

SMART PUBLIC RESTROOM

Project Definition

The project's primary goal is to revolutionize public restroom management by implementing IOT (Internet of Things) sensors to monitor occupancy and maintenance requirements. By doing so, we aim to offer the general public real-time information on restroom availability and cleanliness through a user-friendly platform or mobile application. This comprehensive project comprises several key elements:

Design Thinking

Project Objectives

Real-time Restroom Availability Information: Provide the public with up-to-the-minute data on the availability of restrooms in specific locations. This includes information on whether a restroom is currently in use or available for use.

Cleanliness Monitoring: Implement sensors to monitor the cleanliness of public restrooms and offer users insights into the current state of hygiene. This data will be used to alert custodial staff when maintenance is needed.

Improved User Experience: Enhance the overall restroom experience for the public by reducing wait times and ensuring cleaner facilities.

Efficient Restroom Management: Enable facility managers to optimize restroom maintenance schedules based on actual usage and cleanliness data.

IOT Sensor Design

Planning the deployment of IOT sensors is critical to the success of this project. The following sensors should be considered:

Occupancy Sensors: These sensors will detect when a restroom stall or facility is in use, providing real-time information on occupancy.

Cleanliness Sensors: Implement sensors to monitor cleanliness factors such as trash bin fullness, soap and paper towel availability, and overall cleanliness level. These sensors can be strategically placed throughout the restroom.

Temperature and Humidity Sensors: Monitoring environmental conditions can help ensure user comfort and identify issues such as water leaks or excessive humidity.

Real-Time Transit Information Platform

Designing a robust web-based platform and mobile application to display real-time restroom availability and cleanliness data is crucial. Key elements include:

User-Friendly Interface: Develop a user-friendly interface that allows users to easily find nearby restrooms, check availability, and view cleanliness ratings.

Interactive Maps: Incorporate interactive maps to help users locate the nearest restrooms, access directions, and get real-time occupancy updates.

Cleanliness Ratings: Implement a rating system based on cleanliness data collected by sensors. Users can provide feedback on restroom conditions, contributing to data accuracy.

Notifications: Enable users to receive notifications about restroom availability and cleanliness when they are in proximity to a monitored restroom.

Integration Approach

To ensure seamless data flow from IOT sensors to the restroom information platform, consider the following integration strategies:

IOT Connectivity: Utilize Wi-Fi, Bluetooth, or other suitable IOT connectivity protocols to transmit data from sensors to a central data hub.

Data Processing: Implement data processing and analysis algorithms to interpret sensor data in real-time. This includes identifying occupancy patterns and cleanliness metrics.

Cloud-Based Infrastructure: Host the restroom information platform on a cloud infrastructure for scalability and accessibility.

API s: Develop application programming interfaces (API s) to facilitate data exchange between the sensor network and the platform.

By focusing on these key elements, we will create an innovative solution that not only enhances public restroom management but also significantly improves the user experience, making public facilities more efficient and user-friendly. This project represents a cutting-edge approach to addressing a common urban challenge and demonstrates the potential of IOT technology to enhance everyday life.