Market Segmentation

“It's not what you sell that matters as much as how you sell it!” — Brian Halligan, CEO & Co-Founder, Hub Spot

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“We are entering a new world. The technologies of machine learning, speech recognition, and natural language understanding are reaching a nexus of capability. The end result is that we’ll soon have artificially intelligent assistants to help us in every aspect of our lives.” ~Amy Stapleton

Market Segmentation

1.1 Strategic and Tactical Marketing

The purpose of marketing is to match the genuine needs and desires of consumers with the offers of suppliers particularly suited to satisfy those needs and desires. This matching process benefits consumers and suppliers, and drives an organisation's marketing planning process.

Marketing planning is a logical sequence and a series of activities leading to the setting of marketing objectives and the formulation of plans to achieving them (McDonald and Wilson 2011, p. 24). A marketing plan consists of two components: a strategic and a tactical marketing plan. The strategic plan outlines the long-term direction of an organisation, but does not provide much detail on short- term marketing action required to move in this long-term direction. The tactical marketing plan does the opposite. It translates the long-term strategic plan into detailed instructions for short-term marketing action. The strategic marketing plan states where the organisation wants to go and why. The tactical marketing plan contains instructions on what needs to be done to get there.

1.2 Definitions of Market Segmentation

Market segmentation is a decision-making tool for the marketing manager in the crucial task of selecting a target market for a given product and designing an appropriate marketing mix (Tynan and Drayton 1987, p. 301). Market segmentation is one of the key building blocks of strategic marketing. Market segmentation is essential for marketing success: the most successful firms drive their businesses based on segmentation. Market segmentation lies at the heart of successful marketing (McDonald 2010), tools such as segmentation have the largest impact on marketing decisions (Roberts et al. 2014, p. 127). Smith (1956) was the first to propose the use of segmentation as a marketing strategy. Smith defines market segmentation as viewing a heterogeneous market

Conceptually, market segmentation sits between the two extreme views that (a) all objects are unique and inviolable and (b) the population is homogeneous (Saunders 1980, p. 422). One of the simplest and clearest definitions is that used in a newsletter by Grey Advertising Inc. and cited in Haley (1985, p. 8): market segmentation means cutting markets into slices. Ideally, consumers belonging to the same market segments – or sets of buyers (Tynan and Drayton 1987) – are very similar to one another with respect to the consumer characteristics deemed critical by management. At the same time, optimally, consumers belonging to different market segments are very different from one another with respect to those consumer characteristics. Consumer characteristics deemed critical to market segmentation by management are referred to as segmentation criteria.

1.3 The Benefits of Market Segmentation

Market segmentation has a number of benefits. At the most general level, market segmentation forces organisations to take stock of where they stand, and where they want to be in future. In so doing, it forces organisations to reflect on what they are particularly good at compared to competitors, and make an effort to gain insights into what consumers want. Market segmentation offers an opportunity to think and rethink, and leads to critical new insights and perspectives.

When implemented well, market segmentation also leads to tangible benefits, including a better understanding of differences between consumers, which improves the match of organisational strengths and consumer needs (McDonald and Dunbar 1995). Such an improved match can, in turn, form the basis of a long-term competitive advantage in the selected target segment(s). The extreme case of long-term competitive advantage is that of market dominance, which results from being best able to cater to the needs of a very specific niche segment (McDonald and Dunbar 1995). Ideal niche segments match the organisational skill set in terms of their needs, are large enough to be profitable, have solid potential for growth.

Steps of Market Segmentation Analysis

Step 1: Deciding (not) to Segment

1.1 Implications of Committing to Market Segmentation

Although market segmentation has developed to be a key marketing strategy applied in many organisations, it is not always the best decision to pursue such a strategy. Before investing time and resources in a market segmentation analysis, it is important to understand the implications of pursuing a market segmentation strategy.

The key implication is that the organisation needs to commit to the segmentation strategy on the long term. Market segmentation is a marriage, not a date. The commitment to market segmentation goes hand in hand with the willingness and ability of the organisation to make substantial changes (McDonald and Dunbar 1995) and investments. As Cahill (2006) puts it: Segmenting a market is not free. There are costs of performing the research, fielding surveys, and focus groups, designing multiple packages, and designing multiple advertisements and communication messages. Cahill recommends not to segment unless the expected increase in sales is sufficient to justify implementing a segmentation strategy, stating that one of the truisms of segmentation strategy is that using the scheme has to be

more profitable than marketing without it, net of the expense of developing and using the scheme itself.

1.2 Implementation Barriers

A number of books on market segmentation focus specifically on how market segmentation can be successfully implemented in organisations. These books among them, Dibb and Simkin 2008; Croft 1994 and McDonald and Dunbar 1995) highlight barriers that can impede the successful roll-out of a market segmentation strategy.

The first group of barriers relates to senior management. Lack of leadership, pro-active championing, commitment and involvement in the market segmentation process by senior leadership undermines the success of market segmentation. As McDonald and Dunbar (1995, p. 158) state: There can be no doubt that unless the chief executive sees the need for a segmentation review, understands the process and shows an active interest in it, it is virtually impossible for a senior marketing executive to implement the conclusions in a meaningful way.

Senior management can also prevent market segmentation to be successfully implemented by not making enough resources available, either for the initial market segmentation analysis itself, or for the long-term implementation of a market segmentation strategy.

A second group of barriers relates to organisational culture. Lack of market or consumer orientation, resistance to change and new ideas, lack of creative thinking, bad communication and lack of sharing of information and insights across organisational units, short-term thinking, unwillingness to make changes and office politics have been identified as preventing the successful implementation of market segmentation (Dibb and Simkin 2008). Croft (1994) developed a short questionnaire to assess the extent to which a lack of market orientation in the organisational culture may represent a barrier to the successful implementation of market segmentation.

Another potential problem is lack of training. If senior management and the team tasked with segmentation do not understand the very foundations of market segmentation, or if they are unaware of the consequences of pursuing such a strategy, the attempt of introducing market segmentation is likely to fail.

Step 2: Specifying the Ideal Target Segment

2.1 Segment Evaluation Criteria

The third layer of market segmentation analysis (illustrated in Fig. 2.1) depends primarily on user input. It is important to understand that – for a market segmentation analysis to produce results that are useful to an organisation – user input cannot be limited to either a briefing at the start of the process, or the development of a marketing mix at the end. Rather, the user needs to be involved in most stages, literally wrapping around the technical aspects of market segmentation analysis.

After having committed to investigating the value of a segmentation strategy in Step 1, the organisation has to make a major contribution to market segmentation analysis in Step 2. While this contribution is conceptual in nature, it guides many of the following steps, most critically Step 3 (data collection) and Step 8 (selecting one or more target segments). In Step 2 the organisation must determine two sets of segment evaluation criteria. One set of evaluation criteria can be referred to as knock-out criteria. These criteria are the essential, non-negotiable features of segments that the organisation would consider targeting. The second set of evaluation criteria can be referred to as attractiveness criteria. These criteria are used to evaluate the relative attractiveness of the remaining market segments – those in compliance with the knock-out criteria.

