

CUSTOMER SEGMENTATION

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1. Abstract: -

There is a lot of competition among businesses now that so many others have emerged in an effort to attract new customers and retain existing ones. Due to the aforementioned, outstanding customer service is required regardless of its size of the business. Any company will also benefit more from targeted customer services and the creation of unique customer care strategies if it can comprehend the needs of each of its clients. Structured customer service makes it feasible to have this understanding. Customers from each segment are similar in terms of market characteristics. In contrast to traditional market analytics, which frequently fail, especially when the customer base is too broad, big data concepts and machine learning have encouraged a greater acceptance of the automated customer segmentation strategy.

2. Problem Statement

Businesses want to know their target audience so that they can market their product properly. So, a system is to be developed which will divide the customer into segments where the customers share similar market characteristics.

3. Market/Customer/Business need Assessment

Customer segmentation enables businesses to craft more focused marketing messages, customized to each particular segment. According to a survey, campaigns segmented based on customer interest have on average, a 74% higher click rate. This is in comparison to non-segmented campaigns. Other than this it helps the businesses to know who their customers are and what they want to gain from using their goods and services. One can adjust and improve their offerings thanks to it. Consequently, being able to fulfil

consumer demands and expectations would lead to increased customer satisfaction.

4. Target Specification and Characterization.

This recommends businesses to identify the group of customers it serves. This let them to find their most profitable and least profitable customer segment. Other than that, it helps business to know the needs of the customer, which of the services provided by the business is most liked by customers.

There are several other characteristics like what mode of communication engages the customers most, what can be done to improve customer satisfaction.

5. External Search (information sources)

Dataset

The dataset can be found on the Kaggle. This file contains the basic information (ID, age, gender, income, spending score) about the customers.

6. Benchmarking Alternate products.

a. Kissmetrics

Kissmetrics is a marketing analytics tool that's popular with SaaS and eCommerce companies. It's also an effective way to segment your audience and work towards the revenue growth you're after. Kissmetrics makes it super easy to create segmented audiences in a central dashboard space. The tool also offers integrations with essentially all of the most commonly used eCommerce websites. You can build segments based on different behaviours or characteristics of your customer groups so you can design future emails, campaigns,

and products accordingly. Collectively, these features are a huge help for anyone that wants to begin segmenting their audience. With Kissmetrics, you can quickly create the audiences you want in a centralized location and then automatically gather and interpret data about those groups with helpful eCommerce website integrations.

b. Google Analytics

Google Analytics can also be a very good customer segmentation tool for businesses looking for a specific kind of assistance. The platform provides a ton of website traffic data that can be invaluable to your audience segmentation process. Its Audience tool provides a great overview of your web traffic set. However, Google Analytics is a bit limited in terms of advanced features. It's good at helping you develop customer segments based on hard data like age, gender, and household income. But the platform doesn't pull data from many sources that could be quite valuable to your efforts – it doesn't integrate data from eCommerce transactions or email marketing campaigns. So, if you're looking for a customer segmentation tool that will help you use hard data to create audience groupings, then Google Analytics might be ideal.

7. Available patents

V.Vijilesh, A.Harini, M.Hari Dharshini, R.Priyadharshini,
“CUSTOMER SEGMENTATION USING MACHINE LEARNING”,
International Research Journal of Engineering and Technology
(IRJET), Volume: 08 Issue: 05 | May 2021

. According to business, a company may create three segments like High (Group who buys often, spends more and visited the platform recently), Medium (Group which spends less than high group and is not that much frequent to visit the platform) and Low (Group which is on the verge of churning out). This is where

Machine Learning provides a crucial solution, several algorithms are applied for revealing the hidden patterns in data for better decision making. In this paper we proposed a customer segmentation concept in which the customer bases of an establishment is divided into segments based on the customers' characteristics and attributes. This idea can be used by the B2C companies to outperform the competition by developing uniquely appealing products and services and make it reach to potential customers. This approach is implemented using "k-means", an unsupervised clustering machine learning algorithm.

