

# SANITIZER DISPENSER WITH TEMPERATURE MONITORING USING IOT

Madhuri Pawar<sup>1</sup>, Bhairavi Jangale<sup>2</sup>, Neha Munde<sup>3</sup>, Mahesh Khedkar<sup>4</sup>, Prof. Prajakta Patil<sup>5</sup>

<sup>1-5</sup>JSCOE Hadapsar, Pune-411028, Maharashtra, India.

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**Abstract-** *The proposed IoT-based automated sanitizing system, mainly deals with complete COVID-19 care precautionary measures. The automation of systems for everyone is turning very frequently in the present. Yet, common people are facing many issues in their daily routine. Sanitizing is one of the important factors in COVID-19 care measures. Along with sanitizing, this project aims at providing contactless temperature monitoring using thermal sensors within the same system. There are various alert indication mechanisms that would be used in this system along with a cloud-based and app-based approach. Providing the best solution to this is the aim of our project. In selecting NodeMCU as a suitable interface, we aim to provide an easily compatible facility at an economically feasible rate. Hence, on adopting this methodology, we will be able to implement precautionary measures and facilitate people to use these effectively.*

**Key Words:** IoT-based system, automatic dispenser, sanitizer machine, ultrasonic sensor, contactless temperature monitoring, cloud based app.

## 1. INTRODUCTION

In this covid-19 pandemic period which is a global outbreak, hand hygiene is the core preventive measure in the spread of the disease as advised by WHO (World Health Organization) which includes washing hands with water and soap regularly, hand sanitizing using hand sanitizers, etc. Hygiene refers to the practices conducive to maintaining health and preventing disease especially through cleanliness such as washing hands, coughing in the elbow etc. Hand washing helps to prevent any diseases that spread through contact. In order to eliminate most of the germs on the hands, one needs to apply a good hand washing practice. In most healthcare settings, alcohol-based hand sanitizers are preferable to hand washing with soap and water because it can be easily tolerated and it is also more effective at reducing bacteria. Hand sanitizer is a liquid, gel, or foam generally used to decrease infectious agents on the hands. A sanitizer is designed to kill germs on skin, objects and surfaces. Hands are considered to be the primary mode of infectious diseases, especially for those living in close proximity such as college residence halls, shopping malls, bank halls, market areas etc. Because of the frequent contact with hands and multiple surfaces, the incidence of cross-contamination is significantly increased. Hand hygiene is a major requirement for human

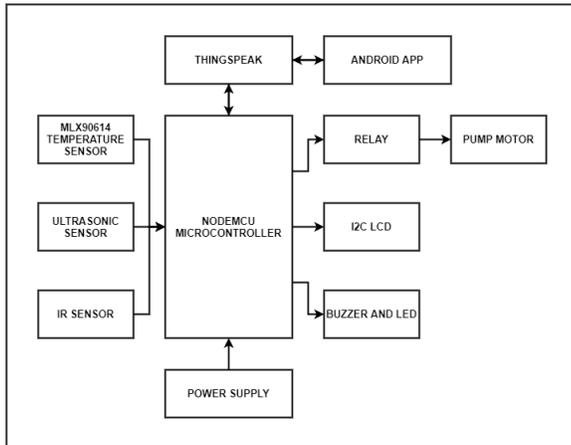
health and many infectious diseases can be emerged if proper hand hygiene procedures are not implemented. Hand washing is the important and cost-effective way to improve hand hygiene in health care and support the prevention of infectious disease. Over recent years, there has been increasing availability and usage of hand sanitizing products. The main advantage of these products seems to be that they are more trusted, quicker and easier to use. They may also provide another way to clean the hands when water and soap are not available. Using hand sanitizers is usually considered to be an effective hand hygiene regime for hospital, health-care settings and others. As we all know, the COVID-19 outbreak hit the world and changed our lifestyle. In this condition, Alcohol and hand sanitizers are vital fluids, however, they must be used properly. Touching alcohol containers or hand sanitizers with infected hands can spread the virus to the next person.

