

To Study the Techniques of Data Mining in Retail Marketing: Pilot Study in Nashik

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Abstract: This pilot study explores the techniques of data mining in retail marketing, focusing on Nashik City. Primary data was collected from 20 retailers and 40 customers using structured questionnaires. Techniques such as association rule mining, clustering, and RFM analysis were applied to understand customer behavior, retailer adoption of analytics, and market basket patterns. The findings suggest that while supermarkets are more digitally equipped, kirana stores rely heavily on loyalty. Customers are segmented into value-seekers, loyal kirana shoppers, and omni-channel heavy spenders. Graphs and charts illustrate key patterns in retailer adoption and customer shopping behavior.

Keywords: Data Mining, Data Mining Techniques, Retail Marketing

1. INTRODUCTION

Retail marketing in India is evolving rapidly, with data-driven decision-making becoming a key factor for competitiveness. Nashik City, with its mix of kirana stores and organized formats, provides a unique setting to explore how data mining can enhance marketing effectiveness. This pilot study aims to assess the feasibility of applying data mining techniques in this context using primary data.

2.OBJECTIVES

1. **To identify** the data mining techniques currently adopted by retailers in Nashik City for marketing and customer relationship management.
2. **To analyze** the reasons behind the adoption (or non-adoption) of specific data mining techniques by different types of retailers (kirana, supermarket, specialty).

3. **To examine** customers' shopping patterns and preferences to understand how data mining techniques can be used to segment and target them effectively.

4. **To compare** the application of various data mining techniques (association rules, clustering, classification, RFM analysis) between retailers and customers in the pilot study.

5. **To evaluate** the feasibility of applying advanced data mining techniques in Nashik's retail sector as a foundation for a larger, more comprehensive study.

6. **To provide** actionable insights and recommendations for retailers on leveraging data mining to improve marketing strategies and customer retention.

3. METHODOLOGY

Primary data was collected from 20 retailers and 40 customers in Nashik City using structured questionnaires. Retailer data focused on store type, POS/CRM adoption, and promotional practices. Customer data captured demographics, shopping frequency, channel preference, and spending patterns. Data was analyzed using descriptive statistics and exploratory data mining techniques. Pie charts and bar graphs were used for visualization.

4. RESULTS

The following charts present key findings from the pilot study.

4.1 Retailer Analysis



Fig:4.1: Retailer analysis

4.2 POS Adoption among Retailers(N=20)

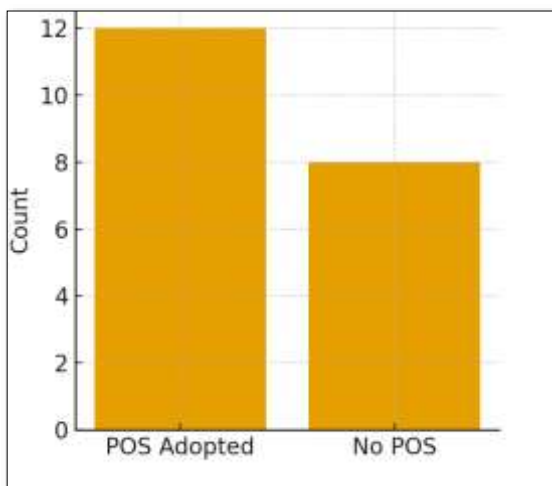


Fig:4.2: POS Adoption among Retailers

4.3 Customer Analysis:

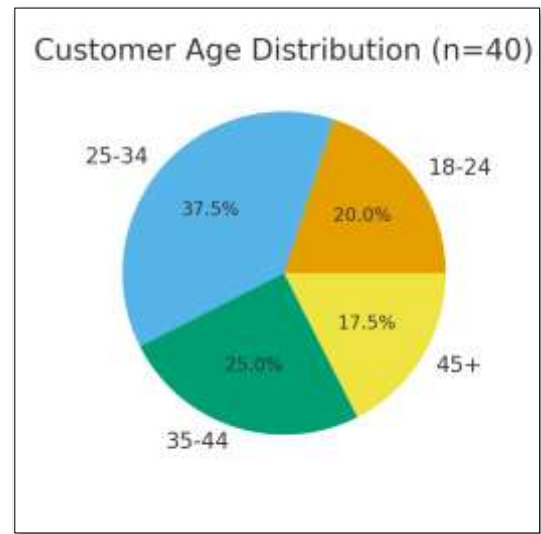
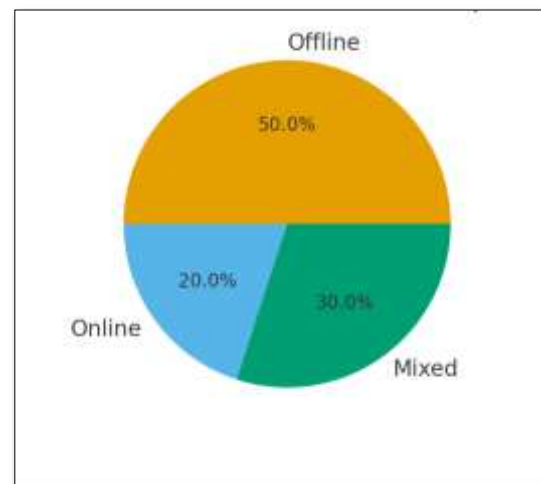


