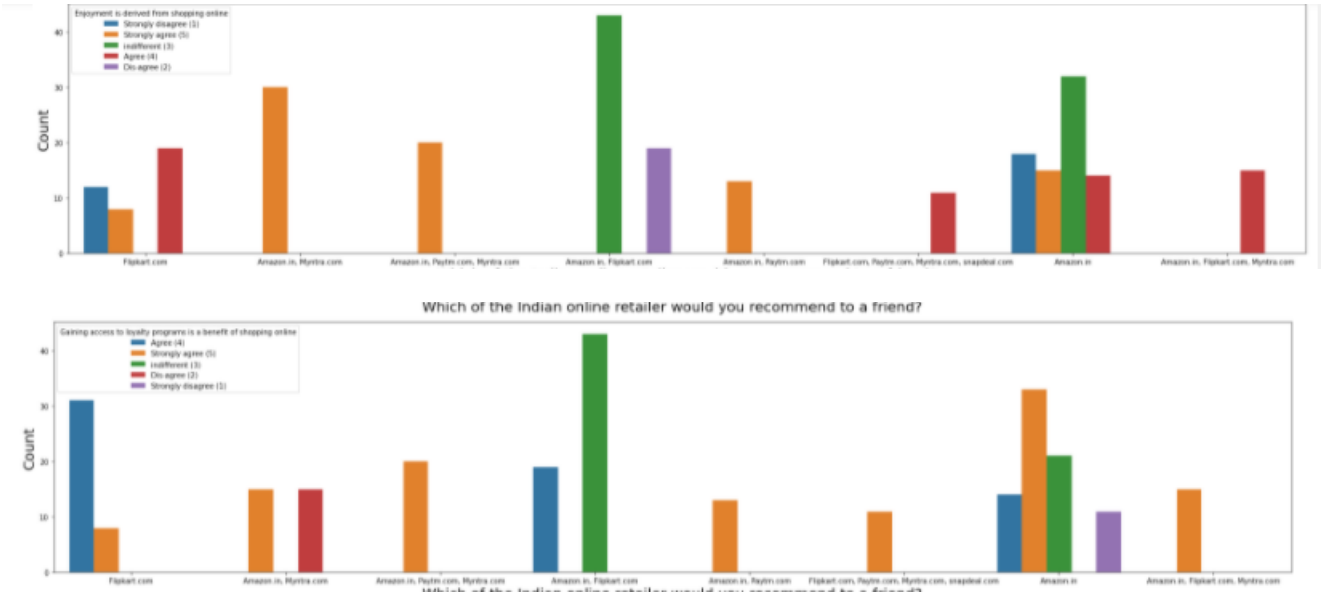
Analysing Relationship between Customer retention and Hedonic Value

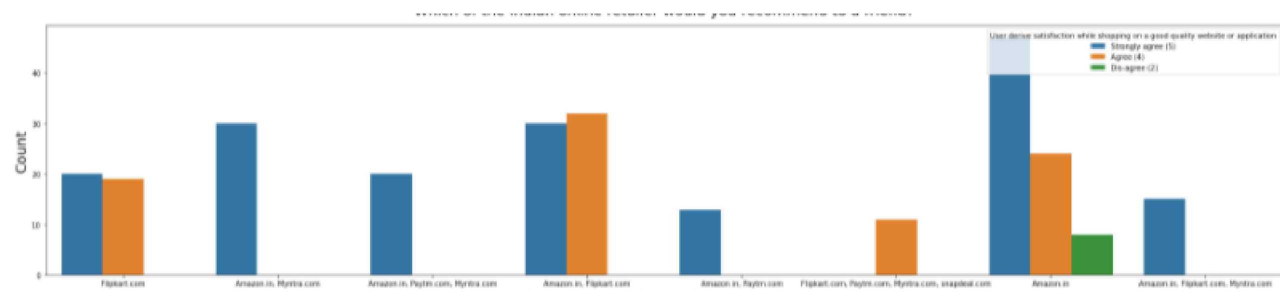
Hedonic Values serve the purpose of giving emotional / multisensory gratification and a sense of fulfillment of a role to Consumers.

