IoT Based Hand-Sanitizer

PREPARED BY

- Dayal Nigam
- Tinkal Shakya
- Arpit Kr. Jain

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INTRODUCTION

We have created hand sanitizer system using IoT which involves NodeMCU & ultrasonic sensors we have gather all the data to the firebase database and retrieving it on the android application we have applied the machine learning techniques also which will predict the date at which the sanitizer bottle gets fill out from alcohol also this smart sanitizer is capable of recognizing the person hands by which it drops the liquid out of it.

OBJECTIVES

The objectives of the project includes:-

- To Detect Amount of Sanitizer left inside the bottle.
- To control the DC motor as it detects the hands in front of the ultrasonic sensor.
- To send the data to the database of the firebase and then we retrieve it on the Android Application.
- To predict the date at which the bottle gets empty.

TASKS

Task 1	Task 2	Task 3	Task 4
To test both the Ultrasonic sensors values on real time basis and test the DC Motor using Relay control.	To test the Android application.	We are using RTC module to send the data to the server.	To test the prediction the level of machine learning model.

SCOPE

1) At this time we target Offices, Factories, Companies employees but in the upcoming version we add the functionality for a Customers of any Shops, hotels, Banks, hospitals etc. so this machine will work for both employee of organization and Customers also.

2) Also add employee dashboard when the employee also Monitor their data.

TESTING STRATEGY

1. **Unit Testing:-** We have completed the testing by following methods mentioned below:-
   A. From Hardware side we have tested each and every component before designing it on circuit.
   B. From software side we have tested the rest API for sending from NodeMCU and receiving the data on the dashboard.

2. **Component Testing:-** In this project we have performed components testing manily in:-

   Hardware part:-

   1. We have tested motor with relay.
   2. We have tested the working of both ultrasonic sensor individually.
   3. The depth of the bottle and the level of Sanitizer has been tested individually before assembling.
   4. The battery % has been tested so as to check the power consumption.

   Software part:-

   1. As the counts are increasing continuously so we have assigned 1s delay for counting the number of counts.

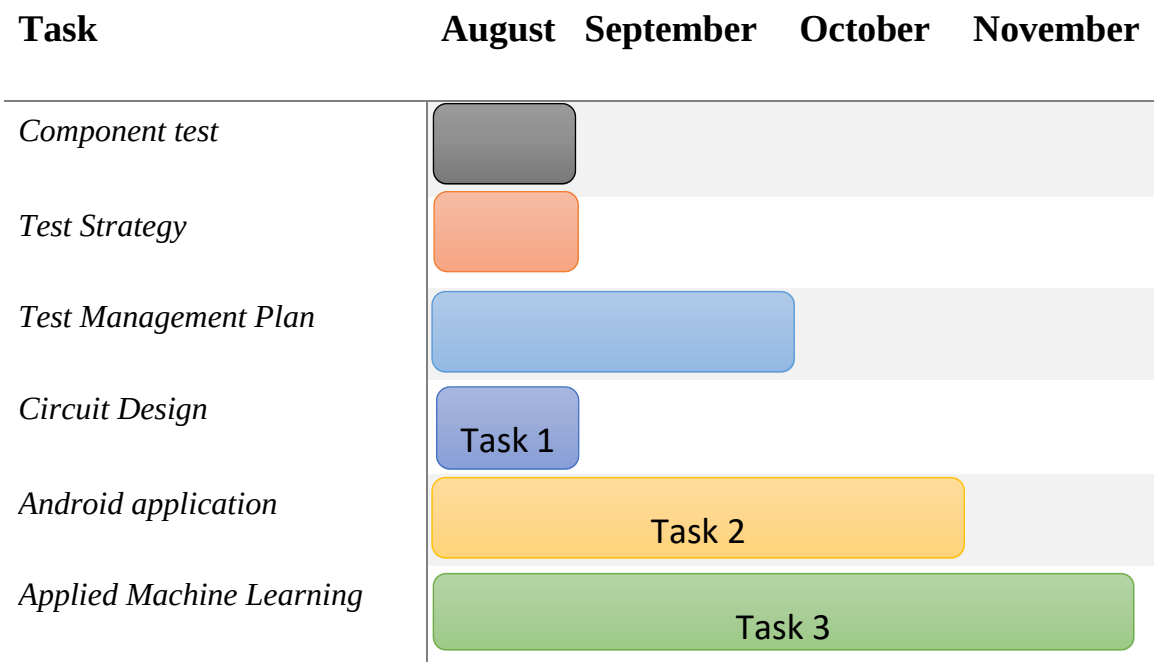
3. **Integration Testing :-** We have completed the testing by following methods mentioned below :-

   a. From Hardware side we have tested combined all components and design circuit.
   b. From software side we have tested the rest API for sending from NodeMCU and receiving the data on the dashboard. Also we have write the code for NodeMCU for sending the data to the Server.

4. **System Testing :-** We have tested design the circuit diagram for the project and also created the software required for the project to run which validates the whole system testing by proper functioning of hardware & software.

Hardware Requirements	Software Requirements
NodeMCU	Arduino IDE
Ultrasonic Sensor	Python IDLE
Relay Module	Android Studio
RTC Module	Firebase
DC Water Pump Motor	
Connecting Wire	

TEST SCHEDULE



FEATURES TO BE TESTED

If the project is rebuilt below features need to be tested again-

- To test whether all the components are working or not
- To test whether program is correct
- To test the values given by sensors are real time values
- To test the data is transferred to firebase
- To test Android application works or not

FEATURES NOT TO BE TESTED

Below features need not be tested if the project is rebuilt –

- We do not perform any testing on NodeMCU Pins and Ultrasonic Sensors Circuit.

RESPONSIBILITIES

Members	RESPONSIBILITIES
Tinkal Shakya	Hardware testing, Arrangements and controlling
Dayal Nigam	Android programming, Python programming, Machine learning
Arpit kr. Jain	Hardware programming, Machine learning

ROLES

- Ultrasonic Sensor – To detect the hand and to measure the level of sanitizer
- Relay – To operate the Water pump
- DC Water Pump – To pull-out the sanitizer from the bottle.
- RTC Module – To detect the real time date & time
- NodeMCU - To control the system and transfer the data on firebase

SCHEDULES – Major Deliverables

Identify the deliverable documents. You can list the following documents: -

- Test Plan
- Test Cases
- Test Summary Reports.

RISKS/ASSUMPTIONS

Risks in the project may include –

- Sometimes the motor is not working properly or other components due to battery power supply.
- We should enough battery power of maximum 12v to the system for proper functioning.
  • As the ultrasonic sensor is sensitive so it continuously detects the physical substance that's why we have to built in the place where it only detects the hands and nothing else.

APPROVALS

Name	Date	Signature	Comment
Dr. R. S. Pavithr			
Dr. Sanjay Saini			
Mrs. Vandana Mairh			
Miss. Manisha Gupta			
Mr. Amarjeet Singh Chauhan			