

**CUBICLE AVAILABILITY SYSTEM**

**Technical Answers To Real World Problems**

**CSE 1901**

**Winter Semester – 2022-2023**



**CUBICLE AVAILABILITY SYSTEM**

**A PROJECT REVIEW REPORT**

*Submitted by:*

Shyam Sankalp Pattnaik 20BCE1170

Nandini Singh 20BCE1171

Prashant Kumar Sharma 20BCE1709

Mohammad Altafkha Ibrahimkha Pathan 20BCE1848

**CSE1901 -** **Technical Answers To Real World Problems**

***Project Guide***

Dr. Sajidha SA

Associate Professor

School of Computer Science and Engineering (SCOPE)

B.Tech. (Computer Science and Engineering)

IN

School of Computer Science and Engineering (SCOPE)



Winter Semester 2022-23

**DECLARATION BY THE STUDENT**

We Shyam Sankalp Pattnaik (20BCE1170), Nandini Singh (20BCE1171), Prashant Kumar Sharma (20BCE1709) and Mohammad Altafkha Ibrahimkha Pathan (20BCE1848) hereby declare that this project report entitled **“Cubicle Availability System”** has been prepared by us towards the partial fulfillment of the requirement for the course of **CSE1901 -** **TECHNICAL ANSWERS TO REAL WORLD PROBLEMS** under the guidance of Dr. Sajidha SA.

We also declare that this project report is my original work and has not been previously submitted for the award of any degree, diploma, fellowship, or other similar titles.

DATE: 08/04/2023

**BONAFIDE CERTIFICATE**

Certified that this project report titled **“Cubicle Availability System”** is the bonafide work of Shyam Sankalp Pattnaik (20BCE1170), Nandini Singh (20BCE1171), Prashant Kumar Sharma (20BCE1709) and Mohammad Altafkha Ibrahimkha Pathan (20BCE1848) who carried out the project work under my supervision in the partial fulfillment of the requirements for the course of CSE1901 - TECHNICAL ANSWERS TO REAL WORLD PROBLEMS.

Dr. Sajidha SA.

**(Name & Signature of the Course Faculty)**

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**ABSTRACT**

As the number of hostel inmates increases, the issue of availability of washrooms during peak hours is a major issue that is faced by the hostellers. As a result, we are inspired to develop this application that helps to resolve this issue and ease the life of the residents on a daily basis. An easy-to-use user-friendly application that keeps track of the availability of restrooms will help save time and allow the user to find an empty cubicle with ease and also eliminate any sort of waiting period to avail the restroom services.

The washroom availability system allows efficient usage of toilets, and display of empty and filled cubicles. This proposed system is especially designed for hostels/ buildings with common washroom areas. The app would also provide direct root access to the building administrator so they could update if any cubicle(s) are out of service.

The idea behind this system is highly vital in many public spaces where we often find huge queues for basic stuff and a lot of people would be able to save a lot of time with the help of this as the system would provide them accurate time of availability or the crowd rush of the needed service and can help them plan their day accordingly so that they are able to find out the most feasible time for using the concerned service, for example, this idea with little modification in hardware components can also be used for metro seat availability or metro occupancy where the number of occupants can be displayed for each metro station wise.

**PROBLEM STATEMENT AND OBJECTIVES**

We were motivated to create this application since it would assist in resolving the issue of availability of washrooms and make everyday life easier for the residents as the number of hostel inmates rises and the availability of washrooms during peak hours becomes a major problem for the hostellers.

The objective of the project is to ease out the daily life issues of hostellers by giving them the option to check details of the availability of vacant cubicles at any time of the day and plan out further accordingly saving a lot of their valuable time.

It also gives the admin to have the option to mark out-of-service cubicles that might happen due to a variety of reasons.

**INTRODUCTION**

The system's benefits include efficient toilet usage and the display of vacant and filled cubicles. This suggested system is especially intended for hostels and other structures with shared restrooms. Additionally, the program would grant the building manager direct root access so they could update any inoperable cubicles.

When a resident has to use the restroom, they can check the cubicle's availability in advance, saving time by being directed to another floor, if necessary, when the preferred floor does not have a cubicle accessible.

The foundation of our model is a concept seen in automated parking management systems. It includes and refreshes information about whether there is a vacant space nearby on the app. Based on this concept, we also included a system-only setting that allows the administrator to disable a free space if a cubicle is not in use. The concept can, with some alterations in hardware, be utilized in a lot more forms than just this including options like limiting the number of passengers that board a metro in certain cities, or by using the same concept for counting the passengers of the metro and suggesting the other incoming passengers which is the most vacant metro to board in the next 5-10 minutes etc. Machine learning algorithms can also be used in the same to as prediction and analysis in such systems is of great use.

