# AUTOMATED PUBLIC SETTINGS FOR PHYSICALLY DISABLED PERSONS

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Abstract: This project is to introduce a "Clean and hygienic toilets in Public especially for Physically Challenged". Our project will be a help to improve hygiene condition in India public toilets. It will create awareness among people in terms of "Toilet Management".Our idea is inspired by "Swachh Bharat Abhiyan" Scheme to improve cleanliness in the country by Our Prime Minister Sir Narendra Modi.The proposed system" Smart Toilet for disabled person" is based on IoT, smell sensor, weight sensor, water pump, vibration sensor, door magnetic sensor and Wi-Fi module.People who use toilets in public will face lots of health related and detrimental issues due to the unhygienic and insanitary toilets.To maintain a automatic clean and hygienic public toilets by using Internet of Things.This will reduce the wastage of water and improve the sanitation of the toilets.Using our project, we can make physically challenged persons more comfortable while using public toilets, which will change people's perception towards public toilets.
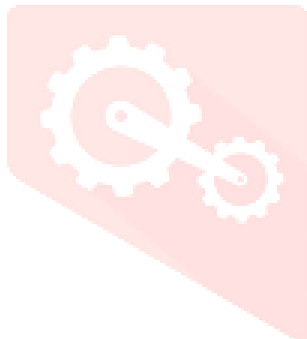
INTRODUCTION

The project Development of a smart toilet for automatic flushing deals with automatic cleaning of public toilets without requiring any human assistance. Most of the public toilets are not clean due to the irresponsible peoples who often forget to flush the toilet after using it. In India all the state and central government are allotting numerous funds. The central government under "SWACH BHARAT MISSION" has built a vast number of new toilets to provide the citizens a healthy and hygienic environment. Therefore, cleaning of public toilets is equally important as cleaning of household toilets. So we have developed a mechanism to flush the toilets automatically by utilizing the human weight.

The mechanism does not require any external power or human concern. Rather, it just works mechanically utilizing the weight of the person sitting on it.

Keywords - IoT, ARDUINO UNO,SENSORS, ESP8266 WIFI

RELATED WORK

K.Elavarasi1, Mrs.V.Suganthi , Mrs.J.Jayachitra proposed DEVELOPING SMART TOILETS USING IOT - The abstract of this paper is to deliver clean and hygiene toilets. All the public toilets should be clean and hygiene. In our country, our government has introduced the scheme called "Swachh Bharat" (Clean India). Keeping the toilets uncontaminated is the one of the objective of Clean India scheme. This paper can be helpful to encourage the clean India project. In future, it can show the major part in clean India scheme. In an Existing system, they are focused only on identifying the dirt in the toilets. In our proposed system, we have determined on keeping clean toilets, observing the sweeper's working activities. It can dodge many syndromes. It may create the consciousness amongst people about the toilet management. Therefore, our development is to use safe and hygienic toilets. This paper is based on IOT and image-processing concepts using different sensors like smell sensor, IR sensor, sonic sensor, RFID reader. By using these sensors, we can create the smart toilets.

Farzana Shaikh, , Feza Shaikh, Needa Mittha, , Khadija Sayed, Naziya Khan proposed Smart Toilet Based On IoT - In today's world with the ever increasing growth in the population of India, the hygiene of our country is endangered. Our Prime Minister Sir Narendra Modi has introduced "Swach Bharat Abhiyan" Scheme to improve cleanliness in the country. Our project will definitely be a help to improve hygiene condition in India. It will create awareness among people in terms of "Toilet Management". The proposed system "Smart Toilet" is based on IoT, smell sensor, IR sensor, sonic sensor, RFID sensor. The smart toilet will take care of opening and closing of the toilet seat, the IR sensor tracks the dirt present on the toilet seat and raise an alarm, The cleanliness of the toilet will be improved by monitoring the sweeper's activity to maintain the hygiene of the toilet, it also will deal with water conservation. This irresponsible behavior results in dirty toilets. Also in many cases public toilets do not have flushing facility. But now flushes are installed in some of them, still the flushes are not used due to lack of knowledge and laziness.

PROPOSED SYSTEM

In this proposed system, will trying to create awareness among the people about the proper hygiene or sanitation of using toilet by using internet of things. It is a rapidly emerging technology. Our proposed system will make everyone to strictly follow the cleanliness and proper sanitation in the toilets and to produce disease free toilets. It prevents from many diseases that spread due to improper sanitation of the toilet. So, by using IOT technologies in the smarter way, we can maintain the proper cleanliness which is next to godliness. In below system first phase is, IR sensor which is used to detect person present in the toilet. If person is present in the toilet it can sense. After using the toilet, the flush system will start automatically with the help of Load Sensor. Then there are sensors, first is Ammonia sensor measure smell inside the toilet. If unwanted smell is present more than natural odour then room freshener system will ON automatically it maintain good smell in washroom. If many number of persons use washroom, odour level increase more than normal odour, and so the system send signal automatically to receiver hub station. This is how smell sensor works. A special sensor called vibration sensor is attached incase of person slips down accidentally inside the washroom. That sends alert to the sweeper nearby to get help. Water Management and Door Management is also concerned in this proposed system.

