GreenNest

Saving the planet one person at a time.
UX Design in Web & Mobile Applications (CSIS 3375 - Section 001)

Team Members:

- Sachini Epa (300381972) - Team Lead
- Theodore O. Amodu (300371625)
- Frederick Okornoe (300373397)

Requirements Gathering

Purpose or Objectives for Requirements Gathering User Study

The primary purpose of this study is to gather and understand user behaviour, motivations, and actions and to deduce how they affect the environment. Again, the study seeks to find user preferences and tastes to help design a platform or app that appeals to the user's senses. The study will ensure the app aligns with user needs while balancing educational value, usability and reward-driven participation.

The study aims to uncover the following:

- **Understanding User Demographics**: Identify the primary users of GreenNest, including age, profession, lifestyle, and eco-consciousness levels.
- **Analyzing the User Behaviors**: Investigate daily habits related to sustainability, such as carbon footprint awareness, recycling, and energy consumption.
- **Identify User Problem Points:** Determine challenges users face in adopting and maintaining eco-friendly habits
  .
- **Assess Relevance Feature:** Validate the demand for features like carbon footprint tracking, personalized eco-tips, gamification, and community engagement and prioritize.
- **Gauge Motivation Factors:** Discover what incentives (e.g., rewards, streaks, challenges) best encourage users to engage with sustainable practices.
- **Evaluate Technological Preferences:** Understand user familiarity with mobile applications, AI-driven suggestions, and gamified interfaces.
- **Explore Community Engagement Needs:** Assess interest in environmental events, social challenges, and group-based sustainability initiatives.
- **Validate Market Differentiation:** Compare user feedback with competitor eco-apps to ensure GreenNest offers unique and compelling value.
- **Clarify ambiguities**: Use of feedback to help refine and finalize the project scope.

Choice of user study and user sample

To ensure the app meets expectations, with a sample size of 23, we conducted a survey, which we distributed via google forms to allow us to gather insights from a broad audience to help understand the user needs.

According to the context of our app idea, the target users of our application would be individuals who are interested in adopting sustainable habits to bring the carbon footprint down.

This includes,

- Students interested in sustainability
- Professionals interested in adopting eco-friendly habits

- Households interested in adopting greener practices
- Enthusiastic individuals who want to make a positive impact on the environment.

To capture the feedback of the audience, we have conducted a single survey focusing on

- Current sustainability habits and awareness
- Common challenges/ difficulties in adopting sustainable habits.
- Importance of each feature in a sustainability app
- Any preferred feature in the app the users would appreciate

Note: We have not chosen the dual perspective and used a single survey to capture the needs of the broad audience.

Draft of the User Study Survey or Interview

Survey Link:
https://docs.google.com/forms/d/e/1FAIpQLSev4rsMcXfqTUVzMmdvyCeK8xzutfY0lrPuUqRrjZOhLMKPGg/viewform?usp=header

1. What is your age range?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55+

2. Which best describes your occupation?

- Student
- Professional
- Self-employed
- Retired
- Other:

3. Do you use any apps/ tools to reduce/track the carbon footprint at the moment?

- Yes
- No

4. How involved are you in environment sustainability efforts?

- Very involved
- Moderately involved
- Slightly involved
- Not involved

5. How often do you track your carbon footprint?

- Daily
- Weekly
- Monthly
- Annually
- Never

6. Which methods do you currently use to reduce your carbon footprint? *(Select all that apply)*

- Public transportation/biking
- Reducing meat consumption
- Energy-efficient appliance
- Recycling/composting
- None of the above

7. Rank this feature by importance for a carbon footprint app *(1 = Most important, 5 = Least important)* ***Real-time tracking of emissions***

- 1
- 2
- 3
- 4
- 5

8. Rank this feature by importance for a carbon footprint app *(1 = Most important, 5 = Least important)* ***Personalized reduction goals***

- 1
- 2
- 3
- 4
- 5

9. Rank this feature by importance for a carbon footprint app *(1 = Most important, 5 = Least important)* ***Educational resources (articles, tips)***

- 1
- 2
- 3
- 4
- 5

10. Rank this feature by importance for a carbon footprint app *(1 = Most important, 5 = Least important)* ***Carbon offset purchasing options***

- 1
- 2
- 3

- 4
- 5

11. Rank this feature by importance for a carbon footprint app *(1 = Most important, 5 = Least important)* **Social sharing/community challenges**

- 1
- 2
- 3
- 4
- 5

12. How interested are you in engaging with a community on social media for carbon reduction efforts (e.g., sharing eco-friendly actions, participating in sustainability challenges, joining discussions)?

- Very interested
- Somewhat interested
- Neutral
- Not very interested
- Not interested at all

13. Which of these metrics would you want the app to track? *(Select all that apply)*

- Transportation
- Diet
- Home energy usage
- Shopping habits (fast fashion)
- Waste production

14. How important is reducing your carbon footprint to you?

- Extremely important
- Moderately important
- Slightly important
- Not important