The project's goal is to make hostellers' everyday problems easier by offering them the option to check information on the availability of vacant cubicles at any moment of the day and plan ahead accordingly, saving a significant amount of their important time. Our projects incorporate ideas from a variety of fields, including sensor technology, the Internet of Things, database management systems, app development, and UX/UI design. The working application that the user interacts with will be the project's primary focus. It will be of utmost importance to design and develop the application in a way that adheres to the design principles of human-computer interaction to enable a seamless and effective interaction between the application and the user.

**LITERATURE SURVEY**

* IoT Based Cubicle Occupancy Indicator for Public Toilets (2022) [PIR motion sensor, Arduino Uno, Occupancy indicator]: The system design employed in this study would assist in enhancing the user experience in public toilets by removing lengthy wait times brought on by inadequate information regarding the availability of cubicles. IoT (Internet of Things) technology would make it easier for the general population to use restrooms without having to worry about huge lines.
* Smart public toilet health check system (2019) [HC-SR501, HC-SR04,YF-S201, Raspberry Pi 3B+, Google cloud firestore, Way2SMS, Passive infrared human detection sensor, Ultrasonic water level sensing, Water flow and leakage sensing] : The system successfully detects unclean public toilets and notifies the janitor about the same. It issues notifications via SMS to the janitor if water usage is above the specified threshold or if water usage is too less, hinting at a possibly unclean toilet.
* IoT based Smart Washroom (2020) [Methane and Ammonia Gas Sensor, Turbidity Sensor, IR sensor, BLE Beacon Technology]: The system uses different IOT sensors to determine the cleanliness levels of the washroom and notifies the sweeper about cleaning.
* WCIoT: A Smart Sensors Orchestration for Public Bathrooms using LoRaWAN (2021) [LoRaWAN Services, People counter, Paper Dispenser, Soap Dispenser, Garbage bin]: By utilising LoRaWan, the primary issue with data transmission in long-range networks has been resolved because it wasn't essential to have a high refresh rate and to economise on energy. The fuzzy logic system is designed to make it simple to comprehend how clean or dirty the restrooms are.
* UParking: Developing a Smart Parking Management System Using the Internet of Things (2019) [TCRT5000 sensors, an Arduino mega board and Nodemcu chip]: The system manages parking access and keeps an eye on where the cars and parking lot are at all times. Based on clearly specified needs and studies, this system suggests an integrated solution to improve parking management procedures.
* Developing smart toilets using IOT (2018) [IR sensors, Figaro sensor, RDIF, Sonic sensor, GSM]: IOT based smart toilet which ensures all the people are well aware on how to follow proper sanitization protocols, ensures that the cleaning workers are honest with their job. This project uses IR sensors, Figaro sensor, Sonic sensor, RFID and GSM.
* Smart public toilets (2020) [IR sensors, Figaro sensors, biometric system, Proximity sensors]: IoT based smart Washrooms which ensures proper hygiene and cleanliness is followed by the people using it, it eliminates the problem of people not flushing the toilet and washrooms not being cleaned.
* Intelligent hygiene monitoring system for public toilets (2022) [MQ-135 sensor, Thingspeak, RFID sesor, IR sensor, Ultrasonic senor, ESP8266 wifi module]: An advanced IOT based project which aims on proper maintenance and management of the toilet systems, contrary it also calculates the number of people inside the toilets at once.
* Smart toilet system (2020) [Smoke sensor , IR sensor, Website for feedback and analysis]: A medium level IOT project which automatically cleans and manages the toilets and has a feedback system by which the user can give a feedback of the toilet and the data can be further analyzed.
* IOT based smart washroom using automated sensors (2020) [RFID, Ultrasonic sensor, odor sensors, micro controller ATmega 328, L293D driver IC]: An advanced IOT based project that aims on automating the toilets, it uses IOT and several sensors which automates the odor sensor and the IR sensor.
* Occupancy Monitoring System for Workplace Washrooms (2019) [Haar- featured object identification algorithm]: This project is a level 1 based IOT and can display the vacant washrooms.
* Smart Parking System using IoT Technology (2020) [TCRT5000 sensor is used and the motion is detected through it]: Unoccupied vehicle parking spaces are indicated using lamps and users are guided to an empty parking space, thus eliminating the need to search for a parking space.
* Smart Parking System using IoT (2019) [Machine learning algorithm, GSM]: The parking information is sent to the user via notification. Thus, the waiting time for the user in search of parking space is minimized.
* IoT Based Automatic Seat Vacancy Detection in Travel Buses using Cloud Database (2021) [TCRT5000 and HAAR OpenCV algorithm]: It automatically sends the signal to centralized server and enables that particular seat for fresh booking. So that, the passengers who planned for travel by last minute can able to book ticket through online from the upcoming boarding stations.
* SMART PARKING VACANCY SYSTEM USING IOT (2022) [IR sensors, random forest]: Availability of an unfastened slot with its vicinity records has transmitted the usage of WIFI module generation, microcontroller, and wifi communiqué generation to the server.
* Intelligent Hygiene Monitoring System for Public Toilets (2022) [MQ-135 Sensor to detect presence of ammonia gas in the atmosphere. Infrared Sensor, Water Sensor, luminosity sensor, RFID Scenner]: The project succeeded in achieving its objective of developing a cost-effective, user-friendly interface between the cleaning firm and public restrooms, enabling more efficient staffing. The installation of this application is simple.
* E-Swachh Public Toilet monitoring system (2020) [MQ-135 Sensor, HC-SR04, Ultra Sonic Senor]: We have put in place an autonomous toilet monitoring system that ensures adequate sanitization with the use of electronic sensors like an ultrasonic sensor, a gas sensor, and an Arduino controller. It lessens the spread of infectious diseases brought on by inadequate sanitization.
* Smart Toilet Monitoring System Using IOT (2020) [Arduino UNO, Node MCU, MQ-135 Gas Sensor, Ultrasonic and IR Sensor, GSM Module]: The proposed work will help to detect the presence of human with the help of MQ-135 Gas Sensor. The other sensors will help in making sure the toilets remain clean.
* IoT Powered Restroom Usage Indication System (2019) [PIR Sensor, Wifi Module, Arduino UNO]: The proposed work will help in detecting the motion using PIR sensor. PIR sensor helps to detect the human presence.
* Automation of restrooms on the highways: STOPOVERS (2020) [ Node MCU, Servo Motor, RFID Reader, NodeMCU, ESP8266 Arduino Core]: The complete concept was created and put into practise in accordance with the user's specifications. It offers security and safety. Through an entry card, it enables automated user access to the room. Therefore, future versions of our project, which are planned, are possible

