

Marketing Segmentation of McDonald's

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2. Summary for market segmentation of McDonald's:

McDonald's is one of the most popular fast-food restaurant companies in the world. The way McDonald's built its marketing segmentation remains mysterious. Though multiple online articles discuss its marketing strategy, none indicate the different approaches McDonald's utilized to build its marketing segmentation. To analyze McDonald's approaches to building marketing segmentation, seven different countries' McDonald's websites are visited and the product types information from the official menu list on the website is extracted. These seven countries represent seven continents while Antarctica is not considered. India and China are chosen since they are the most populated countries on Earth. Then, every approach that McDonald's uses in building marketing segmentation are listed, and how these approaches contribute to the overall structure is analyzed. The approaches all have advantages and drawbacks at the same time. Meanwhile, the five-year total return rates indicate that McDonald's has won its customers' hearts in these several years.

3. Team involvement in the project:

For this task, we have divided the work equally among the members based on their knowledge and experience in data science. Members of this team have covered the first three steps of market segmentation mandatory apart from these 3 steps members of the team have covered additional steps like:

Monish covered:

Data collection:

McDonald's is a giant international fast-food company. Aside from its operation in the U.S, McDonald's also operates in another 117 countries across the world. In addition, these 118 countries in total cover all seven continents. Since the goal is to explore all approaches used by McDonald's to build its marketing segmentation and geographic approach is one of its components. It's necessary to pick countries that represent its continents. The mtheir information would be extracted from each country's McDonald's website. It's logically sound to select countries that have the most population in

its continents. On the other hand, the following countries were selected which are the U.S, China, India, Brazil, Egypt, Australia and Germany. The reason that Egypt is chosen instead of the two other countries with more population is that those two countries do not have McDonald's operation as for operations. China and India are selected together because they are two of the most populated countries in the world and they have almost identical populations as now. Last but not least, Russia does not have an official McDonald's site which makes the data collection impossible. In this case, Russia was replaced with Germany which are on the second place with population in Europe.

SEGMENTATION, TARGETING AND POSITIONING, PROFILING IN ORGANIZATIONS :

- SEGMENTATION, TARGETING AND POSITIONING are strategic marketing models used by organizations to attract the right customers for their goods, products or services.
- It is done to position the brand image of their organization in the mindset of customers against their rivals in the market.
- For a good marketing strategy it is important for a company to understand its target customers in order to communicate their products accordingly.

SEGMENTATION :

Segmentation is the process of dividing the population into different groups of similar needs and wants. Segmentation is necessary to know the customer in detail which will help to serve the customers better.

McDonald's has divided its consumer market into —

- Geographic
- Demographic
- Psychographic
- Behavioral

GEOGRAPHIC SEGMENTATION :

It segments the market like geographic criteria by region and density. McDonalds breaks its business into different geographical segments like-

- America
- Europe
- Asia/Pacific, Middle East and Africa
- Other countries like Canada

McDonald's optimizes its Menu and price to suit the regional tastes and needs of customers on the basis of their based segmentation.

In the United States of America McDonald has its “DOLMcDonald’s” which will be replaced with the “MC PICK2” menu, it will allow customers to pick two items for \$2 each. In India it has “HAPPY PRICE MENU”.

McDonald’s respect cultural differences in their respective countries and design their products accordingly. In US People tend to have Beef rather than Chicken but in India and China people don’t prefer Beef so more chicken items are included in the menu.

In India Vegetarian Burgers are included like McAloo Tikki, Mc Veggie and Veg Pizza McPuff, Mexican Aloo Wrap.



In

Middle East it has introduced ‘Mc Arabia’ to its menu and in Philippines ‘Mc Spaghetti’.

Countries like Germany, Europe and Japan Mc Donald’s even sell a Draft beer as part of drinks with their food in order to attract more adult into

their business.

They Introduced PLANT-LETTUCE-TOMATO OR PLT SANDWICH as often promoted in Ontario, as well as locations in London and Sarnia.



DEMOGRAPHIC SEGMENTATION :



- Income, socio economic status.
 - AGE — They have targeted below Age Groups.
 - CHILDREN — MC Donald's offers great features to childrens like “HAPPY MEALS”
 -
 - Which is serve with favorite toys of children.
 - Toys are part of the marketing strategy which aims at attracting children to
 - McDonald's.
 - Ronald McDonald was introduced to target children as their audience and make the meals more appealing to them.
- McDonald's had even built playgrounds for kids in the restaurant.
 - The Happy Meals offered by the company targets whole family. The reason being that most parents will bring their children in the restaurant and order something for themselves too.

YOUNG ADULTS (BETWEEN 18-29) :

This segment is the main source of business for McDonald's. Their consumption pattern are much more than the other market segment.

Example- Children's from school and college hangout with their friends in McDonalds for lunch, dinner and birthday celebration, working professionals visit for lunch and dinners.



ADULT :

- McDonald's in order to target this segment tweaked its menu and made it in less calories and healthy.
- For families they have different outlets which offer takeaways and Drive-thru.
- The Happy Meals offered by the company targets whole family. The reason being that most parents will bring their children in the restaurant and order something for themselves too.



INCOME

McDonald's make products of different price which is affordable by low and high income group as well.

They have specific value pricing as well as bundling strategies like Combo Meal, Happy Meal, Family Meal and Happy Price Menu which increases the sales. Example- Burgers such as Mc Aloo Tikki costs Rs. 49 in India. They have come up with stay Home Combos which costs from Rs. 309 onwards for vegetarian meals.

PSYCHOGRAPHIC SEGMENTATION :

It segments the market into social class and life style of people. McDonald's has adopted itself according to the convenience and lifestyle of consumers in different countries. Like taste, preference of consumers, religious beliefs and behaviour of consumers for the particular country and made changes in their menu and modified themselves.

Example: India has huge vegetarian population so McDonald's has come up with a different and new product line like Mc Aloo Tikki, Mc Veggie. In United States people prefer beef so more beef products are available such as Quarter Pounder (Beef) Burger.



BEHAVIOURAL SEGMENTATION :

It focuses on Degree of Loyalty, Benefits Sought, Personality, User Status and Occasions.

Example : McDonald's provide party rooms for children's birthday celebrations in order to attract more customers.

DEGREE OF LOYALTY

Loyalty depends on how satisfied the customers are with the product or service. McDonald's offers its customers excellent services with less waiting time and menu designed as per the country and preferences of people which makes it different from other companies.



BENEFITS SOUGHT :

It is different benefits customers get in using a product or service.

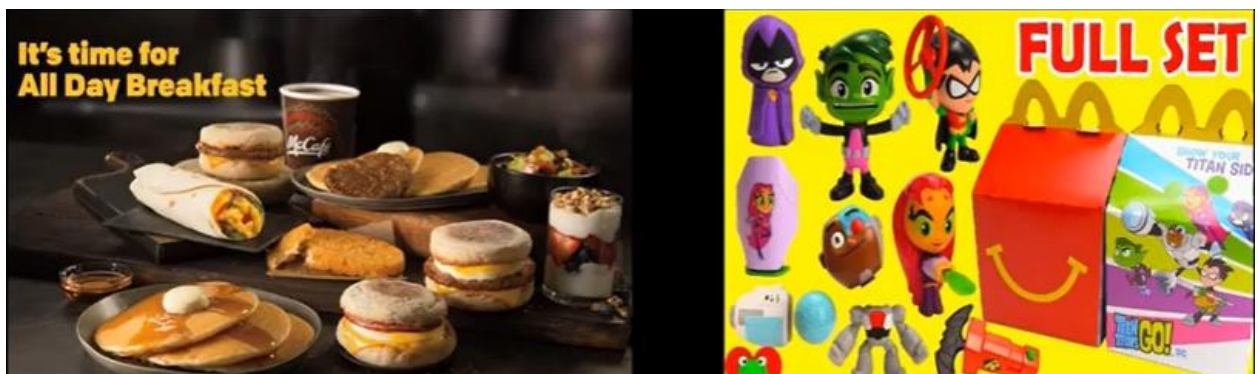
Example : McDonald offers its customers Quick service as compare to other restaurants, price is affordable by low income people also and Free WiFi.

TARGETING :

- Targeting implies selecting market segments that companies want to focus on and then customize or position their products to each segment.
- McDonald's chooses below market segments to target for driving their business strategy, sales and marketing.



- **EXAMPLE** — McDonald's targets Children with 'HAPPY MEALS' and Youngsters with Free WiFi.
- McDonald's targeted 'Breakfast lovers' in Australia and New Zealand to serve breakfast during the whole day.
- They targeted Vegetarians in India and changed their menu by introducing Vegetarian Burger.



POSITIONING AND PROFILING :

Positioning is a process of creating an 'image' in the mind of consumers by which they can understand the uniqueness about your product as compare to competitor.



McDonald's uses segment insights i.e. values, needs and lifestyle of each segment of the consumer behaviour that are developed through market research.

McDonald's had developed a unique image in the mind of consumers through their positioning strategy.

McDonald's unique Positioning Strategies that made its brand different from their rivals.

They came up with the Mascot of 'RONALD MC DONALD' a clown — shaped man that had a great attraction for children which made children driving to the restaurants

They advertised through Social Media and Billboards as their mainstream to position its brand against its rivals.



Example : For Breakfast lovers McDonald's came up with a giant egg that breaks into half between 6:30 am to 10:30 pm which shows the hours in which McDonalds serves breakfast. This kind of differentiation makes them position their brand in consumer mindset as compare to their competitors.

McDonald's is known for 'Ronald McDonald House Charities' (RMHC) which is an independent non-profit organization whose mission is to create, find and support programs that directly improve the health and well-being of children. Through RMHC they had made an impact on consumers.



Pricing Strategy of McDonald's is a strategical tool to position its brand and products in the consumer mind. McDonald's also sponsors Sporting Events like Little League, FIFA World Cup and Olympics.

McDonald's has established itself to be the Family friendly low cost restaurant in the fast food business and set up an example for the importance of having Segmentation Targeting and Positioning Strategy for differentiating business from their competitors.

PROFILING SEGMENT:

A market segment profile is a detailed description of the market segment that you wish to offer your products or services in – across a range of factors and measures. It is designed to provide the organization with an in-depth understanding of consumers within each segment for the purposes of comparison and strategy.

Segment extraction leads to one or more segmentation solutions. They may have been pre-selected on the basis of statistical criteria. But statistical criteria are no substitute for user assessment. The profiling stage is the opportunity for all members of the segmentation team to inspect what characterizes each of the resulting market segments, and to select which segment to retain for the next step. Profiling is based on segmentation variables.

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.

Benefits of market segmentation include:

- ✓ Increased resource efficiency. Marketing segmentation allows management to focus on certain demographics or customers.
- ✓ Stronger brand image.
- ✓ Greater potential for brand loyalty.
- ✓ Stronger market differentiation.
- ✓ Better targeted digital advertising.

The situation is quite different in the case of data-driven segmentation: users of the segmentation solution may have decided to extract segments on the basis of benefits sought by consumers. Yet – until after the data has been analyzed – the defining characteristics of the resulting market segments are unknown. Identifying these defining characteristics of market segments with respect to the segmentation variables is the aim of profiling. Profiling consists of characterizing the market segments individually, but also in comparison to the other market segments.

Characteristics of Market Segments:

There are several different ways businesses can segment a market, but not all market segments are equally valuable to a business. Before deciding to focus on a segment, it's important to see whether it is viable.

- Rest and relax
- Change of surroundings
- Excitement, a challenge
- Fun and entertainment
- Good company
- Not exceed planned budget
- Free-and-easy-going
- Luxury / be spoiled
- Entertainment facilities
- Not care about prices
- Cosines/familiar atmosphere
- Everything organized
- Do sports
- Realize creativity
- Health and beauty
- Intense experience of nature
- Maintain unsolid surroundings
- Unsolid nature/natural landscape
- Life style of the local people

Nivas Covered :***Step 5: Extracting Segments***

Market segmentation is a business practice that brands use to divide their target market into smaller, more manageable groups of people based on common ground they share to optimize their marketing, advertising, and sales efforts. Simply put, customers of each market segment have similar characteristics that businesses can leverage to advance their efforts.

Distance Based Methods:

The classification of observations into groups requires some methods for computing the distance or the (dis)similarity between each pair of observations. The result of this computation is known as a dissimilarity or distance matrix.

The choice of distance measures is a critical step in clustering. It defines how the similarity of two elements (x, y) is calculated and it will influence the shape of the clusters.

The classical methods for distance measures are Euclidean and Manhattan distances, which are defined as follow:

1. Euclidean distance:

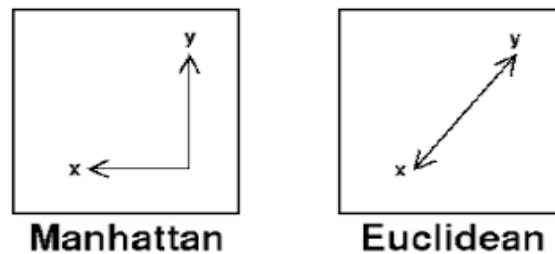
$$d(\mathbf{p}, \mathbf{q}) = \sqrt{\sum_{i=1}^n (q_i - p_i)^2}$$

p, q = two points in Euclidean n-space
 q_i, p_i = Euclidean vectors, starting from the origin of the space (initial point)
 n = n-space

2. Manhattan distance:

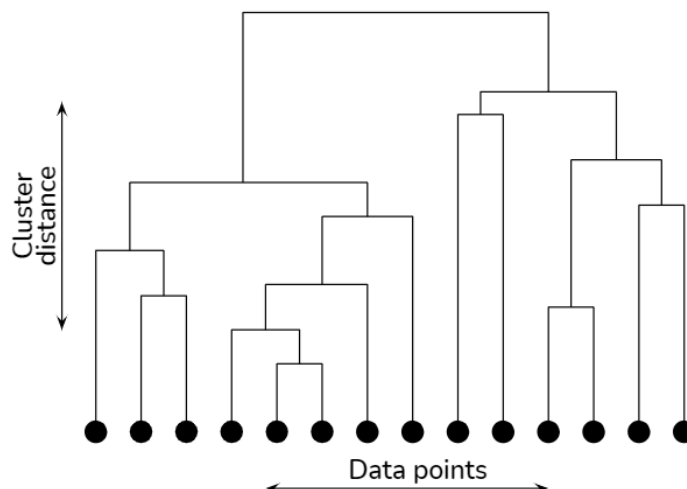
$$d(x, y) = \sum_{i=1}^n |x_i - y_i|$$

Where, x and y are two vectors of length n .



Hierarchical Methods:

In this technique, initially each data point is considered as an individual cluster. At each iteration, the similar clusters merge with other clusters until one cluster or K clusters are formed. The Hierarchical clustering Technique can be visualized using a Dendrogram. A Dendrogram is a tree-like diagram that records the sequences of merges or splits.



