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A Project Report on

Automated Water Dispenser-For Garden plants

Submitted by,

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A Report submitted to MIT Academy of Engineering, Alandi(D), Pune, An Autonomous Institute Affiliated to Savitribai Phule Pune University in partial fulfillment of the requirements of

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CERTIFICATE

It is hereby certified that the work which is being presented in the BTECH Project Report entitled **"Automated Water Dispenser-For Garden plants"**, in partial fulfillment of the requirements for the award of the Bachelor of Technology in Computer Engineeringand submitted to the **School of Computer Engineering** of **MIT Academy of Engineering, Alandi(D), Pune, Affiliated to Savitribai Phule Pune University (SPPU), Pune**, is an authentic record of work carried out during Academic Year **2022–2023**, under the supervision of **Dr. Manish Giri**, **School of Computer Engineering**

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DECLARATION

We the undersigned solemnly declare that the project report is based on our own work carried out during the course of our study under the supervision of **Dr. Manish Giri**.

We assert the statements made and conclusions drawn are an outcome of our project work. We further certify that

1. The work contained in the report is original and has been done by us under the general supervision of our supervisor.
2. The work has not been submitted to any other Institution for any other degree/diploma/certificate in this Institute/University or any other Institute/University of India or abroad.
3. We have followed the guidelines provided by the Institute in writing the report.
4. Whenever we have used materials (data, theoretical analysis, and text) from other sources, we have given due credit to them in the text of the report and giving their details in the references.

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Abstract

Here we introduce an Automated Water Dispenser system which is most commonly used daily the use of automated water dispenser models gains beneficial importance nowadays, Watering plants is a major task in our daily to daily activities through this reduces or completely over efforts.

This system contains a Microcontroller along with the solenoid valve which is connected to the water system and with the help of a relay and motor the water distribution is carried out. Electronic components such as Microcontrollers, relays, and motors are connected and formed a hardware system that is connected to the water system as the motor function on and off of the system carries out. This timing set is connected to an app, by which we can control the hardware system.

This system is used for small-scale as well as large-scale gardens. This can be an optimized solution for watering fruits and vegetables, enabling farmers and gardeners to look after their products.

Acknowledgment

We feel much rectitude and praise on submission of report on Automated Water Dispenser System for small scale, large scale gardeners in such an attested way which tackles of our knowledge to an extended level of understanding about the product. With immense pleasure and continuous effort drawn from the source of knowledge, We would like to express our sincere gratitude towards our project guide, respected Dr. Manish Giri sir for your constant encouragement and valved guidance during the completion of the project work. We also want to express our distinctive gratitude towards our respected Dean of the School of computer science and Technology Dr. Rajeshwari Goudar for then precise encouragement. We wish to express particular gratitude to MITAOE for providing their support and facilities, which could have made it possible to complete the dissertation of the report. We are also thankful to our classmates who helped with the dissertation of the report.

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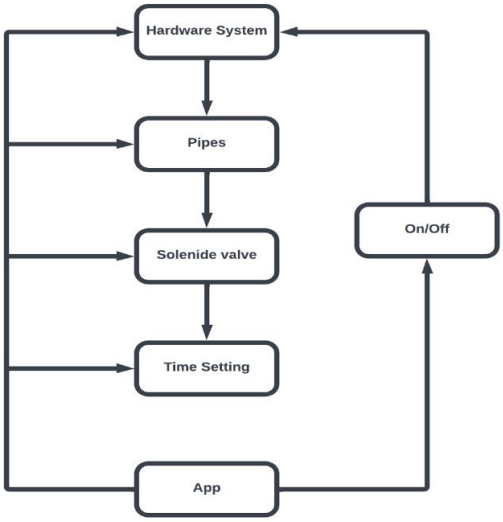
Chapter 1

Introduction

1.1 Background

Our daily operations related to watering plants are a major task in our routine. It's a cultural basis practice that is carried forward and most labor-intensive work. Whatever might be the season, whichever day will be there at any weather watering plants is done on a priority basis. Most urban areas of them have mini gardens, Taking this idea in mind evolved into an automated water dispenser system. Which can reduce manual efforts and the work can go in a simulated way. This system is also connected to an app which is connected to a hardware system resulting in a distribution of water to the plants. Gardners of small scale and wells as large scale, for watering fruits and vegetables used can be addressed.



[fg.1.1 Block Diagram Of Automated Water Dispensor]

Out of 100, 60 percent of the total population is engaged in the farming sector for large-scale production of crops irrigation system can be used. But many of the farmers are engaged in fruits, flowers, vegetables, etc., for that irrigation system cannot be adopted and for small scale to adopt the system became a most unusual task. To overcome this idea of watering the plants in an automated way can be adopted. If farmers go for the irrigation system for small-scale plants then the tentative cost becomes higher. An adequate water supply is important for plant growth. When rainfall is not sufficient, the plants must receive additional water from irrigation. Various methods can be used to supply irrigation water to plants. Each method has its advantages and disadvantages. These should be taken into account when choosing the method which is best suited to the local circumstances. This can be a very time-consuming method and involves very heavy work. However, it can be used successfully to irrigate very small plots of land, such as vegetable gardens, that are close to the water source.

More sophisticated methods of water application are used when larger areas require irrigation. There are three commonly used methods: surface irrigation, sprinkler irrigation, and drip irrigation. Which mainly involves, Surface irrigation mainly involves three types of basic irrigation,

a.Basin irrigation

b.Furrow irrigation

c.Border irrigation

These are some of the basic techniques by which plants can be watered. There are again two types of irrigation that are used most frequently which are sprinkler drip irrigation.

1.2 Project Idea

The basic theory of the idea of the project, from where it evolved? lots of manual work is required to complete the water distribution task whether it a small sale or the production at large scale, manual operations of work was involved to overcome this thing, one can be able to think "Is there anything that can reduce this thing of manual operations so that one can get free from their gardening work.

