

Project 3

Final Jury Presentation | 26 May 2021

Service design for changing the waste management behavior of the students of IIT Bombay

Guided by

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Project Brief

Designing the services for the students of IIT Bombay to create awareness and nudge them to change their behavior towards sustainable waste management practices by incorporating the principles of behavioral change in Service Design.

Gaps in the current system

1. The failure at the systems level interventions
2. Lack of interest among the people to practice waste management

Literature Review

1. Theory of planned behavior
2. Theory of reasoned actions
3. Transtheoretical model
4. Precaution adoption model
5. CraftChange framework

Secondary Research

1. Waste management in South Korea



Secondary Research

1. Waste management in South Korea
2. The Nudge Unit of the UK

“Nine out of ten people pay their tax on time. You are in the minority that does not pay their tax on time.”

“Nine out of ten people in your local area pay their tax on time. You are in the minority...”

“Nine out of ten people with a debt like yours pay their tax on time. You are in the minority...”

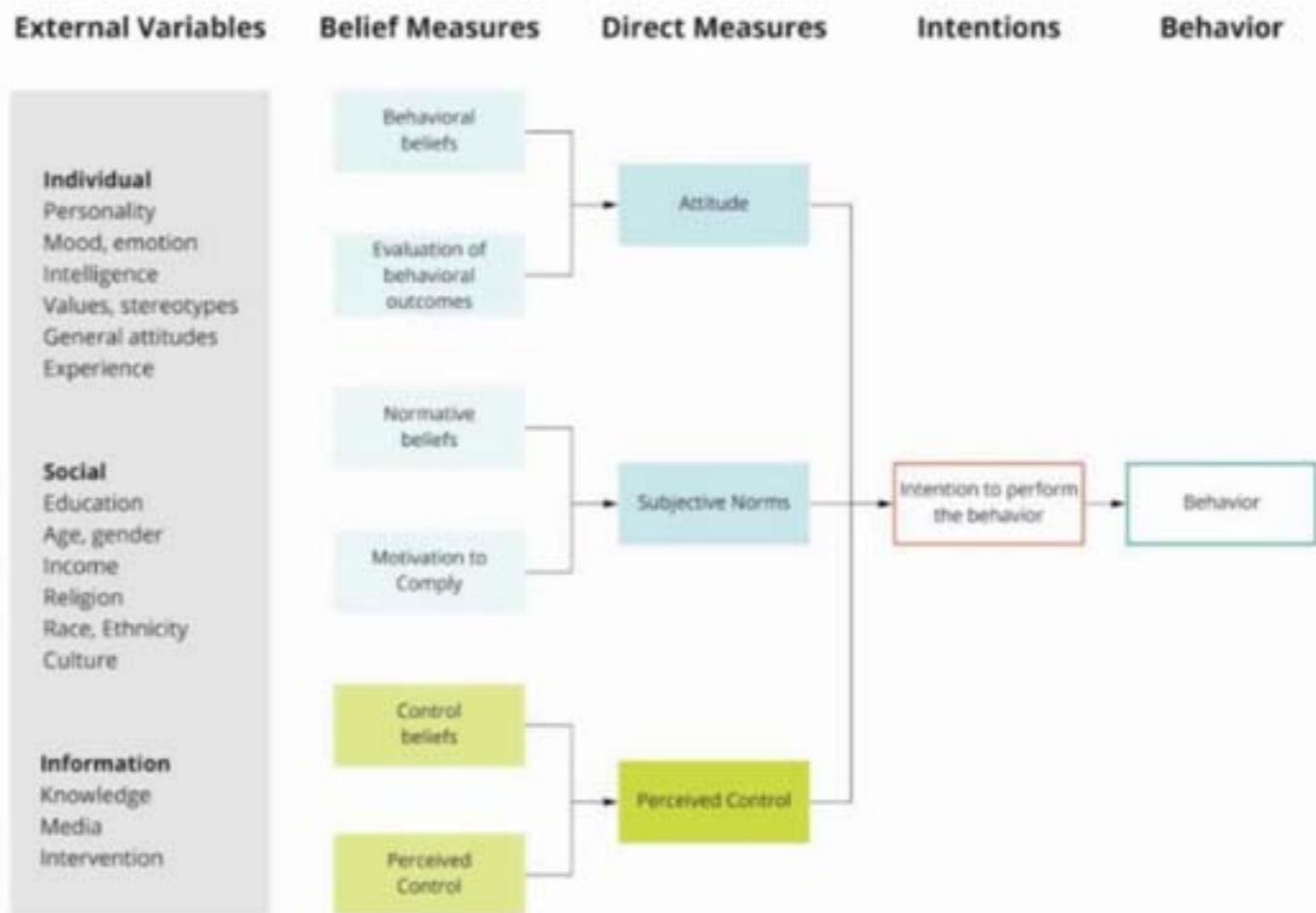
“Nine out of ten people with a debt like yours, in your area, pay their tax on time. You are in the minority...”

