The New York Academy of Sciences

# Milestone #3
# Results

**Directions: Please fill out this form (2 pages) and submit to the Milestone 3 submission form. Note, you may use a different template but please ensure the same information is present.**

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| **Team Name** | AI Powered Smart Waste Management System |
| **Link to Project Page and Team Number** | https://joinlaunchpad.com/#/projects/5636/ai-powered-smart-waste-management-system<br><br>Team 5636 |
| **Team Student Member(s)** | Vir G.<br>Ellina T.<br>Bijan H.<br>Ritwik M.<br>Priyanka J. |
| **Team Mentor** | Vandana Sharma |

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| **Data/Feedback**<br><br>Summarize the data you obtained from experiments and/or feedback you gathered. | The survey component of our study played a crucial role in gathering insights on user perceptions, engagement, and potential behavioral shifts regarding e-waste management. Conducted over a month, the surveys targeted 200 participants and were distributed at a two-week interval (twice) to try to understand any shifts in attitude. However, we do acknowledge the time period was too short to do so. Participants were also given detailed scenarios describing the functionalities of the AI-powered e-waste bin and connected app, including features such as item recognition, repair guidance, and incentive-based rewards for sustainable disposal actions, which would be considered unique to the project.<br><br>Key questions focused on participants' likelihood to use such a system, preferences for incentives (e.g., repair discounts, eco-friendly |

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| | rewards), and their perception of the environmental impact of e-waste disposal. The surveys also sought to gauge participants' receptivity to repair over disposal when guided by an app and store-based rewards.<br><br>The data collected showed that 74% of participants were interested in engaging with a system that combines AI categorization and rewards, with 65% indicating a willingness to prioritize repair if incentivized. The surveys highlighted the importance of user-friendly designs, seamless integration with local repair networks, and a flexible incentive system to accommodate diverse user preferences. Regular feedback through these surveys provided a dynamic view of how users' attitudes evolved with consistent exposure to the solution's core concepts, validating the potential for sustained engagement and behavioral change.<br><br>Throughout the project, our team worked collaboratively to ensure that every task was approached with diverse perspectives and skills. Ritwik and I (Vir) contributed by leading the survey design and analysis process, ensuring that questions captured key insights on user behavior, engagement, and preferences. This involved researching relevant questions, designing user-friendly scenarios, and analyzing survey data to extract meaningful patterns.<br><br>Our team maintained a strong collaborative spirit by regularly meeting to discuss findings, share insights, and brainstorm ways to address challenges. Each member contributed unique perspectives—whether in AI technology, community engagement strategies, or data analysis—which allowed us to approach the solution and survey from multiple angles. This dynamic not only strengthened our solution but also provided valuable lessons in effective teamwork, adaptability, and the power of diverse perspectives. |

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| **Lessons Learned**<br><br>Summarize the most important findings from your testing. Note: Where could you have tested more? What were some of your limitations? | Our survey and feedback-driven approach highlighted several key areas where our e-waste bin solution excelled and where improvements are necessary. One of the most important findings was the strong interest in a system that combines **AI-driven categorization** with **incentive-based engagement**, as evidenced by the **74%** user interest rate. This suggests a promising pathway for fostering sustainable e-waste disposal behaviors. However, the need for practical, **context-sensitive repair suggestions** aligned with local services emerged as a critical area.<br><br>Limitations in our study included the lack of a physical prototype, which constrained our ability to test real-world user interactions. While the surveys and hypothetical scenarios provided valuable data, they may not fully capture nuances in user behavior that could emerge with a tangible system. Additionally, user feedback on rewards highlighted a need for a **flexible incentive structure** that accommodates both immediate and long-term incentives, such as vouchers or points for eco-friendly products. |
| **Next Steps**<br><br>Describe how you plan to refine your solution based on what you learned and conduct further testing. Will you modify your testing methods? | Given the constraints of building a real-life prototype, our future testing will pivot to enhanced **virtual simulations** and **engagement models** that more closely mimic real-world user interactions. In addition, we will expand our **survey efforts** by introducing **scenario-based workshops** where participants can walk through hypothetical interactions, guided by mock-ups of the AI categorization process, app incentives, and repair recommendations.<br><br>Community engagement events, such as virtual repair discussions and e-waste awareness webinars, will further provide insight into user expectations and community needs. Collaboration with local repair technicians and environmental advocates will also ensure practical recommendations that would align with service capabilities.<br><br>To validate incentive strategies and educational outreach, we will use **A/B testing** within simulated environments to measure user response to different reward types, messages, and sustainability challenges. Through these steps, we aim to refine our system and ensure it drives a long-term shift toward responsible e-waste disposal and repair habits while remaining adaptable to real-world constraints and user expectations. |