SMART PUBLIC RESTROOM

INTERNET OF THINGS - PHASE 4- GROUP 1

CLG NAME: MADHA INSTITUTE OF ENGINEERING AND TECHNOLOGY

N.M ID: au211221106003

Sensors and IoT Devices:

- Motion sensors for occupancy detection.
- Automated flush sensors for toilets and urinals.
- Automated faucet sensors for touchless handwashing.
- Automated soap dispensers.
- Toilet paper and paper towel level sensors.
- Air quality sensors for monitoring and controlling ventilation.

User Interface:

- Touchless interfaces for control and feedback.
- Mobile app for users to locate and access nearby smart restrooms.
- QR code or NFC tags for accessing the restroom.
- Voice command options for hands-free control.

Data Collection and Analysis:

- Centralized data collection from sensors for real-time monitoring.
- Analytics and reporting for restroom usage patterns.
- Predictive maintenance to detect and address issues proactively.

Water and Energy Efficiency:

- Smart water management to control water usage.
- Energy-efficient lighting and HVAC systems.

Security and Safety:

- CCTV cameras for security.
- Automated door locking/unlocking based on occupancy.
- Emergency call buttons for assistance.

Maintenance and Cleaning:

- Automated alerts for cleaning and restocking supplies.
- Scheduling and tracking maintenance tasks.

Payment System (Optional):

- Payment gateways for paid access or usage fees.

Mobile App and Web Platform:

- Mobile app for users to find and access the nearest smart restroom.
- Web platform for administrators to manage and monitor the restrooms.

Machine Learning and AI:

- Machine learning algorithms for predictive maintenance and usage optimization.
- AI-powered cleaning schedule optimization.

Cloud Infrastructure:

- Cloud servers for data storage and processing.

Here's a simplified example of a smart public restroom code platform using Python and Flask for the web application and IoT devices:

Web Application (Python and Flask):

- Create a web-based platform for administrators to monitor and manage smart restrooms.
- Use Flask for building the web application.
- Implement user authentication for administrators.
- Display real-time data from IoT devices, such as occupancy status and supply levels.
- Provide an interface for administrators to remotely control devices (e.g., flush toilets, unlock doors).
- Implement data analytics and reporting.

IoT Device Code (Python and Raspberry Pi):

- Use Raspberry Pi or similar devices to control sensors and actuators.
- Write Python scripts to interact with sensors and control devices.
- Use MQTT or other IoT communication protocols to send data to the cloud platform.
- Implement predictive maintenance algorithms using machine learning libraries.

Mobile App (Android/iOS):

- Develop a mobile app for users to find nearby smart restrooms.
- Enable QR code or NFC functionality for touchless access.
- Implement user reviews and ratings for restrooms.
- Include user-friendly interfaces for navigation.

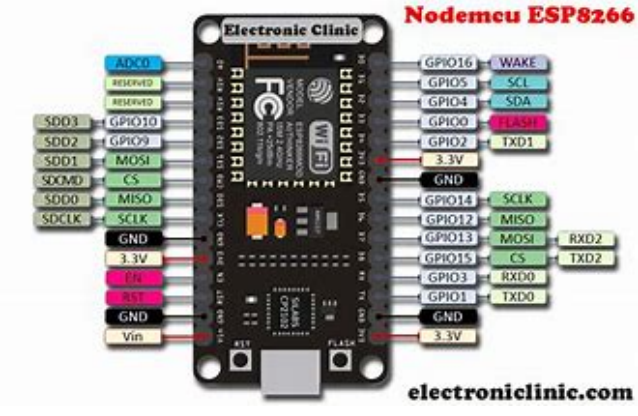
Cloud Infrastructure:

- Set up a cloud server for data storage and processing.
- Use databases for storing sensor data and user information.
- Implement security protocols for data protection.

an example sensor used in our technology:

PIR motion sensor:

Nodemcu esp8266:



Moisture sensor:

Shock proof sensor:

Team members:

211221106003

211221106004

211221106005

211221106006

211221106007

211221106008