

## Design & development of an automatic water supply system

<sup>1</sup>Arfat Kasimsab Chandwale, <sup>1</sup>Anand, <sup>1</sup>Bhushan L., <sup>1</sup>Skanda S. Rao,

<sup>2</sup>Dr. Sindhu Sree M., <sup>3</sup>Dr. Pavithra G., <sup>4</sup>Dr. T.C.Manjunath

<sup>1</sup>First Semester BE (ECE) Students, Dept. of Electronics & Communication Engg.,

Dayananda Sagar College of Engineering, Bangalore, Karnataka

<sup>2</sup>Assistant Prof., Electronics & Communication Engg. Dept.,

Dayananda Sagar College of Engineering, Bangalore, Karnataka

<sup>3</sup>Associate Prof., Electronics & Communication Engg. Dept.,

Dayananda Sagar College of Engineering, Bangalore, Karnataka

<sup>4</sup>Professor & HOD, Electronics & Communication Engg. Dept.,

Dayananda Sagar College of Engineering, Bangalore, Karnataka

### Abstract

In this paper, the automatic water supply system is presented. This paper suggests an IoT device for automatic plant watering when the soil moisture level drops below a threshold value. The proposed system can be implemented in various projects like green buildings, roof farming, etc. The IoT device is connected to the internet, enabling the user to receive moisture level updates. The paper aims to address the need for an efficient plant watering system by providing an automatic solution using IoT technology. This paper presents the design and development of an automatic water supply system using IoT technology. The system detects the soil moisture level of plants and automatically waters them when the moisture drops below a certain threshold value. The proposed system is suitable for use in green building projects and roof farming. The device is connected to the internet, allowing the user to receive real-time updates on moisture levels. The paper details the development process and the key components of the system, including sensors, actuators, and the microcontroller. The work done & presented in this paper is the result of the mini-project work that has been done by the first sem engineering students of the college and as such there is little novelty in it and the references are being taken from various sources from the internet, the paper is being written by the students to test their writing skills in the starting of their engineering career and also to test the presentation skills during their mini-project presentation. The work done & presented in this paper is the report of the assignment / alternate assessment tool as a part and parcel of the academic assignment of the first year subject on nanotechnology & IoT.

**Keywords:** Water, Supply, System, IoT, Automation.

### Introduction

In daily operation related to watering the plants are the most important cultural practice and the most labour-intensive task. No matter whichever weather it is, either too hot and cold or too dry and wet it is very crucial to control the amount of water reaches to the plants [4]. So, It will be effective to use an idea of automatic plant watering system which waters plants when they need it. An important aspect of this project is that: “when and how much to water” [3]. To reduce manual activities for the human to watering plant, an idea of plant watering system is adopted. The method employed to monitor the soil moisture level continuously and to decide whether watering is needed or not, and how much water is needed in plant’s soil [2]. This project can be grouped into subsystems such as; power supply, relays, Arduino, Soil moisture sensor and LCD [5]. Fig. 1 gives the equipment for detection process in the pot.

### Scopes & Objectives

The main objectives of our Automatic Plant Watering System are: Supplementing Plant life Our product with its remote application ensures that the user's plants are regularly watered on a day-today basis [1]. This will ensure that plant life is not compromised due to negligence. 2B. Timely Watering

of Plants With a busy schedule people forget to water their plants which can have an adverse effect on plant life [4]. Our product through our mobile application will give the users a daily reminder as to when they should water their plants. 2C. Remote Plant Watering. The Fig. 1 gives the flow-chart design for the proposed project.

