

MARKET SEGMENTATION

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1 Market Segmentation

Introduction To Market Segmentation

Market segmentation is a process of dividing a broad market into smaller, more specific groups of consumers with similar needs and characteristics. This allows companies to tailor their marketing mix (product, price, promotion, and place) to better reach and resonate with each target segment.



The most common segmentation criteria include:

Demographics

This includes factors like age, gender, income, education level, family size, and occupation. Understanding these demographics helps businesses identify potential customers and tailor their marketing messages accordingly.

Psychographics

This segmentation focuses on a consumer's lifestyle, personality, values, interests, and opinions. It helps companies understand what motivates customers, what they aspire to, and how they perceive themselves.

Behavioral characteristics

This criterion considers how consumers purchase, use, and dispose of products and services. It includes factors like purchasing occasion, loyalty status, user status (heavy user, medium user, light user), and benefits sought.

Geographics

This segmentation divides the market based on geographic location, such as country, region, state, city, or even zip code. Geographic segmentation can be particularly useful when consumer preferences and needs vary depending on location.

Companies can choose between different market segmentation strategies depending on their resources and the market landscape:

- **Concentrated strategy:** Focuses on a single, well-defined segment. Suitable for resource-constrained companies.
- **Differentiated strategy:** Develops and markets different products for each identified segment. Works well in mature markets where consumers have distinct preferences.
- **Undifferentiated strategy:** Offers the same product to the entire market. Applicable for staple products or when introducing a new product category.

Benefits of Market Segmentation

- **Strategic benefits:**

Market segmentation encourages critical self-evaluation for businesses, forcing them to analyze their strengths and identify consumer needs. This leads to a better understanding of target markets, which can be leveraged to build a long-term competitive advantage.

- **Niche marketing and hyper-segmentation:**

The concept of niche marketing emphasizes targeting very specific customer groups with highly tailored products or services. Hyper-segmentation takes this a step further, potentially offering customization to individual consumers.

- **Marketing efficiency:**

By focusing marketing efforts on specific segments, businesses can avoid wasting resources on consumers who wouldn't be interested in their offerings. This targeted approach leads to a higher return on investment for marketing campaigns.

- **Benefits for small businesses:**

Market segmentation allows small companies to focus on well-defined niches, enabling them to compete effectively despite limited resources.

- **Sales and organizational benefits:**

Segmentation helps target sales efforts towards specific groups, improving their effectiveness.

Cost of Market Segmentation

- **Resource investment:**

Conducting market segmentation analysis requires significant time and effort from personnel across various departments.

Developing and executing customized marketing mixes for different segments further increases resource needs.

- **Risk of failure:**

A poorly implemented segmentation strategy can be a waste of resources. Instead of gaining a competitive edge, a failed approach can lead to financial losses and employee dissatisfaction.

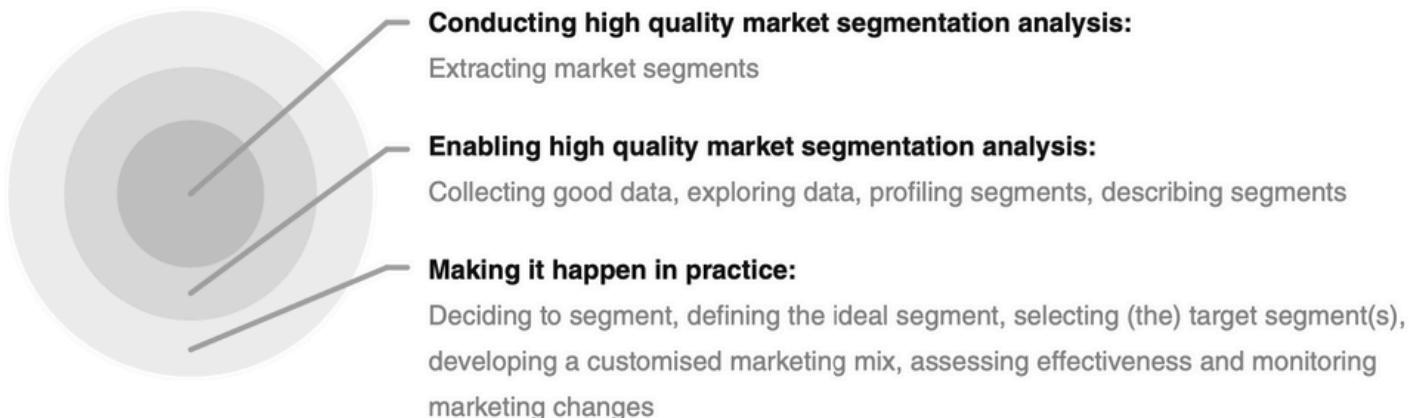
- **Decision-making:**

Businesses need to weigh the potential benefits against the upfront investment before embarking on market segmentation.

