IOT ENABLED HYDROPONIC FARM MONITORING USING ARDUINO & CLOUD

THESIS

Proposed as a requirement for obtaining
Sarjana degree at
Business Information Systems
Master Track (Macquarie) – Information Systems Management
Education Level Strata-1 (Sarjana/Bachelor)

by

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BINUS UNIVERSITY
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2024

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Business Information Systems

Master Track (Macquarie) – Information Systems Management

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Abstract

This case study focuses on the development of an Arduino and PHP based integrated hydroponic farm monitoring system by leveraging IoT and cloud technologies. The system's objective is to deliver relevant environmental parameter data, such as parts per million (PPM), pH levels, CO_2 levels, humidity, and temperature, to greatly optimize the routine hydroponic monitoring activity performed by JUST HYDROPONICS.

Preliminary information collection is done qualitatively, which is used in the system's conception process. The Arduino is used as the sensor. The detailed specifications of the Arduino's software and hardware are discussed in detail, including the specific models of the components and subcomponents used in the creation of the Arduino prototype, which are specifically compatible with Arduino. The web application provides the users with an interface to visualize the collected data. The web API, which is built into the web application serves as a receiver for data from the Arduino. The design of the web application and API are also discussed in detail. The cloud platform provides application hosting, data storage, and remote access to the system.

Primary evaluation of the system's performance is done by studying the system's accuracy and reliability. A secondary evaluation is done qualitatively by directly interviewing JUST HYDROPONICS's owners & management about the system's impact and effectiveness.

The findings of this case study contribute to the progress of research on IoT and precision agriculture, which are highly important fields in addressing the sustainability and security of food in the world. The findings of this case study should be easily adaptable to a variety of hydroponic farm types.

Key Words

IOT, Hydroponic, Farm, Arduino, Cloud

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