Fig:4.3: Customer Age Distribution

4.4. Customer Channel Preferences(N=40)



5. DATA MINING TECHNIQUES AND THEIR RELEVANCE

This section presents the data mining techniques commonly applied in retail marketing, explaining their purpose and relevance based on the pilot study findings in Nashik City.

5.1 Association Rule Mining

Helps identify products frequently bought together (e.g., bread \Rightarrow butter). Useful for cross-selling and promotions. In Nashik, supermarkets can apply this due to POS systems, while kirana stores lag.

5.2 Clustering (Customer Segmentation)

Groups customers by shopping behavior (frequency, spend, category breadth). Enables tailored promotions. Pilot data suggests three clusters: value-seekers, loyal kirana shoppers, and omni-channel heavy spenders.

5.3 Classification Models

Predicts customer churn or repurchase behavior. Useful for targeted retention. Currently limited in kirana stores; supermarkets experimenting with loyalty card data.

5.4 RFM Analysis

Classifies customers based on recency, frequency, and monetary value. Helps identify champions and at-risk customers. Pilot data shows customers aged 25–34 are frequent and higher spenders.

5.5 Descriptive Statistics & Visualization

Provides baseline insights such as demographics and channel preferences. Pilot revealed kirana dominance (50%), POS adoption (60%), and offline preference (50%).

The following graph illustrates the relative emphasis placed on each data mining technique by retailers in the pilot study:

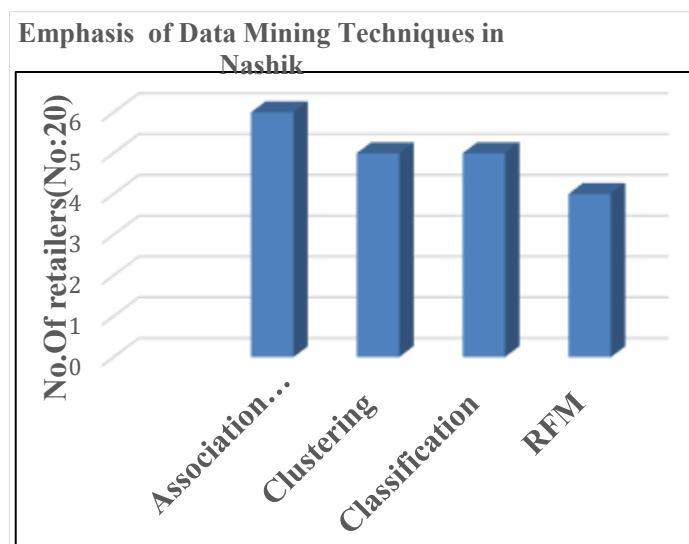


Fig: 5.1: Emphasis of Data Mining Techniques in Nashik

6. DISCUSSION

The pilot study reveals that kirana stores dominate Nashik’s retail landscape but lag in POS/CRM adoption. Supermarkets and specialty stores are ahead in analytics adoption, which positions them better for targeted promotions. Customers are largely between 25-34 years and prefer offline channels, though mixed channel use is emerging. Data mining techniques such as association rules and clustering are feasible in this setting and can guide retailers in assortment planning and customer targeting.

7. CONCLUSION

The pilot study demonstrates the practicality of applying data mining techniques in Nashik’s retail sector. While adoption varies across formats, actionable insights can be generated even from small samples. Future studies should expand the sample size and incorporate real transaction data for robust predictive modeling.

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