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AUTOMATIC VERTICAL GARDENING SYSTEM

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Abstract : Interconnection of number of devices through internet describes the Internet of things (IOT). Every object is connected with each other through unique identifier so that data can be transferred without human to human interaction. It allows establishing solutions for better management of natural resources. The smart objects embedded with sensors enables interaction with the physical and logical worlds according to the concept of IoT. This proposed system is based on IOT that uses real time input data. Real time sensed data handling and demonstration on the server is accomplished using web based graphical user interface. Wireless monitoring of vertical gardening system reduces human intervention and allows remote monitoring and controlling on phone. An automated watering method for efficient water supervision has been proposed. Soil Parameters like soil moisture, pH, Humidity are measured and the pressure sensor and the sensed values are displayed in LCD. The GSM module has been used to establish communication link.In this gateway sensor is used to handle sensor information and helps to transmit data to user, Wireless through moisture, Humidity and Temperature sensors is programmed with microcontroller based gateway. The master node with Wi- Fi enabled so that it will receive data from all sensor nodes, store data on storage device and it will get displayed on smart phone and web portal on PC in tabular and graphical format.

1. INTRODUCTION

Presently, everybody leads a hectic and busy life. As the technology is advancing, the nature is ignored more and more. Half of the land of forests and wildlife is already used to benefit humans. All the natural resources are being used as if there is no tomorrow. Many projects are coming up with various ideas as to how to conserve nature. But the revolution can be brought with small steps and not overnight. Every house, every person is required to look after the nature. This is high time to balance the equation between humans and nature lest the end is disastrous. Today, we all live in concrete gardens. No interaction with the nature. In order to contribute to ecosystem, the least we can do is maintain a garden. The garden does require a lot of care and nourishment to stay green all the time. The garden requires water daily(except monsoon). Moreover, when the gardener(user) goes out on a vacation there is no means to water the garden. This constant ignorance towards the garden can ultimately lead to its death. And as said earlier, nobody has enough time to nourish garden manually. People can automate stuffs to keep their gardens alive. The gardens are ought to be in an open area and outside the house. This system proposes an idea to have a garden vertically. It will neither consume a lot of space in the house nor it would be too clumsy to maintain. The basic idea of vertical garden is to dedicate a wall of the apartment for gardening. The issue still remains the same; how to water it daily. To fix this problem, the proposed system allows us to water the garden from any place. The garden is designed in a manner that pipes are tucked to wall and there is a hole in a pipe for every respective pots(plants). The pipe is then dipped into a tank of water. The system also has the ability to alert about the moisture level of the soil. It is designed to be operated from a phone call. The user can call the system and command it to start flow of water. The system is very smart to notify the user about any kind of mismatch constraints. Ex-Water level is low in the tank.

Problem Definition Requires a huge land area.

In normal conventional farming the land required for farming is used in horizontal way which leads to usage of more land area compare to vertical farming to grow the same amount of crop.

LITERATURE SURVEY

Arul Jai Singh S had narrated in their article the innovations in the embedded system has the close relationship with the environment science aesthetics. Their work suggests a simple and easy to install, microcontroller-based circuit system in order to monitor and record the values of various parameters like humidity, temperature, soil moisture and sunlight of the natural environment. They are continuously modified and controlled for optimizing them to achieve high productivity and crop growth. The micro-controller communicates with the various sensor modules in real-time. Here light, aeration and drainage process were controlled efficiently inside a greenhouse. Actuation of a cooler, dripper and lights were done respectively according to the necessary condition of the plants. The drawback was this system was confined to only the home environment and couldn‟t be implied for
remote monitoring.

[1].Hydroponics is the art of growing plants in water (nutrient medium) without land. Nutrients are supplied to the roots in the form of a liquid solution that can be in the form of static or flowing. Hydroponics can be implemented in green house environment and can be seen in figure 3. This work regarding Hydroponics, mainly focuses on two tasks. The first one was the automation of the greenhouse environment monitoring. Internet of things is used to transfer the sensed data to the internet. A mobile app is used to communicate the present status
to the user via the internet in their mobile phones. Major drawback was that there was no usage of zone orvertical farming in the system

[2]Dr.S.Saraswathi, explained that the existing system has the lack of ability to control indoor humidity. Green House Monitoring system is a complete system, which is designed to monitor and control the humidity inside a green house. The developed software used an Android mobile phone. Connection with wi-fi was necessary to a centralize the server which connects through serial communication with a microcontroller, and then with humidity sensor. The achieved test result concludes that the system is working properly. Cloud services weren‟t available in this system.

[3]Aju G Nair proposed that the smart farming results a huge contribution for the food production and sustainability for the 21st century. An enclosed, continuously growing structure was demonstrated where crops are grown, and the growth conditions are maintained. There was no scope for artificial photosynthesis in this system.

2. DESIGN PATTERN

The Design pattern for the system can be described by the block diagram of the components used in the system is shown below.

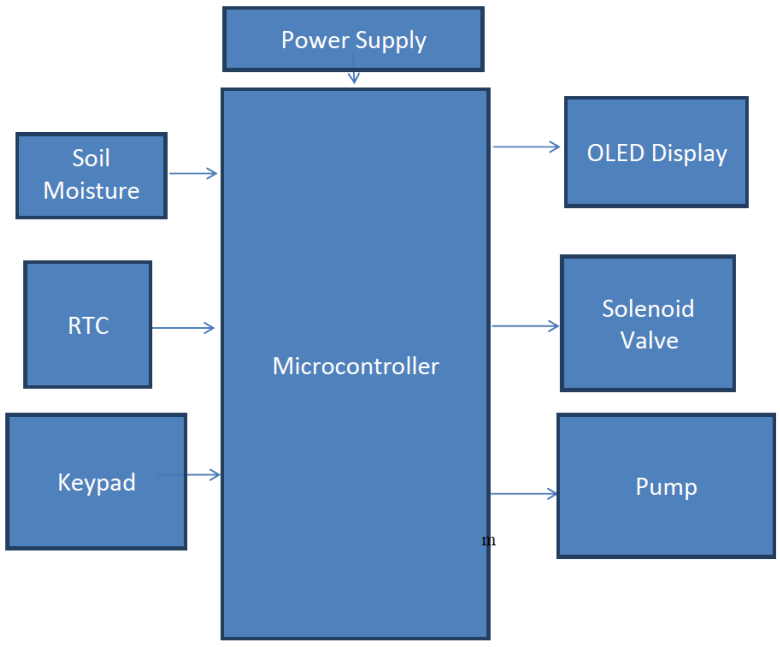

Fig 6 Block Diagram

3. METHODOLOGY

This system works on following terminology,

- System is ON
- Check connectivity
- Spoil moisture sensor will Monitor Soil Moisture
- Through keypad take input time from user
- Watering to plant as per real time clock set by user
- Pump Spray water to plant
- Solenoid Valve control the water
- Real time information display on OLED

4. CONCLUSION

1. The Project concludes the study of existing setup based on vertical farming in India.
2. It proposes a vertical farming structure in Metropolitan cities
3. A model is constructed based on hydroponics technique.
4. Cost benefit of vertical farming over horizontal farming is done.

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