Columns titled: *‘ Enjoyment is derived from shopping online','Gaining access to loyalty programs is a benefit of shopping online','User derive satisfaction while shopping on a good quality website or application','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','Visual appealing web-page layout' and 'Change in website/Application design’* Represent hedonic values.

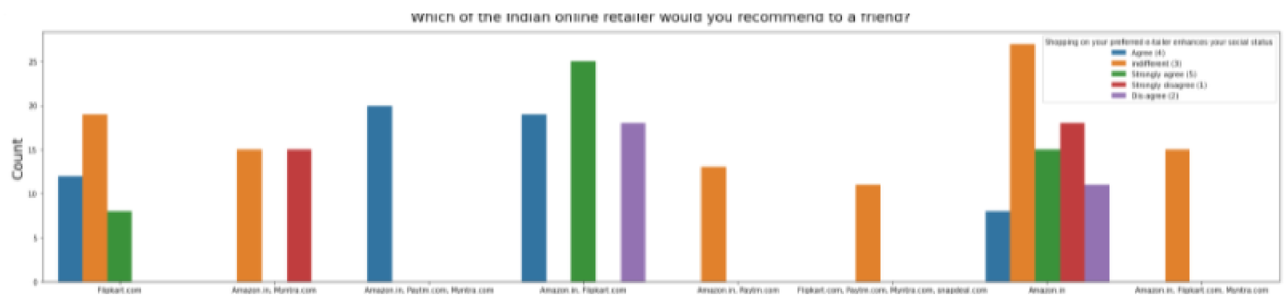
The relationships between the columns representing the Hedonic Values and the column representing Customer retention were visualized using the code below and observations were made.

```
In [172]: plt.figure(figsize=(25,55),facecolor='white')
          plotnum=1
          y = Df[['Enjoyment is derived from shopping online','Gaining access to loyalty programs is a benefit of shopping online','User d
          X = Df['Which of the Indian online retailer would you recommend to a friend?']
          for col in y:
              if plotnum<=10:
                  plt.subplot(10,1,plotnum)
                  sns.countplot(X,hue =y[col])
                  plt.xlabel('Which of the Indian online retailer would you recommend to a friend?',fontsize=20)
                  plt.ylabel('Count',fontsize=20)
              plotnum+=1
          plt.tight_layout()
```