15. What barriers prevent you from reducing your carbon footprint? *(Select all that apply)*

- Lack of awareness
- Cost
- Time constraints
- Lack of motivation
- No barriers

16. How often would you use a carbon footprint tracking app?

- Daily

- Weekly
- Monthly
- Rarely

17. Would you participate in app-based challenges to earn rewards

- Yes
- No
- Maybe

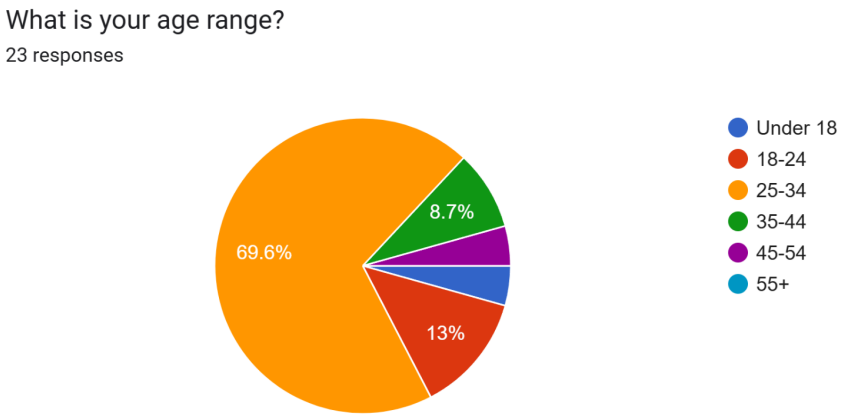
18. What additional features would you like to see in a sustainability tracking app? (Open ended question)

Data Visualization and Analysis:

For the study, we have used a sample size of 23.

And here is the visual of the data collected for each question respectively:

1.



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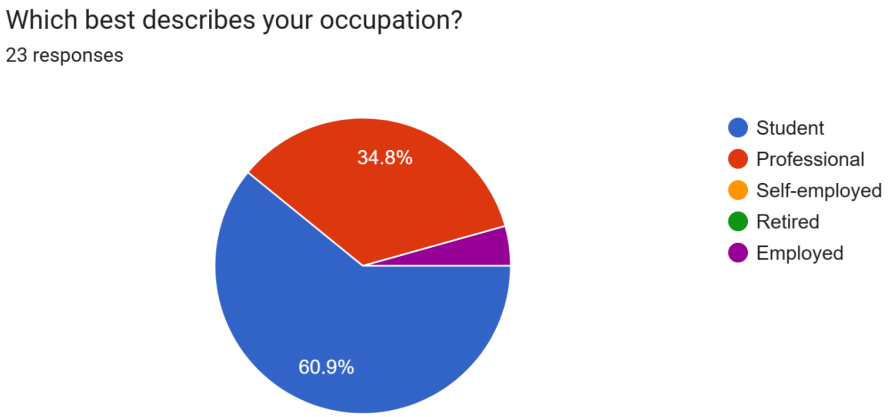
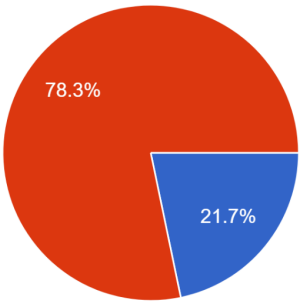


3.

Do you use any apps/ tools to reduce/track the carbon footprint at the moment?

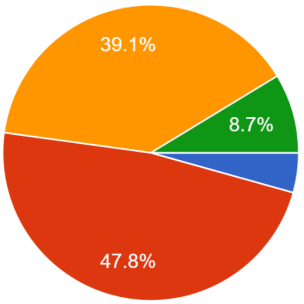
23 responses

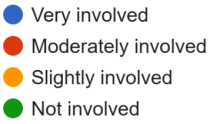


4.

How involved are you in environment sustainability efforts?

23 responses

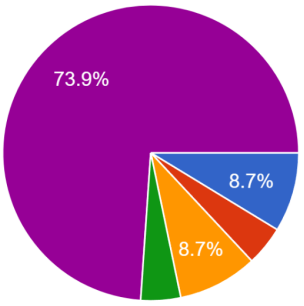


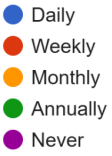


5.

How often do you track your carbon footprint?

23 responses

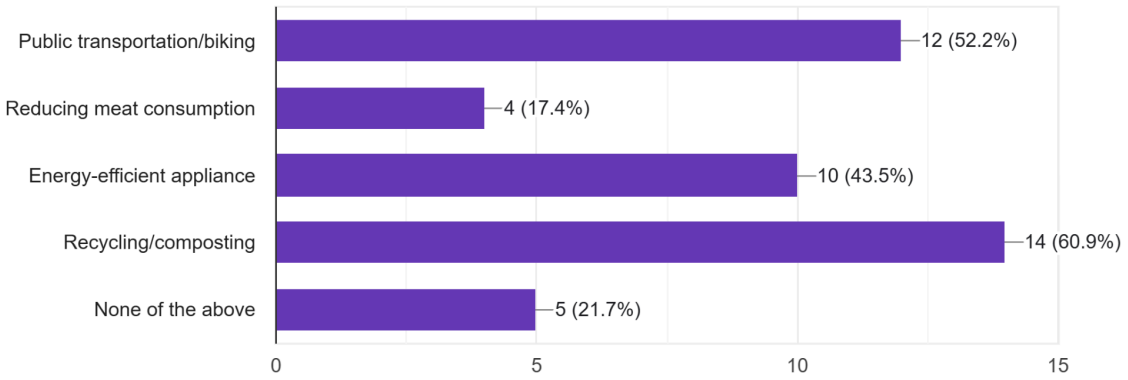




6.