Market Segmentation Analysis

Layers of Market Segmentation Analysis

- **Layer 1 (Core):** Data analysis to group consumers with similar characteristics. This involves statistical techniques but requires both a skilled analyst and someone who understands the organization's goals (the user).
- **Layer 2:** To ensure high-quality segmentation, several additional tasks are necessary. First, data collection is crucial as the segmentation's quality depends on the data used. Next, data exploration involves analyzing the data to determine the possible types of segmentation. Finally, segment profiling entails describing each identified segment in detail to understand their characteristics and needs.
- **Layer 3 (Implementation):** To use segmentation results for strategic marketing decisions, users first need to assess if segmentation offers new market opportunities and if they are committed to a long-term strategy. They then specify relevant consumer information for data collection. Based on the organization's strengths and the segment's needs, users select the target segment(s). Finally, they develop a marketing plan and customize the marketing mix for the chosen target segment(s).



Nine Steps of Market Segmentation Analysis

STEP 1: Deciding (Not) to Segment

This step involves evaluating whether market segmentation is the right strategy for the organization. It requires careful consideration of the implications and potential barriers.

1.1 Implications of Segmentation

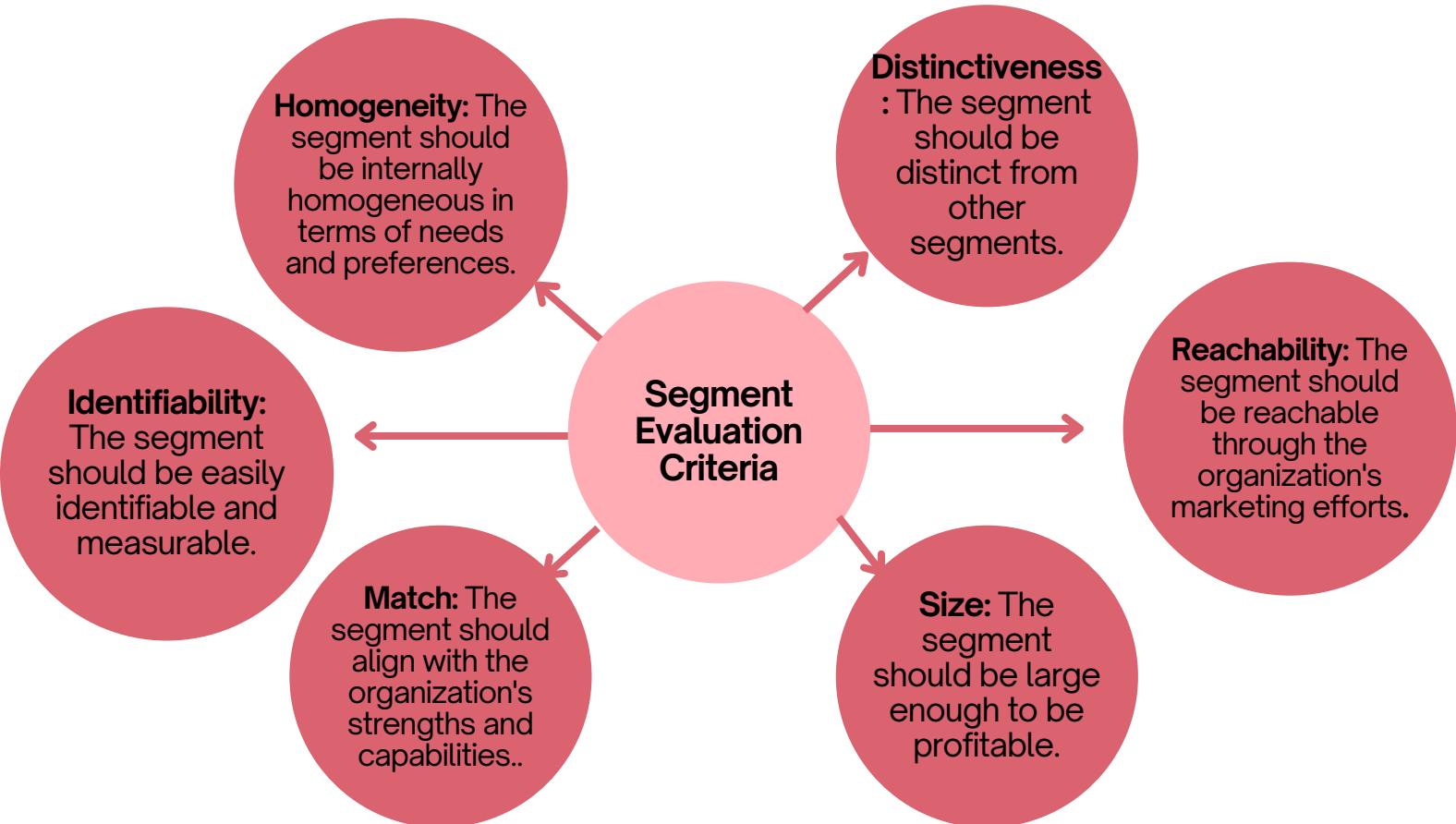
Requires significant resources, strategic alignment, long-term commitment, and deep market understanding.

