

# Sentiment Analysis of Public Opinions on the McDonald's Boycott Movement Using CNN and Word2Vec Feature Extraction

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**Abstract**—McDonald's has been the subject of a global boycott movement due to the company's assumed approach and behavior amid the geopolitical tension in the Middle East. During this time, implementing sentiment analysis becomes crucial for McDonald's to understand public perception and monitor brand reputation across social media platforms. Although sentiment analysis has been utilized to examine boycott campaigns broadly, current research predominantly utilizes singular model architectures. It fails to provide a targeted analysis of the effects on individual brands. Moreover, previous research has primarily concentrated on English-language content, resulting in a deficiency in comprehending sentiment patterns within varied linguistic environments. Therefore, this study presents a comprehensive evaluation of deep learning and traditional machine learning approaches for classification, comparing the performance of a Convolutional Neural Network (CNN) with Support Vector Machines (SVM) implementing different kernel functions. This research aims to analyze and classify public opinion in the context of the McDonald's boycott movement, evaluating sentiment trends in Indonesian society. This research revealed that the strongest performance was reached by CNN, with an accuracy of 94.40% and an F1-score of 94.94%. In comparison, SVM utilizing the Polynomial kernel maintained comparable performance with an accuracy of 93.75% and an F1-score of 94.00%. This performance highlights CNN ability to efficiently manage sentiment classification problems through its hierarchical feature extraction.

**Keywords**—sentiment analysis, CNN, SVM, McDonald's boycott, Indonesia

## I. INTRODUCTION

In the digital era, social media has emerged as a powerful tool for individuals to express opinions and share their viewpoints on a variety of topics, including brands and socio-political issues. A prominent example of this phenomenon is the trend of boycotting major brands such as McDonald's, which is frequently linked with a variety of issues ranging from unethical business practices to perceived involvement in geopolitical conflicts. McDonald's has reportedly failed to meet its sales targets for the past four years amid the boycott trend [1].

With boycott trends emerging on social media, sentiment analysis is becoming a valuable tool for companies to understand the public's perception of their brand. Sentiment analysis, which uses machine learning techniques to classify the polarity of opinions in text, is a rapidly growing area of research.

Social media text analysis is becoming more sophisticated, therefore sentiment analysis methods have evolved. Rule-based strategies are straightforward to implement and

comprehend; yet, they frequently encounter difficulties with context-dependent phrases, sarcasm, and the informal language prevalent in social media posts. Conventional machine learning methods like Support Vector Machine (SVM) offer a balance between computational demands and efficacy. While more computationally intensive than rule-based techniques, they use fewer resources than deep learning models. SVM can struggle with scalability with large datasets, especially in training time and memory. Due to these restrictions, deep learning methods like Convolutional Neural Network (CNN) and transformer-based models have excelled at handling contextual information and semantic complexities [2].

Research related to sentiment analysis is quite common, so it is necessary to pay attention to the method chosen. In 2024, Delva and Lhaksmana examined sentiment analysis of the Palestine-Israel conflict in X and utilized CNN and Word2Vec embedder to classify public statements [3]. The CNN method got 93.85% accuracy, 93.76% precision, 93.95% recall, and 93.86% F1-score. On the other hand, the research done by Rizky et al. uses SVM with 3 kernels namely Linear, Polynomial, and RBF to classify the sentiment expressed on the Twitter dataset. RBF with oversampling achieved the highest accuracy of 88% compared to the Linear and Polynomial kernels which are only 86% and 84% respectively [4].

The objective of this study is to find the best classification model for the McDonald's boycott movement observed in X. To determine which one of the two models is the most successful, a detailed comparison is presented.

## II. METHODS

### A. Research Design

This research begins with reviewing related literature to gain an understanding of the problem and some approach suggestions for solving it. The study continues by crawling data from X (formerly Twitter) and analyzing it to select the features, which are then visualized. During the preprocessing stage, data is cleaned to improve the accuracy, dependability, and efficiency of the analysis or modeling process. Word2Vec is employed as a feature extraction method to transform textual data into dense vector representations, capturing semantic relationships between words based on the contextual usage in the dataset. Furthermore, the dataset is segmented into two sets: data train and data test. After that, CNN and SVM will be applied to the dataset for classification. Then, each model will be evaluated to decide which model is the best. A flowchart of the research process is provided in Fig. 1.