2.2 Knock-Out Criteria

Knock-out criteria are used to determine if market segments resulting from the market segmentation analysis qualify to be assessed using segment attractiveness criteria. The first set of such criteria was suggested by Kotler (1994) and includes substantiality, measurability and accessibility (Tynan and Drayton 1987). Kotler himself and a number of other authors have since recommended additional criteria that fall into the knock-out criterion category (Wedel and Kamakura 2000; Lilien and Rangaswamy 2003; McDonald and Dunbar 2012):

- The segment must be homogeneous; members of the segment must be similar to one another.
- The segment must be distinct; members of the segment must be distinctly different from members of other segments.
- The segment must be large enough; the segment must contain enough consumers to make it worthwhile to spend extra money on customising the marketing mix for them.
- The segment must be matching the strengths of the organisation; the organisation must have the capability to satisfy segment members' needs.
- Members of the segment must be identifiable; it must be possible to spot them in the marketplace.
- The segment must be reachable; there has to be a way to get in touch with members of the segment in order to make the customised marketing mix accessible to them.

Knock-out criteria must be understood by senior management, the segmentation team, and the advisory committee. Most of them do not require further specification, but some do. For example, while size is non-negotiable, the exact minimum viable target segment size needs to be specified.

2.3 Attractiveness Criteria

In addition to the knock-out criteria, Table 4.1 also lists a wide range of segment attractiveness criteria available to the segmentation team to consider when deciding which attractiveness criteria are most useful to their specific situation.

Attractiveness criteria are not binary in nature. Segments are not assessed as either complying or not complying with attractiveness criteria. Rather, each market segment is rated; it can be more or less attractive with respect to a specific criterion. The attractiveness across all criteria determines whether a market segment is selected as a target segment in Step 8 of market segmentation analysis.

2.4 Implementing a Structured Process

There is general agreement in the segmentation literature, that following a structured process when assessing market segments is beneficial (Lilian and Rangaswamy 2003; McDonald and Dunbar 2012).

The most popular structured approach for evaluating market segments in view of selecting them as target markets is the use of a segment evaluation plot (Lilian and Rangaswamy 2003; McDonald and Dunbar 2012) showing segment attractiveness along one axis, and organisational competitiveness on the other axis. The segment attractiveness and organisational competitiveness values are determined by the segmentation team. This is necessary because there is no standard set of criteria that could be used by all organisations. Factors which constitute both segment attractiveness and organisational competitiveness need to be negotiated and agreed upon. To achieve this, a large number of possible criteria has to be investigated before agreement is reached on which criteria are most important for the organisation. McDonald and Dunbar (2012) recommend to use no more than six factors as the basis for calculating these criteria.

Optimally, this task should be completed by a team of people (McDonald and Dunbar 1995; Karson 2015). If a core team of two to three people is primarily in charge of market segmentation analysis, this team could propose an initial solution and report their choices to the advisory committee – which consists of representatives of all organisational units – for discussion and possible modification. There are at least two good reasons to include in this process representatives from a wide range of organisational units. First, each organisational unit has a different perspective on the business of the organisation. As a consequence, members of these units bring different positions to the deliberations. Secondly, if the segmentation strategy is implemented, it will affect every single unit of the organisation. Consequently, all units are key stakeholders of market segmentation analysis.

Step 3: Collecting Data

Empirical data forms the basis of both common sense and data-driven market segmentation. Empirical data is used to identify or create market segments and later in the process – describe these segments in detail.

Throughout this book we use the term segmentation variable to refer to the variable in the empirical data used in common sense segmentation to split the sample into market segments. In common sense segmentation, the segmentation variable is typically one single characteristic of the consumers in the sample. Each row in this table represents one consumer, each variable represents one characteristic of that consumer. An entry of 1 in the data set indicates that the consumer has that characteristic. An entry of 0 indicates that the consumer does not have that characteristic. The common sense segmentation uses gender as the segmentation variable. Market segments are created by simply splitting the sample using this segmentation variable into a segment of women and a segment of men.

All the other personal characteristics available in the data – in this case: age, the number of vacations taken, and information about five benefits people seek or do not seek when they go on vacation – serve as so-called descriptor variables. They are used to describe the segments in detail. Describing segments is critical to being able to develop an effective marketing mix targeting the segment. Typical descriptor variables include socio-demographics, but also information about media behaviour, allowing marketers to reach their target segment with communication messages.

Getting Data

```
[ ] df = pd.read_csv('/content/drive/MyDrive/data/Market_segmentation/mcdonalds.csv')
    df.head()
```

	yummy	convenient	spicy	fattening	greasy	fast	cheap	tasty	expensive	healthy	disgusting	Like	Age	VisitFrequency	Gender
0	No	Yes	No	Yes	No	Yes	Yes	No	Yes	No	No	-3	61	Every three months	Female
1	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	+2	51	Every three months	Female
2	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	+1	62	Every three months	Female
3	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	+4	69	Once a week	Female
4	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No	+2	49	Once a month	Male

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1453 entries, 0 to 1452
Data columns (total 15 columns):
 #   Column          Non-Null Count  Dtype 
---  ------          --------------  ----- 
 0   yummy           1453 non-null   object
 1   convenient      1453 non-null   object
 2   spicy           1453 non-null   object
 3   fattening       1453 non-null   object
 4   greasy          1453 non-null   object
 5   fast            1453 non-null   object
 6   cheap           1453 non-null   object
 7   tasty           1453 non-null   object
 8   expensive       1453 non-null   object
 9   healthy         1453 non-null   object
 10  disgusting      1453 non-null   object
 11  Like            1453 non-null   object
 12  Age             1453 non-null   int64 
 13  VisitFrequency  1453 non-null   object
 14  Gender          1453 non-null   object
dtypes: int64(1), object(14)
memory usage: 170.4+ KB
```

```
## checking for missing values
df.isna().sum()
```

```
yummy             0
convenient        0
spicy             0
fattening         0
greasy            0
fast              0
cheap             0
tasty             0
expensive         0
healthy           0
disgusting        0
Like              0
Age               0
VisitFrequency    0
Gender            0
dtype: int64
```

Observations

- There are no missing values.

