☑ 4.3.8 Event Table – EcoSweep Cleaning Robot

🎯 Purpose of Event Table

To clearly define all the important events, their triggers, the corresponding system responses, and the next expected state.

☑ ▶ **Example Event Table Structure**

Event No.	Event	Trigger	System Response	Next State / Action
1	App Launch	User opens Mobile App	App initializes UI and waits for user input	Display "Connect to EcoSweep" screen
2	Connect to EcoSweep	User clicks "Connect"	Mobile App sends Bluetooth pairing request to Raspberry Pi	Connection Established / Error shown
3	Mode Selection	User selects 'Manual' or 'Semi-Automatic'	App sets mode and sends mode command to Raspberry Pi	Ready to accept control commands
4	Movement Command	User presses "Move Forward" button	Mobile App sends structured movement command to Raspberry Pi	Robot moves forward
5	Arm Control Command	User adjusts servo angle for robotic arm	Mobile App sends arm control command to Raspberry Pi	Arm position changes accordingly
6	Start Cleaning	User presses "Start Cleaning"	Mobile App sends cleaning start command to Raspberry Pi	Robot begins cleaning operation
7	Stop Command	User presses "Stop" button	App sends stop command → Raspberry Pi → Arduino Mega stops motors & servos	Robot stops all actions
8	Sensor Data Read	Arduino periodically reads sensors (Ultrasonic, GPS, IMU, Compass)	Sensor data read and optionally forwarded to Raspberry Pi → Mobile App	Sensor values displayed (if enabled)
9	Error in Bluetooth Connection	Bluetooth disconnects unexpectedly	Mobile App shows error "Connection lost"	User prompted to reconnect
10	Low Battery Detected	Battery level drops below threshold	Arduino Mega triggers low battery warning → Raspberry Pi → Mobile App shows warning	User alerted to recharge battery
11	Emergency Stop	User or System triggers emergency stop	Immediate stop of all motors and servos	System enters safe state
12	System Shutdown	User exits Mobile App or sends shutdown command	All devices safely shut down, log stored (optional)	EcoSweep powers off safely

☑ Explanation to Add in Documentation

- The **Event Table** defines each significant event in the EcoSweep system.
- It includes the **triggering condition** (e.g., user action, system event),

- The **system response** (e.g., sending commands, stopping motors, showing warnings),
- And the **next expected state** (e.g., robot moving forward, system idle, error shown).
- This helps in system design by clearly specifying the flow of events and expected outcomes, ensuring predictable and safe behavior.

☑ Summary of Data to Add in Documentation

▶ Example Event Table (as shown above).

▶ Text explanation:

This table helps systematically define how the system reacts to user inputs and system events like sensor readings, connection loss, and low battery. It is critical for ensuring system stability and usability.