DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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CSE6011: Data Mining

Forecasting SMS Traffic and Balance Availability with Machine Learning

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Chapter 1

Introduction

This report presents a comprehensive analysis of SMS traffic and balance availability for a specific set of clients, with a particular focus on predicting potential service interruptions during holidays. By utilizing advanced machine learning techniques, such as **polynomial regression**, we aim to accurately forecast future SMS traffic and balance levels, enabling clients to optimize their usage and avoid unexpected service disruptions.

By using advanced data analytics, this study provides a comprehensive forecast of SMS traffic and balance levels, enabling organizations to proactively manage their client communication strategies and resource allocation. This predictive model accurately anticipates SMS traffic during peak periods, such as holidays, and offers hourly updates on balance levels for the next two days, ensuring a seamless and uninterrupted service experience for clients.

Ultimately, this research contributes to the field of machine learning applications and provides practical solutions for organizations seeking to effectively manage their SMS balance allocation to clients, particularly during peak demand periods like holidays.

1.1 Background

1.1.1 The Problem

In today's fast-paced world, SMS communication has become an integral part of our daily lives. For organizations with a large customer base, managing SMS traffic and ensuring

adequate balance availability can be a complex challenge, especially during peak periods such as holidays. Service interruptions due to insufficient balance or overloaded networks can lead to customer dissatisfaction and financial losses.

1.1.2 The Solution

To address these challenges, this report presents a comprehensive analysis of SMS traffic and balance prediction & automation for a specific set of clients. By employing advanced machine learning techniques, such as **polynomial regression**, we aim to develop a predictive model that can accurately forecast future SMS traffic and balance levels. This information will empower organizations to make informed decisions regarding their communication strategies and resource allocation, ensuring a seamless and uninterrupted service experience for their clients.

1.1.3 The Benefits

- **Improved Service Quality:** Accurate predictions of SMS traffic and balance levels will enable organizations to proactively address potential issues, ensuring a consistent and reliable service experience for their clients.

- **Optimized Resource Allocation:** By understanding future demand, organizations can allocate resources more efficiently, reducing employees hours of struggle during the holidays and minimizing service disruptions.

- **Enhanced Customer Satisfaction:** A reliable and uninterrupted SMS service can significantly improve customer satisfaction and loyalty.

- **Data-Driven Decision Making:** The insights gained from this analysis will provide organizations with a data-driven foundation for making informed decisions about their SMS communication strategies.

This report aims to contribute to the field of machine learning applications and provide practical solutions for organizations seeking to optimize their SMS communication infrastructure and deliver exceptional customer service.

1.2 Literature Review

1.3 Research Gap

1.4 Objectives

- The objectives of this paper is to develop a predictive model using advanced machine learning techniques to accurately forecast masking and non-masking SMS traffic and balance levels for a specific set of clients. More specifically the purpose of this project is generate next 2 days predictions.

- To identify potential service interruptions during peak periods, such as holidays, and provide early warnings to organizations and it's clients.

- To enable organizations to optimize their SMS communication strategies and resource allocation by providing timely information on SMS traffic and balance levels.

- To contribute to the field of machine learning applications by demonstrating the effectiveness of polynomial regression in predicting SMS traffic and balance.

- To provide practical solutions for organizations seeking to improve their SMS communication infrastructure and deliver exceptional customer service.

Chapter 2

Methodology

2.1 Corpus Collection

2.1.1 Description of the data sources used

For this project, data from Wintel Limited was used. To achieve better results and improve model building, a real-life, real-time dataset will be used, ensuring more accurate and practical outcomes.

2.1.2 Data Collection Process

In wintel each 4 hours a cron/scheduler will be called where this model will work and generate the predictions. For Both masking and non-masking sms traffic and balance seperate models will be called. In each day approximately 6 times the this process will work. We will pick last 180 days dataset from database and use it to the model.

2.1.3 Data preprocessing techniques

For data preprocessing

2.2   Training Data

2.3   Test Data

Chapter 3

Experimental Results and Analysis

Chapter 4

Conclusion and Future Works