```
df.describe(include=['O']).T
```

	count	unique	top	freq
yummy	1453	2	Yes	803
convenient	1453	2	Yes	1319
spicy	1453	2	No	1317
fattening	1453	2	Yes	1260
greasy	1453	2	Yes	765
fast	1453	2	Yes	1308
cheap	1453	2	Yes	870
tasty	1453	2	Yes	936
expensive	1453	2	No	933
healthy	1453	2	No	1164
disgusting	1453	2	No	1100
Like	1453	11	+3	229
VisitFrequency	1453	6	Once a month	439
Gender	1453	2	Female	788

```
Distribution of fast
Yes    1308
No      145
Name: fast, dtype: int64
------------------------------------------------------------
Distribution of cheap
Yes    870
No     583
Name: cheap, dtype: int64
------------------------------------------------------------
Distribution of tasty
Yes    936
No     517
Name: tasty, dtype: int64
------------------------------------------------------------
Distribution of expensive
No     933
Yes    520
Name: expensive, dtype: int64
------------------------------------------------------------
Distribution of healthy
No     1164
Yes     289
Name: healthy, dtype: int64
------------------------------------------------------------
Distribution of disgusting
No     1100
Yes     353
Name: disgusting, dtype: int64
------------------------------------------------------------
------------------------------------------------------------
Distribution of Like
+3               229
+2               187
0                169
+4               160
+1               152
I hate it!-5     152
I love it!+5     143
-3                73
-4                71
-2                59
-1                58
Name: Like, dtype: int64
------------------------------------------------------------
Distribution of VisitFrequency
Once a month              439
Every three months        342
Once a year               252
Once a week               235
Never                     131
More than once a week      54
Name: VisitFrequency, dtype: int64
------------------------------------------------------------
Distribution of Gender
Female    788
Male      665
Name: Gender, dtype: int64
------------------------------------------------------------
```

```
[ ]  ## creating bins for the age

     df['Agebin'] = pd.cut(df['Age'], bins = [17,25, 35, 49, 60, 75], labels = ['17-25','26-35', '36-49', '50-60', '61-75'])
```

```
[ ]  df['Agebin'].value_counts()/len(df)*100

     36-49    27.253957
     50-60    26.496903
     26-35    18.857536
     61-75    15.554026
     17-25    11.837577
     Name: Agebin, dtype: float64
```

Observations

- More than 50% of the customers belongs to 36-50
- only 11% customers belongs to adult age

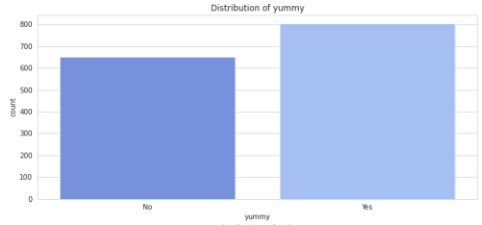
Step 4: Exploring Data

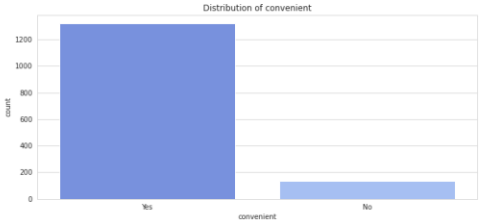
After data collection, exploratory data analysis cleans and – if necessary – pre-processes the data. This exploration stage also offers guidance on the most suitable algorithm for extracting meaningful market segments. At a more technical level, data exploration helps to (1) identify the measurement levels of the variables; (2) investigate the univariate distributions of each of the variables; and (3) assess dependency structures between variables. In addition, data may need to be pre-processed and prepared so it can be used as input for different segmentation algorithms. Results from the data exploration stage provide insights into the suitability of different segmentation methods for extracting market segments.

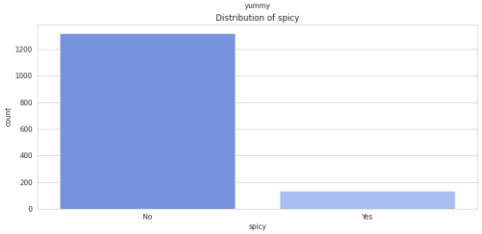
```
[ ]  fig,([ax0,ax1],[ax2,ax3],[ax4,ax5],[ax6,ax7],[ax8,ax9],[ax10,ax11],[ax12,ax13]) = plt.subplots(ncols=2,nrows=7,figsize=(25,40))

     ax = [ax0,ax1,ax2,ax3,ax4,ax5,ax6,ax7,ax8,ax9,ax10,ax11,ax12,ax13]
     for i in range(0,14):
       sns.countplot(data=df,x=category[i],ax=ax[i])
       ax[i].set_title('Distribution of '+category[i])