.

**METHODOLOGY**

Our projects include concepts from multiple domains such as Internet of Things, Database Management Systems, App Development, UX/UI Design and working with sensors. The main focus of the project will be based on the working application that the user interacts with. Designing and developing the application in a manner that follows the design principles of human computer interaction that will allow a smooth and efficient interaction between application and user will be a topmost priority.

An easy-to-use user-friendly application that keeps track of the availability of restrooms will help save time and allow the user to find an empty cubicle with ease and also eliminate any sort of waiting period to avail the restroom services. The proposed system is especially designed for hostels/ buildings with common washroom areas. The app would also provide direct root access to the building administrator so they could update if any cubicle(s) are out of service. Main goal would be to enhance user experience while searching for empty cubicles. And also, an overall view for the admin to see the status of each cubicle in the whole building.

**DETAILED ARCHITECTURE**

The model comprises of both hardware components as well as software components. Infrared sensors, an Arduino Uno, a WiFi Module 8266, and jumper wires are all components of the physical circuit. Software for storing the sensed data from the sensors that will subsequently be used in user and administrative applications includes Android Studio and a Web Database.

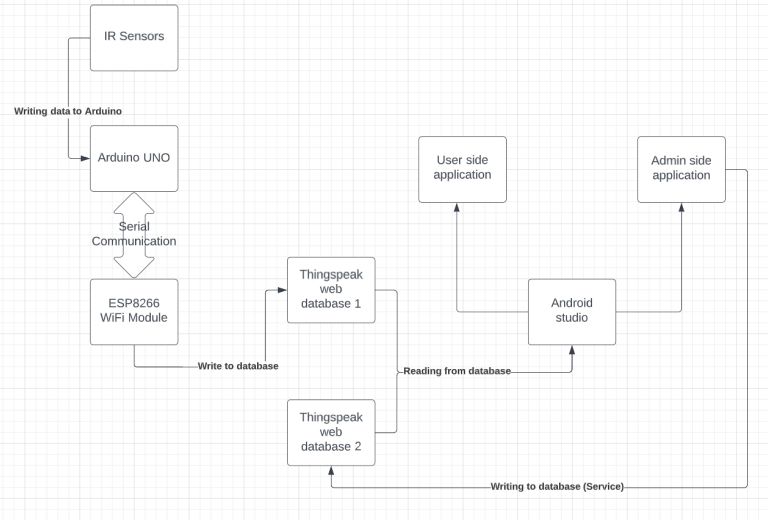


Fig. 1 ( Detailed system architecture)

The sensor will be connected to the microcontroller, which will collect data from the sensor and transmit it over the internet. The model's brain is the Arduino UNO microcontroller, which gathers data from all the infrared sensors used to determine if a door is closed by detecting the presence of an obstacle using infrared waves.

The ESP8266 WiFi module, which connects to the Arduino via serial communication and uploads all the data to the online database, which will allow us to manage the data, visualize it, and set up alerts if necessary and to establish connectivity to a web server.

Using APIs (Application Programming Interface), the application will read data from a web database and display it on the user interface.

Finally, a reliable power source must be used to keep the system running. This can be a battery, a power outlet, or a combination of both.

