The Genki Ala Wai Project Website

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Abstract

This project worked in assisting the Genki Ala Wai Project nonprofit in restoring the Ala Wai Canal, a polluted central waterway in Honolulu. We were tasked with creating a website that would better advertise their goals, allow for streamlined internal operations regarding scheduling and emailing, and collect donations. For this website to be created, research on nonprofits, education, website creation, and other non-profit websites was conducted. This research resulted in a list of important features to be added to the website being determined. Interviews with our sponsors reaffirmed this research and allowed us to refine our goals and work. In addition, there were multiple iterations of researching, presenting, and receiving feedback, which resulted in us making greater progress on the website. Finally, we presented the sponsor with the final version of the website and provided recommendations for future changes.

Executive Summary

The primary goal of this IQP was to assist the Genk Ala Wai Project nonprofit by creating a new website for them. The Genki Ala Wai Project is a small organization under the Hawai'i Exemplary State Foundation working to restore the Ala Wai Canal: a major waterway in Honolulu and one of the most polluted waterways in Hawai'i. They are doing this by using "Genki Balls" and Effective Microorganisms (EM-1®) treatment. The Genki Ala Wai Project had a previously existing website, but the individual working on it left in late 2023. This meant that Genki Ala Wai could no longer update, access, or change the data and information on their website. To solve this problem a new website needed to be made, which is where our team came in.

Our team designed the website with several primary goals. We needed to streamline the process for individual citizens and sponsors to host/join events, which was accomplished by implementing a calendar linked with a form to manage sign ups and inquiries. We also needed to supply Genki Ala Wai with a way to handle donations, which was incorporated through a Squarespace asset and PayPal. Additionally, we wanted to allow the Genki Ala Wai Project to better tell the story of the canal. To do this, we created an interactive quiz to engage younger users alongside a page dedicated to the history of the canal.

Our team built the website on Squarespace. This was because Squarespace is a website hosting platform designed to allow individuals without technical backgrounds to create and update websites. By design, this would allow the project members of Genki Ala Wai to continue updating and expanding the website after our project was completed. Our new website was loosely based on Genki Ala Wai's previous website. However, through our methodology of researching, interviewing, designing, implementing and refining, we were able to create a new and unique product that met the needs of our sponsors. In our final deliverable we solved the Genki Ala Wai Project's main issue of not having an updatable website and provided them with new capabilities for handling donations and event requests. In the process, we also helped reduce time spent managing event logistics, provided a platform to better explain their mission and progress and seek help from others more easily. Furthermore, we left them with a comprehensive list of recommendations and guides for continued support of the website; something that should help Genki Ala Wai in achieving their goals by providing them the capabilities and advantages of having a customer-facing website.

Table of Contents

Table of Figures

1.0 Introduction

Figure 1. *The image above shows a Genki Ball.*

The Ala Wai canal is one of the most polluted waterways in the state of Hawai'i. It has been a depository for natural and unnatural waste for decades and has suffered compound damage from the misused surrounding watershed. The Genki Ala Wai Project is a non-profit organization established in 2019 under the Hawai'i Exemplary State Foundation. It has the goal of taking the waterway and returning it to a state where it will be both fishable and swimmable by 2026. To do so they employ bioremediation technology in the form of Genki Balls (Figure 1). Beyond this end goal, however, the project has a mission to make students, teachers, and the surrounding community more aware of the destruction and pollution of the canal and watersheds. They aim to empower all stakeholders in the Ala Wai watershed and want to involve the entire community in the restoration of the Ala Wai ecosystem. Leaders of the project hope that Genki Ala Wai may serve as an example for the good that can come out of both education and action regarding restoring and conserving natural waterways.

In their effort to facilitate education, Genki Ala Wai made a website which contains information about their project history and the results of their efforts. The website is still active, and included data up until 2022, with the most recent update to the website being made on April 25, 2023. Unfortunately, the creator of this website departed from Genki Ala Wai earlier this year. This departure and a lack of standard operating procedures left the Genki Ala Wai Project team unable to continue updating and using this website. This was an issue for a few reasons. First, the inability to continue publishing new data to their website meant individuals stumbling upon the Genki Ala Wai Project, or individuals checking back in on the progress of the project were unable to see any improvements. This could falsely lead people to believe that progress has stopped and impact interest in the project. Additionally, it caused an increased number of questions a website could answer to be redirected to project members, taking up valuable time and resources. As a result, our project team has been tasked with creating a new website for the project that both meets their desired requirements and can be utilized and updated after our project is completed.

