Test Strategy Document: AetherWing Mobile Application

**1. Introduction**

The AetherWing project aims to create an innovative birdhouse with various sensors such as temperature, camera, humidity, controllable LED lights, and a feeder. This document outlines the Test Strategy to ensure the quality and functionality of the smart birdhouse system.

The Test Strategy is crucial for guiding the testing process and ensuring that the final product meets the desired quality standards. It provides a comprehensive approach to testing, focusing on achieving project objectives.

The key objectives of the testing process are to validate the functionality of sensors and features, ensure seamless integration, and verify user interactions for optimal user experience.

**2. References**

This Test Strategy document has been formulated based on industry standards and best practices for software testing. References include:

* ISO 25010 for software quality certification
* Partial MIL-STD-810 standards for durability and reliability testing.
* Blynk 2.0: <https://blynk.io>

**3. QA Deliverables**

The Quality Assurance (QA) team will produce the following deliverables:

* Test Plans: Detailed plans outlining the testing approach, scope, objectives, and for each feature.
* Test Cases: Comprehensive test cases covering various scenarios for sensors, user interactions, and system features.
* Defect Reports: Detailed reports of any defects identified during testing.
* Test Summary Reports: A summary of testing activities, results, and recommendations.

**4. Test Management / Test Approach**

The Test Management / Approach includes:

* The QA team will be responsible for test planning, execution, and reporting. Developers will collaborate on test case creation and defect resolution.
* The testing process will include unit, integration, and system testing. Additionally, usability testing and compatibility testing will be conducted.
* Entry criteria involve test environment and test data availability. Exit criteria include successful completion of test cases and resolution of critical defects.
* Supported operating systems are Windows 10 and 11

**5. Scope of Testing**

The scope of testing encompasses:

* Sensor Functionality: Thorough testing of temperature, humidity, and camera sensors to ensure accurate readings and data capture.
* User Interaction: Testing user interface and interactions, including LED light control and feeder functionality.
* System Integration: Verifying seamless communication between sensors, software components, and external systems.
* Network Connectivity: Tests the Wi-Fi network connectivity and capability to enable remote access and data transmission of the application.

**6. Test Environment**

The test environment will consist of:

* Hardware: Smart birdhouse prototype built with NodeMCU and equipped with sensors and microcontrollers.
* Software: Firmware for sensor control and data processing.
* Network: Local Wi-Fi network for communication with mobile devices.

Prerequisite setups will involve sensor calibration and software installation on the birdhouse hardware.

**7. Testing Tools**

Testing tools to be utilized include:

* Arduino IDE: For programming and uploading firmware to microcontrollers.
* Blynk: Testing and interacting with the microcontrollers and see real-time updates on the app.

These tools will aid in efficient test case execution, defect tracking, and documentation. This Test Strategy document serves as a guideline for the testing process and ensures the successful development of the smart birdhouse system, meeting both functionality and quality requirements.