**DATA DESCRIPTION**

A proximity sensor, also known as a "nearness" sensor, detects whether or not an item is nearby using infrared (IR) technology. An infrared receiver is what the IR implies. The radiation outside of our visible range is called infrared.

The IR receiver constantly scans for reflected light while the IR emitter continuously emits IR light. The IR sensor picks up this light if it is reflected back by striking anything in front of it. In the instance of an IR camera, the item is discovered in this manner. The IR sensor is a digital sensor, thus, the output received from it will either be 1 or 0.

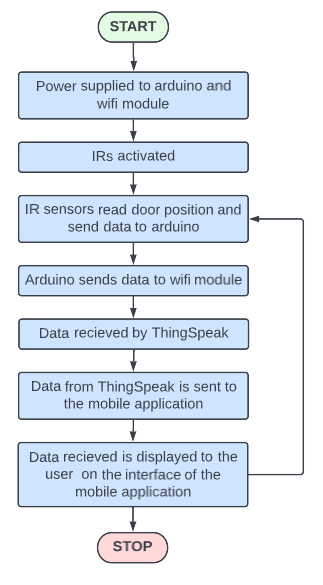
In the sample model that we created for the implementation of the same, we’ve created a building having washrooms at three different floors, each one of which has dedicated bathing stalls as well as toilets. We place an IR sensor at the door of each of these stalls.

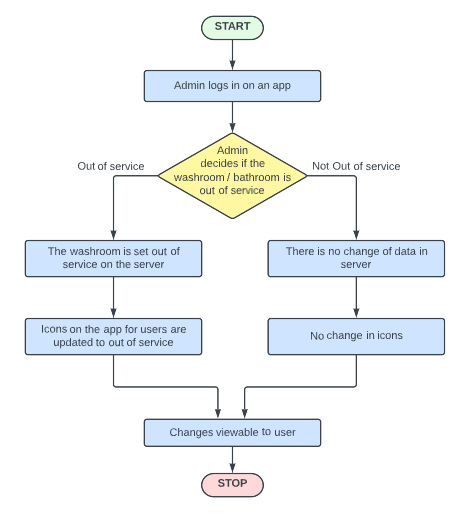
When the hatch-bolt of the door closes the IR Sensor will sense it. When it is closed, ‘0’ will be sent to the server. Serial communication takes place between the arduino board and node Mcu. Then the data is posted to server(channel-washroom) as a JSON object. The data of all the IR sensor are posted at once.

The app will continuously read the data from the server. When the data is ‘1’ the cubicle will be shown vacant. When the data is ‘0’ the cubicle will be shown occupied. Now if the admin sets the status of a cubicle as out of service. A JSON object will be sent to the server (channel-washroom\_admin). If the data is ‘0’ then the washroom will be showed Out of service and if ‘1’ then the washroom will be showed as ‘In service’.

**FLOW DIAGRAM**

* USER APPLICATION FLOW



* ADMIN APPLICATION FLOW

**RESULTS**

The user when opens the app all the data will be read from server. Once a user opens the app on his/ her device, he/she can select the floor that he/she wants to view the cubicle availability on through a dropdown option. When the user selects the floor the status of each cubicle will be shown i.e. once the user selects floor they want to view, they are shown whether there are any empty cubicles on that floor and then also a detailed description with the basic division on type of cubicle, it shows the number of cubicles on that floor, the number of vacant ones and the number of out of service ones. If no washroom on the floor is available then a button will be shown on clicking which the nearest washroom available will be shown and will be redirected to that floor. If no washroom is available then a toast message will be shown saying “No Washroom Available”. Similarly, there is a button to show Nearest Bathroom.

The admin has same viewing functions as the user along with certain other features that include having the option to set the status of washroom. When the All-info button is created, the info about each and every washroom will be shown in a tabular form. If one cubicle is out of service, that floor will be highlighted as grey. If both the cubicles are out of service then the floor will be highlighted as red.

The data obtained from the IR sensors has been analyzed in ThingSpeak using MATLAB, and the resulting graphs have been plotted against time. By utilizing this information, we have been able to determine the average length of time that each facility on every floor remains occupied. This can provide valuable insight to maintenance workers regarding when the toilets may require cleaning or servicing.