EXISTING SYSTEM

In India people mostly prefer defecating in open ethics in field railways tracks, open grounds, public toilets etc. Sometimes the users do not have knowledge about how to reach the public toilets and use the toilet. Even if they reach the toilets the hygienic conditions of the public toilets is not well maintained up to user's satisfaction which stops him or her from using the public toilets. One of the reasons is the user's laziness of cleaning the toilet The other reason is the sweeper's ignorance towards the responsibility of cleaning the toilet. It is one's responsibility to follow rules of cleanliness. In spite of the availability of the public toilets, their improper management restricts the user from using it. Thus the existing scenario lacks overall management of published toilets. And physically challenged people suffer a lot during emergency situations. Theirs is no proper facility available for them in existing public toilet systems

COMPONENTS

A module is a software component or part of program that contain one or more routines. One or more independently developed modules make up a program. It consists of two main modules they are,

- Hardware
- Software

HARDWARE:

ARDUINO UNO

The Microcontroller used here is an Arduino UNO. The UNO is a Microcontroller board based on ATMEGA 328P.

The ATMEGA 328P has 32kB of flash memory for storing code. The board has 14 digital input and output pins, 6 analog inputs, 16 MHz quartz crystal, USB, an ICSP circuit and

a reset button. The UNO can be programmed with the Arduino software.

SENSORS

A sensor is a device, module, machine,or subsystem whose purpose is to detect events framework gives a promising ease remote arrangement just as remote controlling for exactness water system or changes depends upon transducer in its environment and send the information to other electronics, frequently a microcontroller. A sensor is always used with other electronics.

ESP8266 WIFI

The ESP8266 Arduino compatible module is a low-cost Wi-Fi chip with full TCP/IP capability, and the amazing thing is that this little board has a MCU (Micro Controller Unit) integrated which gives the possibility to control I/O digital pins via simple and almost pseudo-code like programming language. This device is produced by Shanghai-based Chinesemanufacturer, Espresso if Systems.
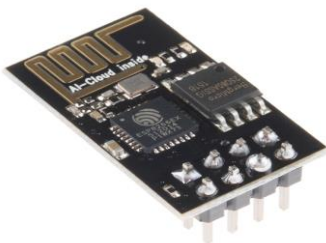
RESULTS AND DISCUSSION

This is the module of the proposed system. Here the sensors are connected with the microcontroller. The present work is successful in the view that the proposed mechanism has been successfully designed and demonstrated; but there is still a lot of room for further improvement.


GAS SENSOR

Sensitive material of MQ135 gas sensor is SnO2, which with lower conductivity in clean air. When the target combustible gas exist, The sensors conductivity is more higher along with the gas concentration rising. Please use simple electrocircuit, Convert change of conductivity to correspond output signal of gas concentration. MQ135 gas sensor has high sensitivity to Ammonia, Sulfide and Benze steam, also sensitive smoke and other harmful gases. It is with

low cost and suitable for different application.Used for family,Surrounding environment noxious gas detection device, Apply to ammonia, aromatics, sulfur, benzene vapor, and other harmful gases/smoke, gas detection, tested concentration range: 10 to 1000ppm.
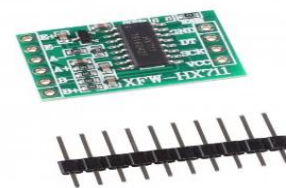

IR SENSOR

IR LED emits light, in the range of Infrared frequency. IR light is invisible to us as its wavelength (700nm – 1mm) is much higher than the visible light range. IR LEDs have light emitting angle of approx. 20-60 degree and range of approx. few centimeters to several feets, it depends upon the type of IR transmitter and the manufacturer. Some transmitters have the range in kilometers. IR LED white or transparent in colour, so it can give out amount of maximum light.
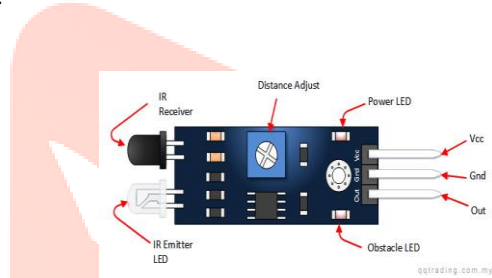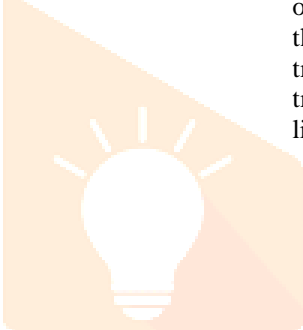
LOAD CELL AND HX711

They are many types of Load Cell, but today we will be using the straight bar type.When pressure or a load is applied, the electrical resistance will change in response to this applied pressure and by taking this information and after some calibration we can determine the precise weight.

VIBRATION SENSOR

This module features an adjustable potentiometer, a vibration sensor, and a LM393 comparator chip to give an adjustable digital output based on the amount of vibration. The potentiometer can be adjusted to both increase and decrease the sensitivity to the desired amount. The module outputs a logic level high (VCC) when it is triggered and a low (GND) when it isn't. Additionally there is an onboard LED that turns on when the module is triggered.