In urban areas, all are more interested in growing plants, and many of them have their garden. to take care of their plant's lot many times as well as home automation is one of the most emerging trends in the modernization of home appliance control. Presently, conventional wall switches are located in different parts of the house and one has to physically go near them and press them to turn the loads on/off. It becomes very difficult for the elderly or physically handicapped people to do so. This system is designed to provide control of home appliances remotely and via Bluetooth Android-based Smartphone app. The proposed system does not require a dedicated server PC concerning similar systems and offers a novel communication protocol to monitor and control the home environment more than just these devices can be controlled through a web application or via Bluetooth Android-based Smartphone app.

1.3 Motivation

By configuring the needs of farmers and gardeners, we proposed a solution. Watering not only requires manual efforts but also requires time which is most expensive nowadays, to switch this to a new platform.

70 percent of the economy is based on agriculture, for the need of the most demanding fields to which we "can we proposed a solution"? from that the motivation the thing came to make a distribution system. in the market there is various type of distribution system available but from that, we are doing more. this was a challenge to us and then we decide to make an automated water distribution system that can be used by both small-scale as m well as large-scale farmers for their distribution of water to plants.

1.4 Project Challenges

There were many challenges as the market is an extended state to curricular. As we can see many times systems are implemented on various types by using different types types of Microcontroller which includes complex types of structure, in many of the system complex judgment, was given to propose a different type of solution to this problem. In this type of product, we have to modify different things,

a.system should be operated only with the valve settings

b.time should be set by an app that can give u excess to on an off the system at any instance of time

c.Structure of complexity should be reduced

1.5 Proposed Solution

We came to a final culmination to propose as a solution to connect the bridge between the hardware and software type of system which can help people to connect themselves. We think modifying this problem with the automated distribution of water will lead them to solve various types of problems. This system is a detailed analytic that can help farmers or the Gardners to distribute the water in a conjugate way. This product should not only perform a task in an automated way, but ones can control the excess of water at any instance of time.

1.6 Project Report Organization (Chapter wise summary)

Chapter 1:

In the first chapter, we saw what was the background of the project and how we got the idea to implement the same. To implement the project what was the motivation to propose this problem statement and for that problem was it the correct problem solution?

Chapter 2:

In the second chapter, we see to implement the project how much such research are been implemented at first. Through this research, we went through different types of research papers in which we have done 10 research paper surveys. By understanding this we find out the pros and cons and how better we can modify the product.

Chapter 3:

In the third chapter we see what is an actual problem statement, what need to configure, and what goals and objectives we have to achieve. For the implementation what are the requirements and the future scope of the project we have in this chapter?

In chapter 4:

In this, we specified the system specification by drawing the connections and interactions between the user and the interface.

Chapter 5:

To Propose this model what specific methodology we have applied is mentioned. Through this method, we have implemented the system.

Chapter 6:

In this, we mention the result and the analysis of the product.

Chapter 7:

In this we have seen what is the future scope and hence we concluded.

Chapter 2

Literature Review

2.1 Related work And State of the Art (Latest work)

Recent research produces in the field of the agriculture sector which leads to the "Smart Water Dispenser", Water management involves the tasks of conserving water resources, harvesting water, planning the available net water resources, and distributing it very appropriate to the consumers. It also involves setting up of policies and practices to execute the tasks under fragmented controls. The conventional methods and practices were found to be inadequate in executing the tasks effectively. Water management practices need to take full account to maintain water resource sustainability over the long term. Nearly 97water. Several sectors like intensive agriculture [1], wastewater (UN-Water, 2011), mining, industrial production, and untreated urban runoff are the major causes of water pollution. Water from various sources needs to be utilized in an efficient manner which lacks traditional water management methods. The existing methods for water usage are not so cost-effective [2], and there is also a disinclination towards implementing the latest information and communication technologies (ICT). Machine learning algorithms have the potential to expand the learning process exponentially with a specific target. Artificial intelligence (AI) comprises "a branch of computer science dealing with the simulation of intelligent behavior in computers."1 In the context of delivering efficient water supply, AI or machine learning is mainly applied to decision-making tasks: how water utilities can

maximize information and data available to make better decisions. while enhancing service delivery; optimizing capital investment (CAPEX); and reducing.

Business intelligence is the modern discipline of navigating the era of big data at the management level. Business intelligence tools include a combination of the following features related to data: (i) Integration. This involves the consolidation of different types of data coming from various sources (operations, customers, financial, marketing, competitors, market, etc.), within and outside the water utility. As a result of this integration, business intelligence tools are useful to track the trends of KPIs. (ii) Smart visualization. A picture is worth a thousand words. Business intelligence tools are specifically designed and customized to create the most useful graphs and dashboards for operation staff, as well as decision-makers. (iii) Trend forecasting. Data analysis identifies relationships and trends between variables. Through a dedicated spatial analysis based on location and time variables, business intelligence tools can forecast the evolution of the water distribution system under certain scenarios. (iv) Advanced trend forecasting (AI platform). Advanced business intelligence tools use machine learning algorithms to detect internal patterns and identify hidden relationships among data.13 Using explanatory variables, such as calendar events, socioeconomic development, climatological variables, etc. external to the water utility, the AI platform can predict the evolution of its operations way beyond the trend analysis. $-V_o/L$.

$$\Delta W = \int_b^a \frac{f_x}{1} dx \tag{2.1}$$

$$\Delta W = -\frac{f_x}{1} x_{a-b} \tag{2.2}$$

Another useful example of the application of integration to compute work comes in the pumping of fluids, often illustrated in the context of emptying a storage tank by pumping the fluid out the top. This situation is different than our previous examples for the forces involved are constant. After all, the force required to move one cubic foot of water (about 62.4 lb) is the same regardless of its location in the tank. What is variable is the distance that cubic foot of water has to travel; water closer to the top travels less distance than water at the bottom, producing less work.