**OUTPUTS**

* THINGSPEAK OUTPUTS

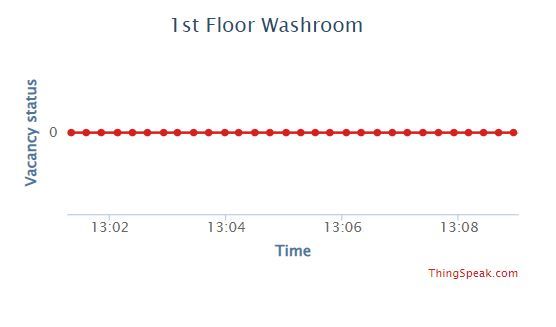


Fig 1.1 [Depicts that the washroom in first floor is occupied from 1pm to 1:10 pm]

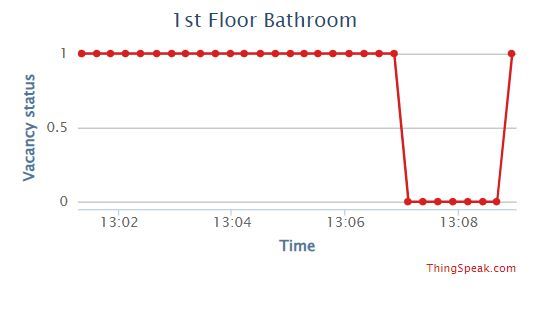


Fig 1.2 [The plot shows that the bathroom in 1st floor was vacant from 1 pm to 1:07 pm and then occupied till 1:08 pm and vacant afterwards]

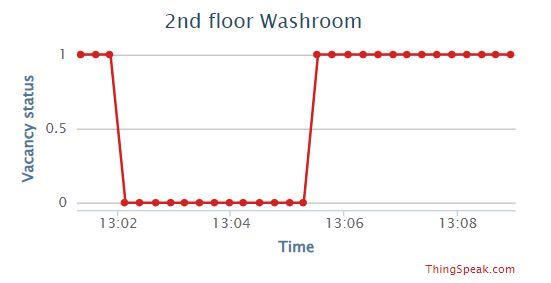
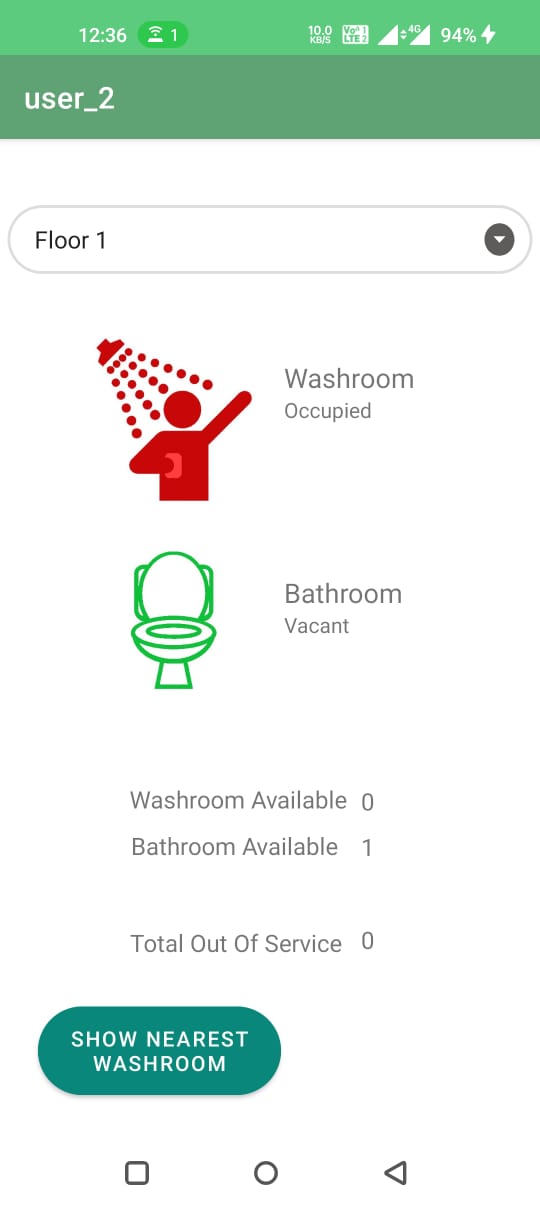
 Fig 1.3 [According to the information presented in this figure, the washroom located on the second floor was not in use between 1:00 pm and 1:02 pm. However, it was occupied from 1:02 pm until 1:05 pm, and then it became vacant again.]

 Fig 1.4 [Based on the data shown in this figure, it can be inferred that the bathroom situated on the second floor was in use between 1:00 pm and 1:10 pm]

