Design and Implementation of an Android-Based Delivery Note Application Integrated with a Bluetooth Thermal Printer in a Sugar Production System

Dr. Ir. Nurul Zainal Fanani, S.ST., M.T. *as a thesis supervisor*

Ilmi Alfiah

Mechatronik Engineering Technology Study Program

Engineering Department

ilmialfiah16@gmail.com

ABSTRACT

This study aims to address human error and logistical delays caused by manual sugar production recording by designing an automatic delivery note printing system on an Outsea PLC-based conveyor. The system integrates an HC-05 Bluetooth module for data communication, an MIT App Inventor-based Android application with TinyDB local storage, and a thermal printer. Based on performance evaluation using the Quality of Service (QoS) method, the Bluetooth connection is maintained up to 60 meters under Line of Sight (LoS) conditions and 50 meters under Non-Line of Sight (NLoS) conditions. The system demonstrates highly reliable data performance with a throughput of 125 Bytes/second (or tiny/second), 0% packet loss within the operational range, and an average printing time of 4 seconds, which is primarily influenced by the printer's mechanical process. Overall, the implementation of this design successfully automates logistics administration, ensuring fast, accurate, and digitally documented production data management.

Keywords: *Conveyor, PLC Outseal, Bluetooth, MIT App Inventor, Printer Thermal, Quality of Service (QoS).*