1.2 Implementation Barriers

Challenges include data availability, organizational readiness, cost vs. benefit analysis, and internal resistance.

STEP 2: Specifying the Ideal Target Segment

In this step, the organization defines what an ideal target segment looks like based on specific criteria.



2.2 Knock-Out Criteria

Establish criteria that will automatically eliminate non-viable segments.

These criteria include homogeneity, distinctiveness, size, match, identifiability, and reachability.

2.3 Attractiveness Criteria

Evaluate potential segments based on attractiveness factors such as growth potential, competitive intensity, and accessibility.

Each criterion should be weighted based on its importance to the organization.

2.4 Implementing a Structured Process

Create a structured process for evaluating and selecting target segments.

Involve a cross-functional team to ensure all perspectives are considered.

Use a scoring system to rank segments based on the agreed criteria.

STEP 3: Collecting Data

In Step 3, the focus is on gathering relevant and high-quality data essential for effective market segmentation. This step involves selecting the appropriate segmentation variables, such as geographic, socio-demographic, psychographic, and behavioral factors. Each type of segmentation variable serves a unique purpose.

Data collection methods include survey studies, which involve designing questionnaires with carefully chosen variables and response options. This step also emphasizes addressing potential response biases and determining an adequate sample size to ensure the data's reliability and representativeness.

Additionally, data can be sourced from internal company records and experimental studies, which provide valuable insights into consumer behavior under controlled conditions.



STEP 4: Exploring Data

Exploring data involves cleaning, analyzing, and preparing it for segmentation. This step is crucial to ensure the quality and usability of the data.

A First Glimpse at the Data:

- Initial data exploration identifies the measurement levels of variables, examines univariate distributions, and assesses dependency structures. This helps determine the suitability of different segmentation methods.

Data Cleaning:

- Cleaning the data involves identifying and correcting errors, handling missing values, and ensuring consistency. Clean data is critical for accurate analysis and reliable results.

Descriptive Analysis:

- Descriptive statistics summarize the basic features of the data, providing a clear picture of the distribution and central tendencies. Descriptive analysis helps identify patterns and anomalies in the data.

Pre-Processing:

- Categorical Variables:** Involves encoding categorical variables into a suitable format for analysis, such as converting text labels into numerical codes.
- Numeric Variables:** Normalizing or standardizing numeric variables to ensure they are on a comparable scale, which is essential for many segmentation algorithms.

Principal Components Analysis (PCA):

- PCA is a dimensionality reduction technique that transforms the data into a set of uncorrelated variables called principal components. This simplifies the data structure while preserving as much variability as possible, making it easier to identify meaningful segments.

STEP 5: Extracting Segments

Step 5: Extracting Segments covers methods for grouping consumers into market segments using various clustering techniques. Below are the key points from this section:

7.1 Grouping Consumers

Objective: Group consumers based on similarities in their behaviors, preferences, or characteristics.