* USER APPLICATION

Fig 2.1

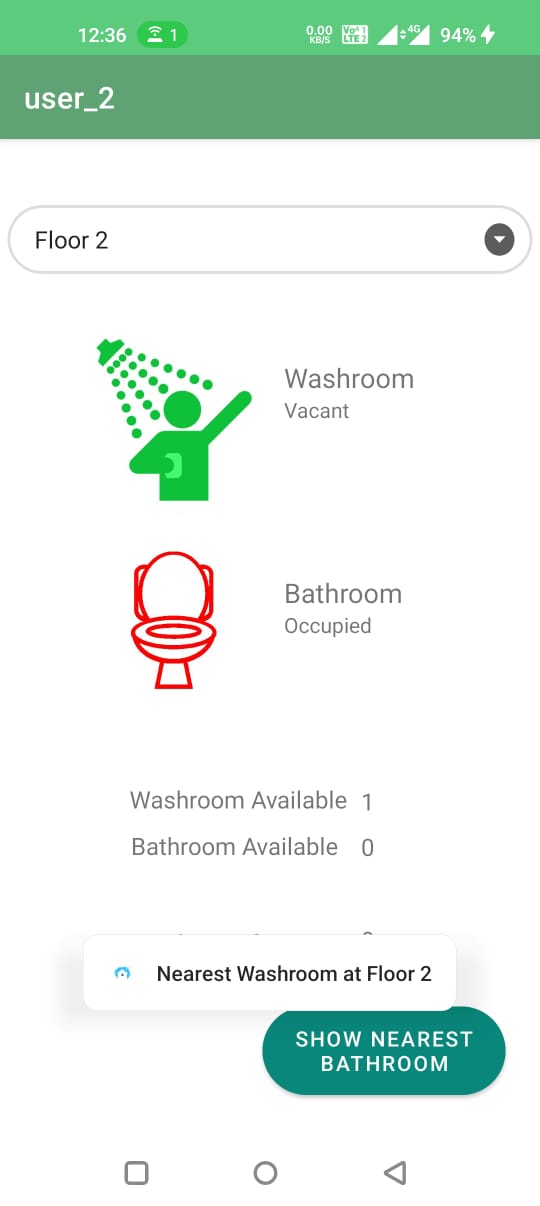
Fig 2.2

Figure 2.1 depicts the occupancy status and number of out of service systems for the bathrooms and washrooms located on the first floor. The user application includes a useful feature that enables users to locate the nearest available bathroom or washroom on the floor if all facilities are occupied. In the figure, it is evident that the washroom is currently occupied, while the bathroom is unoccupied, and the application can help the user find the nearest available washroom. Figure 2.2 shows that the nearest available washroom is located on the second floor.

* ADMIN APPLICATION

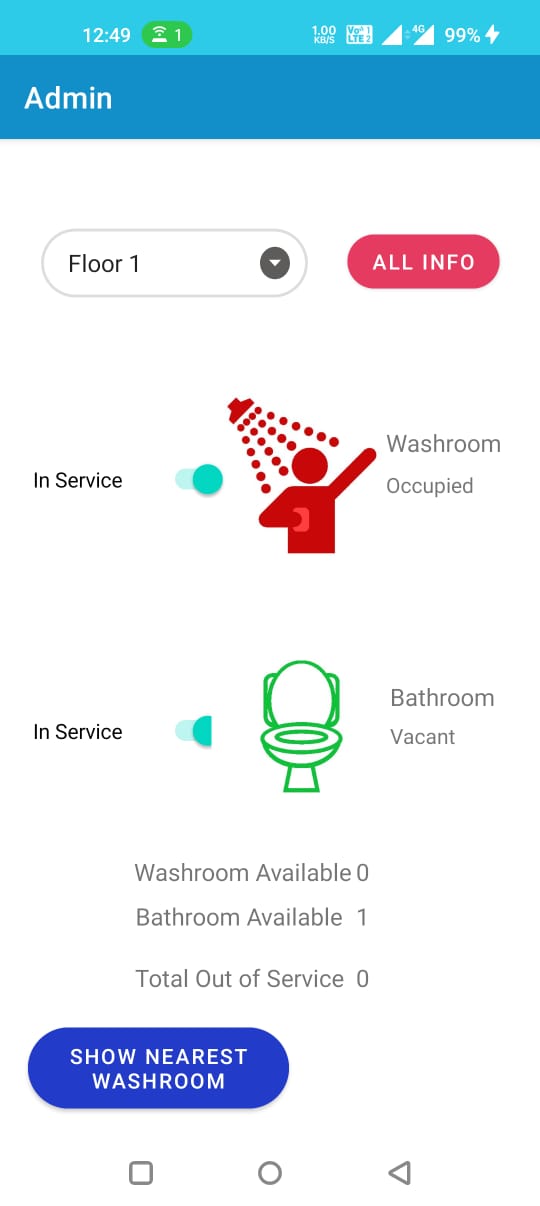
Fig 3.1

Fig 3.2

Figure 3.1 displays the interface of the administrative application, which is similar to the user application. However, it includes additional options for the administrator to set a facility as either "in service" or "out of service," enabling it to be serviced promptly. Figure 3.2 highlights the "All Info" feature, which presents comprehensive information regarding the facilities on each floor, such as their occupancy and servicing status.

