

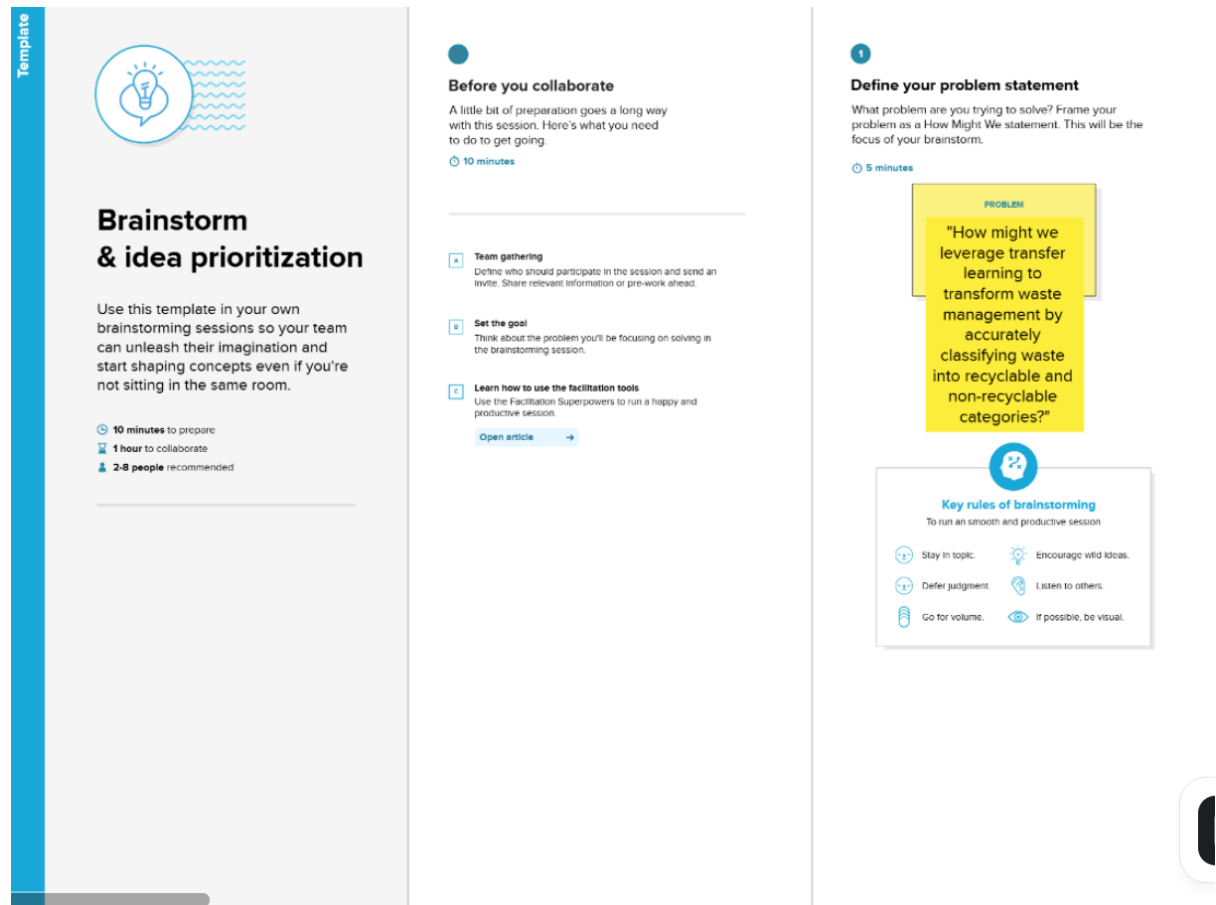
Project: CleanTech: Transforming Waste Management with Transfer Learning

Document Type: Brainstorming, Idea Generation & Prioritization

Project Team: (LTVIP2025TMID45663)

