# ABSTRACT

Baby incubators are vital for maintaining the health of premature babies by ensuring stable and standardized conditions. However, the standardization and quality monitoring of incubators in healthcare facilities are often manual, which is time-consuming, resource-intensive, and prone to inaccuracies.

To overcome these challenges, this research develops an innovative system based on Artificial Intelligence of Things (AIoT) for baby incubator standardization management. This system integrates Internet of Things (IoT), Artificial Intelligence (AI), and cloud computing technologies in one connected platform to simplify and accelerate the process of standardizing baby incubators. The system features various advanced sensors, such as DS18B20 for temperature, DHT22 for humidity, MQ135 for air quality, KY-037 for sound, YF-S201 for airflow, LDR for light intensity, and MAX30102 for heart rate, which are integrated in one platform for comprehensive monitoring. The Isolation Forest algorithm detects temperature and humidity anomalies efficiently without requiring labeled data. A website and mobile application provide real-time access, facilitating user-friendly monitoring and management.

Based on the test results, the StandBy hardware successfully integrated with the Supabase platform, while demonstrating optimal security indications. In addition, the implemented artificial intelligence (AI) model achieved an accuracy rate of 97% in detecting anomalies. The results of user experience testing on the website and mobile application showed an average score of 4.61 and 4.64, which falls into the category of "Strongly Agree." The integration of each subsystem shows optimal performance, thus ensuring a more consistent fulfillment of quality standards. However, this system still has limitations, such as the potential decrease in model accuracy due to data changes, dependence on internet connection, and the need for user interface improvements.

Keywords: AIoT, Cloud Computing, Health Monitoring, Incubator Standardization, Isolation Forest.