**REFERENCES**

1. Adrian B. Alfonso, Rainier C. Atizado, Angela Mae V. Encinas, Deanne Marie Nivera,Leanne Kirsten G. Samala, Dr. Eric Blancaflor, "IoT Based Cubicle Occupancy Indicator for Public Toilets", Proceedings of the International Conference on Industrial Engineering and Operations Management Nsukka, Nigeria, 5 - 7 April, 2022, pp. 1-5
2. Shinganwade, S. Saxena, S. Suryavanshi, A. Kamat and P. Soygaonkar, "Smart Public Toilet Health Check System," 2019 IEEE Pune Section International Conference (PuneCon), Pune, India, 2019, pp. 1-4, doi: 10.1109/PuneCon46936.2019.9105698.
3. Ms. Nayana B. Chide, Mr. Nilesh P. Bobade, " IoT based Smart Washroom," International Research Journal of Engineering and Technology (IRJET), Sevagram, Maharashtra, India, 2020, pp.1-5
4. S. Mendes, L. A. Silva, H. S. S. Blas, D. M. Jiménez-Bravo, V. R. O. Leithardt and G. V. González, "WCIoT: A Smart Sensors Orchestration for Public Bathrooms using LoRaWAN," 2021 Telecoms Conference (ConfTELE), Leiria, Portugal, 2021, pp. 1-5, doi: 10.1109/ConfTELE50222.2021.9435574
5. N. Farooqi, S. Alshehri, S. Nollily, L. Najmi, G. Alqurashi and A. Alrashedi, "UParking: Developing a Smart Parking Management System Using the Internet of Things," 2019 Sixth HCT Information Technology Trends (ITT), Ras Al Khaimah, United Arab Emirates, 2019, pp. 214-218, doi: 10.1109/ITT48889.2019.9075113.
6. Mrs.K.Elavarasi, Mrs.V.Suganthi, Mrs.J.Jayachitra, "DEVELOPING SMART TOILETS USING IOT," 2018 International Journal of Pure and Applied Mathematics, 2018, pp. 214-218
7. Kirithika, L. R. Madhan Kumar, M. Kingson Kumar, E. Keerthana and R. Lohalavanya, "Smart Public Toilets using IoE," 2020 International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE), Vellore, India, 2020, pp. 1-5, doi: 10.1109/ic-ETITE47903.2020.429.
8. Nikhil P Mahalsekar, Shreyas Ganapaiah, Rakshith R Poojary, Sushmitha, Sathisha " Intelligent Hygiene Monitoring System for Public Toilets," International Research Journal of Engineering and Technology (IRJET), Moodabidri, India, 2022, pp.1-5
9. Sakshi Shahane, Mansi Patil, Apurva Mahajan,Bhushan Gholap, "Smart Toilet Feedback System," 2020 International Research Journal of Engineering and Technology (IRJET), 2020, pp. 214-218
10. Ms. Nayana B. Chide, Mr. Nilesh P. Bobade, "IoT Based Smart Washroom using Automated Sensor," 2020 International Journal of Trend in Scientific Research and Development (IJTSRD), 2020, pp. 2456 – 6470
11. V. M. P. Godakandage, K. R. M. Kothalawala, E. J. A. Chathumali and A. W. Madhubhashana, "Occupancy Monitoring System for Workplace Washrooms," 2019 International Research Conference on Smart Computing and Systems Engineering (SCSE), Colombo, Sri Lanka, 2019, pp. 24-28, doi: 10.23919/SCSE.2019.8842711.
12. D. Ashok, A. Tiwari and V. Jirge, "Smart Parking System using IoT Technology," 2020 International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE), Vellore, India, 2020, pp. 1-7, doi: 10.1109/ic-ETITE47903.2020.457.
13. ElakyaR,Juhi Seth, Pola Ashritha, R Namith, "Smart Parking System using IoT," 2019 International Journal of Engineering and Advanced Technology (IJEAT), 2019, pp. 2249-8958
14. M. Venkatesh, R. Rashia Suba Shree, "IoT Based Automatic Seat Vacancy Detection in Travel Buses using Cloud Database," International Journal of Innovative Technology and Exploring Engineering (IJITEE), 2021, pp. 2278-3075
15. Hrishikesh Shinde, Sourabh Pisal, Shripad Kanpude,Anubhav Jagadhane, "SMART PARKING VACANCY SYSTEM USING IOT," International Research Journal of Modernization in Engineering Technology and Science, 2022
16. Nikhil P Mahalsekar, Shreyas Ganapaiah,Rakshith R Poojary, Sushmitha, Sathisha, "Intelligent Hygiene Monitoring System for Public Toilets," International Journal of Engineering Research & Technology (IJERT), 2022
17. Sushant A. Parab, Kashyap K. Meher, Trupti A. Patil, Vomeshwari T. Badhe, Ranjana R. Gite, "E-SWACHH PUBLIC TOILET MONITORING SYSTEM," International Journal of Engineering Research & Technology (IJERT), 2020
18. Vimalesh Dhamale, Shekhar Singh, Shubham Zadane, Manish Bhelande "Smart Toilet Monitoring System Using IOT," International Journal of Computer Trends and Technology, 2020
19. Youngwoo Chang "IoT Powered Restroom Usage Indication System," International Journal of Computer Trends and Technology, 2020
20. K.Ramyaharika, G.Pravallika, Monika, K.Navyasree, Ms.M Phani Anusha, " Automation of restrooms on the highways:STOPOVERS," International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering, 2020