SR.NO	Title	Author	Remark
1	Automatic Plants Watering System for Small Garden	Monika Nurgeni	This paper presents a design of the Internet of Things for small gardens inside houses using Wireless networks and sensors. In automatic watering plants, information about soil moisture needed for plants. Sensors are devices used for smart agricul-ture. Arduino Uno will control all system operations as monitoring the plant wa-tering system.

Sr.No	Title	Author	Remark
2	Microcontroller Based Automatic Mini-Garden Water Supply System	Dr. Aung San Min 1 , Dr. Win Win Hlaing 2 , Cho Cho Myint3	By using the constructed system, it has some advantages such as saving water, saving time of workers, and adjusting water to a variety of specific plant needs. And then, the system is also useful to university students for studying how to control the water pump by the PIC16F628A, and how to use FC-28 soil moisture,

2.2 Limitation of State of the Art techniques

Limitations of smart water dispenser system, this model uses various types of domains which mainly involved high fields such as AI(Artificial intelligence), Cybersecurity, etc., with the help of this modern technology will sculpture the fields of farming but, is the water distribution require the same system to implement t on the regular basis. In this type of system, the average margin goes very high, the cost is not that much effective, and total expenses go very high.

2.3 Discussion and future direction

Limitations can be overcome, to the future scope and direction of the project in the project we are distributing water with the help of valves and hardware systems. This project can be uplifted to a different extent in which, water quantity level can be determined, and this type of project can be extended for large-scale production. In this era all types of resources are precious and need to be conserved taking, water

is an important aspect of life that need to be considered. we waste more than 40 percent of the water in a day. Plants do not require that much quantity for their needs, then also 30 percent of the excess water is wasted in one way. so, the quantity of the water can be determined.

2.4 Concluding Remarks

From all types of confinement statements, we are to the distinct point of proposing a water-distributing system that can be controlled in an automated way. Which can be used to solve various types of problems hence the design should also be an effective model and the cost should be also even friendly to one another.

Chapter 3

Problem Definition and Scope

3.1 Problem statement

Watering of plants is done on a regular basis, this aims to implement the product on watering home and terrace farming plants using technology. Which can be used for small as well as large-scale production for watering the plants. During day-to-day activities, many people sometimes forget to water the plants which becomes challenging to protect or keep the plants safe and healthy. Also, it's a challenging problem for farmers to take care of and maintain their plants and fields. Keeping this idea in mind we came across an idea to implement an Automated Water Dispenser system that can be used for household purposes, and gardening purposes and may use over farming fields. We also are in that technology can help people in cultivating plants not just by automation but by harmonic communication, which can notify with growing plants. Therefore, our project aims to implement the system which is an automated water-distributing system with less human intervention.

3.2 Goals and Objectives

1. Water the plants in an automated way

2. Using mobile applications watering of plants

3. Application should only be used for on and off of solenoid valve to water the plants

3.3 Scope and Major Constraints

Limitations can be overcome, to the future scope and direction of the project in the project we are distributing water with the help of valves and hardware systems. This project can be uplifted to a different extent in which, water quantity level can be determined, and this type of project can be extended for large-scale production. In this era all types of resources are precious and need to be conserved taking, water is an important aspect of life that need to be considered. we waste more than 40 per cent of the water in a day. Plants do not require that much quantity for their needs, then also 30 per cent of the excess water is wasted in one way. So, the quantity of the water can be determined.

3.4 Hardware and Software Requirements

Hardware requirements:

A. Arduino

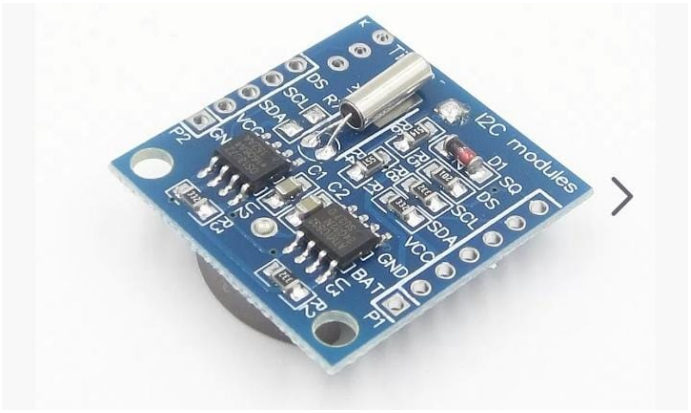
Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, in the worst-case scenario you can replace the chip for a few dollars and start over again.

B. Power Supply

A power supply is a device that converts the output from an ac power line to a steady dc output or multiple outputs. The ac voltage is first rectified to provide a pulsating dc and then filtered to produce a smooth voltage.

C. RTC Module (DS1307)

The DS1307 is a popular real-time clock (RTC) module used in electronic devices. It provides accurate timekeeping functionality, including the ability to track seconds, minutes, hours, days, months, and years. It communicates with a microcontroller through I2C interface and has battery backup to maintain time during power loss.



D. Motor

"Motor" refers to any power unit that generates motion, that is a "prime mover", while "electric motor" refers to a "prime mover using electricity." Fig. 1.1 Input and output to and from a motor. An electric motor is a device used to convert electrical energy into mechanical energy.

