Plant Care System (Gharsah)

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Gharsah- غرسة

Introduction

Agriculture and plant care are the essential basics for living a pure and healthy life, which many people tend to follow nowadays, as well as countries and ministries, as it has an important role in various environmental, life and aesthetic fields. And due to the nature of the harsh, dry climate and weather throughout the year due to the desert environment in the Kingdom of Saudi Arabia, it is difficult to deal with the different needs of the plant, such as providing the required temperature and humidity, watering at specific times and providing appropriate lighting. It is also difficult to plant in these conditions, which will reduce productivity and damage the purity of the air, and since the plant world is big and renewable, it's a good idea to dig into it and start creating solutions that help increase productivity and harness technology to enjoy that world.

Background

In previous studies they have used IoT based automatic irrigation system to help monitor the water tank level and to measure soil moisture, to get stored data monitoring and real-time monitoring of varied contents of the soil, to water plant if the soil is dry automatically if the water level in the tank is normal or above the normal.[1][2]

In this project, the focus was to develop a plant care system, and what distinguishes this project from the previous studies is that an application will be created that will support Arabic language. In the application, the user can explore plant types and find information about different ways to take care of them. Also, the user can view his plant data. Send notifications to the user about plant conditions and control the plant system using the application.

Objectives

The aim of this project is to help users who are interested in gardening to follow the status of the plant in terms of soil moisture and room temperature through an application in Arabic.

Increase vegetation and facilitate the care of a plant in all surrounding conditions.

Develop an application that supports Arabic language that provides information to take care of the plant.

Provide Searching of plant types and get recommendations on light, soil moisture, temperature and humidity and plant's water tank level.

Result

Conclusions

This project aims to facilitate the process of caring for the plant by a device that measure all the vital factors surrounding the plant. This device provides appropriate lighting and automatically irrigates the plant when needed. These goals were achieved by linking the device to the application " Gharsah " to help the user monitoring the plant through the application. The project team faced many obstacles. But, on the other hand by working on this project, the team members have learned many new lessons and skills.

References

[1] R. 'Abdullah, A. 'Mohammad, "Smart Tank," 2022.

[2] R. S. Ghumatkar, M. K. Hulbatte, M. M. Gaikwad, and Mrs. R. B. Gurav, "IoT Based Temperature and Soil Monitoring System with Motor Pump Control," Int J Res Appl Sci Eng Technol, vol. 10, no. 4, pp. 1165–1168, Apr. 2022, doi: 10.22214/ijraset.2022.41352.

[3] "Agiledefintion." https://www.atlassian.com/agile (accessed Sep. 17, 2022).

[4] "geeksforgeeks." https://www.geeksforgeeks.org/software-engineering-architectural-design/ (accessed Nov. 05, 2022).

