

IoT Based Smart Washroom using Automated Sensor

Ms. Nayana B. Chide, Mr. Nilesh P. Bobade

Department of Electronics Engineering,
B. D. College of Engineering and Technology, Sevagram, Maharashtra, India

ABSTRACT

In the contemporary world, the technologies are sharply developed, but still the hygiene in our country is under hazards. The abstract of project is to provide clean and hygienic toilets or washrooms. All the public toilets should be clean and hygienic means disease free. In our country, government has introduced the scheme called "Swachh Bharat" (Clean India) so keeping the toilets clean is the one of the objective of Clean India Scheme. Our proposed solution can contribute to raise the clean India project. In future, it can play the major role in Clean India scheme. The existing system focus on detecting the dirt in the toilets. In our proposed system, we have focus on keeping clean toilets, observing the sweeper's working activities. It can avoid many diseases and may create the awareness among people about the Toilet management. Therefore, our solution is used to have safe and hygienic toilets. The proposed system is based on IOT and using different sensors like smell sensor, IR sensor, ultra sonic sensor, RFID reader. By using these sensors, we can create the smart toilets.

KEYWORDS: IOT, Smell Sensor, Automatic Flusher, Ultra Sonic Sensor, RFID reader

INTRODUCTION

The term Internet of Things generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers, allowing these devices to generate, exchange and consume data with minimal human intervention.

As we know the concept of IOT very well, connecting any devices whether it can be one or more than one. We can operate IOT devices from long distance also (ON or OFF). Internet of Things is a very huge network use to gather information and split too many devices. When we build the many devices and objects with the sensors and then connected to the IOT, it will start working.

In our country, people do not have enough knowledge of "How to use toilets?". This forefront to several diseases, such as Flu, Typhoid, etc. Hence, we have introduced the concept of IOT based smart washroom. Proposed system used to maintain the toilets in the clean and hygienic way. With the help of internet of things and by using different sensors like smell sensor, dirt sensor, ultra sonic sensor, RFID reader, Database. Using these materials we are trying to provide the clean toilets and create the awareness among the people.

A. PROPOSED SYSTEM

The proposed system of IOT based smart washroom is shown in below figure. In this block diagram we use RFID Reader, ultra sonic sensor, odor sensor, Microcontroller ATmega 328, relay, LCD, Automatic flush mechanism etc.

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In our proposed system, we use one chip i.e. Microcontroller ATmega328. It is high performance and low power controller. It is 8 bit microcontroller belongs from AVR family (Advance Virtual Risk).

In the first phase of proposed system is that, we are going to scan the ID card of the sweepers on RFID Reader, for the attendance purpose. It is the responsibility of sweeper to clean the washroom daily, before enter in the washroom they need to scan the ID card otherwise they will be declared as absent.

All the information will be save in the database and the feed data of sweeper will be display on LCD.

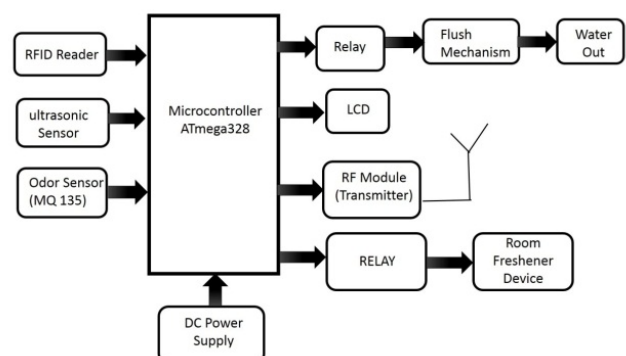


Figure 1: Washroom System Block Diagram

In the second phase, there is Ultrasonic Sensor. If the person is present in the washroom then the signal is high,

otherwise signal is low. So many times people do mistakes they don't flush, that time when signal is low (it happens when person leave the washroom) then automatic flusher is ON for the particular second. We are going to set the time in the coding near about 3 second then flusher will automatically get turn OFF. We are going to use the L293D driver IC as an amplifier to operate the flush mechanism. In the third phase, there is a Gas Sensor or called it as an Odor Sensor i.e. MQ135. This sensor detects the bad smell which present in the washroom. Then we are going to set the coding for the room freshener. If the bad smell level increases then automatically room freshener will get turn ON.

