E-TOILET USING IOT

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Abstract: While India's population continues to increase in today's world, the health of our country is also under threat. Progress will increase in this word ,but at the sametime ,the health of our country is at risk. So subject is to provide clean toilets. All public toilets must be clean and hygienic. In our system ,we decided to take care of the cleaning of a toilet. It can avoid many diseases. It can lead to the management of toilets. Therefore, our evolution id to use safe and clean toilets. Using the Arduino concepts which uses different sensors like MQ-135 Sensor,MQ-8 Sensor, RFID Reader, RFID Tag ,MQ 4,Arduino,DHT-11 Temperature and Humidity Sensor. .By using these sensors, we can create the smart toilets. Proposed systemcleans the public toilet with the help of Arduinotechnology. TheArduino-based E-Toilet system, mainlydeals with solving the problem of the unhygienic conditionof public toilets. The hardware kit has attached in the toilet with location ,Ki-Id and Cleaning Boy details. To maintain the periodicity of cleanliness level different kind of sensors are used. A database is maintained which gives all the notifications to authorities of cleaning department of municipal corporation on a web page. MNC views cleaning logs and Uncleaned toilets. System also provide RFID reader. When the sensor value crossed threshold values then smell sensor detect unclean toilet If toilet is unclean then cleaning boy read there RFID tag . Hardware kit has RFID tag that contains a unique ID scanned by the cleaning boy. Kit data save on server. When the RFID Tag is detected by the Cleaning boy, the system will get all sensors value. Cleaning boy Clean Toilet and After Toilet cleaning read RFID Tag to get all sensor values to view toilet conditions. The advantages ofthe system are that it reduces the labour work and its working is flexible. In India this type of project is not implemented. It is affordable for municipal corporation for its implementation.

Keywords- MQ-135 Sensor, MQ-135 Sensor, Rfid Reader, Rfid Tag, MQ-4, Arduino, DHT-11 Temperature Humidity Sensor, MNC.

I.INTRODUCTION

The project is based on arduino concepts using different sensors like MQ-135 Seensor,MQ-8 Sensor, RFID Reader, RFID Tag,MQ-4,Arduino, DHT-11 Temperatureand Humidity Sensor, Database.Using these materials weare trying to provide the clean toilets and create theawareness among the people.The model comprises of sensors controlled by Arduino controller.Arduino board collect the data from sensors and then it transfer throughweb application to municipal corporation.The toilets conditions are continuously monitored by sensors. If badodour detected, a notification will be sent to the municipal corporation.The main objective of this project is to provide a hygienic toilet and also to eliminate the duty of a worker to continuously present in the washrooms.Arduino is getting very popular due to its vast application possibilities. A general idea behind Arduino is a network of various devices being connected together to perform a certain task.We will be designing an arduinobased system for monitoring the hygiene of public toiletsby various using various sensors. These sensors will be connected to a microcontroller which will send the data to the backend, where it will be stored and processed. This data can be fetched and monitored by using a website. Various sensors are available, like MQ-135 Seensor,MQ-8 Sensor, RFID Reader, RFID Tag,MQ-4,Arduino, DHT-11 Temperature Humidity Sensor, etc. can be used.

II.LITERATURE SURVEY

Smart and automatic technologies developed Sarode in the paper designed and fabricated an automatic flush system for sanitation using microcontroller and IR sensor technology. The system is designed to use pH sensor for identifying the change in the purity of water and activates the controllable flushing system. [1] Tsai et al. designed and implemented an auto flushing device with ultralow standby power consumption. The system uses sensor,low-power chips and state control mechanism to save power when no user is using the toilet. The system consumes 10mW which is very low power while the other systems consume 0.5 to 1W of power when no user is present for 24 hours a day. [2]. Elavarasi et al. in the paper proposed and developed a smart toilet using IoT. The authors proposed a microcontroller based system

