

Project Proposal

Himnish Jain, Ayesha Baweja, Kalika Raje, Sydney Klesner, Mateo Campoverde-Fordon

Project Summary and Goals

Problem statement

Our client's sustainability challenge focuses on the urgent need to reduce landfill waste and develop a culture of reuse. This complex problem necessitates the development of a solid infrastructure to minimize waste production and execute persuasive public relations efforts to encourage zero-waste behaviors. One notable example of this issue is the continued use of single-use water bottles on campus, especially in the resident halls, sports facilities, and convenience stores. Our campus community still has sizable usage of single-use bottles despite efforts to solve this problem, and many installed water bottle fillers. Convenience is a critical component in promoting the use of reusable water bottles, according to survey data collected from students living in residence halls. As a result, resolving this issue requires comprehensive solutions that improve convenience and actively encourage and mainstream sustainable practices among campus inhabitants and visitors alike.

Research Questions:

We found some of the research questions when evaluating the current research area.

1. What are the prevailing attitudes and behaviors among students regarding the use of water bottle filling stations?
2. How effective have previous sustainability campaigns been in increasing usage of hydration stations on campus?
3. What are the logistical challenges and barriers hindering widespread adoption of sustainable hydration practices?
4. Are there specific demographics or user segments that require intervention to maximize impact?

5. How can technology be leveraged to enhance awareness, accessibility, and utilization of water bottle filling stations?

Challenges/Gaps/Problems:

A range of challenges, gaps, and problems exist in relation to promoting sustainability. One prevalent issue that exists with this goal is limited awareness. Many students may not be fully aware of the location and benefits of hydration stations on campus, leading to underutilization. Accessibility barriers such as inadequate signage, inconvenient locations, or lack of information may deter students from utilizing existing hydration facilities. This can lead to a significant gap in sustainability due to the barriers created by this lack of accessibility. Other problems include behavioral barriers. It is documented that it is fundamentally complex. A habitual reliance on single-use plastic bottles and a lack of motivation to prioritize sustainability may impede efforts to promote alternative hydration practices. In relation to broader challenges, existing infrastructure limitations can be a notable roadblock. This is because insufficient infrastructure or outdated facilities may undermine the effectiveness of sustainability initiatives. Another area for improvement within existing sustainability efforts is gaps in measurement and evaluation data. The lack of comprehensive data on usage patterns and user feedback poses challenges in assessing the impact of interventions and refining strategies accordingly.

Opportunities for Technological Intervention:

These were some of the opportunities we noted for technological intervention in relation to sustainability efforts after evaluating research.

1. Development of a user-friendly mobile app or web interface to locate nearby water bottle filling stations and provide real-time information on availability and wait times.
2. Integration of gamification elements or rewards systems to incentivize sustainable behavior and encourage regular use of hydration stations.
3. Implementation of QR code-based campaigns to raise awareness and facilitate easy access to information about sustainability initiatives and resources.
4. Utilization of data analytics and machine learning algorithms to analyze usage patterns, predict demand, and optimize the placement and design of hydration facilities.

5. Collaboration with campus stakeholders and student organizations to co-create innovative solutions and foster a culture of sustainability through technology-enabled engagement strategies.
6. Condense sustainability information and make it easily accessible, possibly through the idea of a chatbot

Exploratory Research

For this project, it is crucial to use a combination of primary and secondary research to garner insights that can help us with our campaign. According to our project timeline, our goal is to conduct user interviews to get students insights on their opinions about sustainability efforts on campus, their use of hydration stations, and the convenience of plastic water bottles.

As plastic water bottle usage is a widespread issue, we can use many case studies and articles to begin to guide our research. I have summarized a few below:

Case study #1: PET Bottle Case Study¹

84% of plastic bottles will never be recycled, and bottled water holds the largest share of the global market regarding packaged water consumption. Additionally, in the United States alone, 50 billion bottles are produced annually, and 500 billion bottles are used each year worldwide. Many countries and states have attempted to enact legislation to deal with this problem. For example, Toronto implemented a law prohibiting the sale and distribution of water bottles in all the capital and public spaces. Other cities, such as Concord, Massachusetts, and San Francisco, California, extended this legislation to ban the sale of single-use bottled water in all contexts. This study was created by Elkay, the creator of the hydration stations we see all across campus.

