Chapter 13
Customer Segmentation of Shopping Mall Users Using K-Means Clustering

Amit Kumar

Andhra University, India

ABSTRACT

The most successful companies are the one that know their customers very well and can anticipate their needs. Good customer profiles at the fingertips have businesses improve marketing campaigns, targeting feature launches and product roadmaps. In this study, exploratory data analysis was done on the shopping mall data, and customer segmentation was done using k-means clustering. Two different clusters were done based on age vs. spending score and annual income vs. spending score. Four optimum clusters were obtained for age and spending scores using the elbow graph method, and five optimum clusters were obtained for annual income and spending scores. Firstly, for clusters based on age and spending score, people with higher age groups have less spending scores. Secondly, clusters based on annual income and spending scores had high annual income and very low spending scores. Thus, the mall can offer these cluster customers to attract them, thereby increasing its profits.

INTRODUCTION

The growth of the market has forced older companies to apply marketing strategies to stay competitive in the market as it has become more difficult to survive. Every day, the number of consumers increases significantly, and businesses find it difficult to cater for the needs of every customer. Thus, customer segmentation is used, which is the process of dividing customers into groups based on their common characteristics to target each group efficiently (Smith, 2016). The analysis allows companies to determine what their true customers are buying, thus allowing them to better serve their customers, resulting in customer satisfaction. The analysis also allows businesses to determine their target consumers and improve their marketing tactics to get more revenue. Successful marketing not only requires knowledge about who the customers are but also where exactly they are in the buying process and customer segmentation.

Customer segmentation was previously a challenging and time-consuming task that demanded hours of manual pouring over different tables and querying the data in hopes of finding ways to keep customers together. But, in recent years it has become much easier by the application of machine learning algorithms that tune statistical regularity and data to such problems (Dullaghan & Rozaki, 2017). Machine learning models can process customer data and discover recurring patterns across various features (Janakirman & Umamaheswari, 2014). In many cases machine learning algorithms can help marketing analyst find customer segment that would be very difficult to spot through intuitions and manual examination of data. Customer segmentation is a perfect example of how combination of machine learning and human intuition can create something that is greater than the sum of its parts (Ezenkwu, Ozuomba & Kalu, 2015).

There are few advantages of customer segmentation. The first advantage of customer segmentation is price optimization (Wilson-Jeanselme & Reynolds, 2006). Understanding the customer and financial status of the customers will assist the company to pace up with the price optimization accordingly and thus it helps in better allocation of resources which in return helps the companies to gain economics of scale. The second advantage is that it enhances competitiveness. The More the customer retention, more will be the revenue generated and all of this will enhance their competitiveness in the market. If a company segments the market, then it will know who are its customers and thus it can come up with new products or variations according to the changing preferences of the customers. If the company is vigilant enough then it may also have the first mover advantage. The third advantage is the brand awareness. By segmenting the customers, the company can make the customers well aware of its brand. Identifying the brand will help customers to directly purchase the product which will increase the company's goodwill in the market and the brand value which is established among other competitors. The fourth advantage is acquisition and retention of customer with a personalized connection and the customers which will help the company to win the satisfied customers. Satisfied customers are more likely to retain with the organization who regularly meet up with them. Better customer segmentation will lead to developing a better relationship with prospective customers. Customer segmentation allows the company to learn a great deal about its customers and thereby it can carter to their needs more effectively. The last advantage would be increased revenue and return on interest. By fine tuning the company's marketing message, there will be an increase in revenue because users will be more likely to make a purchase when they are delivered exactly what they need (Mirela & Stanica, 2009).

BACKGROUND

The Role of Data Mining in Customer Relationship Management (CRM)

Customer information can be analyzed using data mining techniques, but clustering and association rules mining are the most common. CRM data mining is based on the idea that past data can contain information that can be useful in the future. Rather than capturing random behavior, corporate data captures customer needs, preferences, propensities and treatments. Data mining aims to extract patterns from historical data. Identifying patterns can be challenging, as they are not always strong, and customer's signals can be confusing. The data mining process involves the separation of signal from noise, which is one of the most difficult things to do. Through data mining, for example, it is possible to reveal distinct customer segments that can be used to develop customized new products and services designed to better meet the specific needs of the customers. The process of data mining can be used to gain valuable customer

Related Content

Dangerous Liaisons?: Ethical Challenges on Entrepreneurship in Family Business
Edgar Ramírez-Solísand Verónica I. Baños-Monroy (2022). *Research Anthology on Strategies for Maintaining Successful Family Firms (pp. 878-897).*
www.irma-international.org/chapter/dangerous-liaisons/288293

Risk-Off Method: Improving Data Quality Generated by Chemical Risk Analysis of Milk
Walter Coelho Pereira de Magalhães Junior, Marcelo Bonnet, Leandro Diamantino Feijóand Marilde Terezinha Prado Santos (2013). *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications (pp. 353-376).*
www.irma-international.org/chapter/risk-off-method/75974

Women on Boards Improving Women's Empowerment Through Entrepreneurship in Turkey
Meltem Ince Yenilmez (2019). *Handbook of Research on Entrepreneurial Leadership and Competitive Strategy in Family Business (pp. 22-41).*
www.irma-international.org/chapter/women-on-boards-improving-womens-empowerment-through-entrepreneurship-in-turkey/225646

CSR Initiatives of Family Firms: An Analysis of Mexican Business Groups
Salvador S. Guajardo, Aurora Correa-Flores, Barbara I. Mojarro-Duránand Alfonso Ernesto Benito Fraile (2019). *Handbook of Research on Entrepreneurial Leadership and Competitive Strategy in Family Business (pp. 149-172).*
www.irma-international.org/chapter/csr-initiatives-of-family-firms/225653

The Use of Collaborative Technologies within SMEs in Construction: Case Study Approach
Vian Ahmedand Aisha Abuelmaatti (2013). *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications (pp. 1341-1357).*
www.irma-international.org/chapter/use-collaborative-technologies-within-smes/76021