Methodology

In this project, the Agile methodology was adopted and means: "a group of methodologies that demonstrate a commitment to tight feedback cycles and continuous improvement "[3]
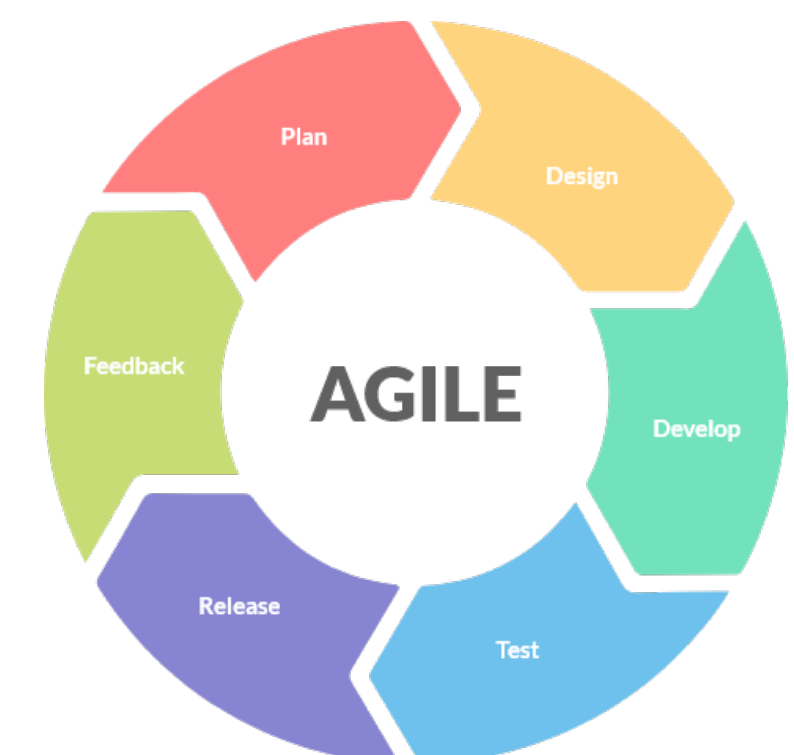
Architectural Design means "The process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system"[4]. Users will connect directly to the application interface through the Internet, and the application in turn will connect to the database to get the data of the plants stored in it and display it, as well as the NodeMCU board to get all the vital factors of the plants by associated with sensors.
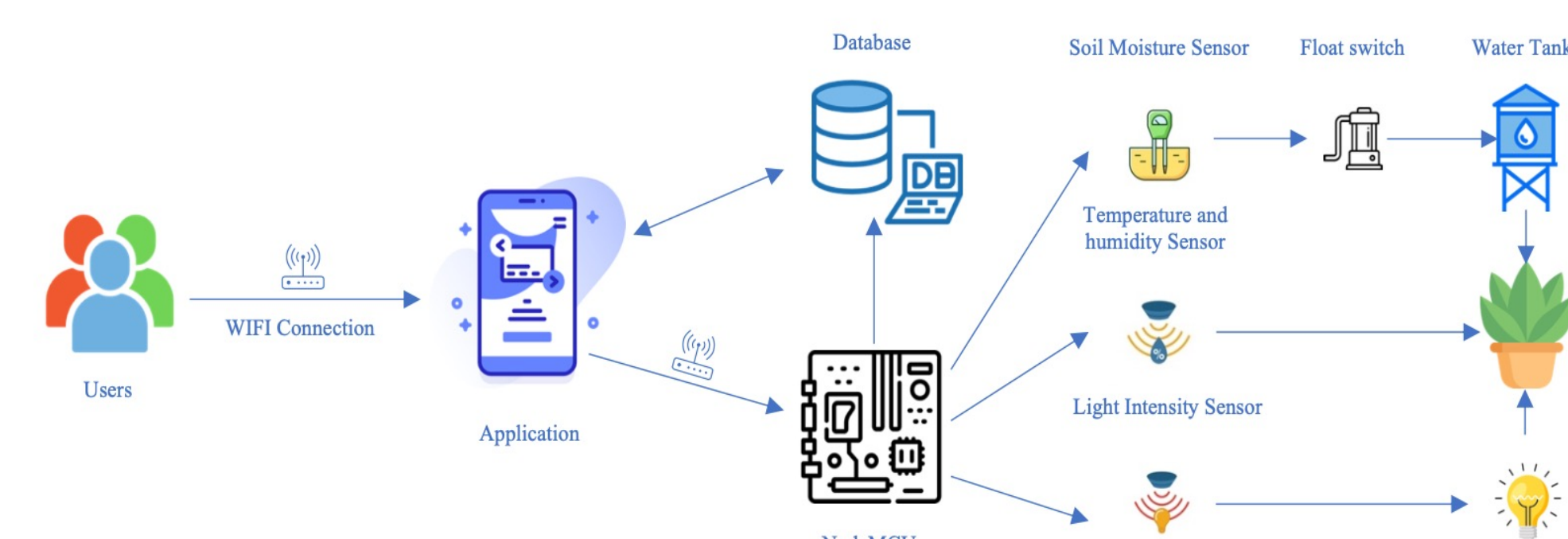
Future Works

In the future, team members aspire to develop a plant care system project, where more features will be added to support the idea and achieve more goals through the following :

o Add a Soil Ph Sensor to measure the soil Ph value in the soil to help the user know the acidity level of the soil and the plant's need for fertilizer.

o Implement the AR technology to identify a plant and detect a plant diseases.

o Add a "Favourite Plant" page to store the plants that the user is interested in.

o Add more plants to the "Plant Magazine".

Acknowledgements