

Naan Mudhalvan -IOT

# Problem Statement: SMART PUBLIC RESTROOMS

MENTOR NAME: EVALUATOR NAME:

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**Project Definition:**

The Smart Public Restrooms Enhancement project aims to revolutionize public restroom facilities by integrating advanced technologies to improve user experience, sanitation, and operational efficiency. These smart public restrooms will provide a more convenient, hygienic, and sustainable solution for the community.

* Upgrade existing public restrooms or construct new ones with smart features.
* Enhance user experience through automation and convenience.
* Improve cleanliness and hygiene through innovative sanitation solutions.
* Increase operational efficiency and reduce maintenance costs.
* Promote sustainability and reduce water and energy consumption.
* Ensure accessibility and inclusivity for all users.

Design thinking:

\*\*Empathize\*\*:

- Understand the needs and pain points of the users. Conduct interviews, surveys, and observations of people using public restrooms to gather insights.

- Identify specific user groups, including individuals with disabilities or special requirements.

2. \*\*Define\*\*:

- Create user personas based on the gathered insights to represent different user groups.

- Define the problem statement and design challenges. For example, "How might we create a more hygienic and convenient public restroom experience for all users?"

3. \*\*Ideate\*\*:

- Brainstorm innovative ideas for smart restroom features using IoT technology. Encourage cross-functional teams to participate in ideation sessions.

- Consider concepts such as touchless entry, sensor-based fixtures, real-time occupancy monitoring, and sustainable resource management.

4. \*\*Prototype\*\*:

- Develop low-fidelity prototypes or mockups of the smart restroom features. These could be physical or digital representations of the IoT solutions.

- Test the prototypes with potential users to gather feedback and refine the concepts.

5. \*\*Test\*\*:

- Conduct usability testing with real users to evaluate the functionality and user-friendliness of the IoT-enabled features.

- Gather feedback on issues, concerns, and suggestions for improvement.

Development part 1:

\*\*Phase 1: Project Initiation and Planning\*\*

\*\*Objective:\*\* Lay the foundation for the development of the IoT-enabled Smart Public Restrooms system, including project setup, team formation, and initial planning.

\*\*Tasks:\*\*

1. \*\*Project Kickoff \*\*

- Assemble a project team with members from various disciplines, including IoT experts, architects, engineers, and project managers.

- Define project goals and objectives.

- Assign roles and responsibilities to team members.

- Establish communication channels and protocols.

2. \*\*Needs Assessment and Requirements Gathering\*\*

- Conduct a comprehensive needs assessment to understand user requirements and preferences.

- Identify the specific IoT features and technologies required, such as occupancy sensors, touchless fixtures, and water-saving systems.

- Define the technical requirements, including connectivity options (e.g., Wi-Fi, cellular), data storage, and user interfaces.

3. \*\*Budget and Resource Planning\*\*

- Develop a detailed project budget, considering both initial setup costs and ongoing operational expenses.

- Identify potential funding sources and explore partnerships or grants.

- Procure the necessary resources and equipment.

\*\*Deliverables:\*\*

- Project kickoff meeting minutes.

- User needs assessment report.

- Technical requirements document.

- Project budget and resource allocation plan.

Development Part 2:

\*\*Phase 2: Implementation and Integration\*\*

\*\*Objective:\*\* Implement the IoT-enabled features in the public restroom facilities, ensuring seamless integration and functionality.

\*\*Tasks:\*\*

7. \*\*Restroom Construction or Retrofit\*\*

- Begin construction or retrofitting of the selected restroom facilities.

- Install the plumbing and electrical infrastructure necessary for IoT devices.

- Ensure compliance with architectural plans and accessibility standards.

8. \*\*IoT Device Installation\*\*

- Deploy IoT devices, sensors, and actuators according to the architectural and IoT system design.

- Configure network connectivity and establish data communication channels.

- Test IoT devices for proper functionality.

9. \*\*Integration and Testing\*\*

- Integrate IoT devices into a central control system.

- Conduct comprehensive testing to ensure all IoT features work together seamlessly.

- Implement security measures to protect IoT data and systems.

\*\*Deliverables:\*\*

- Completed restroom facilities with integrated IoT features.

- IoT devices installed and functional.

- Integration and testing documentation.