     plt.savefig('count.png')
```

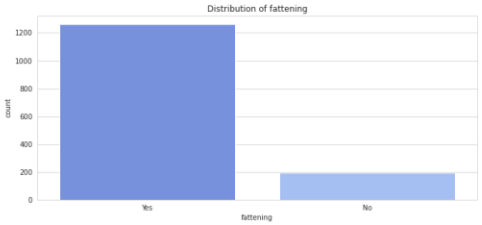
Observations

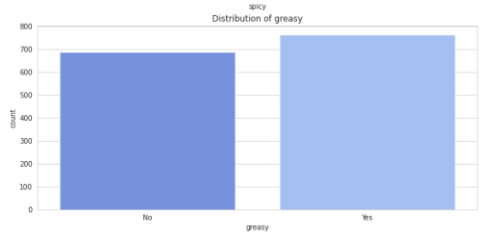
- There are many customers who have never visited once
- Majority of the customers visits once a month
- +3 and +2 is given by approx 30 percent the customers
- 60% customers Found the food yummy
- Approx 90 percent doesn't found convinent and spicy
- Most of the customers found the service fast and cheap
- A few customers found the food disgusting
- Majority customers are Female customers
- A big group of customers said the food is fatty

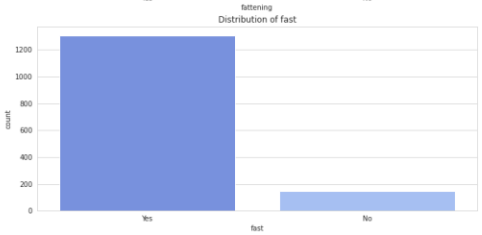

Distribution of yummy
count
No
Yes
yummy

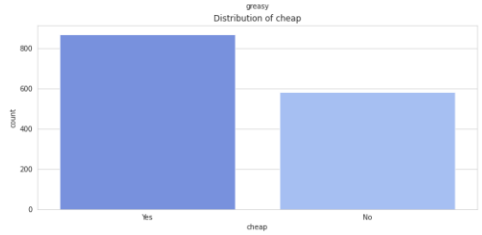

Distribution of convenient
count
Yes
No
convenient

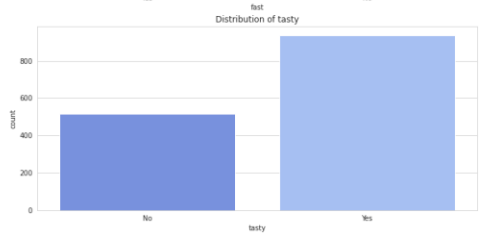

Distribution of spicy
count
No
Yes
spicy

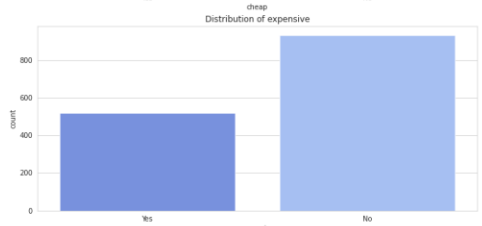

Distribution of fattening
count
Yes
No
fattening

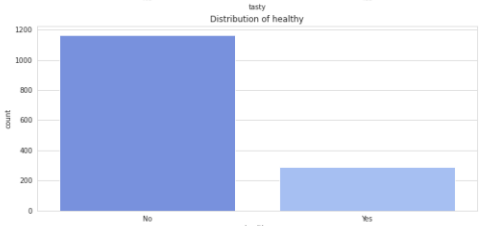

Distribution of greasy
count
No
Yes
greasy

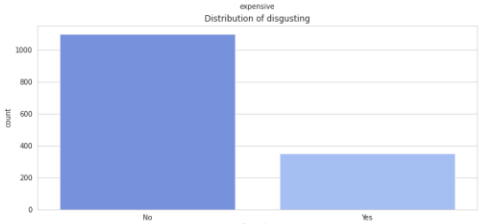

Distribution of fast
count
Yes
No
fast

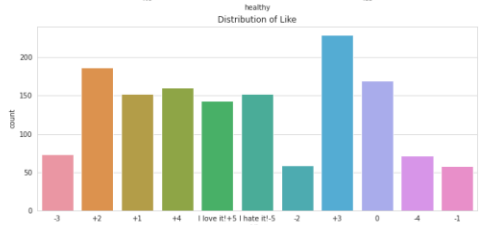

Distribution of cheap
count
Yes
No
cheap

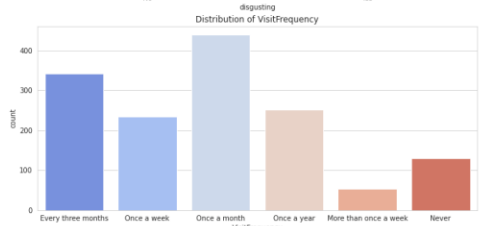

Distribution of tasty
count
No
Yes
tasty

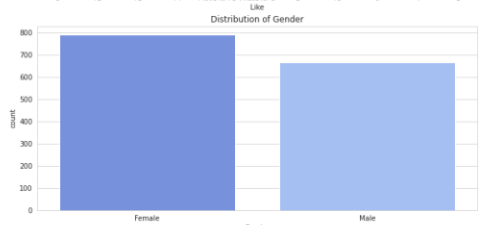

Distribution of expensive
count
Yes
No
expensive

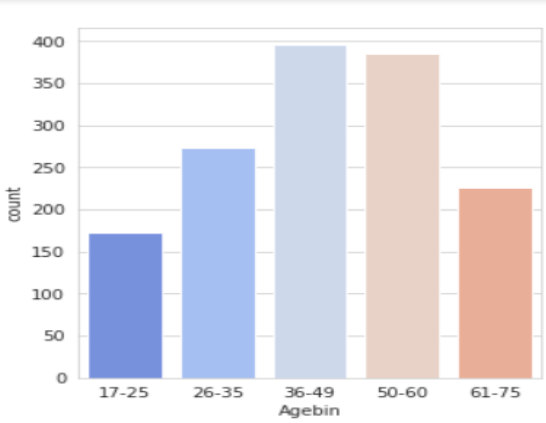

Distribution of healthy
count
No
Yes
healthy

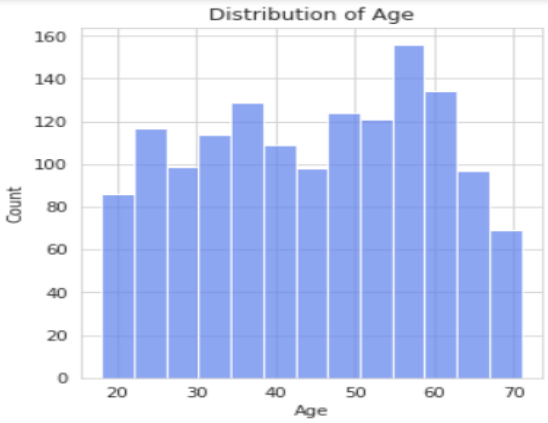

Distribution of disgusting
count
No
Yes
disgusting


Distribution of Like
count
-3
+2
+1
+4
I love it!
+5
I hate it!
-5
-2
+3
0
-4
-1
Like


Distribution of VisitFrequency
count
Every three months
Once a week
Once a month
Once a year
More than once a week
Never
VisitFrequency

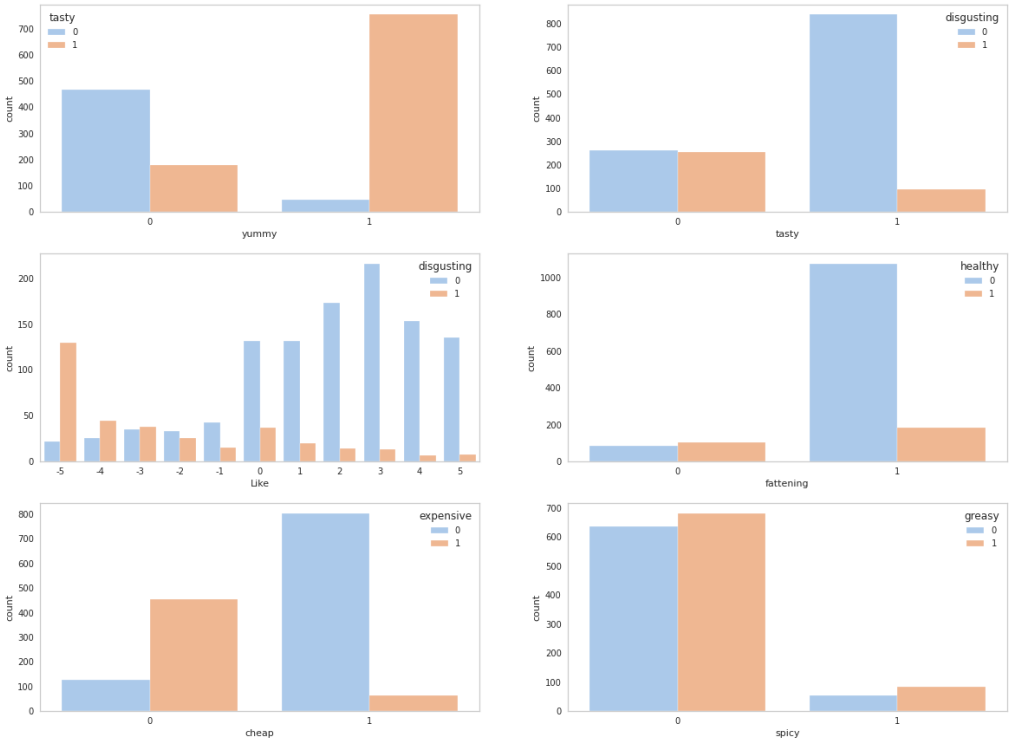

Distribution of Gender
count
Female
Male
Gender





Observations

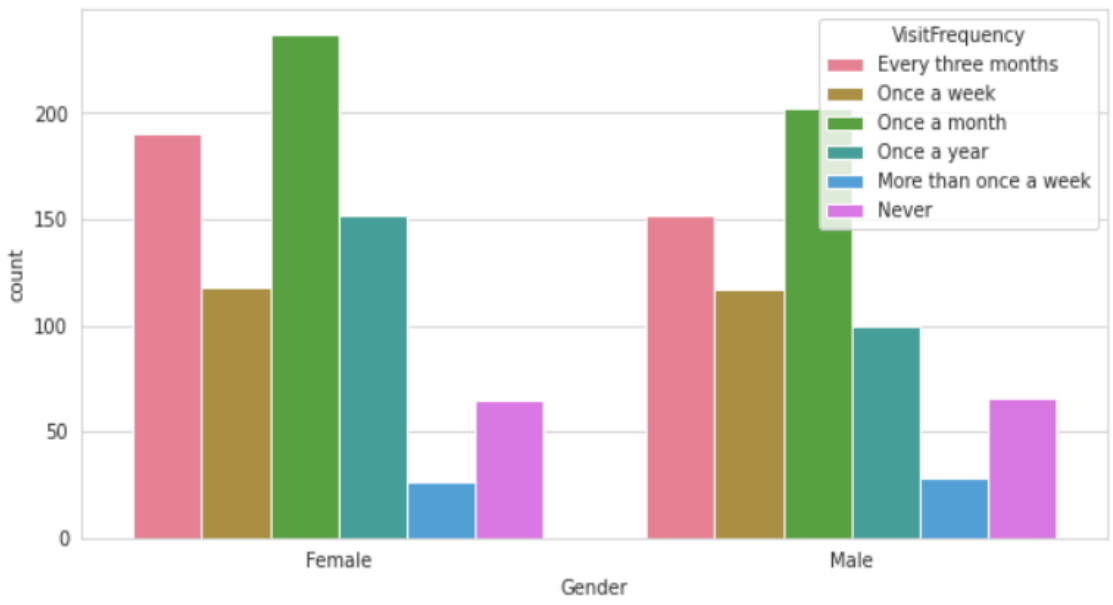
- Majority of the customers aged between 36-49
- Distribution of age is quite a normal
- Atleast 10 percent of the customers belongs to each of the age group



Observations

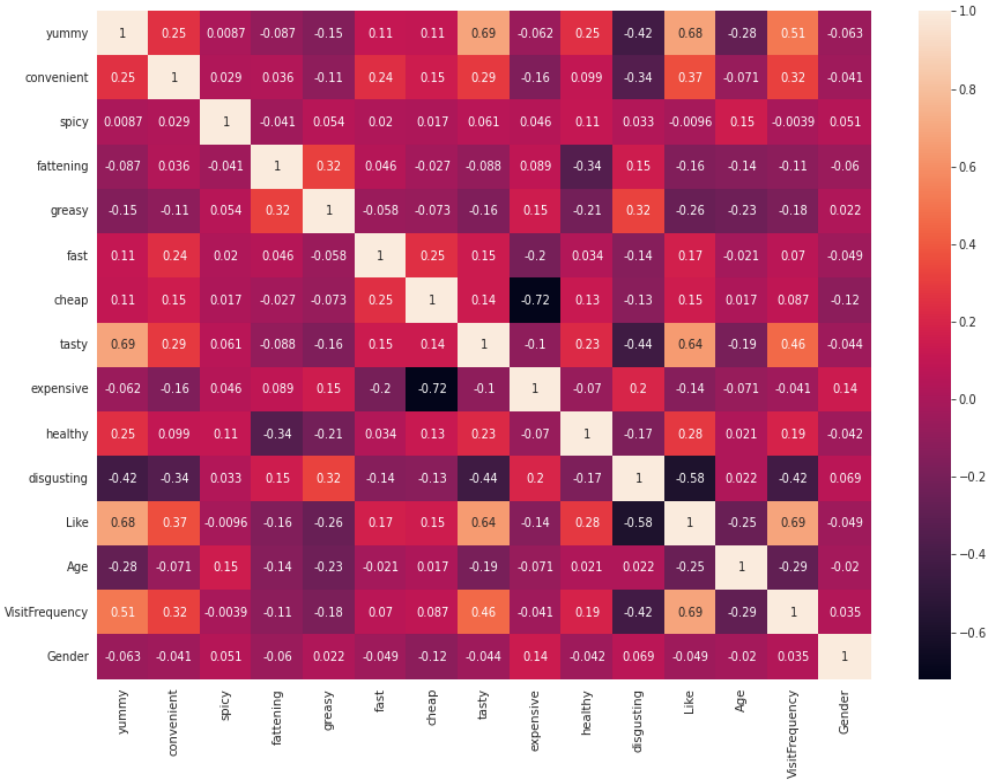
- From the plot it can be seen data have alot of discrepencies
- `yummy` and `tasty` are a kind of same can remove either of one
