

ABSTRACT

The export value of ornamental fish reached USD 20.5 million or IDR 326.1 billion in 2022, with koi fish as one of the main commodities. Optimal water quality is crucial for the growth and health of koi fish, with key parameters including water temperature, room temperature, water pH, and water turbidity (TDS). Currently, koi fish farmers measure water temperature using thermometers and pH using litmus paper, which are inefficient and time-consuming methods. Based on this background, a platform is needed to help koi farmers monitor pond water conditions in real-time and facilitate decision-making in koi pond management to minimise sudden fish deaths due to drastic changes in water quality. This study aims to create a smart dashboard that can collect pond water quality data using Internet of Things (IoT) technology. Water quality prediction is performed using the Seasonal Autoregressive Integrated Moving Average (SARIMA) model with configuration (1,0,1)(1,0,1)[24]. The prediction results show good accuracy with MAPE of 5.08% for pH, 2.86% for Total Dissolved Solids (TDS), 19.38% for water temperature, and 22.44% for room temperature. The system was developed using the prototyping method to ensure that each feature meets user needs. Testing results indicate that the dashboard can notify of potentially harmful water quality changes. User interface testing using the Single Ease Question (SEQ) showed an average score of 6.5, with the highest score for the "Login" scenario (7.00) and the lowest for the "Adding New IoT Device" scenario (5.80). The System Usability Scale (SUS) assessment gave an average score of 91, which falls into the "Excellent" category and is equivalent to grade "A".

Keyword: SARIMA, smart dashboard, prototyping, water quality monitoring, water quality predictions