UNIVERSITI TEKNOLOGI MARA

IOT-BASED SOLUTION FOR CONTINUOUS MONITORING AND MANAGEMENT OF STRAWBERRY CROP FARMING

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ABSTRACT

The generic issues that Malaysian strawberry plants may encounter, without mentioning the current circumstances specifically. Several issues affect strawberry plants, including weather, soil, and irrigation [1]. Because of these issues many strawberry farmers face a lot of consequences such as the product will comes out with low quality, the death of the crop and so on. Thus, the issues experienced by strawberry farmers in Malaysia can be efficiently addressed by an IoT-based system for continuous monitoring and control of strawberry crop farming using Arduino UNO, pH sensor, MQ-135(for monitoring air quality including CO2 levels) sensor, soil moisture sensor, LED, mini water pump, and LCD. Data is gathered by the Arduino UNO microcontroller from the pH sensor, MQ-135 sensor, and DHT11 sensor. Farmers can regulate irrigation, ventilation, and climate control using this real-time data to generate the best possible growing conditions for strawberries. The solution makes use of the LED and mini water pump to provide visual and tactile feedback, such as when regulating airflow or signalling when watering is necessary. Farmers can quickly manage illnesses, pests, and unfavourable conditions thanks to the LCD display's real-time information and notifications. The IoT-based system enables farmers to effectively manage their strawberry crops and increase productivity and ensure high quality yields by merging these elements.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Growing strawberry harvests is a challenging task for farmers in the modern world, especially in locations like Malaysia. An innovative method for resolving these problems and boosting crop yields has been devised: an Internet of Things-based system for continuous supervision and control of strawberry crop cultivation. This system makes use of contemporary hardware such as LCD displays, mini water pump, pH sensors, MQ-135 gas sensors, soil moisture sensors, LED indicators, and Arduino microcontrollers. By combining these components, the Internet of Things-based solution offers real-time data collection and analysis, enabling farmers to take precise action to enhance growth conditions and make well-informed decisions.

There are numerous benefits that the IoT-based system provides for strawberry farming in Malaysia. By employing the pH sensor to monitor and adjust the degree of soil acidity, farmers can accurately control the nutrient availability and pH balance required for the optimal plant growth. Effective ventilation and air circulation control are essential for a healthy growing environment. The MQ-135 sensor measures air quality, including CO2 levels, and makes these tasks possible.

Next, at the centre of the system is the Arduino UNO microcontroller, which functions as its brain. It collects and analyses sensor data to provide data sharing and real-time networking. This enables farmers to optimise growth conditions for strawberries through data-driven decision-making, cultivation technique modification, and timely intervention. The output devices provide farmers with feedback and information that they can utilise to make decisions. These devices include LCD displays, mini water pump, and LED indicators. Mini water pump can control ventilation systems to provide the best possible air circulation, and LED indicators can