Secondary Research

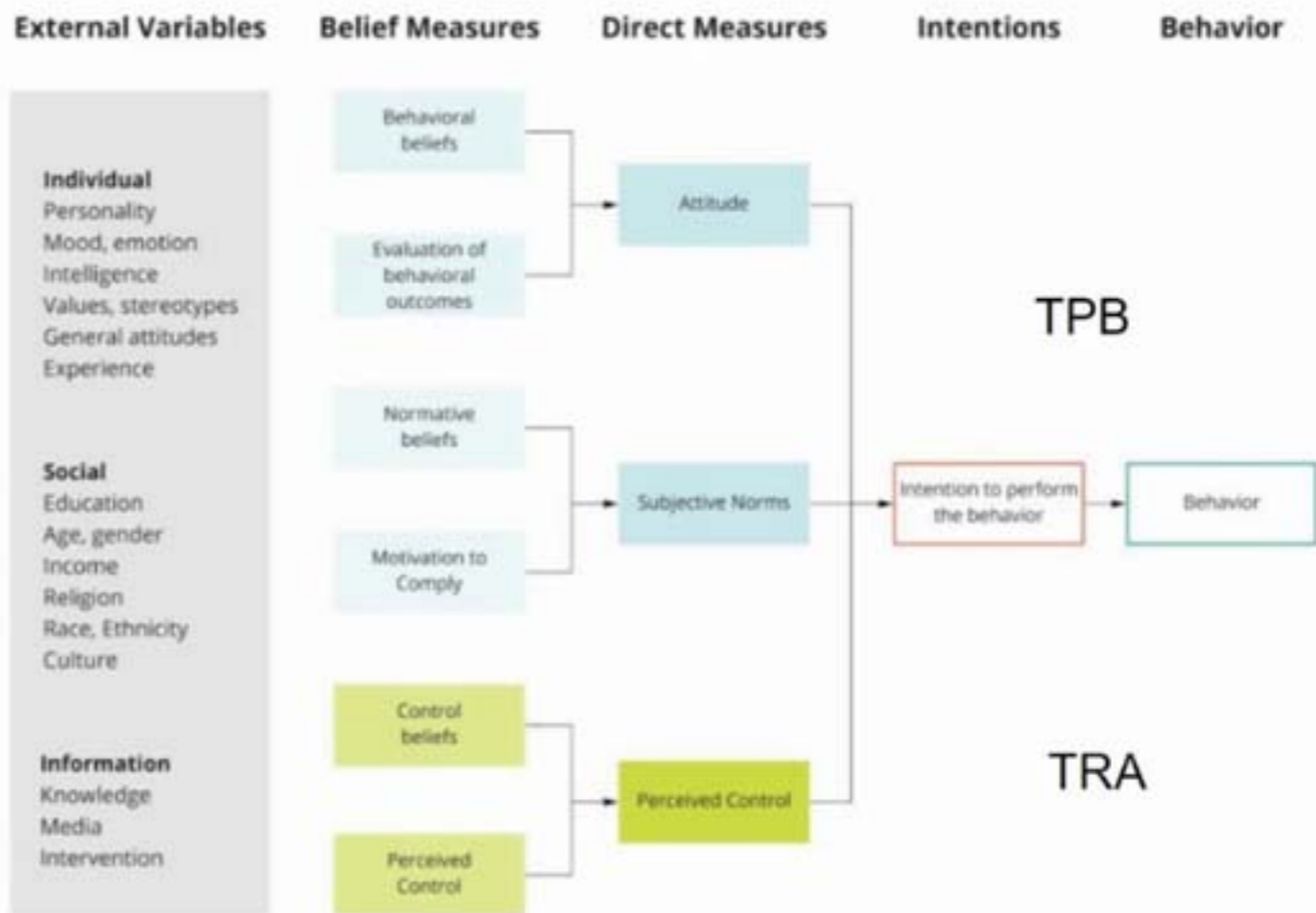
1. Waste management in South Korea
2. The Nudge Unit of the UK
3. NSTAR power report



Primary Research



Primary Research



Primary Research

Primary Research

1. What is the motivation for students to practice sustainable waste management?
2. How are the students maintaining their sustainable behaviors?