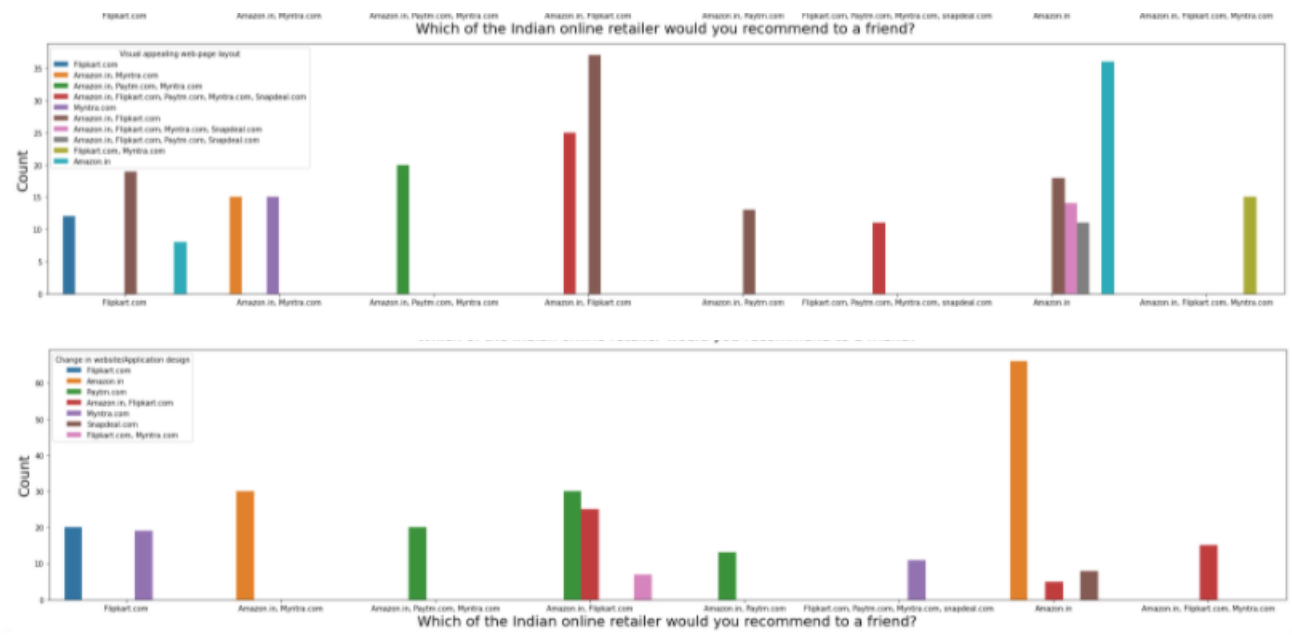

Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com


Which of the Indian online retailer would you recommend to a friend?
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com


Which of the Indian online retailer would you recommend to a friend?
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com


Which of the Indian online retailer would you recommend to a friend?
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com


Which of the Indian online retailer would you recommend to a friend?
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com



From the graphs above the following observations are made:

- Customers who recommend Myntra.com,paytm.com and Amazon.in Strongly agree that enjoyment is derived from shopping online, while those who recommend Flipkart and Amazon.in are indifferent about it.
- Gaining Access to loyalty programs is a benefit of shopping online for those who recommend Amazon.in and Flipkart.com
- Those who Recommend Amazon.in,flipkart.com and Myntra.com strongly derive satisfaction while shopping on a good quality website / application.
- Those who Recommend Amazon.in,flipkart.com,paytm.com and Myntra.com strongly agree that they get a sense of adventure from shopping online.
- Although most consumers are indifferent to whether or not shopping on e-commerce websites enhances their social status, Those who recommend Amazon.in,Flipkart.com,paytm.com and myntra.com agree that shopping on those websites enhances their social status.
- Most consumers agree that shopping on Amazon.in and Flipkart.com get a sense of gratification from shopping on their favourite e-tailer.
- Most consumers agree that shopping on Amazon.in,Flipkart.com,Myntra.com,snapdeal.com and Paytm.com agree that shopping on the websites fulfills certain roles.
- Most consumers consider Amazon.in and Flipkart.com to have the most visually

appealing web-page layout.

- Most consumers who recommend Amazon.in appreciate change in website/application design.

Analysing Relationship between Customer retention and Utilitarian Value

Utilitarian values are based on rational decisions,are goal related and give importance to functional values of products / transactions on websites that are aimed at enhancing customer satisfaction through meaningful online transactions.

Columns titled: *' How much time do you explore the e- retail store before making a purchase decision?','Wild variety of product on offer','What is your preferred payment Option?','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','Empathy (readiness to assist with queries) towards the customers','Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)','Online shopping gives monetary benefit and discounts','Shopping online is convenient and flexible','Return and replacement policy of the e-tailer is important for purchase decision','Displaying quality Information on the website improves satisfaction of customers','Net Benefit derived from shopping online can lead to users satisfaction',' Offering a wide variety of listed product in several category','Provision of complete and relevant product information','Monetary savings','The Convenience of patronizing the online retailer','Getting value for money spent','Easy to use website or application','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 ','Website is as efficient as before','Presence of online assistance through multi-channel','Limited mode of payment on most products (promotion, sales period)'* represent Utilitarian values.

The relationships between the columns representing the Utilitarian Values and the column representing Customer retention were visualized using the code below and observations were

made.

