JP COLLEGE OF ENGINEERING

COLLEGE CODE : 9512

TEAM MEMBERS:

Venkadesan . M
Siva. T
Sivalingam .S
Blessing .D

PROJECT ID : Proj_211928_Team_1

SMART PUBLIC RESTROOM

Phase 1:

Problem Definition and Design Thinking

Smart public restroom iot project summary:

A smart public restroom IoT project aims to enhance the efficiency, cleanliness, and user experience of public restrooms through the integration of Internet of Things (IoT) technologies. Key components and features of such a project may include:

Automated Sensors | Usage Analytics

Smart Lighting | Queue Management

Hygiene Monitoring | Maintenance Alerts

User Feedback | IoT-Enabled Cleaning Robots | Water and Energy Efficiency

Security and Privacy

Project Definition :

1.Automated Sensors: IoT sensors can monitor restroom occupancy, detect leaks, and assess toilet paper and soap levels in real-time.

2.Usage Analytics: Data collected from sensors can be analyzed to predict peak usage times and optimize cleaning schedules.

3.Smart Lighting: Motion-sensing lights can save energy by only illuminating the restroom when in use.

4.Queue Management: IoT can help manage restroom queues by providing real-time information on restroom availability.

5.Hygiene Monitoring: Sensors can monitor handwashing frequency and provide reminders to users.

6.Maintenance Alerts: Automatic alerts can be sent to maintenance teams for immediate response to issues.

7.User Feedback: Digital kiosks or apps can collect user feedback to improve restroom conditions.

8.IoT-Enabled Cleaning Robots: Robotic devices can be deployed for automated cleaning tasks.

9.Water and Energy Efficiency: Smart plumbing systems can reduce water usage and energy consumption.

10.Security and Privacy: Ensure data security and privacy measures are in place to protect user information.

Design Thinking :

A smart public restroom IoT project aims to enhance the efficiency, cleanliness, and user experience of public restrooms through the integration of Internet of Things (IoT) technologies. Here's a summary of such a project:

1.Sensors and Monitoring: IoT sensors are installed in public restrooms to monitor various parameters, such as occupancy, water usage, and cleanliness. Motion sensors detect when someone enters or exits, while water flow sensors track water usage in sinks and toilets.

2.Real-time Data: Data from these sensors is collected in real-time and transmitted to a central database or cloud platform. This data includes occupancy status, toilet availability, soap and paper towel levels, and even air quality measurements.

3.User Interface: Users can access restroom information through a mobile app or display screens near the restroom entrance. The app provides real-time information on restroom availability, cleanliness ratings, and estimated waiting times.

4.Resource Management: Restroom facilities can optimize resource usage based on data. For example, they can schedule cleaning based on actual usage rather than fixed intervals, leading to cost savings and improved cleanliness.

5.Maintenance Alerts: Sensors can detect issues such as water leaks, toilet malfunctions, or low supplies. Maintenance staff receive automatic alerts, enabling quicker response times and reducing downtime.

6.Accessibility Features: IoT can enhance accessibility by offering features like automatic door openers, voice-activated controls, and gender-neutral restroom availability information.

7.Data Analytics: Over time, the data collected can be analyzed to identify usage patterns and trends. This information can guide decisions on restroom design, maintenance schedules, and resource allocation.

8.Hygiene Improvements: Smart restrooms can encourage better hygiene practices by reminding users to wash their hands and providing touchless options for faucets, soap dispensers, and hand dryers.

9.Energy Efficiency: IoT technology can also contribute to energy efficiency by optimizing lighting and HVAC systems based on occupancy and time of day.

10.User Feedback: Public restroom users can provide feedback through the app, helping facility managers continuously improve the restroom experience.