

# Document History

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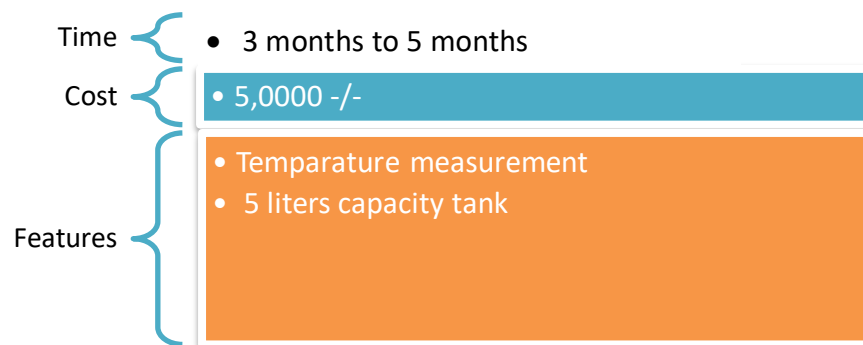
## Case Study of Smart Sanitizer Dispenser

### 1. Requirements:

#### i. Empathize Research:

Smart sanitizer dispenser with Temperature checking device by hospital staff Maintaining hand hygiene is a simple and effective way to prevent infections. A smart sanitizer dispenser used by hand sanitizing for hospital staff is the best method to improve hand hygiene. Staff tends to improve hand hygiene when they are aware of hand sanitizing. The Smart sanitizer Dispenser is a simple and cost-effective device to display the temperature of the hospital staff before and after Entering the patient room. To create a safe working environment for hospital staff.

#### Analysis:



#### ii. High-Level Requirement:

| ID   | Description          |
|------|----------------------|
| HR01 | Sanitizing           |
| HR02 | Temperature checking |

#### iii. Low-Level Requirement:

| ID   | Description           | Datasheet            |
|------|-----------------------|----------------------|
| LR01 | Thermal Sensor data   | <a href="#">Link</a> |
| LR02 | Ultra-sonic signal    | <a href="#">Link</a> |
| LR03 | Sanitizer Liquid Tank | <a href="#">Link</a> |
| LR04 | Motor Pump            | <a href="#">Link</a> |

#### iv. SWOT Analysis:

##### Strengths :

1. portable sanitisation device
2. Temperature display
3. 5 liters of capacity
4. cost efficient

