

## **Predicting the Quality of E-Commerce Products using Machine Learning**

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### **Abstract**

E-commerce product reviews are vitally important for maintaining a positive reputation and for increasing sales opportunities. Generally, there are thousands of reviews available for a product and therefore, it is time consuming to analyze reviews to get the idea of the product manually. This study is focused on evaluating the quality of e-commerce products by analyzing reviews gathered from AliExpress online marketing. In this analysis, a security camera product was selected, and 568 textual reviews were collected for this product. Then, after preprocessing, this dataset was divided into a training (80%) set and a testing (20%) set for analysis. Reviews in English language were selected for this research and therefore non-textual elements such as emojis were disregarded. To address potential imbalances in the dataset, particularly in instances of class imbalance, the Synthetic Minority Over-Sampling Technique (SMOTE) was employed. This technique helped to ensure a more equitable representation of different classes within the dataset. After that, binary vectorization method was used to transform the text data into numerical vectors, facilitating the application of machine learning techniques. The Support Vector Machine (SVM) served as the chosen machine learning model for this analysis, achieving a remarkable training accuracy of 95.8% and a testing accuracy of 86% of the prediction model. Then a prediction pipeline designed method was used to classify the reviews as either "positive" or "negative," assessing the quality based on the customer feedback. The results of this analysis are presented in graphical and tabular formats, aiding potential consumers in making informed purchasing decisions. This model helps consumers to quickly see the quality of the product, as it reviews all the data providing a predictive model for product quality. Despite limitations, our approach offers valuable insights for consumers navigated online marketplaces, aiding them in evaluating the desirability and worthiness of products under consideration.

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