Chapter 13
Analysis and Prediction of Customer Sentiment for Real Estate Organizations Using Machine Learning Approaches

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ABSTRACT

The purpose of the current study was to analyse and predict of customer sentiment towards real estate organizations using Machine Learning Approaches (ML) approaches. The study employed five ML models to predict customer sentiment toward real estate organizations. The data was collected from Yelp.com and filtered using the "Real Estate" tag. The findings revealed that all four machine learning models effectively classified the review text. The logistic regression (LR) and support vector machine (SVM) models achieved the highest accuracy scores at 93.1 and 93.16, respectively. This study emphasizes the potential of machine learning in improving customer experience and facilitating better decision-making in the real estate industry. The results can guide real estate organizations in understanding customer opinions and preferences, enabling them to make necessary improvements. Additionally, the findings have social implications, as they can enhance products, services, and overall customer experiences, leading to increased satisfaction and trust in the industry.

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1. INTRODUCTION

Real estate encompasses various aspects related to land, buildings, air rights, and underground rights. It involves the creation, acquisition, and sale of properties, including both land and permanent structures (Ricciotti et al., 2022). The real estate market involves a wide range of investments, such as land, buildings, immovable properties, interests in real estate, and housing as a whole. Managing assets, properties, and buildings is a crucial part of the value chain (Kwakye & Haw, 2021). The real estate industry plays a vital part in the global economy, environment, and society. However, it has been consistently ranked as having a low level of digital maturity compared to other industries (Saari et al., 2022). Due to the complexity of real estate and the diverse expertise required, real estate firms are recognized as highly knowledgeable entities. They need to continuously adapt and acquire new skills to thrive in their unique industry (Azmi et al., 2015).

Property valuation organizations, whether governmental or private, are examples of service-oriented entities within the real estate sector. These organizations engage in extensive client consultation and provide expert guidance on real estate matters. Their services include property valuations, property management, project feasibility reports, real estate brokerage, market research, and among others (Azmi et al., 2015). Overall, the real estate industry encompasses a broad spectrum of activities, requiring specialized knowledge and offering a range of services to meet the diverse needs of clients.

Moving on to consumers, it is crucial to understand how well a company's product or service satisfies its target market. It's a powerful tool that can help businesses in many ways, including boosting profits and decreasing marketing expenditures (Chepukaka & Kirugi, 2019). Nothing makes clients feel more valued than asking for and valuing their reaction. Customers' ability to voice their opinions online has opened the door for marketing executives to gain valuable insight into their products and services (Rambocas & Pacheco, 2018; Erevelles et al., 2016). There are already a huge number of buyer reviews posted online that are yonder the visual capacity of any single person. So there is a demand for new approaches to evaluating consumer reviews. Sentiment analysis is therefore helpful for automatically identifying online reviews (Hossain and Rahman, 2022). Since data is now accessible digitally, extensive user data analysis is encouraged. Data scientists, researchers in artificial intelligence, and people working in the internet sector are all fascinated by how customers behave. Reviews are a fundamental source of customer evaluation on the online platform (Hossain and Rahman, 2022).

All businesses rely on customer feedback, including the real estate business. Customer reviews can help businesses learn more about their products or services. Consequently, a review basis will help businesses find more profitable clients and develop offers that are tailored to their needs. With more and more people using the internet, feedback from consumers takes on greater significance. Organizations can respond to customers' feedback in a unified space where it has been aggregated from multiple sources (Adak et al., 2022). It has been stated that analyzing customer feedback is essential for modern businesses.

On the other hand, customizing customer ratings is a tedious process that takes a lot of time and effort. That's why it's crucial for companies to implement reliable systems for monitoring and analyzing social media user reactions. According to Mohammad (2016), recent developments in ML have led to the development of computer systems that act like humans. Due to the proliferation of digital news, information, and opinionated data as well as the development of more sophisticated textual analysis methods, sentiment analysis (SA) has become a focus of research in the field of natural language processing (NLP). With the advent of more powerful computers, researchers have a new tool for analyzing textual documents. Consequently, of these developments, researchers in the real estate industry were able to develop new sentiment proxies that go beyond the standard measures of sentiment used in the past, such as closed-end fund discounts and survey-based measures (Hausler et al., 2018). When applied to fields like government policy, public health, business, the social sciences, and the arts, sentiment analysis (the automated detection of emotions in text) opens up possibilities that were previously unavailable. Recent research (Feizollah et al., 2019; Ainin et al., 2020; Luo & Xu, 2021) has also utilized customer reviews as a means of assessing customer satisfaction. Sentiment analysis (SA), also denoted to as judgement mining, is a technique for