Project Design Phase
Proposed Solution Template

Date	15 February 2025
Team ID	LTVIP2025TMID38840
Project Name	CleanTech: Transforming Waste Management with Transfer Learning
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Improper segregation and management of solid waste results in increased environmental pollution and inefficiencies in recycling. Manual waste classification is time-consuming, inconsistent, and lacks scalability.
2.	Idea / Solution description	"CleanTech" is an AI-powered smart waste classification system that leverages **Transfer Learning** to automatically identify and classify different types of waste (e.g., plastic, organic, metal, e-waste) from images. Users upload images via a web interface, and the model predicts the waste category, helping automate segregation and optimize disposal/recycling processes.
3.	Novelty / Uniqueness	Unlike traditional rule-based or sensor-based waste management systems, Cleantech applies **deep learning with transfer learning**, allowing the model to adapt with fewer images and achieve high accuracy even in diverse real-world conditions. The solution is low-cost, flexible, and easily deployable on mobile/web platforms.
4.	Social Impact / Customer Satisfaction	The solution promotes sustainable living, reduces landfill accumulation, and enhances recycling rates. Municipal bodies, recycling companies, and the general public benefit through improved awareness, cleaner surroundings, and easier waste handling.
5.	Business Model (Revenue Model)	The model can be monetized through: - Licensing to municipalities and waste management companies - Subscription-based mobile app for residential and corporate users - API integration for smart bins and IoT devices in smart cities
6.	Scalability of the Solution	The solution is highly scalable: - Can be trained on regional datasets to adapt to different waste types

		- Deployable across devices (mobile, kiosks, smart bins) - Cloud-based architecture allows for continuous updates and expansion