

Market Segmentation Analysis

Harshit Kumar Pathak

22 July 2024

Market Segmentation

Market segmentation is the process of dividing a broad consumer or business market into sub-groups of consumers also known as segments, based on shared characteristics such as demographics, psychographics, behavior, or needs. This allows businesses to tailor their products, services, and marketing efforts to meet the specific needs of each segment, leading to more effective marketing strategies, better customer satisfaction, and increased market share. By understanding the unique preferences and behaviors of different segments, companies can allocate resources more efficiently and create targeted marketing campaigns that resonate with specific audiences.

Step 1- Deciding (not) to Segment

- Market segmentation requires a long-term commitment, involving substantial changes and investments in products, pricing, distribution, and communication.
- Segmenting a market includes costs for research, surveys, designing packages, and advertisements. Segmenting a market costs money but can lead to more sales, making it worthwhile.
- Effective segmentation can require new products, tweaks to existing ones, and even company reshuffling to better target specific customer groups.
- Active involvement and commitment from senior management are crucial for successful market segmentation implementation.
- The decision to pursue market segmentation should be made at the highest executive level and consistently communicated across all organizational levels.
- Proper training is needed to ensure that senior management and the segmentation team understand the principles and implications of market segmentation.
- Clear objectives, structured processes, and well-defined responsibilities are necessary for effective market segmentation. Visualizations can help make the results easy to understand and interpret by managers.
- There are various key barriers in market segmentation, includes lack of leadership, insufficient resources, resistance to change, poor communication, and lack of market orientation within the organization.

Step 2 - Specifying the Ideal Target Segment

- Successful market segmentation requires continuous involvement from users at multiple stages, not just at the beginning or end.
- There are two sets of Segmentation Evaluation Criteria:
 - Knock-Out Criteria (non-negotiable): These criteria include substantiality, measurability, accessibility, homogeneity, distinctiveness, size, alignment with organizational strengths, identifiability, and reachability.
 - Attractiveness Criteria (used to evaluate segment appeal): These criteria are used to rate segments' attractiveness and are tailored to the organization's specific needs and strategic goals.
- A structured process is beneficial for evaluating and selecting target segments, often using a segment evaluation plot.
- Segment evaluation plot assesses segment attractiveness and organizational competitiveness, helping in the selection of target segments.
- Factors determining segment attractiveness and organizational competitiveness need to be negotiated and agreed upon by the segmentation team.
- A core team should propose initial solutions and involve representatives from all organizational units to ensure diverse perspectives and stakeholder engagement.
- Selecting attractiveness criteria early ensures relevant information is captured during data collection and simplifies target segment selection later.

Step 3 - Collecting Data

- Utilizes a single characteristic of consumers as the segmentation variable, with each row in the dataset representing one consumer and each variable representing a specific characteristic. Other personal characteristics available in the data are used to describe segments in detail.
- Types of Segmentation Criteria:
 - Geographic Segmentation: Based on physical locations or regions.
 - Socio-Demographic Segmentation: Based on demographic factors such as age, gender, income, education, and social class.
 - Psychographic Segmentation: Based on lifestyle, values, interests, and personality traits.
 - Behavioral Segmentation: Based on purchasing patterns, product usage, brand loyalty, and decision-making processes.

- Experimental data which is derived from field or laboratory experiments, offering valuable insights into consumer preferences and influencing factors that can serve as segmentation criteria.
- Internal data, such as scanner data or online purchase information, reflects actual consumer behavior but may be biased towards existing customers.
- Survey data is commonly used for market segmentation due to its affordability and ease of collection, but potential biases in survey responses must be considered and addressed.
- Ensuring the reliability of the collected data is critical for accurate market segmentation, involving careful selection of variables, addressing biases, and using representative samples.

Step 4 – Exploring Data

- Understanding the data is crucial, as it helps to identify patterns, anomalies, and relationships within the dataset. This initial exploration involves visualizing the data using various types of plots such as histograms, scatter plots, and box plots. These visual tools allow us to see distributions, correlations, and outliers clearly. Identifying patterns and anomalies is essential for recognizing trends, correlations, and unusual data points that might require further investigation.
- Data cleaning is a critical step to improve the quality of data by removing or correcting inaccuracies. This step involves handling missing data by deciding whether to fill in missing values through imputation, drop the missing entries, or simply mark them for special treatment. It also includes removing duplicate records to ensure data integrity, correcting errors resulting from data entry inconsistencies, and dealing with outliers that could potentially skew the results
- Descriptive analysis aims to summarize and understand the structure of the data. It involves calculating descriptive statistics such as means, medians, modes, ranges, and standard deviations to get an overview of the data. Data summarization tools provide a comprehensive overview of the dataset's structure, including sample size, data types, and the presence of missing values.
 - Univariate analysis focuses on individual variables, summarizing their central tendency, dispersion, and frequency distributions using visual tools like histograms and bar charts.
 - Bivariate and multivariate analyses examine relationships between two or more variables, employing scatter plots, correlation matrices, and cross-tabulations to understand variable interactions.
 - Data visualization, integral to descriptive analysis, uses graphical representations to reveal data trends, patterns, and outliers.