8. Applicable constraints

- **Limited production:** Not every product is produced in mass scale.
- **Promotion problem:** Different set of customers requires different methods and types of promotions.
- **Expensive Production:** In order to satisfy different groups/segments of buyers, producers have to produce products of various models, colours, sizes, etc., that result into more production costs.
- **Heavy Investment:** In order to satisfy different needs and wants of various groups, a company has to produce variety of product lines and product items. For the purpose, the company requires to invest more on technology and other inputs that may demand heavy investment.

9. Business Opportunity

When using a one-size-fits-all approach to marketing, even the smartest strategy may not bring the desired results. No matter how effective your marketing efforts are to some, they could fail with others. This is where customer segmentation comes in to play. If done right, it can bring numerous benefits for businesses.

10. Concept Generation

It is very difficult to identify which customer needs what, so there should be a method to find what a customer need. Market segmentation allows you to target your product to the right people in the right way, rather than targeting your entire audience with a generic product. This helps you increase the chances of people engaging with your ad or content, resulting in more efficient campaigns and improved return on investment.

11. Concept Development & Final Product Prototype

The technique of customer segmentation is dependent on several key differentiators that divide customers into groups to be targeted. Data related to demographics, geography, economic status as well as behavioral patterns play a crucial role in determining the company direction towards addressing the various segments.

There are three major sections :

- 1 Data Pre-processing.

- 2 RFM score calculation.

- 3 Cluster Creation.

Data Pre-processing-

This is a data preparation phase. The feature usually helps to refine all data items at a standard rate to improve the performance of the clustering algorithm. Each data point changes from grade 2 to +2. Integration techniques that include Min-max, decimal and z-points The standard z-signing strategy are used to make things unequal before applying the k-Means algorithm to a dataset.

RFM score calculation-

Our dataset is limited to sales record, we can use a RFM based model for finding segments where R is Recency (how recently a purchase happened), F is Frequency (how frequent transactions are made), M is Monetary value(Value of all transactions).

Recency, Frequency and Monetary score for each customer is calculated. The latest date is assigned as a placeholder to calculate recent purchases. All the transactions are grouped using CustomerID and then aggregate lambda operations are performed. As a result of this operation numbers will be obtained which depicts the recency., frequency and how much a specific customer spent till date. All these are stored in a new data frame RFMscores. To note, the distribution for recency is right skewed.

Cluster Creation-

K-Means is an unsupervised learning algorithm and used for clustering tasks which works really well with complex dataset. It is an iterative algorithm that partitions the dataset into “k” pre-defined nonoverlapping subgroups (clusters) where each data point belongs to only one group. The algorithm works as follows:

Step-1 : Specifying the number of clusters – k value.

Step-2 : Centroids are initialized by shuffling the dataset and then randomly selecting k data points for the centroids without replacement.

Step-3: Repeat the iteration until there is no change to the centroids. i.e, assignment of data points to the clusters does not change. Recency, Frequency and Monetary are brought to the same scale and the data is normalized before clustering process. It is important to determine the optimum number of clusters i.e, “k value”.

Silhouette method is used to find the optimum number of clusters. Calculate the silhouette $s(i)$ as follows , ratio of the difference between cluster cohesion and separation to the greater of the two :

$$s(i) = \frac{b(i) - a(i)}{\max\{a(i), b(i)\}}$$

12. Conclusion

The proposed model can be helpful for businesses and e-commerce. Customer segmentation can have a positive impact on a business if done properly. Hence, we can think of ways depending on the type of customers to increase the sales. This will be useful for applying further data mining strategies and the derived insights are helpful in decision making for the business wings.

13. References/ Source of Information

<https://towardsdatascience.com/data-driven-growth-with-python-part-2-customer-segmentation-5c019d150444>

<https://neptune.ai/blog/customer-segmentation-using-machine-learning>