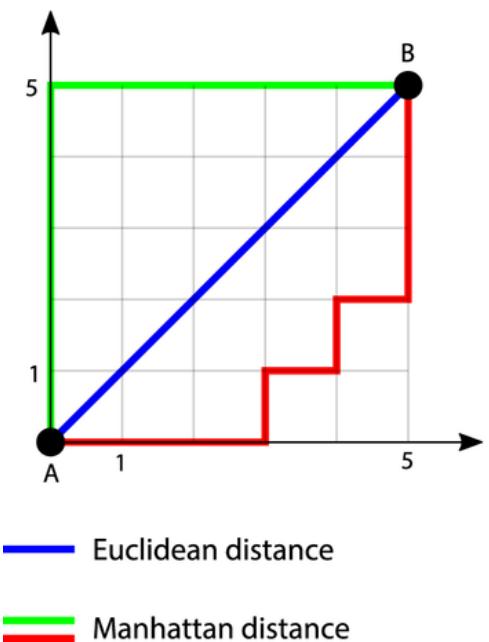
Importance: Identifying meaningful segments allows for targeted marketing strategies.

7.2 Distance-Based Methods

Overview: These methods group consumers based on calculated distances between data points.

7.2.1 Distance Measures: Key to these methods is selecting an appropriate distance measure (e.g., Euclidean, Manhattan).

- **Euclidean Distance:** Commonly used; calculates the straight-line distance between points.
- **Manhattan Distance:** Sum of absolute differences between points, suitable for high-dimensional data.



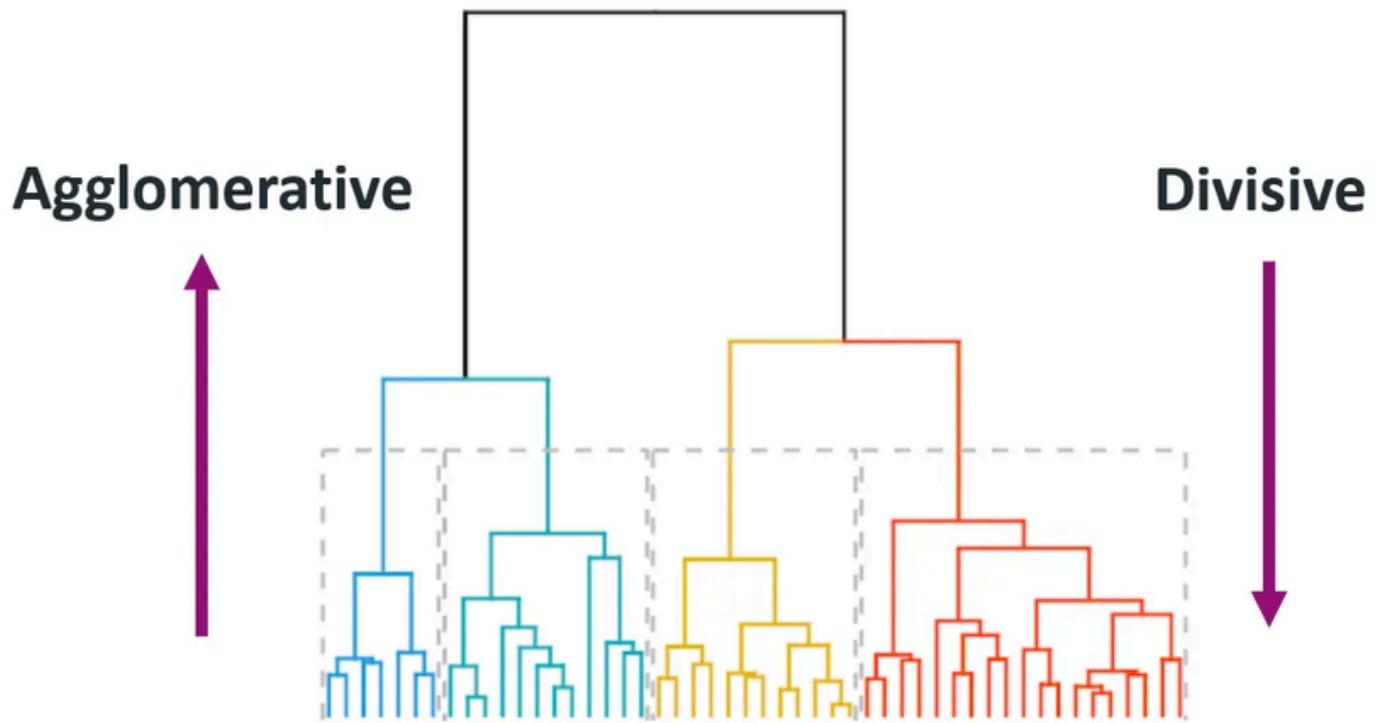
7.2.2 Hierarchical Methods

Approach: Builds a hierarchy of clusters either by agglomerative (bottom-up) or divisive (top-down) methods.

