Synopsis Report

On

CUSTOMER SEGMENTATION

Submitted as partial fulfillment for the award of

BACHELOR OF TECHNOLOGY DEGREE

Session 2023-24

in

CSE-Data Science

By:

Jagriti Gangwar

2100321540076

Under the Guidance of

Ms. Yashi Bhardwaj

Assistant Professor

DEPARTMENT OF CSE-DS

ABES ENGINEERING COLLEGE, GHAZIABAD

Student's Declaration

I hereby declare that the work being presented in this report entitled **"Customer Segmentation"** is an authentic record of my own work carried out under the supervision of Ms. Yashi Bhardwaj, **Assistant Professor, CSE-DS.** The matter embodied in this report has not been submitted by us for the award of any other degree.

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Signature of Student

Name: Jagriti Gangwar

Roll No.: 2100321540076

Department: CSE-DS

Signature of Supervisor

Ms. Yashi Bhardwaj

Assistant Professor

Signature of Project Coordinator

Dr. Dimple Tiwari

Assistant Professor

Signature of HOD

Mr. Prabhat Singh

Head Of Department

Acknowledgement

We would like to convey our sincere thanks to **Ms. Yashi Bhardwaj** for giving the motivation, knowledge and support throughout the course of the project. Continuous support helps in the successful completion of project. The knowledge provided is very useful for us.

We also like to give a special thanks to the department of Information and Technology for giving us the continuous support and opportunities for fulfilling our project.

We would also like to extend our sincere obligation to Mr. Prabhat Singh, Head of Department, Information Technology for providing this opportunity to us.

Signature of student

Jagriti Gangwar
(2100321540076)

Table of Contents

ABSTRACT

In contemporary business, segmenting customers with machine learning—specifically, the k-means clustering algorithm—is a commonly used strategy. Its main goal is to increase profitability and client retention by classifying customers according to their purchasing habits and income. The k-means clustering technique is employed due to its ability to efficiently classify clients based on shared characteristics. This approach is thought to be more effective than other strategies.

The efficiency of the segmentation process is attributed in large part to the behavioral components that are incorporated into it. To effectively classify products or services, one must comprehend how customers engage with them.

Following their formation, the clusters are carefully utilized to target specific clients.

This segmentation strategy's ultimate objective is to raise customer satisfaction and engagement, which will eventually result in higher revenues for the business. In addition to being a tool for classification, the customer clusters may be used to create focused marketing campaigns that include content distribution via social media and other channels that are tailored to the individual interests of each customer cluster.

Chapter 1

Introduction

The splitting of a market into discrete client groups with comparable attributes is known as customer segmentation. A powerful tool for identifying unmet client needs is customer segmentation. At that point, victimization on top of knowledge firms will surpass the competition by creating clearly attractive goods and services.

Data about orientation, age, marital and family status, income, education, and occupation are examples of demographic information. Geographical data, which differs according to the organization's size. This information may be relevant to specific towns or regions for restricted organizations. For larger enterprises, the client's home country, state, or city may be included. Psychographics, such as lifestyle, socioeconomic status, and personal traits. Behavioral data, such as purchasing and usage patterns, item/administration use, and desired outcomes.

Customer segmentation is a technique that helps you market more effectively to your clients by grouping them based on shared criteria such as demographics or behaviors.

The advantages of segmenting your customer base

1. Enhancing your entire offering: You will be able to separate your organization as needed if you have a clear idea of who needs to buy your merchandise and what they need it for. Better execution against competitors and increased fulfillment are the expected results.
2. Concentrating your marketing message: Associated with improvements to the product, managing a client division project may assist you in cultivating more involved showcasing messages that are customized to each of your best segments, resulting in more incoming interest in your product.
3. Obtaining better-quality revenue: Not every dollar of revenue is created equal. Deals

that go into an unsatisfactory section may be more expensive to market and maintain, and they may also have a reduced chance of an upsell after the initial purchase has been made or a higher churn rate. By steering clear of these types of customers and concentrating on superior ones, you may strengthen your position and grow your clientele.

Chapter 2

Related Work

Following is a list of related work that is relevant to our project:

2.1 Existing Approaches

Customer segmentation by python:

Purchase History Analysis: This method divides up a client base into groups according to their previous purchasing patterns in order to discover high-value or repeat customers.