E. Led Screen Display

7-Segment LED Display

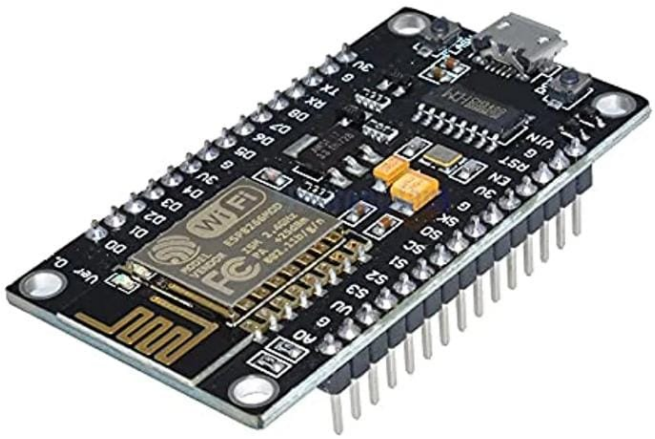
They are among the most common LED display configurations used for providing simple numerical readouts on a broad range of device types.

F. Solenoid Valve

Solenoid valves are the most frequently used control elements in fluids. Their tasks are to shut off, release, dose, distribute or mix fluids.

G.Wifi module (ESP866) The ESP8266 is a widely used Wi-Fi module that enables Internet connectivity in electronic devices. It features a low-cost microcontroller with built-in Wi-Fi capabilities, allowing devices to connect to Wi-Fi networks, and send and receive data over the Internet. It supports TCP/IP protocols, has GPIO

pins for interfacing with other components, and can be programmed using various development environments.



Software Requirement

A. Time-Controlling App

Best Screen Time Apps to Monitor and Limit Screen Time on your iPhone and Android which gives excess to Parental Control.

B. Arduino IDE Arduino IDE is an integrated development environment for programming Arduino boards. It provides a user-friendly platform with a simplified coding interface, libraries, and a compiler. It supports C++ language and allows users to write, compile, and upload code to Arduino boards, enabling easy prototyping and development of electronic projects.

3.5 Expected Outcomes

From this text need to reduce the man intervention by reducing manual efforts. and the system should be designed with a user-friendly interface so that ones can use it safely.

Chapter 4

System Requirement Specification

4.1 Overall Description

4.1.1 Product Perspective

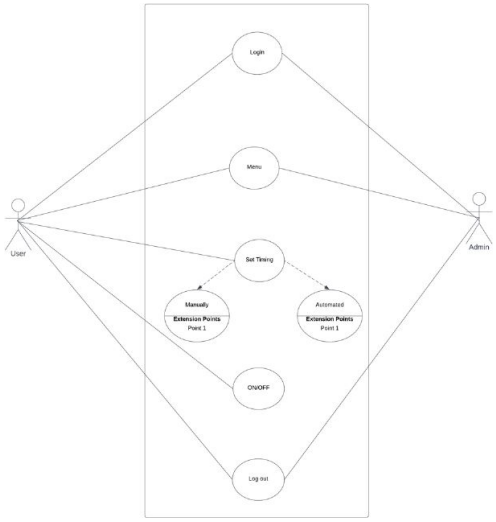
in the age of advanced technology and electronics, the life of humans and work indeed from them should be smart and skilled enough. Many, people faced problems while watering their plants, and do not have enough time to recognize the safety and heredity of plants. so to attach all ideas and bring, an automated production for the water distribution system.

4.1.2 Product Function

Through this diagram, we can able to see how the product functions,

A.User Case Diagram

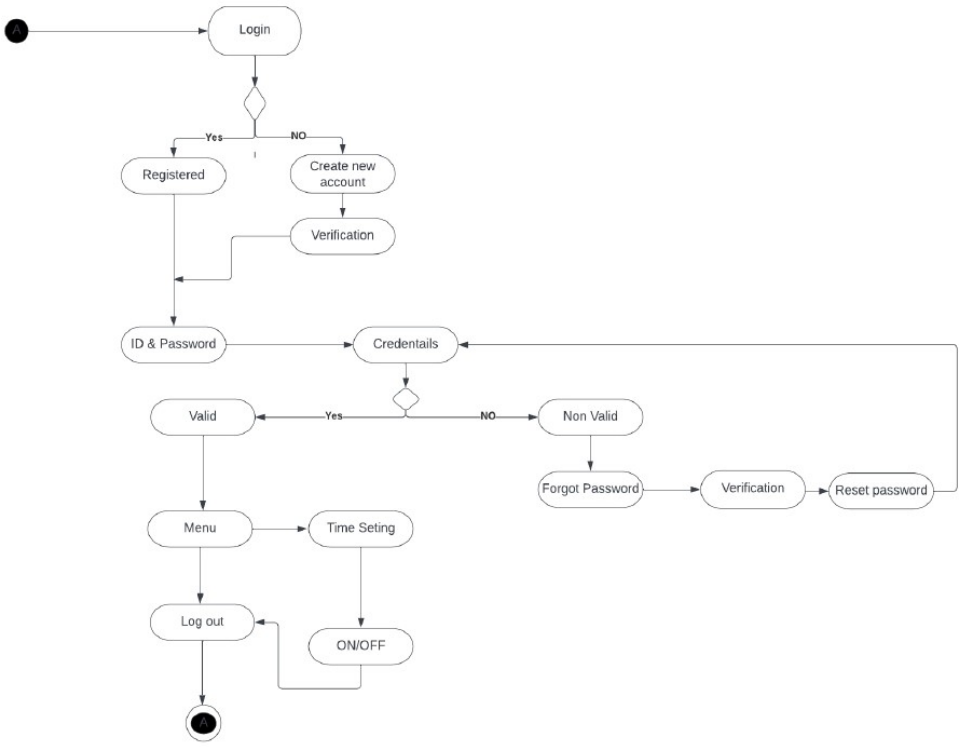
The user case diagram helps us to understand the interaction between the user and the admin.