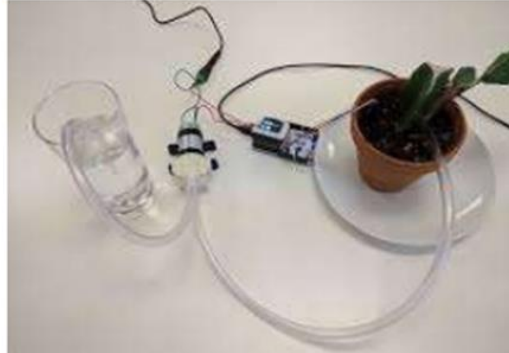


Fig. 1 : Equipment for detection process in the pot

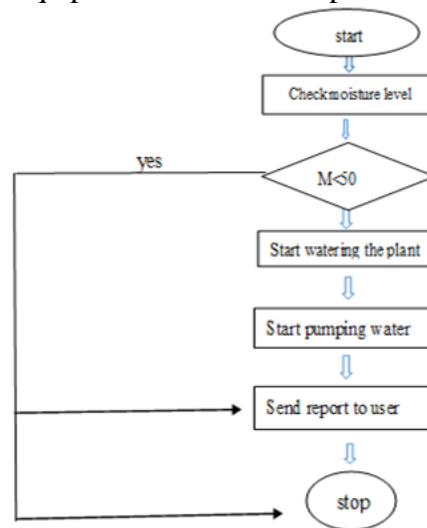


Fig. 2 : Flow-chart design for the proposed project

### Proposed Idea & Block Diagram

There are two functional components in this paper. They are moisture sensor and motor / pump [11]. Arduino board is programmed using the Arduino IDE software. Humidity sensor is used to detect the soil moisture content. Motor / pump is used to supply water to plants. Soil moisture and temperature predetermined range is set particularly for specific plants requirement, and according to that system is being operated [12]. Microcontroller is the brain of the system. Both humidity and temperature sensor is connected to the controller's input pin. Pump and servo motor coupled to the output pin. In case of soil moisture value is less than threshold system automatically triggers water pump on till sensor meets threshold and then sets off automatically. The overall activity is reported to the user using mobile application [13].

### Real-time view of proposed Automated Gardening System

The Fig. 3 gives the real-time view of proposed automated gardening system. An automatic water supply system is a system that can supply water without human intervention. It is designed to automate the process of pumping and distributing water to various locations, such as homes, commercial buildings, and farms. This type of system is often used in areas where water is scarce or unreliable, or where it is necessary to provide a constant supply of water. The design and development

of an automatic water supply system involves various components, such as pumps, sensors, controllers, and valves, which work together to ensure that water is delivered efficiently and effectively. In this context, this paper aims to discuss the design and development of an automatic water supply system, including the various components used, their functions, and the overall system architecture. The paper will also discuss the benefits of an automatic water supply system and its potential applications.

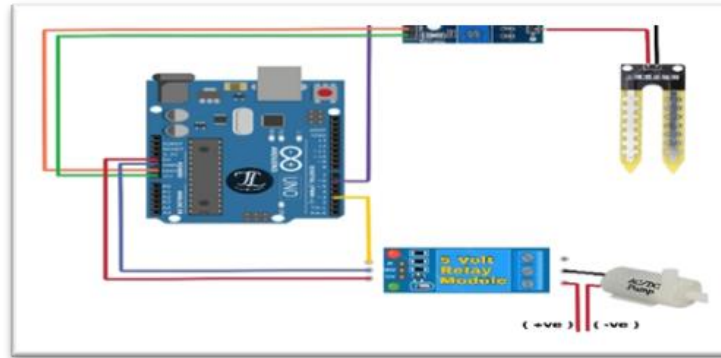


Fig. 3 : Real-time view of proposed Automated Gardening System

### Conclusions

The work is designed and implemented in such a way, that it is much easy and cost effective. Such system will be able to contribute to the socio-economic development of the nation ,with fast response and user friendly [9]. As water supplies become scarce and polluted, there is a need to irrigate more efficiently in order to minimize water use and chemical leaching. Recent advances in soil water sensing make the commercial use of this technology possible to automate irrigation management for vegetable production [8]. However, research indicates that different sensors types perform under all conditions with no negative impact on crop yields with reductions in water use range as high as 70% compared to traditional practices. The working of project is basically dependent on the output of the humidity sensors [7]. Whenever there is need of excess water in the desired field then it will not be possible by using sensor technology. So we have to adopt some other technology like Bluetooth . By using this we will be able to irrigate the desired field and in desired amount more efficiently. Since it is also scalable, it can be used to irrigate a large amount of land also [6].

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