Single linkage: distance between the two closest observations of the two sets.

$$l(\mathcal{X}, \mathcal{Y}) = \min_{\mathbf{x} \in \mathcal{X}, \mathbf{y} \in \mathcal{Y}} d(\mathbf{x}, \mathbf{y})$$

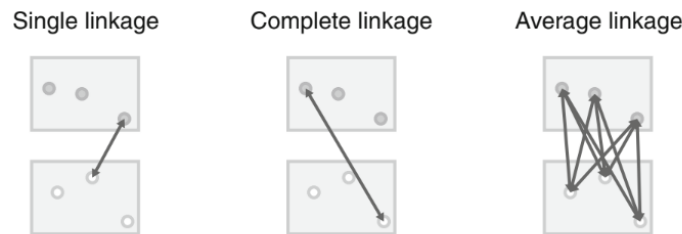
Complete linkage: distance between the two observations of the two sets that are farthest away from each other.

$$l(X, Y) = \max_{x \in X, y \in Y} d(x, y)$$

Average linkage: mean distance between observations of the two sets.

$$l(X, Y) = \frac{1}{|X||Y|} \sum_{x \in X} \sum_{y \in Y} d(x, y),$$

where $|X|$ denotes the number of elements in X .



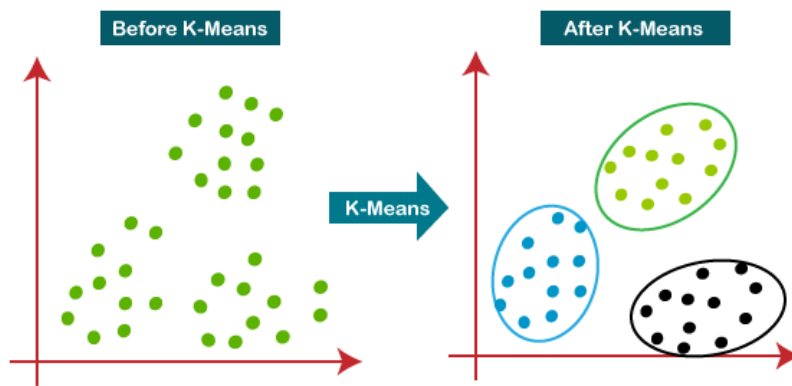
Partitioning Methods:

This clustering method classifies the information into multiple groups based on the characteristics and similarity of the data. It's the data analysts' job to specify the number of clusters that has to be generated for the clustering methods. In the partitioning method when database(D) that contains multiple(N) objects then the partitioning method constructs user-specified(K) partitions of the data in which each partition represents a cluster and a particular region.

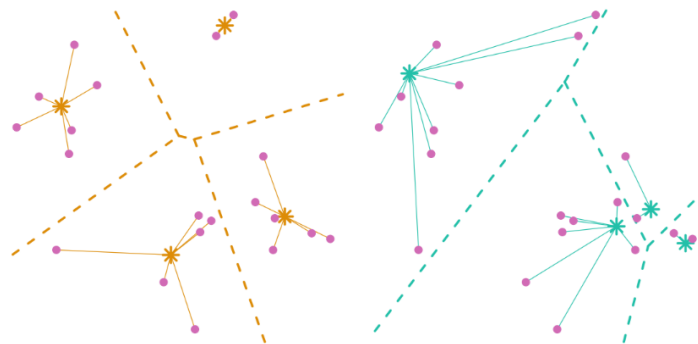
K-means Clustering:

To process the learning data, the K-means algorithm in data mining starts with a first group of randomly selected centroids, which are used as the beginning points for every cluster, and then performs iterative (repetitive) calculations to optimize the positions of the centroids. It halts creating and optimizing clusters when either:

- The centroids have stabilized — there is no change in their values because the clustering has been successful.
- The defined number of iterations has been achieved.



Hard Competitive Learning:



Hard competitive learning, also known as learning vector quantization which differs from the standard k-means algorithm in how segments are extracted. Although hard competitive learning also minimizes the sum of distances from each consumer contained in the data set to their closest representative (centroid), the process by which this is achieved is slightly different. k-means uses all consumers in the data set at each iteration of the analysis to determine the new segment representatives (centroids). Hard competitive learning randomly picks one consumer and moves this consumer's closest segment representative a small step into the direction of the randomly chosen consumer.

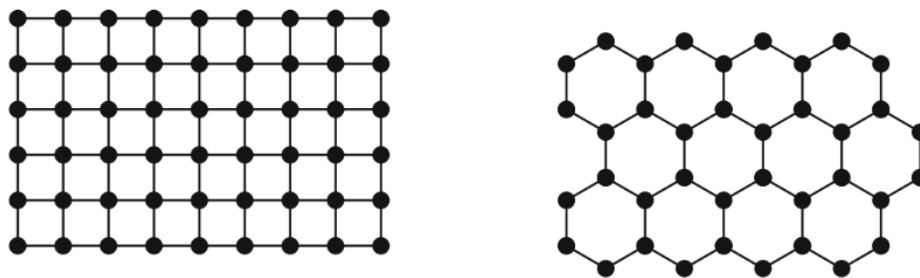
Neural Gas and Topology Representing Networks:

A variation of hard competitive learning is the neural gas algorithm. Here, not only the segment representative (centroid) is moved towards the randomly selected consumer. Instead, also the location of the second closest segment representative (centroid) is adjusted towards the randomly selected consumer. However, the location of the second closest representative is adjusted to a smaller degree than that of the primary representative. Neural gas has been used in applied market segmentation analysis

A further extension of neural gas clustering are topology representing networks. The underlying algorithm is the same as in neural gas. In addition, topology representing networks count how often each pair of segment representatives (centroids) is closest and second closest to a randomly drawn consumer. This information is used to build a virtual map in which similar representatives those which had their values frequently adjusted at the same time are placed next to one other. Almost the same information which is central to the construction of the map in topology representing networks can be obtained from any other clustering algorithms by counting how many consumers have certain representatives as closest and second closest in the final segmentation solution.

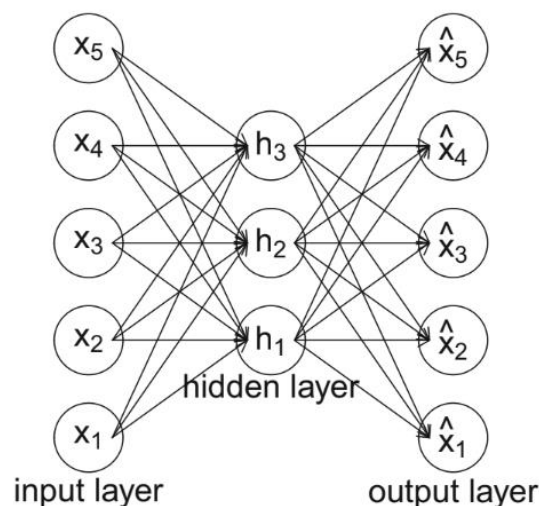
Self-Organizing Maps:

The self-organizing map algorithm is similar to hard competitive learning. a single random consumer is selected from the data set, and the closest representative for this random consumer moves a small step in their direction. In addition, representatives which are direct grid neighbors of the closest representative move in the direction of the selected random consumer. The process is repeated many times; each consumer in the data set is randomly chosen multiple times, and used to adjust the location of the centroids in the Kohonen map. What changes over the many repetitions, however, is the extent to which the representatives are allowed to change. The adjustments get smaller and smaller until a final solution is reached. The advantage of self-organizing maps over other clustering algorithms is that the numbering of market segments is not random. Rather, the numbering aligns with the grid along which all segment representatives (centroids) are positioned. The price paid for this advantage is that the sum of distances between segment members and segment representatives can be larger than for other clustering algorithms. The reason is that the location of representatives cannot be chosen freely. Rather, the grid imposes restrictions on permissible locations.



Neural Networks:

Auto-encoding neural networks for cluster analysis work mathematically differently than all cluster methods presented so far. The most popular method from this family of algorithms uses a so-called single hidden layer perceptron.



Hybrid Approaches:

The basic idea behind hybrid segmentation approaches is to first run a partitioning algorithm because it can handle data sets of any size. But the partitioning algorithm used initially does not generate the number of segments sought. Rather, a much larger number of segments is extracted. Then, the original data is discarded and only the centers of the resulting segments (centroids, representatives of each market segment) and segment sizes are retained, and used as input for the hierarchical cluster analysis. At this point, the data set is small enough for hierarchical algorithms, and the dendrogram can inform the decision how many segments to extract.

Two-Step Clustering:

The two steps consist of run a partitioning procedure followed by a hierarchical procedure. The two-step clustering algorithm is designed to analyze large databases as primary purpose. This algorithm groups the observations in the clusters using the trait approach. Compared to classical clustering algorithms, two-step cluster analysis provides both more continuous and more featured categories. In addition, this method automatically determines the optimum number of clusters.

Bagged Clustering:

In bagged clustering, we first cluster the bootstrapped data sets using a partitioning algorithm. The advantage of starting with a partitioning algorithm is that there are no restrictions on the sample size of the data. Next, we discard the original data set and all bootstrapped data sets. We only save the cluster centroids (segment representatives) resulting from the repeated partitioning cluster analyses. These cluster centroids serve as our data set for the second step: hierarchical clustering. The advantage of using hierarchical clustering in the second step is that the resulting dendrogram may provide clues about the best number of market segments to extract.

Model-Based Methods:

Model-based methods are viewed as one additional segment extraction method available to data analysts. Given that extracting market segments is an exploratory exercise, it is helpful to use a range of extraction methods to determine the most suitable approach for the data at hand. Having model-based methods available is particularly useful because these methods extract market segments in a very different way, thus genuinely offering an alternative extraction technique.

Model-based methods can be seen as selecting a general structure, and then fine-tuning the structure based on the consumer data. The model-based methods used in this section are called finite mixture models because the number of market segments is finite, and the overall model is a mixture of segment-specific models. The two properties of the finite mixture model can be written down in a more formal way.

Property 1: (that each market segment has a certain size) implies that the segment membership z of a consumer is determined by the multinomial distribution with segment sizes π :

$$z \sim \text{Multinomial}(\pi).$$

Property 2: states that members of each market segment have segment-specific characteristics. These segment-specific characteristics are captured by the vector θ , containing one value for each segment-specific characteristic. Function $f()$, together with θ , captures how likely specific values y are to be observed in the empirical data, given that the consumer has segment membership z , and potentially given some additional pieces of information x for that consumer:

$$f(y|x, \theta_z).$$

These functions $f()$ together with their parameters θ are also referred to as segment-specific models and correspond to statistical distribution functions. This leads to the following finite mixture model:

$$\sum_{h=1}^k \pi_h f(y|x, \theta_h), \quad \pi_h > 0, \quad \sum_{h=1}^k \pi_h = 1.$$

The finite mixture model literature uses the following terminology: market segments are referred to as mixture components, segment sizes as prior probabilities or component sizes, and the probability of each consumer to be a member of each segment given as posterior probability.

Finite Mixtures of Distributions:

The simplest case of model-based clustering has no independent variables x , and simply fits a distribution to y . The distributions are divided into Normal and binary distributions. The finite mixture model reduces to

$$\sum_{h=1}^k \pi_h f(y|\theta_h), \quad \pi_h \geq 0, \quad \sum_{h=1}^k \pi_h = 1.$$

Finite Mixtures of Regressions:

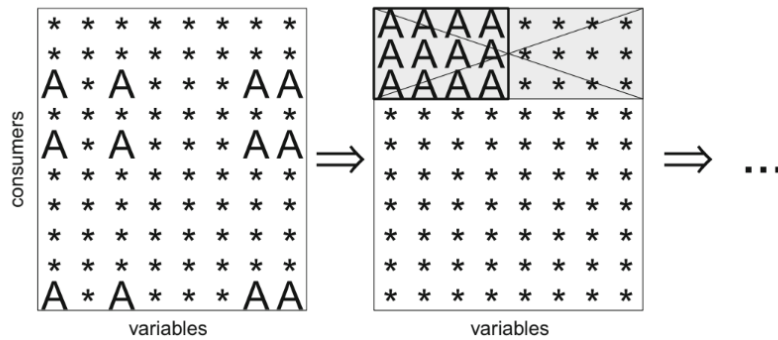
Finite mixtures of distributions are similar to distance-based clustering methods and – in many cases – result in similar solutions. Compared to hierarchical or partitioning clustering methods, mixture models sometimes produce more useful, and sometimes less useful solutions. Finite mixture of regression models assume the existence of a dependent target variable y that can be explained by a set of independent variables x . The functional relationship between the dependent and independent variables is considered different for different market segments.

Algorithms with Integrated Variable Selection:

Bi-clustering Algorithms:

Bi-clustering simultaneously clusters both consumers and variables. Bi-clustering algorithms exist for any kind of data, including metric and binary. This section focuses on the binary case where these algorithms aim at extracting market segments containing consumers who all have a value of 1 for a group of variables. These groups of consumers and variables together then form the bi-cluster.

Step 1 First, rearrange rows (consumers) and columns (segmentation variables) of the data matrix in a way to create a rectangle with identical entries of 1s at the top left of the data matrix. The aim is for this rectangle to be as large as possible.



Step 2 Second, assign the observations (consumers) falling into this rectangle to one bicluster. The segmentation variables defining the rectangle are active variables (A) for this bicluster.

Step 3 Remove from the data matrix the rows containing the consumers who have been assigned to the first bicluster. Once removed, repeat the procedure from step 1 until no more biclusters of sufficient size can be located.

Variable Selection Procedure for Clustering Binary Data (VSBD):

VSBD method is based on the k-means algorithm as clustering method, and assumes that not all variables available are relevant to obtain a good clustering solution. In particular, the method assumes the presence of masking variables. They need to be identified and removed from the set of segmentation variables. Removing irrelevant variables helps to identify the correct segment structure, and eases interpretation.

Step 1 Select only a subset of observations with size $\phi \in (0, 1]$ times the size of the original data set.

Step 2 For a given number of variables V , perform an exhaustive search for the set of V variables that leads to the smallest within-cluster sum-of-squares criterion. The value for V needs to be selected small for the exhaustive search to be computationally feasible. The higher the number of clusters, the larger V should be to capture the more complex clustering structure. The higher p , the smaller V needs to be to make the exhaustive search computationally feasible.

Step 3 Among the remaining variables, determine the variable leading to the smallest increase in the within-cluster sum-of-squares value if added to the set of segmentation variables.

Step 4 Add this variable if the increase in within-cluster sum-of-squares is smaller than the threshold. The threshold is δ times the number of observations in the subset divided by 4. δ needs to be in $[0, 1]$.

Variable Reduction: Factor-Cluster Analysis:

The term factor-cluster analysis refers to a two-step procedure of data-driven market segmentation analysis. In the first step, segmentation variables are factor analyzed. The raw data, the original segmentation variables, are then discarded. In the second step, the factor scores resulting from the factor analysis are used to extract market segments.

