

***Development of an IoT-Based Smart Clothesline System
Using ESP32 with Real-Time Weather Monitoring
Through an Android Application***

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ABSTRACT

Unpredictable weather changes often complicate the activity of drying clothes, especially for busy individuals who are not always at home. This research aims to develop an Internet of Things (IoT)-based smart clothesline system that can respond to weather changes in real time. The system uses an ESP32 microcontroller connected to a YL-83 rain sensor and an LDR light sensor to detect weather conditions and control a stepper motor to automatically move the clothesline.

Information from the sensors is sent to the Firebase Realtime Database and displayed through an Android application, allowing users to monitor the status of the clothesline and the weather in real time, as well as issue manual commands through the application. The methodology used in this research is the Waterfall software development model, starting from requirements analysis, design, implementation, and testing. System testing demonstrated that the clothesline can respond accurately to weather conditions, both automatically and through manual control.

The system is also capable of sending notifications of weather changes and clothesline status to users quickly. The final results of this study demonstrate that the integration of ESP32, weather sensors, Firebase, and an Android application can create an effective, efficient, and user-friendly smart clothesline system.

Keywords: *Internet of Things (IoT), Smart Clothesline, Sensor, Firebase, Android.*