## Prototype of Application of Deep Learning Method for Predicting Temperature and Humidity in Tobacco Warehouse Based on Internet of Thing

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## ABSTRACT

Tobacco quality is greatly influenced by environmental conditions during storage, especially temperature and humidity. Fluctuations in these two parameters can cause a decrease in tobacco quality, which has an impact on its selling value and export eligibility. This study aims to develop a prototype of a temperature and humidity prediction system in a tobacco warehouse using the Deep Learning method with Long Short-Term Memory (LSTM) architecture, which is integrated through Internet of Things (IoT) technology. This system consists of a DHT22 sensor, an ESP8266 microcontroller, and Laravel and Flask-based applications. Temperature and humidity data are collected in real-time and processed by the LSTM model to produce predictions for the next five minutes. The results of model training showed the best performance in the 40th epoch with a temperature prediction accuracy of 99.69% and humidity of 98.56%. This system is able to display actual data and predictions through an interactive dashboard. Testing of sensors and models shows that the system has a high level of accuracy and can be relied on to help warehouse managers maintain tobacco quality proactively. Thus, this prototype has the potential to be a preventive solution for intelligent control of the tobacco storage environment.

**Keywords**: *Deep Learning*, LSTM, *Internet of Things*, *Temperature Prediction*, *Humidity Prediction*, *Tobacco*.