

A New Model for Predicting the Probability of Product Return in Online Shopping

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Abstract

One of the current important issues for online stores regarding online shopping is customer satisfaction from online shopping. Many of the customers who purchase their products online from electronic stores are not satisfied with the products they receive. Some of the reliable online stores follow the policy of "product returns" to increase their customers' satisfaction. According to this policy, if the customers are not satisfied with the products they have received, they can return them to the store under predetermined conditions. Therefore, the purpose of this paper is to present a model based on the factors influencing online customers' satisfaction during online shopping. The presented model in this study is based on the data obtained from eBay Store using data mining and SPSS Modeler. Using this method and well-known algorithms such as CHAID and C&R Tree, and C5.0, a model is created that can predict the order returns at high accuracy. The investigations showed that the values of cross-validation for the accuracy of the models created by CHAID, C&R Tree and C5.0 algorithms on the data set of the three algorithms were 78.6 – 80.1 percent, which confirmed the accuracy of the final model. Research results showed that prediction of the probability of product returns is, in fact, in line with the estimation of the maximum logical costs which determine the logical number of messages and call duration for any product with specific profit and cost so that product returns can be prevented.

Keywords: Online shopping, Data mining, Satisfaction, Product return

1. Introduction

Nowadays, one of the important business challenges among most of the sellers is product return by users. Product returns by users are different from product returns from retailers (to the manufacturer) and it ends by the consumers stopping using the product (usually after several months or years). The cost of returning the customers is considerable (Asadi, Nilashi, Husin, & Yadegaridehkordi, 2017; Ng & Stevens, 2015). In the past, the return fee among electronic retailers such as computer sellers was common by mail orders (Chu, Gerstner, & Hess, 1998). However, nowadays, almost all great retailers present a full refund. The retailers generally believe that a full refund is the best return policy considering the considerable costs of following such a policy.

Online shopping is one of the newest and most popular types of shopping in the present era (Abumalloh, Ibrahim, & Nilashi, 2020; Nilashi et al., 2020). Many people shop online due to different reasons such as being busy or long distances. However, the main problem with this type of shopping is the fact that the products are intangible and they cannot be examined closely, which leads to the customers' dissatisfaction when the products are delivered

in most cases. Some of the reliable online stores are willing to take back their products from dissatisfied customers to increase their customers' satisfaction (Ahani, Nilashi, Ibrahim, Sanzogni, & Weaven, 2019; Asadi, Abdullah, Safaei, & Nazir, 2019; Asadi, Hussin, & Dahlan, 2018; Asadi, Nilashi, et al., 2019; Asadi et al., 2020; Samad et al., 2020; Yadegaridehkordi, Iahad, & Asadi, 2015), which apart from losses for the store will lead to a waste of time, paying extra costs and customers' dissatisfaction.

Product return is one of the main problems in stores, especially online stores. Accordingly, the model that will be presented in the present study can be used by recommender systems or individuals at online stores to reduce the product returns to a significant level. Recommender systems can test the products that they want to recommend to the customers based on their profile and shopping background (Nilashi, bin Ibrahim, & Ithnin, 2014; Nilashi, bin Ibrahim, Ithnin, & Sarmin, 2015; Nilashi, Jannach, bin Ibrahim, Esfahani, & Ahmadi, 2016). In case the model output confirms lack of product return, then the recommendations will be provided for the customers with a higher degree of confidence and in case a customer orders a product whose return is positive according to the model, the customer can be called before sending the product and