

Chapter 10

Case Studies on the Use of Data Mining Techniques in Data Science

ABSTRACT

This chapter presents data science research conducted by authors Sarawut Ramjan and Jirapon Sunkpho, showcasing the use of RapidMiner to gather data from social networks. The research includes the analysis of customer satisfaction for mobile applications, predicting condominium prices in Bangkok, and discovering demand and supply patterns based on Thai social media data using the association rule mining approach. Additionally, the chapter touches on other topics such as corrosion under insulation severity classification for carbon steel in a marine environment and variables that influence pilot's safe driving. The chapter is beneficial for readers without data science experience and for businesses interested in employing data mining techniques. The research highlights that software application skills are not the only important factor, but also understanding the processes of data science, such as data exploration, data pre-processing, data mining, and data presentation, which are essential and useful skills.

INTRODUCTION

This book has mentioned data mining techniques both in nature Supervised-Learning and Unsupervised Learning using RapidMiner as a data analysis tool. Several case studies from the author's researches are presented as examples for analyzing real data. They are not only the application of data mining techniques to process the data, but also cover other processes of data science work. The case studies consist of 1. Analysis of customer satisfaction in using Mobile Application, published in the journal "Thammasat Review", 2. Predicting Condominium Price in Bangkok Using Web Mining Techniques, published in the journal "Srinakharinwirot Research and Development", and 3. An Association Rule Mining Approach to Discover Demand and Supply Patterns Based on Thai Social Media Data, published in an International Journal of Knowledge and Systems Science. 4. Corrosion under Insulation Severity Classification for Carbon Steel in Marine Environment which is a part of Independent Study of Data Science Program that

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author is advisor as well as 5. Variables Influence Pilot's Safe Driving which is a part of Independent Study of Data Science Program that author is an advisor.

THE CASE STUDY ON ANALYZING CUSTOMER SATISFACTION ON A MOBILE APPLICATION USING DATA MINING TECHNIQUES (SUNKPHO & HOFMANN, 2019)

The case study shows the analysis on customer satisfaction using mobile app services of state-owned energy enterprises in the metropolitan area of Bangkok, Thailand. The analysis follows CRSIP-DM Process, which this book has already mentioned in Chapter 1. The researcher found that Data used to reflect performance of the state energy enterprise is the satisfaction of users on services related to information technology and one important service, the Mobile App.

Mobile App is available to users as they can access the Mobile App to check the amount of energy usage each month. The app notifies important news, such as the cessation of energy services for infrastructure repairs, the area where the power is interrupted and unable to provide service, and payment channel.

Business Understanding

In the Business Understanding process, the key is that Energy enterprises have questioned the variables that effect customer satisfaction and dissatisfaction so that SOEs can develop features. Therefore, the researcher has formulated a problem for data analysis, namely Classification of data that should be used to predict customer satisfaction.

Data Understanding

After that, the researcher entered the Data Understanding process. Datasets collected customer satisfaction on mobile apps were imported into RapidMiner software to conduct surveys. The data are satisfaction level, gender, age, education, amount of mobile app usage per year, mobile app usage per month, reliability and mobile app usage in emergency situations. From the survey data, it was found that there were 81% of customers satisfied with using the mobile app at a level 4 - 5 on the Likert Scale, and 19% of the customers showed a satisfaction level of 3 or lower.

1. **Data Exploration:** The researchers then used Tableau software to perform Data Exploration for deeper data, which consists of Customer satisfaction on App Feature and User Experience. The overall satisfaction level was at a very level. However, the least satisfied part of the data was data security. As for the App Feature, the part which need to be improved and showed the least satisfaction was the Payment Feature. In the User Experience section, the overall satisfaction was at very satisfied level.
2. **Data Quality Verification:** Researchers have prepared the data by manipulating the Missing Value. It was found that the Demographic Data had a total of 26 Missing Values. There was no missing value in terms of reliability and usability of the Mobile App in emergency situations. There was 0 data because the customer had never used the Mobile App in such a manner.

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