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1. Idea Generation

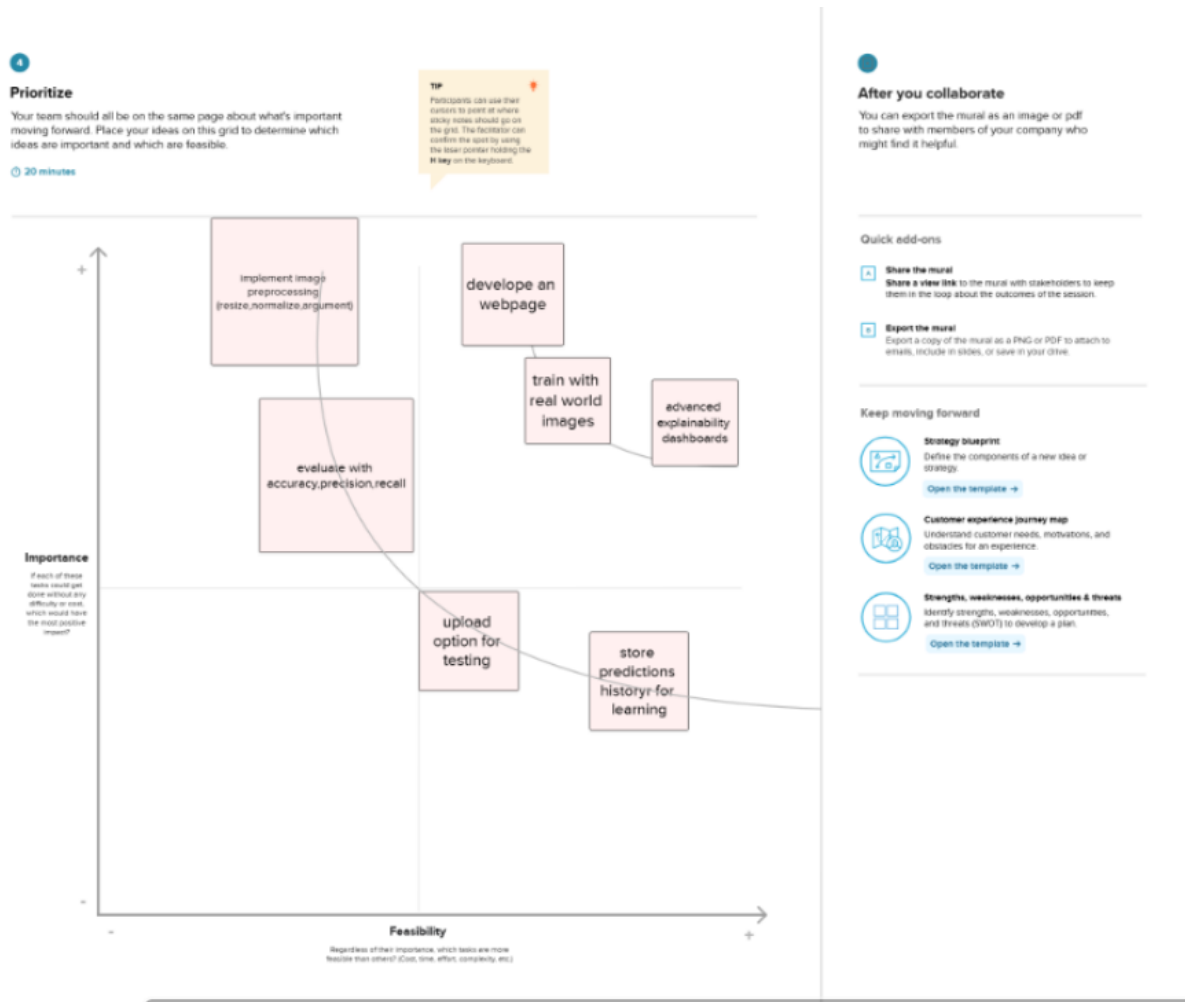


This section outlines the initial ideas and concepts generated during the project's ideation phase, based on the Brainstorming & Ideation.docx file.