**APPENDIX**

1. Arduino UNO code

#include <SoftwareSerial.h>

#include <ArduinoJson.h>

SoftwareSerial nodemcu(5,6);

// 5=Rx 6 =Tx

String str;

void setup() {

  Serial.begin(9600);

  delay(1000);

  Serial.println("Program Started");

  nodemcu.begin(9600);

  pinMode(7,INPUT);

  pinMode(8,INPUT);

  pinMode(9,INPUT);

  pinMode(10,INPUT);

  pinMode(11,INPUT);

  pinMode(12,INPUT);

}

void loop() {

  int a=digitalRead(7),b=digitalRead(8);

  int c=digitalRead(9),d=digitalRead(10);

  int e=digitalRead(11),f=digitalRead(12);

  Serial.print("IR 1:");

  Serial.print(a);

  Serial.print(" IR 2:");

  Serial.println(b);

    Serial.print("IR 3:");

  Serial.print(c);

  Serial.print(" IR 4:");

  Serial.println(d);

    Serial.print("IR 5:");

  Serial.print(e);

  Serial.print(" IR 6:");

  Serial.println(f);

  StaticJsonBuffer<1000> jsonBuffer;

  JsonObject& data = jsonBuffer.createObject();

  data["IR1"]=a;

  data["IR2"]=b;

   data["IR3"]=c;

  data["IR4"]=d;

   data["IR5"]=e;

  data["IR6"]=f;

  data.printTo(nodemcu);

  jsonBuffer.clear();

  Serial.println("Data Sent!");

  delay(1000);

}

1. Connect wifi to node mcu

#include <ESP8266WiFi.h>

#include <WiFiClient.h>

#include <ESP8266WebServer.h>

#include "ThingSpeak.h"

const char \*ssid =  "shyam";

const char \*pass =  "301910loool";

#include <SoftwareSerial.h>

#include <ArduinoJson.h>

WiFiClient client;

unsigned long myChannelNumber=1;

const char\* myWriteAPIKey="VWPZ8HMCKMTHO8Y8";

SoftwareSerial nodemcu(D6, D5);

//D6-Rx d5 -Tx

void setup()

{

       Serial.begin(9600);

       delay(10);

       nodemcu.begin(9600);

       //while (!Serial) continue;

       Serial.println("Connecting to ");

       Serial.println(ssid);

       WiFi.begin(ssid, pass);

       //Serial.println("hlo");

       while (WiFi.status() != WL\_CONNECTED)

          {

            delay(500);

            Serial.print(".");

          }

      Serial.println("");

      Serial.println("WiFi connected");

      WiFi.mode(WIFI\_STA);

      ThingSpeak.begin(client);

      Serial.println("hello");

}

void loop()

{

  StaticJsonBuffer<1000> jsonBuffer;

  JsonObject& data = jsonBuffer.parseObject(nodemcu);

  if (data == JsonObject::invalid()) {

    //Serial.println("Invalid Json Object");

    jsonBuffer.clear();

    return;

  }

  Serial.println("JSON Object Recieved");

  int a = data["IR1"];

  int b = data["IR2"];

  int c = data["IR3"];

  int d = data["IR4"];

  int e = data["IR5"];

  int f = data["IR6"];

  Serial.println("-----------------------------------------");

  Serial.print("IR1 :");Serial.print(a);

  Serial.print("IR2 :");Serial.println(b);

  Serial.print("IR3 :");Serial.print(c);

  Serial.print("IR4 :");Serial.println(d);

  Serial.print("IR5 :");Serial.print(e);

  Serial.print("IR6 :");Serial.println(f);

   ThingSpeak.setField(1, a);

   ThingSpeak.setField(2, b);

    ThingSpeak.setField(3, c);

   ThingSpeak.setField(4, d);

    ThingSpeak.setField(5, e);

   ThingSpeak.setField(6, f);

   ThingSpeak.writeFields(myChannelNumber, myWriteAPIKey);

   Serial.println("ths");

   //ThingSpeak.writeField(myChannelNumber, 1, a, myWriteAPIKey);

   //ThingSpeak.writeField(myChannelNumber, 2, b, myWriteAPIKey);

  delay(100);

}

1. Execution video link

Part 1: <https://drive.google.com/file/d/1lLoBO_StvC7UyhesLrk5KUuQqhzCyTj1/view?usp=drivesdk>

Part 2:

<https://drive.google.com/file/d/1lOGTiSgFFVpabKu4tjfM_ot86yLgix7b/view?usp=drivesdk>