##### weaknesses :

1. space occupied
2. 5V power supply required

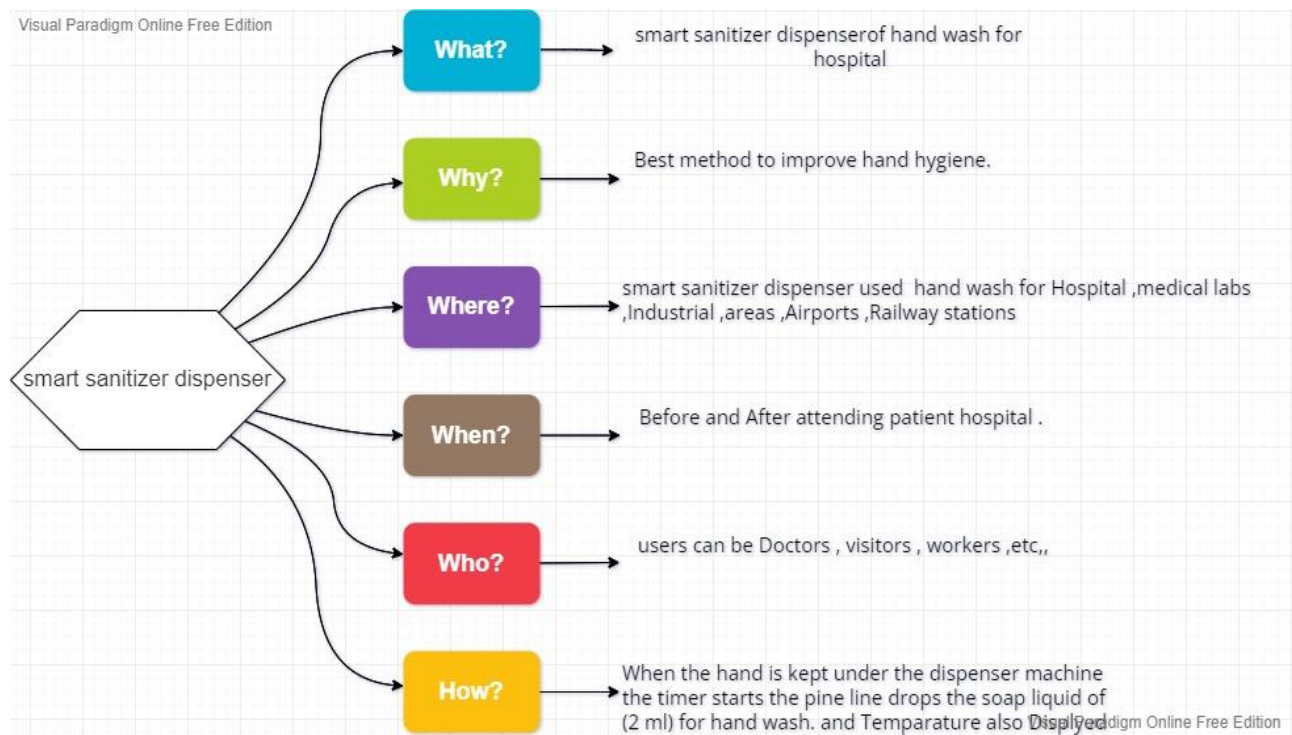
##### Opportunities :

1. Hospitals , medical lab staff
2. Shopping mall
4. Industrial Purpose ,
5. commercial purpose
6. Airports

##### Threats:

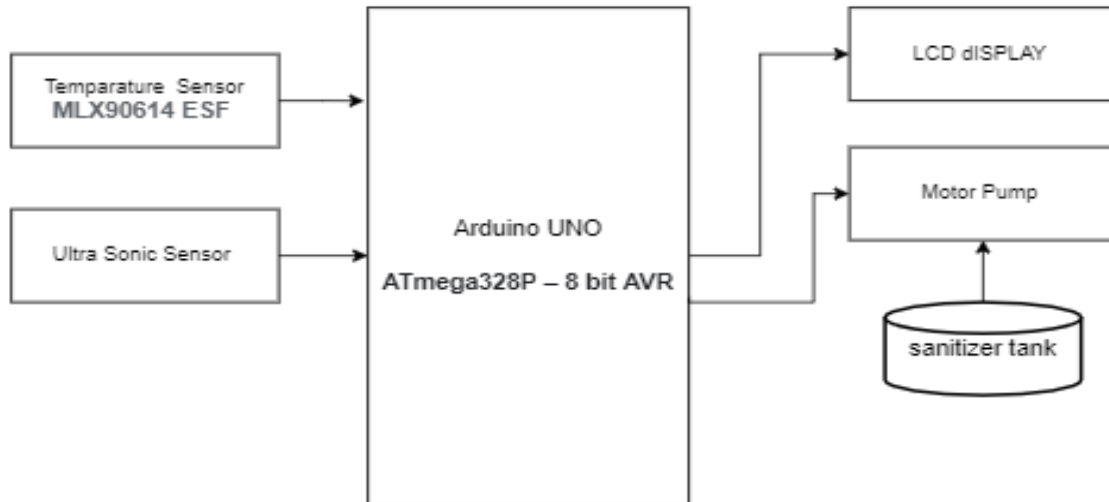
1. minimum range of a Requirement
2. tough competition
3. slow stock clearance sale

#### v. 5W 1H:



## 2. Design:

### i. Block Diagrams:



- **Sensors:**

- **Temperature sensor:**

- The temperature sensor used in this project gives an additional advantage over traditional hand wash dispenser machines. The best way to identify the illness of anybody is to measure the temperature

- **Ultra-sonic sensor**

- This kind of sensor emits ultrasonic sound waves to detect any nearby objects. It has two main components are Transmitter and receiver. when the user raises their hands to the sensor it is detected and sends the data to the Arduino.

