IMPLEMENTATION OF CUSTOMIZED PROMOTION SCHEME FOR THE RETAIL INDUSTRY USING MACHINE LEARNING TECHNIQUES

W. A. Thisal Avishka Wijayasekara

A Dissertation Submitted in Partial Fulfillment for the Requirement for

Master of Science in Business Analytics

School of Business

Informatics Institute of Technology, Sri Lanka
in collaboration with
Robert Gordon University, United Kingdom

2021

ABSTRACT

Retail is a key commercial activity as it offers customers the opportunity to purchase goods and services from different types of merchants. Today, the area of retail trade is complex and diverse. It includes the sale of all kinds of physical goods, such as auto parts, medicines, clothing, health products, books and food, as well as the sale of services such as auto repair or carpet cleaning. Retailing is a vital commercial activity, providing customers with an opportunity to purchase goods and services from various types of merchants. According to the U.S. Department of Commerce, total sales in 2015 were about $ 5 billion, while most of the sales were $ 5 billion. In 2015, ecommerce represented only 7.1 percent of revenue. According to the findings of 'The Retail Revelation' by Mr. Rutnam, E, it is hoped that this percentage will grow in the near future and 2019 it will be 9.8%. More than 25 million people in the United States are employed by retailers. Today, one-stop shops are becoming more and more popular among mega-stores, such as malls, restaurants and entertainment venues. Day by day promotion strategies of retail industry is also being developed. They use many business intelligence and unsupervised rule-based machine learning techniques such as content-based filtering and collaborative filtering coming under the association rule, which are to be discussed in this study to develop varies promotion strategies. The main objective of the study is to recognize patterns of customer shopping experience and through that kind of an analysis, the company can identify what customers are needed to be addressed to promote the right product to the right customer.

The main transaction database which is used for the implementation process is a public dataset which can be downloaded through Dunnhumby official website. For the first stage, it has been used loyalty customer transactions within three months and those datasets are cleaned through a Python script which will be discussed more in the research. One of the commonly used application is market basket analysis. On the other hand, one of the rule-based techniques that can be used to find common patterns in large datasets is Association rule. This is coming under the unsupervised machine leaning tools. The main two models