

TODDLER GROWTH PREDICTION SYSTEM USING THE PROPHET METHOD BASED ON HISTORICAL GROWTH DATA

(Sistem Prediksi Pertumbuhan Balita Menggunakan Metode Prophet Berdasarkan Data Historis Pertumbuhan)

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ABSTRACT

Monitoring toddler growth is a critical effort in preventing chronic nutritional problems such as stunting, which remains a significant health challenge in Indonesia, yet current monitoring at community health posts (Posyandu) is conducted manually and reactively, resulting in delayed nutritional interventions. This study designed and implemented a toddler growth prediction system based on the Prophet method, integrated into an Android application named Kawan Tumbuh, developed using the Flutter framework with a Python (Flask) backend, utilizing 259 historical records of Posyandu toddlers aged 24–60 months, configured with a growth=logistic parameter consistent with the biological growth pattern of toddlers, capable of predicting three key anthropometric indicators — weight, height, and head circumference — for 1–3 months ahead along with nutritional status classification based on Z-Score according to WHO and Indonesian Ministry of Health standards. Model evaluation results demonstrated excellent performance: weight achieved MAE of 0.309 kg, RMSE of 0.339 kg, and MAPE of 1.88% (accuracy 98.12%); height achieved MAE of 0.285 cm, RMSE of 0.320 cm, and MAPE of 0.27% (accuracy 99.73%); and head circumference achieved MAE of 0.131 cm, RMSE of 0.140 cm, and MAPE of 0.27% (accuracy 99.73%). Expert validation using an ISO/IEC 25010-based instrument yielded a feasibility score of 89.29% classified as Highly Feasible, while Black-Box Testing on 20 toddler samples produced a nutritional status classification accuracy of 90.00% against expert diagnosis as the gold standard, demonstrating that the system is effective and feasible for implementation as an Android-based nutritional monitoring tool in Posyandu settings.

Key words: *Android, Flutter, Kawan Tumbuh, Posyandu, Growth Prediction, Prophet, Stunting, Z-Score.*