Case Study #2: SUNY New Paltz²

SUNY New Paltz is a school in New York that signed the Second Nature's Carbon Commitment in 2008, which mandates more sustainable practices across campus. To reduce plastic usage, the campus discontinued the use of plastic bags and the sale of bottled water. To support sustainable behaviors, they installed 35 bottle filling stations, and retrofitted over 25 existing water fountains with “gooseneck” bottle fillers. They also began giving away reusable water bottles for new students on campus and began examining contracts with drink vendors on campus to reduce the

1

https://europe.elkay.com/content/dam/intleuropev2/resources/case-studies/F-4787_Case_Study_PET_Bottles.pdf

2

<https://www.newpaltz.edu/sustainability/view-programs-and-progress/beyond-plastics-initiative/case-study-from-plastic-bottles-to-aluminum-cans/>

usage of one-time use of plastic bottles. They filled the vending machines with primarily aluminum cans (especially for soda), which had the double benefit of smaller drinks, which will encourage the students to drink less soda.

Case Study #3: University of Chester Single use Plastic Reduction³

To reduce the prevalence of single-use plastic bottles sold, used, and placed in general waste disposal bins, the University of Chester installed 19 Eco-Dispenser chilled bottle filling stations across campus. These water bottle filling stations have prevented 500,000 bottles from going to landfill.

These case studies demonstrate the objective positive value of water bottle filling stations and how important it is to direct students to use them. Doing some social media mining, I was also able to find some quotes from students talking about how valuable these filling stations were:

“At my university, I only [drank] water from these fountains as well because the water taste[d] horrible. I remember when I lived on campus, I’d walk two floors down and across the building to fill my jug from a water fountain pictured above rather than drink the tap water.⁴”

Through exploratory research, we have evaluated that plastic water bottle usage is a widespread problem across universities and seen how other cities have attempted to solve it. We have also validated the need for accessible, easy-to-find water bottle filling stations. We will utilize primary research to validate our insights further as we continue the project.

Proposed solutions

Our technology will be a web-facing Application Programming Interface (API) that, based on the user’s location, will point the user to the nearest point within a given data set. The concept is parallel to AirTag functionality. For the purpose of the client, we will include default information that will point users towards the nearest water bottle filling station. This API will also allow users to input their own location dataset, so this can have broader applications and

³ <https://www.miw.co.uk/case-study-the-university-of-chester-single-use-plastic-reduction/>

⁴ https://www.reddit.com/r/ZeroWaste/comments/agpwry/i_work_at_a_school_and_theyre_starting_to_put/

user functionality. The website will also be mobile-optimized. We intend to use JavaScript Object Notation (JSON) input to organize coordinates, messages, and locations. UserAgent location API will be used for the user location, and Euclidean distance will be used to calculate the nearest coordinates.

With respect to sustainability messaging, our API will have popups with sustainability tips and information to integrate the client's message within the technology. Having this type of feature as a persistent portion to the API will ensure a spread of relevant sustainability information to users. The messaging will encourage these sustainable behaviors, and make the user feel good about using their reusable bottle. The messaging will appeal to different parts of the human psyche. For instance, we can provide them with a statistic like "If one person switches to a reusable water bottle, 217 plastic water bottles will be saved from going to a landfill⁵." We could also use the statistic "On average, every person in the US will go through 13 water bottles a month, which is almost \$30 a month spent just on buying water bottles. By investing in a high quality reusable water bottle you could save almost \$360 a year⁶." Additionally, people are more likely to be convinced to do something that everyone else is doing, so we could also include a number of how many other people have found that water fountain in the last week. The goal of the messaging is to encourage them to continue their sustainable behavior, and make them feel good about doing so.

