

Project Synopsis
on
“IOT Based Smart Sanitizer Dispenser”

Submitted in partial fulfillment of the requirement for the degree of
Bachelors of Engineering by:

Chetan Kandarkar
Monish Soni
Mitesh Vaidya
Sarvesh Shukla

Under the guidance of
Mr. Mohd Farhan



LOKMANYA TILAK COLLEGE OF ENGINEERING

Affiliated to

UNIVERSITY OF MUMBAI



Department of Electronics & Telecommunication Engineering
Academic Year – 2020-2021

LOKMANYA TILAK COLLEGE OF ENGINEERING

UNIVERSITY OF MUMBAI

2020 -21

Department of Electronics & Telecommunication
Engineering

Synopsis

- 1.Chetan Kandarkar.
- 2.Monish Soni.
- 3.Mitesh Vaidya.
- 4.Sarvesh Shukla.

Course: B.E.(Electronics & Telecommunication Engineering)

Title of project: IOT Based Smart Sanitizer Dispenser

Project Guide: Mr. Mohd Farhan

Date:

“CERTIFICATE”

This to certify that **Chetan Kandarkar, Monish Soni, Mitesh Vaidya, Sarvesh Shukla**, have delivered seminar for Project Stage- I on ‘**IOT Based Smart Sanitizer Dispenser**’ on , 17th Dec 2020 and submitted a report in the , Lokmanya Tilak College of Engineering, Navi Mumbai for the partial fulfilment of the degree of B.E in “ Electronics and Telecommunication Engineering” from University of Mumbai, for the year 2020-21.

Mr.Mohd Farhan

(Project Guide)

Dr.Ravindra Duche

(Head of Department)

Dr.Vivek Sunnapwar

(Principal)

External Examiner

Place: Lokmanya Tilak College of Engineering

Date:

ACKNOWLEDGEMENT

We would like to acknowledge and extend our heartfelt gratitude to all those people who have been associated with this Project and have helped us with it thus making it a worthwhile experience.

Firstly we extend our thanks to various people which include our Project Guide **Mr.Mohd Farhan** who has shared her opinions and experiences through which we received the required information crucial for our project synopsis. I am also thankful to Head of Department **Dr.Ravindra Duche** and all the staff members of Electronics & Telecommunication Department for their highly co-operative and encouraging attitudes, which have always boosted us.

We also take this opportunity with great pleasure to thank our Principal **Dr.Vivek Sunnapwar** whose timely support and encouragement has helped us succeed in our venture.

Name of Candidate

Signature

1.Chetan Kandarkar

2.Monish Soni

3.Mitesh Vaidya

4.Sarvesh Shukla

“ABSTRACT”

Covid 19 is creating havoc in the world. The transmission of the disease was viewed as spread through person-to-person that make it easily diffuse. The infection spreading starts from the infectee droplets during sneezing or coughing. In order to reduce the spread of coronavirus, any contacts between people and potential carriers of the virus have to be limited. In current circumstances, social distancing and constant disinfection of public places become a necessity. Though, nowadays it is essential to sanitize hands, touching the same bottle surface already used by someone may increase the risk of contamination. So we have designed a smart touchless hand sanitizer-dispensing system using Iot. It also has feature such as auto refilling to reduce human labour and also possess alarm to remind person to sanitize hand before entering the premises and also keeps count of persons to monitor the no of persons present in the premises.

Contents

Abstract	iii
List of Figures	v
1 INTRODUCTION	1
2 SCOPE OF PROJECT	2
3 LITERATURE SURVEY	3
3.1 Referred Paper 1	3
3.2 Referred Paper 2	4
3.3 Referred Paper 3	5
4 METHODOLOGY	6
4.1 Review from Literature	6
4.2 Proper Planning	7
5 Block Diagram and Components Details	8
5.1 Block Diagram	8
5.2 Components Details	9
6 Conclusion	15
6.1 Conclusion	15
6.2 Advantages and Application	16
7 REFERENCES	17

List of Figures

5.1	Block Diagram	8
5.2	Arduino Uno	9
5.3	Bolt WIFI Module	10
5.4	HC-SR04 Ultrasonic Sensor	11
5.5	IR Sensor	12
5.6	Buzzer	13
5.7	LCD Display	14
5.8	Stepper Motor	14

Chapter 1

INTRODUCTION

Demand for hand sanitizer has increased due the coronavirus broke out and spread around the world. Hand sanitizers are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand .This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Pressing the pump handle is bothersome, and many pass by without disinfecting their hands. Moreover, each person presses the pump handle differently, making it difficult to predict the amount of use and to manage refills and replacements. For this reason, the actual use of hand sanitizers is reduced, which does not help prevent spread of the virus.

