

PREDIKSI DIABETES MELITUS TIPE II DENGAN *DECISION TREE* DI RSUD MUHAMMADIYAH BANTUL

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INTISARI

Latar Belakang: Diabetes Melitus Tipe II (DMT2) merupakan penyakit kronis yang terus meningkat di Indonesia, termasuk di RSUD Muhammadiyah Bantul. Prediksi dini risiko DMTII sangat penting untuk pencegahan komplikasi. Teknologi informasi kesehatan seperti rekam medis elektronik (RME) dan penerapan machine learning dapat membantu mengidentifikasi pola risiko penyakit. Salah satu metode klasifikasi yang potensial adalah algoritma Decision Tree.

Tujuan Penelitian: Memprediksi risiko Diabetes Melitus Tipe II menggunakan algoritma Decision Tree berdasarkan data Rekam Medis Elektronik di RSUD Muhammadiyah Bantul.

Metode Penelitian: Penelitian menggunakan pendekatan kuantitatif dengan data sekunder berupa 1.122 data pasien DMTII periode Januari-Desember 2024. Tahapan pengolahan data mengikuti metode CRISP-DM (*Cross Industry Standard Process for Data Mining*) yang terdiri dari *business understanding*, *data understanding*, *data preparation*, *modelling*, dan *evaluation*. Atribut yang digunakan meliputi usia, jenis kelamin, tekanan darah sistolik dan diastolik, indeks massa tubuh (IMT), serta gula darah sewaktu (GDS). Pemodelan dilakukan menggunakan *RapidMiner* dan evaluasi akurasi diperoleh melalui *confusion matrix*.

Hasil Penelitian: Hasil penelitian ini menunjukkan bahwa algoritma *Decision Tree* menghasilkan tingkat akurasi yang tinggi dalam mengklasifikasikan data pasien, dengan akurasi mencapai 93,50%, *precision* sebesar 92,21%, *recall* sebesar 96,95%, dan *F1-score* sebesar 96,07%. Hal ini menunjukkan bahwa model mampu melakukan prediksi secara tepat dan konsisten.

Kesimpulan: Penelitian ini membuktikan bahwa algoritma Decision Tree efektif dalam memprediksi risiko Diabetes Melitus Tipe II di RSUD Muhammadiyah Bantul dengan pendekatan CRISP-DM dan aplikasi RapidMiner. Model klasifikasi yang dibangun menggunakan data rekam medis elektronik mampu mengidentifikasi faktor risiko utama dan menghasilkan akurasi yang baik, sehingga mendukung deteksi dini, pengambilan keputusan medis, serta pencegahan diabetes secara sistematis.

Kata Kunci: *Decision Tree*, Diabetes Melitus Tipe II, Prediksi, Rekam Medis Elektronik, Data Mining

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PREDICTION OF TYPE II DIABETES MELLITUS WITH DECISION TREE AT PKU MUHAMMADIYAH HOSPITAL, BANTUL

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ABSTRACT

Background: Type II Diabetes Mellitus (TIIDM) is a chronic disease that continues to rise in prevalence across Indonesia, including at RSU PKU Muhammadiyah Bantul. Early risk prediction of TIIDM is crucial for preventing complications. Health information technologies such as electronic medical records (EMRs) and the application of machine learning can help identify disease risk patterns. One potential classification method is the Decision Tree algorithm.

Objective: To predict the risk of Type II Diabetes Mellitus using the Decision Tree algorithm based on Electronic Medical Record data at RSU PKU Muhammadiyah Bantul.

Methods: This study employed a quantitative approach using secondary data consisting of 1122 TIIDM patient records from January to December 2024. The data processing stages followed the CRISP-DM (Cross Industry Standard Process for Data Mining) methodology, which includes business understanding, data understanding, data preparation, modeling, and evaluation. The attributes used included age, gender, systolic and diastolic blood pressure, body mass index (BMI), and random blood glucose (RBG). Modeling was conducted using RapidMiner, and model accuracy was evaluated using a confusion matrix.

Results: The study found that the Decision Tree algorithm produced a high accuracy in classifying patient data, achieving 93.50% accuracy, 92.21% precision, 96.95% recall, and a 96.07% F1-score. These results indicate that the model is capable of making accurate and consistent predictions.

Conclusion: This research demonstrates that the Decision Tree algorithm is effective in predicting the risk of Type II Diabetes Mellitus at RSU PKU Muhammadiyah Bantul using the CRISP-DM approach and RapidMiner application. The classification model built from electronic medical record data is capable of identifying key risk factors and achieving strong accuracy, thereby supporting early detection, medical decision-making, and systematic diabetes prevention.

Keywords: Decision Tree, Type II Diabetes Mellitus, Prediction, Electronic Medical Records, Data Mining

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