

ABSTRACT

Indonesia is an agricultural country that has a dependency on the horticulture sub-sector. Bok choy is included in the mustard greens group as one of the strategic products from the horticulture. The needs for mustard greens are getting higher. Based on Indonesia's Central Statistics Agency data in 2019, the mustard beans production rate increases only 2.63 % higher than in 2018. If it does not meet the desired supply, it opens the possibility of a lack of bok choy supply at the market, resulting in high potential price fluctuations. These conditions initiate relevant system research to help the farmer develop a bok choy crop reference guide, especially in the seeding phase.

In reducing the limitations caused by the lack of science and knowledge in the farmer environment, the prediction model is the proposed outcome by considering the use of IoT mechanism that has widely developed. The model is based on a system that integrates IoT's interest in the agriculture field, namely smart farm, for retrieving real-time data based on automatic control, MySQL database for storing data, and machine learning technique to establish the prediction model as the guide for the farmers to find appropriate parameters for planting bok choy. The prediction model performs using Python, a high-level popular programming language due to its ease and open source. Python interprets the bok choy growth dataset based on the irrigation system scenario from the integrated system with the relevant library of data preprocessing interest and the Decision Tree algorithm of the Scikit-learn library to train the model. The system conducts a series of machine learning phases to take the insight analysis needed to create a prediction model.

This thesis's expected result is an ideal prediction model that results from the global system dataset based on the previous undergraduate thesis created as a reference guide for the farmer environment in planting bok choy during the seeding phase. The model performance metrics as the consideration in deciding the outcome model, which are accuracy and precision.

Keywords: IoT, smart farm, machine learning, Python, Decision Tree, Scikit-learn, dataset.