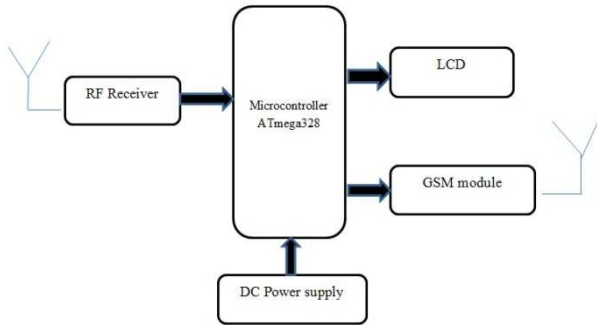


Figure 2: Hub Station

Above diagram is Hub Station. Here in both the circuits we use the 7805 IC called as Voltage Regulator. It converts 12v into 5v. Some of the components in our project need 5v supply voltage that time heat liberation process happens (there is chances of IC burn) for that we use heat sink.

B. PROGRESSION WORK DIAGRAMS

Below diagrams are of IOT based smart washroom. Figure 3 is of washroom system block diagram and figure 4 is of hub station.

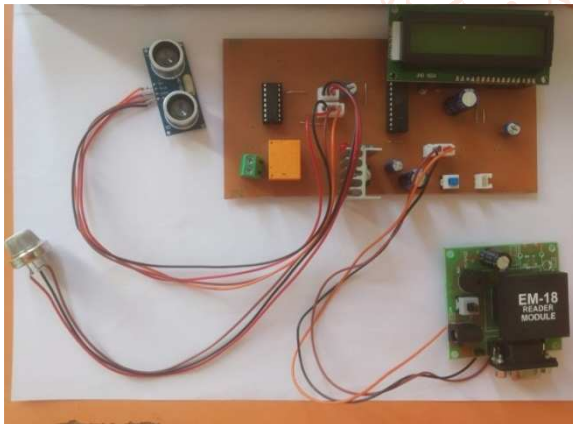


Figure 3: Washroom System Block Diagram

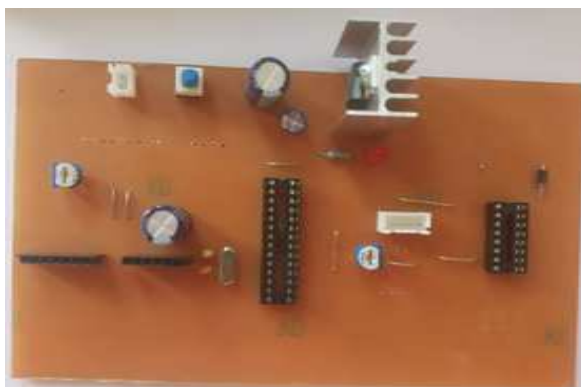


Figure 4: Hub Station

All the PCB designs are drawn by PCB artist software. For PCB designs, first of all draw the design on butter paper put the mirror image on the copper plate then remove the unwanted copper by etching process only tracks of the design are remains. In this way PCB designs are ready for the next process means for mounting the components by soldering process.

C. ADVANTAGES OF SMART WASHROOM

The following are the advantages of smart washrooms:

➤ **Ease of Use**

One of the main advantages of choosing to use a smart toilet instead of a traditional one is the fact that smart toilets will flush automatically once you get up and move away. This means that you will never have to worry about forgetting to flush and leaving waste sitting in your bathroom for an extended period of time, which can be pretty gross. This makes smart toilets a good choice for homeowners with mobility issues who may enjoy not having to twist and turn when using the bathroom, and for families who have small children who may not always remember to flush once they're done.

➤ **Environmentally Friendly**

Finally, one of the most important reasons to consider installing a smart toilet in your home is because they will use less water on average than regular toilets. This is because they only use enough water necessary to flush the waste that is within them, instead of using a general purpose, one-size-fits-all flush that can waste water if you're not flushing anything solid. This can help make your home and bathroom much more environmentally friendly. This has a practical benefit, beyond being a good thing to do generally: reduced water usage will drop your utility bills each month as well, which can help pay against the initial cost of the toilet.

➤ **Awareness in people**

This system creates the awareness in people about how to maintain proper hygiene, management of washroom. The main advantage of this system is diseases free washroom. It prevents from contagious diseases.

D. Conclusion

In this progress paper, we have partially implemented the IoT based smart washroom using automated sensor. Our proposed solution will create the awareness to the public about proper hygiene, for this it makes use of Internet of Things, which is rapidly emerging technology. Thus by using technologies in smarter way, we can maintain cleanliness which is next to godliness. Be Clean, Be Safe

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