# Smart QR-Based Recycling and Reward System Integrated with College App

## Team_EcoNova

**Project Title : BIN2WIN**

SPARK by CIE

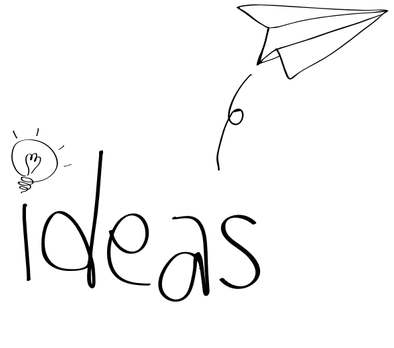
BIN2WIN

Date: 27-10-2025

PES UNIVERSITY | CIE CENTRE FOR INNOVATION & ENTREPRENEURSHIP

# ECONOVA

## Sustainability+Innovation




### :TEAM MEMBERS:

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### CORE PROBLEM STATEMENT : TARGET AUDIENCE : COST OF THE PROBLEM

Students lack motivation and tracking for recycling, resulting in low efficiency and campus waste mismanagement.

> College Students
> Hostel residents
> college administration

> Over 60% of recyclable waste is mixed with general trash daily.
> Lack of data leads to inefficient waste management and lost opportunities for sustainability rewards

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## 8-10 IN-DEPTH INTERVIEWS


## KEY INTERVIEW INSIGHT

- Students often forget or avoid segregating recyclables due to lack of motivation.
- No recognition or reward system leads to low participation
- Students are willing to recycle more if the process is simple and rewarding.
- Data tracking and gamification were highlighted as engaging ideas.

## POWERFUL CUSTOMER QUOTE

**"I see the recycling bins, but I never bother separating plastics because there's no point or reward." - 2nd Year Hostel Student**

01

## TAM:

TAM (Total Addressable Market): All university students in India
→ ~40 million students (UG + PG across 40,000+ colleges and 1,000+ universitie

02

## SAM:

SAM (Serviceable Addressable Market): Students in Bengaluru
→ ~500,000+ students in major institutions like VTU, PES, RVCE, Christ, BU, etc.

03

## SOM:

SOM (Serviceable Obtainable Market): Students on our campus
→ ~5,000 students (Initial pilot group)

# Cost of the problem:

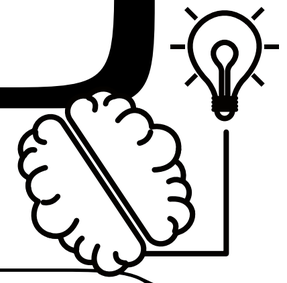
Our campus generates thousands of recyclable items every year. Due to improper segregation and lack of motivation, a significant portion of this recyclable waste ends up as general trash — leading to unnecessary disposal costs and lost sustainability opportunities.(we are not aware of exact data)

## TIMELY

Plastic waste on campus is increasing rapidly. With sustainability becoming a top institutional goal and rising digital adoption, this is the right time to act with a tech-driven recycling initiative.

## Important

Improper segregation leads to avoidable waste-handling costs and inefficiencies. Students currently lack motivation due to the absence of rewards, recognition, or data visibility



## Scalable

With over 5,000 students on campus, even small improvements in recycling efficiency can save significant resources and boost engagement — a model easily scalable across campuses in India.

## Solvable

Our team has the technical skills to develop and integrate the solution (QR tech, app backend, reward logic) using existing infrastructure with minimal setup cost.

## Contextual

As students who experience this issue daily, we have direct access to users for piloting, testing, and feedback — ensuring practical, real-world adoption.

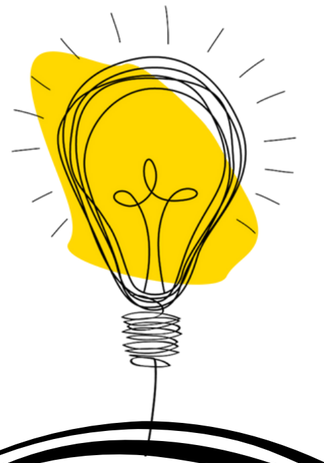
Current Situation:

Cleaning staff manually collects mixed waste from campus bins.

Recycling bins exist but are rarely used properly by students.

Awareness campaigns happen occasionally but lack sustained impact.

No system to track or reward student recycling efforts.



Why It Falls Short:

Manual segregation by staff is inefficient and slow.

Students lack motivation without incentives or feedback.

Poor engagement limits behavior change toward recycling.

Absence of data means recycling efforts can't be measured or improved.

The Gap:
No integrated, tech-driven system exists at PES RR Campus to motivate, track, and reward recycling, resulting in ineffective waste segregation and missed sustainability goals.

# Proposed Solution Direction:

A SMART, QR-BASED RECYCLING AND REWARD SYSTEM INTEGRATED INTO THE EXISTING CAMPUS APP THAT MOTIVATES STUDENTS TO RECYCLE BY TRACKING THEIR CONTRIBUTIONS THROUGH UNIQUE QR CODES ON RECYCLING BINS. THIS DIGITAL SOLUTION PROVIDES REAL-TIME DATA ON RECYCLING ACTIVITY, OFFERS INCENTIVES THROUGH REDEEMABLE REWARD POINTS, AND FOSTERS ENGAGEMENT WITH GAMIFIED ELEMENTS LIKE LEADERBOARDS AND RECOGNITION.

# Key Value Proposition:

THIS SYSTEM DIRECTLY ADDRESSES THE LACK OF MOTIVATION AND FEEDBACK BY REWARDING STUDENTS FOR THEIR RECYCLING EFFORTS, MAKING PARTICIPATION CONVENIENT AND REWARDING. IT ALSO PROVIDES THE ADMINISTRATION WITH MEASURABLE DATA TO OPTIMIZE WASTE MANAGEMENT AND IMPROVE SUSTAINABILITY INITIATIVES.

# What is Novel About Your Solution?

UNLIKE TRADITIONAL RECYCLING PROGRAMS, THIS SOLUTION INTEGRATES TECHNOLOGY AND GAMIFICATION INTO THE STUDENTS' EVERYDAY DIGITAL ECOSYSTEM, CREATING A SEAMLESS, INTERACTIVE EXPERIENCE THAT ENCOURAGES CONSISTENT, MEANINGFUL RECYCLING BEHAVIOR WHILE ENABLING TRANSPARENT TRACKING AND REWARDING OF INDIVIDUAL CONTRIBUTIONS.

## Link to full response/data:

https://docs.google.com/spreadsheets/d/1075yRBdwop1xUori_bbn9wgF5K5j907kDTOHNcQ4GCU/edit?resourcekey=&gid=1167925042#gid=1167925042

## Supporting Images:






Pilot the QR-based recycling system in 2–3 high-traffic locations (e.g., one hostel block, canteen, library) with 3–4 QR-enabled bins. Collect usage and reward redemption data over 4–6 weeks to evaluate participation, measure waste reduction, and refine the system before scaling campus-wide. Alongside the pilot, conduct online awareness campaigns (e.g., social media posts, student community updates, and digital challenges) to promote participation and educate users about the system.