Our mission was to create a new, engaging website that makes teachers, students, and the overall community more aware of the Genki Ala Wai Project, and encourages collaboration in restoring the Ala Wai canal ecosystem. We aimed to design and develop a solution that exceeded the desires of our sponsor and remained a resource after our time in Hawai'i. To do so, our website had to achieve several objectives:

1. Tell the Genki Ala Wai Project and Ala Wai watershed's story and history.
2. Display the current and previous data to the community.
3. Portray the capabilities and benefits of watershed conservation.

4. Encourage and facilitate individual donations to the project to further their goal.

To create a product that met these goals, several steps needed to be taken. First, we had to go through the existing website and establish with what content we would be working. Then, we would have to understand Genki Ala Wai's involvement and interaction with the community, and their position as a non-profit conservation project. Finally, we would research the history of the Genki Ala Wai Project, the Ala Wai canal and watershed, informal education, educational websites, and how school-age children learn best. This was done to better understand how we may facilitate interaction between school communities and Genki Ala Wai. Finally, how conservation interacts with digital technologies and the fundamentals of website design will be explored to ensure our website optimizes the delivery of our research.

2.0 The Genki Ala Wai Project

The Ala Wai Canal is an artificial waterway in Honolulu, Hawai'i. The Canal was started in 1921 and finished in 1928 and is approximately 2.4km long. Its original purpose was to drain rice paddies for land reclamation and flood mitigation. The water of the canal was once clean enough to support fishing, swimming, and other recreational activities in its waters. The Genki Ala Wai Project is a non-profit project that aims to clean the canal so it can be swimmable and fishable by 2026.

2.0.1 Origin of the Genki Ala Wai Project

The use of effective microorganisms (EM) was first conceptualized in 2006 when 48 million gallons of sewage was diverted into the canal to avoid a worse flooding disaster. This

event solidified the infamous reputation of the canal for being one of the most polluted waterways in Hawai'i. However, the Genki Ala Wai Project would not start until 2019, when the Genki Ala Wai project members met with Dr. Ken Kaneshiro and signed an MOU (Memorandum of Understanding) to be part of the nonprofit HESF (Hawaii Exemplary State Foundations) and his vision to restore the Ala Wai Watershed on March 19. Three students from Punahou High School visited The Genki Ala Wai Project's EM Hawaii LLC shop and learned about the Genki Ball restoration method from the Osaka Fishermen Cooperative. During their sophomore year of High School, these students entered the "Make the Ala Wai Awesome Challenge" in 2017. Their project was not selected, but Master Navigator Nainoa Thompson invited them to toss the Genki Balls off the Hokulea with David Ige, the former Governor of Hawaii. This Toss was part of the Ceremonial Toss at the end of the Mahalo Sail, where the Hokulea was docked facing the Hawai'i Convention Center Promenade, on April 19, 2019, for Genki Ala Wai's official start. (Hiromichi Nago, President of EM Hawaii LLC, 1/11/2024)

Over the last 100 years pesticides, heavy metals, mud, trash, organic debris, and other pollutants, from some urban areas, have found their way into the canal. The Genki Ala Wai Project identified sludge as the main problem the canal faces. Sludge is an organic material that has rotted and compiled due to a lack of oxygen, and after a century of unchecked pollution, upwards of twenty inches of sludge had accumulated in the Ala Wai. In addition, putrefactive bacteria decomposed the sludge producing methane, ammonia, and hydrogen sulfide. These gases were and are harmful to the canal and surrounding ecosystems.