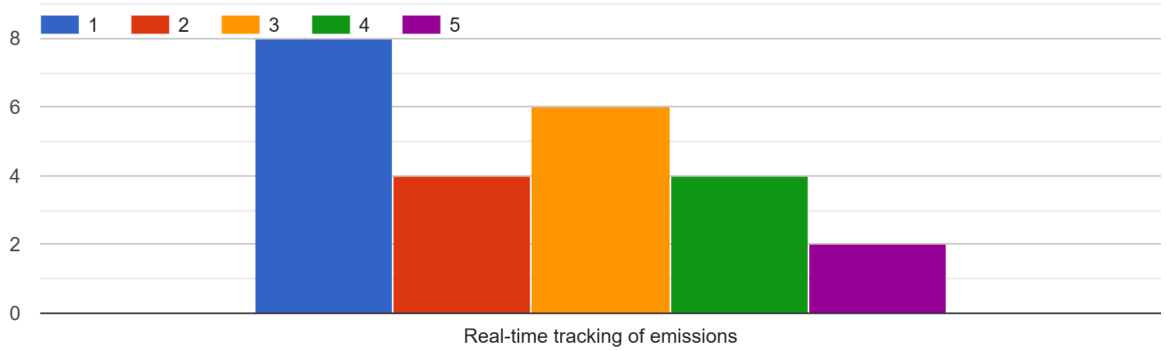
Which methods do you currently use to reduce your carbon footprint? (Select all that apply)

23 responses



7.

Rank this feature by importance for a carbon footprint app (1 = Most important, 5 = Least important)



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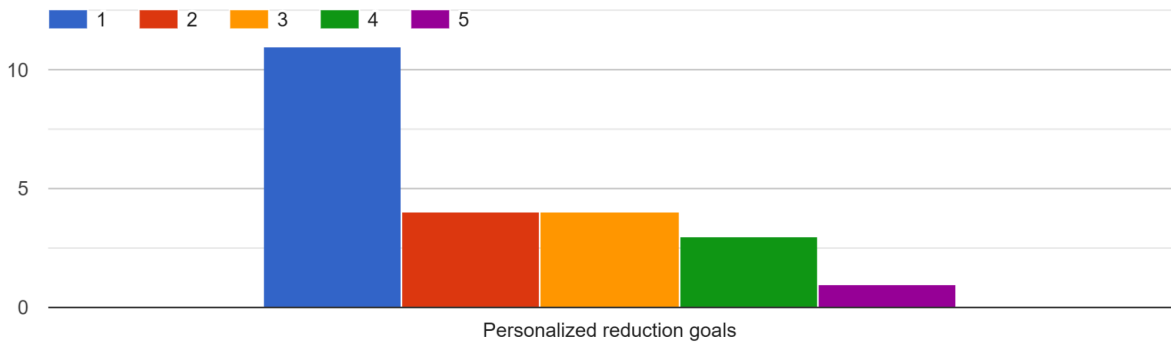

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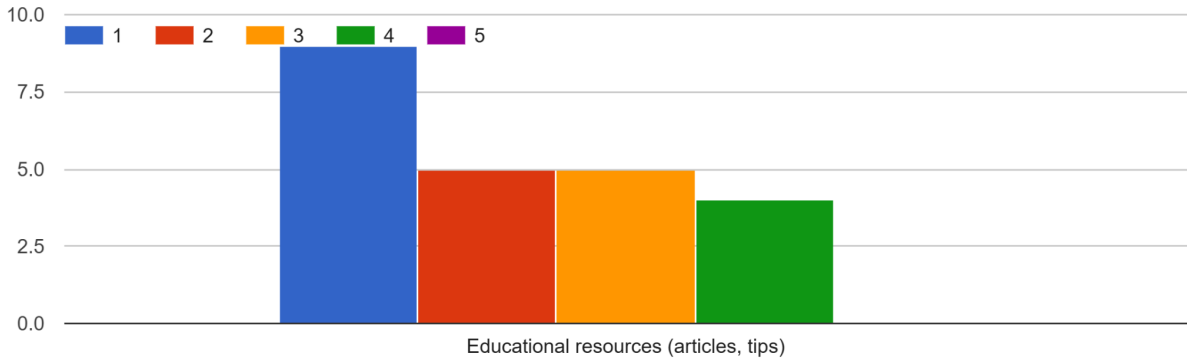

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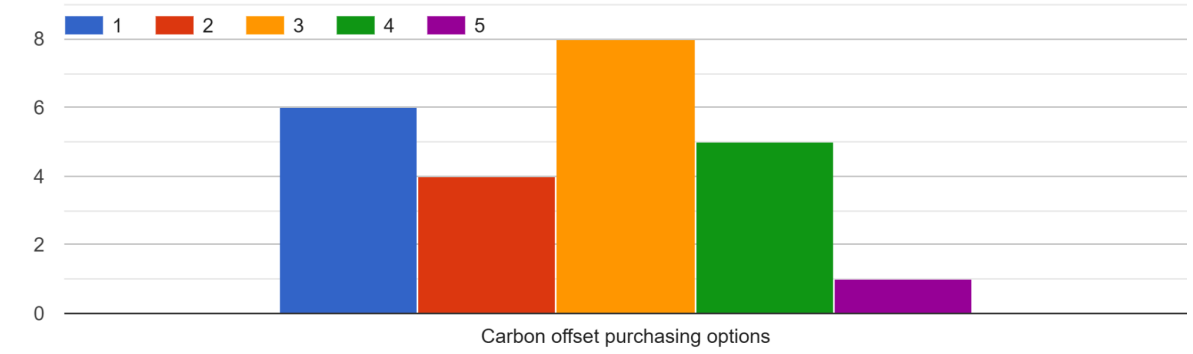

