SAYS
- ❑ "I don't understand how this bin works."
- ❑ "Why isn't the lid opening?"
- ❑ "I preferred the old bins."

THINKS
- ❖ "Is this really better than traditional bins?"
- ❖ "The indicators are confusing."
- ❖ "Will this actually improve waste collection?"

USER

DOES
- o Avoids using the bin or leaves waste outside.
- o Tries to manually open it when sensors fail.
- o Complains to city authorities.

FEELS
- ➤ Frustrated due to sensor malfunctions.
- ➤ Confused by unclear indicators.
- ➤ Resistant to change, especially among older users.

Connecting to the Expanded Design Thinking Approach

1. Scope
- •Assess the feasibility of proposed solutions (cost, resources, implementation time).
- •Prioritize the most effective features based on user needs.
- •Develop a roadmap for gradual implementation.

2. Empathize
- •Gather feedback from residents (interviews, surveys).
- •Observe real-time interactions with the bins.
- •Identify pain points like sensor failures and unclear indicators.

3. Define

•Problem Statement: "Users struggle with smart trash bins due to unreliable sensors, unclear signals, and resistance to adoption, leading to inefficiencies in waste management."

4. Ideate

•Improve **sensor reliability** using better calibration and testing.

•Implement **color-coded LED indicators** (e.g., green = open, red = full).

•Introduce **audio cues** (e.g., "Lid opening" or "Bin full" announcements).

•Conduct **community workshops** for awareness.

5. Prototype

•Deploy updated sensors in select locations.

•Redesign LED indicators for better clarity.

•Test audio cues with different user groups.

6. Test

•Gather feedback from residents after implementing changes.

•Track bin usage and issue resolution times.

•Adjust features based on user responses.

7. Implement

•Scale the improved smart bins citywide.

•Provide continuous monitoring and updates for sensor performance.

•Launch public awareness campaigns to drive adoption.

User-Centric Solution

By improving sensor reliability, making indicators clearer, and educating users, we can **increase adoption, reduce overflowing bins, and enhance waste collection efficiency.** The addition of **Scope** and **Implement** ensures that the solution is feasible and scalable for long-term success.