Primary Research

1. The awareness about the waste management
2. Influence of the servicescape, friends and family
3. Empathy on the maintenance staff
4. Access to sustainable alternatives
5. Estimation on the resources required
6. Efficient infrastructure and back-end activities
7. Other personal benefits

Main sources of the waste generation from students at IIT Bombay

| Place | Mess | Hostel | Departments | Eateries / other shops |
|-------------------------------------|--|--|--|---|
| Activities | <ul style="list-style-type: none"> • Cooking • Eating • Storing vegetable • Storing cooked food • Stock management | <ul style="list-style-type: none"> • Studying • Sleeping • Cooking • Eating • Partying • Online shopping • Others (bathing, laundry..) | <ul style="list-style-type: none"> • Teaching • Studying • Seminars / Conferences • Eating • Partying • Online shopping • Administrative activities | <ul style="list-style-type: none"> • Cooking • Eating • Storing vegetable • Storing cooked food • Stock management |
| Types of waste generation | <ul style="list-style-type: none"> • Food waste <ul style="list-style-type: none"> • Cooked • Raw | <ul style="list-style-type: none"> • Food waste <ul style="list-style-type: none"> • Cooked • Raw • Packaging • Stationary • Cloths/footwear • E-waste • Sanitary waste • Daily commodities • Other dry waste | <ul style="list-style-type: none"> • Food waste <ul style="list-style-type: none"> • Cooked • Raw • Packaging • Stationary • E-waste • Sanitary waste • Other dry waste | <ul style="list-style-type: none"> • Food waste <ul style="list-style-type: none"> • Cooked • Raw • Packaging • Other dry waste |
| Reasons for waste generation | <ul style="list-style-type: none"> • Substandard taste • Wrong estimation • Slothful behavior • Inefficient storage facilities | <ul style="list-style-type: none"> • Lack of awareness on resource management • Unsustainable shopping practices • Lack of designated bins • Lack of awareness on waste disposal/treatment practices • Lack of exposure on how to sustainably reuse | <ul style="list-style-type: none"> • Lack of awareness on resource management • Lack of designated bins • Lack of awareness on waste disposal/treatment practices • Lack of exposure on how to sustainably reuse | <ul style="list-style-type: none"> • Substandard taste • Wrong estimation • Lack of designated bins • Unsustainable packaging • Inefficient storage facilities |

Reasons for waste generation

- Substandard taste
- Wrong estimation
- Slothful behavior
- Inefficient storage facilities

- Lack of awareness on resource management
- Unsustainable shopping practices
- Lack of designated bins
- Lack of awareness on waste disposal/treatment practices
- Lack of exposure on how to sustainably reuse

- Lack of awareness on resource management
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- Lack of awareness on waste disposal/treatment practices
- Lack of exposure on how to sustainably reuse

- Substandard taste
- Wrong estimation
- Lack of designated bins
- Unsustainable packaging
- Inefficient storage facilities

Existing interventions by the Institute

- Designated bins for food waste
- A board which display how much food waste is generated in day (*Placement matters*)


- Designated bins for e-waste (*Placement matters*)

Existing interventions by student bodies

- Zero waste day - Students have to pay fine when they waste food in the mess

- Waste collection drives to create awareness about SWM and sustainability

- Waste collection drives to create awareness about SWM and sustainability

- 
1. Choice architecture : placement of the food waste statistics board
 2. Changing the plate design - so that students take less food initially
 3. Feedback board in the mess - students take food based on other students feedback
 4. Instant feedback on the amount of food wasted. - digital display
 5. Collaboration with NGOs to distribute left overs to needy
 6. Raw waste segregation - to feed cows in the campus
 7. Segregation of cooked food waste

1. Designated bins for different types of waste (Wet/dry/Re-usable/e-waste)
2. Statistics on waste generation: daily/weekly/monthly in the hostel
3. Collaboration with NGOs to donate unused cloths, footwear and other commodities
4. Compost pit for every hostel - make student contribute and participate - maintaining hostel garden
5. Compost pit for every hostel - make student contribute and participate - maintaining hostel garden

1. Designated bins for different types of waste (Wet/dry/Re-usable/e-waste)
2. Statistics on waste generation: daily/weekly/monthly in the Department
3. Collaboration with startups / student bodies to give away discarded products/materials
4. Competitions b/w departments to produce less waste - Most sustainable department of the year award
5. Measure carbon foot prints or at

1. Designated bins for wet/dry waste
2. Choice architecture : placement of the food waste statistics board
3. Feedback board in the mess - students take food based on other students feedback - could improve their business
4. Collaboration with NGOs to distribute left overs to needy
5. Raw waste segregation - to feed cows in the campus
6. Segregation of cooked food waste to feed dogs in the campus
7. Sustainable packaging

Opportunities

1. Consideration of waste to distribute left overs to needy
6. Raw waste segregation - to feed cows in the campus
7. Segregation of cooked food waste to feed dogs in the campus
8. Competitions btw hostels to produce less waste - Most sustainable hostel of the year award
9. Watchfulness while servin food in the mess - might be a psychic cost
10. Monitoring (Human TP) at food waste disposal - might make the students guilty for wasting food

