Penerapan Algoritma *K-Nearest Neighbor* Untuk Deteksi Dini Diabetes Melitus Berdasarkan Rekam Medis Pasien Rawat Inap di RSD dr. Soebandi Jember. *Application of K-Nearest Neighbor Algorithm for Early Detection of Diabetes Mellitus Based on Medical Records of Inpatients at RSD dr. Soebandi Jember*. Mudafiq Riyan Pratama, S.Kom., M.Kom. (*Supervisor*)

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ABSTRACT

At RSD dr. Soebandi Jember, half of the patients with diabetes mellitus (DM) are diagnosed after complications occur, and DM ranks as the third leading cause of death among non-communicable diseases, with a percentage of 13.6%. This leads to an increase in mortality and morbidity due to delayed diagnosis. This study aims to develop a web-based early detection system for DM using the K-Nearest Neighbor (K-NN) classification algorithm. The development method follows the Waterfall model, which includes the stages of communication, planning, modeling, construction, and deployment. Data comes from the medical records of 342 inpatients, and after preprocessing, 164 clean data entries are obtained. The variables used include age, gender, family history, blood pressure, random blood sugar, and body mass index (BMI). The data is divided using a stratified sampling technique with a 50:50 ratio, and the value of K=5 is selected based on the best performance. Functionality testing uses the blackbox testing method to ensure all system features work as intended. System performance testing compares the classification results with the test data. The results show that the system achieves an accuracy of 97.56%, precision of 100%, and recall of 95.83%. Based on the high accuracy and consistency with results from the WEKA tool, the system is expected to serve as a screening tool to support the prevention and control of DM cases. Further development may involve adding additional risk factor variables not yet included in the detection form to enhance the classification process.

Keywords: *Diabetes Mellitus, Early Detection, K-NN, Waterfall, Medical Records*