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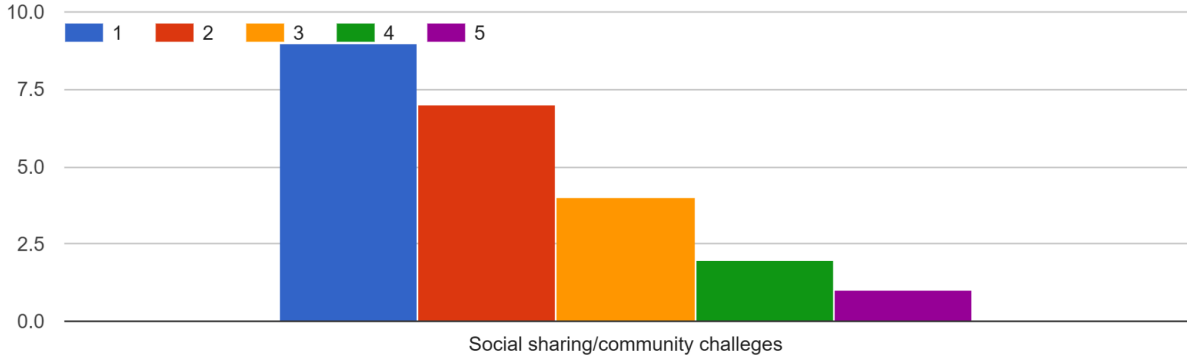

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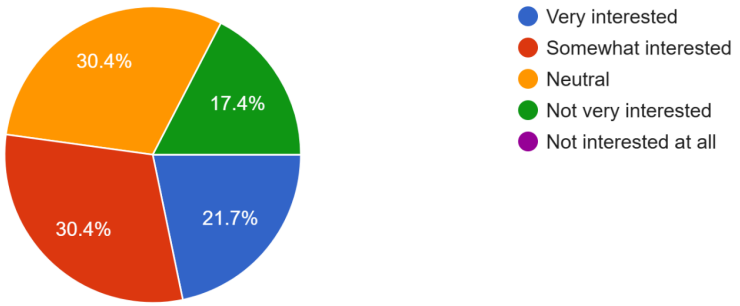
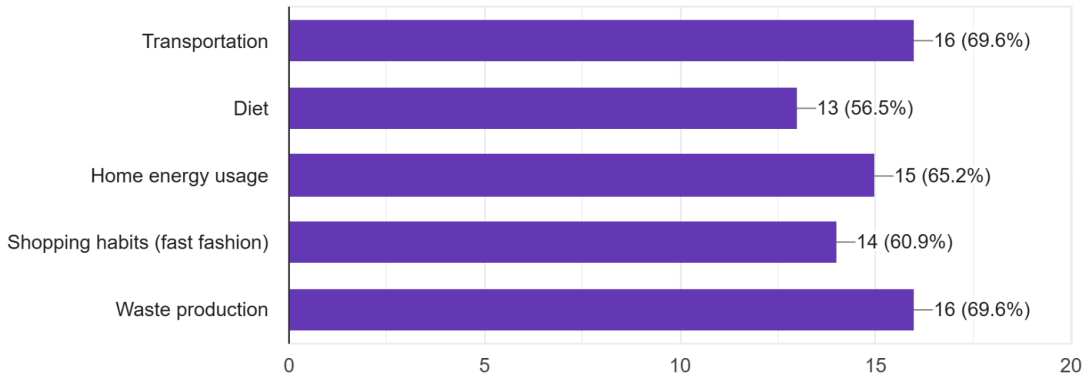
23 responses



13.

Which of these metrics would you want the app to track? (Select all that apply)

23 responses



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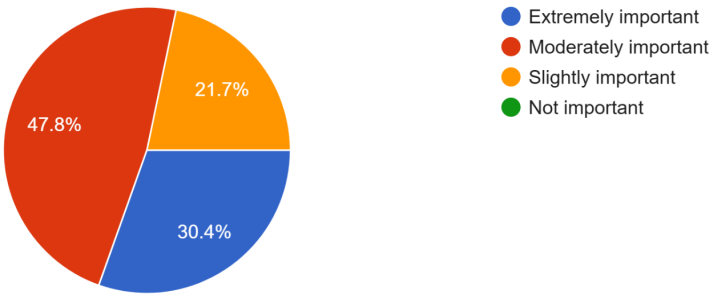
How important is reducing your carbon footprint to you?

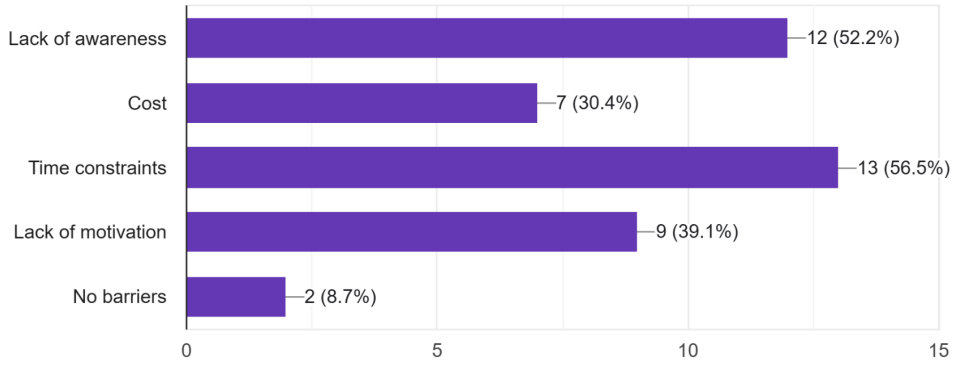
23 responses



15.