Data Structure Analysis:

Data structure analysis provides valuable insights into the properties of the data. These insights guide subsequent methodological decisions. Most importantly, stability-based data structure analysis provides an indication of whether natural, distinct, and well-separated market segments exist in the data or not. If they do, they can be revealed easily. If they do not, users and data analysts need to explore a large number of alternative solutions to identify the most useful segment(s) for the organization.

Cluster Indices:

cluster indices represent the most common approach to obtaining such guidance. Cluster indices provide insight into particular aspects of the market segmentation solution. Which kind of insight, depends on the nature of the cluster index used. Generally, two groups of cluster indices are distinguished: internal cluster indices and external cluster indices.

Internal Cluster Indices: Internal cluster indices are calculated on the basis of one single market segmentation solution, and use information contained in this segmentation solution to offer guidance. An example for an internal cluster index is the sum of all distances between pairs of segment members. The lower this number, the more similar members of the same segment are. Segments containing similar members are attractive to users.

$$W_k = \sum_{h=1}^k \sum_{\mathbf{x} \in S_h} d(\mathbf{x}, \mathbf{c}_h).$$

External Cluster Indices:

$$\frac{\text{index} - \text{expected index}}{\text{maximum index} - \text{expected index}}$$

External cluster indices cannot be computed on the basis of one single market segmentation solution only. Rather, they require another segmentation as additional input. The external cluster index measures the similarity between two segmentation solutions. If the correct market segmentation is known, the correct assignment of members to segments serves as the additional input. The correct segment memberships, however, are only known when artificially generated data is being segmented.

Gorge Plots:

A simple method to assess how well segments are separated, is to look at the distances of each consumer to all segment representatives. Let d_{ih} be the distance between consumer i and segment representative (centroid, cluster centre) h . Then can be interpreted as the similarity of consumer i to the representative of segment h , with hyper parameter γ controlling how differences in distance translate into differences in similarity. These similarities are between 0 and 1, and sum to 1 for each consumer i over all segment representatives h , $h = 1, \dots, k$.

$$s_{ih} = \frac{e^{-d_{ih}^\gamma}}{\sum_{l=1}^k e^{-d_{il}^\gamma}}$$

Segment Level Stability Analysis:

Segment Level Stability Within Solutions (SLSW):

Segment level stability within solutions (SLSW) measures how often a market segment with the same characteristics is identified across a number of repeated calculations of segmentation solutions with the same number of segments. It is calculated by drawing several bootstrap samples, calculating segmentation solutions independently for each of those bootstrap samples, and then determining the maximum agreement across all repeated calculations

Segment Level Stability Across Solutions (SLSA):

Segment level stability across solutions (SLSA), can be calculated in combination with any algorithm which extracts segments. However, for hierarchical clustering, segment level stability across solutions will reflect the fact that a sequence of nested partitions is created. If partitioning methods (k-means, k-medians, neural gas, ...) or finite mixture models are used, segmentation solutions are determined separately for each number of segments k . A common problem with these methods, however, is that the segment labels are random and depend on the random initialisation of the extraction algorithm (for example the segment representatives which are randomly drawn from the data at the start). To be able to compare market segmentation solutions, it is necessary to identify which segments in each of the solutions with neighboring numbers of segments (P_i , P_{i+1}) are similar to each other and assign consistent labels. The difference in number of segments complicates this task. A way around this problem is to first sort the segments in P_1 using any heuristic, then renumber P_2 such that segments that are similar to segments in P_1 get suitable numbers assigned as labels, etc.

Sanskriti covered:

Exploring Data:

What is Data Exploration?

Data exploration is the first step of data analysis used to explore and visualize data to uncover insights from the start or identify areas or patterns to dig into more. Using interactive dashboards and point-and-click data exploration, users can better understand the bigger picture and get to insights faster.

Why is Data Exploration Important?

Starting with data exploration helps users to make better decisions on where to dig deeper into the data and to take a broad understanding of the business when asking more detailed questions later. With a user-friendly interface, anyone across an organization can familiarize themselves with the data, discover patterns, and generate thoughtful questions that may spur on deeper, valuable analysis.

What are the Main Use Cases for Data Exploration?

Data exploration can help businesses explore large amounts of data quickly to better understand next steps in terms of further analysis. This gives the business a more manageable starting point and a way to target areas of interest. In most cases, data exploration involves using data visualizations to examine the data at a high level. By taking this high-level approach, businesses can determine which data is most important and which may distort the analysis and therefore should be removed. Data exploration can also be helpful in decreasing time spent on less valuable analysis by selecting the right path forward from the start.

Data cleaning is one of the important parts of machine learning. It plays a significant part in building a model. It surely isn't the fanciest part of machine learning and at the same time, there aren't any hidden tricks or secrets to uncover. However, the success or failure of a project relies on proper data cleaning. Professional data scientists usually invest a very large portion of their time in this step because of the belief that "Better data beats fancier algorithms".

If we have a well-cleaned dataset, there are chances that we can get achieve good results with simple algorithms also, which can prove very beneficial at times especially in terms of computation when the dataset size is large.

Obviously, different types of data will require different types of cleaning. However, this systematic approach can always serve as a good starting point.

Steps involved in Data Cleaning:



What are the Steps of Data Cleaning?

Every organization's data cleaning method will vary according to their individual needs as well as the particular constraints of the dataset. However, most data cleaning steps follow a standard framework:

1. Determine the critical data values you need for your analysis.
2. Collect the data you need, then sort and organize it.
3. Identify duplicate or irrelevant values and remove them.
4. Search for missing values and fill them in, so you have a complete dataset.
5. Fix any remaining structural or repetitive errors in the dataset.
6. Identify outliers and remove them, so they will not interfere with your analysis.
7. Validate your dataset to ensure it is ready for data transformation and analysis.
8. Once the set has been validated, perform your transformation and analysis.

Descriptive Analysis

The conversion of raw data into a form that will make it easy to understand & interpret, i.e., rearranging, ordering, and manipulating data to provide insightful information about the provided data.

Descriptive Analysis is the type of analysis of data that helps describe, show or summarize data points in a constructive way such that patterns might emerge that fulfil every condition of the data.

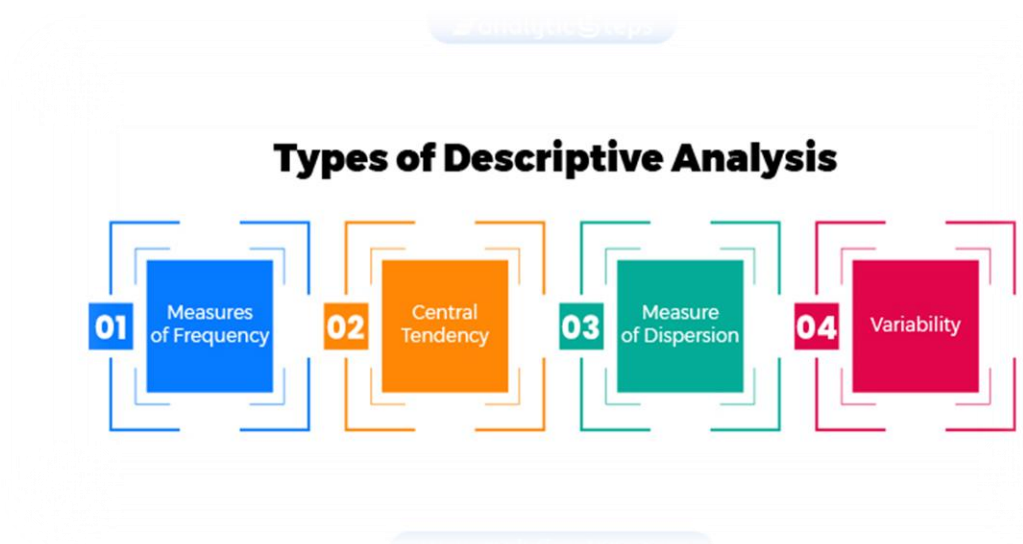
It is one of the most important steps for conducting statistical data analysis. It gives you a conclusion of the distribution of your data, helps you detect typos and outliers, and enables you to identify similarities among variables, thus making you ready for conducting further statistical analyses.

Techniques for Descriptive Analysis

Data aggregation and data mining are two techniques used in descriptive analysis to churn out historical data. In Data aggregation, data is first collected and then sorted in order to make the datasets more manageable.

Types of Descriptive Analysis

Descriptive analysis can be categorized into four types which are measures of frequency, central tendency, dispersion or variation, and position. These methods are optimal for a single variable at a time.



1. Measures of Frequency

In descriptive analysis, it's essential to know how frequently a certain event or response is likely to occur. This is the prime purpose of measures of frequency to make like a count or percent.

For example, consider a survey where 500 participants are asked about their favourite IPL team. A list of 500 responses would be difficult to consume and accommodate, but the data can be made much more accessible by measuring how many times a certain IPL team was selected.

2. Measures of Central Tendency

In descriptive analysis, it's also important to find out the Central (or average) Tendency or response. Central tendency is measured with the use of three averages — mean, median, and mode. As an example, consider a survey in which the weight of 1,000 people is measured. In this case, the mean average would be an excellent descriptive metric to measure mid-values.

3. Measures of Dispersion

Sometimes, it is important to know how data is divided across a range. To elaborate this, consider the average weight in a sample of two people. If both individuals are 60 kilos, the average weight will be 60 kg. However, if one individual is 50 kg and the other is 70 kg, the average weight is still 60 kg. Measures of dispersion like range or standard deviation can be employed to measure this kind of distribution.

4. Measures of Position

Descriptive analysis also involves identifying the position of a single value or its response in relation to others. Measures like percentiles and quartiles become very useful in this area of expertise.

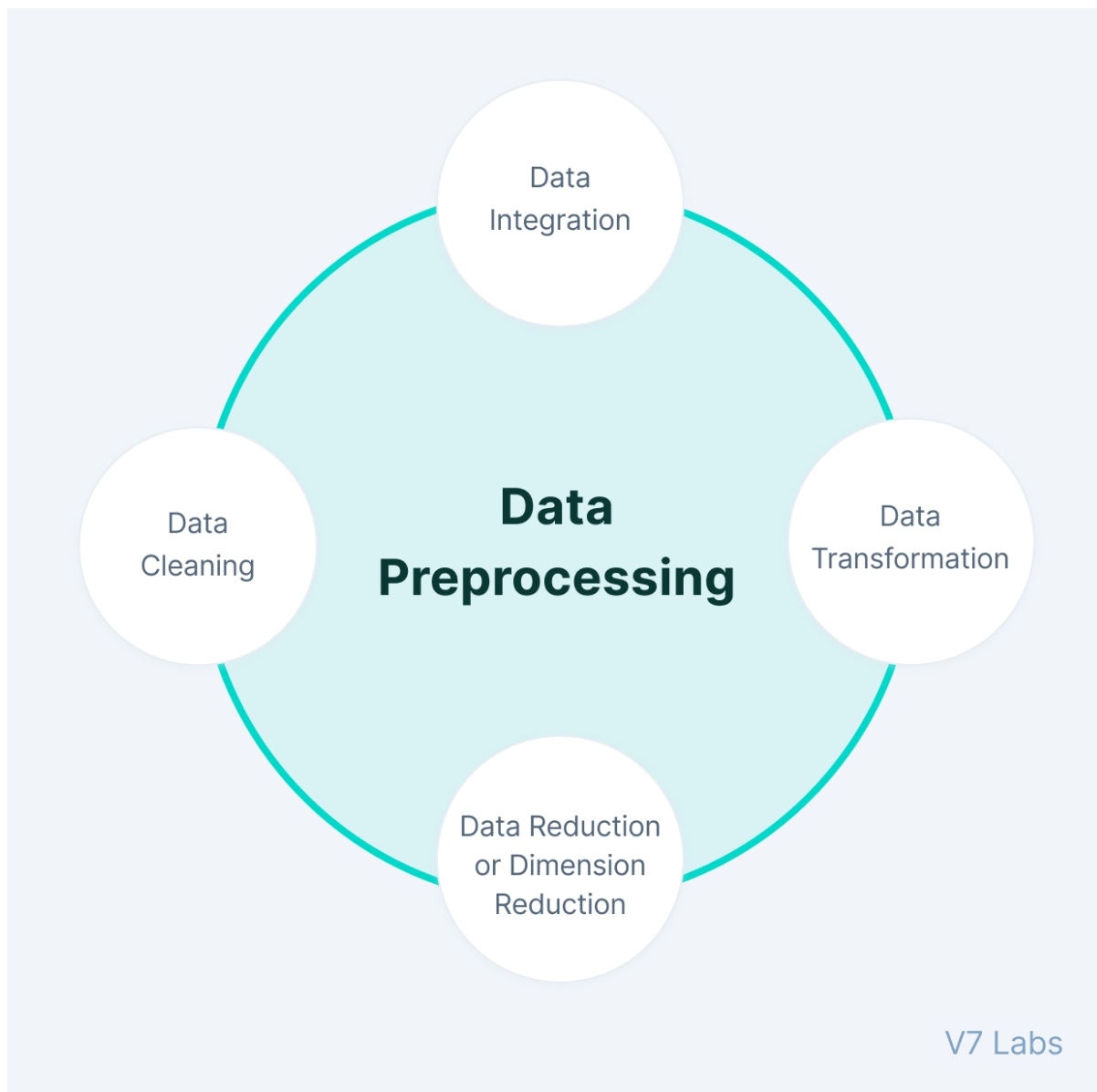
Apart from it, if you've collected data on multiple variables, you can use the Bivariate or Multivariate descriptive statistics to study whether there are relationships between them.

In bivariate analysis, you simultaneously study the frequency and variability of two different variables to see if they seem to have a pattern and vary together. You can also test and compare the central tendency of the two variables before carrying out further [types of statistical analysis](#).

Data preprocessing

Data pre-processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.

When creating a machine learning project, it is not always a case that we come across the clean and formatted data. And while doing any operation with data, it is mandatory to clean it and put in a formatted way. So, for this, we use data pre-processing task.



A **categorical variable** is a category or type. For example, hair colour is a categorical value or hometown is a categorical variable. Species, treatment type, and gender are all categorical variables.

A **numerical variable** is a variable where the measurement or number has a numerical meaning. For example, total rainfall measured in inches is a numerical value, heart rate is a numerical value, number of cheeseburgers consumed in an hour is a numerical value.

Principal component analysis

Principal component analysis, or PCA, is a [dimensionality-reduction](#) method that is often used to reduce the dimensionality of large [data sets](#), by transforming a large set of variables into a smaller one that still contains most of the information in the large set.

Reducing the number of variables of a data set naturally comes at the expense of accuracy, but the trick in dimensionality reduction is to trade a little accuracy for simplicity. Because smaller data sets are easier to explore and visualize and make analysing data much easier and faster for [machine learning algorithms](#) without extraneous variables to process.

So, to sum up, the idea of PCA is simple — reduce the number of variables of a data set, while preserving as much information as possible.

