Developing a Unified Customer Segmentation Framework using Multi-Industry Behavioral Data

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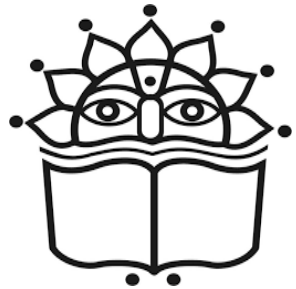

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Introduction

What is RFM and how it is used for customer segmentation ?

- Customer segmentation is crucial for successful advertising campaigns and marketing new products.
- Recency ,Frequency ,Monetary and Diversity.
- RFM Analysis : It assigns scores to each customer based on these three factors and puts them into segments.

Motivation

- To evaluate customer in the sector of electronic commerce by segmenting customers based on RFM values.
- To divide customers into homogeneous clusters based on their RFM values, identify distinct customer segments with specific characteristics and properties.
- Develop successful strategies adaptable to each cluster, optimize advantages and establish a win-win scenario for the organization and its customers.

Literature Survey

Table 1: Literature Survey

Sr.no	Author	Technique Used	Advantages	Gaps
1	Juan Liao et.al. [2022]	MB-RFM model to analyze multiple behaviors	Application utilization and improve targeted promotion	Performance Evaluation Measures are not elaborated
2	A.Joy Christy et.al [2018]	Repetative K-Means Algorithm	Proposed Algorithm has good complexity	RM K-Means problem with clusters

3	A. Syaifudin et.al [2023]	Fuzzy C-Means clustering, Genetic Programming to optimize FCM	GP overcomes local minimum issue in FCM.	Comparison with other clustering algorithms not shown.
4	Hanaa Hachimi et.al [2023].	statistical clustering method	Improved Customer Segmentation considering diversity.	Insufficient explanation of CLV factor calculation in RFM-D model

Problem Statement

To enhance the previous RFM modeling technique to integrate different customer behaivours and implement effective marketing strategy.

Objectives

- Gain insights into customer preferences and needs and understand product development and innovation.
- Develop targeted acquisition strategies to attract new customers who align with existing segments.
- To compare the performance of traditional K-means clustering, Fuzzy C-Means clustering, RM Kmeans, DBSCAN for customer segmentation.

Algorithms And Techniques

Recurrent Neural Networks (RNN):

- For time-series behavioral data, RNNs like LSTMs capture sequential patterns influencing customer segments.

Deep Embedding Clustering (DEC):

- Jointly learn feature embeddings and cluster assignments using deep networks in an unsupervised manner.

Algorithms And Techniques

Variational Autoencoders (VAE):

- Discover latent segments and corresponding profiles via probabilistic modeling using VAEs.

Generative Adversial Networks (GAN)

- Generative synthetic customer profiles via GANs to augment real data and improve generalizability.

Conclusion

Customer segmentation is critical for businesses to leverage the power of data analysis for improved profitability.

Various clustering techniques divides into data into categories of clusters and patterns gives idea for complementary marketing strategies.

Gained valuable insights for effective marketing and contributed to meaningful customer segmentation .

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Thank You