4. Make student committees participate - maintaining hostel gardens
5. Competitions b/w hostels to produce less waste - Most sustainable hostel of the year award
6. Show where the waste is going, how the waste is reused/treated
7. Wrapper collection at stationary shops and return gifts - exchange

3. Competitions b/w departments to produce less waste - Most sustainable department of the year award
5. Measure carbon foot prints or at least waste generation from each department
6. Separate wing for sustainability in each department: Comes up with sustainable solutions for several issues at departmental level, encourages students/staff to practice sustainability
7. IDC: Designated room to store/dump discarded projects - might useful for upcoming batches to reuse/modify or even to inspire - Physical artifacts matters

5. Raw waste segregation - to feed cows in the campus
6. Segregation of cooked food waste to feed dogs in the campus
7. Sustainable packaging



Other Interventions

- Digital displays in the campus which shows real-time carbon foot prints or waste generated- day/department/individual..etc
- Leverage the influence of the teachers/professors
- Awareness camps on waste treatment practices - segregation by maintenance staff, recycling process, etc)
- Connect with resume points and other benefits - academic incentives
- Hackathons on sustainability and waste management
- Involve students in several institute level sustainable activities, make them feel accountable - empathize
- Instant rewards system
- Choice architecture; placement of the designated bin at main hotspots. (Ex: Paper dispenser at department offices)
- Artifacts or useful products from the discarded waste - Could be new exploitative space for artists and industrial designers
- Providing alternatives by the institute (cycles, green bags, solar powered commuters, etc)
- Track the waste disposals - digitize the waste generation - reward the individual who generates less waste
- Color coded biodegradable garbage bags

Project scope

As the ultimate goal is to make IIT Bombay a zero waste campus, this project aims to act as an initial step towards understanding the issue through a broader spectrum and to proclaim various possibilities to design the solutions for a wide range of contexts across the campus.

Final Concepts

1. Green Week
2. Sustainability Cell
3. Green Treasure hunt
4. Sustainability @IITBStores
5. Source segregation @IITBHostels

Why a broader scope?

Why 5 different concepts?

Infrastructure

Friends

Social media

Family

Society



Green Treasure hunt

Sustainability Cell

Source Segregation
@IITBHostels

Green Week



Sustainability
@IITBStores

Green Treasure hunt

Sustainability Cell

Source Segregation @IITBHostels

Green Week

Sustainability @IITBStores



| | | | | | | | |
|---------|-----------|-----------|--------------------|--------------|----------|---------|----------|
| Unaware | Unengaged | Undecided | Prepare to perform | Perform once | Maintain | Sustain | Advocate |
|---------|-----------|-----------|--------------------|--------------|----------|---------|----------|

Concept I

Green Week

Goal: To create awareness about the types of waste, its management and costs involved in handling it.

Target beneficiaries: Students, maintenance staff and other campus residents.

When? Ideally once in a semester. But the program can also be subdivided into smaller events which can be organized throughout the semester.

Concept I

Green Week

1. Waste collection drive
2. Waste segregation
3. Wet waste treatment
4. Dry waste treatment
5. Photography, documentary making and Journalism contest

