

STUDY ON MARKET SEGMENTATION

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STEP:1 DECIDING (NOT) TO SEGMENT

Committing to market segmentation is a significant and long-term strategic decision for businesses that comes with various implications. This approach requires ongoing effort and investment, involving expenses for research, surveys, and design work. The costs associated with market segmentation must be justified by the expected increase in sales. It often entails substantial changes such as developing new products, adjusting pricing, and adapting communication approaches. Organizations may need to make structural adjustments, potentially shifting from product-focused structures to segment-oriented ones. This decision should be made at the executive level, and continuous communication and alignment within the organization are crucial to ensure long-term objectives are met.

However, there are several barriers that can impede the successful implementation of a market segmentation strategy. These barriers include a lack of leadership and resource allocation from senior management, resistance to change within the organizational culture, insufficient knowledge and training in segmentation fundamentals, financial limitations, unclear objectives, and inadequate processes. Overcoming these barriers requires a commitment from leadership, a cultural shift, training, resource allocation, and clear communication to ensure the effective implementation of market segmentation strategies.

STEP 2: SPECIFYING THE IDEAL TARGET SEGMENT

SEGMENT EVALUATION CRITERIA

In the market segmentation analysis process, the third layer focuses on continuous user involvement, emphasizing the importance of user input at various stages. Step 2 involves defining two sets of segment evaluation criteria: "knock-out criteria" and "attractiveness criteria." Knock-out criteria are non-negotiable standards that automatically eliminate certain segments from consideration, while attractiveness criteria

provide a diverse list of factors for evaluating segment appeal. These two sets of criteria help the organization distinguish between absolute prerequisites and characteristics that determine the appeal of remaining market segments. The relative importance of each attractiveness criterion is determined by the segmentation team and applied in Step 8 to assess the overall attractiveness of each remaining market segment.

KNOCK-OUT CRITERIA

Knock-out criteria are fundamental standards used to filter market segments resulting from segmentation analysis. They include criteria like homogeneity, distinctiveness, adequate size, fit with organizational strengths, identifiability, and reachability. These criteria are essential for senior management, the segmentation team, and the advisory committee to understand. While most of these criteria do not require further specification, minimum viable target segment size should be specified to ensure clarity.

ATTRACTIVENESS CRITERIA

In addition to knock-out criteria, a wide range of segment attractiveness criteria is available to the segmentation team. These criteria are not binary in nature but involve rating each market segment in terms of how attractive it is with respect to specific criteria. The overall attractiveness across all criteria determines whether a market segment is selected as a target segment in Step 8.

IMPLEMENTING A STRUCTURED PROCESS

Implementing a structured process for assessing market segments is crucial. This typically involves using a segment evaluation plot that considers segment attractiveness and organizational competitiveness. The criteria for these factors should be determined by the segmentation team and may involve a diverse group of individuals, including a core team proposing criteria and an advisory committee for discussion and potential modifications. The outcome of this step should be a list of approximately six segment attractiveness criteria, each assigned a weighted value indicating its importance to the organization compared to other criteria. Seeking approval from the advisory committee is recommended to ensure diverse perspectives are considered in setting these criteria. This structured approach ensures that market segmentation decisions are well-informed and aligned with the organization's goals and capabilities.

STEP 3 : COLLECTING DATA

SEGMENTATION VARIABLES

Empirical data is vital in both commonsense and data-driven market segmentation. Segmentation variables are used to split consumers into different segments. In commonsense segmentation, a single characteristic like gender is typically used. Descriptor variables, such as age and preferences, describe segments in more detail. Commonsense segmentation relies on a single variable, while data-driven segmentation uses multiple variables to identify segments based on shared preferences or behaviors.

High-quality data is crucial for accurately assigning individuals to segments and creating effective marketing strategies tailored to each segment. Data sources for segmentation studies include surveys, observations (like scanner data from loyalty programs), and experimental studies. It's important that data reflect actual consumer behavior for meaningful segmentation and effective marketing strategies. Survey data may not always be the best source, especially for socially desirable behaviors.