[fg.4.1 User Case]

B.Activity Diagram

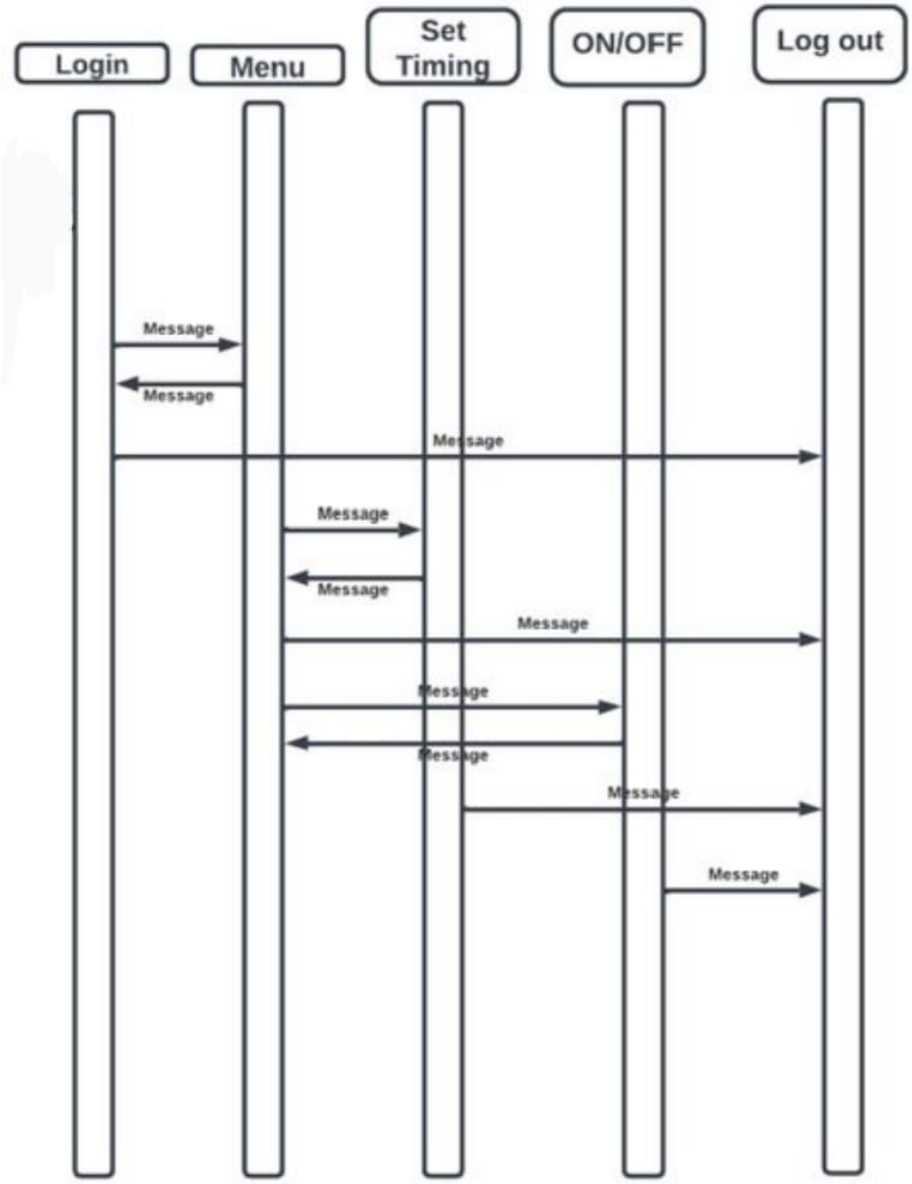
Activity Diagram helps us to understand the flow of activity in the given system.



[fg.4.2 Activity Diagram]

c.Sequence Diagram

A sequence Diagram helps us to understand the sequence of the system.



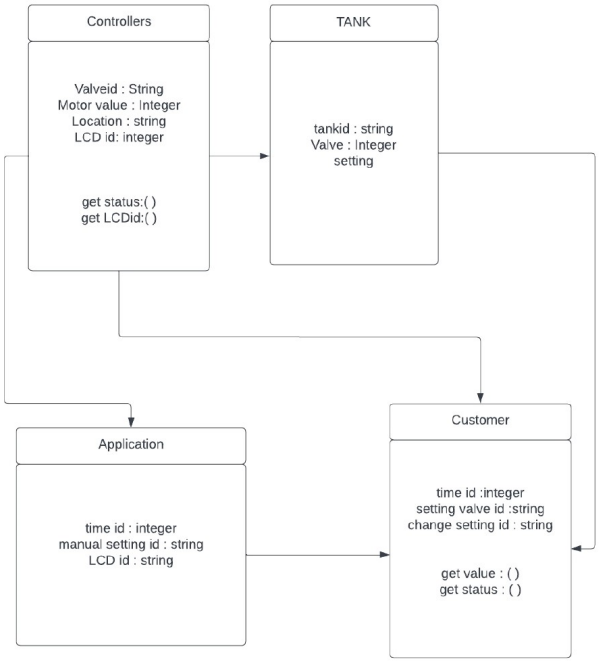
[fg.4.3 Sequence Diagram]