D11

| | A | B | C | D | E | F | G | H | I | J |
|----|--|--|---|--|---|--|---|--|--|---|
| 2 | | Pre Core | | | | Waste Collection Drive (Day 1 - Day 2) | | | | |
| 3 | Stage | Awareness Campaign | Registration | Waste Warrior safety kit | Introduction session | Session with the maintenance staff (Waste Pickers) | Equipping with safety gear | Waste Collection (2Days) | Deposit the collected waste | |
| 4 | Stage Goal | To know about the Green Week | To register for the program | To receive the tool kit which consists of a brochure about Green Week, safety gear like gloves, googles if required, apron | Brief introduction about the vision and mission of the Green Week and how it's contributing to the sustainable practices in the campus | To create awareness about backend activities - What the workers go through - measures they take while collecting the waste - Issues with campus residents from their perspective | To Wear the essential safety gear for the particular task (Collection, segregation, etc) | To collect the waste from different locations across the campus | To deposit the collected waste so that it could be further segregated | |
| 5 | Thoughts | How does this benefit me? | - Will this benefit me? - Will I get time to participate? | Is this safety gear enough? | Is attending the program worthy? | How could they even do this? Can I do this? It sounds so difficult | This is not comfortable Will this gear protect me? | So much waste is being generated How could they even do this? Can I do this? It's so difficult and gross Does the vehicle has capacity to carry the waste? | Am I safe and protected? Do we have enough space to deposit the waste? | |
| 6 | Feelings | Anticipation, Optimism, curious, excited | Anticipation, Optimism, doubtful, excited | Enthusiasm, Excited, Optimism, doubtful, curious | Surprised, Opdimism | Doubtful, sad, thoughtful, gross | Doubtful, worried, Optimism | Uncomfortable, doubtful, worried | Uncomfortable, doubtful, worried | |
| 7 | Journey Related Activities | Connecting with the Green Week student coordinators | - Registration at the stall - Online registration | Collect the safety kit from the Green week stalls which are across the campus | Attending the introduction session | Attending the session | Wearing the gear | Moving across the campus and collecting the waste | Depositing the waste in the allotted space | |
| 8 | Resources and Enablers | Posters, brochures, stalls, online campaigns, emails | - Helpline to answer queries in the online registration - Reliable Online registration platform - Registration desks | - Stalls - Volunteers at the stalls - Sponsorship for safety gear | space at different locations across the campus Student volunteers Projects/screens | Availability of workers and their timeline/activities/daily goals should considered while making the schedule | Access to the safety gear, sponsorship | A vehicle to travel and carry the waste, List of people and places to collect waste from | A location to store the collected waste Could be away from human settlements to avoid grief | |
| 9 | Potential Behavioral Change Principles | Credibility, Social comparison, Normative influence | Trivialization Effect, Recognition effect | Noble edge effect, | Implementation Intention, Partitioning | Identifiable Victim Effect, Implementation Intension, | Noble edge effect, | Goal Gradient Effect, self monitoring, systematic praise, Commitment, Partitioning | Trivialization Effect, Recognition effect, Ostrich effect, Peak end rule, | |
| 10 | Potential Service Design Interventions | - Leverage the influence of the popular student bodies / faculty and their credibility - Publicity / campaigns on Instagram/fb/linkedin where students are active - Highlight the benefits through the digital Notice boards across the campus | - Provide Goodies to the participants to keep them motivated and excited about the event - Interaction guidelines for the human touchpoints at the stall | - Send a safety kit / good lies to the participants to show that the Green Week team cares for their participants | - Explain how the activities are going to benefit and environment and the society - Explain the four phases involved - Introduce the responsible stakeholders involved at each phase - Explain the responsibilities of each participant - A schedule of the Whole program | - Let the maintenance staff / volunteers share their own experiences about the waste management which could further triggers the participants to empathize | - A schedule of the whole program - A checklist for the participants to keep track and progress - could be a mobile app or a sheet of paper - If it's an app, it could give rewards/green points for finishing every checkpoint | - A personalized thanking note for all the participants - Rewards based on the performance | | |
| 11 | | | | | | | | | | |

D11

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| 10 | Potential Design I | <ul style="list-style-type: none"> Blueprints - Treasure Hunt ✓ CJM Green Week Blueprints - Green Week Blueprints - Resource management @IDCStudios Blueprints - Management of Discarded Projects @IDC Blueprints - Waste collection at stores Behavirol Change Principles | | Send a safety kit / good lies to be participants to show that the reen Week team cares for their participants | <ul style="list-style-type: none"> - Explain how the activities are going to benefit and environment and the society - Explain the four phases involved - Introduce the responsible stakeholders involved at each phase - Explain the responsibilities of each participant - A schedule of the Whole program | <ul style="list-style-type: none"> - Let the maintenance staff / volunteers share their own experiences about the waste management which could further triggers the participants to empathize | <ul style="list-style-type: none"> - A schedule of the whole program - A checklist for the participants to keep track and progress - could be a mobile app or a sheet of paper - If it's an app, it could give rewards/green points for finishing every checkpoint | <ul style="list-style-type: none"> - A personalized thanking note for all the participants - Rewards based on the performance | | |
| 11 | | | | | | | | | | |

| A4 | A | B | C | D | E | F | G | H | I | J |
|----|--|--|---|--|---|--|---|--|--|---|
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| | | | | | | | | | | |

Major Encounters during the Green Week

Figure 33: Awareness Campaigns



These campaigns happen a week or a two prior to the actual event.

Goal: To create exposure and awareness about the Green Week and benefits of participating in it.

Enablers: Stalls across the campus, Social media publicity (Instagram, fb, WhatsApp), Posters and Brochures.

Potential Failures: Could attract only the people who are interested in environment and sustainability

Recovery: There could be other competitions like photography, documentary making, journalism contests on the Green Week to pull in other groups of the population as well. The outcome could be used on social media to multiply the impact.

Figure 34: Waste warriors safety kit



Registered students receive the safety kit which includes gloves, mask, the schedule for the Green Week and some goodies.

Goal: To show how the service provider cares for the students and also to motivate them to take part in the event.

Enablers: sponsorship and logistics

Potential Failures: Safety kit is a touchpoint to motivate students to participate in the event but they might not come and participate even after receiving the safety kit.

Recovery: There could be frequent updates on social media, whatsapp groups about the event like team formations, sharing tips, countdown, establishing the goals, etc.

Figure 35: Introductory Sessions



Everyday throughout the week starts with the introductory sessions by volunteers and the maintenance staff.