What barriers prevent you from reducing your carbon footprint? (Select all that apply)

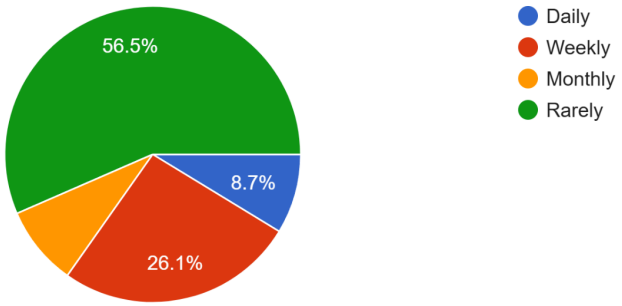
23 responses



16.

How often would you use a carbon footprint tracking app?

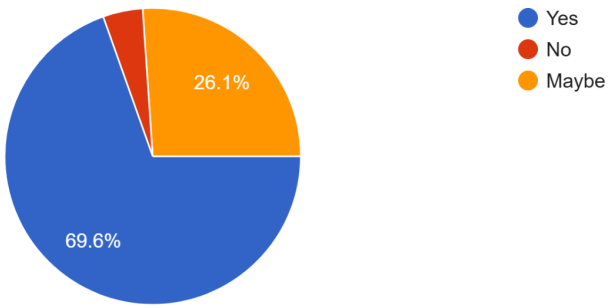
23 responses



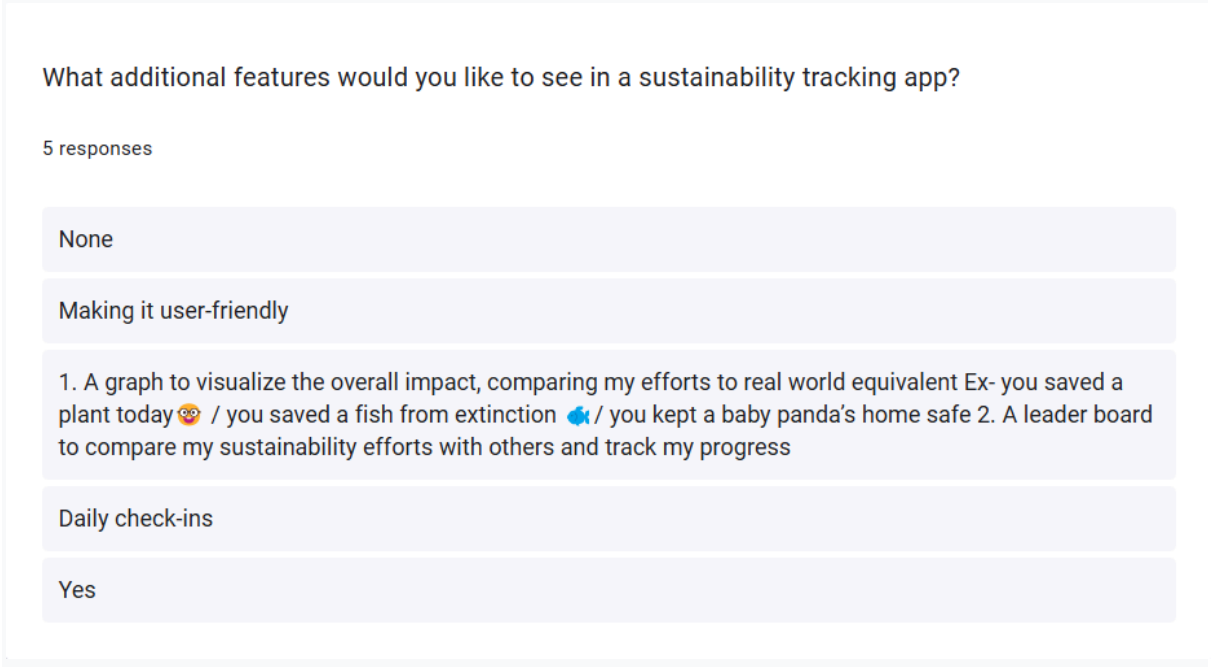
17.

Would you participate in app-based challenges to earn rewards

23 responses



18. What additional features would you like to see in a sustainability tracking app?



For the last open-ended question in the survey, only 5 out of 23 responded and below points were suggested as additional features the audience would like to see, in addition to the features stated in the survey.

1. Graphical representation of the overall impact
2. Leaderboard to compare individual sustainability efforts
3. Daily check-ins

We believe that the first two suggestions would make the application more useful and will encourage the users more to keep using the app. Therefore, we will be integrating the first two suggestions to the application to make it user friendly and appealing while accommodating the audience's needs.