4.2 Specific Requirements

To design this particular structure we need a particular state detailed analysis that will able to explain the relationship between the user and the interface. The flow involves,

a.Class Diagram

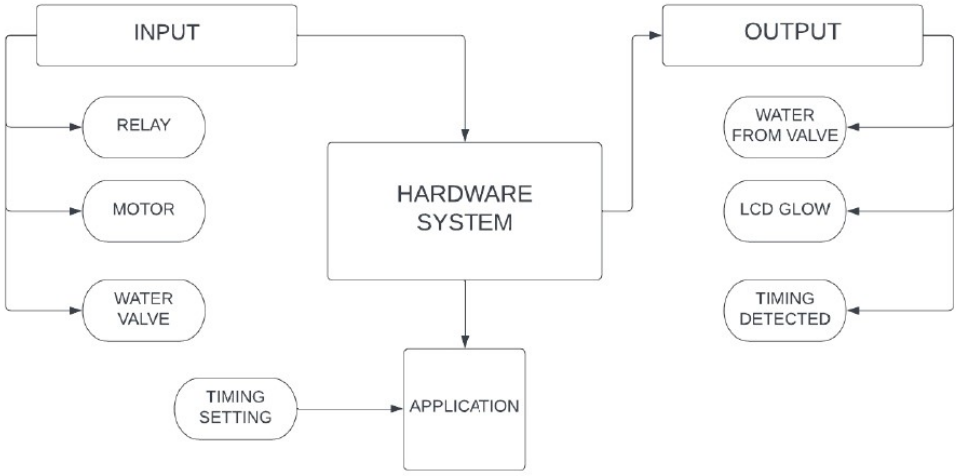
Class diagrams are involved in different types of classes we are using in the system.



[fg.4.4 Class Diagram]

b.Architecture Diagram

Helps us to understand the architecture of the system.

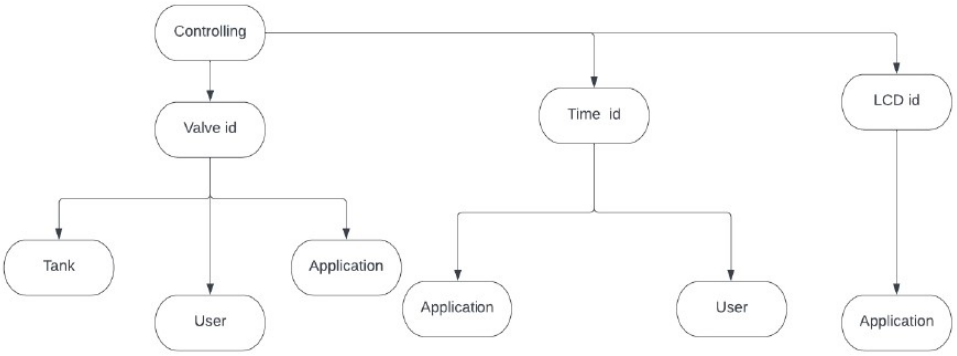


[fg.4.5 Architecture Diagram]

c.Object Diagram

It shows the interaction between the different objects use in the system and their

interaction with the elements of the system.



[fg.4.6 Object Diagram]

4.2.1 Cost Analysis

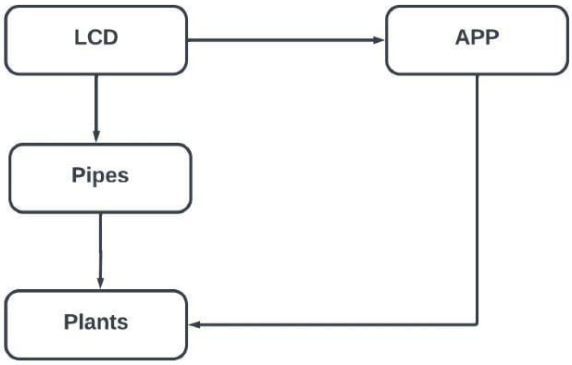
Cost analysis is the process of evaluating and determining the expenses associated with a particular project, product, or business operation. It involves assessing both direct costs, such as materials, labor, and overhead, as well as indirect costs, including administrative expenses and marketing expenditures. By conducting a comprehensive cost analysis, organizations can gain insights into the financial implications of their decisions, identify areas for cost reduction or optimization, and make informed choices to enhance profitability. It helps in budgeting, pricing, and resource allocation, ensuring efficient utilization of resources while maintaining competitiveness in the market. Ultimately, cost analysis enables businesses to make strategic and informed financial decisions to achieve their goals effectively. To implement the system we require elements and components to design the system. The cost estimate is below:

ITEM DESCRPITION	QUANTITY	RATE	AMOUNT
Arduino UNO	1	1x800	800
LCD 16X2	1	1x150	150
Wifi module	1	1x200	200
Servo motor	1	1x275	275
9v Battery	1	1x33	33
RTC module	1	1x160	160
PCB	1	1x59	59
I2C	1	1x150	150

[fg.4.7 Cost Analysis]

4.2.2 External Interface Requirements

The external interface is user-friendly so that one can use it for the shortest time.



[fg.4.8 External Inter Face Diagram]

4.2.3 Functional Requirements

Hardware and software both systems are both involved in the product to build. This included the hardware which helps to function with the components and the app which can be called the controlling app, through that app we can exceed with the hardware system.

4.2.4 Performance Requirement

From the system, we accept that the system should run in a way that if the time is set from the app hardware should take the instruction of the app and execute the instruction accordingly.

4.3 Project Planning

The above table includes information regarding the planning of the project from semester 3 to semester 4. The starting is done from the initial stage where we decide the scratch and find the problem statement. Further, we find from the literature survey and market survey on the significance of the product we are planning to

implement. Then we find the suitable algorithm for designing the model, next by select of the proper methodology we study various terms regarding the project and hence we implement and deploy the project.

Important dates	**Task**
1 Aug to 15 Aug	Selection of Project topic and domain
16 Aug to 1 Sept	Literature Survey and Market Survey
2 Sept	Review 1
3 Sept to 15 Sept	Study of various algorithms - Convolution Neural Network (CNN)
15 Sept to 4 Oct	Selection of proper Methodology
7 Oct	Review 2
8 Oct to 28 Oct	Study of Various terms regarding Project
SEMESTER VI	Project implementation and deployment
SEMESTER VII	Documentation

[fg.4.9 Planning of System]

Chapter 5

Methodology

5.1 System Architecture

The system is designed in such a way that system involved two basic components,

a.Hardware system

b.Application

In this application Hardware system is linked with an LCD which is connected to the app from which we can control the excess of the hardware system.