In [174]:
```
plt.figure(figsize=(25,120),facecolor='white')
plotnum=1
y = Df[['How much time do you explore the e- retail store before making a purchase decision?','Wild variety of product on offer'
X = Df['Which of the Indian online retailer would you recommend to a friend?']
for col in y:
    if plotnum<=34:
        plt.subplot(34,1,plotnum)
        sns.countplot(X,hue =y[col])
        plt.xlabel('Which of the Indian online retailer would you recommend to a friend?',fontsize=20)
        plt.ylabel('Count',fontsize=20)
    plotnum+=1
plt.tight_layout()
```


All relevant information on listed products must be stated clearly
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


Ease of navigation in website
Agree (4)
Strongly agree (5)
Strongly disagree (1)
Dis-agree (2)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


Loading and processing speed
Strongly disagree (1)
Strongly agree (5)
Agree (4)
Dis-agree (2)
Indifferent (3)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


User friendly interface of the website
Dis-agree (2)
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Indifferent (3)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


Convenient Payment methods
Dis-agree (2)
Strongly agree (5)
Agree (4)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?

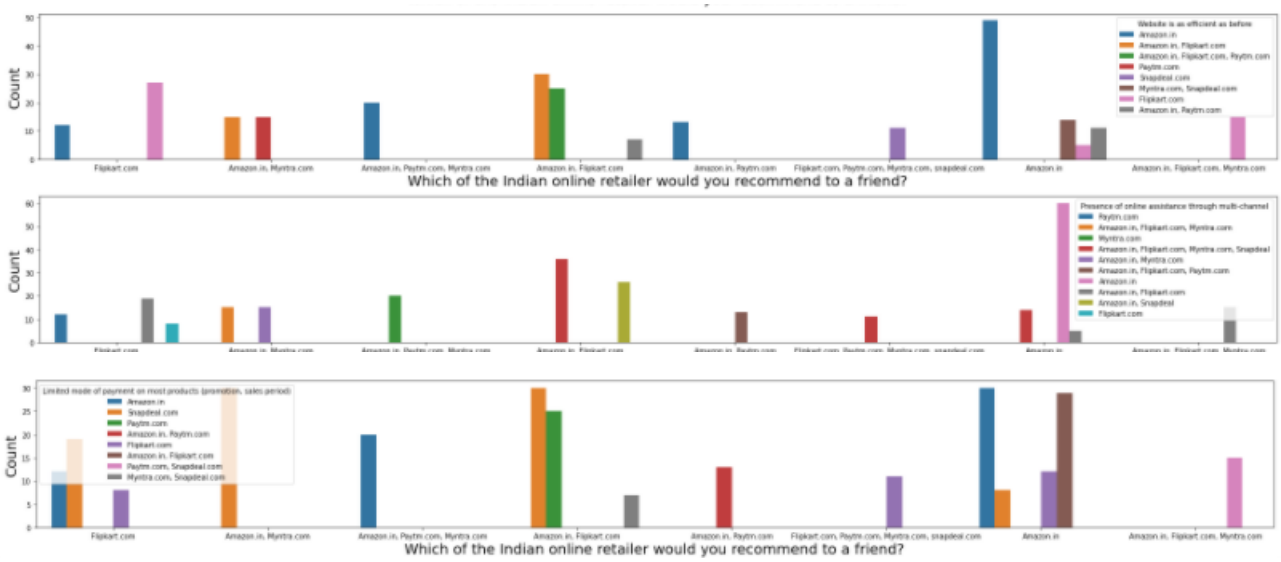

Empathy (readiness to assist with queries) towards the customers
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Indifferent (3)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
Agree (4)
Strongly agree (5)
Indifferent (3)
Strongly disagree (1)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


Online shopping gives monetary benefit and discounts
Indifferent (3)
Strongly agree (5)
Agree (4)
Strongly disagree (1)
Dis-agree (2)
Count
Flipkart.com
Amazon.in, Myntra.com
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
Amazon.in
Amazon.in, Flipkart.com, Myntra.com
Which of the Indian online retailer would you recommend to a friend?


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


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



From the graphs above, the following observations can be made:

- Most Consumers who recommend amazon and myntra spend more than 15 minutes on Amazon and Myntra.
- Amazon and Flipkart offer the widest varieties of products
- Most Consumers who recommend amazon and flipkart Prefer payments via Credit/Debit cards and Cash on Delivery
- Most Consumers who recommend amazon and flipkart appreciate the ease of understanding and reading content on the respective websites.
- Most Consumers who recommend amazon and flipkart find it important for information on similar product to be available for comparison
- Most Consumers who recommend amazon and flipkart find complete product information important.
- Most Consumers who recommend amazon and flipkart clarity on product information to be important.
- Most Consumers who recommend amazon and flipkart find ease of website navigation important.
- Most Consumers who recommend amazon and flipkart want the website to load and process quickly.
- Most Consumers who recommend amazon and flipkart find the interface of the websites user friendly.
- Most Consumers who recommend amazon and flipkart find the payment methods most

convenient.

