

ABSTRACT

Swiftlet nest cultivation requires stable environmental condition management because habitat quality is influenced by fluctuations in temperature, humidity, and air quality. The monitoring and operational recording processes using separate tools such as *spreadsheets* and digital documents cause operational data to be scattered across various media, thereby hindering centralized data updates. This research aims to develop a *mobile*-based swiftlet nest management application named Smartlet to support periodic environmental monitoring and livestock operational activity management within a single *mobile* platform. The software development *method* used is *Waterfall*, which includes the stages of *requirements*, *System and Software Design*, *implementation*, integration and system testing, and *maintenance*. The application is developed using the Flutter framework on the Android platform with a *Layered Architecture*. The *mobile* application connects to *backend* server services using a REST API to access telemetry data collected by *Internet of Things* (IoT) devices consisting of temperature, humidity, and ammonia *sensors*. The main features developed include periodic environmental monitoring that utilizes *sensor* data sent by *hardware* devices every 10 seconds, swiftlet house management, remote device control, harvest data management, financial transaction recording, notification systems, and report generation. The research results indicate that the Smartlet application has been implemented in accordance with the defined functional requirement specifications. Testing shows the system is capable of displaying *sensor* data with periodic updates every 1 minute on the control page, executing remote device control instructions, providing historical data logs, and facilitating harvest and financial data recording. Thus, the Smartlet application can be utilized as a centralized tool for periodic monitoring and operational management of swiftlet houses.

Keywords : Flutter , *Internet of Things*, *Mobile*, Swiftlet Nest Farming, *Waterfall*.