Goal: To create exposure and awareness about the backend activities which further evokes deeper emotions and empathise the maintenance staff.

Enablers: Student volunteers, maintenance staff

Potential Failures: Maintenance staff or workers might not be able to communicate well. The event might affect the workers daily schedules

Recovery: There could be training sessions for the workers and the maintenance staff to communicate and present well. The event should be planned and scheduled in accordance with the availability of workers and the maintenance staff

Figure 36: Waste collection drive



Goal: To create exposure and awareness about the amount of waste which is being generated across the campus from different sources.

Enablers: Prior notice to the residents to discard the unwanted goods separately along with the daily solid waste generation. Transportation facility across the campus.

Potential Failures: Participants might have stigma handling the waste. Might lose interest in the middle of the event.

Recovery: Creating awareness about how they handle the waste and it's impotence by exposing the backend activities through the workers along with providing the safety gear could reduce the stigma. Tracking individuals' contribution, giving targets/goals and giving rewards/incentives could keep the participants engaged throughout the event.

Figure 37: Waste Segregation



Goal: To create exposure and awareness about the types of wastes which are being generated in the campus and difficulties in segregating the mixed waste.

Enablers: Segregated bins and safety gear

Potential Failures: Participants might have stigma handling the waste. Might lose interest in the middle of the event.

Recovery: Creating awareness about how they segregate the waste and it's impotence by exposing the backend activities through the workers along with providing the safety gear could reduce the stigma. Tracking individuals' contribution, giving targets/goals and giving rewards/incentives could keep the participants engaged throughout the event.

Figure 38: Wet waste treatment



There could be many activities involved in the wet waste treatment like biogas production which involves handling the biogas plant and composting.

Goal: To create exposure on how much food waste is being generated from different sources and resources / efforts involved in treating the wet waste.

Enablers: Access to the bio gas plant and compost pits.

Potential Failures: Participants might have stigma handling the waste. Might lose interest in the middle of the event.

Recovery: Creating awareness about why it is important to treat wet waste by exposing the backend activities through the workers along with providing the safety gear could reduce the stigma. Tracking individuals' contribution, giving targets/goals and giving rewards/ incentives could keep the participants engaged throughout the event.

Figure 39: Dry waste treatment



[Upcycling]



Image credits: 5-min craft items



[Recycling]



Image credits: Plastics make it possible

There could be many activities involved in the dry waste treatment like recycling and upcycling.

Goal: To create exposure on how much dry waste is being generated from different sources and resources / efforts involved in treating the dry waste.

Enablers: Access to dry waste recycling and upcycling plants.

Potential Failures: Participants might have stigma handling the waste. Might lose interest in the middle of the event.

Recovery: Creating awareness about why it is important to treat dry waste by exposing the backend activities through the workers along with providing the safety gear could reduce the stigma. Tracking individuals' contribution, giving targets/goals and giving rewards/ incentives could keep the participants engaged throughout the event.

Post event activities



The outcome from the other parallel events like photography, documentary and journalism contests could be leveraged to keep the participants engaged after the completion of the events. As we are leveraging social media, the reach could be maximized and has potential to influence a much greater population.

Figure 94 (left): A screenshot (prototype) of a facebook post from the Team Zero Waste declaring the results of the photography contest. Such posts could have more reach and impact than a usual post because a lot of people share and comment on such posts. Similarly, even the best documentaries could also be shared across social media.

Figure 95 (right): A magazine cover (prototype) published by Insights IIT Bombay on several Green initiatives in the campus. As the insights is one of the popular publishers in the institute they could be leveraged to highlight the initiatives and create awareness among the campus residents.

Analysis on the Green Week

Influence of the Green Week on the Participant behavior



The different programs within the Green Week have different values and significance. For example, Waste collection drives create awareness about how much and what type of waste is being generated across the campus from different sources. The waste segregation drive focuses more on creating awareness about the segregation of waste at source which also sensitizes the participants about how this segregation affects the further waste treatment activities. Similarly, food waste treatment at the Bio gas plant sensitizes the participants about the amount of food which is being wasted and resources required to process it. Students who have participated in the program for a couple of times could have enough experience to advocate from the next event.