Sahaj covered:

Using Visualisations to Describe Market Segments

Here, we discuss two basic approaches suitable for nominal and ordinal descriptor variables (such as gender, level of education, country of origin), or metric descriptor variables (such as age, number of nights at the tourist destinations, money spent on accommodation).

Using graphical statistics to describe market segments has two key advantages:

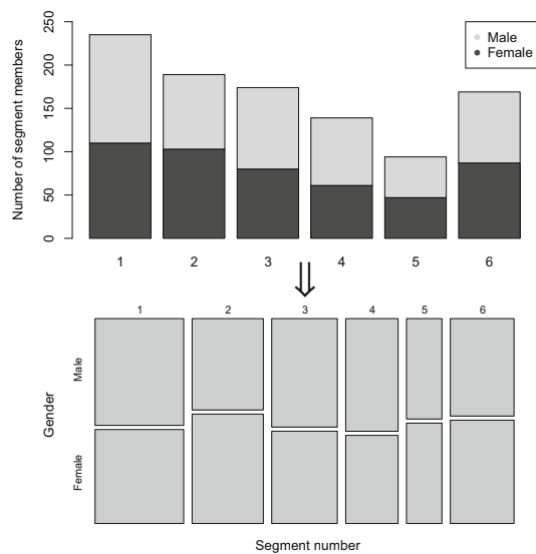
It simplifies the interpretation of results for both the data analyst and the user, and integrates information on the statistical significance of differences, thus avoiding the over-interpretation of insignificant differences.

1. Nominal and Ordinal Descriptor Variables

When describing differences between market segments in one single nominal or ordinal descriptor variable, the basis for all visualisations and statistical tests is a cross-tabulation of segment membership with the descriptor variable.

```
R> C6.Gender <- with(vacmotdesc,
+   table("Segment number" = C6, Gender))
R> C6.Gender
```

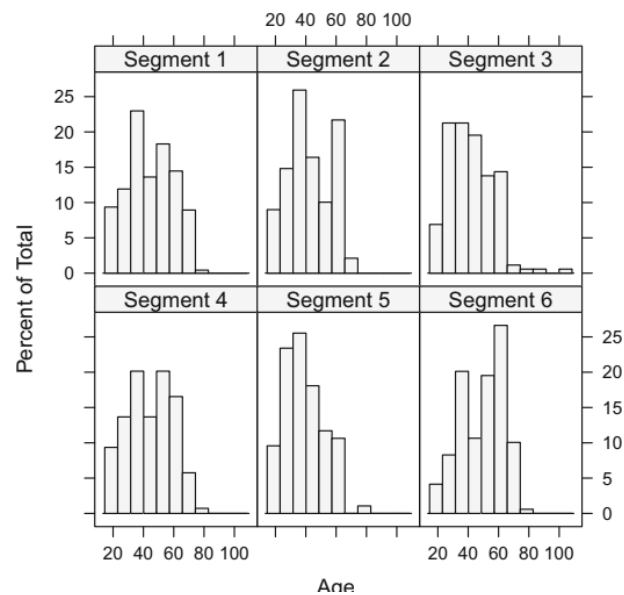
Segment number	Gender	
	Male	Female
1	125	110
2	86	103
3	94	80
4	78	61
5	47	47
6	82	87



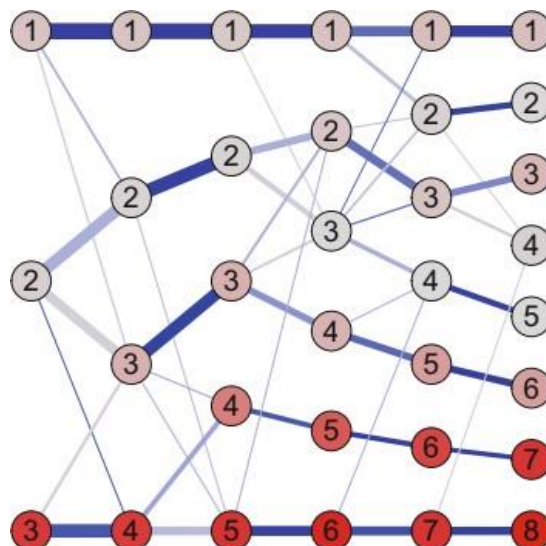
2. Metric Descriptor Variables

Conditional in this context means that the plots are divided in sections (panels, facets), each presenting the results for a subset of the data (for example, different market segments). Conditional plots are well-suited for visualising differences between market segments using metric descriptor variables.

To have segment names (rather than only segment numbers) displayed in the plot, we create a new factor variable by pasting together the word "Segment" and the segment numbers from C6



Segment level stability across solutions (SLSA) plot for the Australian travel motives data set for three to eight segments with nodes coloured by mean moral obligation values.



Testing for Segment Differences in Descriptor Variables

Simple statistical tests can be used to formally test for differences in descriptor variables across market segments. The simplest way to test for differences is to run a series of independent tests for each variable of interest. The outcome of the segment extraction step is segment membership, the assignment of each consumer to one market segment. Segment membership can be treated like any other nominal variable. It represents a nominal summary statistic of the segmentation variables. Therefore, any test for association between a nominal variable and another variable is suitable.

Predicting Segments from Descriptor Variables

Another way of learning about market segments is to try to predict segment membership from descriptor variables. To achieve this, we use a regression model with the segment membership as categorical dependent variable, and descriptor variables as independent variables. We can use methods developed in statistics for classification, and methods developed in machine learning for supervised learning.

Regression analysis is the basis of prediction models. Regression analysis assumes that a dependent variable y can be predicted using independent variables or regressors x_1, \dots, x_p :

$$y \approx f(x_1, \dots, x_p).$$

Regression models differ with respect to the function $f(\cdot)$, the distribution assumed for y , and the deviations between y and $f(x_1, \dots, x_p)$.

The basic regression model is the linear regression model. The linear regression model assumes that function $f(\cdot)$ is linear, and that y follows a normal distribution with mean $f(x_1, \dots, x_p)$ and variance σ^2 . The relationship between the dependent variable y and the independent variables x_1, \dots, x_p is given by:

$$y = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p$$

In the linear regression model, the mean value of y given x_1, \dots, x_p is modelled by the linear function:

$$E[y|x_1, \dots, x_p] = \mu = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p.$$

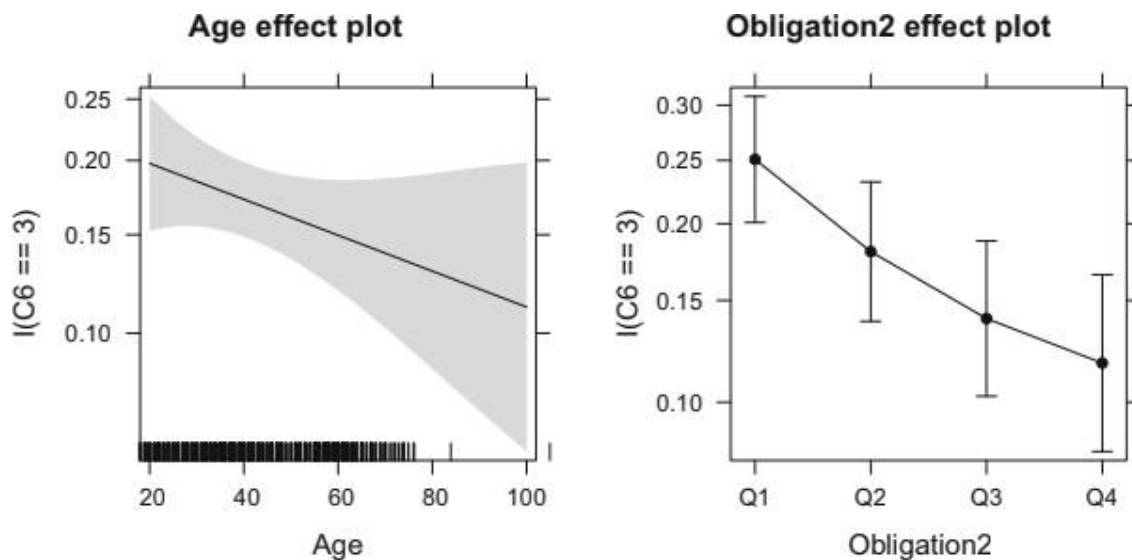
Generalised linear models y are not limited to the normal distribution. We could, for example, use the Bernoulli distribution with y taking values 0 or 1.

$$g(\mu) = \eta = \beta_0 + \beta_1 x_1 + \dots + \beta_p x_p.$$

1. Binary Logistic Regression

We can formulate a regression model for binary data using generalised linear models by assuming that $f(y|\mu)$ is the Bernoulli distribution with success probability μ , and by choosing the logit link that maps the success probability $\mu \in (0, 1)$ onto $(-\infty, \infty)$

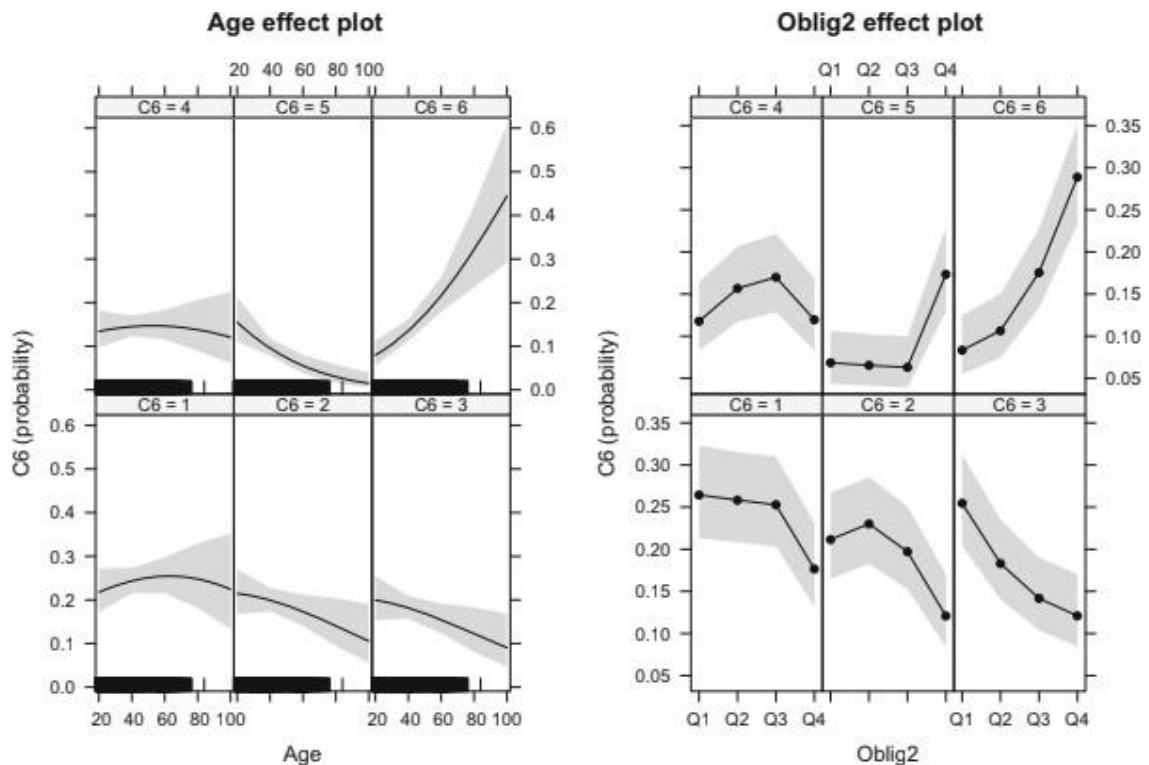
$$g(\mu) = \eta = \log(\mu/1-\mu)$$



2. Multinomial Logistic Regression

Multinomial logistic regression can fit a model that predicts each segment simultaneously. Because segment extraction typically results in more than two market segments, the dependent variable y is not binary. Rather, it is categorical and assumed to follow a multinomial distribution with the logistic function as link function.

The regression coefficients are arranged in matrix form. Each row contains the regression coefficients for one category of the dependent variable. Each column contains the regression coefficients for one effect of an independent variable.



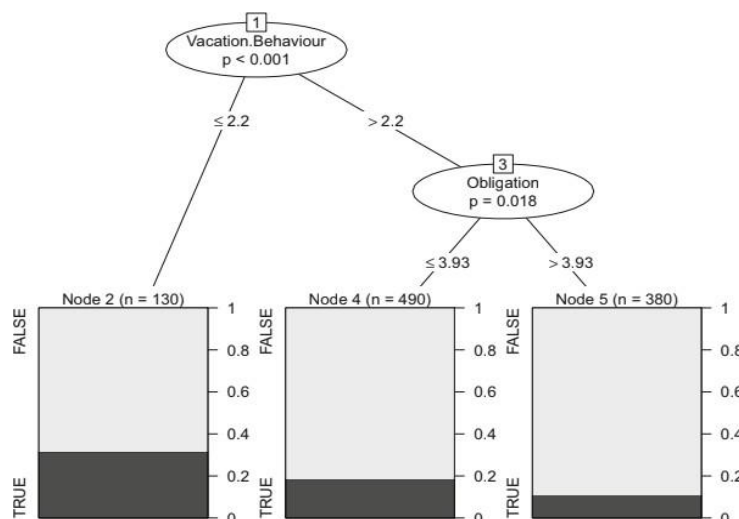
3. Tree-Based Methods

Classification and regression trees are an alternative modelling approach for predicting a binary or categorical dependent variable given a set of independent variables. Classification

and regression trees are a supervised learning technique from machine learning. The advantages of classification and regression trees are their ability to perform variable selection, ease of interpretation supported by visualisations, and the straight-forward incorporation of interaction effects. Classification and regression trees work well with a large number of independent variables. The disadvantage is that results are frequently unstable. Small changes in the data can lead to completely different trees. The tree approach uses a stepwise procedure to fit the model. At each step, consumers are split into groups based on one independent variable. The aim of the split is for the resulting groups to be as pure as possible with respect to the dependent variable. This means that consumers in the resulting groups have similar values for the dependent variable. In the best case, all group members have the same value for a categorical dependent variable. Because of this stepwise splitting procedure, the classification and regression tree approach is also referred to as recursive partitioning.

Tree constructing algorithms differ with respect to:

- Splits into two or more groups at each node (binary vs. multi-way splits)
- Selection criterion for the independent variable for the next split
- Selection criterion for the split point of the independent variable
- Stopping criterion for the stepwise procedure
- Final prediction at the terminal node



MARKET SEGMENTATION

ANALYSIS MURALI S

Murali

Covered:

Introduction:

Market - Segmentation - Analysis

→ To study of customers divided among into the smaller groups to understand their specific characteristics like behaviour, age, income and personality.

→ it's easier for companies to advertise when they're marketing a smaller segment of customers.

→ By this way each can be highly targeted & precise to the characteristics of each group.