to keep the toilets clean by detecting dirt and to observe the sweeper's working activities using IoT and image [3]. Processing. Elakiya et al. designed and implemented a smart toilet using IoT embedded sensor devices to detect dirt in the toilet, gas detection and the presence of sweeper. The system also detects the depth of the septic tank and sends a message to a particular organization. [4] In the paper, Smart toilets using BLE beacon technology by N. Mishra et al. developed an application of smart toilets using Bluetooth low energy beacons and readers technology for the management of public toilets by government. The system counts the number of users using the toilet and the data is stored in cloud database for performing monthly analysis. [5] Boonyakan et al. in the paper,investigated in one of the public toilets on how much clean water to be used for cleaning the toilet bowl. After investigation, the results were shown that duration of 3.8 seconds was sufficient for flushing water in the toilets. Smart toilet mechanism is very important especially in rural areas. [6] Mithya et al. proposed a technique for smart toilets using turbidity sensor to sense the bacteria in the toilet and identifying dirt in toilets and monitoring the sweeper's working activities. If the bacteria is sensed or dirt is identified then the alert message is send to the sweeper. [7] Sonekar et al. proposed a system of smart sensible washrooms to optimize the manpower and real-time tracking of toilet condition in term of odour level and user count, and turning on/off lights using different sensors like ammonia sensor, PIR sensor, buzzer, LCD display. [8] 9) Ashiq et al. in the paper designed and fabricated the semi-automated pressurized flushing system in the toilets in Indian Railways. The system is designed and fabricated in such a way that the water is flushed only when the passenger opens and closes the door, which reduces the wastage of water and keeps the toilet clean.[9] Katariya et al. in the paper Smart toilet proposed a toilet system to main tain hygienic level of Railway toilets through automation with the help of IoT. The proposed system automatically cleans the squat pan toilet with the help of robotic arm, by using sequential cleaning algorithm. [10] In a Mobile Flush Toilet have been suggested. In an emergency, finding a good toilet can be challenging. Damage to essential infrastructure makes it difficult for shelters to clean toilets. As a result, the purpose of this study is to develop a mobile flush toilet that is self- contained in terms of power, water, and drainage. In flood-affected regions, the field test was conducted successfully. Before a disaster, placing this mobile toilet near public build ings that are used as emergency shelters helps improve access to a proper toilet.Furthermore, in underdeveloped nations with little infrastructure, this toilet design might be used.[11] Mrs. K. Elavarasi, Mrs. V. Suganthi, Mrs. J. Jayachitra have proposed "Developing Smart Toilets Using IOT" paper for the development of safe and hygienic toilet and also ensure the responsibilities of sweepers. The system prevents many contagious diseases that spread due to improper sanitation of the toilets. The paper shows ways of maintaining hygiene of a toilet using microcontroller, LCD, buzzer, GSM and different sensors like gas sensor, ultrasonic sensor, infrared sensor and RFID reader. The system consists of 4 phases. In first phase, it checks if there is any dirt present in the toilet basin and if present, it increases an alarm. In second phase, the smell is monitored by Figaro sensor. If sensed value extends the threshold, alert SMS is sent via GSM so that the toilet can be cleaned. The third phase monitors the sweeper's activity by using RFID tags. In the final stage, if the sewage level reaches the threshold, alert is sent to the control room that the septic tank is full. [12]

III.MOTIVATION

To create the awareness among the people about the clean and hygienic toilets. To ensure the responsibilities of the sweeper. Finally, this concept is the one of the stepping stone to the "Clean and disease free India".The smart public toilets can be implemented using the latest technologies. If the toilets are clean and maintained well, the users will increase and help in keeping the environment clean. The maintenance of the toilet can be monitored at the organization by sending the data to the organization application. The toilets built in a smart waycan help reduce the pollution. Smart toilets will help people in identifying the diseases which the users are unaware.

IV.OBJECTIVE

Provide solution with least hardware requirement. To develop an application that is cost efficient. The main objective of this project is to provide a hygienic toilet and also to eliminate the duty of a worker to continuously present in the washrooms.Arduino is getting very popular due to its vast application possibilities. A general idea behind Arduino is a network of various devices being connected together to perform a certain task. To transmit these information to the concerned Doctor. To ensure data readability of the sensors where MNC can easily identify thestatus of the Public Toilet. The system is to monitor and evaluates Toilet Condition In Real-Time, enabling city governments to improve the toilet cleaning. This project is aimed to contribute to the Central Government Scheme of "Swachh Bharat Abhiyan" where