- Some of the customers rate the food tasty as well as disgusting and vice-versa, needs to check the data
- same error can be seen in `cheap`,`expensive`,`disgusting`,`Likes`,`fattening`,`healthy`
- `spicy` and `grease` are highly correlated, can remove either of them
- Needs to check the data for discrepency and if needs to remove the values than we'll

[ ]



Observations

- Female customers found it less convenient than male customers
- Majority of the female customers found the food expensive where as males doesn't
- Both the male and the female customers are almost alikly distributed



Observations

- yummy is correlated with like and tasty
- expensive with cheap
- like is correlated with visitfrequency

Step 5: Extracting Segments

Data-driven market segmentation analysis is exploratory by nature. Consumer data sets are typically not well structured. Consumers come in all shapes and forms; a two-dimensional plot of consumers' product preferences typically does not contain clear groups of consumers. Rather, consumer preferences are spread across the entire plot. The combination of exploratory methods and unstructured consumer data means that results from any method used to extract market

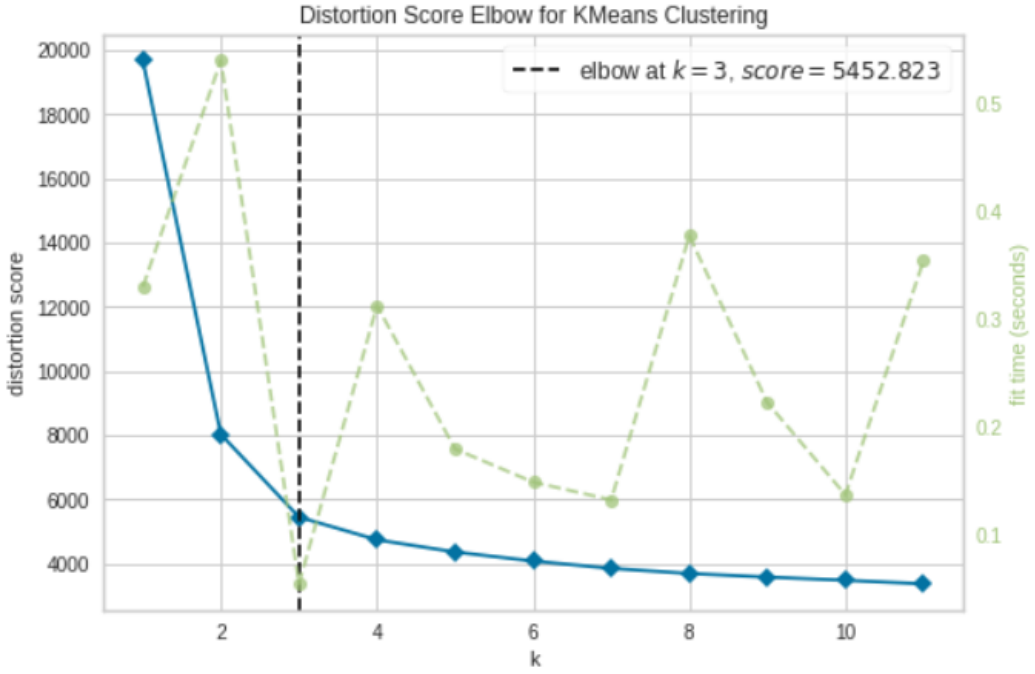
segments from such data will strongly depend on the assumptions made on the structure of the segments implied by the method. The result of a market segmentation analysis, therefore, is determined as much by the underlying data as it is by the extraction algorithm chosen. Segmentation methods shape the segmentation solution. Many segmentation methods used to extract market segments are taken from the field of cluster analysis. In that case, market segments correspond to clusters. As pointed out by Henig and Liao (2013), selecting a suitable clustering method requires matching the data analytic features of the resulting clustering with the context-dependent requirements that are desired by the researcher (p. 315). It is, therefore, important to explore market segmentation solutions derived from a range of different clustering methods. It is also important to understand how different algorithms impose structure on the extracted segments.

