i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

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Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality . I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH

WELCOME MESSAGE (i-SPiKE 2023 CHAIR)

We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPiKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPiKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail
Chair
3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

IOT SMART IRRIGATION MONITORING AND CONTROLLING SYSTEM

Thanissa A/P Ganason
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ABSTRACT

The IoT-based smart irrigation monitoring and controlling system is designed to optimize water usage, conserve resources, and improve crop productivity in agriculture and landscaping. By integrating soil moisture sensors, weather stations, actuators, and a central control platform, the system collects real-time data on soil moisture levels and weather conditions. Through advanced data analytics, it determines the optimal irrigation schedules and activates actuators to deliver precise amounts of water to plants or crops. The system promotes water conservation by minimizing wastage and provides farmers and users with real-time monitoring and control through a mobile or web interface. With its ability to enhance water efficiency, crop yield, and scalability, this smart irrigation system contributes to sustainable agricultural practices and resource management.

INTRODUCTION

Agriculture is the practice of growing crops and raising animals for food and other essential products. It is crucial for food security, economic development, and sustainability. Agriculture combines knowledge, technology, and sustainable practices to meet global food demands and support communities worldwide.

PROBLEM STATEMENT

The agriculture industry faces numerous challenges such as inefficient resource management, unpredictable weather patterns, rising labour costs, and increasing pressure to meet the growing global demand for food. These challenges lead to issues like water wastage, overuse of pesticides and fertilizers, crop losses, and reduced profitability for farmers. Additionally, the lack of real-time monitoring and data-driven decision-making hampers the ability to optimize agricultural operations and respond effectively to changing conditions. There is a need for innovative solutions that leverage IoT technology to address these challenges, improve efficiency, sustainability, and profitability in agriculture, and ensure food security for a growing population.

OBJECTIVE

Here, we have developed remarkable innovation to address difficulties in agriculture. Our innovation offers solutions such as:

Water Conservation: IoT smart irrigation systems optimize water usage by monitoring soil moisture levels, weather conditions, and plant water requirements, reducing water waste and conserving water resources.

Increased Efficiency: Precise control of irrigation schedules based on real-time data improves the efficiency of water and energy usage in agriculture.

Cost Savings: By optimizing water usage and reducing resource wastage, IoT smart irrigation systems lead to cost savings in water bills, energy expenses, and maintenance costs.

Remote Monitoring and Control: Farmers can remotely monitor and control their irrigation systems through mobile applications or web interfaces, providing convenience and flexibility in managing their operations.

Early Detection of Issues: IoT sensors can detect anomalies such as leaks, equipment malfunctions, or changes in environmental conditions, allowing farmers to take timely action and prevent potential problems.