SEGMENTATION CRITERIA

The crucial decision that organizations must make when selecting a segmentation criterion for market segmentation. It distinguishes between segmentation criteria, which are the broader types of information used for segmentation, and segmentation variables, which are specific attributes like age or gender. The choice of criterion cannot be easily outsourced and requires prior market knowledge.

Common segmentation criteria include geographic, sociodemographic, psychographic, and behavioral factors. The relevant consumer differences for segmentation, such as profitability and preferences. It raises the question of which criterion to choose and notes the lack of clear guidelines. The recommendation is to use the simplest approach that works for the product or service, emphasizing that sophistication in criteria doesn't necessarily mean better results.

GEOGRAPHIC SEGMENTATION

Geographic segmentation involves dividing a target market based on location, region, or country, using a consumer's place of residence as the primary criterion. It's used in cases like national tourism organizations tailoring communication to neighboring countries or global companies adjusting offerings based on customer location. The advantage is easy assignment of consumers to geographic units for targeted

communication, but it may not reflect shared characteristics beyond location. A key disadvantage is that sharing a geographic location does not necessarily imply that people have other shared characteristics relevant to marketers, such as preferences or benefits sought. In many cases, other segmentation criteria like socio-demographics may be more relevant. geographic information has experienced a resurgence in international market segmentation studies, aiming to create segments across geographic boundaries.

SOCIO-DEMOGRAPHIC SEGMENTATION

Socio-demographic segmentation involves dividing a market based on age, gender, income, and education, which is useful in some industries where these factors strongly correlate with consumer preferences. It allows for easy identification of target segments and can explain product choices in some cases. However, socio-demographic criteria have limitations, as they only explain a small portion of consumer behavior (about 5%) and may not be the primary driver of preferences for many products. Values, tastes, and preferences are often more influential. Therefore, some marketers advocate for using psychographic factors to gain deeper insights into consumer decisions. In practice, a mix of demographic, psychographic, and behavioral segmentation is often employed for a more comprehensive understanding of consumer segments.

PSYCHOGRAPHIC SEGMENTATION

Psychographic segmentation categorizes people based on their psychological traits, like beliefs, interests, and motivations for buying products. Benefit segmentation and lifestyle segmentation are popular forms of this approach. It's more complex than demographic or geographic segmentation, often using multiple variables to capture these psychological aspects. The advantage is that it provides deeper insights into consumer behavior, like how travel motivations influence vacation choices. However, it's more challenging to determine consumer segments and relies on reliable and valid measurements of psychographic traits. In essence, psychographic segmentation looks at the deeper reasons behind consumer choices, offering valuable insights but requiring careful measurement and analysis.

BEHAVIORAL SEGMENTATION

Behavioral segmentation involves categorizing people based on their actual behaviors or reported behaviors, such as purchase history, spending patterns, or brand choices. It's advantageous because it focuses on the most relevant behavior, eliminating the need for measuring psychological traits. However, it may not

always be readily available, especially for potential customers who haven't interacted with the product or service. This is in contrast to using demographics or psychographics, which can be applied to a broader audience, including those who haven't interacted with the organization's products or services. Behavioral segmentation is a powerful approach that relies on actual behaviors for grouping individuals. It's highly effective when behavior is the most relevant factor, but it may be limited in cases where data on potential customers' behaviors is scarce.

DATA FROM SURVEY STUDIES

Survey data is a cost-effective and accessible method for organizations to gather information. However, it can be influenced by various biases, unlike data obtained from directly observing real behaviors. These biases can undermine the accuracy and reliability of market segmentation analysis results.

CHOICE OF VARIABLES

The selection of variables is crucial for the quality of market segmentation solutions, whether through common-sense or data-driven approaches. In data-driven segmentation, it's vital to include all relevant variables while avoiding unnecessary ones. Unnecessary variables can lead to longer and tedious questionnaires, causing respondent fatigue and reducing response quality. Noisy or irrelevant variables can hinder segmentation algorithms from identifying the correct solution.

They may result from poorly formulated survey questions or the inclusion of redundant variables, which can seriously interfere with accurate market segmentation. To overcome this, it's recommended to include necessary and unique questions while avoiding redundancy. This often involves a two-stage process, combining exploratory research for insights into beliefs and behaviors with quantitative survey research to ensure no critical variables are omitted.