each and every citizen of the nation is entitled to have a cleaner and hygienic future. RFID tags can be used to monitor the cleaning done by staff of daily basis. MQ-135 and help to sensor installer for selection of best sensor based on best sensitivity. To create better and healthy stink-free male urinal and toilets for future.
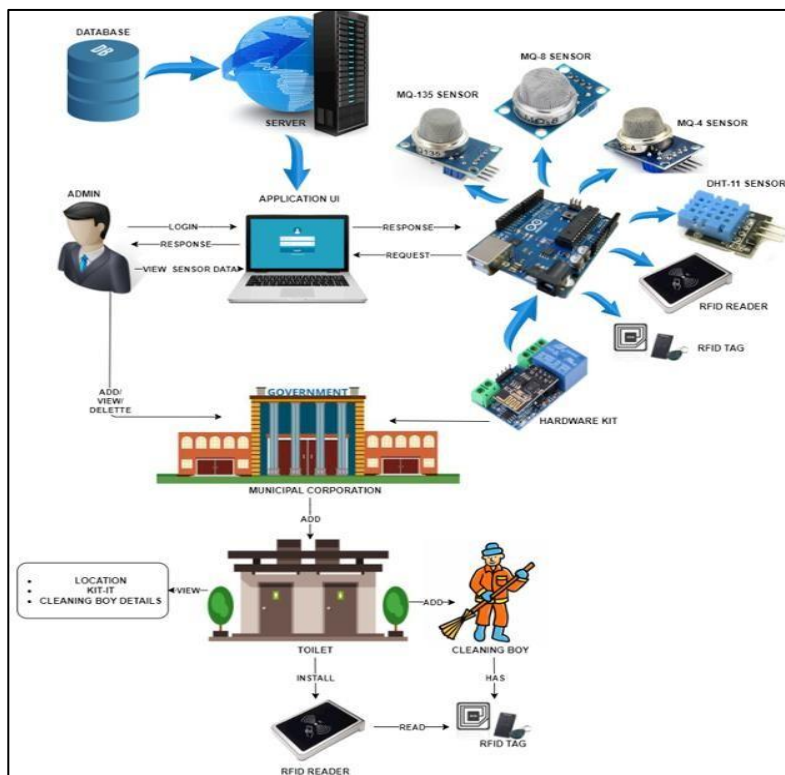
V.SYSTEM ARCHITECTURE

Figure 1. System Architecture

All of the data is stored inside database, which stores all the information about the results. It is an application development soft ware. The data is accessed through a web application where the municipal corporation receives the output message which informs that the toilet must be cleaned. The MNC must install this application to access the alerts and view the data which has been received. Then a sweeper is sent to clean the toilet.GUI will be provided to the MNC where they can get notifications and messages directly from the office.

VI.METHODOLOGY AND SCOPE

The Arduino is an open source hardware and software that can make a user to do effective operation in it. The Arduino is a microcontroller. These microcontroller devices help in sensing and controlling the objects in the real-time situations and environment. These boards are available cheaper in the market. There are a number of inventions performed in it and still it is going on.A developer can send a set of instructions to the microcontroller . All Arduino boards are open-source, empowering users to build them independently, and ultimately adapt them to their particular needs. Ar duino/Genuino Uno board consists of an ATmega328P microcontroller chip. It has 14 digital input-output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, and a reset button. The ATmega328 on the Arduino Uno comes programmed with a bootloader that allows uploading new code. The sensor is placed on the patient body for medical data generation. The main job of the sensors is to send regular updates about patient medical status to the nearest gateway in an encrypted format. At the same time, the sensors need to sign the data before sending to gateway using SignData() module. During the signing process, it includes data hash code, timestamp and sensor pseudo ID to the actual data.

VII.IMPLEMENTATION

To develop a arduino based application to monitor public toilet.It is high level that arduino-based public toilet monitoring. Public Toilets have always been a topic of concern. In this innovative world, where all the countries are advancing in their developments and making smart cities, yet the cleanliness and hygiene in our nation is under threat. The public toilets have been established in many parts of the country but they are not maintained well. Due to ill maintenance, the air in the toilets and the surrounding area is not clean and there is bad odor. Hence even though there are many toilets, people do not use the toilets and prefer to excrete in the open environment or near the rivers. Consequently, this causes pollution in our country and spreads more diseases to the living beings. In this paper, new innovative technologies that have been implemented in making of smart toilets have been discussed.