```
##Using k-means clustering

from sklearn.decomposition import PCA

pca = PCA(n_components=14)
data = pca.fit_transform(df.drop(['Age','Agebin'],axis=1))
pc = pd.DataFrame(data=data,columns=['pc1','pc2','pc3','pc4','pc5','pc6','pc7','pc8','pc9','pc10','pc11','pc12','pc13','pc14'])
```

```
[ ] pc.head()
```

	pc1	pc2	pc3	pc4	pc5	pc6	pc7	pc8	pc9	pc10	pc11	pc12	pc13	pc14
0	3.746578	0.711531	-0.340867	0.442599	0.615926	-0.337585	-0.319521	-0.242126	-0.376609	-0.188142	0.138768	0.184291	0.539076	-0.553440
1	-1.112208	-0.719394	0.251637	-0.675627	0.340507	0.356094	-0.151875	-0.086281	-0.079150	-0.089554	-0.036662	0.126941	0.507671	-0.531743
2	-0.078865	-0.393926	0.747944	-0.168268	0.539078	0.203277	0.720776	-0.885240	-0.623744	0.597505	0.321975	-0.321744	0.068764	0.222372
3	-3.519994	0.537511	-0.321155	-1.034471	0.080770	-0.120180	0.274559	0.801217	-0.103357	0.065294	-0.222402	-0.082562	-0.214825	-0.005298
4	-1.252794	0.234411	-0.340806	-0.131475	-0.792487	-0.645553	0.788675	-0.647022	-0.106097	-0.472202	0.208451	-0.096126	0.023990	0.136414

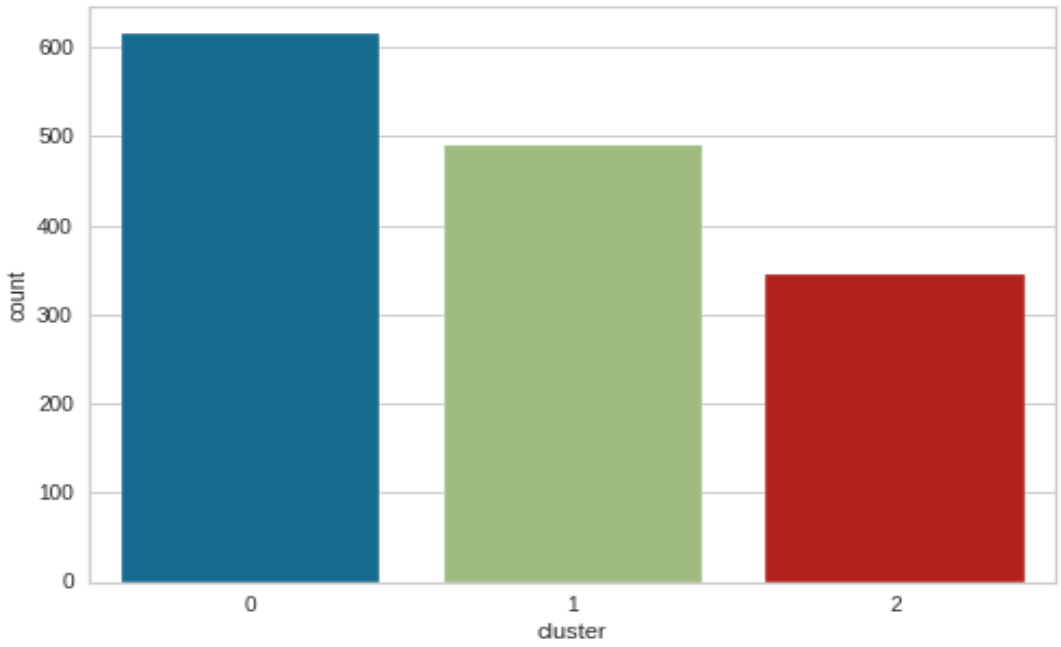