RESPONSE OPTIONS

Response options in surveys determine the scale of data for analysis. Binary options are straightforward and suitable for segmentation. Nominal options can be transformed into binary data, while metric data (e.g., age) allow various statistical procedures. Ordinal data (like likert scales) are common but lack clear distances between options, complicating segmentation analysis. Ideally, metric or binary options should be used to avoid complications. Visual analogue scales, like slider scales, can provide metric data. Binary options, especially in a level-free format, often

outperform ordinal scales for more precise segmentation. Binary response options, especially those formulated in a level-free way, have been shown to outperform ordinal options in many contexts, offering a more precise and reliable basis for segmentation analysis

RESPONSE STYLES

Survey data is prone to biases, including response biases and response styles. Response biases involve systematic tendencies to answer questions for reasons other than the question's content. Response styles represent consistent biases displayed by respondents over time, independently of the survey questions. These biases can manifest in various ways, like favoring extreme or midpoint answers. Response styles can affect segmentation results, potentially leading to misinterpretation.

To ensure the accuracy of segmentation analysis, it's important to minimize the risk of capturing response styles during data collection. When segments with response patterns influenced by response styles are identified, additional analysis is required to confirm their true characteristics. Alternatively, respondents influenced by response styles may need to be excluded from targeting in those segments to avoid misinterpretation.

SAMPLE SIZE

Sample size is a crucial factor in market segmentation analysis, and a lack of it can lead to unreliable results. Small samples can make it difficult to determine the correct number and nature of market segments. Sample size recommendations for segmentation studies vary. One suggestion is at least $2p$ (better if five times $2p$) respondents, where p is the number of segmentation variables. Another recommendation is at least ten times the number of segmentation variables times the number of segments, or $10 * p * k$, where p represents segmentation variables, and k represents segments.

Simulation studies show that increasing the sample size generally improves segmentation correctness, with the most significant improvement seen in very small samples. A minimum of $60 * p$ or $70 * p$ is recommended, depending on the data's complexity. The effect of sample size also varies based on market and data characteristics, like the number of segments, their size, and the presence of correlations or overlapping segments. High-quality, unbiased data with no unnecessary items, no correlated items, and responses from a suitable sample are essential for accurate segmentation. Ideally, the data should be binary or metric, free of response styles, and

include a sufficient sample size, with at least 100 respondents for each segmentation variable.

DATA FROM INTERNAL SOURCES

Organizations are increasingly using their internal data for market segmentation analysis, which includes scanner data, booking data, and online purchase records. This data is valuable because it reflects actual consumer behavior, eliminating biases associated with consumer statements or intentions.

The advantage of internal data is that it's automatically generated, and its collection doesn't require additional effort when stored in an accessible format. However, it's essential to recognize that this data may be biased as it often represents existing customers, potentially excluding information about potential future customers with different consumption patterns. Organizations should be aware of this limitation when using internal data for market segmentation.

DATA FROM EXPERIMENTAL STUDIES

Experimental data from field or laboratory experiments can serve as a valuable source for market segmentation analysis. These experiments may involve testing responses to advertisements or conducting choice experiments and conjoint analysis. In choice experiments and conjoint studies, participants evaluate product attributes and levels, providing insights into how these factors influence consumer preferences. This information can be used as segmentation criteria in market segmentation analysis.

STEP 4 : EXPLORING DATA

Exploring data in market segmentation involves several key steps, including data cleaning, descriptive analysis, preprocessing, and possibly even advanced techniques like Principal Component Analysis (PCA). Here's a detailed breakdown of these steps:

1. Data Cleaning :

Before beginning any analysis, it's essential to clean and preprocess your data. This involves tasks such as handling missing values, removing duplicates, and addressing outliers. Clean data is crucial for accurate segmentation

2. Descriptive Analysis:

Descriptive analysis helps to understand the data by summarizing its key characteristics. This often includes statistical measures like mean, median, standard deviation, and visualizations like histograms, box plots, and scatter plots. Descriptive analysis helps to gain insights into the distribution of variables within the dataset