- Handling missing values ensures data quality by using deletion, imputation, or analysis based on available data.
- Correlation analysis and normality tests are performed to understand variable relationships and distribution deviations, respectively.
- Preprocessing transforms raw data into a format more suitable for modeling, making it an essential step in the data analysis pipeline. These preprocessing steps ensure that the data is in the best possible state for subsequent modeling:
 - Feature encoding, where categorical data is converted into numerical format using methods like one-hot encoding, label encoding or ordinal encoding.
 - Feature scaling or normalization adjusts the range of features to ensure uniformity.
 - Splitting the data into training and test sets is crucial for model evaluation.
 - Feature engineering involves creating new features from existing ones to enhance model performance.
- Principal Component Analysis is used to reduce the dimensionality of the data while retaining most of the variance, making it a powerful tool for simplifying complex datasets. PCA involves transforming the data from a high-dimensional space to a lower-dimensional space by identifying principal components, which are new axes that maximize variance. This process helps in data projection, where the data is projected onto these new axes, reducing the number of features and making the dataset more manageable for analysis. PCA is implemented to fit and transform data, followed by variance analysis to determine the explained variance, simplifying the dataset for easier visualization and analysis.

Step 5 – Extracting Segments

- Grouping Consumers: This involves dividing a market into smaller, homogeneous groups based on characteristics such as demographics, psychographics, and behaviors. The goal is to tailor marketing strategies to each segment, enhancing customer satisfaction and brand loyalty.
- Distance-Based Methods: These methods measure the similarity or dissimilarity between objects to cluster similar items together. They are fundamental in clustering algorithms, with the choice of distance measure affecting the results.
 - Hierarchical Methods: These methods cluster data by either starting with individual items and merging them (agglomerative) or starting with all items in one group and splitting them (divisive). They provide a sequence of nested partitions, useful for understanding data at various levels.

- Partitioning Methods: Suitable for large datasets, these methods create a fixed number of segments and are more efficient for datasets with over 1000 observations. They focus on generating a specific number of segments rather than a nested hierarchy.
- Hybrid Approaches: These combine hierarchical and partitioning methods to leverage the strengths of both. Typically, a partitioning algorithm is used first to handle large data, followed by hierarchical clustering on the resulting segment centroids.
- Model-Based Methods: These methods fit probabilistic models to the data, such as Gaussian Mixture Models (GMM), to identify clusters. They offer flexibility for complex data distributions but require careful validation of the model assumptions.
- Algorithms with Integrated Variable Selection: These algorithms select relevant segmentation variables while extracting segments, especially when dealing with binary or noisy data. They ensure that only useful variables contribute to the segmentation.
- Data Structure Analysis: This exploratory approach assesses the stability and reliability of segmentation results by repeated calculations. It helps in understanding the natural structure in the data and guides the selection of appropriate segments.
- Validation Techniques: Traditional validation in market segmentation focuses on stability and reliability of solutions rather than optimality. It involves comparing different segmentation solutions to identify the most effective segments.
- Stability-Based Analysis: This method assesses whether distinct, well-separated market segments exist in the data. If clear segments are present, they can be easily identified; otherwise, extensive exploration may be needed to find useful segments.

Step 6 – Profiling Segments

- Profiling Market Segments: Profiling is essential for understanding and differentiating market segments, particularly in data-driven segmentation. It involves detailing and comparing segments to accurately interpret them and make strategic marketing decisions.
- Traditional Profiling Approaches: Data-driven segment profiles are often presented as either overly simplified summaries or detailed tables. Both approaches can be ineffective; summaries may be misleading, while tables can be hard to interpret quickly.
- Visualizations for Segment Profiling: Data visualizations, such as segment profile and separation plots, are crucial for understanding segment characteristics and their relationships. They help in interpreting complex data and making informed strategic decisions by clearly illustrating segment differences and overlaps.

Step 9: Customizing the Marketing Mix

The 4Ps model (Product, Price, Place, and Promotion) is essential for creating an effective marketing strategy. Market segmentation enhances this by ensuring that each component is tailored to specific consumer segments, integrating with positioning and competitive strategies.

- **Product:** In the product dimension, alignment with customer needs is crucial. This involves making decisions about product design, features, quality, branding, and packaging to ensure that the product meets the expectations and demands of the target market effectively.
- **Price:** Pricing strategies must balance covering production costs with remaining competitive. This includes selecting pricing approaches such as penetration or skimming to appeal to the target market while ensuring profitability.
- **Place:** Place focuses on the distribution channels and logistics required to deliver the product to customers. Decisions here involve choosing appropriate channels, managing inventory, and ensuring availability across the right locations and times.
- **Promotion:** Promotion involves all activities to communicate and advertise the product to the target audience. This includes advertising, sales promotions, public relations, and personal selling, aimed at increasing awareness and persuading customers to make a purchase.

GitHub Link - [https://github.com/harshitpathak18/Data-Science-Internship-Feynn-Lab-/blob/f9a3dadde53c38a532cc8246af4d0a7e8c31f2a7/Project%202.0/McDonald's%20Case%20Study/Fast Food McDonald Case Study.ipynb](https://github.com/harshitpathak18/Data-Science-Internship-Feynn-Lab-/blob/f9a3dadde53c38a532cc8246af4d0a7e8c31f2a7/Project%202.0/McDonald's%20Case%20Study/Fast%20Food%20McDonald%20Case%20Study.ipynb)