College Name:Madha Institute of Engineering and technology

College Code:2112

Name:Deepa Anuradha.A

Naan Mudhalvan ID:Au211221104005

Register No:211221104005

Department:B.E-CSE

SMART PUBLIC RESTROOM

Abstract

Smart public restrooms are a new and innovative way to improve the cleanliness, hygiene, and accessibility of public toilets. They use a variety of sensors and technology to monitor and manage the restroom environment, and to provide users with a more pleasant and convenient experience.

Smart public restrooms can include a variety of features, such as:

- **Automatic doors and faucets:** This can help to reduce the spread of germs and make the restroom more accessible for people with disabilities.
- **Occupancy sensors:** These sensors can be used to turn on lights and ventilation systems only when the restroom is in use, which can help to save energy.
- **Waste level sensors:** These sensors can be used to alert maintenance staff when a toilet needs to be cleaned or serviced.
- **Air quality sensors:** These sensors can be used to monitor the air quality in the restroom and to turn on ventilation systems if necessary.
- **Urinalysis sensors:** These sensors can be used to test urine for health problems, such as diabetes or kidney disease.

Smart public restrooms can also be connected to the internet, which allows them to be monitored and managed remotely. This can help to ensure that the restrooms are always clean and in good working order.

Module

The following is a module for a smart public restroom:

Sensors:

1. Occupancy sensors
2. Waste level sensors
3. Air quality sensors
4. Urinalysis sensors

Microcontroller:

- Arduino Mega

Actuators:

- Automatic doors and faucets
- Ventilation systems
- Lights

Communication module:

- GSM module

Software:

Custom software to monitor and manage the restroom environment

Operation:

The system works as follows:

- The occupancy sensors detect when someone enters or leaves the restroom.
- When someone enters the restroom, the automatic doors open and the lights turn on.
- The waste level sensors monitor the level of waste in the toilets. When a toilet needs to be cleaned, the sensors send a signal to the microcontroller.
- The air quality sensors monitor the air quality in the restroom. If the air quality is poor, the sensors send a signal to the microcontroller to turn on the ventilation systems.

- The urinalysis sensors test urine for health problems. If a health problem is detected, the sensors send a signal to the microcontroller to alert the user.
- The microcontroller is responsible for managing all of the sensors and actuators in the system. It also communicates with the GSM module to send alerts to maintenance staff or users.

The custom software monitors and manages the restroom environment. It uses the data from the sensors to determine when to turn on and off the actuators. It also sends alerts to maintenance staff or users as needed.

Benefits

Smart public restrooms offer a number of benefits, including:

- **Improved cleanliness and hygiene:** Smart public restrooms can help to reduce the spread of germs by using automatic doors and faucets, and by monitoring the air quality and waste levels.
- **Increased accessibility:** Smart public restrooms can make it easier for people with disabilities to use public toilets by using automatic doors and faucets, and by providing real-time information about the availability of accessible stalls.
- **Reduced costs:** Smart public restrooms can help to reduce maintenance costs by monitoring the status of the restrooms and sending alerts to maintenance staff when necessary.
- **Improved user experience:** Smart public restrooms can provide users with a more pleasant and convenient experience by providing real-time information about the availability of stalls, and by offering features such as automatic doors and faucets.

Conclusion

Smart public restrooms are a new and innovative way to improve the cleanliness, hygiene, and accessibility of public toilets. They offer a number of benefits, including reduced costs, improved user experience, and increased accessibility.