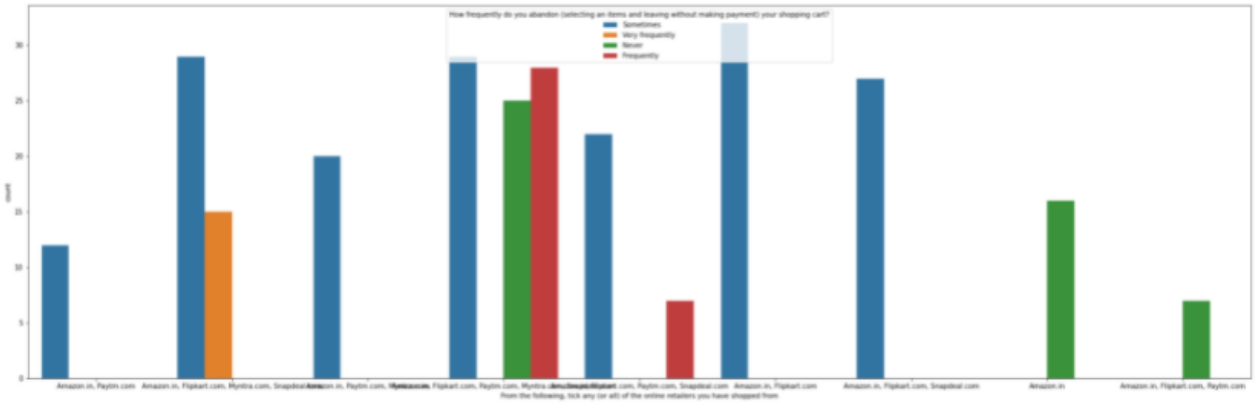
- Most Consumers who recommend amazon and flipkart find it important for customer support representatives to be empathetic.
- Most Consumers who prefer Amazon and flipkart find it important for there to exist Responsiveness and availability of many communication channels.
- Most Consumers who recommend Amazon and flipkart find that shopping on there gives them monetary benefits and discounts.
- Most Consumers who recommend Amazon find shopping on there convenient and flexible.
- Most Consumers recommend Amazon because return and replacement policy is important for purchase decisions.
- Most Consumers recommend Amazon and flipkart because they display quality information on websites.
- Most Consumers recommend Amazon and flipkart because they believe net benefit is derived from shopping online leads to user satisfaction.
- Most Consumers recommend Amazon and flipkart because they offer a wide variety of products in several categories.
- Most Consumers recommend Amazon and flipkart because they provide complete and relevant product information.
- Most Consumers recommend Amazon,myntra,paytm and flipkart because they offer monetary savings
- Most Consumers recommend Amazon and flipkart because they consider convenience of patronizing the online retailer important
- Most Consumers recommend Amazon and flipkart because they get value for money spent.
- Most Consumers recommend Amazon,paytm,myntra and flipkart because of the ease of using them.
- Most Consumers recommend Amazon and flipkart because they are quick to load,reliable, many payment options are available,purchasing is quick.
- Most Consumers recommend Amazon because the website is as efficient as before.
- Most Consumers recommend Amazon because of presence of online assistance through multiple channels
- Most Consumers recommend Amazon and flipkart because snapdeal,myntra,paytm have limited modes of payment during promotion or sale periods.

Perceived Risk on E Commerce Websites

The relations between perceived risks and online e-commerce websites were visualized and observations were made.