## 2. METHODOLOGY / WORKING

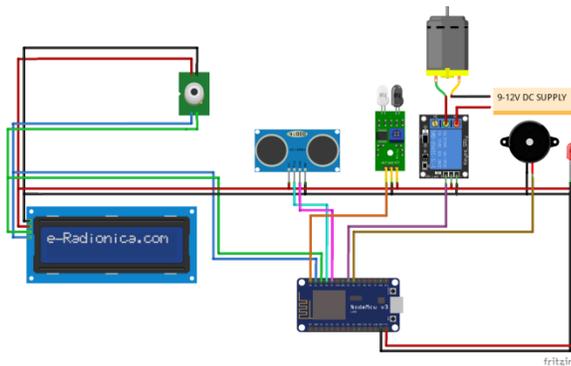
The project uses NodeMCU ESP-12E as the microcontroller as it an IoT Based project. An IR Sensor is used to detect hands and dispense sanitizer using a DC pump. When IR Sensor provides a signal the as 5V Single Channel Relay is turned on. The DC Pump Motor connected to the relay turns on and remains on till the relay is on. The DC Pump Motor pumps sanitizer on users' hand through a transparent plastic pipe outlet. The system also has a Thermal Scanner for contactless body temperature monitoring. If the body temperature of the user is normal the user is allowed to enter a place. For temperature greater than threshold an alert is given locally as well as through app remotely. An Ultrasonic Sensor is used for Sanitizer Level Detection. Whenever the sanitizer level falls below a threshold alert is given to the owner. Local data is displayed through I2C LCD Screen and remote monitoring is provided over cloud server as well as Android App. ThingSpeak is used as the IoT Cloud Server while the Android App is designed in MIT App Inventor2.

Alert Mechanism for High Temperature as well as Low Sanitizer Level is provided at local as well as remote level.

**2.1 Block Diagram of Proposed System :**



**2.2 Hardware Design :**



**3. LITERATURE SURVEY:**

SR NO	PROJECT TITLE	AUTHORS	YEAR
1	Emergence of the novel Coronavirus	Golin, A. P., Choi, D., & Ghahary, A	2020
2	Framework for early identification and monitoring of COVID-19 cases.	M. Otoom, N. Otoum, M. A. Alzubaidi, Y. Etoom, and R. Banihani	2020
3	IoT applications to fight	P.Singh,M.Javaid,A.H aleem,andR.Suman	2020

	against COVID-19 pandemic		
4	The infection caused by drug resistant microorganisms	Satoru Mitsuboshi, Masami Tsugita	2018
5	The hospital grasped infections	Jessica Hillburn MT(ASCP),CIC, Brian S Hammond, Elanor J Fendler PhD, Patricia A Groziak MS.	2003

[1] Virus has single stranded or double stranded RNA or DNA encapsulated in capsid. Complete comparison between hand sanitizers and soap, foam vs gel. Reducing the transmission rate of the disease. Quantity of sanitizer depends on situation or else occasion

[2] This paper proposes a COVID-19 detection and monitoring system that would collect real-time symptom data from wearable sensor technologies. The results show that five of these eight algorithms achieved accuracies of more than 90 %.It uses wearable sensor technologies which increases risk of spreading infection through touch and this system requires Internet connection all the time.

[3] This technology is helpful to capture the real-time data and other necessary information of the infected patientThe patient can use IoT services for proper monitoring of heart rate, blood pressure, glucometer and other activities for personalisIt helps to track the health conditions of older peopleed attention. This system is not contactless

[4] The multidrug resistant bacteria includes MRSA, ESBL producing bacteria, MDRP. The alcohol based hand sanitizers had negative association with MRSA isolation rate .Take other precautions too with sanitization

[5] They used hand sanitizers with 60 to 70 percent ethanol or isopropanol for reducing significant number of pathogens. For 10 month period of using hand sanitizers showed a result of 36.1% infection reduction. Not enough to sanitize only with that body temperature is also important.

**4. ADVANTAGES**

1. The device combines all the necessary sensors into a single system. Hence there is no need of different devices.

2. Alerts can be viewed at local as well as remote levels.

#### 4.1 DISADVANTAGES

Requires internet connection for operation.

#### 4.2 APPLICATIONS

Hospitals, Malls, Commercial & Residential Areas etc.

#### 5. EXPECTED OUTCOMES

The following characteristics will be included in our system:

1. Contactless Sanitizer Dispensing
2. In-built Thermal Scanner for contactless body temperature monitoring
3. Sanitizer Level Detection for low level alert
4. Local data display through LCD Screen and remote monitoring over cloud server as well as Android App.
5. Alert Mechanism at local as well as remote level hence no need of continuous human intervention.

#### 6. CONCLUSION AND FUTURE SCOPE

To conclude this project, on selecting NodeMCU as a suitable interface, we aim to provide an easily compatible facility at an economically feasible rate. Hence, on adopting this methodology, we will be able to implement precautionary measures and facilitate people to use these effectively.

1. A pulse oximeter sensor can also be added for measurement of heart rate and oxygen levels.
2. Cameras can be installed for capturing images of users for record keeping and tracking.

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