**Phase-1:Brainstorming & Ideation**

**Objective:**

* Identify the problem statement
* Purpose and impact of the project

**Key points:**

**1.Problem statement:**

Waste management is a growing concern in urban and rural areas, where the classification and disposal of waste are often inefficient, leading to environmental pollution, health hazards, and increased operational costs. Traditional waste sorting methods are manual, time-consuming, and error-prone.

There is a need for a smart, automated system that can classify different types ofwaste (organic, plastic, metal, paper, etc.) accurately toenableefficient recycling, composting, or disposal.

**2.Proposed Solution:**

* Use image classification to automatically detect and classify waste as recyclable or non-recyclable.
* Train a machine learning model using a labeled dataset from Kaggle containing various waste categories.
* Preprocess the dataset with resizing, normalization, and data splitting to improve model accuracy and reduce noise.
* Develop a lightweight, user-friendly HTML web

interface where users can:

* Upload images of waste
* Get instant classification results(Recyclable / Non-Recyclable)

**3.Target Users:**

**🏙️ Smart Cities & Municipal Corporations**

* To implement AI-powered waste segregation in smart bins and public areas.

**🏫 Educational Institutions**

* Schools and colleges can use it to teach students about waste management and sustainability.

**🏭 Recycling Centers & Waste Management Companies**

* To speed up waste sorting on conveyor belts and improve recycling efficiency.

**👨‍👩‍👧‍👦 General Public / Households**

* Individuals can use the web app to learn how to properly classify their daily waste.

**🧑‍🔧 Sanitation Workers & Waste Collectors**

* To reduce their manual effort and improve workplace safety by automating waste classification.

**🌱 Environmental NGOs & Awareness Campaigns**

* To promote eco-conscious behavior and educate communities using interactive tech tools**.**

**4.Excepted Outcome:**

* 🧠 Trained ML Model that accurately classifies waste as Recyclable or Non-Recyclable using image data.
* 🌐 Fully Functional Webpage where users can upload waste images and get instant classification results.