Agglomerative Clustering: Starts with individual consumers and merges the closest pairs iteratively.

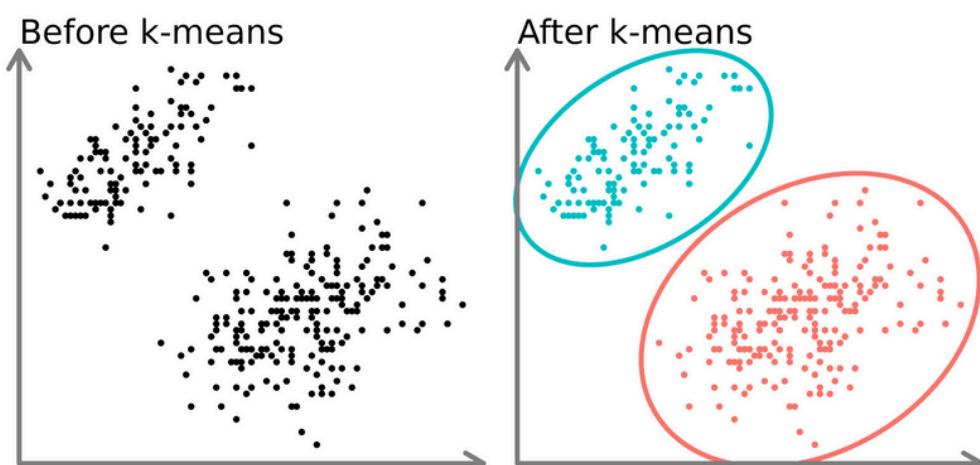
Divisive Clustering: Starts with a single cluster and splits it iteratively into smaller clusters.

Output: Dendograms, which visually represent the hierarchy and help decide the number of clusters.



7.2.3 Partitioning Methods

Partitioning methods, such as **k-means clustering**, involve dividing the data into a predefined number of clusters. The k-means algorithm starts by randomly selecting initial centroids for each cluster. Consumers are then assigned to the nearest centroid, and the centroids are recalculated as the mean of all consumers assigned to each cluster. This process is repeated until the centroids stabilize. One challenge with k-means clustering is that the initial random selection of centroids can lead to different solutions; hence, multiple runs are recommended to identify the best clustering solution. K-medians clustering is a variation that uses the median instead of the mean, making it more robust to outliers.



