

Market Segmentation Analysis

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Contents

1. Abstract	3
2. Market Segmentation	3–5
1.1 What is Market Segmentation	3
1.2 Why is it important	3
1.3 Types of Market Segmentation	3
1.3.1 Geographic Segmentation	4
1.3.2 Demographic Segmentation	4
1.3.3 Psychographic Segmentation	4
1.3.4 Behavioral Segmentation	5
3. The How	5–9
2.1 Data Exploration	5
2.2 Data Cleaning	5
2.3 Data Preprocessing	6
2.3.1 Numerical Variables	6
2.3.2 Categorical Variables	7
2.4 Descriptive Analysis	7
2.5 Principal Component Analysis (PCA)	7
2.6 K-Means Clustering	8
2.6.1 What is this algorithm?	8
2.6.2 How does it work?	9
2.6.3 The Elbow Method	9
2.6.4 Why use this algorithm?	9
4. Market Segmentation Case Study on McDonalds Dataset	10
5. Conclusion	10
6. References	10

Abstract

This report introduces the concept of Market Segmentation (MS) — a marketing strategy that divides a broad audience into smaller groups based on shared traits like demographics, interests, or behavior. By doing so, businesses can target each segment more effectively with tailored products, services, or messages. Along with the basic theory behind Market Segmentation, this report also shows how to apply it in practice using Python, demonstrating how data can be analyzed to identify and understand different customer segments.

1. Market Segmentation

1.1 What is Market Segmentation?

Market Segmentation is the process of identifying distinct segments within a target market and dividing that market into smaller, more manageable subgroups. These subgroups are formed based on factors such as demographics, needs, priorities, common interests, and other psychographic or behavioral characteristics. By understanding the unique traits and preferences of each segment, businesses can design marketing strategies, products, and services that better meet the specific needs of different customer groups. This approach allows companies to use their resources more efficiently, increase customer satisfaction, and gain a competitive advantage in the marketplace.

1.2 Why is it important?

Market Segmentation is necessary because:

- It helps you target the people most likely to become customers.
- Understanding segments improves product, sales, and marketing strategies.
- It informs product development for different segments like men vs. women, or high income vs. low income.

1.3 Types of Market Segmentation

There are different types of market segments that can be created. Below are the four major types.

1.3.1 Geographic Segmentation

Divides a market by physical locations — countries, regions, cities, or neighborhoods. It considers local factors like climate, language, or urban vs. rural living. This lets

companies tailor products and marketing to local needs.

1.3.2 Demographic Segmentation

Sorts people by measurable personal and social factors: age, gender, income, education, family, job, religion, nationality, and ethnicity. Easy to gather, this data helps understand who customers are and what they can afford.

1.3.3 Psychographic Segmentation

Focuses on mental and emotional aspects: lifestyle, beliefs, opinions, values, and attitudes. This helps brands connect with customers at a deeper level by appealing to interests and beliefs.

1.3.4 Behavioral Segmentation

Looks at how people behave towards a product or brand: buying patterns, usage rates, loyalty, reasons for buying, and responses to marketing. This enables businesses to create offers and messages that match actual behaviors.

2. The How

Key steps in Market Segmentation.

2.1 Data Exploration

- Explore data to understand its meaning and suitability.
- List variables and check: types (numerical or categorical), range, distribution, outliers.
- Tools: frequency tables, histograms, scatter plots, heat maps, correlation matrices.
- Practical value: find features useful for splitting the market.

2.2 Data Cleaning

- Fix problems: duplicates, typos, gaps, inconsistent labels.
- Key tasks: fix spelling/formatting, remove duplicates, handle missing data, check logic, standardize categories.
- Extra checks needed if data comes from multiple sources.

2.3 Data Preprocessing

Good preprocessing makes data ready for analysis.

2.3.1 Numerical Variables

- Scale matters: large numbers can overshadow smaller ones.
- Methods: standardization (mean zero, std dev one), min-max scaling.
- Treat outliers to avoid skewing results.

2.3.2 Categorical Variables

- Convert categories to numbers: label encoding or one-hot encoding.
- Merge too many small categories into broader groups.
- Example: grouping IT job titles under “IT Professionals”.

2.4 Descriptive Analysis

- Confirm data behaves as expected.
- Tasks: frequency counts, means, medians, spread, cross-tabulations.
- Visuals: box plots, scatter plots, bar charts.
- Helps pick the best variables for clustering.

2.5 Principal Component Analysis

- Condense many variables into fewer components.
- PCA creates uncorrelated components explaining most variation.
- Scree plots help decide how many to keep (70–90% coverage).

2.6 K-Means Clustering Algorithm

2.6.1 What is this algorithm?

K-Means groups unlabeled data into K clusters. For K=2, you get two clusters; K=3, three clusters, and so on.

2.6.2 How does it work?

1. Choose K.
2. Pick K random points as centroids.
3. Assign points to nearest centroid.
4. Recalculate centroids.
5. Repeat until points stop changing clusters.
6. Calculate cluster variance.
7. Repeat until total variance is minimized.

2.6.3 The Elbow Method

- Run K-Means with different K.
- Plot WCSS for each K.
- Find the “elbow” point — best K.

2.6.4 Why use this algorithm?

- Simple to implement.
- Scales well.
- Guarantees convergence.
- Adapts to different cluster shapes/sizes.

3. Market Segmentation Case Study on McDonalds Dataset

For complete code, refer: <https://github.com/Ankit222001-eng/Market-segment-Analysis.git>

4. Conclusion

Market segmentation is vital for effective targeting, positioning, pricing, and communication. While the concept is simple, execution needs planning and clean data. Done well, it helps identify the right audience and tailor marketing efforts. Success depends on high-quality, up-to-date data for better decisions and sustainable growth.

5. References

- <https://rb.gy/1azcm9> — Overview of basic concepts and practical applications.
- <https://rb.gy/ehf02b> — Insights into strategies, methods, and examples.
- <https://rb.gy/gn7kuw> — Data-driven techniques for modern marketing.