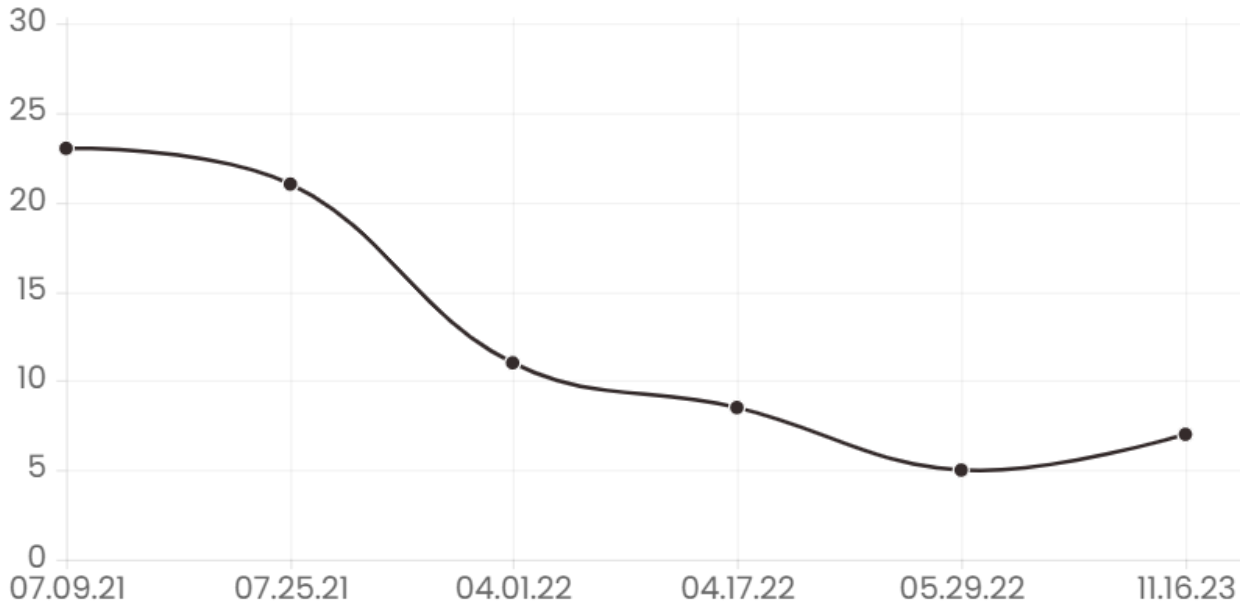


Figure 2. Inches of sludge measured at the Jefferson Elementary testing site at different testing dates.

2.0.2 Current Progress of the Genki Ala Wai Project

This Genki Ala Wai Project saw significant results within just a few weeks of their start. The original website has a varying collection of data from different times. As seen in Figure 2, measurements of the sludge primarily began after the COVID-19 pandemic, as Genki Ball tosses couldn't occur during it. However, a photo timeline highlighted differences between the appearance of the canal between first toss on November 27th, 2019, and 2021, Where no sand was visible in the canal in 2019, schools of native ama' ama (mullets), ahole'hole (mountain bass), and weke (goat fish) were found feeding in the canal by 2021. The Genki Ala Wai Project is currently collecting data at the Jefferson Elementary School, the Ala Wai Elementary School, by the Hawai'i State Department of Health, and by the Country of Honolulu's Water Quality Lab. The students of both these schools are involved in the project: the Jefferson Elementary School introduced Genki Balls in November 2019 and Ala Wai Elementary School had Genki

Balls for the first time in December 2019. Jefferson Elementary School is near one of the ends of the canal, whereas the Ala Wai Elementary School is closer to the middle of the canal.

The enterococci numbers, bacterial indicators that can be used to test if fecal material is in the water, are high near Jefferson Elementary and around the same near Ala Wai Elementary. But since 2019, the numbers have gone from 697 colony-forming units (cfu) to 46 cfu near Jefferson. Unfortunately, the numbers have risen and then declined a bit for Ala Wai Elementary during heavy rainfalls as it is close to the streams. These testing sites also test for oxygen because the dissolved oxygen readings in a waterway indicate water productivity. Higher levels mean a waterway is healthier, while lower levels mean the opposite. Jefferson Elementary has an oxygen level of 69.8% and Ala Wai has an oxygen level of 135%. This indicates organisms producing pure oxygen that could measure over 100% atmospheric oxygen levels. In addition, sludge levels decreased from 23 inches to 3 inches at the Jefferson Elementary site, indicating their efforts have been proactive in getting rid of the sludge (*Genki Ala Wai Project*, n.d.).