5.2 Mathematical Modeling

A mathematical model is a description 0f a system using mathematical concepts. The process of developing a mathematical model is termed mathematical modeling. Mathematical models are used in

a.natural sciences (such as physics, biology, earth

b.science, chemistry) Engineering disciplines (such as computer science, and electrical engineering), non-physical systems such as the social sciences (such as economics, psychology, sociology, and political science). Mathematical models are usually composed of relationships and variables. Relationships can be described by oper-

ators, such as algebraic operators, functions, differential operators, etc. Variables are abstractions of system parameters of interest, that can be quantified. Several classification criteria can be used for mathematical models according to their structure: Linear vs. nonlinear: If all the operators in a mathematical model exhibit linearity, the resulting mathematical model is defined as linear. Static vs. dynamic: A dynamic model accounts for time-dependent changes in the state of the system, while a static (or steady-state) model calculates the system in equilibrium, and thus is time-invariant. Dynamic models typically are represented by differential equations or difference equations. Explicit vs. implicit: If all of the input parameters of the overall model are known, and the output parameters can be calculated by a finite series of computations, the model is said to be explicit. But sometimes it is the output parameters that are known, and the corresponding inputs must be solved by an iterative procedure, such as Newton's method or Broyden's method. In such a case the model is said to be implicit. Discrete vs. continuous: A discrete model treats objects as discrete, such as the particles in a molecular model or the states in a statistical model; while a continuous model represents the objects in a continuous manner, such as the velocity field of fluid in pipe flows. Deterministic vs. probabilistic (stochastic): A deterministic model is one in which every set of variable states is uniquely determined by parameters in the model and by sets of previous states of these variables; therefore, a deterministic model always performs the same way for a given set of initial conditions. Conversely, in a stochastic model—usually called a "statistical model"—randomness is present, and variable states are not described by unique values, but rather by probability distributions.

For example, the following is a DFA M with a binary alphabet, which requires that the input contains an even number of 0s. M = (Q, , , q0, F) where

Q = S1, S2,

= 0, 1,

q0 = S1,

F = S1, and

is called a state transition table.

5.3 Objective Function

The main objective is to reduce manual effort and carry the task most easily by using technology.

1. Water the plants in an automated way

2. Using mobile applications watering of plants

3. Application used only for on and off of solenoid valve to water the plants

+

5.4 Approach/Algorithms

IOA is a formal language for describing Input/Output automata that serves both as a formal specification language and as a programming language (Garland et al. in http://theory.lcs.mit.edu/tds/ioa/manual.ps, 2004). The IOA compiler automatically translates IOA specifications into Java code that runs on a set of workstations communicating via the Message Passing Interface. This paper describes the process of compiling IOA specifications and our experiences running several distributed algorithms, ranging from simple ones such as the Le Lann, Chang, and Roberts (LCR) leader election in a ring algorithm to that of Gallager, Humblet, and Spira (GHS) for minimum-weight spanning tree formation in an arbitrary graph (Humblet et al. in ACM Trans Program Lang Syst 5(1):66–77, 1983). Our IOA code for all the algorithms is derived from their Input/Output automaton descriptions that have already been formally proved correct. The successful implementation of these algorithms is significant for two reasons: (a) it is an indication of the capabilities of the IOA compiler and its advanced state of development, and (b) to the best of our knowledge, these are the first complex, distributed algorithms implemented in an automated way that have been formally and rigorously proved correct. Thus, this work shows that

it is possible to formally specify, prove correct, and implement complex distributed algorithms using a common formal methodology.

Algorithms used in this application to design the product "Algorithm" is a word that one hears used much more frequently than in the past. One of the reasons is that scientists have learned that computers can learn on their own if given a few simple instructions. That's all that algorithms are mathematical instructions. Wikipedia states that an algorithm "is a step-by-step procedure for calculations.

Algorithms

Algorithms are used for calculation, data processing, and automated reasoning." Whether you are aware of it or not, algorithms are becoming ubiquitous in our lives. Some pundits see danger in this trend. For example, Leo Hickman writes, "The NSA revelations highlight the role sophisticated algorithms play in sifting through masses of data. But more surprising is their widespread use in our everyday lives. So should we be warier of their power?" It's a bit hyperbolic to declare that algorithms rule the world; but, I agree that their use is becoming more widespread. That's because computers are playing increasingly important roles in so many aspects of our lives.

Code for implementation of the system: The provided code appears to be an Arduino sketch for a watering system using various components such as an LCD display, a real-time clock (RTC) module, a servo motor, and a SoftwareSerial communication.

Here's a breakdown of the code:

1. Library Inclusions: - 'LiquidCrystal$_I$2$C.h$' : $ThislibraryallowscommunicationwiththeLCDdispl$
'$Arduino.h$' : $Thislibraryprovidesthecorefunctionsanddefinitionsfor Arduinoboards.-$
'$uRTCLib.h$' : $Thislibraryprovidesfunctionsforinteracting withtheRTCmodule.-$
'$Servo.h$' : $Thislibraryallowscontrolofservomotors.-$'$SoftwareSerial.h$' : $Thislibraryenablesof$
$basedserialcommunicationonspecificdigitalpins.$

2. Variable and Object Declarations: - 'mySerial': An instance of the 'SoftwareSerial' class used for serial communication on pins 8 (RX) and 9 (TX). - 'myservo': An instance of the 'Servo' class used to control the servo motor. - 'period' and 'time$_n ow$' : $Variablesusedfortime-basedoperations.-$'$lcd$' : $Aninstanceofthe$'$LiquidCrystal_I2C$'$classusedtoc$

‘rtc‘ : $An instance of the ‘uRTCLib‘ class used to interact with the RTC module. - ‘hr‘, ‘min‘, ‘sec‘ : Variables to store the hour, minute, and second values obtained from serial communication. - ‘daysOfTheWeek‘ : An array of strings representing the days of the week.$

3. ‘setup()‘ Function: - Serial communication is initialized. - ‘mySerial‘ is initialized. - The servo motor is attached to pin 3. - The servo motor is moved to 0 degrees, then 90 degrees, and finally back to 0 degrees. - The LCD display is initialized and cleared. - A welcome message is printed on the LCD display.

