UNIVERSITY OF TARTU
Institute of Computer Science
Software Engineering Curriculum

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Customer Churn Prediction and Retention Through Personalised Recommendation System In a SuperMarket

Master's Thesis (30 ECTS)

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Klientide ebalojaalseks muutumise ennetamine ja klientide hoidmine tuginedes personaliseeritud soovitussüsteemile supermarketites.

Lühikokkuvõte:

Ebalojaalsed kliendid on olnud jaemüüjatele võtmetähtsusega saamata jäänud müügitulu valdkonnas, eriti kui see puudutab internetivälist kaubandust. Kuna kliendid ei ole seotud lepingutega, siis nad sageli otsustavad konkurentide kasuks, sest konkurendid pakuvad erinevaid soodustusti ja stiimuleid.

Selleks, et selliseid juhtumeid piirata pakutakse välja raamistik, milles identifitseeritakse kliendid, kes muutvad ebalojaalseteks 3 kuni 6 kuu jooksul, tunduvalt varem järelvalvega masinõppe lähenemisega(Supervised Machine Learning Approach). Kui ebaloojalsed kliendid tuvastatakse, luuakse soovitussüsteem tuginedes nende tehingute ajaloole, soovitamaks neile erinevaid tooteid, misläbi ennetatakse klientide ebaloojalseks muutumist.

Selles töös pakutakse välja uus algoritmiline raamistik ületamaks ebalojaalsete klientide probleem tuginedes soovitussüsteemile. Efektiivseim viis ebaloojalse kliendi identifitseerimiseks tugineb RFM (äsjasus, sagedus ja raha) tunnustele. Mudelid on ehitatud erinevatele tarbjaga ja tema mineviku ostukäitumisega seotud tunnustele. Õige ja eesmärki teeniva algoritmi tuvastamine on võtmetähtsusega ning selleks rakendatakse ja testitakse toimimist mitmete erinevate algoritmidega näiteks otsustusmets, k-lähima naabri meetod, otsustuspuud ning klassifitseerija võimendamismeetod gradiendiga.

Soovitusmudel, mida kasutatakse, on kasutajapõhine kaasfiltreerimismeetod ja asjapõhine soovitussüsteem. Katsed viiakse läbi kasutades reaalseid turult saadud andmeid tõestamaks väljapakutava raamistiku efektiivsust. Seega churn'i ja soovitusmudeliga tuvastatakse potentsiaalsed ebaloojalsed kliendid ning seeläbi suudetakse neid kliente hoida.

Võtmesõnad: masinope, juhendamisega õpe, lahkuvad kliendid, otsustusmets, soovitaja, ennetamine, jaemüük

CERCS: P170, Arvutiteadus, arvutusmeetodid, süsteemid, juhtimine (automaatjuhtimisteooria)

Customer Churn Prediction and Retention Through Personalised Recommendation System In a SuperMarket

Abstract:

Customer churn has been a key area of revenue loss for retailers specifically when it concerns an offline market. As customers are not bound by any contract, it is often the case that they are lost to the whims of discounts and incentives offered by competitors.

In order to curtail this situation we suggest a framework wherein customers who are going to churn in 3-6 months are identified well in advance with supervised machine learning approach. Once churners are identified we train a recommendation system based on their transactional history to suggest products and therefore prevent churners from churning.

In this paper, a novel algorithmic framework is suggested to overcome the churn issue with the help of recommendation system. The most effective way to identify a churner is based on RFM (Recency, Frequency and Money) features. The models are built on various features about the customer and their shopping habits in the past. Identifying the right algorithm which serves the purpose is of utmost importance and for that we apply and test the performance of quite a few algorithms namely Random Forest, K-Nearest Neighbors , Decision Tree, Gradient Boosting Method.

Recommender Model applied are User Based Collaborative Filtering and Item Based Recommmender System. Experiments are performed on real market data to prove the effectiveness of proposed framework. Thus with the help of churn and recommender model, churners are identified and retained.

Keywords: Machine Learning, Supervised Learning, Churn, Random Forest, Recommender, Prediction, Retail

CERCS: P170, Computer science, numerical analysis, systems, control

To the Vice-Dean for Academic Affairs of the Faculty of Science and Technology, University of Tartu

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