Why business use Market Segmentation :-

- ★ when offering promotion, sales & new products, when the company can focus on the detail of segmented groups (rather than customers at Mass).
- ★ Market segmentation creates perfect environment for
 - engagement
 - customer retention
 - acquisition
- ★ Sometimes it will hit 100% that the mass source people want the product at particular time with specific things.

→ Segment

→ Target

→ Position - what Product, Price, Promotion Place Combination will attract customers to buy their Product

How to Conduct M.S.A

- * Preliminary Research
- * Segment Your list
- * Create your study
- * Test!

Preliminary Research

- To know our customer - in depth.
- Talking with them directly is the best way
- (such survey, phone calls, in-person), etc...
- Try to collect more information about our customer, it help for to segment them easier.

Segment

- Now we have data about customer, Now we going to segment them.
- we segment our customer based

- * Segmentation Type
 - Price
 - Time
 - Psychographic
 - Demographic
 - Geographic

- (*) → Not segmented our customer into all of these segments.

Create Our Study

- Creating Survey :- Based on asking several questions related to segment.
- From their answers, we segment them accordingly.

Eg: Our customers have high personal income, from segmenting by price may be smart.

Test

- Now we have data & we segment our customers.
- To check our brief campaigns, discounts (or) other marketing materials to see if it matches with the customers in our segments.
- If not again check our data & re-segment our customers.

Step by Step

Approach

(A)

Step 1

To decide whether (a) Not To segment.

Step 2

Specifying the Ideal target Segment

(a) identify the target Market.

ST:3

Collect the data

ST:4

Exploring the data

(Pre-processing)

E.D.A (Technique)

ST:5

Identifying Expectations of Target Audience

ST:6

Extracting Segment | Create Subgroups

Eg. (Classification | clustering algorithm)

ST:7

Profiling segments.

ST:8

Review the need of the target audience

ST:9

Describing segments

ST:10

Selecting the target segments

(a) Name our target Market Segment.

ST. 11

Customising the Marketing Mix
(iv) Marketing Strategies

ST. 12

Evaluation, Monitoring

ST. 13

Review the behavior of Seg of Target Market

Step 1

Deciding Segment / Not

(*) →

We need to commit to the Segmentation Strategy

for long Term

Eg. Suppose if a Manufacturer introduces a new Product in environment the long Term Segmentation is important because for if a Manufacturer phone has target Segment customers based female only, after certain years the use of female reduced it cause an Problem. The Product will Not succeed certain Time.

So, again I need to segment by collecting the data, and everything.

→ To cost for research, advertisement, etc. again I have to spend.

(x)(x) →

NOT to segment unless the expected increase in

Sales.

Eg.

Suppose

→ To launch new Product, to modification of Existing Product, change the price of the Product & to sell the Products in various channels & communication with the Market, Advertisement, etc.

Barriers :-

First Barrier → Senior Management

- * lack of leadership
- * Not active in composing
- * less commitment & involvement
- * without not enough resources / data.

Second Barrier → Organizational Culture

- * lack of consumer
- * " " creative thinking.
- * lack of communication with the customers.
- * lack of sharing information by the customers.
- * Short-term thinking
- * unwilling to make new changes
- * office politics.
- (X) * lack of Training / Trained Peoples.

→ lack of qualified data Manager & analyst on the organisation.

→ Not that much clarity about objective of Market Segmentation. | Bad Planning.

How To overcome these barriers

- To understand about customers.
- To segment them based on their requirements.
- Good leadership
- To easy to understand & present the results by graphical representation.

→ If the barriers are not removed, then abandoning the Market segmentation strategy.

Environment for M.S.A

→ Organisation

- * Market oriented
- * willing to make new changes
- * long-term / futuristic view
- * Create new ideas / thinking
- * good communication among members

organisation / customer

- * have sufficient financial resources
- * good Senior Management
- * giving training about segmentation
- * Create a Team

→ Team

- * have Market expert
- * have good data Expert / statistics
- * " " " analyst
- * " " " Business "
- * " " " Product "
- * giving enough time without pressure

Step 2 Shedding the ideal target
The organisation must determine the sets of
Segment evaluation criteria.

- (i) Knock-out criteria
- (ii) Attractiveness criteria

Some important Six characteristics that segments have

1) Identifiable :-
★ identify customer in each segment & measure their characteristics like demographics (or) their behaviour.

2) Substantial :-
★ Not - cost effective to target small segments
★ Target larger segments it gives more

Profitable

3) Accessible :-
★ To reach its segments via communication and distribution channels.

4) Stable ★ segment should be stable enough for a long period of time.

5) Differentiate People in our segment should have similar needs that are clearly different from needs of other people in other segments.

6) Actonable — able to provide products or services to our segments.

Knock-out Criteria

Segment must be

- (i) Homogenous — Similar to one another in same segment
- (ii) distinct — customers have different characteristics from one segment to another
- (iii) large enough
- (iv) Measurable — Organisation have the capability to satisfy the segment members needs.

(v) Member of the segment must be Identifiable

(vi) Reachable — was to touch with members of segment in order to make the Customised Marketing more accessible to them.

Attractiveness

Criteria

— it determines whether a Market Segment is selected as a target segment. (S: 8)

Example.

Identify the target Market.

→ first step to identify the target segment / Market.

Eg. A male & female can't be included in one segment they have different needs & expectation.

Example ①

→ Burberry stocks separate merchandise for both men and women. The management is very clear on the target market & separate strategies for product promotion among both the segments.

Example ②

→ Maruti Suzuki Focused → Create segment within large market to promote their cars.

- (i) lower income Group — Maruti 800, Alto
- (ii) Middle " " — Swift DZi, Wagon, Ritz
- (iii) High " " — Vitara, Kizashi

Identify Expectations of Target Audience

* Example

Once we find our target segment & customer.
Then we have to find the need of them.

* To interact with the audience to know more about their interest & demand.

Ex Maruti Suzuki

→ To find the need of lower - income group who interest to buy car. what they are expecting within that range

- * A/C
- * Comfort
- * Mileage
- * Service center, etc.

* Camera - Sensor

→ Middle - income group

- * Sun-roof
- * Back-seat A/C
- * Rear - Camera & front sensor, etc.

→ High - income group

- * Ventilator seats
- * Memory - Seats
- * Premium materials, etc.

Step 3

Collecting Data

Segmentation Variables

→ Common base

segmentation

Segmentation Variable is only one single characteristic of the consumers in the same.

→ Data-driven

segmentation

Not based on one, but on multiple Segmentation Variables

→ Descriptive Variable

Variables used to describe the Segments in detail

Segmentation - Criteria

refers to the nature of the information used for Market Segmentation

Most Common are:-

- * Geographic
- * Socio-demographic
- * Psychographic
- * Behavioural

Which Criteria is chosen for best to use?
→ depends upon the requirement of target peoples.

Geographic →

Demographic →

Psychographic →

Behavioural Criteria →

Two types of

HOT DATA

COLD DATA

Geographic

- Simplest criteria
- Segmentation is based on the location

Demographic

- Most commonly used criteria
- - gender
 - age
 - nationality
 - education
 - profession
 - income

eg.

Diplant → Segment their audience by gender.

Psychographic

- Focus on lifestyle of customers

- * Interest
- * Personality
- * Values
- * Belief
- * Opinion

Behavioral Criteria

- data depends on ^(Offline) Past & ^(Online) Present behavior
- (Time spent, product used, etc.)

Two types of data

HOT DATA

- Behavioral Criteria
 - Contextual " (location, weather)
 - Technical " (browser, device used)

COLD DATA

- Historical data
 - demographic criteria (age, gender, ...)
 - historical data from previous purchase.

Sample Size \Rightarrow No. of samples \Rightarrow No. of observations
 \rightarrow Less Sample Size \Rightarrow Less accurate (2^P) , where
 \rightarrow Sample Size \rightarrow number of Segmentation Variables
P is the number of Segmentation Variables

(n) $\rightarrow 10 \times P \times K \rightarrow$ Segmentation Variables
 where $P \rightarrow$ number of Segmentation Variables
 $K \rightarrow$ " " " "
 $\rightarrow 60 \times P$ (or) $70 \times P$

Demographics :-

- * age
- * gender
- * family size
- * income
- * occupation
- * education
- * religion
- * Nationality

Psychographics

- * Lifestyle
- * Personality
- * attitudes
- * Social class

Behavioral

- * User status
- * purchase occasion
- * loyalty
- * readiness to buy

Geography

- * Nation
- * State
- * region
- * Cities
- * Neighborhoods
- * Zip codes, etc.

Step: 8

Selecting the Target Segment

If we select two or more segment will affect the future performance of an organization.

First Task

→ while ensure that all the market segments are under consideration to be target segments and have well & truly passed the

Knock-out Criteria Test

- ★ organization ^{more} likely to target? which segment
- organization like to commit?
- ★ organization offering some products would each of segments most like to buy from?

Market - Segment Evaluation

we → Decision Matrix to visualize relative

Segment attractiveness

→ Boston Matrix

→ McKinsey Matrix

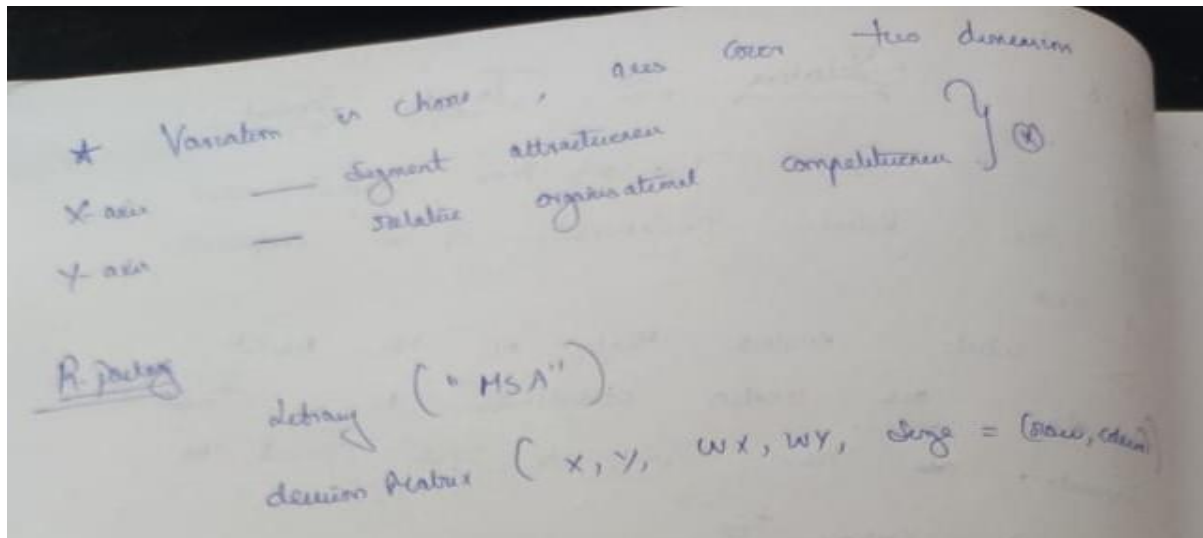
→ directional Policy Matrix

→ McDonald four-box directional Policy

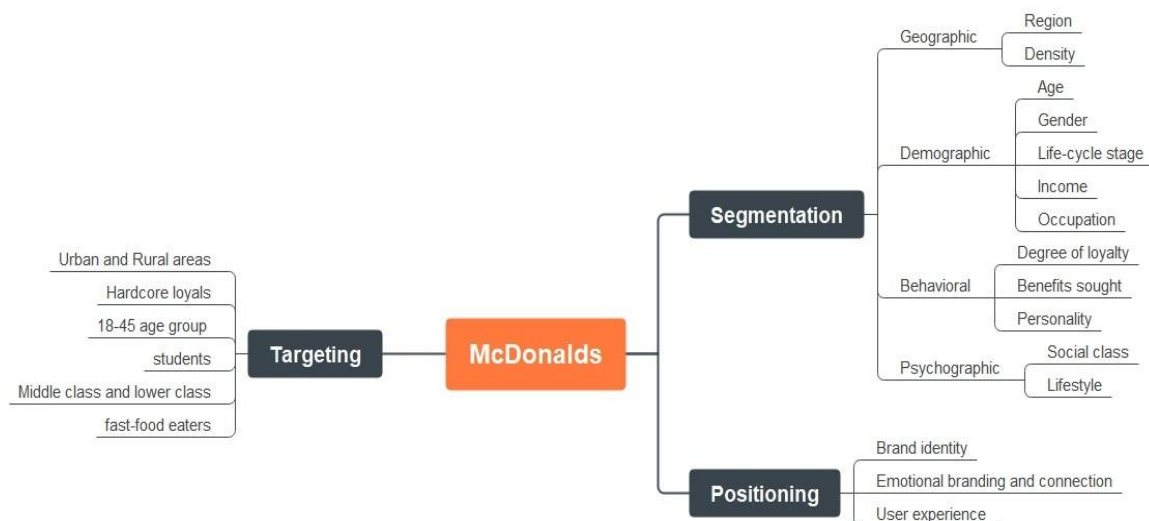
Matrix

→ Market Attractiveness business strength matrix

From this M.S. Team decide which variation for the decision matrix offers the most useful framework with decision Making.



CASE STUDY IN McDonalds



Introduction:

McDonald's is one of the most popular restaurant chains in the world. Nowadays, there are more than 40000 McDonald's restaurants globally which serve tens of millions of customers every day. The question becomes what did McDonald's do in order to make sure its customers stuck on McDonald's products. The difficult part is that each of the customers has a different profile. The profile could include elements as broad as nationality and elements that are much more specific such as preference of meat. To satisfy all these needs, it's crucial to know about customers and build a marketing segmentation so that the other departments could start advertising and branding accordingly. Indeed, McDonald's marketing team does a lot of work behind and one of its jobs is to build customer segmentation in order to know their customers better and target new potential customers. In the following text, the goal is to explore what approaches do McDonald's use to build marketing segmentation.

Market Segmentation of McDonald's

It is important to make a marketing plan because it is important to understand the company's target clients for better communication and marketing. It's easier to communicate with a consumer base after you've figured out who they are. This turns into the most successful advertising to the consumer base imaginable.

McDonald's divided their items into categories based on psychographic, behavioral, and demographic factors. Children, learners, families, and businessmen are all targets for their products. McDonald's targets these market sectors because of their enormous size, as well as the projected growth rates. These categories are known for having extremely high-profit margins. Segmentation of the Market.

Placement Segmentation

The division of a single market into smaller market segments is known as market segmentation. This is done to make it simpler to respond to the needs of small categories of customers. As a result, McDonald's may market various goods to groups based on their consumption habits. A segment usually refers to a group of people who have similar traits. Gender, geography, age, lifestyle, economic level, and a variety of other factors are among them.

Behavioral Segmentation

Special occasions, such as children's birthday celebrations, are related to behavioral segmentation. McDonald's attracts local youth clubs and sports teams not just because of its low costs but also because of its convenient location. McDonald's can accommodate a large population of persons and appeals to the younger audience. Their food and promotion are targeted primarily toward retaining a young consumer base.

