Chapter 13

Customer Behavior Prediction using K–Means Clustering Algorithm

Juhi Singh
Banasthali Vidyapith, India

Mandeep Mittal
Amity School of Engineering and Technology, India

Sarla Pareek
Banasthali Vidyapith, India

ABSTRACT

Due to the increased availability of individual customer data, it is possible to predict customer buying pattern. Customers can be segmented using clustering algorithms based on various parameters such as Frequency, Recency and Monetary values (RFM). The data can further be analyzed to infer rules among two or more purchases of the customer. In this chapter we will present a clustering algorithm, enhanced k- means algorithm, which is based on k- means algorithm to divide customers into various segments. After segmentation, each segment is mined with the help of a priori algorithm to infer rules so that the customer’s purchase behavior can be predicted. From large number of association rules with sufficient coverage, the customer’s purchasing pattern can be predicted. Experiment on real database is implemented to evaluate the performance on effectiveness and utility of the approach. The results show that the proposed approach can gain a well insight into customers’ segmentation and thus their behavior can be predicted.

DOI: 10.4018/978-1-4666-9888-8.ch013
INTRODUCTION

Customer relationship management (CRM) focuses on developing customer relations and improving customer retention which in turn enhances profit. The primary goal of CRM is to identify a customer and understand the customer-buying pattern so that appropriate offers can be made and delivered to the consumer in a personalized format. The increased availability of individual consumer data provides the possibility of direct targeting of individual customers. If we have transactional database of various customers over a certain period of time, we can group them into various categories on the basis of different criteria. Major criteria are recency i.e. how recently the particular customer has done his last purchase, frequency i.e. how many times each customer has purchase some item and monetary i.e. how much each customer has spent in total. After categorization, we can analyze which category generates maximum revenue and can focus more on it making more attractive policies for the customers belonging to that category. Moreover, the generated categories can further be analyzed by applying association rule mining algorithm. Association rules help in finding the correlation between different items. For example, if a customer buys a certain product the possibility that he will buy another product related to that purchase can be predicted i.e. association rules can be used to infer a rule among two or more purchases of a customer. Association rules are of the form that “if item X purchased then item Y also purchased”. With the help of such rules, the nature of purchase can be predicted. From association rules with sufficient coverage, which product the customer tend to buy along with the purchase of particular products, can be predicted. In the proposed work, we have first categorized the consumers into various categories on the basis of their monetary values using enhanced k-means clustering algorithm. The category which generates the maximum revenue is then analyzed and the transactions of the customers belonging to this category are then mined using association rule mining. A numerical example is used to explain the approach. Experiments on real database are implemented to evaluate the performance on effectiveness and utility. The results show that the proposed approach can gain a well insight into customer’s segmentation and thus their behavior prediction.

RELATED WORK

Customer analytics have become a vital tool for success, used to glean important information, anticipate customer behavior and drive loyalty. As businesses evaluate their investments on marketing activities, they tend to focus more on customers behavior and their inclination towards particular products. This information can be used to make appropriate choices to customers, and understand which marketing
Food Consumption Patterns in Times of Economic Recession

www.igi-global.com/article/food-consumption-patterns-in-times-of-economic-recession/185531?camid=4v1a