Usage Patterns: Examines how consumers use goods and services, classifying them according to their frequency, intensity, or particular qualities used.

Loyalty Initiatives Participation: Divides clients into groups according to how they use loyalty programmers: devoted, infrequent, and non-participating.

Abandonment Behavior: Targets clients who have stopped using services or who have abandoned their shopping carts by using re-engagement tactics.

Product Preferences: Allows for customized marketing messages and recommendations by grouping clients according to the features or product categories they like.

Channel Interaction: To customize communication tactics, an analysis of customer interactions across several channels, including online, offline, and social media, is conducted.

Analysis of Reviews and Feedback: Groups reviews and feedback into categories.

2.2 Comparative Analysis of Existing Works

Depth of knowledge: While purchase history and usage patterns offer quantitative data and feedback and reviews offer qualitative insights, integrating the two results in a more comprehensive knowledge.

Actionability: While wider patterns like channel interaction may necessitate more analysis for specific actions, abandonment behavior and participation in loyalty programmers provide actionable data for targeted efforts.

Temporal Aspect: Predictive analytics examines future behavior, while cohort analysis, abandoning behavior, and loyalty programmers concentrate on certain time periods.

Positive vs. Negative Behavior: While negative reviews and abandoning behavior draw attention to areas that need work, loyalty programmers and positive feedback emphasize the positive features of a situation.

Flexibility: While loyalty programmed may be more sector-specific, usage patterns and channel interactions can be tailored to a variety of industries.

Chapter 3

Project Objective

The process of separating consumers into discrete groups according to comparable behaviors is known as customer segmentation. Gaining a deeper understanding of consumers, adjusting marketing tactics, and raising customer happiness are the goals of customer segmentation. It supports companies in determining their target markets, customize communications, streamlining their product lines, and improving client interactions.

Businesses can better manage resources, foster client loyalty, and spur corporate expansion by segmenting their consumer base. For firms to remain competitive and satisfy the wide range of wants of their clientele, this is a crucial tactic.

Chapter 4

Proposed Methodology

The following our project suggested Methodology :

Step 1: Developing a strategy to address the stated problem.
Step 2: Investigating the dataset and drawing insightful conclusions from it.
Step 3: Eliminating duplicate records, handling nan values and other tasks to clean up dataset.
Step 4: Vital information is extracted from data using data visualization.
Step 5: Preprocessing of data is done to prepare it for fitting the model. This adds : dividing dataset into features, labels, scaling, dimensionality reduction etc.
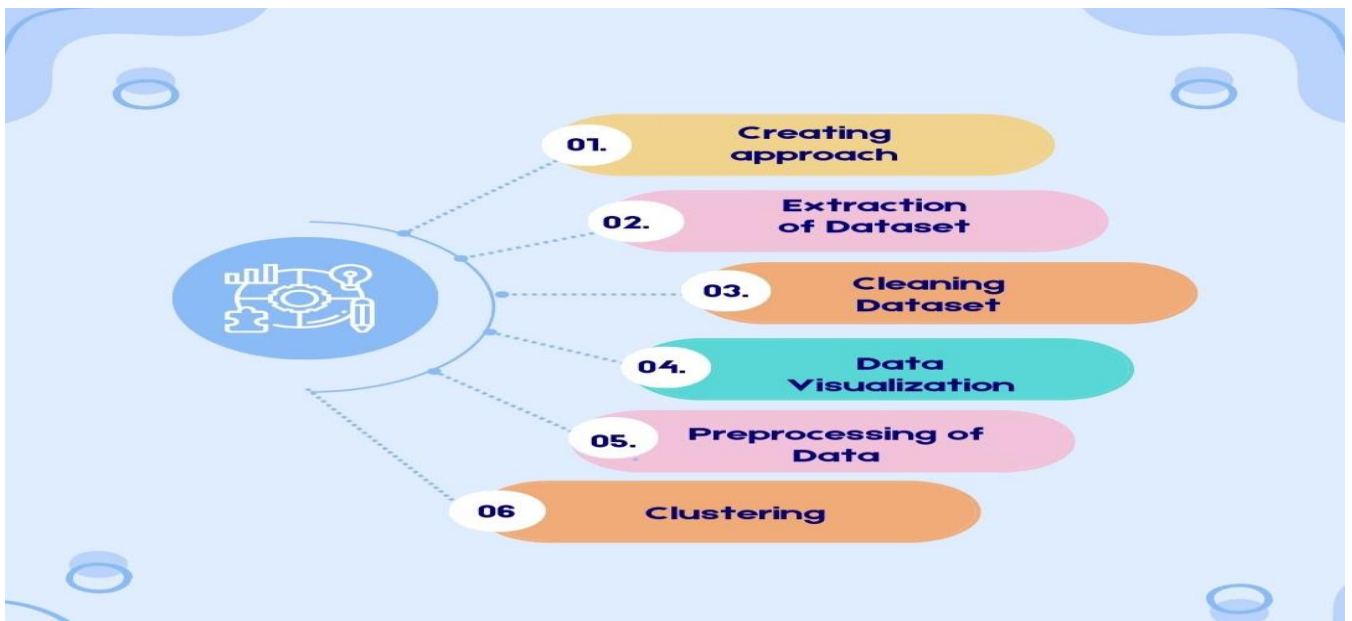**Step 6:** The result is represented using different charts.