2.0.3 Supporters of the Project

Genki Ala Wai works with several partners, all of which are credited on their website. On the current Genki Ala Wai website there is a section where students and teachers can watch a video about Genki Balls and the schools can coordinate having an event where their students toss Genki Balls into the canal. They also show some past events with certain schools. The staff and children of Jefferson and Ala Wai Elementaries have supported the Genki Ala Wai Project. Many other schools have also helped with cleansing the canal like Aliamanu Middle School, Nu ʻ Uanu Elementary, and SEEQS Charter School (Genki Ala Wai Project,

n.d.).Outside of local schools, Genki Ala Wai also has active partnerships with local hotels. These hotels include Hilton Hotels & Resorts, Marriott International Inc., Ohana Waikiki East Hotel, Outrigger Resorts & Hotels, and the Ritz-Carlton Residences. These hotels help fund testing and Genki Ball Toss events. Additionally, Genki Ala Wai has received substantial financial donations from international companies such as Hawaiian Airlines, Girl Scouts of the USA, Starbucks, and Verizon. Finally, Genki Ala Wai has even partnered with international exchange programs and has had international students participate in making and throwing Genki Balls.

Figure 3. *The image above shows a Genki Ball making event.*

2.0.4 Genki Balls and the Science Behind Genki Ala Wai

Effective Microorganisms® or EM, were developed by Dr. Teruo Higa, who is a professor of horticulture at Ryukyus University in Okinawa, Japan. (Higa, 1994) The Doctor

discovered the EM by accident because he had pesticide poisoning and wanted to research a natural, regenerative method for crop cultivation. EM stands for Effective Microorganisms, which are found in the natural environment. EM•1® is mostly made of lactic acid bacteria, yeast, and phototropic bacteria. Lactic acid and yeast are fermentative bacteria and help eat the sludge out of the canal. Phototrophic bacteria are the bacteria that help get rid of harmful gases. The safety level of EM, Effective Microorganisms, level 1, which means that they are used in food production and are not known to cause diseases and problems in humans. Genki Balls are the size of a tennis ball, which contain clay soil, rice bran, molasses, water and EM•1® solution (*Genki Ala Wai Project*, n.d.).

2.1 The Genki Ala Wai Project, A Nonprofit Organization

While the Genki Ala Wai Project is a non-profit group that holds a societal mission to "empower students, teachers, and the community to work together to restore the Ala Wai ecosystem," (Genki Ala Wai Project, 2023), the highlighted community serves two important purposes. As a non-profit group, the Genki Ala Wai Project relies on the support of their surrounding community not only for participation and the advancement of their mission, but also in the form of monetary donations to help support the project's efforts. Likewise, the local government and federal funding all play key roles in the ability to advance the project.

2.1.1 Similar Project Work – Japan Travel Agency (JTB)

The JTB has been utilizing tourism and merchandising to help regenerate communities. One of those communities the JTB has helped restore is the Otaru Canal in Hokkaido, which inspired the cleanup of the Ala Wai Canal in Honolulu, Hawai'i. (Putra et al., 2022). Some Pollution

Problems to Consider the Design for Remediation. In *Design of Materials and Technologies for Environmental Remediation* (pp. 33-78). Singapore: Springer Nature Singapore.) The Otaru canal used to be a docking place for merchant ships and was slightly abandoned when larger ships moved to docking in other facilities that were larger than the Otaru canal. The canal was at risk of becoming a landfill, so the locals in Hokkaido created a movement to preserve the Otaru canal. The communities' movement caused a lot of positive changes, which resulted in gas lights being added along the perimeter of the canal and the surrounding buildings to be transformed into restaurants, shops, museums, etc. The Otaru Canal is now one of the most popular spots for sight-seeing in Hokkaido because of the communities' hard work protecting its waterways.