Quantitative Data Summary:

For the rankings related to the carbon footprint app features:

1. Personalized reduction goals (e.g., "Set a goal to reduce your energy consumption by 10% this month")
    - Mean: 2.0
    - Median: 1.0
2. Educational resources (articles, tips) (e.g., "How to reduce plastic waste," or "Energy-saving tips for your home")
    - Mean: 2.1
    - Median: 2.0
3. Real-time tracking of emissions (e.g., "Track your CO2 emissions live based on activities like driving or energy use")
    - Mean: 2.0
    - Median: 3.0
4. Community engagement (sharing eco-friendly actions, participating in challenges) (e.g., "Join sustainability challenges and share your achievements on social media")
    - Mean: 2.0
    - Median: 2.0

5. Integration with other sustainability apps/tools (e.g., "Sync with other apps like fitness trackers or energy usage monitors")
    - Mean: 3.2
    - Median: 3.0
6. Suggestions for eco-friendly products or services (e.g., "Recommendations for reusable water bottles or green energy plans")
    - Mean: 2.8
    - Median: 3.0

Insights from the Results:

- The most highly ranked features are Personalized reduction goals and Educational resources, with low means and medians, suggesting that most respondents find these features highly important.
- Community engagement, Integration with other apps/tools, and Suggestions for eco-friendly products received mid-range ratings, with means and medians closer to 3, indicating moderate importance.
- User Interest and Involvement: Many users indicated that they are moderately or very involved in environmental sustainability efforts.

Carbon Footprint Tracking App Preferences:

- Key Features Desired: The most important features for users in a carbon footprint tracking app are real-time emissions tracking and personalized reduction goals.
- Educational Resources: Educational resources (like articles or tips) were also highly valued.
- Community Engagement: A significant number of users expressed interest in participating in social sharing or community challenges.
- Frequency of Use: Many users use the app frequently (daily or weekly), suggesting that the app should provide continuous tracking and notifications to maintain regular engagement.

How This Changes App Requirements:

- User Education: Incorporate educational resources to support users in understanding and reducing their carbon footprints.
- Social Features: Include community features like sharing eco-friendly actions or participating in challenges, as this was a noted interest.
- Personalization: Focus on offering personalized carbon reduction goals and real-time tracking, as these were highly rated in the survey.

In addition to the above, we will also take the preferred features suggested by the respondents like visualizing individual efforts and generating a leaderboard into account.

Requirements Generation

Personas and Scenarios:

Persona 1:

Name: John Black

Age: 42

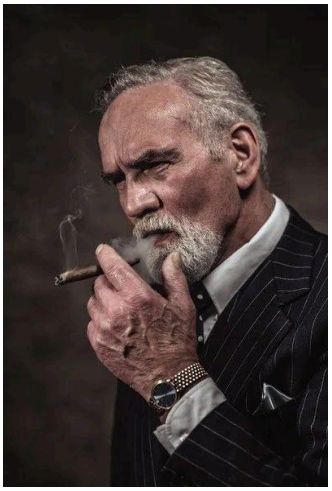
Works as a software engineer

- He lives with his wife and child
- Tech-savvy
- Travels to work daily
- Has an outgoing personality
- Sustainability enthusiastic
- Loves outdoor activities with the family and getting to know people in the same age group

1. John has been noticing the increasing alarms about global warming and is feeling guilty for the negative impact his activities have.
2. He often discusses the importance of protecting the environment with the family and mentions that every small step matters.
3. As a software engineer, he believes in working with technology and data driven insights. He is looking for an efficient tool to identify how he can do better and comes across GreenNest.
4. Despite being a busy professional, *GreenNest* always recommends John potential ways of reducing the carbon footprint by suggesting tips based on his lifestyle.

5. John finds these tips really helpful and after a busy week, John feels energized and even more motivated to do his part for the environment by seeing how his efforts have positively contributed through the visuals.
6. John loves to attend related events suggested by the app with his family and working with like-minded individuals, believing that his child would inherit the habit of protecting the environment.