- **Microcontroller:**

- **Arduino AT mega 328p:**

- Arduino Uno is a microcontroller development board with a chip of ATmega328P. 6 GPIOs, 6 PWM and 6 ADC, a 16 MHz crystal frequency, USB program debug with the reset button.

- **Actuator:**

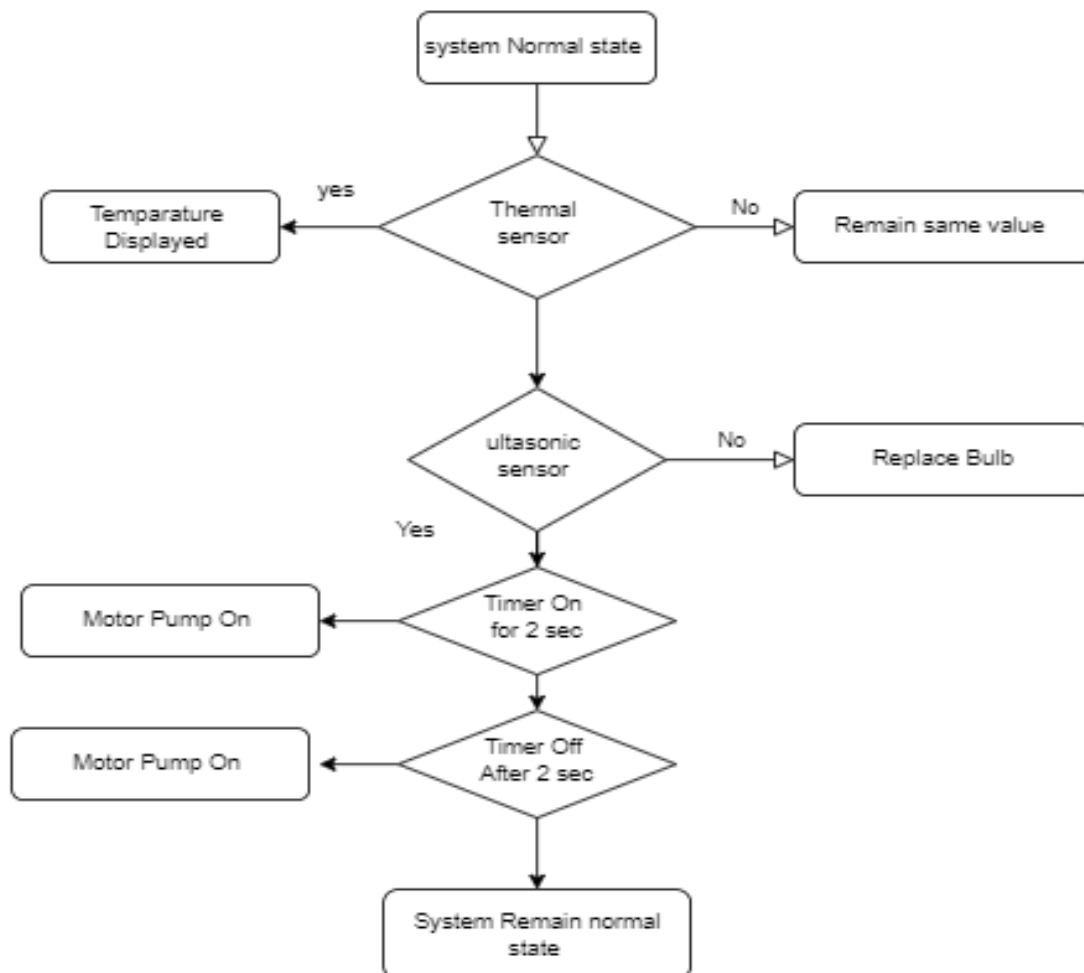
- **Motor Pump:**

- Pump size: 40 x 90 x 35 mm and 1 Meter Silicon Tube included – 2 Pcs and R365 Diaphragm Pump and Do not Run Without Water and Easy to use.