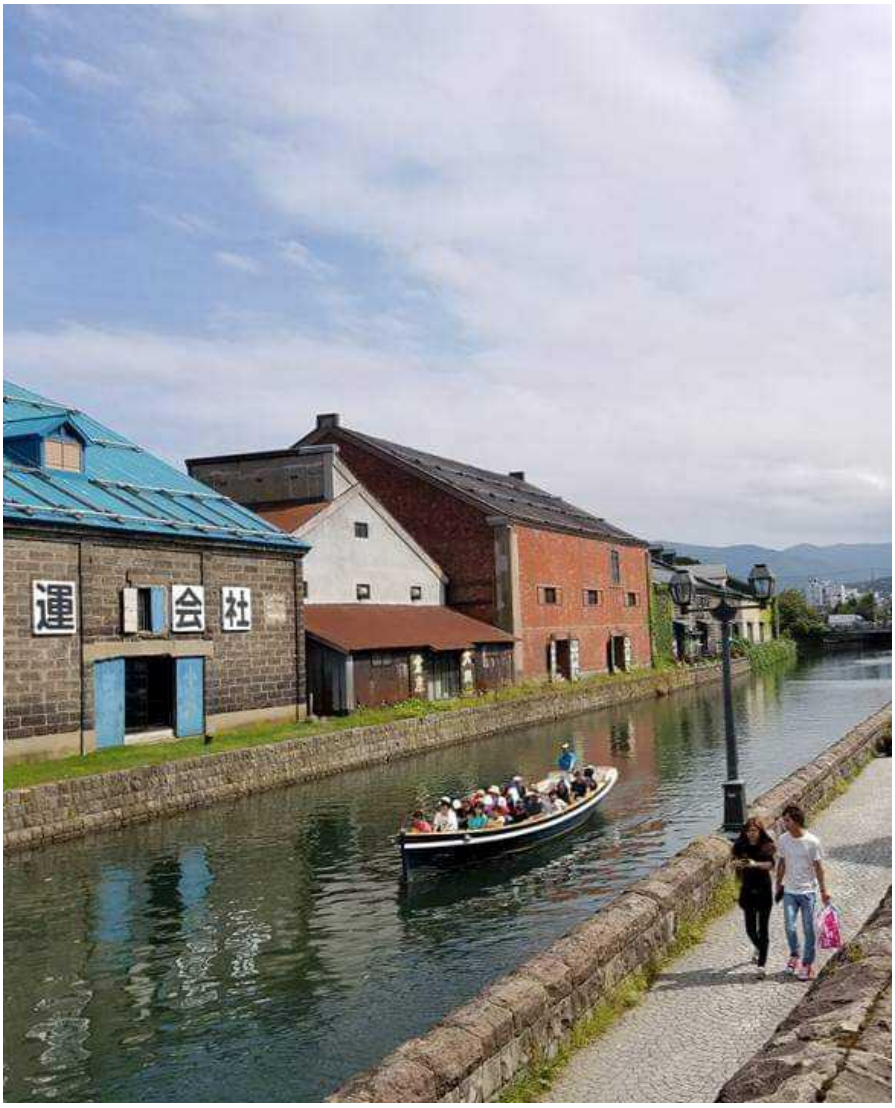


Figure 4. *The image above shows the Otaru Canal in 2018.*

2.1.2 The Role of the Individual

For The Genki Ala Wai Project, and several nonprofits around the world alike, funding is the most important part of their operation. Climate-based nonprofits often perform significant roles in their local community, and "to perform these roles in society, charities generally rely on donations from the public" (Freeling, 2022). While Hiro Nago of The Genki Ala Wai Project

acknowledged in our team's initial interview that public support was strong, funding often dictated the future. It is the role of the individual to see that "nonprofit organizations are critical actors in the sustainable development goals as they provide a wide range of social services to the community and contribute to creating a sustainable future" (Nordin, 2022).

2.1.3 The Role of Nonprofits

As stated by Freeling et al (2022, n.p.), "when it comes to climate solutions, non-profit organizations have a vital role to play." Nonprofit, climate-based organizations have a strong propensity for advancing research into lesser-known fields, and The Genki Ala Wai Project is no exception. Their role in Hawai'i is one of a trusted advisor, taking charge of using innovative bioremediation technology to clean the Ala Wai Canal in Waikiki. As best summarized by Freeling et al (2022, n.p.), "these charities further climate research and policy by funding research into new technologies, developing mitigation strategies, and educating the public, particularly important roles." However, as noted by Hiro Nago of The Genki Ala Wai Project in our team's initial interview, progress moves at the will of funding, especially in terms of taking measurements on the true effects their bioremediation technology has had on the canal. "For climate charities to maximize their impact, it is critical to understand what motivates people to engage with them" (Freeling, 2022, n.p.) and secure future funding to continue ongoing missions, especially for The Genki Ala Wai Project.

2.1.4 Governments and Non-Profits

In a historical sense, the role of the government and the role of nonprofits have been largely separate, with nonprofits often fitting into a hole where the government was seen as absent.