```
from sklearn.cluster import KMeans
from yellowbrick.cluster import KElbowVisualizer
kmeans = KMeans()
visualizer = KElbowVisualizer(kmeans, k=(1,12)).fit(pc)
visualizer.show()
plt.savefig('count9.png')
```



The K Means Algorithm is implemented in the following steps:
1. Decide the number of clusters, i.e. K
2. Select K random points in the dataset. These points will be the centers of each of the K clusters and shall be called Centroids.
3. Assign each data point in the dataset to one of the K centroids, based on the point's distance from each of the centroids.
4. Consider this clustering to be correct and reassign the Centroids to the mean of these clusters.
5. Repeat Step 3. If any of the points change clusters, go to step 4. Else go to step 6.
6. Calculate the variance of each of the clusters.
7. Repeat this clustering a specific number of times until the sum of variance of each cluster is minimum.

The Elbow Method

Finding the ideal number of clusters to divide the data into is a critical stage in any unsupervised technique. One of the most prominent techniques for figuring out this ideal value of k is the elbow approach. It is probably the most well-known approach which involves calculating the sum of squares for each cluster size, graphing the results, and identifying the ideal cluster size by looking for an elbow where the slope changes from steep to shallow.



Observations

- cluster 0 contains most of the customers who voted for not yummy where as in cluster 1 customers mostly voted yummy
- same is for tasty, cluster 0 customers almost doesn't find the food tasty
- customers belonging to cluster 1 doesn't find the food convienent
- Like is distributed with in intervals
    - Like -5 to -2 belongs to cluster 0
    - +2 to +5 belongs to cluster 1
    - -2 to +2 belongs to cluster 2
- cluster 0 doesn't contain customers visited more than once in a month
- cluster 1 does not contain who have never visited the store
- most of the customers of cluster 2 have not visited more than once in a week

Step 6: Profiling Segments

Once the market segments have been extracted, we need to understand what the four-segment k-means solution means. The first step in this direction is to create a segment profile plot. The

segment profile plot makes it easy to see key characteristics of each market segment. It also highlights differences between segments. To ensure the plot is easy to interpret, similar attributes should be positioned close to one another. We achieve this by calculating a hierarchical cluster analysis. Hierarchical cluster analysis used on attributes (rather than consumers) identifies – attribute by attribute – the most similar ones. At the end of step 6, the officials can have a good understanding of the nature of the four market segments in view of the information that was used to create these segments. Apart from that, they know little about the segments.

Identifying Key Characteristics of Market Segments

The aim of the profiling step is to get to know the market segments resulting from the extraction step. Profiling is only required when data-driven market segmentation is used. For commonsense segmentation, the profiles of the segments are predefined. If, for example, age is used as the segmentation variable for the commonsense segmentation, it is obvious that the resulting segments will be age groups. Therefore, Step 6 is not necessary when commonsense segmentation is conducted.

Traditional Approaches to Profiling Market Segments

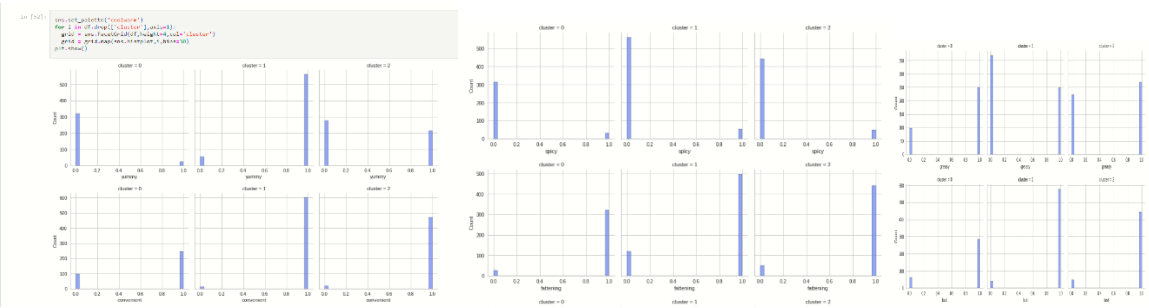
Data-driven segmentation solutions are usually presented to users (clients, managers) in one of two ways: (1) as high level summaries simplifying segment characteristics to a point where they are misleadingly trivial, or (2) as large tables that provide, for each segment, exact percentages for each segmentation variable. Such tables are hard to interpret, and it is virtually impossible to get a quick overview of the key insights.

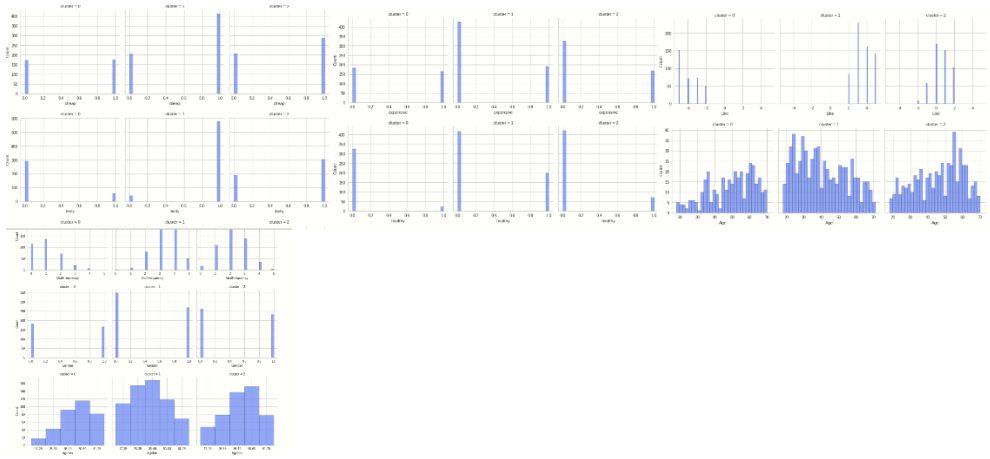
Segment Profiling with Visualisations

Visualisations are useful in the data-driven market segmentation process to inspect, for each segmentation solution, one or more segments in detail. Statistical graphs facilitate the interpretation of segment profiles. They also make it easier to assess the usefulness of a market segmentation solution. The process of segmenting data always leads to a large number of alternative solutions. Selecting one of the possible solutions is a critical decision. Visualisations of solutions assist the data analyst and user with this task.

• Identifying Defining Characteristics of Market Segments : A good way to understand the defining characteristics of each segment is to produce a segment profile plot. The segment profile plot shows – for all segmentation variables – how each market segment differs from the overall sample. The segment profile plot is the direct visual translation of tables.

• Assessing Segment Separation: Segment separation plots are very simple if the number of segmentation variables is low, but become complex as the number of segmentation variables increases. But even in such complex situations, segment separation plots offer data analysts and users a quick overview of the data situation, and the segmentation solution.





Step 7: Describing Segments

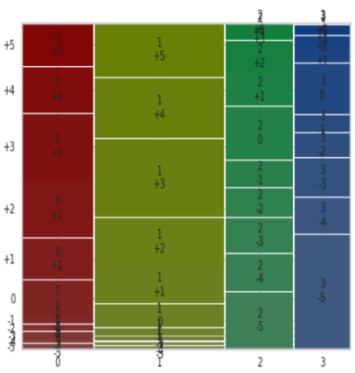
Step 7 (describing segments) is similar to the profiling step. The only difference is that the variables being inspected have not been used to extract market segments. Rather, in Step 7 market segments are described using additional information available about segment members. If committing to a target segment is like a marriage, profiling and describing market segments is like going on a number of dates to get to know the potential spouse as well as possible in an attempt to give the marriage the best possible chance ,and avoid nasty surprises down the track. As van Raaij and Verhallen state: segment …should be further described and typified by crossing them with all other variables, i.e. with psychographic …, demographic and socio-economic variables, media exposure, and specific product and brand attitudes or evaluations.

