ABSTRACT

IMPLEMENTATION OF THE RANDOM FOREST ALGORITHM TO PREDICT PACKAGE ARRIVAL TIME IN A MOBILE-BASED APPLICATION
(Case Study: *Toko Limbah Sultan*)

By:
NAYANDRA FAHRI HIMAWAN
2111010127
E-mail: fahrihim.2111010127@mail.darmajaya.ac.id

The rapid growth of e-commerce demands delivery systems capable of providing accurate package arrival time predictions to enhance customer satisfaction. This study aims to implement the Random Forest algorithm in a mobile-based e-commerce application for *Toko Limbah Sultan*, a business specializing in second-hand footwear. The Random Forest algorithm was used to predict package arrival time based on variables such as distance, road conditions, traffic conditions, weather, service type, packing process, and package weight. The system was developed using the Waterfall software development model, which consisted of requirement analysis, design, implementation, testing, and maintenance phases. The application was built using Java in Android Studio, with PHP serving as the API connector and MySQL as the database management system. System testing using Black Box Testing demonstrated that all functionalities operated correctly and met user requirements. The findings indicated that implementing the Random Forest algorithm provides more accurate package arrival time predictions and enhances delivery transparency for customers of *Toko Limbah Sultan*.

Keywords: Random Forest, Arrival Time Prediction, E-Commerce, Android