However, “the government and nonprofit sectors have become increasingly intertwined and interdependent in recent years” (Nikolic, 2008, n.p.). This has been especially prevalent in the sector of environmental management, where several local, state, and federal agencies, including the United States Environmental Protection Agency, have found nonprofit organizations to take on their management plans. While “impacts [from federal intervention on nonprofits] are typically seen as negative” (Nikolic, 2008, n.p.), government agencies view these collaborations as positive. This is because actions and intentions from governments are often met with opposition, while similar actions from nonprofits often face little public backlash. Therefore, to policy makers, providing direct assistance to nonprofits is a viable alternative to circumvent certain regulations.

2.1.5 Advancing Government Missions Through Nonprofits

Currently, The Genki Ala Wai Project operates under the Hawai'i Exemplary State Foundation. This foundation combines the work of the Center for Conservation Research & Training, the Center for Island, Maritime, and Extreme Environmental Security, and the Hawai'i State Civil Defense. Each of these organizations conducts a branch of research under the University of Hawai’i, a public, state-funded university system. The Hawai’i Exemplary State Foundation was created as “a statewide effort in which K-12 schools in their respective ahupua’a communities participate in place-based STEM collaborations in which teachers, students, Hawaiian cultural experts, researchers, engineers, technologists and resource managers are engaged in research activities that will contribute to Hawai'i’s scientific knowledge base about the current state of biodiversity, climate and environmental human health” (The Hawai'i Exemplary State Foundation, 2023, n.p.).

2.1.6 Nonprofits as the Facilitator

With a clear-stated mission from The Hawai'i Exemplary State Foundation, The Genki Ala Wai Project is acting as the Hawaiian government's facilitator for the bioremediation of the Ala Wai Canal. During our meeting with several team members of The Genki Ala Wai Project, a certain story of note was brought to our attention. To make a proposal for federal funding to the Army Corps of Engineers, the Genki Ala Wai Project offered several points of evidence to support their project. However, in response, federal funding was given to a similar, adjacent project. The reason supplied to the team members at the Genki Ala Wai Project was that the bioremediation technology proposed was not eligible for federal support. However, an adjacent project to remove an invasive tree species from drainage areas of the Ala Wai Canal would still help their mission. This interdependence, as well as a slight circumvention of regulations, and "the increasing role of nonprofits and other nongovernmental organizations in public policy has been described as a fundamental feature of modern government" (Nikolic, 2008, n.p.) that is likely to stay for many years to come.

2.2 Impacts on Local Biodiversity

The Ala Wai Watershed is home to many species of fish, snails, worms, insects and crustaceans, several of which are candidates for being endangered. Unfortunately, the Ala Wai Watershed has been invaded by several alien and invasive species from trees that exacerbate the already hazardous storm damage, catfish that threaten the balance of the food chain and land animals that pollute and erode the forests. While there has been well thought out plans developed

to combat these issues, and keep several species from becoming endangered, problems continue to persist instead of being treated as a meaningful hazard.

2.2.1 Ala Wai Watershed Invasive Species and Damage

The Ala Wai Canal is “home” to several invasive species. In terms of vegetation, the Albizia trees are worth noting as they create a very dense tree line. In the water, catfish have become one of the most common fish. Even on land, feral pigs have entered the surrounding area and claimed their place among the many invasive species in the Ala Wai Canal and surrounding area.

Unfortunately, the prevalence of invasive species poses a serious risk to the Ala Wai Canal. Although increased biodiversity may not seem alarming, non-native species being placed into an environment they have not adapted to through evolution can have meaningful consequences. For example: non-native vegetation typically causes more runoff, polluting water with unnecessary sediment, additional trees lead to more storm damage, feral pigs have polluted waters with excess bacteria and degrade the forest, and invasive fish (particularly catfish) are known to disrupt the finely tuned balance of an environment's ecosystem. In the case of the catfish, they have surpassed the native ‘o‘opu fish (Hawaiian freshwater goby) among others, disrupting the balance of the food chain.

2.2.2 Alien Species Alternatives

There is a current effort to remove catfish from the water by hand because of the severity of the situation they cause.[1] Despite the current state of forests, there are currently no large-scale funded efforts being made to combat the invasive pigs, insects, and other invasive animals that inhabit the forests. The Hawai'i Invasive Species Council (HISC) released a plan to minimize the impact of invasive trees, but this plan has not been followed through.[2] It is a comprehensive plan, involving physical, chemical, and biological treatment to return the forests safely and successfully to their previous state while minimizing damage caused by storms.

