

“Revyew”

Hotel Maintenance Issue Classifier and Analyzer using Machine Learning and Natural Language Processing

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Abstract- Hospitality and tourism industry websites attract a lot of customers that book hotels on a regular basis. The modern trend to book hotels is through online websites due to the convenience and discounts offered. When a customer visits a hotel they usually post a positive or negative review about their experience on the respective booking website. Identifying maintenance related issues from these reviews is a major problem that even most large hotel chains face. There are many applications for customers related to that area (such as hotel aggregators) but there are only a very few applications for the hotel management to improve their workflow and provide a better service to the customers. This research is to explore a method to analyze hotel reviews and extract maintenance related problems and present them in a user-friendly manner for the hotel management to take the necessary action. It explores the use of machine learning techniques such as binary classifiers, multiclass classifiers along with natural language processing techniques such as sentiment analysis to extract maintenance related issues from text and categorize the issues. A publicly available data source of reviews was used to test and the results show that the SVM classifier performs best for both cases.

Index Terms—Machine Learning; Natural Language Processing; Sentiment Analysis; Support Vector Machines

I. INTRODUCTION

Hospitality and tourism industry has a trend of using online websites for bookings and reservations. Hotels are registered under many or all available booking websites such as TripAdvisor, Agoda, Expedia [1] and such websites have a lot of customers who book on a regular basis. 148.3 million bookings are made online each year, and majority of travelers use websites like TripAdvisor before making the booking. [2]. After a customer visits a hotel, they can leave a rating and also write a review about the hotel based

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on their experience. Customers are free to leave both a positive or negative feedback. Some reviews have mixed reactions. In the studies done by Tzsjii and his team, it was found that, online reviews influence a lot of travelers [3]

‘Mintek’ states that it takes shorter than 60 seconds for a tourist to form an impression about the hotel. [4] Therefore, the hotel management has to make sure the experience is pleasant for the tourist in order to gain a good review at the end of the stay. If by any chance, there is some issue in the hotel; the management should be aware of it and take some action to solve it. The problem is that most hotels have an issue of prioritizing and classifying these reviews and complaints. As a result, they fall behind on providing necessary solutions. This in return leads them to lose customers and build a bad reputation in the long term.

Maintenance based issues are inevitable. No matter how good the equipment is, materialistic things could break after a certain time period. For an example, if a hotel room has air-conditioning and if the air-conditioning unit fails, the management should take some quick action to claim the warranty to fix it or replace it immediately. If the hotel promises to have a room with air-conditioning but if the air-conditioners are broken, that creates a big issue where a guest will have a terrible experience. This is why it is important to always be in touch with what is happening and have an eye out for the reviews and complaints made. Especially for large hotel chains that get many customers each day, it is a challenge to keep up to date with the customer reviews and improvement suggestions. It is very important to make sure the quality and standard of the hotel is always protected.

When there are issues about the hotel mentioned in the reviews, the hotel management has to know about it in order to fix it. This is where user reviews can be analyzed to identify such issues. An automated system made with the latest technology will make this process easier and the hotel will not necessarily need to have a dedicated person to check the issues at the hotel as well.

A guest at a hotel, should always feel that the hotel “truly cares” about the guests and strongly value their opinions. With the correct method, the customer fulfilment can be expanded while creating more income for the hotel[5]. Staggering 84% of customers improve their opinions about the hotel if the hotel management has responded to reviews and taken the necessary action [6]. Using this input to improve the experience for the customers will help hotels