A Recommender System for the Upselling of Telecommunications Products

Navin Dookeram*, Zahira Hosein, Patrick Hosein

**Department of Mathematics and Statistics, The University of the West Indies, St. Augustine, Trinidad and Tobago*

ndookeram@yahoo.com, zhosein@tstt.co.tt, patrick.hosein@sta.uwi.edu

***Abstract*—Telecommunication providers are always seeking ways to upsell products to corporate customers. Traditionally, the telecommunication provider's Account Managers build a business relationship with the customers and try to persuade them to upsell. However, only some instances result in a successful upsell while others are unsuccessful. First, we focus on a binary classification framework for predicting the successful upsell of products and services, using data from one such telecommunications provider. Through this prediction model, we illustrate a recommender system for voice products/services to corporate customers of the telecommunications company. We use a logistic regression classifier to automate the selection of customers that are most likely to upsell. We also acknowledge that there may be monetary costs associated with misclassification errors. Note that minimizing losses (or maximizing revenue) may conflict with the objective of minimizing errors and so we address this trade-off. We apply our predictive model to recommend a set of target customers to approach for upsell, illustrating the different accuracy results for different cost weightings. We also show that the success rate of upselling products to the selected customers is dramatically improved when compared to the traditional approach.**

***Keyword*—Recommender System, Binary Classification, Cost Optimization, Machine Learning, Upselling, Telecommunications**

Navin Dookeram (M'22) was born in Trinidad and Tobago on 4th February, 1996. Navin attended the University of the West Indies, St. Augustine, Trinidad and Tobago. He holds a BSc. Petroleum Geoscience (2017) and an MSc. Statistics (2020) degree, and is currently pursuing a PhD in Statistics, all via the University of the West Indies. He has worked as an intern at Schlumberger, Trinidad (2016-2017), as an associate professional and part time demonstrator in the Department of Mathematics and Statistics, UWI (2017-2019), as a data science intern at the Telecommunications Services of Trinidad and Tobago (2019-2020).

Zahira Hosein is a Business Analyst within the Enterprise group of Telecommunications Services of Trinidad and Tobago Limited (TSTT) for the past 10 years. Through analytical dashboards and data models focused on business customers and products, she supports the executive, management and operational teams to make timely data backed decisions. Prior to joining the Enterprise group, she has 12 years IT experience at TSTT. She is experienced in several BI tools. She earned her MBA (Distinction) from Heriot-Watt University in 2021, and a Bachelor of Science Degree in Computer Science from The University of the West Indies in 1995.

Prof. Patrick Hosein. Patrick attended the Massachusetts Institute of Technology (MIT) where he obtained five degrees including a PhD in Electrical Engineering and Computer Science. He has worked at Bose Corporation, Bell Laboratories, AT&T Laboratories, Ericsson and Huawei. He has published extensively with over 150 refereed journal and conference publications. He holds 41 granted patents in the areas of telecommunications and wireless technologies. He was nominated for the Ericsson Inventor of the Year award in 2004, was the Huawei US Wireless Research Employee of the year for 2007 and is a 2015 Anthony Sabga Caribbean Laureate for Science and Technology. Patrick is presently the administrative and technical contact for the TT top level domain, CEO of the TTNIC and a Professor of Computer Science at the University of the West Indies. His present areas of research include Applied Data Science, Operations Research and Performance and Pricing Optimization for Cellular Networks.