So to avoid the above problem we have to use automatic hand sanitizer dispenser. In this the ultrasonic sensor is used for auto opening the sanitizer and for each opening it will count the number of person who uses the sanitizer. When person enters from the gate then again the IR sensor will count the person. If counting of IR and Ultrasonic sensor are equal then that person is sanitized and if it is not equal then alert message will go to bolt IoT and buzzer will indicate that someone is not used the sanitizer. This process is programmed through arduino.

The main sanitizer bottle is also connected to secondary bottle whose size is greater than main bottle. The main bottle is connected to a water level indicator which indicates the level of water if it is low then it will indicate and pumps the sanitizer from secondary bottle to main bottle and manages the refills. This process is also programmed through arduino.

Chapter 2

SCOPE OF PROJECT

Corona Virus is wreaking havoc in the world. Almost every country is suffering from the Corona Virus. WHO has already announced it as a Pandemic and many cities are under lockdown people can't step out of their homes, and thousands have lost their lives. In these pandemic sanitizers are playing a very vital role in disinfecting but it's not touchless it is possible that one may get infected due to virus present on the surface of the bottle or what if someone enters the premises without using sanitizer. To protect yourself from getting infected it is essential to sanitize on a regular basis before entering any premises or home. So we have designed an automatic sanitizer machine with a lot of features in it which makes it different and safe from other sanitizers.

Chapter 3

LITERATURE SURVEY

3.1 Referred Paper 1

- **Design of Automatic Hand Sanitizer System Compatible with Various Containers.**

Abstract: Demand for hand sanitizers has surged since the coronavirus broke out and spread around the world. Hand sanitizers are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand. This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Some hand sanitizers on the market are automatically pumped. However, because sanitizer containers and pump devices are designed to be compatible only between products produced by the same manufacturer, consumers must also repurchase the container for the liquid if they replace the hand sanitizer. Therefore, this paper suggests the design of an automatic hand sanitizer system compatible with various sanitizer containers.

3.2 Referred Paper 2

• Bidirectional Visitor Counter using Arduino.

Abstract: It is a circuit used for accurately counting the number of persons/visitors entering or leaving the premises. if somebody enters the premises then the Counter is incremented by one, or decremented by one if someone leaves the premises. This count will be very accurate. The aggregate number of people will appear on the 16X2 LCD module. In the circuit an Arduino UNO Board is utilized. This will help in the accurate measurement of the visitors and is less complex compared to a microcontroller. The Arduino receives signals from the sensors and operate under the control of program stored in Arduino rom. there are two IR modules one at the entrance and other at the exit gate to count the number of persons entering and leaving the premises respectively. The main concept of this system is to keep track of people present inside the premises which is very useful in current situation.

3.3 Referred Paper 3

- **Automatic Water Tank Filling System Controlled Using Arduino™ Based Sensor for Home Application.**

Abstract: Water supply is the most important thing in daily home activity especially for washing, cleaning, and taking a bath. The Indonesian villagers commonly supply the water by pumping the groundwater to fill a water tank. However, the utilization of non-automated switch used to turn on and turn off a pumping machine sometimes causes either the water spills or a wasteful electrical consumption. The previous works reported the utilizations of Arduino™ based sensors for plant watering system, water tank overflow control, and automated irrigation system. In this work, an automated water tank filling system will be proposed. The system is designed by applying an ultrasonic sensor, an automatic switch module, a water-flow sensor, an Arduino™ microcontroller, and a pumping machine in order to automatically switch the water filling. By applying an ultrasonic sensor, an ultrasonic transmitter is mounted on the top of the tank and transmits an ultrasonic pulse down into the tank. This pulse which travels at the speed of sound will be reflected back to the transmitter from the liquid surface. The time delay measurement between transmitted and received signals enables the device to calculate the distance to the surface. The transmitter is programmed to automatically determine the liquid level and switch the pumping machine. The dynamics of water flow and liquid level during filling and draining the water tank will be reported. We hope to this system, people will enjoy supplying water without their worries related to water spills and a wasteful electrical consumption.