```
[63]: #DESCRIBING SEGMENTS

from statsmodels.graphics.mosaicplot import mosaic
from itertools import product

crosstab =pd.crosstab(df['cluster_num'],df['Like'])
#Reordering cols
crosstab = crosstab[['-5','-4','-3','-2','-1','0','+1','+2','+3','+4','+5']]
crosstab
```

[63]:

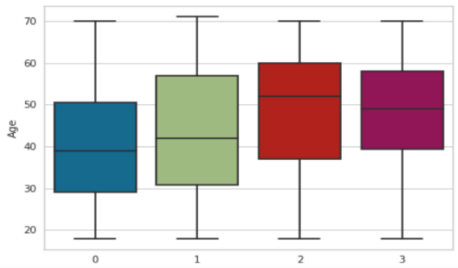
cluster_num	Like -5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
0	5	3	7	6	7	36	42	60	66	47	44
1	4	4	2	6	13	43	65	90	143	111	99
2	54	36	34	28	25	51	31	31	12	2	0
3	89	28	30	19	13	39	14	6	8	0	0

```
#MOSAIC PLOT
plt.rcParams['figure.figsize'] = (7,5)
mosaic(crosstab.stack())
plt.show()
```



```
#box plot for age

sns.boxplot(x="cluster_num", y="Age", data=df)
```

```
<AxesSubplot:xlabel='cluster_num', ylabel='Age'>
```

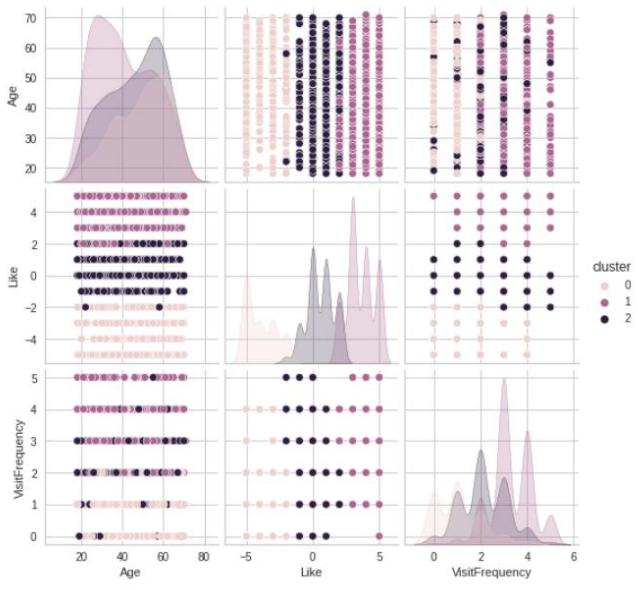


Step 8: Selecting Target Segments

Market segmentation and targeting refer to the process of identifying a company's potential customers, choosing the customers to pursue, and creating value for the targeted customers. It is achieved through the segmentation, targeting, and positioning (STP) process. In targeting, the company selects the segment of customers they will focus on. Companies will determine this base on the attractiveness of the segment. Attractiveness depends on the size, profitability, intensity of competition, and ability of the firm to serve the customers in the segment.

```
In [55]:  # selecting Target Segments

          df_1 = df[['Age','Like','VisitFrequency','cluster']]
          sns.pairplot(data=df_1,hue='cluster')
```

```
Out[55]: <seaborn.axisgrid.PairGrid at 0x7ff28eeb1b50>
```



After you segment target markets and develop a measure of insight about them, you can begin to see those that have more potential. Now you are hunting with a rifle instead of a shotgun. The

question is, do you want to spend all day hunting squirrels or ten-point bucks? An attractive market has the following characteristics:

- It is sizeable (large) enough to be profitable given your operating cost.
- It is growing.
- It is not already swamped by competitors, or you have found a way to stand out in a crowd.
- Either it is accessible or you can find a way to reach it.
- The company has the resources to compete in it.
- It “fits in” with your firm’s mission and objectives.

Step 9: Customising the Market Mix

A marketing mix includes multiple areas of focus as part of a comprehensive marketing plan. The term often refers to a common classification that began as the four Ps: product, price, placement, and promotion.

Product

This represents an item or service designed to satisfy customer needs and wants. To effectively market a product or service, it's important to identify what differentiates it from competing products or services. It's also important to determine if other products or services can be marketed in conjunction with it.

Price

The sale price of the product reflects what consumers are willing to pay for it. Marketing professionals need to consider costs related to research and development, manufacturing, marketing, and distribution—otherwise known as cost-based pricing. Pricing based primarily on consumers' perceived quality or value is known as value-based pricing.

Placement

The type of product sold is important to consider when determining areas of distribution. Basic consumer products, such as paper goods, often are readily available in many stores. Premium consumer products, however, typically are available only in select stores. Another consideration is whether to place a product in a physical store, online, or both.

Promotion

Joint marketing campaigns also are called a promotional mix. Activities might include advertising, sales promotion, personal selling, and public relations. A key consideration should be for the budget assigned to the marketing mix. Marketing professionals carefully construct a message that often incorporates details from the other three Ps when trying to reach their target audience. Determination of the best mediums to communicate the message and decisions about the frequency of the communication also are important.

Market Segmentation Case Study on McDonalds Dataset

Kindly refer to any of the following GitHub links for the complete code implementation.

Name	GitHub Link
Parth Gupta	Project Link
Kushagra Sharma	Project Link
Arya BS	Project Link
Raunak Shukla	Project Link
Kovuri Mohan Kumar	Project Link
Dataset	Link

Conclusion

It was noted in this study that market segmentation is regarded essential by marketing practitioners for various reasons, including targeting, proposition development, price formulation and developing of mass communication. Though being conceptualized as simple in its rationale, the process of segmentation is not necessarily easy and it requires various considerations that should be taken into account. From the literature it is evident that many marketers are expressing concern about implementation and the integration of segmentation into marketing strategy. To address this, priorities in the area of future segmentation research include the selection and incorporation of new variables into segmentation models, as well as developing new and innovative segmentation strategies.

Using market segmentation, companies are able to identify their target audiences and personalize marketing campaigns more effectively. This is why market segmentation is key to staying competitive. It allows you to understand your customers, anticipate their needs, and seize

growth opportunities. This powerful technique allows you to improve your decision-making, marketing efforts, and improve your company's bottom line.

The key to successful market segmentation remains data quality; therefore, you need to pick your data provider after doing your due diligence, ensuring that you have access to the latest industry information in accessible and easy-to-understand formats.