Fig.1. Proposed Approach

Chapter 5

Design and Implementation

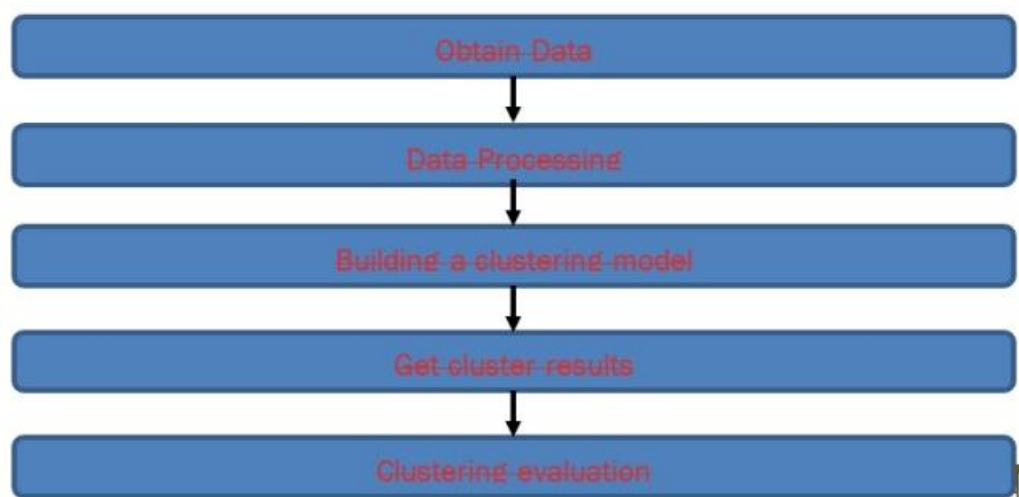Our Project's Layout and Execution are as follows:

## 5.1. Workflow Diagram


Fig.2. Workflow Diagram

An extraction of dataset has been made. Data processing is done with pandas and numerical computation is done with NumPy Python module. The results are shown graphically using Matplotlib and seaborn. Preprocessing and clustering are done using Standard Scaler and Kolbow Visualizer respectively.