Demographic Segmentation

McDonald's prefers to concentrate on demographic segmentation as a major segment. This group consists of students, children, and parents. McDonald's provides a welcoming setting for students, allowing them to socialize with their peers. McDonald's is a popular lunch venue for students as well as an after-school hangout. McDonald's scores big with their happy meal and the complimentary toy that comes with it because kids are a significant emphasis.

Psychographic Segmentation

McDonald's needs to create and advertise new goods, as well as modified products with minimal fat and cholesterol, to stay ahead of the competition. This is the current trend, and eating healthy is on everyone's mind in the United States. McDonald's and the fast-food business face fierce competition. With it in consideration, it's time to devise a penetrating pricing plan. This would enable the corporation to launch new and improved items at a cheaper cost than the competitors. This will boost the company's market share and align with its marketing goals. The final objective is to grow sales to increase overall income.

Type of segmentation	Segmentation criteria	McDonald's target segment
Placement	Region	Domestic and international
	Place	Urban and rural areas
Demographic	Age	8 – 45
	Gender	Males & Females
	Life-cycle stage	Married couples, single people, friends, old age
	Income	Middle class
	Occupation	Students, employees, teachers, regulars
Behavioral	loyalty	Loyal customers
	Benefits	Cost benefits and time efficiency
	Personality	chill & carefree personality
	User status	Fast food eaters
Psychographic	Social class	Lower, working, and middle classes
	Lifestyle	Mainstream individuals

Market Segment Evaluation:

McKinsey Matrix

ORIGIN OF GE-MCKINSEY MATRIX

The GE-McKinsey Matrix was developed in the 1970s when McKinsey & Company was hired by GE (General Electric) company to develop a tool or model for analysis and management of a business portfolio that is best suitable as per their requirements.

In the 1970s, projections related to future cash flows, market growth, etc. were the main elements for the companies to make decisions of investments.

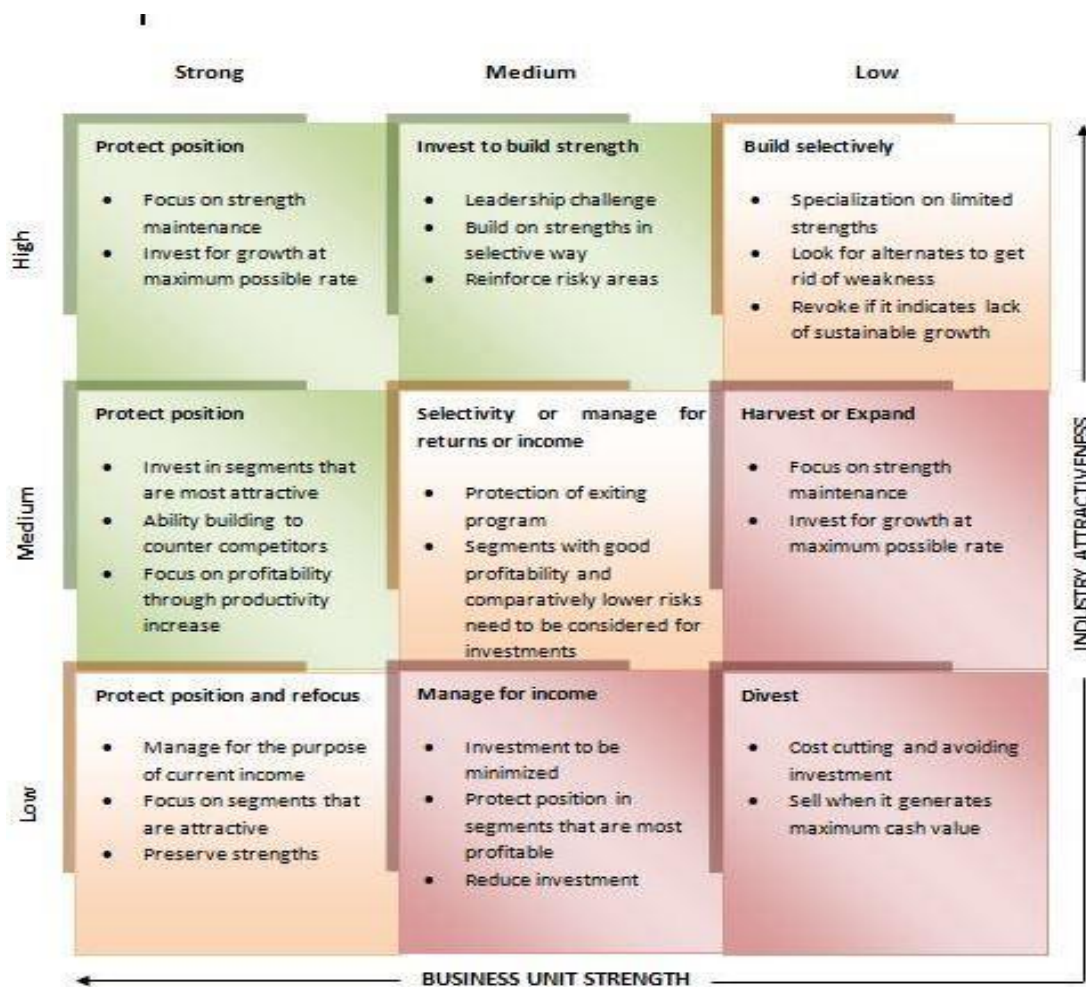
GE-McKinsey Matrix was designed which is a strategy tool aimed at supporting business in making decisions related to whether invest or not in its sub-business units or products.

GE-MCKINSEY MATIX:



AXIS OF GE-MCKINSEY MATRIX

The y-axis of the matrix represents market attractiveness and the x-axis shows a businessunit's competitive strength.

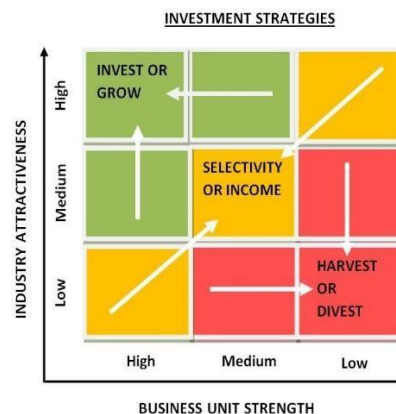
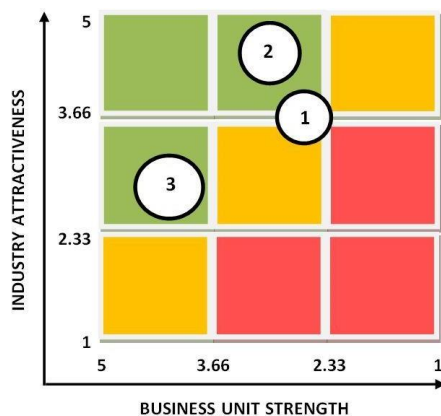


The process of GE-McKinsey Matrix

1. Determine each business unit's industry attractiveness

This includes the following steps:

- **List down factors:** This is the first step in which a list of relevant factors needs to be identified and compiled while measuring the attractiveness of the industry. Some common factors are available across industries but an organization should choose the most appropriate factors for its business. These factors may include growth rate, size, environmental factors, competitive landscape, profit margin, etc. that affect the industry.
- **Allocate weights:** It is mandatory to give weights to the factors that have been listed. These weights indicate the value of the factor in determining industry attractiveness. This weight could be anything between 0.01 (not important) and 1.0 (extremely important) which has to be assigned to each factor. The aggregate of all the weights should be 1.0.
- **Provide rating to the factors:** Once the weight is allocated to the factors, the next step is to rate each one of them associated with each business unit or product of the company. Values can be selected between 1 to 5 or between 1 to 10. In this, 1 shows the low attractiveness of the industry, wherein, the scoring of 5 or 10 represents the high industry attractiveness.
- **Determine the weighted and total/final scores:** Once the weights and ratings are ready, a final or total score is calculated which is the aggregate of the weighted score of all factors for each business unit. Weighted scores are determined by multiplying ratings and weights.



EXAMPLES OF GE-MCKINSEY MATRIX (PRACTICAL IMPLICATIONS IN RENOWNED BRANDS)

1. Apple Inc.

Let's see the practical implication of GE-McKinsey Matrix with an example of a large technology brand Apple Inc. The company has many multi-businesses or multi-business units that are operating in different markets such as laptops, desktops, Tablets (iPads), smartphones (iPhones), portable music players (iPods), etc. Apple also develops software to facilitate these products.

A competitor of Apple who is looking to gain competitive access to Apple's activities could do this by plotting its business units in the matrix. Through this analysis, the competitor could find out different business units into which Apple is about to invest a huge amount, divest, or develop selectively. The x-axis i.e. industry attractiveness would be comparatively easy to

access for the competitor in case of operating in the same market, as this includes Apple's external factors. This consists of information that could be easily revealed like the growth rate of the market, the current size of the market, etc. Still, few factors would have to be examined thoroughly, like entry barriers and technological development.

On the other hand, the competitive strength of the business unit i.e. y-axis would be quite tough to be assessed as it includes internal factors of Apple i.e. access to resources, the strength of management, customer loyalty. In this, secondary sources like media, internet, etc. could be a great help to obtain a great amount of information.

Ajay(team leader) covered:

Introduction

McDonald's is one of the most popular restaurant chains in the world. Nowadays, there are more than 40000 McDonald's restaurants globally which serve tens of millions of customers every day [2]. The question becomes what did McDonald's do in order to make sure its customers stuck on McDonald's products. The difficult part is that each of the customers has a different profile. The profile could include elements as broad as nationality and elements that are much more specific such as preference of meat. To satisfy all these needs, it's crucial to know about customers and build a marketing segmentation so that the other departments could start advertising and branding accordingly. Indeed, McDonald's marketing team does a lot of work behind and one of its jobs is to build customer segmentation in order to know their customers better and target new potential customers. In the following text, the goal is to explore what approaches do McDonald's use to build marketing segmentation.

The Implications of a Marketing:

Implementation of a marketing strategy can improve business profitability because of implications for all aspects of the company's operations. The marketing strategy focuses company attention on particular target market segments and makes it clear what product characteristics are required for successfully satisfying customer needs. This focus eliminates marginal operations that don't contribute to business growth and promotes a streamlined approach to the company's business •

Customers

1. The main implication of a marketing strategy is the orientation toward meeting customer needs that results in increased customer satisfaction. Once you have identified your target market and the characteristics of your targeted customers

through surveys and market studies, you can focus on strategies to serve your customers better than your competition. Customer impressions of your company improve with this focus, and your image in the marketplace becomes more positive. Such a marketing strategy is designed to gain new customers as you build a more favorable reputation.

Products

1. A marketing strategy has important implications for product design and promotion. Once you know what your customers want, you have to ensure that the product features meet their needs or change the design to add corresponding features. Instead of convincing customers to buy the product you have, you offer them the product they need and promote the features they want. A marketing strategy focused on offering products that suit your target market promotes innovation and improves product quality. The marketing strategy then specifies that you run ads promoting the innovative nature and high quality of your products.

Performance

1. With improved customer satisfaction and innovative products of high quality, your company can increase both sales and profitability. Your marketing strategy projects the increased demand based on market studies and allows you to plan production to meet it. At the same time, your marketing strategy identifies the price that members of the target market are willing to pay for the newly revised product. A well-implemented marketing strategy lets you plan for increased production with confidence while reducing costs by eliminating expensive product features that your target market members don't value. The result is improved company performance.

Employees

1. For employees, an effective marketing strategy implementation means working for a more successful company. Better company performance improves employee morale, and high-quality products result in high levels of commitment to the organization. The customer-orientation of the marketing strategy gives employees increased job satisfaction as they deal with customers who have positive experiences with company products and in customer service. Such an atmosphere is conducive to excellent team spirit and employee cooperation to achieve ambitious company objectives.

What You Need to Know About Segmentation:

The marketers of Clearblue Advanced Pregnancy Test, a product that can tell you if you're one-week, two-weeks, or three-plus weeks pregnant, asked a couple of D-list celebrities to tweet out their positive tests back in 2013. As , the maker of the test, Swiss Precision Diagnostics, has a 25% share of the at-home pregnancy-testing industry and is targeting its

marketing efforts at Millennials. Grose quotes IbisWorld researcher Jocelyn Phillips as pointing to the high-tech aspects of Clearblue's test, also noting that young women might be more willing to shell out more money for such technology — the digital version costs about \$5 more than the boring old blue and pink line version.

There is nothing new about this kind of segmenting in the pregnancy test market, however. And it's actually a really useful (if not slightly unsettling) example of how you might segment potential customers with very different needs and behaviors.

For example, you could segment the market for early pregnancy tests based on demographics such as age and income, or you could segment the market based on consumers' price sensitivity. But in this situation, it is useful to ask **why**: Why would a woman want to take a pregnancy test? And are these reasons the same for everyone? A little bit of thought would suggest that there are two groups of women: **hopefuls**, those who want to be pregnant, and **fearfuls**, those who are afraid that they might be pregnant.

How would you identify these two segments and market to them differently? Often companies offer multiple products that appeal to different market segments and let customers *self-select*. That is, the firm does not identify customers in various market segments; instead, the customers reveal their market segment identity by choosing different products. Quidol, a company based in San Diego, California, created two different products to appeal to two segments in the market for early pregnancy tests: the hopefuls and the fearfuls. The actual test products were almost identical, but the two products were given different names and package designs, were placed in different aisles of a drugstore, and were priced differently.

Regardless of your approach, a useful segmentation should include these six characteristics:

1) Identifiable. You should be able to identify customers in each segment and measure their characteristics, like demographics or usage behavior.

2) Substantial. It's usually not cost-effective to target small segments — a segment, therefore, must be large enough to be potentially profitable.

3) Accessible. It sounds obvious, but your company should be able to reach its segments via communication and distribution channels. When it comes to young people, for example, your company should have access to Twitter and Tumblr and know how to use them authentically — or, as Clearblue smartly did, reach out to celebrities with active Twitter presences to do some of your marketing for you.

4) Stable. In order for a marketing effort to be successful, a segment should be stable enough for a long enough period of time to be marketed to strategically. For example, lifestyle is often used as a way to segment. But research has found that, internationally, lifestyle is dynamic and constantly evolving. Thus, segmenting based on that variable globally might not be wise.

5) Differentiable. The people (or organizations, in B2B marketing) in a segment should have similar needs that are clearly different from the needs of other people in other segments.

6) Actionable. You have to be able to provide products or services to your segments. One U.S. insurance company, for example, spent a lot of time and money identifying a segment, only to discover that it couldn't find any customers for its insurance product in that segment, nor was the organization able to design any actions to target them.

Now you can start breaking down segments by *who* buys, *what* they buy, and *why* they buy (or use or view, etc.) it. The pregnancy test interactive above is a great example of how this works.