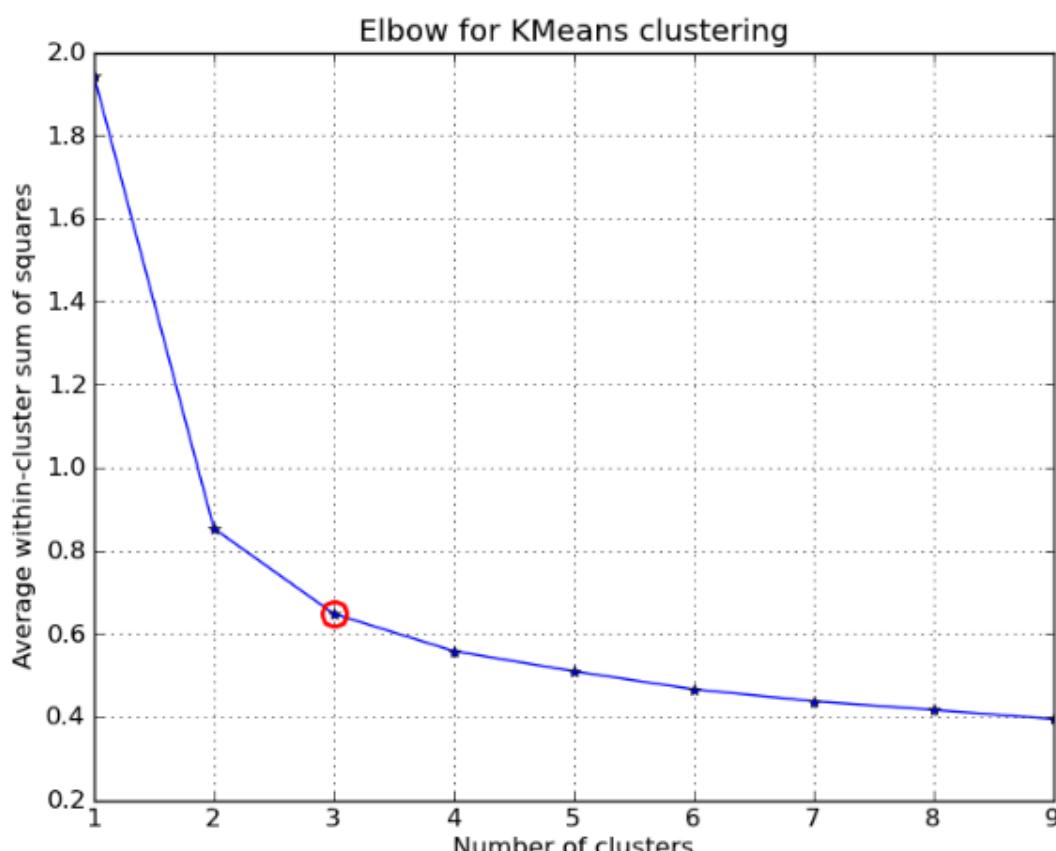
7.2.3.1 Elbow Method

As we know in the k-means clustering algorithm we randomly initialize k clusters and we iteratively adjust these k clusters till these k-centroids riches in an equilibrium state. However, the main thing we do before initializing these clusters is that determine how many clusters we have to use.

For determining K(numbers of clusters) we use Elbow method. Elbow Method is a technique that we use to determine the number of centroids(k) to use in a k-means clustering algorithm. In this method to determine the k-value we continuously iterate for $k=1$ to $k=n$ (Here n is the hyperparameter that we choose as per our requirement). For every value of k, we calculate the within-cluster sum of squares (WCSS) value.

WCSS - It is defined as the sum of square distances between the centroids and each points.

Now For determining the best number of clusters(k) we plot a graph of k versus their WCSS value. Surprisingly the graph looks like an elbow (which we will see later). Also, When $k=1$ the WCSS has the highest value but with increasing k value WCSS value starts to decrease. We choose that value of k from where the graph starts to look like a straight line.



7.2.4 Hybrid Approaches

Hybrid approaches combine the strengths of both hierarchical and partitioning methods. For example, an initial hierarchical clustering can be performed to determine the number of clusters, followed by k-means clustering to refine the segments. This approach leverages the stability of hierarchical methods and the efficiency of partitioning methods.

7.3 Model-Based Methods

Model-based methods, such as finite mixture models, assume that the data is generated from a mixture of several probability distributions. These models are particularly useful for handling complex data structures and provide probabilistic assignments of consumers to clusters. The Expectation-Maximization (EM) algorithm is commonly used for parameter estimation in these models, iteratively improving the likelihood of the observed data given the model parameters.

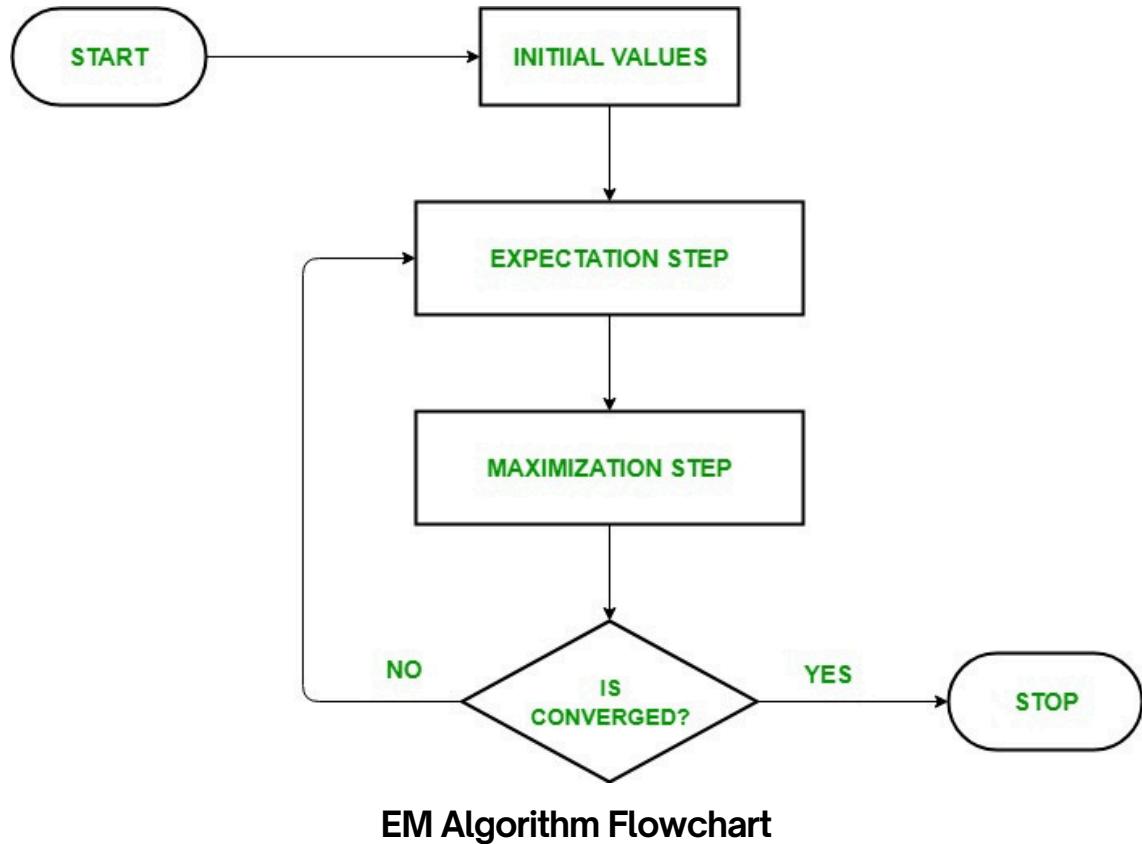
How Expectation-Maximization (EM) Algorithm Works:

Initialization: Begin with initial parameter values, assuming the observed data originates from a specific model.

E-Step (Expectation Step): Estimate the missing data using the observed data and current parameters. Compute the posterior probability of each latent variable and the log-likelihood of the observed data with the current parameters.

M-Step (Maximization Step): Update model parameters by maximizing the expected complete data log-likelihood obtained from the E-step. Employ optimization techniques suitable for the model to find these parameter values.

Convergence: Check if the change in log-likelihood or parameter values is below a predefined threshold. If converged, stop. If not, repeat the E-step and M-step until convergence.



7.4 Algorithms with Integrated Variable Selection

- **Purpose:** Simultaneously perform clustering and variable selection to identify the most relevant variables.
- **Methods:**
 - **Biclustering Algorithms:** Simultaneously cluster rows and columns of a data matrix.
 - **Factor-Cluster Analysis:** Reduces dimensionality before clustering, using methods like PCA.

7.5 Data Structure Analysis

Analyzing the stability and validity of the extracted segments is crucial. Stability analysis ensures that the segments are robust and consistent across different clustering solutions.

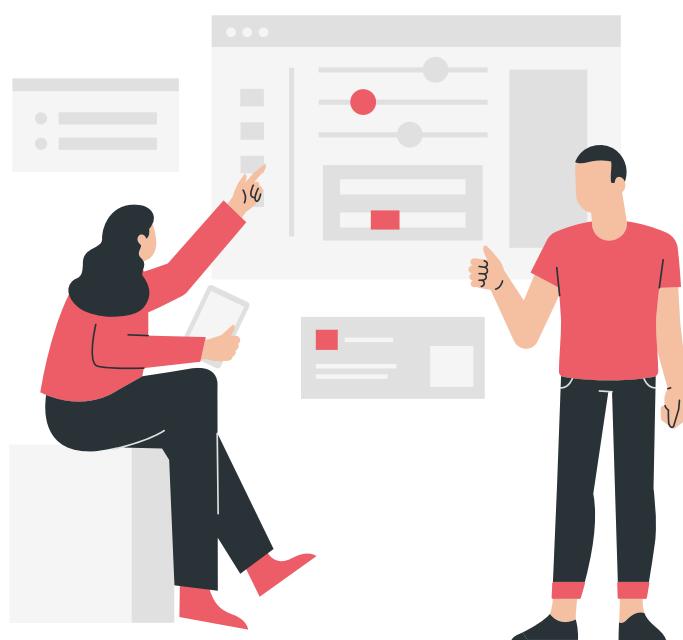
Techniques such as **Segment Level Stability Across Solutions (SLSA)** evaluate the consistency of segments when varying the number of clusters. Internal validation measures, like silhouette scores, assess how well-separated and distinct the segments are, ensuring that the clustering solution is both meaningful and reliable.