3. Preprocessing Steps:

Data preprocessing is crucial for market segmentation. Here are some common preprocessing steps:

a. Normalization or Standardization: Standardize variables if they are measured on different scales. This ensures that no variable dominates the segmentation process due to its larger range

b. Encoding Categorical Variables: If the data includes categorical variables, you'll need to encode them into numerical format, often using techniques like one-hot encoding

c. Feature Selection: Identify the most relevant features (variables) for segmentation to reduce dimensionality and improve model performance. This can be done using various techniques like feature importance analysis

d. Data Transformation: In some cases, it is important to transform the data to make it more suitable for segmentation. For instance, use of log transformations for variables that exhibit skewed distributions

e. Handling Imbalanced Data: If the imbalanced segments (some segments have significantly fewer data points), might need to address this issue by oversampling, undersampling, or using other techniques to balance the data

4. Principal Component Analysis (PCA):

PCA is an advanced technique used to reduce the dimensionality of the data while retaining most of the important information. It's particularly useful when dealing with high-dimensional datasets. The steps for PCA include:

a. Standardization: Standardize the data to have a mean of 0 and a standard deviation of 1

b. Calculate Covariance Matrix: Compute the covariance matrix of the standardized data

c. Eigenvalue Decomposition: Decompose the covariance matrix into its eigenvectors and eigenvalues

d. Select Principal Components: Sort the eigenvalues in descending order and choose the top-k eigenvalues to represent the data

e. Project Data: Project the data onto the selected principal components to create a lower-dimensional representation

PCA is useful for reducing data complexity, visualizing relationships between variables, and identifying the most influential variables within data

STEP 5: EXTRACTING SEGMENTS

Extracting segments in market segmentation involves the process of grouping consumers into distinct segments based on their similarities and differences. This can be done using various methods, including distance-based methods, model-based methods, algorithms with integrated variable selection, and data structure analysis.

1. Distance-Based Methods:

K-Means Clustering: K-means is a popular unsupervised clustering algorithm. It groups data points into clusters based on the similarity of their attributes. The algorithm minimizes the sum of squared distances between data points and the centroids of their respective clusters.

Hierarchical Clustering: This method builds a hierarchy of clusters by successively merging or splitting clusters based on their similarity. Usage of single-linkage, complete-linkage, or average-linkage methods to determine cluster similarity.

DBSCAN (Density-Based Spatial Clustering of Applications with Noise): DBSCAN groups data points into clusters based on their density. It can identify clusters of varying shapes and effectively handle noise in the data.

2. Model-Based Methods:

Gaussian Mixture Models (GMM): GMM is a probabilistic model that assumes data points are generated from a mixture of Gaussian distributions. It can identify clusters with different shapes and sizes.

Latent Class Analysis (LCA): LCA is a statistical method that assumes the existence of latent classes within the data. It's commonly used for categorical data and identifies unobservable subpopulations with shared characteristics.

Self-Organizing Maps (SOM): SOM is a type of artificial neural network that projects high-dimensional data onto a low-dimensional grid, effectively preserving the topology of the data. It can be used for clustering and visualization.

3. Algorithms with Integrated Variable Selection:

Some clustering algorithms, like K-Means, can be extended to include variable selection techniques. By choosing relevant features or variables, can improve the quality of segmentation and potentially reduce dimensionality.

4. Data Structure Analysis:

Principal Component Analysis (PCA): While PCA is often used in data preprocessing, it can also be used for analyzing data structure. It helps in dimensionality reduction and reveals the underlying structure of the data.

Factor Analysis: Factor analysis explores underlying factors that drive variations in the data. It's helpful for identifying latent factors that contribute to market segmentation.

Multidimensional Scaling (MDS): MDS visualizes the relationships between data points in a lower-dimensional space, making it easier to identify groups or clusters.