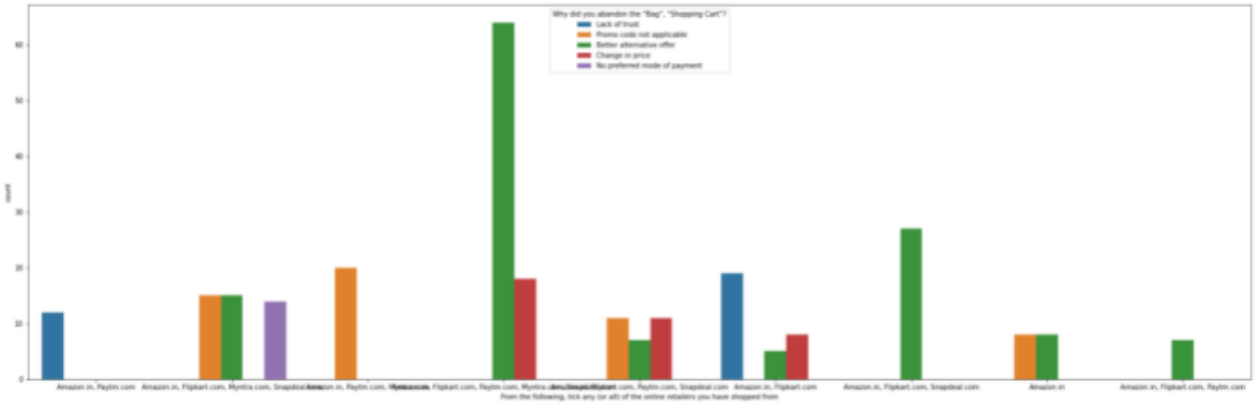
```
In [175]: plt.figure(figsize=(32,10),facecolor='white')
          sns.countplot(Df['From the following, tick any (or all) of the online retailers you have shopped from'],hue =Df['How frequently
```

```
Out[175]: <AxesSubplot:xlabel='From the following, tick any (or all) of the online retailers you have shopped from', ylabel='count'>
```



```
In [176]: plt.figure(figsize=(32,10),facecolor='white')
          sns.countplot(Df['From the following, tick any (or all) of the online retailers you have shopped from'],hue =Df['Why did you aban
```

```
Out[176]: <AxesSubplot:xlabel='From the following, tick any (or all) of the online retailers you have shopped from', ylabel='count'>
```



From the graphs above it is observed that:

- Most customers abandon their shopping carts on Amazon and flipkart because of change in price or when they find a better deal elsewhere, whereas on paytm,myntra snapdeal etc, the reasons are varied but largely are due to lack of trust or absence of preferred mode of payment.

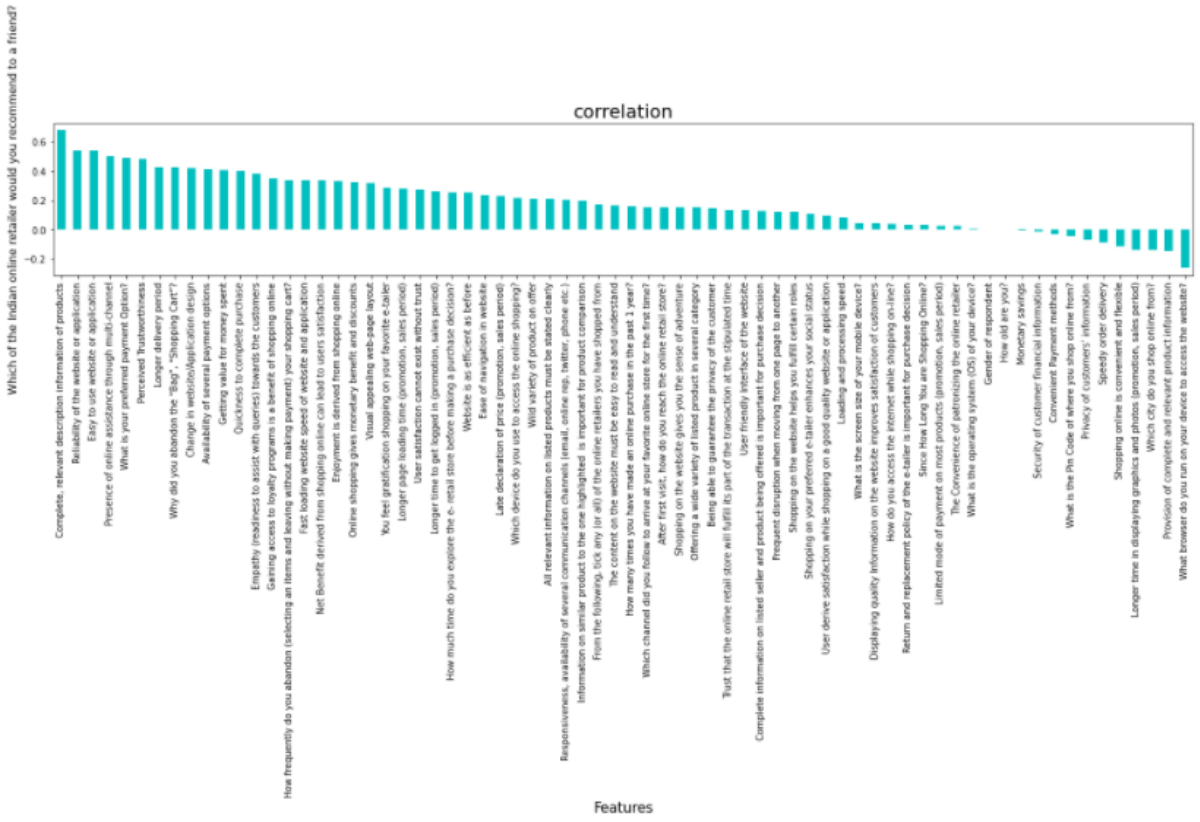
Finding the correlation between Customer Retention and Perceived Risks