2.3 Informal Education and its Importance

Informal education is extremely important to the Genki Ala Wai Project because of the need to make more schools and students aware of the pollution problems with the Ala Wai Watershed. Informal education is education that occurs outside of schooling. This would include all educational sites aimed at people not in school. For example, ABC mouse is aimed at young children. There are different types of non-formal education but one of the specific types is personal development activities, such as organizations promoting music, sports, etc. Non-formal education helps people gain soft and life skills, such as helping with one's communication either in a professional setting or non-professional setting.

2.3.1 *Educational Websites*

[1] *12/08/21-native forests help protect Ala Wai from flooding*. 12/08/21-NATIVE FORESTS HELP PROTECT ALA WAI FROM FLOODING. (n.d.-b). https://dlnr.hawaii.gov/blog/2021/12/08/nr21-224/

[2] Department of Land and Natural Resource, https://dlnr.hawaii.gov/blog/2021/12/08/nr21-224/

Educational websites are especially important for students to seek knowledge outside of school. Some of these websites can help students and adults further their learning and education on topics of their interests *(Miller, 2023)*. There are some components of educational websites that are helpful; however, these components can be easily mucked up and make the student's learning experience complicated and confusing. One of these components is the navigation aspect of the website. Some ways to fix navigation issues are to have a search bar, add many concise descriptions, and to ensure accessibility of relative links. The website should remain simple and have correct information that is updated regularly to provide current information to the users. There should also be a lot of visuals on the website, the use of graphs and pictures help the user stay engaged on the website, whereas if the website had no pictures and just text the user would not be able to process the text as fast as the visuals. *(Tips for Creating Great Digital Content for Kids, 2013)* For accessibility, the website should be able to be presentable on mobile phones, iPads, Tablets, etc. This enables every user to be able to access the website whenever they need regardless with what device they have. *(Calvert, 2008)*

2.3.2 Content

The website should have relevant information to its topic. For example, the team's website would include canal sludge data from the Ala Wai Canal, along with any other data the Sponsor wants included. If any data is to be displayed, it needs to be in an easy-to-understand way because the community might not understand the science behind the data. Visuals of the topic should be included to bring awareness to the community about said topic. Next some textual information on the topic should be added to the website so the community can have another way of understanding the data and visuals. Additionally, there should be an interactive aspect of the

website. The interactive aspect should be geared more towards children but should also be able to be used by adults. Something like videos and quizzes that will help teach the website viewers about the topic. This will help make an informative and interactive educational aspect of a website.

2.3.3 Engagement

To keep the users engaged, there should be many visuals and less text. This is because people can process images/visuals a lot faster than they can process paragraphs of text. They also tend to remember a high percentage of what they see instead of a very low percentage of what they would read. Another aspect of a website that could help engage users are interactive games or quizzes to test their knowledge of the specific topic. *(Team, 2023) (Designing Websites for Kids, n.d.)*

2.3.4 Information, Educational Games & Videos Geared Towards Children

All the information on a children's website should be very simple and straight forward. The information should be delivered in a way that is fun and exciting, this includes interesting/immersive stories and games. Some examples include interactive and educational games and videos. *(Designing Websites for Kids, n.d.)*

The games' main purpose is to educate and entertain the young users. These games should engage the children and help develop problem solving, critical thinking, and decision-making skills. Some examples of productive educational games include puzzles, drawing, action/adventure, cross word, etc. *(Effects of Game-Based Learning on Students' Critical thinking: A Meta-Analysis – Weijie Mao, Yunhuo Cui, Ming M. Chiu, Hoa Lei, 2022, n.d.)*

Educational videos help keep kids interested and hold their focus on the topic they are studying/learning about. The videos should be short and on topic. There should be multiple audio and visual aspects to convey explanations and keep them engaged. Another aspect of educational videos is an interactive element. This could be a spoken and written question the child could answer by clicking the answer on their screen. An interactive aspect like this would help keep the child engaged, so they could further develop their soft skills and their learning (*Designing Websites for Kids, n.d.*).