STEP 6: PROFILING SEGMENTS

IDENTIFYING KEY CHARACTERISTICS OF MARKET SEGMENTS

The profiling step in market segmentation is essential for understanding the characteristics of segments resulting from data-driven approaches, but it is not required in cases of commonsense segmentation where segments are predefined. For data-driven segmentation, defining segment characteristics based on segmentation variables is the primary aim of profiling. Profiling involves characterizing each market segment individually and in comparison to others, and it helps identify distinguishing features. It is particularly crucial when no natural segments exist in the data, and it allows for the exploration of alternative segmentation solutions. Data-driven segmentation solutions can be complex and challenging to interpret, often appearing as black boxes to managers. Research indicates that many marketing managers struggle to understand and interpret data-driven segmentation results. Effective profiling, whether through traditional or graphical statistical approaches, is vital for accurately interpreting and making strategic marketing decisions based on the resulting segments. Graphical statistics approaches can make profiling less tedious and more accessible, reducing the risk of misinterpretation.

TRADITIONAL APPROACHES TO PROFILING MARKET SEGMENTS

The discussion of the challenge of interpreting data-driven segmentation solutions using the Australian vacation motives dataset. Segments were extracted using the neural gas clustering algorithm, resulting in six segments. Typically, data-driven segmentation solutions are presented as either oversimplified high-level summaries or large tables providing precise percentages for each segmentation variable within each segment. The table presented in the text showcases the percentage of segment members agreeing to various travel motives. Profiling segments using such tables requires extensive comparisons, making it complex and time-consuming. For instance, to interpret six segments across 20 travel motives, over 420 comparisons need to be made. If multiple segmentation solutions are considered, the task becomes overwhelmingly tedious. While some attempt to provide statistical significance for differences between segments, this approach may not be statistically sound due to the way segments are created to maximize dissimilarity, rendering standard statistical tests less applicable.

SEGMENT PROFILE WITH VISUALIZATION

Segment profiling through visualization is an effective way to identify the defining characteristics of market segments and assess how distinctly they are separated from each other. Here's how we can use visualization techniques for this purpose:

1. Bar Charts and Histograms:

Create bar charts or histograms for each segment, representing the percentage or frequency of each defining characteristic or variable. This helps in visually comparing the segments' preferences and behaviors, and can easily identify which characteristics are more dominant in each segment.

2. Stacked Bar Charts:

Stacked bar charts show how each segment compares across multiple characteristics simultaneously. This visualization technique allows us to see the relative importance of different variables within each segment.

3. Heatmaps:

Heatmaps are useful for comparing multiple segments across a range of characteristics. They use color-coding to indicate the strength or frequency of each characteristic. Hotter colors (e.g., red) might represent higher values, while cooler colors (e.g., blue) indicate lower values. Heatmaps make it easy to spot patterns and differences.

4. Radial Plots:

Radial plots, also known as spider or radar charts, show multivariate data for each segment on a circular grid. Different characteristics are plotted as lines radiating from the center. This helps in comparing how segments differ across various attributes.

5. Parallel Coordinates Plot:

Parallel coordinate plots display multiple characteristics as parallel axes, with each segment's data represented as a line connecting points on those axes. By looking at how lines intersect and diverge, see which segments have similar or distinct profiles.

6. Scatter Plots:

Scatter plots can be useful for assessing segment separation. Create scatter plots for pairs of variables and color-code the data points based on segment membership. This allows us to visualize how well-separated the segments are in two-dimensional space.

7. Ternary Plots:

Ternary plots are beneficial when you have three characteristics to compare. They use a triangular grid, and each point within the triangle represents a combination of the three variables.

8.Cluster Dendrograms:

The hierarchical clustering for segmentation, dendrograms can be informative. They visually display how segments are related in a hierarchical manner, with branches representing the degree of similarity.

9. MDS Plots:

Multidimensional Scaling (MDS) plots transform high-dimensional data into two or three dimensions, making it easier to visualize segment differences. Segments that are close together in an MDS plot are more similar.

Visualization tools can provide valuable insights into the characteristics and separation of market segments. They make it easier to communicate complex information to stakeholders, aiding in strategic decision-making, marketing campaigns, and product development tailored to the unique needs and preferences of each segment.

LINK TO MCDONALDS FAST FOOD STUDY CODE:

https://colab.research.google.com/drive/1EtcX4DHOZjJs_N5vusL30azM7iM1bG0V?usp=sharing