Chapter 4

METHODOLOGY

4.1 Review from Literature

We are making a automatic hand sanitizer dispenser with some modification in that we are adding counting system which can count the people we are also adding alert system which can alert the people to sanitize there hands and also we are adding level indicator and refilling system. So we have done some literature surveys for this idea. From refered paper 1 we get idea about Design of Automatic Hand Sanitizer System using arduino From refered paper 2 we get idea about Visitor counter using arduino it is used for accurately counting the number of persons/visitors entering or leaving the premises. if somebody enters the premises then the Counter is incremented by one, or decremented by one if someone leaves the premises. This count will be very accurate.and From refered paper 3 we get idea about Automatic liquid or Water Tank Filling System Controlled Using Arduino in this an automated liquid or water tank filling system is proposed with the help of pump machine we will refill the liquid.

4.2 Proper Planning

We will start our project by making Automatic Sanitizer using Arduino and other components. Then we will create alert system using another sensor and buzzer. It can send alert through alarm to people who try to enter premises without sanitizing. After that we will make counting system for putting at door. It will keep count of how many people have entered the building. Then we will add automatic tank filling system. It helps to refill on its own so sanitizer doesn't require anyone to refill it.

We referred online courses on Internet of Things. Also referred research paper for getting new ideas. We arranged our group discussion virtually on meet and discuss on how to proceed further. We also collected information for projects by reading different reference books.

As we already know that due to this pandemic, travelling has been restricted, we haven't been able to meet and everything we have discussed is done virtually. So, we have tried to do what we can do in this situation. We have purchased the WIFI module and some more components which we will be requiring in early stage. And also, we are trying to figure out the programming part of the project.

Chapter 5

Block Diagram and Components Details

5.1 Block Diagram

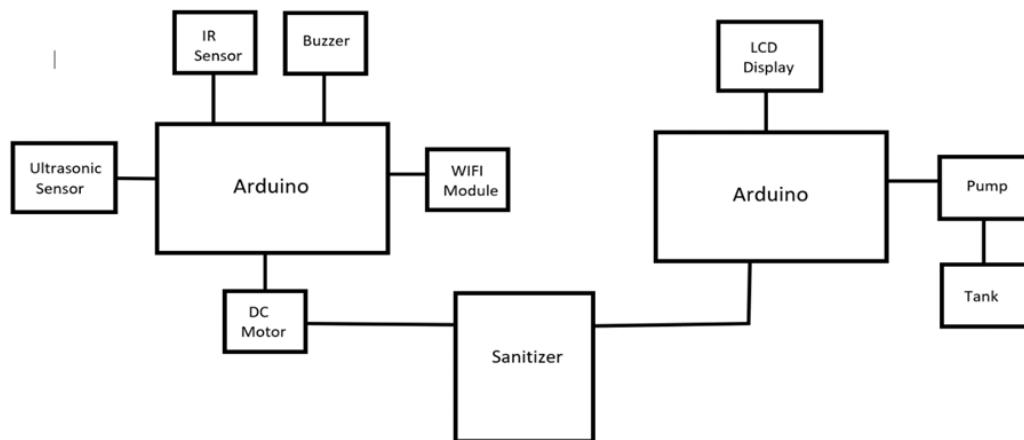


Figure 5.1: Block Diagram

In this project we will use two Arduinos. Ultrasonic Sensor will connect to the Arduino and also DC Motor connect to the Arduino using motor driver IC. Other part of motor will connect to sanitizer bottle. IR Sensor and Buzzer also connect to same Arduino. Then we will connect WIFI module with Arduino. After that

we will use second Arduino for automatic tank filling system. Pump will connect to that Arduino by using relay module. Other part of pump will connect to the tank. LCD display will also connect to the Arduino for indicating purpose. This Arduino will connect to sanitizer bottle by using probs.

