

A Consuming-Behavior based Clustering Algorithm

Student : Chuang-Cheng Chiu

Advisor : Dr. Chieh-Yuan Tsai

Institute of Industrial Engineering and Management
Yuan-Ze University

ABSTRACT

To satisfy customers' requirements and increase competition in serve market, it is critical for an enterprise to enhance Customer Relationship Management (CRM). Making appropriate marketing segment for customers is the primary task to fulfill a well CRM. Through segmentation, the enterprise can offer suitable products and services to every customer group according to their unique consuming behaviors or contributed profits. To distinguish customers for segmentation purpose, most enterprises/researches uses customers' demographic attributes as clustering variables. However, this approach makes the customers in the same cluster tend to have different consuming behaviors, so that the segmentation result is usually not as satisfied as predicted.

To conquer the difficulties, this research proposes a consuming-behavior based clustering algorithm. The algorithm distinguishes customers into clusters using consuming-behavior variables such as the amount and monetary of products purchased. The algorithm adapts the concept of "support" from association rule algorithm to measure the similarity between customers. Based on the support concept, measurable methods of finding a new centroid customer in each customer cluster and calculating the quality of the clustering result are developed. In addition, to eliminate the drawback of unstable clustering quality due to random centroid selection procedure, this algorithm uses genetic algorithm (GA) to generate new centroid points for each cluster so that a more stable and

better clustering result can be achieved.

The algorithm is applied to a retailer transaction datasets and found that the developed algorithm makes the customers in the same cluster having more similar consuming models. In addition, this algorithm also successfully applies to the customers' transaction data of a credit card issuing bank to accomplish marketing segmentation. It is found that the proposed algorithm is beneficial for the bank to achieve a better and efficient CRM.

Keywords : Data Mining, Clustering Analysis, Consuming Behaviors, Genetic Algorithm,
Customer Relationship Management