Goals

1. Increase usage of hydration stations on campus by 20%
2. Engage 5 student developers each month to adopt the technology for various sustainability projects
3. 1200 monthly visitors to the website

Plan to Evaluate Effectiveness

⁵

https://europe.elkay.com/content/dam/intleuropev2/resources/case-studies/F-4787_Case_Study_PET_Bottles.pdf

⁶https://europe.elkay.com/content/dam/intleuropev2/resources/case-studies/F-4787_Case_Study_PET_Bottles.pdf

Using the specific, measurable objectives described above, we will also set monthly progress goals for each objective. More specifically, to evaluate our campaign's effectiveness, we will conduct user testing, track adoption rates, and conduct stakeholder interviews. When conducting usability testing, we will have students use the website to find a water bottle filling station and then evaluate the ease of use, quality of the interface, and potential pain points. We will also closely monitor the tool's adoption rate, as this aligns with one of our main goals. Finally, stakeholders at the university, such as iSEE and facilities management are an essential part of the project's success, so we will engage them in our success evaluation to ensure that they are satisfied with the adoption rates.

Additionally, a big part of the project is engaging student developers to use the API to expand the project's use cases, so to measure success, we would track usage of the API from these developers on campus.

Finally, as demonstrated from the case studies above, the impact of every water bottle filling station is so high, and there may be underutilized filling stations all across campus. One big way to evaluate effectiveness would be to see if there's increased usage of historically underutilized filling stations.

Target Audience

The primary target audience would be first- and second-year students within campus dorms. The client gave this target audience, and to help us better evaluate success, we will add more specificity to our project.

Certain residence halls on campus have fewer bottle-filling stations, so students in these residence halls would benefit more from the usage of our campaign. Residence halls such as Busey Evans, Weston, SDRP, Wassaja, and Snyder have the least bottle fillers. Other residence halls have fewer water fountains, but these are often upperclassmen housing and do not align with our target audience.

Through our user research, we will also identify which demographic groups will most likely benefit from the campaign and be able to tailor our project to them.

Our secondary target audience for the project is student developers on campus. We want the usage of our API to expand beyond just water bottle fillers, and the technology has extensive capabilities. Developers can utilize our API to create other websites to help students find the nearest trash cans or recycling bins or find some other creative way to leverage the technology.

Roll Out Plan

It is important to note that the campaign must stay within the bounds of university guidelines, considering that iSEE is directly linked with the University of Illinois. The content created for this campaign must reflect this in its language and graphics.

In the client call, iSEE mentioned that SFC and Memorial Stadium now allow empty, reusable bottles and have increased filling stations, a policy that not many people know about. Therefore, to garner the highest impact from our project, we will start the promotion and rollout of our campaign in these locations. There are large screens that file through ads before and during sports events, which is something we could consider using to our advantage via photo/video/interactive content. SFC and Memorial Stadium are not only large public venues that would attract many eyes to our campaign but are also places where many first-year students

find themselves when trying to capture that early “college experience” feeling. In order to take advantage of this, we would need to find the correct permissions and contacts; then, once that is figured out, we can focus on finding the most effective content for this location.

To target students in dorms, we will use a combination of out-of-home and guerrilla marketing. For out-of-home, we will use both physical and digital billboards in the dorms and dining halls to leverage both formats. These OOH ads could be placed in on-campus stores such as 57 North and Terabyte (specifically near the water bottle coolers). For the messaging on these ads, we could educate students about the adverse effects of single-use plastic bottles in an effort to discourage the usage of plastic bottles and switch to reusable bottles.

We will utilize more creative advertising methods for guerrilla marketing to ensure increased adoption. It is felt that this will be very effective due to the volume of conventional/physical marketing students see on the daily. By taking the extra step to implement something that would set the campaign apart, there would be an increase in uptake of the campaign’s goals.