Persona 2



Arthur Whitmore

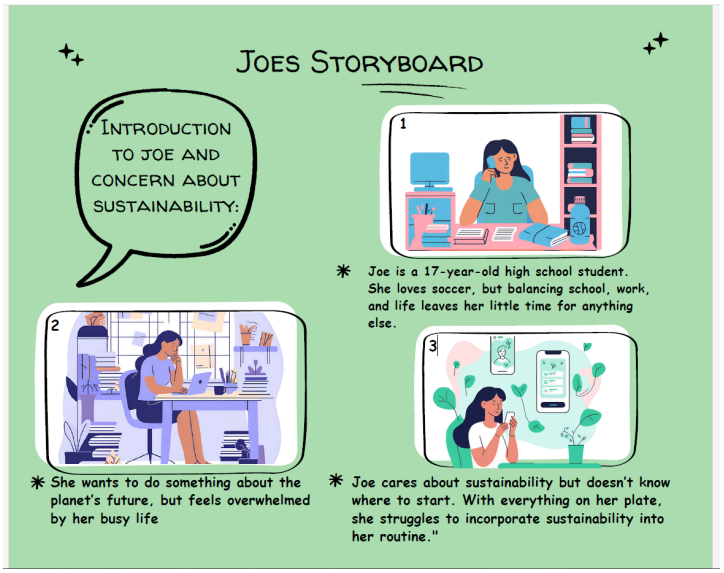
Age: 68

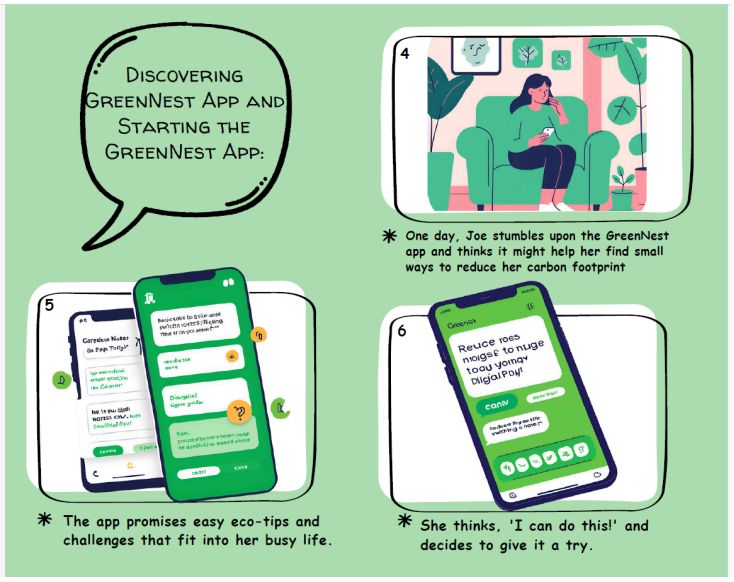
Retired CEO of a company

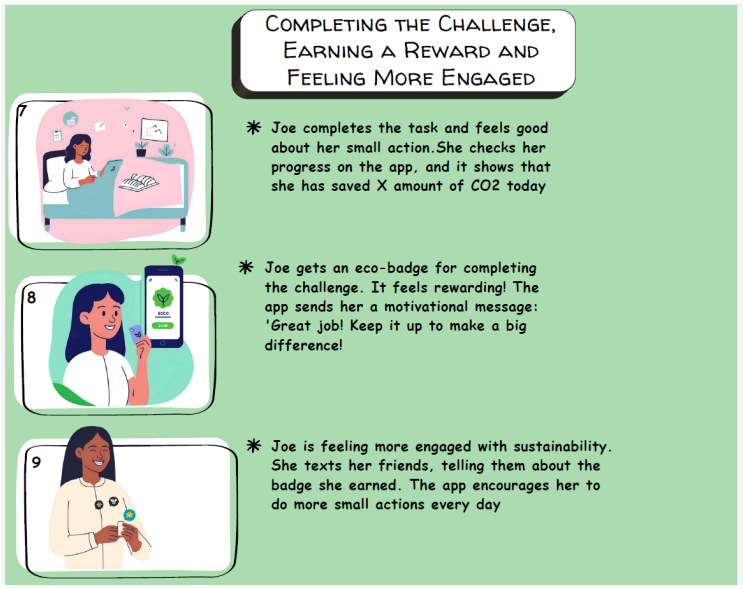
Background:

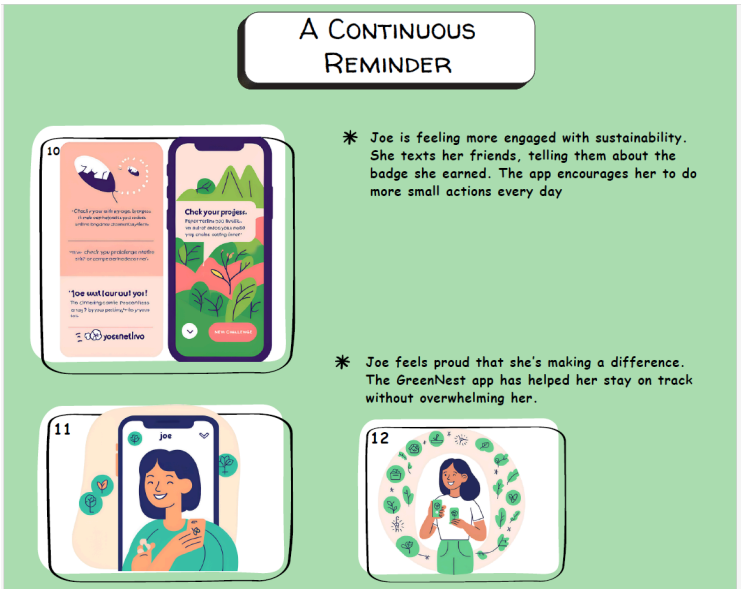
1. Retired CEO of a manufacturing company
2. Proud of building a successful business but now seeks purpose in retirement
3. Chain smoker, he views smoking as a reward for his hard work
4. Lives in a large, energy insufficient suburban home
5. Drives a gas guzzling vintage car
6. He has a garden but uses chemical fertilizers and pesticides
7. Wants to leave a legacy but is unaware of his environmental impact

Persona 3:









Requirement Generation

Analysis of Persona 1:

1. Proactive
2. Sociable
3. Optimistic
4. Ambitious
5. Diligent
6. Optimistic
7. Environmentally-conscious
8. Tech-savvy
9. Optimistic
10. Inquisitive
11. Resilient

Analysis of Persona 2:

1. Retired professional
2. Traditional, old school and reluctant to change
3. Hardworking
4. Proud
5. Environmentally harmful
6. Reward oriented

Analysis of Persona 3 (Storyboard):

1. Joe is proactive
2. Cares about the environment
3. Diligent
4. Inquisitive
5. Sociable
6. Optimistic
7. Ambitious
8. Resilient

Requirements Generation Based on Scenario/ Story Analysis

1. Login/ Registration
2. Real-time tracking of emissions
3. Personalized reduction goals
4. Personalized generation of eco-tips
5. Progress Tracking
6. Community engagement events
7. Social media integration
8. Reward mechanism - gamification
9. Smart home and IOT integration
10. Eco-friendly marketplace
11. Access to Educational resources on sustainability
12. Leaderboard

Synthesis of Requirements Gathering and Generation

Based on the insights gotten from the survey, we can categorize requirements into essential, moderate and low-priority. This will help to identify the most necessary features of the app and also offer a clear path for feature prioritization and development. Here are the requirements drawn from the survey:

Essentials (Must haves)

These are the high priority features, strongly ranked by users:

1. Real-time tracking of emissions
2. Personalized reduction goals
3. Personalized generation of eco-tips
4. Education resources

Moderate Priority
These are features that add values but are not essential for the app's baseline functionality. These are the moderately ranked options

1. Eco-friendly marketplace
2. Community engagement events
3. Reward mechanism - gamification
4. Progress tracking
5. Leaderboard

Least Priority (Want-to-Haves)
These feature while appealing to certain users, are not essential for the app's success

1. Visual impact representation'
2. Social media integration
3. Smart home and IOT Integration

A detailed analysis of the survey reveals several outcomes. Users often cited the lack of motivation as a factor in sustaining the usage of the app. Gamification and social engagement could help in increasing app usage.

