Universidad Internacional de la Rioja

Masters Thesis

Building a predictive model for CSR Backlog at Ericsson

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A thesis submitted in fulfilment of the requirements

for the

Msc. BIG DATA AND VISUAL ANALYTICS

July 2020

Declaration of Authorship

I, Erika Meyer Kvalem Soto, declare that this thesis titled, 'Building a predictive model for CSR Backlog at Ericsson' and the work presented in it is my own. I confirm that this work submitted for assessment is my own and is expressed in my own words. Any uses made within it of the works of other authors in any form (e.g., ideas, equations, figures, text, tables, programs) are properly acknowledged at any point of their use. A list of the references employed is included.

Acknowledgements

To my granmother Aogot Kvalem.

To all the covid-19 victims and health personnel.

I want to truthfully thank my family and my close friends who have always been supporting me and encouraging me to keep moving forward.

Big thanks to Gonçalo San Payo and Filip Gvardjan for their technical support on the machine learning issues. Thanks to the whole team of Automation and Applications at Ericsson led by Tamara Gomez. Thanks to my colleagues Kelmer Klimovas, Rafael Jose Pachon, Ivan Lara Javier Gismero for their unconditional help.

Abstract

The data handled by telecommunications companies nowadays is massive and of increasing complexity. Traditionally, network incidence management has been done in a reactive way, however this approach falls short when dealing with such large data load. For this purpose, a predictive procedure is needed. This work focuses on developing a predictive classification model for the duration of network incidence management. This process is currently being performed by telecommunication experts at Ericsson. This project deals with network incidences, called Customer Service Request (CSR) at Network Managed Services Delivery (NMSD) Support and Repair organization. The scope is narrowed only for the Customer Unit (CU) Iberia composed of Spain and Portugal. The predictive model will work on forecasting a classification of time ranges, for the time without answer of a CSRs. This is an internal Key Performance Indicator (KPI) known as Backlog. Being able to foresee this value, will allow to perform a pre-emptive network maintenance by automatically and statistically detecting early anomalies. Thus, optimizing resource allocation and budget planning by driving internal actions. Moreover, this prediction is useful information to provide to the customer. In this way the client will know approximately how long it will take until the incidence is solved. Providing the client with this knowledge will increase customer satisfaction and the quality of the service. The prediction of Backlog affects other KPIs such as Turn-Around-Time (TaT). TaT measures the total time since the CSR was opened until a Formal Answer(RST) is delivered. Backlog and TaT are KPIs closely monitored by Support and Repair organization to ensure CSR response time. Making predictions about them will allow to fulfill the high market expectations and remain competitive.

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Abbreviations

CSR	Customer Service Request
CU	Customer Unit
KPI	Key Performance Indicator
TaT	Turn-Around-Time
RST	Formal Answer
NMSD	Network Managed Service Delivery
CART	Classification and Regression Trees
PCA	Principal Component Analysis
GS	Global Support
EDA	Exploratory Data Analysis
LS	Local Support
OLS	Ordinary Least Squares
OvR	One Versus Rest
SVM	support Vector Machine
KNN	K-nearest neighbor algorithm
ARIMA	Auto regressive integrated moving average
RMSE	Root Mean Squared Error
OFI	Opportunities for improvement
EDA	Exploratory data analysis
ETL	Extraction, transformation and loading
SMOTE	Synthetic Minority Over-sampling Technique
LDA	Linear discriminant analysis
PCA	Principal Component Analysis