ABSTRACT

IMPLEMENTATION OF THE SUPPORT VECTOR MACHINE ALGORITHM FOR DIABETES MELLITUS PREDICTION USING PATIENT DATA FROM RSUD PROF. DR. MARGONO SOEKARJO

By

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Diabetes Mellitus (DM) is a chronic disease with a prevalence that continues to increase each year and has become one of the major challenges in the healthcare sector. This study aims to develop a risk prediction model for DM using the Support Vector Machine (SVM) algorithm on patient data from RSUD Prof. Dr. Margono Soekarjo. SVM was chosen for its ability to effectively classify non-linear data. The study employs a data mining approach consisting of data preprocessing, modeling, evaluation, and analysis stages. The dataset includes variables such as age, gender, blood pressure, glucose level, and body mass index (BMI). The results show that SVM with the RBF kernel achieved the best performance, with an accuracy of 93%, precision of 93%, recall of 94%, and an f1-score of 93%. Feature importance analysis revealed that glucose and BMI were the most significant contributors in predicting diabetes risk, while blood pressure, age, and gender had a lesser impact. It can be concluded that the combination of SVM with the RBF kernel and oversampling technique (SMOTE) is the most optimal method for predicting diabetes mellitus on this dataset. This study is expected to assist healthcare professionals in early diagnosis and serve as a foundation for developing technology-based diabetes risk prediction applications to support better clinical decision-making..

Keywords:** **Diabetes Mellitus, Support Vector Machine, Classification, Model Evaluation, Prediction