Benefits

Knowledge benefits: Awareness on solid waste management through the interactive sessions as well as activities which expose the backend practices in waste management

Social benefits: Get to meet and network with like minded students and other campus residents

Emotional benefits: A get away from daily routines

Costs

Time costs: Students might not be interest to participate because of tightly packed academics

Energy costs: Segregation and waste treatment practices involves extra manual efforts

Psychic costs: Few people might be having issues with hygiene and cleanliness, such people might not be comfortable taking part in such events

Final Concepts

1. Green Week
2. Treasure hunt

To expose the freshers to the campus ecosystem and biodiversity

Final Concepts

1. Green Week
2. Treasure hunt
3. Sustainability cell

A systems level intervention to monitor and guide the sustainability aspect of the practices

Final Concepts

1. Green Week
2. Treasure hunt
3. Sustainability cell
4. Sustainability at IITB stores

To promote the sustainable products and waste management at the stores

Final Concepts

1. Green Week
2. Treasure hunt
3. Sustainability cell
4. Sustainability at IITB stores
5. Waste segregation at IITB hostels

To nudge the students to segregate the waste before disposing it

Personas

Personas

1. Raj

Aware and interested

2. John

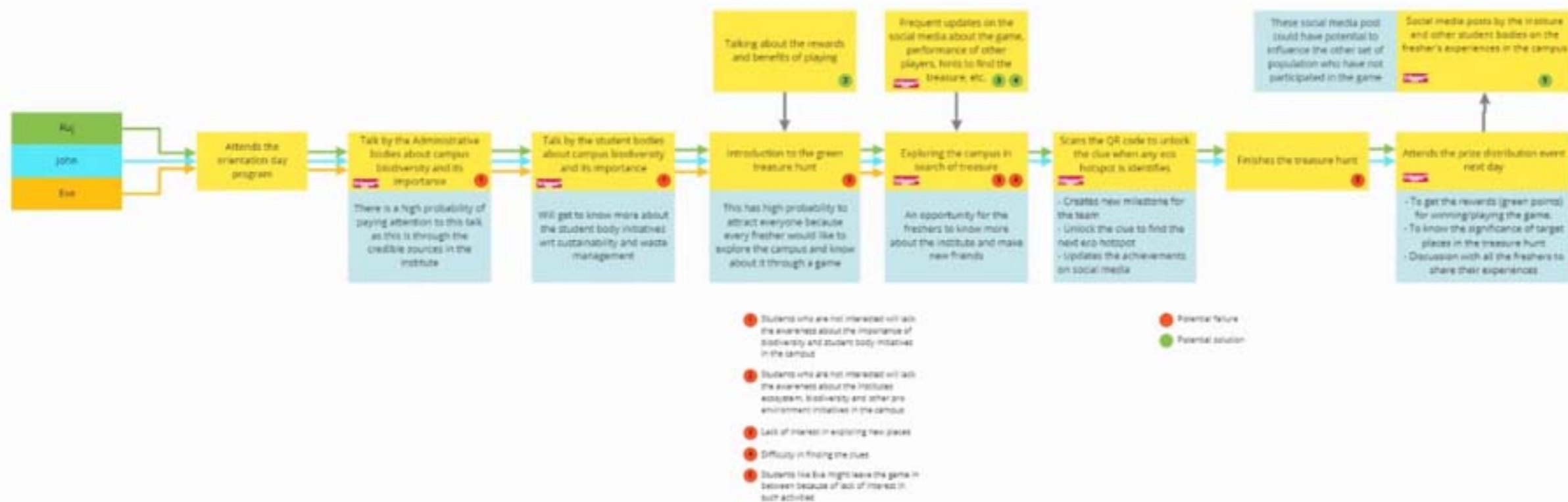
Aware but not interested

3. Eva

Completely unaware



Scenario at Orientation day

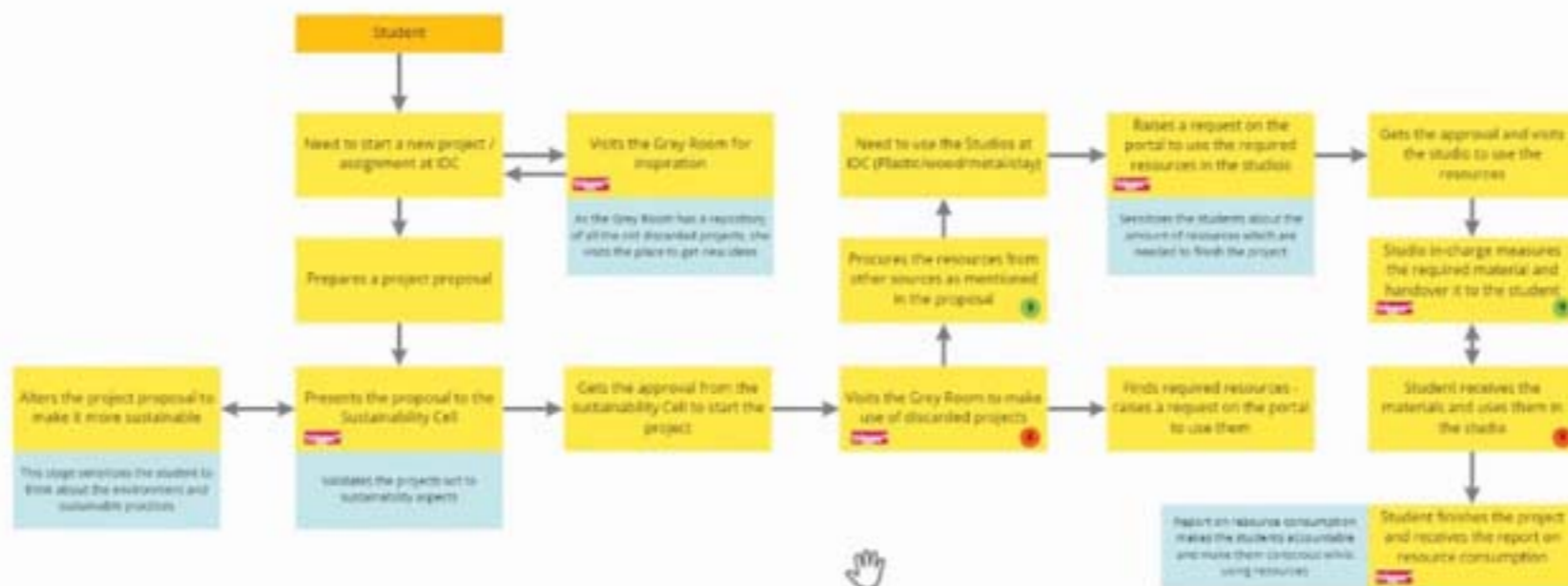


Scenario at the Green Week



Multiple sources for students to know about the Green Week

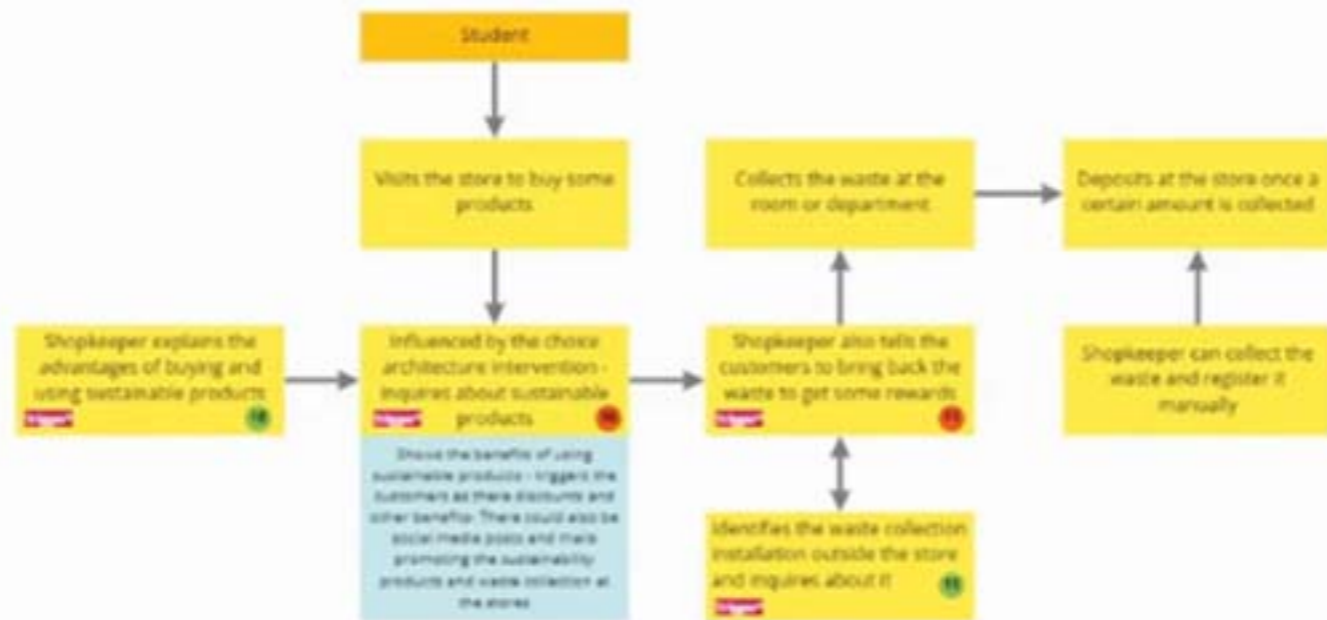
Scenario at IDC - Interventions by the Sustainability Cell of IDC



- If the required resources are not found in the Gray Room
- What if student uses the requested material

This intervention helps the students like Eze who are not interested to know about the importance of sustainability or not interested in taking part in waste management activities. Such rules and regulations forces the students to practice sustainability.

Scenario at the IITB stores - promoting sustainability



- 1 What if the customer ignores or fail to identify the interventions
- 2 What if the shopkeeper forgets to tell about waste collection
- 3 What if the installation doesn't work

Evaluation

1. Waste segregation at hostels



Evaluation

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Evaluation

1. Waste segregation at hostels
2. Remaining concepts - expert feedback

Thank you