VIII.RESULT
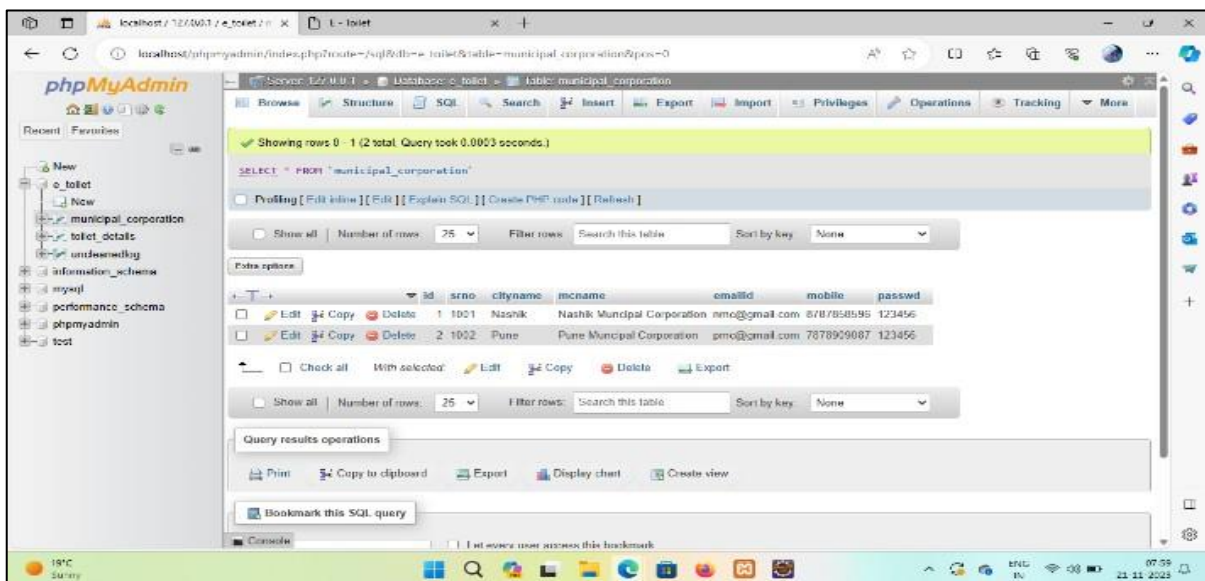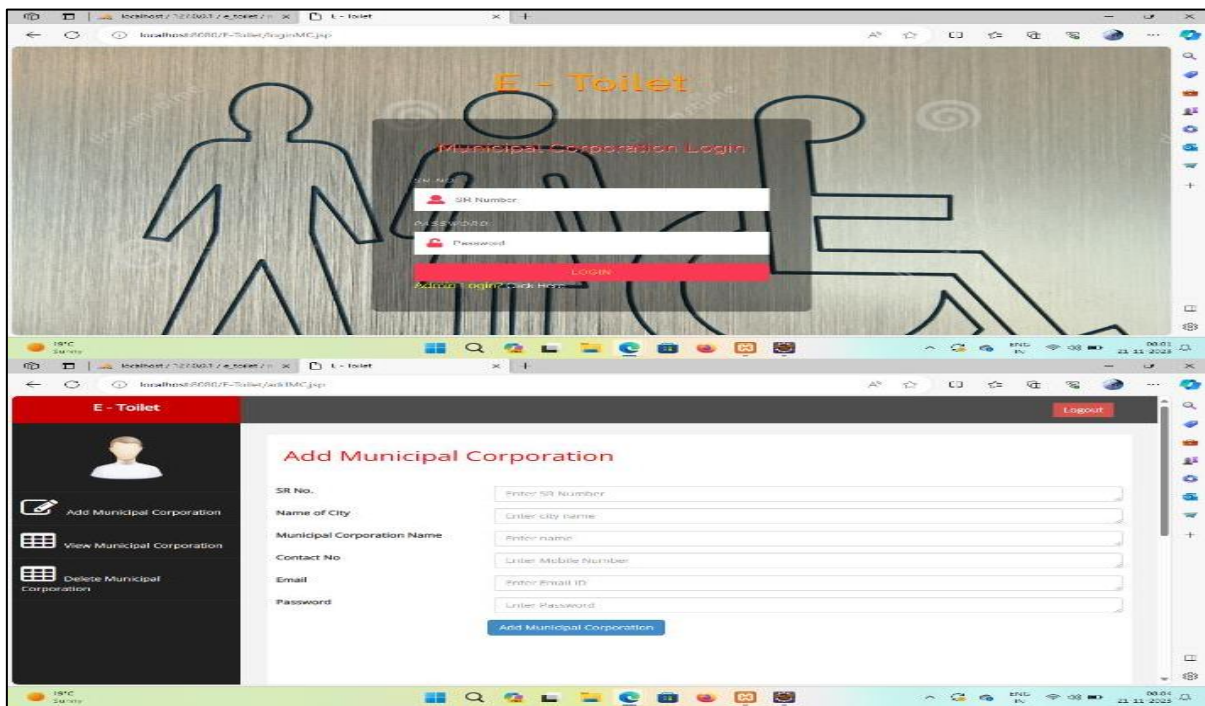
IX. CONCLUSION

In our proposed system we found some advantages over existing system, with the help of sensors and Arduino controller we have implemented an automatic toilet monitoring system. This system will be able to overcome the big problem of poorly maintained public toilets. Since most of them are cleaned by workers, their activities we not being detected, resulting in toilets being unclean most of the time. This system will be able to track their activities effectively and provide a great way for higher authorities to maintain them in real-time. This will result in increased efficiency of the labour and a decrease in extra cost and efforts. The common people will be able to use the regularly clean toilet than before, which will eventually increase the toilet usage. Thus by using technologies in the smarter way, we can maintain the cleanliness which is next to the godliness. Keep Clean, Be Safe.

X. REFERENCES

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