Chapter 6

Results and Discussion

The outcome of our analysis of customer segmentation are given below:
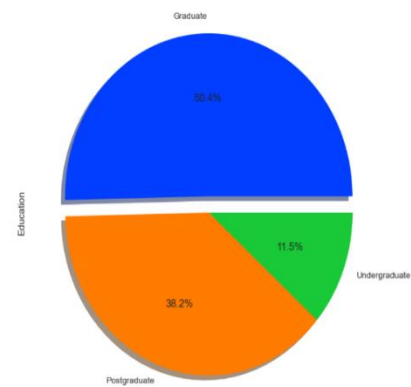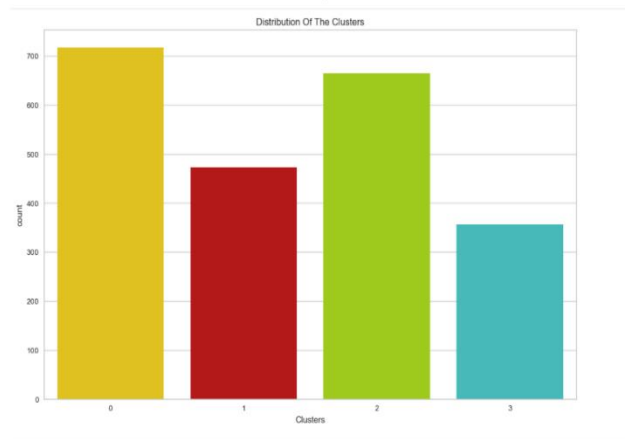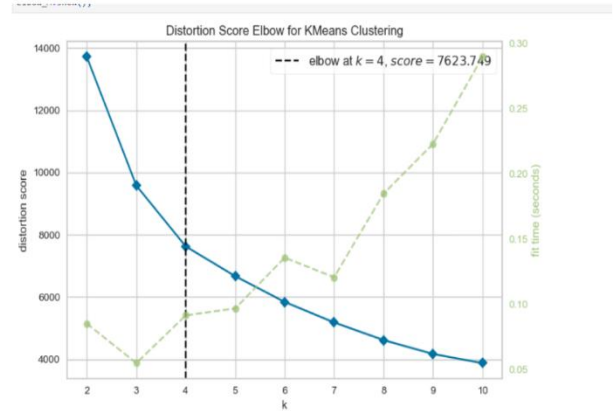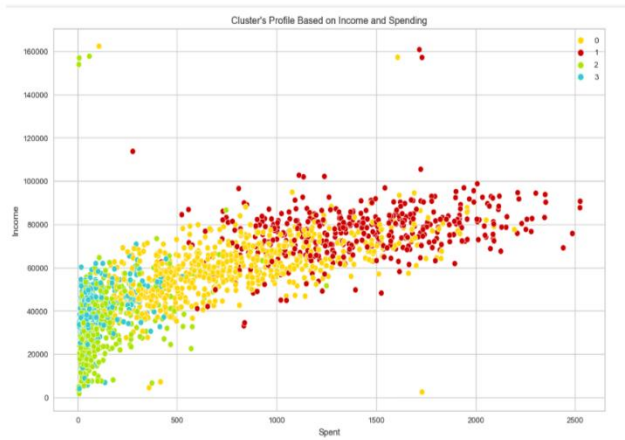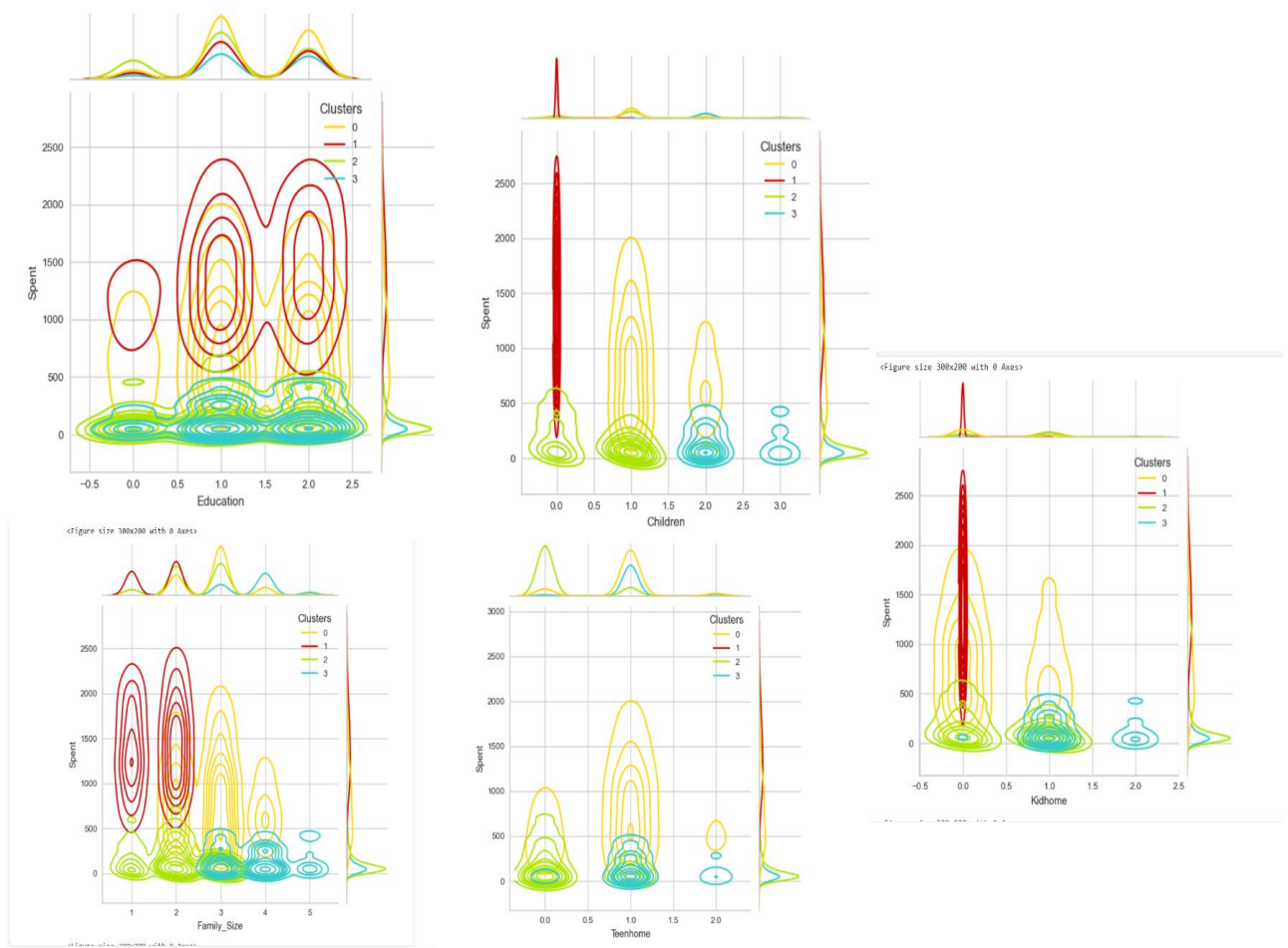
Chapter 7