4. ‘split1()‘ Function: - This function is used to split the received serial data into hour, minute, and second values using the ’’ character as a delimiter. - The extracted values are converted from strings to integers and stored in the ‘hr‘, ‘min‘, and ‘sec‘ variables. - The values are printed to the serial monitor.

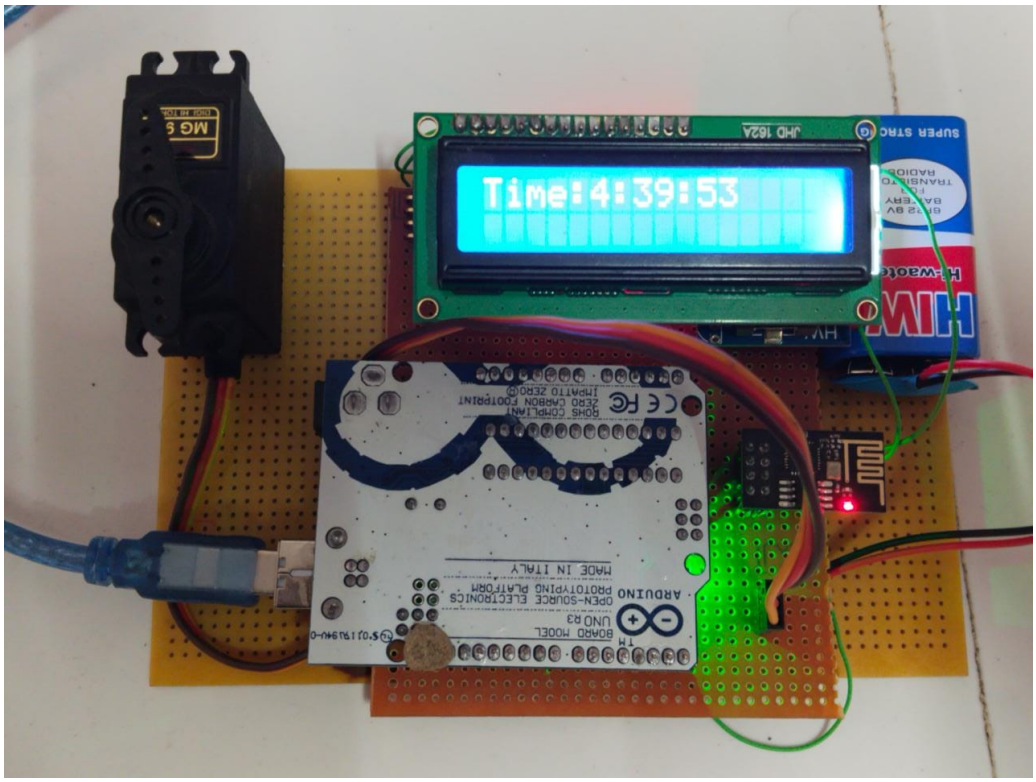
5. ‘loop()‘ Function: - The main code that runs repeatedly. - A check is performed to determine if it is time to execute the watering action based on the elapsed time using the ‘millis()‘ function. - The RTC module is refreshed to update the time. - The LCD cursor is set to the first position on the first line. - If there is serial data available (‘mySerial.available()‘), the received string is read until a newline character (”). - The ‘split1()‘ function is called to extract and process the hour, minute, and second values from the received string.

It’s worth noting that the code provided does not include the complete functionality of the watering system. There may be additional code required to control the solenoid valve and perform the actual watering operation.

Chapter 6

Implementation

6.1 System Implementation



System implementation is linked with an implementing model which involves hardware implementation and software which is linked with a hardware device.

Chapter 7

Result Analysis/Performance Evaluation

7.1 Result Analysis

From this, we came to a solution, and from the analysis we come to the final panacea, to make an automated water dispenser system that can bridge the gap between users and the interface. In this type of system, both hardware and software as well connected the control the excess of the model. The hardware is not only linked with a mobile but, also user can control this device at any time to water the plants by manual operation. Until now we have designed the model and looking for the linking system of the component to a hardware device. By the end of this month, we will be working with the demo, once the model or the system is completed.

Chapter 8

Conclusion

8.1 Conclusion

The work is designed and implemented in such a way, that it is much easy and cost-effective. Such a system will be able to contribute to the socio-economic development of the nation, with fast response and user friendly. Recent advances in soil water sensing make the commercial use of this technology possible to automate irrigation management for vegetable production. Research indicates that different sensor types perform under all conditions with no negative impact on crop yields with reductions in water range. Until now we have designed the model and looking for the linking system of the component to a hardware device. After completing the design we also implemented the system through which we can control the time and can operate with a time setting.

8.2 Future Scope

Limitations can be overcome, to the future scope and direction of the project in the project we are distributing water with the help of valves and hardware systems. This project can be uplifted to a different extent in which, water quantity level can be determined, and this type of project can be extended for large-scale production. In this era all types of resources are precious and need to be conserved taking, water is

an important aspect of life that need to be considered. w waste more than 40 percent of the water in a day. Plants do not require that much quantity for their needs, then also 30 percent of the excess water is wasted in and one way. so, the quantity of the water can be determined.

Appendices

Appendix A

Sponsorship Certificate

Appendix B

Publications/ Achievement

Certificate / Patent

Appendix C

Plagiarism Report of Text

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