METHODOLOGY

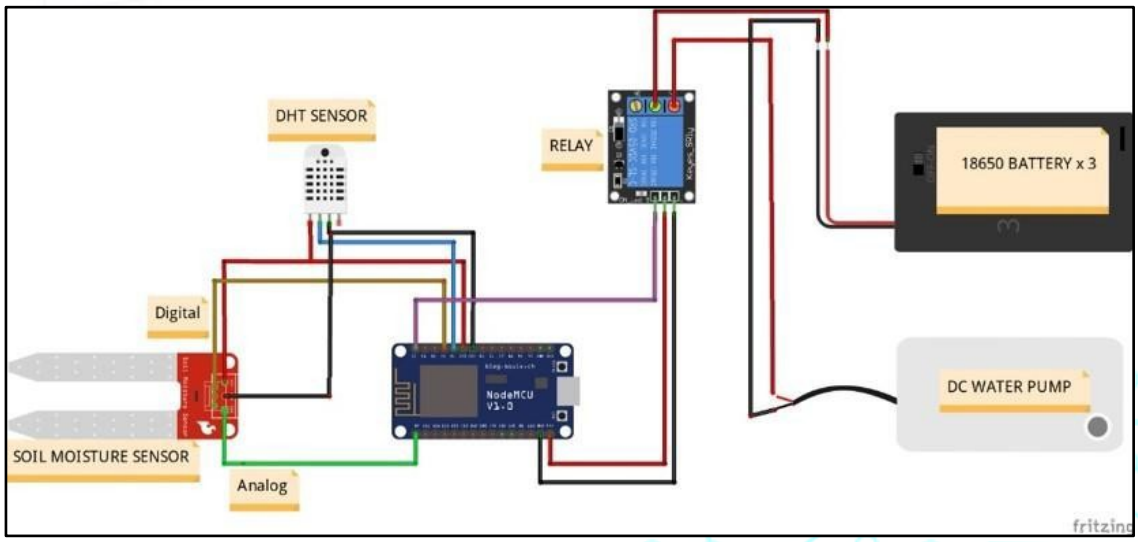

Figure 1. Components and Schematic of this project

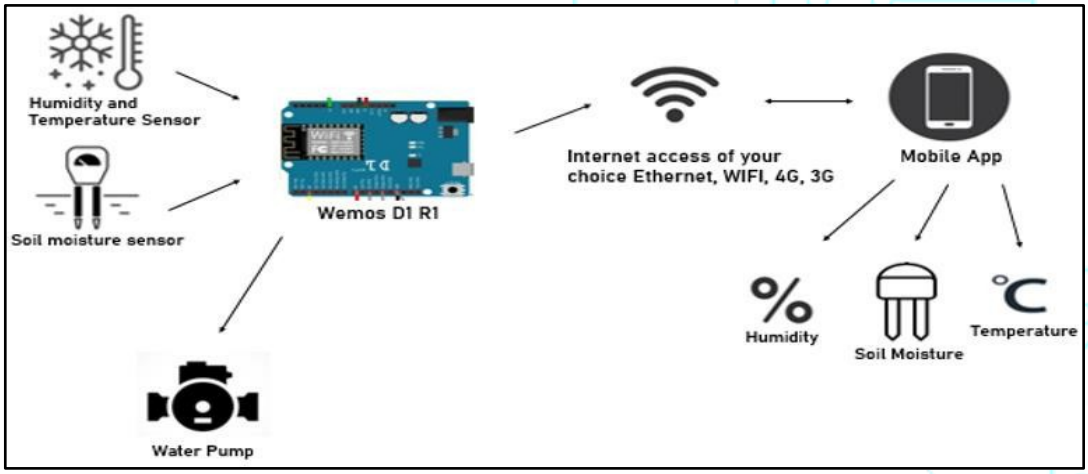

Figure 1.0 IOT Diagram of this project

COMPONENTS

The Node MCU is used in this system to allow all of the sensors to communicate with one another. The DHT sensor is used in this system to determine the humidity and temperature in the surroundings of the plants. A soil moisture sensor is also included in this prototype, which measures the amount of moisture in the soil around each plant's root zone. A direct current (DC) water pump is then used to provide water to the plants in the garden. Furthermore, the relay is an electronic where it is a one-way switch that will start the motor when it receives a signal from the Node MCU. Finally, an 18650 battery is used in order for the aforementioned prototype to function properly.

The IOT Smart irrigation system is primarily linked Wi-Fi. The system can track humidity, temperature, and soil moisture readings, allowing us to closely monitor the plants' condition. The application can then control the irrigation system's water pump. We can control and monitor our plants using the blynk application.

CONCLUSION

The implementation of IoT smart irrigation, monitoring, and controlling systems in agriculture has positive economic implications. These systems enhance productivity, reduce costs, and improve profitability for farmers, contributing to economic growth and stability in the agricultural sector. Additionally, they align with Sustainable Development Goal (SDG) targets by promoting sustainable agriculturalpractices, water conservation, and innovation in line with SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 12 (Responsible Consumption and Production). Overall, IoT smart irrigation systems have the potential to drive economic development while addressing key sustainability goals.

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