Also, the importance of education cannot be overstated. Providing easily digestible content can help users overcome the hurdle of awareness.

Finally, it is essential to customize the app to suit each user's preference. The different preferences among users highlights the need for flexibility and personalized experiences that accommodates different lifestyles.

To conclude, the synthesis reveals a roadmap for developing an engaging and effective carbon tracking app. By focusing on essentials or must-haves and moderately prioritised features and want-to-haves, the app can cater to a wide range of users.

Work Date/Hours logs for student (or each team member)

Sachini Epa

Date	Number of Hours	Description of work done
Jan 22, 2025	1	Research on potential app ideas
Jan 23, 2025	1	Background search on the Green Nest app idea and its features.
Jan 26, 2025	1	Brainstorming session with the professor and discussion with the team to finalize an idea.

Feb 01, 2025	0.5	Google Meet meeting with the team members to plan the project proposal document.
Feb 03, 2025	0.5	Creating the github repository with the ReadMe file and adding collaborators.
Feb 05, 2025	0.5	Working on the project proposal – Proposed App idea for the prototype
Feb 06, 2025	0.75	Working on the project proposal – Proposed App idea for the prototype
Feb 07, 2025	0.5	Working on the project proposal – value proposition, title page and closing
Feb 09, 2025	1	Final touches to the proposal document and submission
Feb 13, 2025	1	Reading online material to familiarize myself with Figma.
Feb 17, 2025	1.5	Watching the Group discussion to go through the requirement document guidelines and plan the next steps
Feb 25, 2025	1	Watching YouTube materials to familiarize with the Figma features.
Mar 05, 2025	1	Group discussion to discuss the next steps, modifications to the user survey and sending the user survey to the professor for feedback.
Mar 06, 2025	0.5	Creating a draft requirement document, modifying the user survey based on the professor's feedback
Mar 08, 2025	0.5	Sending out surveys and following up
Mar 12, 2025	1	Going through the example personas and writing a persona for the project.

Mar 13, 2025	0.5	Group meeting - Discussed the next steps with the group members.
Mar 15, 2025	2	Working on the requirements document, analyzing Fredrick's persona for requirement generation, creating the group and project in Figma.
Mar 16, 2025	1	Fine tuning the requirements document.

Frederick Okornoe

Date	Number of Hours	Description of work
Feb 01, 2025	.5	Teams meeting with the team members to plan the project proposal document.
March 3, 2025	1	Created survey questions using google forms and google sheet to gather user's response
March 9, 2025	.5	Group meeting and discussion on personas
March 10, 2025	.5	Distributed survey
March 10, 2025	.5	Explored the different types of prototypes
March 10, 2025	.5	Explored the different types UI animations
March 10, 2025	.5	Explored the different types of UI trigger
Mar 13, 2025	.5	Group meeting - Discussed the next steps with the group members.
March 14, 2025	.5	Generated traits and character of persona

March 14, 2025	.5	Worked on persona, analyzed and deduced traits from Theodora's persona
March 15, 2025	1.5	Analysis and synthesis of findings from survey
March 15, 2025	.5	Introduction paragraph for purpose for requirements gathering

Theodora O. Amodu

Date	Number of Hours	Description of work done
Feb 01	0.5	Google Meet meeting with the team members to plan the project proposal document.
Feb 03	1	Researched for the Background research and PACT Framework
Feb 04	1.5	Worked on writing out the Background Research, the market competitor apps, the market inspiration
Feb 7,	1.5	Worked on the PACT framework
March 17	1	Had group meeting where we discussed how to go about the second part of the project and we concluded on the type of survey to give out

March 19	1.5	Researched on the purpose of conducting the user study , checking their lifestyle, age group and their goals
March 22	0.5	Did a personal draft of the user survey that will be sent out
March 5	1	Group meeting discussing and checking on our progress and reviewing the survey and also agreed to send our survey to our lecturer
March 11	1	Worked on part of the document, did my research and sent out my share of survey questions
March 12	0.5	Sent out more surveys and followed up
March 12	3	Worked on the word document and the quantitative analysis of the chart while giving insight and solutions. I also got feedback/input from my team members if it was good so far
March 12	1.5	Watched class video to refresh memory on how to go about preparing my persona and scenarios
March 13	3.5	Worked on my Persona and scenario using a storyboard using visuals and canvas. This was really challenging as it was my first time but it worked out well after practice and research

March 13	0.5	Group meeting with team members to discuss the next steps
March 16	0.5	Updated the document

Closing and References

We would like to express our sincere gratitude to all the participants who took time out of their busy lives to fill out the survey for us. Your invaluable insights will immensely contribute to the development and usability of the proposed application, GreenNest. We also highly appreciate the support and guidance provided by our professor, Padmapriya Arasanipalai to better capture the user feedback.