5.2 Components Details

- **Arduino**



Figure 5.2: Arduino Uno

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board. The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Arduino uno has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a USB connection,

a power jack, a reset button and more. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery.

• Bolt WIFI Module

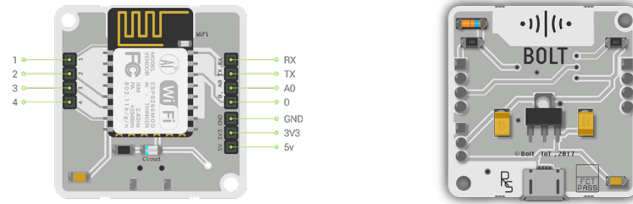


Figure 5.3: Bolt WIFI Module

The bolt Wifi module contains ESP8266 Wifi module. The ESP8266 Wifi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wifi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. The ESP8266 module is an extremely cost effective board. This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area.

- **HC-SR04 Ultrasonic Sensor**



Figure 5.4: HC-SR04 Ultrasonic Sensor

The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package from 2 cm to 400 cm or 1" to 13 feet. It comes complete with ultrasonic transmitter and receiver module. Operating voltage: +5V Theoretical Measuring Distance: 2cm to 450cm. Practical Measuring Distance: 2cm to 80cm.

- **IR Sensor**

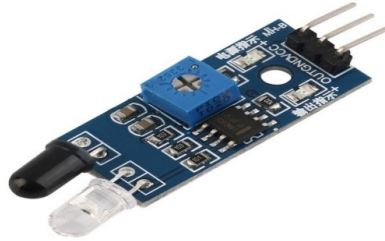


Figure 5.5: IR Sensor

IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode . Photodiode is sensitive to IR light of the same wavelength which is emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.

- **Buzzer**



Figure 5.6: Buzzer

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

- **LCD Display**

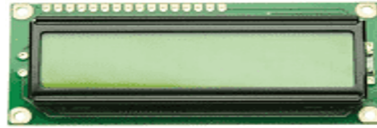


Figure 5.7: LCD Display

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.

- **Stepper motor**



Figure 5.8: Stepper Motor

The stepper motor is used for precise positioning with a motor, such as hard disk drives, robotics, antennas, telescopes, and some toys. Stepper motors cannot run at high speeds, but have a high holding torque. Stepper motors themselves function as ac motors. Stepper motors have a high pole count, usually between 50 and 100.

Chapter 6

Conclusion

6.1 Conclusion

This project will make smart touchless hand sanitizer system with auto refilling feature to reduce human labour and also possess alarm to remind person to sanitize hand before entering the premises. It also keeps count of persons to monitor the no of persons present in the premises. In current Circumstances, social distancing and constant disinfection of Public places become a necessity. So this Project will be very useful to use in hospitals, bank, mall and many public places.

6.2 Advantages and Application

- **Advantages:**

- It provides touch less sanitization.
- No labour required for refilling and monitoring.
- Give alerts to person to sanitize.
- Keeps count of people present in the building.
- Cheap and durable.

- **Application:**

- It can be used in hospital.
- It can be used in offices to sanitize the employees.
- It can also be used in colleges and schools to sanitize the students as well as staff members.

Chapter 7

REFERENCES

- “The Internet of Things” by Samuel Greengard A guided tour through the Internet of Things, a networked world of connected devices, objects, and people that is changing the way we live and work. 20 March 2015.
- ”Internet of Things: With Arduino and Bolt” By Ashwin Pajankar, India 2018.
- Bloomfield SF, Aiello AE, Cookson B, O’Boyle C, Larson EL. The effectiveness of hand hygiene procedures in reducing the risks of infections in home and community settings including hand washing and alcohol-based hand sanitizers. Am J Infect Control. 2007
- Arduino [Internet] Somerville (MA): Arduino; c2020. [cited at 2020 Aug 4]. Available from: <https://www.arduino.cc/> [Google Scholar].
- N. Kaur and S. K. Sood, “An energy-efficient architecture for the Internet of Things (IoT),” IEEE Syst. J., vol. 11, Jun. 2017.