Cluster analysis using data mining approach to develop CRM methodology to assess the customer loyalty

Seyed Mohammad Seyed Hosseini *, Anahita Maleki, Mohammad Reza Gholamian

Industrial Engineering Department, Iran University of Science and Technology, Tehran, Iran

ARTICLE INFO

ABSTRACT

Data mining (DM) methodology has a tremendous contribution for researchers to extract the hidden knowledge and information which have been inherited in the data used by researchers. This study has proposed a new procedure, based on expanded RFM model by including one additional parameter, joining WRFM-based method to *K*-means algorithm applied in DM with *K*-optimum according to Davies–Bouldin Index, and then classifying customer product loyalty in under B2B concept. The developed methodology has been implemented for SAPCO Co. in Iran. The result shows a tremendous capability to the firm to assess his customer loyalty in marketing strategy designed by this company in comparing with random selection commonly used by most companies in Iran.

© 2009 Elsevier Ltd. All rights reserved.

1. Introduction

In a B2B environment, suppliers and/or service providers usually need to understand the nature and characteristics of their customers. As customer attraction and satisfaction are the main objectives of any leading company, so the main objective of this article is to provide an effective and efficient methodology to be used for implementing the firm's objective to the best of possible. This part mainly reviews the studies related to customer relationship management, customer loyalty, RFM model, *K*-means algorithm.

1.1. Customer relationship management

Since the early 1980s, the concept of customer relationship management in marketing, and consists of four dimensions: customer identification, customer attraction, customer retention and customer development has gained its importance. It is difficult to find out a totally approved definition of CRM. We can describe it as a comprehensive strategy and process of acquiring, retaining and partnering with selective customers to create superior value for the company and the customer (Parvatiyar & Sheth, 2004). CRM is a comprehensive business and marketing strategy that integrates technology, process, and all business activities around the customer (Anton, 1996; Anton & Hoeck, 2002). Brown points out that CRM as "the key competitive strategy you need to stay focused on the needs of your customers and to integrate a customer-

facing approach throughout your organization" (Brown, 2000). Chatterjee also defines CRM as a discipline which focuses on automating and improving the business processes associated with managing customer relationships in the area of sales, management, customer service, and support (Chatterjee, 2000). According to Feinberg and Kadam, profits increase by 25–80% when customer retention rates increase by five points (Feinberg & Kadam, 2002). CRM projects often fail and only about 40% of CRM implementations are successful (Feinberg & Trotter, 2001).

1.2. Customer loyalty

Creating a loyal B2B customer base is not only about maintaining numbers of customer overtime, but it is creating the relationship with business customers to encourage their future purchase and level of advocacy. Equipped with the knowledge of their business customers' loyalty levels, a supplier will be able to figure how their endeavors to maintain good relationships can contribute to its profit levels. Some authors believe that loyal customers offer a steady stream of revenue for a company by remaining with the brand/supplier and rejecting the overtures of competitors (Lam, Shankar, Erramilli, & Murthy, 2004; Reichheld & Teal, 1996). Considering this with the nature of large purchase and transactions in a B2B setting; there are gigantic rewards for those suppliers who succeed in creating and maintaining loyal customers.

Some Authors have proposed several theories to link variables that one usually finds in relationship marketing and business marketing to the loyalty construct. In the B2B context, evidence shows that relationship elements affect customer loyalty. For example, Ricard and Perrien found that relationship practices have a direct impact on customer loyalty (Ricard & Perrien, 1999). Other Authors

---

* Corresponding author. Tel.: +982177240447; fax: +982177240482.
E-mail addresses: seyedhoseini@iust.ac.ir (S.M.S. Hosseini), anahitamaleki@yahoo.com (A. Maleki), gholamian@iust.ac.ir (M.R. Gholamian).