The social media aspect of this campaign will be conducted on the Instagram account of iSEE at U of I (@sustainillinois). As of April 3, 2024, the account has 2,071 followers and is public to anyone on the app. Instagram is highly used within the campaign’s targeted age demographic, making it essential to increase awareness on iSEE platforms such as this. Seeing that the campaign will be directing people to iSEE’s services and their general sustainability initiatives, it’s vital to provide content to refer to that ties into the efforts in this campaign rollout. Therefore, a new story highlight will be created to emphasize the importance of using reusable water bottles over plastic bottles. This highlight will include a short title and a graphic consistent with existing content. Additionally, the content placed within the highlight will be multiple story graphics with links to the campaign’s program. These graphics will be informative and visually consistent with iSEE/University content to capture users’ attention and encourage action.

The Unique Selling Proposition for the product is the convenience factor. Students will be able to find hydration stations more efficiently, and will be more motivated to carry around their reusable water bottles.

Project Timeline:

Week 1: March 25 - April 1

- Client call
- Assign group roles and divide responsibilities

Week 2: April 1 - April 8

- Project proposal

Week 3: April 8 - April 15 (progress report #1)

- Design a Figma mockup of the API (due by April 10)
- Conduct user research [primary] (due by April 10)
- Conduct secondary research (due by April 10)

Week 4: April 15 - April 22

- Create a rudimentary compass as a foundation for the API
- Write sustainability tips to embed into the app
- Allow JSON input for the API
- Create custom JSON files
- Create physical and digital advertising graphics

Week 5: April 22 - April 29 (demo video + final presentation due)

- April 24th: Progress report #2 due
- Host API on Firebase or other Platform
- Put together prototype + presentation
- Present to client and film demo video

Role Descriptions

<u>Name</u>	<u>Role</u>	<u>Role Description</u>
Ayesha Baweja	Messaging/Research	<p>Determine appropriate research methods and tools to effectively capture user insights.</p> <ul style="list-style-type: none"> - Organize and lead research activities - Oversee the analysis of research data, working closely with team members to synthesize findings and identify key themes, patterns, and insights <p>Ensure technical and nontechnical parts of the project work together smoothly</p>
Himnish Jain	Full Stack Developer/Designer	<p>Designing Figma mockups:</p> <ul style="list-style-type: none"> - Employing design skills to craft visually appealing and user-friendly mockups of the API, ensuring intuitive and accessible interfaces. <p>Prototype development:</p> <ul style="list-style-type: none"> - Responsible for transforming Figma designs into functional prototypes, employing a hands-on approach to testing and refining user experiences. <p>Frontend development:</p> <ul style="list-style-type: none"> - Contributing to frontend development to create a mobile-optimized website seamlessly integrating API functionality.
Mateo Campoverde-Fordon	Front-end/Back-end Developer	<p>Focusing on implementing main functionality for API</p> <ul style="list-style-type: none"> - Primarily working with JavaScript and other web APIs (UserAgent). <p>Also works with front-end development to integrate</p>

		<p>front-end and back-end</p> <ul style="list-style-type: none"> - Possibly working with platforms such as FireBase to roll out live versions of our API
Kalika Raje	Assisting to support front and back end development	<p>Support front end development</p> <ul style="list-style-type: none"> - Support the development of the details relating to the front end where needed. This includes the figma mockups in both assisting with the design efforts as well as building the functionality to have a viable prototype. <p>Support back end development</p> <ul style="list-style-type: none"> - Will help to fill in any gaps seen with the development of the API functionality
Sydney Klesner	Messaging/User research	<p>Develop effective PR for campaign rollout</p> <ul style="list-style-type: none"> - Create social media graphics using Indesign/Canva. Create a guerilla marketing plan along with other physical and digital advertising aspects. <p>Aid in user research and data gathering</p> <ul style="list-style-type: none"> - Collect data using methods such as interviewing and surveying to hone in on our target demographic.