Conclusion and Future Scope

- **Targeted Marketing**: By making marketing campaigns more relevant and effective, segmentation aids in the creation of more individualized campaigns. Businesses can better target their communications, goods, and services to resonate with particular client groups by knowing the distinct requirements and preferences of each segment.

- **Better Customer Experience**: By using segmentation, companies can provide their customers with more individualized and focused experiences. Businesses may enhance their goods, services, and entire customer experience by learning what matters most to each market segment. This will boost customer happiness and loyalty.

- **Resource Allocation**: It makes it possible to allocate resources more effectively. To maximize return on investment, businesses might concentrate their attention, time, and resources on the most lucrative or rapidly expanding categories.

- Product development is aided by an understanding of the demands and preferences of various segments

References

[1] Sukru Ozan, "A Case Study on Customer Segmentation by using Machine Learning Methods", IEEE, Year: 2020.

[2] Potharaju, S. P., Sreedevi, M., Ande, V. K., & Tirandasu, R. K. (2019). Data mining approach for accelerating the classification accuracy of cardiotocography. Clinical Epidemiology and Global Health, 7(2), 160-164.

[3] Potharaju, S. P., Sreedevi, M., & Amiripalli, S. S. (2019). An Ensemble Feature Selection Framework of Sonar Targets Using Symmetrical Uncertainty and Multi-Layer Perceptron (SU-MLP). In Cognitive Informatics and Soft Computing (pp. 247-256). Springer, Singapore.

[4] Potharaju, S. P., & Sreedevi, M. (2017). A Novel Clustering Based Candidate Feature Selection Framework Using Correlation Coefficient for Improving Classification Performance. Journal of Engineering Science & Technology Review, 10(6).

[5] Thomas, V.J.; Maine, E. Market entry strategies for electric vehicle start-ups in the auto-motive industry–Lessons from Tesla Motors. *J. Clean. Prod.* 2019, *235*, 653–663.

[6] Rina, R.I.; Manohari, G.M.; Leena, R.P. An Empirical Study on Consumer behavior and market Segmentation among Children towards fast food in Coimbatore District. *Asian J. Manag.* 2019, *10*, 357–362.

[7] Nezampour, M.; Rojuee, M.; Jafari Titkanloo, S. Market Segmentation of Nuts and Dried Fruits Based on Customers Expected Values Using DBSCAN Algorithm. *Commer. Surv.* 2022, *19*, 45–68.

[8] Horvat, S.; Došen, O. Managing Private Labels Based on Psychographic Consumer Segments: Emerging European Market Perspective. *Organ. Mark. Emerg. Econ.* 2020, *11*, 461–466.