Idea	Description	Rationale
Mobile Application for Waste Segregation	A user-friendly mobile app that uses the device camera to identify and categorize waste types (e.g., plastic,	Directly addresses the problem of incorrect waste segregation at the source. This is a core feature that

Idea	Description	Rationale
	paper, glass) to assist users with proper disposal.	leverages the machine learning model.
Waste Management Dashboard	A dashboard for municipalities or waste management companies to monitor waste collection, segregation rates, and identify areas with high contamination.	Provides a centralized view for stakeholders, enabling data-driven decisions and resource optimization. This aligns with the overall cleantech goal of improved management.
Smart Bins with Integrated Sensors	Develop smart waste bins equipped with sensors (e.g., weight, fill level, camera) that automatically detect and sort waste, and send data to the central dashboard.	Represents an advanced, automated solution. This integrates hardware with the core software and AI, as mentioned in smartbridge (1).pptx.
Educational Module / Gamification	Integrate a gamified learning module within the mobile app to educate users about waste reduction, recycling best practices, and the environmental impact of proper waste management.	Enhances user engagement and promotes long-term behavioral change, a key non-functional requirement.
API for Third-Party Integration	Create a public API that allows other environmental or smart city applications to leverage the waste classification model.	Expands the project's impact and potential use cases, fostering an ecosystem of related services.

2. Prioritization Matrix



This matrix evaluates the generated ideas based on key criteria to determine their priority for the project, aligned with the Project Design.docx and Solution Requirements.docx.

Scoring Legend:

- **Impact:** High (H), Medium (M), Low (L)
- **Effort:** High (H), Medium (M), Low (L)
- **Priority:** High (H), Medium (M), Low (L)
- **Status:** Selected (S), Backlog (B), Deferred (D)

Idea	Impact	Effort	Priority	Comments / Justification
Mobile Application for Waste Segregation	H	M	H	Selected. This is the core solution identified in the Project Design.docx and is critical for user interaction and achieving the project's main goal.
Waste Management Dashboard	H	M	H	Selected. The Solution Requirements.docx and smartbridge (1).pptx highlight the need for a management tool for key stakeholders. It's a high-impact feature.
Smart Bins with Integrated Sensors	M	H	M	Backlog. This idea is a significant undertaking requiring hardware development. While high-impact, it's a phase 2 or future feature as the initial focus is on the software-based solution.
Educational Module / Gamification	M	L	M	Selected. Low effort and adds significant value by improving user experience and addressing non-functional requirements. Can be developed in parallel with core features.
API for Third-Party Integration	L	M	L	Deferred. A good long-term idea, but not a priority for the initial project scope. Can be considered after the core application is stable and deployed.

3. Brainstorm, Idea Listing and Grouping

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Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Dharmesh

Use a pre-trained model (e.g., MobileNetV2) for classifying waste as recyclable or not

Apply data augmentation (rotation, crop, flip) to increase dataset diversity

Create a mobile-responsive version of the web app

Himasree

Train a CNN model and tune hyperparameters for better accuracy

Gather real-life waste images to improve model generalization

Develop an HTML + CSS web interface to upload waste images

Diisha Begum

Add drag-and-drop image upload with a preview for user experience

Use Grad-CAM to interpret why the model classifies a certain way

Add result cards showing predicted label with confidence score

Nasiruddin Sayyad

Connect backend (Flask) to the ML model and handle predictions

Host the model + site on Render or Railway for online access

Test the complete pipeline with different image types for validation

4. Decision & Next Steps

Based on the prioritization, the core features for the initial phase of the project have been identified.

Selected Ideas:

1. **Mobile Application for Waste Segregation**
2. **Waste Management Dashboard**
3. **Educational Module / Gamification**

Next Steps:

1. Proceed with detailed design and development for the selected features. This aligns with the scope of the Project Planning(Agile Methodologies).docx and Integration & Development.docx.
2. Refine user stories and data flow diagrams, as outlined in Data Flow Diagrams and User Stories.docx.
3. Initiate the development and testing cycles as described in Functional & Performance Testing.docx.
4. Move the remaining ideas (Smart Bins, API) to the project backlog for future consideration.