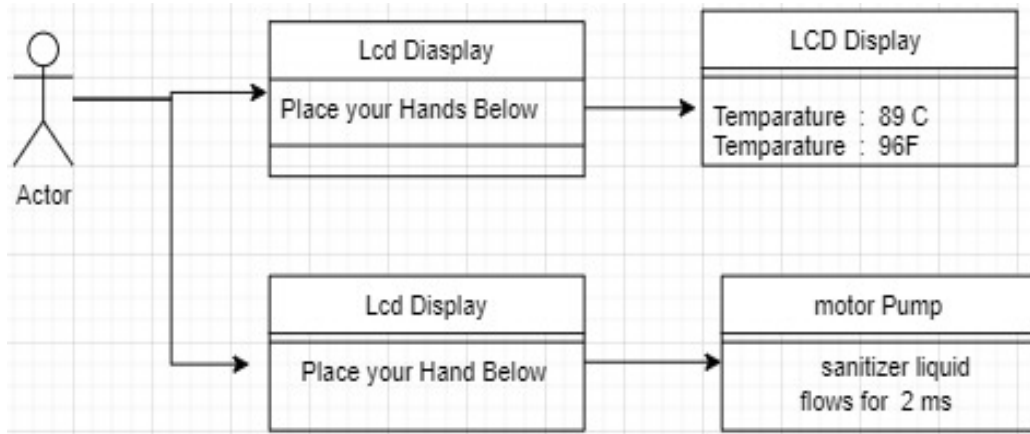
- **Display:**

An LCD display is a 16x2 module used to show the temperature of the user. For that purpose, a sensor is provided shows it in Fahrenheit and Celsius display in real-time.

## ii. Structural Diagram:



### iii. Behavioral Diagram:



## 3. Evaluation

### i. High Level Test Plan:

| Test Id | Test case                      | Expected output | Actual output |
|---------|--------------------------------|-----------------|---------------|
| 01      | Thermal sensor calibration     | 89.69           | 87.98         |
| 02      | Ultra-sonic sensor distance    | Distance 20 cm  | 15            |
| 03      | Motor Pump Ton and Toff Period | delay (1000)    | 2 sec         |

## **4. Conclusion:**

### **i. Summary:**

Automatic Smart sanitizer dispenser with Temperature checking device proposed in this paper is to avoid virus infection prevention. Contactless sanitization & temperature detectors are used to reduce and spread of the COVID-19 virus and can also observe some necessary parameters like a person's body temperature using a contactless temperature sensor. The automatic touch-less hand sanitizer device demonstrated in this study is expected to play a key role in contactless hand disinfection in public places and reduce the spread of infectious diseases in society.

### **ii. Advantage:**

- i. Maintain hand hygiene.
- ii. Noncontactable.
- iii. Temperature can be checked.

### **Disadvantage:**

- i. Power supply needed
- ii. Check the

### **Applications**

The targeted users in the industry:

- i. Hospitals
- ii. medical laboratories
- iii. Industrial
- iv. Airports
- v. Other public service sectors

## **5. REFERENCES:**

- [1] John M. Boyce, M.D and Didier Pittet (2019), "Measuring Health care worker Hand hygiene activity", IEEE Xplore Part Number: CFP20N67-ART; ISBN: 978-17281-5374- 2 2 2 (ICIRCA-2020).
- [2] J.E. Kolassa, Satoru Mitsubishi, "Evaluation of alcohol-based hand sanitizers antibiotic consumption". Chemotherapy, Pediatrics (116:587-59 – 2020).