Next step was to find the strength of correlation, both positive and negative between the feature columns and Target column.

The object type columns were encoded using LabelEncoder technique and the correlations between the feature columns and label column were determined and visualised.

```
In [182]: from sklearn.preprocessing import LabelEncoder

In [183]: labenc = LabelEncoder()

In [193]: obj = ['Which city do you shop online from?','Which of the Indian online retailer would you recommend to a friend?','Website is a
```

```
In [198]: plt.figure(figsize = (22,3))
Df2.corr()['Which of the Indian online retailer would you recommend to a friend?'].sort_values(ascending = False).drop(['Which of
plt.xlabel('Features',fontsize=15)
plt.ylabel('Which of the Indian online retailer would you recommend to a friend?',fontsize=12)
plt.title('correlation',fontsize = 20)
plt.show()
```



From the chart above it is observed that Complete product information,Website/application reliability,ease of using website/application,customer support,variety of payment options,Trustworthiness,Delivery Period,Getting value for money spend,enjoyment derived from shopping,website efficiency,visual appeal of website layout,Gratification from shopping online,Loyalty program access, etc have a strong positive correlation with customer retention, speedy order delivery,longer loading time of website,provision of complete relevant information etc have a strong correlation with customer retention.

Concluding Remarks.

From the above Exploratory Data Analysis, it is determined that for any website to retain customers,for the growth of its customer-base and to build and maintain a successful business, it is important that the E-tailers focus on enhancing customer experience in shopping on their websites, while ensuring that all of their particular hedonic and utilitarian needs are satisfied, while taking steps to minimise the perceived risks. Offering a huge variety of products, impeccable website design, user friendly interface, a huge variety of safe and convenient payment options, offering strong data security and privacy, helpful, empathetic support staff and impeccable customer service, optimised website processes that universally load in optimal time on all types of platforms and systems, faster delivery etc are vital to ensure customer loyalty to the brand of the e-tailer Experienced customers, give great importance to their experiences of previous purchases, which in turn speeds up the process of attaining their shopping goals. In this way customers would purchase repeatedly on the basis of the judgment of value, which is necessary to help consumers to accomplish their goal of shopping. The major reason why Amazon.in and Flipkart.com dominate the E commerce market in terms of customer retention and brand loyalty is that they have dedicated all their resources to studying and understanding the various requirements of individual customers that play as important factors in fulfilling their hedonic and utilitarian needs while giving them a sense of trust in making purchases on their respective websites while at the same time giving them incentives in various forms(discounts,cashbacks loyalty programs etc) that keep them returning to make recurring purchases.