There are also prominent failures that companies should heed. One of the most infamous is when Bic decided to segment its young female consumers. The “Bic Cristal for Her” writing utensils were thinner, designed with more pastel colors, and priced higher than other pens. Women, in general, were offended, [taking to Amazon to write some very creative reviews](#). The pen market, in other words, was not as heterogeneous along gender lines as Bic had thought.

When thinking about how you segment, John Forsyth has several suggestions. For one, he notes, “focus groups are dead. If you're still using focus groups, you're using 30-year-old technology.” A much better way to understand customer needs and behaviors is to spend time with people in their homes, stores, or health clubs. “You watch them, you talk to them while they're doing the kinds of things we want to be observing.”

This type of qualitative research is all the more important because it showcases real stories that are key to convincing stakeholders. “When we illustrate things with qualitative research, we get CEOs going, ‘Wow, you're really telling me my marketing strategy is all wrong and I need to change it,’” says Forsyth. “It's very powerful, and it's really exploded in the last 10 years.”

Big Data and technology have changed how companies approach segmenting. “The old model, particularly in the market research world was, ‘I understand people's needs and attitudes, and behaviors will come from that,’” Forsyth explains. “Today, in many situations, [marketers] have flipped it to say, ‘I'm going to do segmentation based on their behaviors, and then I'm going to try to understand the needs that drive behavioral differences.’”

He warns, however, that this type of segmentation is “a lot harder to do than people think, and I don't think we're anywhere near being good at it yet.”

Forsyth's also seeing a lot of movement in the area of segmenting emerging markets worldwide, which poses a number of challenges. For one, scales marketers use to measure needs or behaviors in one country may be way off in another due to different cultural norms.

He also notes that affordability is still a huge factor in developing countries, too, whereas it may not be elsewhere — as the \$20 pack of digital pregnancy tests demonstrates nicely.

1 Implications for Marketing Mix Decisions

Marketing was originally seen as a toolbox to assist in selling products, with marketers mixing the ingredients of the toolbox to achieve the best possible sales results (Dolnicar and

Ring). In the early days of marketing, Borden () postulated that marketers have at their disposal 12 ingredients: product planning, packaging, physical handling, distribution channels, pricing, personal selling, branding, display, advertising, promotions, servicing, fact finding and analysis. Many versions of this marketing mix have since been proposed, but most commonly the marketing mix is understood as consisting of the *4Ps*: Product, Price, Promotion and Place (McCarthy).

Market segmentation does not stand independently as a marketing strategy. Rather, it goes hand in hand with the other areas of strategic marketing, most importantly: positioning and competition. In fact, the segmentation process is frequently seen as part of what is referred to as the *segmentation-targeting-positioning* (STP) approach (Lilien and Rangaswamy). The segmentation-targeting-positioning approach postulates a sequential process. The process starts with *market segmentation* (the extraction, profiling and description of segments), followed by *targeting* (the assessment of segments and selection of a target segment), and finally *positioning* (the measures an organisation can take to ensure that their product is perceived as distinctly different from competing products, and in line with segment needs). Viewing market segmentation as the first step in the segmentation-targeting-positioning approach is useful because it ensures that segmentation is not seen as independent from other strategic decisions. It is important, however, not to adhere too strictly to the sequential nature of the segmentation-targeting-positioning process. It may well be necessary to move back and forward from the segmentation to the targeting step, before being in the position of making a long-term commitment to one or a small number of target segments.

Figure illustrates how the target segment decision – which has to be integrated with other strategic areas such as competition and positioning – affects the development of the marketing mix. For reasons of simplicity, the traditional 4Ps model of the marketing mix including Product, Price, Place and Promotion serves as the basis of this discussion. Be it twelve or four, each one of those aspects needs to be thoroughly reviewed once the target segment or the target segments have been selected.

Fig. 11.1



How the target segment decision affects marketing mix development

To best ensure maximising on the benefits of a market segmentation strategy, it is important to customise the marketing mix to the target segment (see also the layers of market segmentation in Fig. discussed on pages 11–12). The selection of one or more specific target segments may require the design of new, or the modification or re-branding of existing products (Product), changes to prices or discount structures (Price), the selection of suitable distribution channels (Place), and the development of new communication messages and promotion strategies that are attractive to the target segment (Promotion).

One option available to the organisation is to structure the entire market segmentation analysis around one of the 4Ps. This affects the choice of segmentation variables. If, for example, the segmentation analysis is undertaken to inform pricing decisions, price sensitivity, deal proneness, and price sensitivity represent suitable segmentation variables (Lilien and Rangaswamy).

If the market segmentation analysis is conducted to inform advertising decisions, benefits sought, lifestyle segmentation variables, and psychographic segmentation variables are particularly useful, as is a combination of all of those (Lilien and Rangaswamy).

If the market segmentation analysis is conducted for the purpose of informing distribution decisions, store loyalty, store patronage, and benefits sought when selecting a store may represent valuable segmentation variables (Lilien and Rangaswamy). Typically, however, market segmentation analysis is not conducted in view of one of the 4Ps specifically. Rather, insights gained from the detailed description of the target segment resulting from Step 7 guide the organisation in how to develop or adjust the marketing mix to best cater for the target segment chosen.

2 Product

One of the key decisions an organisation needs to make when developing the product dimension of the marketing mix, is to specify the product in view of customer needs. Often this does not imply designing an entirely new product, but rather modifying an existing one. Other marketing mix decisions that fall under the product dimension are: naming the product, packaging it, offering or not offering warranties, and after sales support services.

The market segments obtained for the Australian vacation activities data set (see Appendix C.3) using biclustering (profiled in Fig) present a good opportunity for illustrating how product design or modification is driven by target segment selection. Imagine, for example, being a destination with a very rich cultural heritage. And imagine having chosen to target segment 3. The key characteristics of segment 3 members in terms of vacation activities are that they engage much more than the average tourist in visiting museums, monuments and gardens (see the bicluster membership plot in Fig.). They also like to do scenic walks and visit markets. They share both of these traits with some of the other market segments. Like most other segments, they like to relax, eat out, shop and engage in sightseeing.

In terms of the product targeted at this market segment, possible product measures may include developing a new product. For example, a MUSEUMS, MONUMENTS & MUCH, MUCH MORE product (accompanied by an activities pass) that helps members of this segment to locate activities they are interested in, and points to the existence of these offers at the destination during the vacation planning process. Another opportunity for targeting this segment is that of proactively making gardens at the destination an attraction in their own right.

3 Price

Typical decisions an organisation needs to make when developing the price dimension of the marketing mix include setting the price for a product, and deciding on discounts to be offered.

Sticking to the example of the destination that wishes to market to segment 3 (which has emerged from a biclustering analysis of the Australian vacation activities data set), we load the bicluster solution obtained in Sect.:

```
R> load("ausact-bic.RData")
```

To be able to compare members of segment 3 to tourists not belonging to segment 3, we construct a binary vector containing this information from the bicluster solution. We first extract which rows (respondents) and columns (activities) are contained in a segment using:

```
R> library("biclust") R> bcn <- biclusternumber(ausact.bic)
```

We use this information to construct a vector containing the segment membership for each consumer.

First we initialise a vector `cl12` containing only missing values (NAs) with the length equal to the number of consumers. Then we loop through the different clusters extracted by the biclustering algorithm, and assign the rows (respondents) contained in this cluster the corresponding cluster number in `cl12`.

```
R> data("ausActiv", package = "MSA")
R> cl12 <- rep(NA, nrow(ausActiv))
R> for (k in seq_along(bcn)) { +   cl12[bcn[[k]]$Rows] <- k
+ }
```

The resulting segment membership vector contains numbers 1 to 12 because biclustering extracted 12 clusters. It also contains missing values because biclustering does not assign all consumers to a cluster. We obtain the number of consumers assigned to each segment, and the number of consumers not assigned by tabulating the vector:

```
R> table(cl12, exclude = NULL)
cl12      1      2      3      4      5      6      7      8      9     10     11     12
 50     57     67     73     61     83     52     65     51     53     80     60
<NA>    251
```

The argument `exclude = NULL` ensures that NA values are included in the frequency table.

Based on the segment membership vector, we create a binary variable indicating if a consumer is assigned to segment 3 or not. We do this by selecting those as being in segment 3 who are not NA (`!is.na(cl12)`), and where the segment membership value is equal to 3.

```
R> cl12.3 <- factor(!is.na(cl12) & cl12 == 3,
+   levels = c(FALSE, TRUE),
+   labels = c("Not Segment 3", "Segment 3"))
```

The categories are specified in the second argument `levels`. Their names are specified in the third argument `labels`.

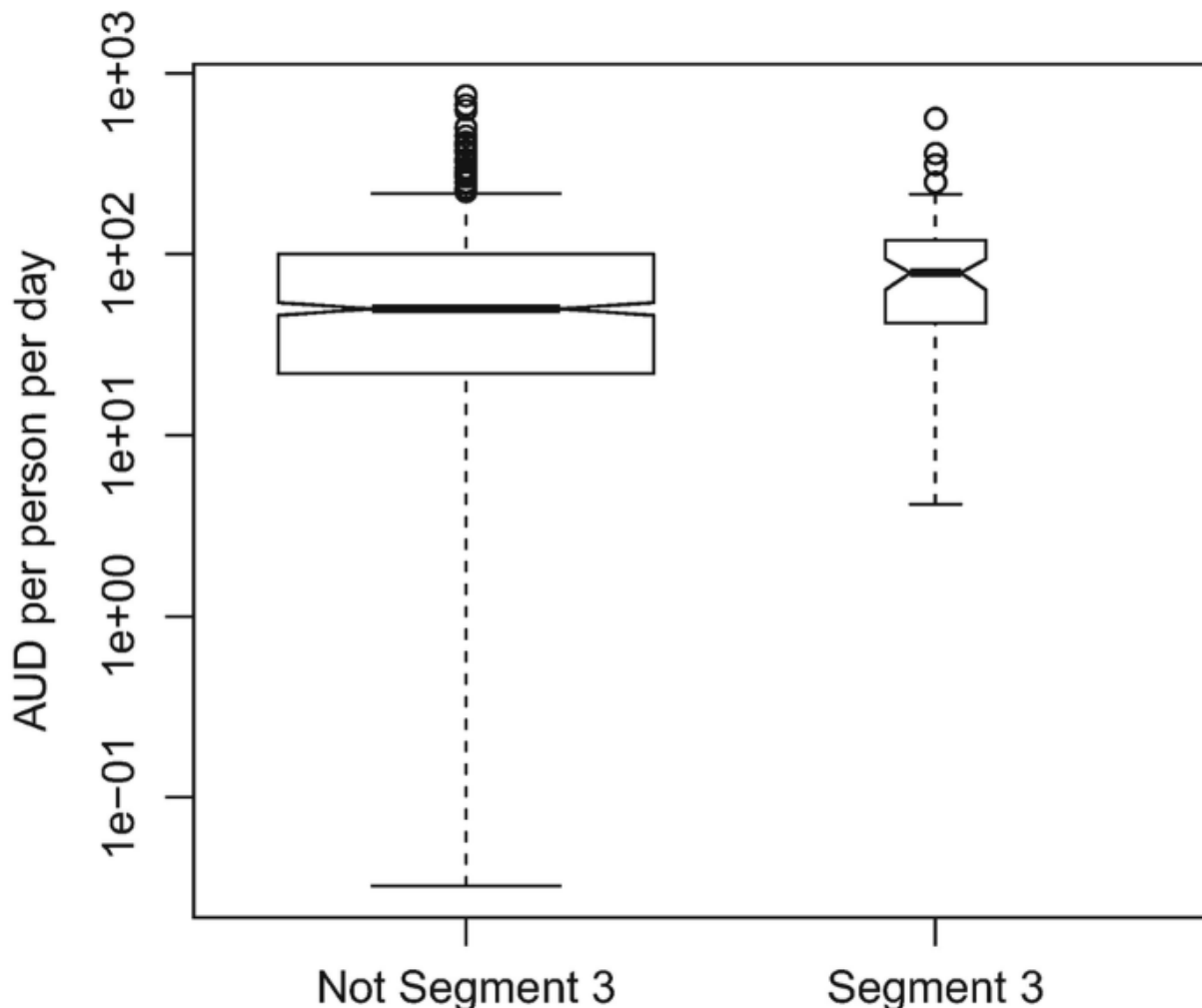
Additional information on consumers is available in the data frame `ausActivDesc` in package `MSA`. We use the following command to load the data, and create a parallel boxplot of the variable `SPEND PER PERSON PER DAY` split by membership in segment 3:

```
R> data("ausActivDesc", package = "MSA")
R> boxplot(spendpppd ~ cl12.3, data = ausActivDesc,
+   notch = TRUE, varwidth = TRUE, log = "y",
+   ylab = "AUD per person per day")
```

The additional arguments specify that confidence intervals for the median estimates should be included (`notch = TRUE`), box widths should reflect group sizes (`varwidth = TRUE`), that the y-axis should be on the log scale because of the right-skewness of the distribution (`log = "y"`), and that a specific label should be included for the y-axis (`ylab`).

Figure shows the expenditures of segment 3 members on the right, and those of all other consumers on the left. Ideally, we would have information about actual expenditures across a wide range of expenditure categories, or information about price elasticity, or reliable information about the segment's willingness to pay for a range of products. But the information contained in Fig. is still valuable. It illustrates how the price dimension can be used to best possibly harvest the targeted marketing approach.

Fig. 11.2



Total expenditures in Australian dollars (AUD) for the last domestic holiday for tourists in segment 3 and all other tourists

As can be seen in Fig, members of segment 3 have higher vacation expenditures per person per day than other tourists. This is excellent news for the tourist destination; it does not need to worry about having to offer the MUSEUMS, MONUMENTS & MUCH, MUCH MORE product at a discounted price. If anything, the insights gained from Fig. suggest that there is potential to attach a premium price to this product.

4 Place

The key decision relating to the place dimension of the marketing mix is how to distribute the product to the customers. This includes answering questions such as: should the product be made available for purchase online or offline only or both; should the manufacturer sell directly to customers; or should a wholesaler or a retailer or both be used.

