**Project Title: Smart Application for Management of Waste Collection and Disposal in Astana**

**1. Problem Statement**

The problem of waste sorting and recycling in Kazakhstan is at a low level. Although awareness of environmental issues is growing, most municipal waste still ends up in landfills, with little being recycled. The main problem is low citizen engagement and the lack of simple tools for waste separation. Many residents do not know recycling rules, rarely sort waste, and lack clear guidance on where and how to dispose of materials. This leads to lost recycling potential, inefficient collection, and negative effects on city cleanliness and sustainability. We needed to find a solution that will improve infrastructure and also will make citizens more eco-friendly.

**2. Solution Overview**

Our solution is a smart mobile application designed to assist residents in waste classification and disposal while providing municipalities with valuable insights to optimize collection processes. The application integrates several key features:

* Interactive city map of recycling points and containers with accepted waste types and schedules.
* Real-time collection tracking for each location.
* AI tool to classify waste from photos (plastic, paper, glass, etc.).
* Crowdsourced rating system for all collection points to improve service quality.

Through this integrated approach, the application simplifies responsible waste disposal for individuals while creating a feedback loop between citizens and city infrastructure.

**3. Creativity & Uniqueness**

Our project is unique because it combines cutting-edge AI capabilities with an approachable design. Although there are a lot of recycling apps available, not many offer smooth AI-driven classification that is seamlessly integrated into an interactive waste management system at the city level. Our application, which makes use of IBM Cloud AI services, enables locals to take a picture of their waste and get immediate classification and drop-off location guidance. This greatly reduces the barrier to participation and eliminates the element of guesswork from recycling. The crowdsourced rating system also introduces a community-driven accountability mechanism, ensuring that collection points remain hygienic, reliable, and user-friendly. Because it integrates civic engagement, real-time infrastructure data, and AI-driven functionality, the solution is truly unique.

**4. Agentic AI Implementation**

The application's core, agentic AI, enables users to quickly and accurately identify various waste types at any time. The system eliminates the need for manual sorting and lessens user confusion by automating this classification process. This ensures that the application provides consistent and trustworthy guidance while also making recycling more accessible. With this AI-powered strategy, the app transforms from a mere informational resource into a useful helper that encourages sustainable lifestyle choices.

**5. Impact & Future Plans**

The project will have a good social and environmental impact.

From an environmental point of view, it promotes waste segregation, enhances recycling, and reduces the need for landfills.

Socially, it improves people-government cooperation, fosters environmentally friendly behavior, and enhances transparency in waste management.

This solution can also be rolled out to other cities in the future, scaled to additional recyclable categories, and employ state-of-the-art AI for better classification.

The integration of municipal data may also facilitate optimization of routes.

Having Astana as a pilot, the long-term vision is to launch an intelligent waste management system nationwide.