ULTRASONIC SENSOR

Ultrasonic ranging module HC - SR04 provides 2cm - 40cm the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitter, receiver and control circuit. The basic principle of work:
(1) Using IO trigger for at least 10us high level signal,
(2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.

DC WATER PUMP

Micro DC 3-6V Micro Submersible Pump Mini water pump For Fountain Garden Mini water circulation System DIY project. This is a low cost, small size Submersible Pump Motor which can be operated from a 3 ~ 6V power supply. It can take up to 120 liters per hour with very low current consumption of 220mA. Just connect tube pipe to the motor outlet, submerge it in water and power it. Make sure that the water level is always higher than the motor.


LCD DISPLAY

There are many display devices used by the hobbyists. LCD displays are one of the most sophisticated display devices used by them. Once you learn how to interface it, it will be the easiest and very reliable output device used by you! More, for micro controller based project, not every time any debugger can be used.

REFERENCES

1.   E.Elakiya,   K.Elavarasi,   R.P.Kaaviya   priya ,"Implementation of Smart Toilet (Swachh Shithouse) Using IOT Embedded Sensor Devices", International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES), Volume 4, Issue 4, pp 65 – 74, April-2018 .
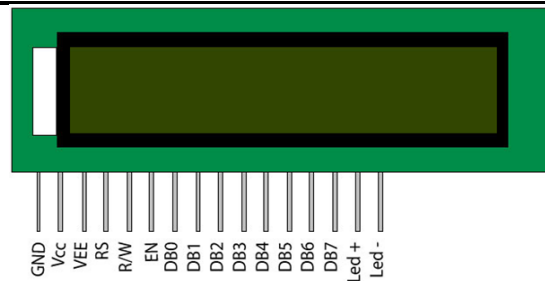
BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or key stroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play."A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric.

CONCLUSION AND FUTURE WORK

Our proposed project will create awareness among the people about the proper sanitation. It makes use of Internet of things, which is a rapidly growing technology. Our proposed system will make automatic cleanliness and proper sanitation in the toilets. It prevents the many new contagious diseases that spread due to improper sanitation of the toilets. Thus by using technologies in the smarter way, we can maintain the cleanliness which is next to the godliness. Keep Clean, Be Safe. The present work is successful in the view that the proposed mechanism has been successfully designed and demonstrated; but there is still a lot of room for further improvement which may include the following

• In the project, the platform is unstable, i.e. it does not hold still when a person mounts or dismounts it. Therefore it could be made more stable by providing bushing instead of bolts to constraint the motion.
2. C. H. Tsai, Y. W. Bai, M. B. Lin, R. J. R. Jhang and Y. W. Lin, "Design and implementation of an auto flushing device with ultra-low standby power," 2013 IEEE International Symposium on Consumer Electronics (ISCE), Hsinchu, pp. 183-184, 2013.

3. Kitisak Osathanunkul, Kittikorn Hantrakul, Part Pramokchon, Paween Khoenkaw and Nasi Tantitharanukul

"Configurable Automatic Smart Urinal Flusher based on MQTT Protocol",IEEE 2017.

4. A. D. Kadge, A. K. Varute, P. G. Patil, P.R. Belukhi "Automatic Sewage Disposal System for Train", International Journal of Emerging Research in Management &Technology (Volume- 5, Issue-5), May 2016.

5. Xavier Gibert, Vishal M Patel, and Rama Chellappa, in their IEEE paper titled as "Deep Multi-Task Learning for Railway Track Inspection"Volume18,Issue1, pp 153 – 167,Jan 2017.

6. S Mohamed Ashiq, K Karthikeyan, S Karthikeyan. "Fabrication of Semi- Automated Pressurized Flushing System in Indian Railway Toilet", International Journal of Engineering and Advanced Technology (IJEAT), Volume-2, Issue- 3, February 2013.

7. Dr. Manoj Hedaoo, Dr. Suchita Hirde ,Ms. Arshi Khan "Sanitation In Indian Railway Premises: A Great Cause Of Concern", International Journal of Advanced Engineering Technology, Volume 3, Issue 1, pp 50 – 55, Mar 2012.

8. Dhanajay G Dange, Dattaprakash G Vernekar, Sagar D Kurhade, Prashant D Agwane, "Methodology for Design and Fabrication of Human Waste Disposal System for Indian Railway", International Journal of Science Technology & Engineering, Volume 2, Issue 07, pp 14 – 19, January 2016.

9. Mesch, F., Puente Le´on, F. & Engelberg, T., Train-based location by detecting rail switches. Computers in Railways VII, eds. J. Allen, R.J. Hill, C.A. Brebbia, G. Sciutto & S. Sone, WIT Press, Southampton, pp. 1251– 1260, 2000.

10. K. Osathanunkul, K. Hantarkul, P. Pramokchon, P. Khoenkaw and N. Tantitharanukul, "Design and Implementation of an Automatic Smart Urinal Flusher", International Computer Science and Engineering Conference (ICSEC2016), Chiang Mai, Thailand, pp 14-17, Dec, 2016.