
Rajeshri Lanjewar¹ and Om Prakash Yadav²
Chhatrapati Shivaji Institute of Technology, Durg, CG
*Corresponding Author E-mail: rajeshrilanjewar@csitdurg.in, opyadav@csitdurg.in

ABSTRACT

The Milk product industry collects huge amounts of data on sales, customer's buying history, goods transportation, consumption and services. Customer profiling is the method for finding out the specific and similar features or patterns and segmentation is the task of partitioned the data into small clusters or segments. This paper elaborates upon the use of the data mining technique of clustering to segment customer profiles for a milk product company. Clustering can help to identify customer buying patterns and behaviors, improve customer service for better customer satisfaction and hence retention. In addition, the research focuses on profiling customers and finding a relation between the profile and the segments. In any industry, the first step to finding and creating profitable customers is determining what drives profitability. This leads to better prospecting and more successful customer relationship management.

Keywords: Customer Relationship Management (CRM), Data Mining (DM), Profiling and Segmentation.

1. INTRODUCTION

Data mining is the process of extracting valid, useful, previously unknown, and ultimately comprehensible knowledge from large databases [1]. Data mining is considered as a step in the whole process of knowledge discovery problem statement [2]. Data mining techniques can be used efficiently in any business application that involves data, such as: (1) Increasing the business unit and overall profitability, (2) Understanding customer desires and needs, (3) Identifying profitable customers and acquiring new ones, (4) Retaining customers and increasing loyalty, (5) Cross-selling and up-selling, (6) Detecting fraud, waste and abuse, (7) Determining credit risks, (8) Increasing website profitability [20]. Data mining can help companies in better understanding of the vast volume of data collected by the CRM systems [4]. Data mining can identify products that are often purchased together, which can help build product bundles that are more likely to be successful [5]. Today, data mining is being used by several industries including banking and finance, retail, insurance, telecommunications, etc. Other possible applications for data mining include database marketing, sales forecasting, call behavior analysis and churning management in telecommunications; forecasting of demand for utilities, such as energy and water; simulation of chemical and other process reactions; finding critical factors in discrete manufacturing (aerospace, automobile, electronics); CPU usage and forecasting. It can help organizations better understand their business, be able to better serve their customers, and increase the effectiveness of the organization in the long run [5] [22] [25].

1.1. Profiling and Segmentation

Customer profiling integrates several aspects of customers into a rational evaluation, such as customer details, historical records and contact details, customer attractiveness, or customer satisfaction [7][8][9]. Segmenting customers provides approaches to better understand their preferences and to more efficiently allocate resources based on the information. The benefit is two fold: (1) First, it enables companies to differentiate themselves by providing appropriate and suitable services for their customers’ needs; therefore, building up a competitive advantage. (2) Second, it guides the companies to where their most valuable
customers are located and helps allocate major capital, effort and time to generate the most profit [5] [15].

Market segmentation is one of the central concepts in marketing and customer profitability as a segmentation criterion is a newer phenomenon which has become increasingly prevalent in many industries, leading to differential treatment of customers [12] [34] [35] [36]. One of the most important points for customer profiling is targeting valued customer and having special attention to them [11]. Xu and Walton [15] distinguished four criteria for segmenting customers: (1) customer profitability score, (2) retention score, (3) satisfaction and loyalty score, (4) response to the promotion [7] [8] [9]. There are two basic approaches to segmentation: (1) market driven and (2) data driven .

1.2. K-Means ALGORITHM

Input – number of clusters k and data set D containing n objects [25]. Output – A set of k clusters.

1. From D, randomly generate k points as the initial cluster centers.
2. Assign each object to a cluster to which the object is the most similar, based on the cluster mean value and the object value.
3. Re-compute mean of each cluster from the objects in it and update the cluster means.
4. Repeat steps (2) and (4) till there is no change in clusters

2. PROPOSED WORK

Flowchart for proposed work

As shown in figure 1, the procedural steps for predicting the customer profiling and segmentation for milk products. The three basic steps are:

(1) Data Collection and Data Preprocessing:

In the process of data collection we simply collected the reports from MIS department and after that MIS department prepared one excel data sheet. In data preprocessing process the excel sheet was converted in MS Access Database.

(2) Variable Selection and Customer Profiling:

In this process the Specific zone was selected for profiling in procurement table and individual product was selected in product table.

(3) Customer Segmentation or Clustering:

In this process the specific profiled data from procurement and product table was partitioned in different segments and clusters.

3. RESULTS

Results and Observations:

As shown in figure2, Customer Profiling for Procurement Table, the three maximum profitable zones are Raipur(37%), Bilaspur(23%), and Korba (13%) and the minimum profitable zone are Dallirajhara(1%), Rajnandgao(2%) and Both Kanker and Kawardha(3%).

As shown in figure3, Customer profiling for Milk Products, the three maximum profitable products are S.B. Milk (47%), St. Flav. Milk (13%) and Both Paneer
& Lassi (9%), the minimum profitable products are Plain Curd & W. Butter(1%), Khova(3%) and Srikhand(5%).

![Customer Profiling for Procurement](image1)

**Figure 2: Zonewise Profiling**

![Customer Profiling for Milk Products](image2)

**Figure 3. Products Profiling**

### 4. DISCUSSION & CONCLUSIONS

The work discussed here proposes an approach for Customer profiling and segmentation using clustering methods. As it is evident from the results, this system provides better profiling and understanding of customers. A successful profiling and segmentation process demands that a company should define its business objectives. At the start of any segmentation process, management should agree on and clearly state their goals using language that reflects targeting and measurement. Business objectives can be (1) new account, sales, or usage driven; (2) new product driven; (3) profitability driven; or (4) product or service positioning driven. There are three segmentation methods that could be employed: predefined segmentation, statistical segmentation or hybrid segmentation. In this case, the data is known, the work involves a limited number of variables, and a limited number of segments are determined.

### REFERENCES


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