STEP 6: Profiling Segments

Profiling Segments is the sixth step in market segmentation analysis, particularly important when data-driven market segmentation is used. This step involves identifying and understanding the defining characteristics of each market segment.

Key Points:

1. **Objective:** The primary goal is to get to know the market segments derived from the data analysis. This includes understanding both individual segment characteristics and how these segments compare to one another.
2. **Data-Driven Context:** Profiling is essential when segmentation is based on empirical data rather than predefined criteria. For example, if segments are created based on consumer benefits sought, the defining characteristics are not known until after data analysis.
3. **Comparison:** Profiling involves comparing segments to identify unique characteristics that distinguish each segment from others. This can include behaviors, preferences, or other relevant attributes.
4. **Interpretation:** Proper profiling is crucial for accurately interpreting the segments, which is essential for making strategic marketing decisions



STEP 7: Describing Segments

Describing Segments is the seventh step, where additional information about the segments is used to develop a complete picture of each segment.

Key Points:

1. **Objective:** The goal is to describe the market segments using information not used during the segmentation process. This includes demographic, psychographic, socio-economic variables, media exposure, and specific product or brand attitudes.
2. **Additional Information:** Variables not used in segmentation but relevant for understanding the segments are utilized. These are known as descriptor variables.
3. **Purpose:** Detailed descriptions are critical for gaining insights into the nature of each segment, which helps in targeted marketing and strategic planning.
4. **Methods:** This step may involve using visualizations to describe segments, assessing differences in descriptor variables, and predicting segment membership using techniques like logistic regression and tree-based methods

STEP 8: Selecting the Target Segments

Selecting the Target Segments is the eighth step in market segmentation analysis, crucial for making informed marketing decisions.



Key Points:

- **Targeting Decision:** This involves choosing one or more market segments to focus on. The decision is based on a combination of segment attractiveness and the organization's ability to serve the segment effectively.
- **Market Segment Evaluation:** The evaluation involves criteria such as segment size, growth potential, competitive position, and compatibility with the company's objectives and resources.
- **Knock-out Criteria:** Segments are filtered based on criteria such as homogeneity, distinctness, size, match with company capabilities, identifiability, and reachability. If a segment fails any of these criteria, it is eliminated from consideration.

STEP 9: Selecting the Target Segments

Customising the Marketing Mix is the ninth step, focusing on tailoring the 4Ps (Product, Price, Place, Promotion) to suit the selected target segments.

Key Points:

- 1. Implications for Marketing Mix Decisions:** Each element of the marketing mix must be adjusted to meet the specific needs and preferences of the target segments. This ensures the marketing strategy is effective and resonates with the target audience.



- 1. Product:** Adjustments may include product features, quality, branding, and packaging to match the preferences of the target segment.
- 2. Price:** Pricing strategies should reflect the segment's willingness to pay, perceived value, and competitive positioning.
- 3. Place:** Distribution channels and locations should be chosen based on where the target segment prefers to shop, ensuring convenience and accessibility.
- 4. Promotion:** Promotional activities should be designed to appeal to the segment's media habits, preferences, and behaviors. This includes advertising, sales promotions, personal selling, and public relations.

Market Segmentation on McDonalds Dataset

NAME	GitHub Link
Pratyush Kumar	https://github.com/Pratyush-12345/Feynn_Lab_Task_2_0_Market_Segmentation_Analysis.git

Conclusion

Market segmentation is a critical tool for businesses looking to enhance their strategic marketing efforts. By dividing a broad consumer or business market into sub-groups with shared characteristics, companies can tailor their products, services, and marketing strategies to meet the specific needs of these segments. This approach not only leads to a more efficient allocation of resources but also helps in achieving a higher return on investment.

The nine-step process outlined in this analysis emphasizes the importance of thorough evaluation, data collection, and segment profiling. Each step—from deciding whether to segment, specifying the ideal target segment, collecting and exploring data, to extracting and profiling segments—requires meticulous attention to detail and a structured approach.

Effective market segmentation leads to several benefits, including improved marketing efficiency, better customer satisfaction, and a sustainable competitive advantage. However, it also poses challenges such as resource investment, risk of failure, and organizational readiness. By understanding and addressing these challenges, businesses can successfully implement market segmentation strategies that align with their strengths and market opportunities.

In conclusion, market segmentation is not just a one-time effort but an ongoing strategic initiative that requires continuous refinement and adaptation to changing market conditions. Companies that commit to this process can better meet the needs of their target markets and achieve long-term success.