**Abstract**

In today’s world customer segmentation is one of the key aspects of business support system. To survive in a competitive world or to get success in this world it is very important to identify the customers. This document will give the glimpse of determining the target customers based on their basic data. After identification of the potential customer the decision can be made for the business to grow. The customer segmentation method discussed is based on the clustering algorithm K-means. A visualization was also constructed in order to get a better picture of the data and the resulting clusters. And also to get some idea of basic data provided.

**Table of Contents**

1. Introduction
   1. What is Customer Segmentation? …………………………………… 03
   2. Why is it so important? ……………………………………………… 03
   3. Customer Segmentation Variables …………………………………… 03
2. Existing Method ……………………………………………………………04

3. Proposed method with architecture ………………………………………. 06

4. Methodology ……………………………………………………………… 08

5. Implementation …………………………………………………………… 09

6. Conclusion ……………………………………………………………… 10

**Introduction**

What is customer segmentation?

Customer segmentation (also called market segmentation) is the practice of dividing customers into groups that share similar characteristics. The dataset provided was of a mall so if we think it as a fashion boutique then its customers are very diverse, with different needs and preferences. What they buy is highly dependent on their annual income and their age. customer segmentation is about more than matching customers with appropriate product offers. It’s also about changing the way you communicate with your customers based on what you know about them. It’s about identifying your most profitable customers and tailoring your products and services to meet their specific needs. Ultimately, customer segmentation is about creating relevant shopping experiences that build brand loyalty.

Why is it so important?

Before the retailers actually focussed on mostly very customers and attracting as many visitors to their stores. Targeting the wrong customers can cost not only waste in marketing dollars also in higher operational costs. And on another hand if we target the right customers it obviously gives the money profit and also high average order values. Targeting the right customers on time is also necessary.

Customer Segmentation Variables

The most common ways in which business segment their customer base are:

* Demographic information, such as gender, age, familial and marital status, income, education, and occupation.
* Geographical information, which differs depending on the scope of the company. For localized businesses, this info might pertain to specific towns or counties. For larger companies, it might mean a customer’s city, state, or even country of residence.
* Psychographics, such as social class, lifestyle, and personality traits.
* Behavioral data, such as spending and consumption habits, product/service usage, and desired benefits.

The dataset provided is basically demographic information like gender, age, etc.

**Existing Method**

The existing method is from research on online business shopping sector and other sector as well it can be used in many other sector as well. The method is mostly dividing email lists into groups based on common features that help in predicting buying such as demographics or interests, in order to better serve the customer. This is called a priori segmentation– a priori is Latin for from the former, and basically means that you’ve deducted these segments based on anecdotal knowledge or observed trends in your marketing efforts. Here are some a priori segments you can use:

* **Demographics**: much of this is publicly-available data that can be gained from your customers during the check-out phase for that first purchase or through other (non-invasive) means: location, age, gender, life stage, marital status.
* **Decision-making status**: especially useful for B2B companies, knowing a customer’s job title can make the difference between barking up the wrong tree and making a sale quickly. But decision-making status also works for B2C companies. If you’re trying to sell children’s products, for example, you’ll need to target those with the expendable income (the parents).
* **Customer history w/ company**: know how long each customer has used your product or followed your brand, which can tell you the most loyal customers, how they’ve seen you change, and maybe how they’ll react to new changes.
* **Personal interactions with customers**: Your support team can help you designate your power users, advocates, and even your difficult tickets. These groups are perfect test segments to start your experiments.

After identifying the customers group they may want to export or combine those into a useable form. Many companies make the list of their email addresses that they use in email marketing or through automation tool. And also through the social media they can try to advertise their company as well which is freely available or they can use the feedback form type in which they ask phone number and email through which they can advertise and through that they will start their own strategy.

**Proposed Method with Architecture**

A customer segmentation requires data of customers so there are customer Ids, age, gender, spending score, annual income through which we make clusters depending on their annual income and spending score using k-means clustering which is a unsupervised learning algorithm. So the flow goes like this:

1.Customers basic data

2.Perform K-means clustering for annual income and spending score.

User

Information

5.Making proper decisions based on the results

4.Visualizing the clusters

3.Using elbow method finding the value of k

1.Customers basic data: It includes data such as name, customers unique ID, age, gender, annual income, spending score. Those data are stored in a database and are used for k-means clustering.

2.Performing k-means for annual income and spending scores: The k-means clustering algorithm will give results like which clusters have high spending low annual vice versa, high spending high annual ,low spending low annual, and equal form of spending and annual.

3.Using elbow method to find the value of k: Using elbow method we can find k as we considered k=10 but not all are suitable that’s why a proper k value is required to perform k-means clustering algorithm.

4.Visualizing the clusters: The clusters help us that there are different types of customers with their different types of basic needs. Some visualization are also done for other basic data like genders(male and female), age(for age there are different categories like age 18-25,26-35,etc.),spending score and annual income as well.

5.Making proper decisions: After getting the results, proper decision has to be made to survive in this competitive world.

**Methodology**

The methodology used in customer segmentation goes through the following steps:

Step 1: To define full potential of the market

Like to define the market,

how much customers are now,

how many potential end users or customers are there in the defined market,

Regional vise sales, defining quantity and quality.

Step 2: To develop factors for segmentation

Customers potential

Demographic factors(from the dataset)

Basic factors of the customers that define the quantitative potential.

Step 3:Validating customer segmentation:

Considering supportive data like researched data of markets,

Do the market work on the way segmented,

What factors help to give proper segmentation

Step 4: Targeting

Targeting the customers based on the segments,

Testify the logic behind targeting the customer,

Make decisions for such customers

Step 5: Deciding the product positioning to the targeted customers

How to customize the core value components to position the products to the customers,

Deciding a clear product positioning for a particular brand which is in trend in each segment to gain a competitive advanatage.

This steps may define the full potential of the market and to develop a way of segmenting the market based on the quantitative factors.

**Implementation**

The first step towards a successful segmentation strategy is to determine a company's expectations and objectives. Different usage expectations require different segmentation methodologies. Strategic objectives, including revisions of core business direction, organizational structure changes, and financial planning initiatives, require more stable and strategic segmentation methodologies. On the other hand, more tactical objectives, including product and service developments and marketing actions, require more frequently revised and detailed segmentation methodologies.

Once the expectations and objectives are clarified,the data environment for the segmentation methodology; each method requires a different set of information. Strategic segmentation requires a long history of financial consumer data, looking at what products or services the consumer purchased, how much was spent, and for how long. Marketing-focused segmentations—such as behavior, needs, and lifestyle—require a more detailed set of customer data, such as what products or services the customer uses, the motives behind this use, the customer's response to campaigns, complaint data, and customer's perception of the brand. Most of the time companies already have the required data, usually housed in systems.

Additionally, companies must keep their segments up to date. Segmentation is a continuous process that should be repeated periodically, allowing companies to keep track of segment trends and changes, identify which segments are likely to grow, and treat different segments differently based on their needs at a given time.

**Conclusion:**

The conclusion from the customer segmentation is increase in their market value and if we go through our dataset then we can say a customer can be targeted based on their annual income and their spending score. This factors helps us to know which clusters helps us in increasing the marketing value.