PERBADINGAN KINERJA MACHINE LEARNING PADA ANALISIS SENTIMEN TOPIK BOARD OF PEACE DI MEDIA SOSIAL X MENGGUNAKAN RANDOM FOREST, SUPPORT VECTOR MACHINE, K-NEAREST NEIGHBOR, DAN *NAÏVE BAYES*

Nama Mahasiswa	:	Abiyyu Valin Zavero
NIM	:	3012211001
Pembimbing	:	Taufiqotul Bariyah, S.Kom., M.IM.

ABSTRAK

Platform X merupakan salah satu tempat bagi masyarakat untuk menyampaikan opini terhadap berbagai isu yang sedang panas, termasuk topik terkait *Board of Peace*. Penelitian ini bertujuan menganalisis sentimen publik di media sosial serta membandingkan kinerja algoritma *Random Forest*, *Support Vector Machine* (SVM), *K-Nearest Neighbor* (KNN), dan *Naïve Bayes*. Dataset yang digunakan berjumlah 4.364 tweet berbahasa Indonesia yang terdiri atas sentimen positif, negatif, dan netral. Data melalui tahapan pelabelan manual, *preprocessing*, ekstraksi fitur menggunakan TF-IDF, serta mengatasi ketidakseimbangan kelas *dataset* dengan SMOTE dan Tomek Links. Evaluasi dilakukan menggunakan *5-fold Stratified K-Fold Cross Validation* dengan metrik *accuracy*, *precision*, *recall*, dan *F1-score*. Hasil penelitian menunjukkan algoritma *Naïve Bayes* memperoleh *accuracy* tertinggi sebesar 83%, *Random Forest* memperoleh *precision* tertinggi sebesar 60%, sedangkan SVM memperoleh *recall* tertinggi sebesar 73% dan *F1-score* tertinggi sebesar 60%. KNN memperoleh performa paling rendah dengan *accuracy* sebesar 19% dan *F1-score* sebesar 22%. Berdasarkan keseimbangan antara *precision* dan *recall*, SVM menunjukkan performa paling baik berdasarkan nilai *F1-score*. Penelitian ini juga menghasilkan prototipe website untuk melakukan klasifikasi sentimen terhadap teks baru.

Kata Kunci: Analisis Sentimen, *Board of Peace*, X (X), Machine Learning, *Random Forest*, SVM, KNN, *Naïve Bayes*

PERFORMANCE COMPARISON OF MACHINE LEARNING ALGORITHMS FOR SENTIMENT ANALYSIS ON THE "BOARD OF PEACE" TOPIC ON SOCIAL MEDIA PLATFORM X, USING RANDOM FOREST, SUPPORT VECTOR MACHINE, K-NEAREST NEIGHBOR, AND NAÏVE BAYES

Student Name	*:* Abiyyu Valin Zaverto
Student Identity Number	*:* 3012211001
Suvervisor	*:* Taufiqotul Bariyah, S.Kom., M.IM.

ABSTRACT

Platform X serves as a prominent medium for the public to express opinions on trending issues, including topics related to the Board of Peace. This study aims to analyze public sentiment on social media and compare the performance of Random Forest, Support Vector Machine (SVM), K-Nearest Neighbor (KNN), and Naïve Bayes algorithms. The dataset comprises 4,364 Indonesian-language tweets categorized into positive, negative, and neutral sentiments. The data underwent manual labeling, preprocessing, and feature extraction using TF-IDF, while class imbalance was addressed using SMOTE and Tomek Links. Model evaluation was performed using 5-fold Stratified K-Fold Cross Validation across accuracy, precision, recall, and F1-score metrics. The results indicate that the Naïve Bayes algorithm achieved the highest accuracy at 83%, Random Forest secured the highest precision at 60%, whereas SVM attained the highest recall at 73% and F1-score at 60%. Conversely, KNN recorded the lowest performance with an accuracy of 19% and an F1-score of 22%. Considering the balance between precision and recall, SVM demonstrated the most robust performance based on the F1-score. Furthermore, this research successfully developed a website prototype for classifying sentiment on newly inputted texts.

***Keywords**: Sentiment Analysis, Board of Peace, X (X), Machine Learning, Random Forest, SVM, KNN, Naïve Bayes*