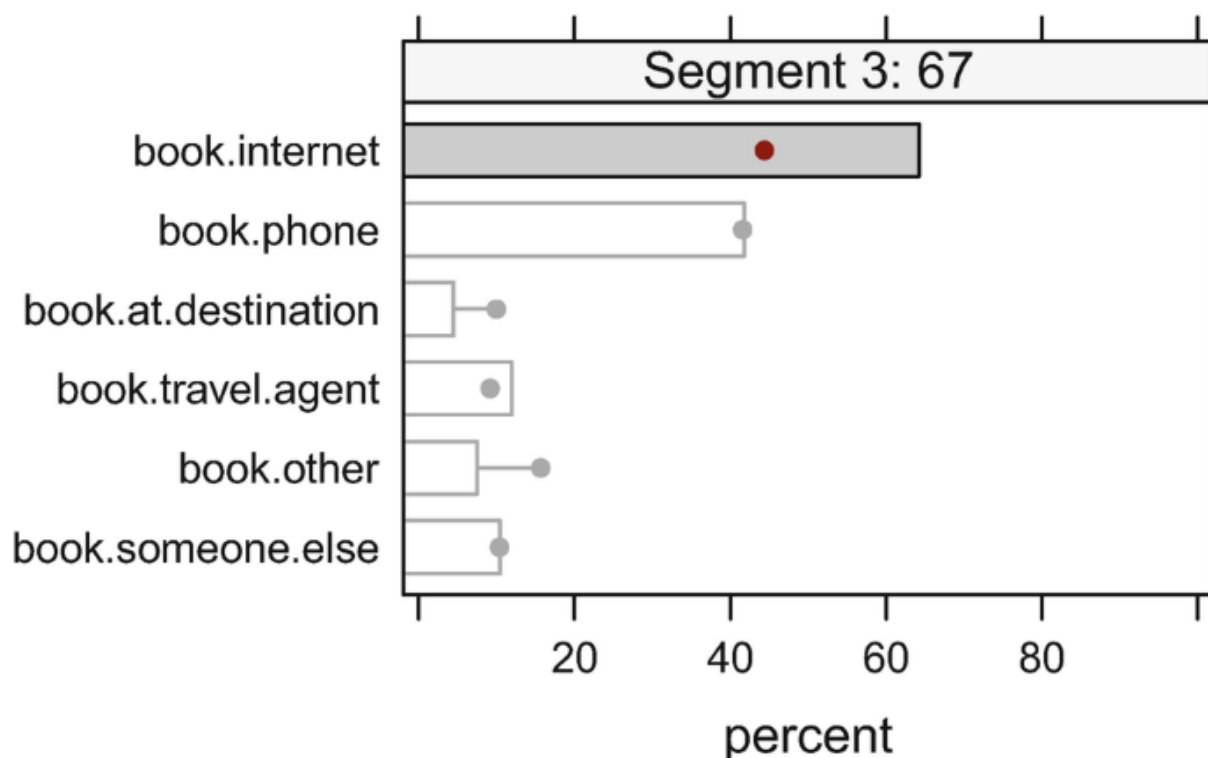
Returning to the example of members of segment 3 and the destination with a rich cultural heritage: the survey upon which the market segmentation analysis was based also asked survey respondents to indicate how they booked their accommodation during their last domestic holiday. Respondents could choose multiple options. This information is place valuable; knowing the booking preferences of members of segment 3 enables the destination to ensure that the MUSEUMS, MONUMENTS & MUCH, MUCH MORE product is bookable through these very distribution channels.

We can use `propBarchart` from package `flexclust` to visualise stated booking behaviour. First we load the package. Then we call function `propBarchart()` with the following arguments: `ausActivDesc` contains the data, `g = cl12.3` specifies segment membership, and `which` indicates the columns of the data to be used. We select all columns with column names starting with "book". Function `grep` based on *regular expressions* extracts those columns. For more details see the help page of `grep`. Alternatively, we can use `which = startsWith(names(ausActivDesc), "book")` instead of `which = grep("^book", names(ausActivDesc))`.

```
R> library("flexclust")
R> propBarchart(ausActivDesc, g = cl12.3,
+   which = grep("^book", names(ausActivDesc)),
+   layout = c(1, 1), xlab = "percent", xlim = c(-2, 102))
```

The additional arguments specify: that only one panel should be included in each plot (`layout = c(1, 1)`), the label for the *x*-axis (`xlab`), and the limits for the *x*-axis (`xlim`). Figure shows the resulting plot for members in segment 3.

Fig. 11.3



Hotel booking avenues used for the last domestic holiday by segment 3 and by the average tourist

Figure indicates that members of segment 3 differ from other tourists in terms of how they booked their hotel on their last domestic vacation: they book their hotel online much more frequently than the average tourist. This information has clear implications for the place dimension of the marketing mix. There must be an online booking option available for the hotel. It would be of great value to also collect information about the booking of other products, services and activities by members of segment 3 to see if most of their booking activity occurs online, or if their online booking behaviour is limited to the accommodation.

5 Promotion

Typical promotion decisions that need to be made when designing a marketing mix include: developing an advertising message that will resonate with the target market, and identifying the most effective way of communicating this message. Other tools in the promotion category of the marketing mix include public relations, personal selling, and sponsorship.

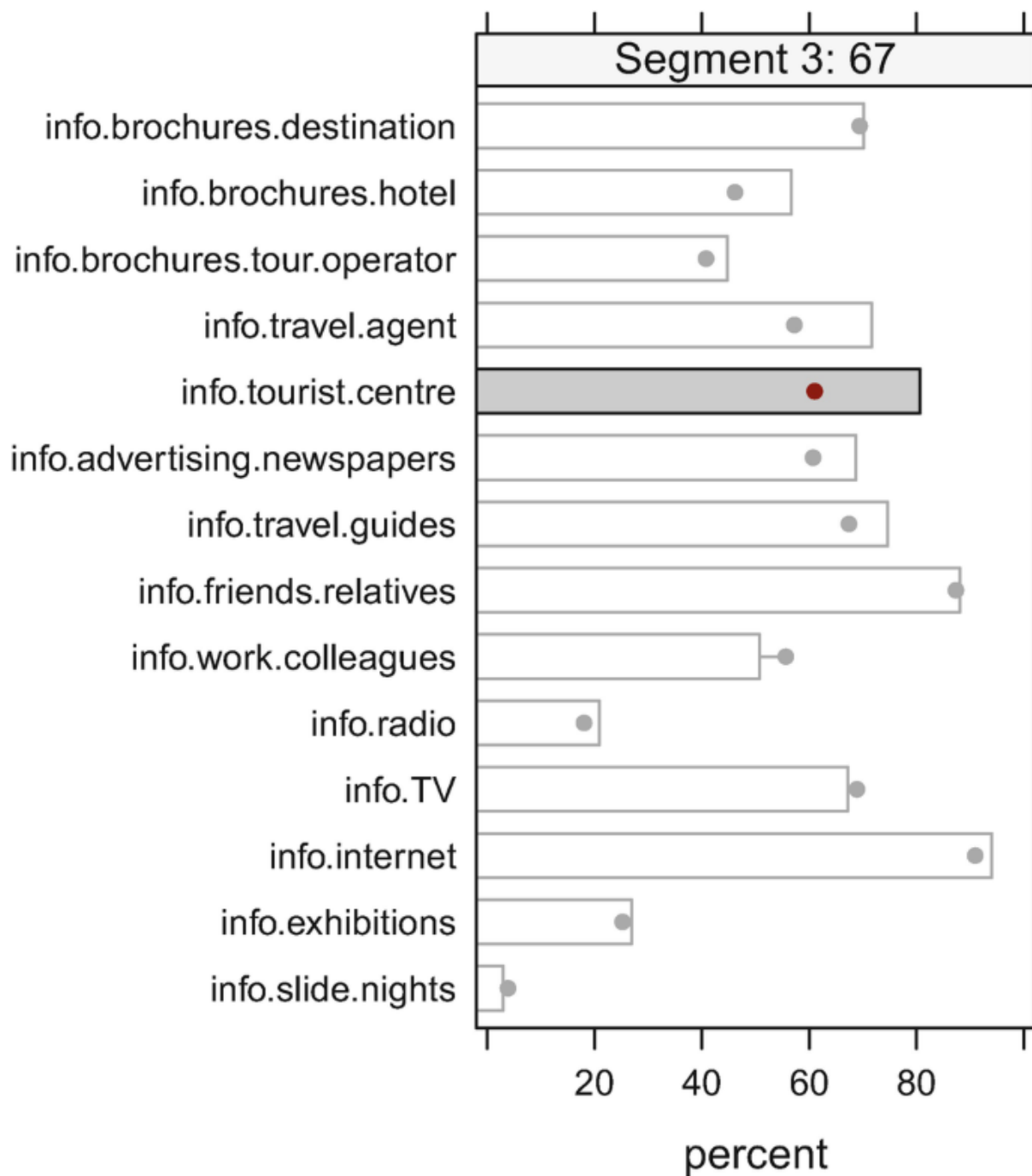
Looking at segment 3 again: we need to determine the best information sources for reaching members of segment 3 so we can inform them about the MUSEUMS, MONUMENTS & MUCH, MUCH MORE product. We answer this question by comparing the information sources they used for the last domestic holiday, and by investigating their preferred TV stations.

We obtain a plot comparing the use of the different information sources to choose a destination for their last domestic holiday with the same command as used for Fig. [11.3](#), except that we use the variables starting with "info":

```
R> propBarchart(ausActivDesc, g = cl12.3,  
+   which = grep("^info", names(ausActivDesc)),  
+   layout = c(1, 1), xlab = "percent", +   xlim = c(-2, 102))
```

slimig. [11.4](#) indicates, members of segment 3 rely – more frequently than other tourists – on information provided by tourist centres when deciding where to spend their vacation. This is a very distinct preference in terms of information sources. One way to use this insight to design the promotion component of the marketing mix is to have specific information packs on the MUSEUMS, MONUMENTS & MUCH, AND MUCH MORE products available both products ready copy in the local tourist information centre at the destination as well as making it available online on the tourist information centre's web page.

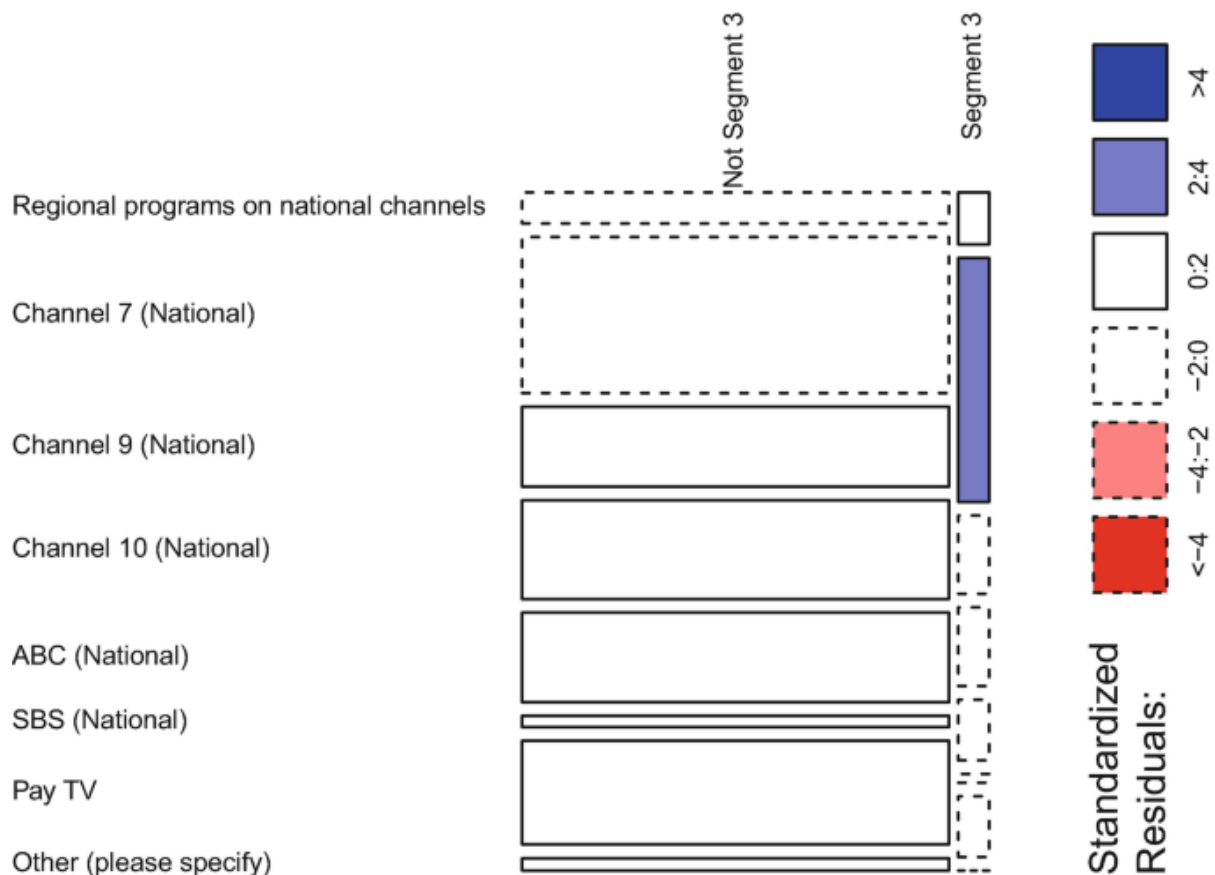
Fcenter's



Information sources used by segment 3 and by the average tourist.

The mosaic plot in Fig shows TV channel preference. We generate Fig with the command:

Fig. 11.5



TV station most frequently watched by segment 3 and all other tourists

```
R> par(las = 2) R> mosaicplot(table(c112mosaic
plotivDesc$TV.channel),
+   shade = TRUE, xlab = "", main = "")
```

lab use `par(las = 2)` to ensure that axis labels are vertically aligned for the *x*-axis, and horizontally aligned for the *y*-axis. This makes it easier to fit the channel names onto the plot.

Figure points to another interesting piece of information about segment 3. Its members have a TV channel preference for Channel 7, differentiating them from other tourists. Again, it is this kind of information that enables the destination to develop a media plan ensuring maximum exposure of members of segment 3 to the targeted communication of, for example, a MUSEUMS, MONUMENTS MUCH, AND MUCH MORE products.

6 Step 9 Checklist

Task	Who is responsible?	Completed?
Convene a segmentation team meeting.		<input type="checkbox"/>
Study the profile and the detailed description of the target segment again carefully.		<input type="checkbox"/>
Determine how the product-related aspects need to be designed or modified to best cater for this target segment.		<input type="checkbox"/>
Determine how the price-related aspects need to be designed or modified to best cater for this target segment.		<input type="checkbox"/>
Determine how the place-related aspects need to be designed or modified to best cater for this target segment.		<input type="checkbox"/>
Determine how the promotion-related aspects need to be designed or modified to best cater for this target segment.		<input type="checkbox"/>
Review the marketing mix in its entirety.		<input type="checkbox"/>
If you intend to target more than one segment: repeat the above steps for each of the target segments. Ensure that segments are compatible with one another.		<input type="checkbox"/>
Present an outline of the proposed marketing mix to the advisory committee for discussion and (if required) modification.		<input type="checkbox"/>

Github links:

- <https://github.com/7monish/McDonalds-Market-Segmentatio>
- <https://github.com/Sanskrutipatke/Market-Segmantation>
- [https://github.com/NivasReddy17/Market-Segmentation/blob/main/Market%20Segmentation%20\(McDonald's\).ipynb](https://github.com/NivasReddy17/Market-Segmentation/blob/main/Market%20Segmentation%20(McDonald's).ipynb)
- https://github.com/ajaysable976/Market_segmentation

- <https://github.com/st44u/Market-Segmentation-Analysis>