2.4 Digital Conservation

Digital technologies such as the internet and its associated information and communication systems have allowed for data to be processed, spread, and consumed at a greater scale than ever previously recorded. Where new networks have been created from this increased connectivity, new communication and governance models are also needed. One such context that has been influenced by the rise of digital technologies is environmental protection and conservation. Technology provides conservation efforts with the ability to gather and present greater amounts of data, visualize data, and present those visualizations, and improve access and general connectivity to their resources. The Global Biodiversity Information Facility provided access to over 500 million records on almost 1.5 million species at the beginning of June 2015. In just over 40 days, a 2014 Greendex survey on sustainable consumption received around a thousand responses in each of the 18 focal countries it was looking at. Platforms such as Open Air Laboratories and eBird connect not just scientists, but regular people in a community documenting flora and fauna (Arts, 2015). As a result, digital technologies have an increasing

capacity to influence public perception and engagement with conservation efforts, such as Genki Ala Wai.

In relation to conservation efforts and Genki Ala Wai, education provides a unique approach to reducing human-caused environmental harm. Environmental awareness creates an understanding of how our actions impact our surroundings. Education about environmental awareness encourages more eco-friendly practices and results in greater eco-awareness in informed individuals. As detailed previously, a direct result of the capacity for digital technologies to be accessed from a range of devices and places is an increase in flexibility and accessibility. When designed properly, online resources can have a significant impact on educating people about conservation. The aspects of knowledge, awareness, attitude, skills, and participation are all crucial for designing a website that effectively teaches conservation education (Leksono, Marianingsih, Ilman, Maryani, 2021).

2.4.1 Website Design

In the context for Genki Ala Wai, our project team alongside the sponsors opted to utilize a website provider service rather than creating a handmade HTML product. This was done to address the scope and time frame of our project alongside establishing a system future employee working with the website can easily build on. Core functionalities of the final deliverable include the presentation of current and past information and data about the Genki Ala Wai Project and watershed, information about the capabilities and benefits of watershed conservation projects, and the capability to handle donations. As a result, the website design must be flexible in its capabilities and design.

2.4.1.1 Squarespace

Of the potential website providers, the Squarespace platform has been chosen for its capabilities to build complex yet manageable and scalable websites. Squarespace combines web hosting and content management, provides constant updates for security and reliability, analytics regarding web traffic, and built-in transaction management systems. Because every website hosted through Squarespace runs on the same content management system, functionality remains consistent across webpages and pricing plans, allowing for a continuously updating platform. Squarespace boasts both pre-made templates and customization capabilities, and if desired can support custom-made web-language aspects. However, Squarespace does come with a monthly expense that follows a tiering system across several different functionalities and becomes reduced if purchased annually (Martin, 2017). A business plan for Squarespace is $23 a month when purchased annually, or $276. However, this is the cheapest option that allows for donation handling: something identified as a key goal of this project.

2.4.1.2 UX Design for Effective Human-Computer Interaction

Human computer interaction (HCI) is a field dedicated to improving human interaction with technology. The goal of effective user interface and user interaction design is to create a product that is easy to learn and use. Efficient user interaction (UI) design helps in influencing consumer perception and engagement and ensures accessibility in final products. In relation to this project, effective UI design will aim to ensure the principles and deliverables previously established are completed in a successful way. Data visualization and interactive media should be designed with engagement at the forefront. Furthermore, the target audience should influence the design and presentation of information, with designs catered to short-term memory typically being the most effective. Efficient user experience (UX) design dictates that what grabs people's

attention is a great experience. Throughout creating the website for Genki Ala Wai, feedback on the user experience will be necessary to continue improving the final product. With the full intent of digital conservation being to educate and encompass the previously noted aspects, proper attention to UX design is necessary (Siricharoen, 2023).

2.4.2 Similar Project Websites

To determine sources of inspiration for designing our webpage, we looked at an informal collection of webpages dedicated to conservation projects of similar sizes to Genki Ala Wai. These websites were for projects occurring in towns throughout the state of Maine (Maine Coast Heritage Trust, 2023; Chewonki, 2022; Falmouth Land Trust, 2023), and due to the geographic and purpose differences between them and Genki Ala Wai, the main takeaways were kept to where and how content was presented. In addition to these similar-sized projects, the National Park Service's websites were also used as a reference (National Park Service, 2024). Some main takeaways we determined from this research were as follows. With one of our deliverables including implementing a system to accept donations, the presence of a dedicated donation link in the top header for the webpage and occasionally on the home page was noted. Also, the front page tended to contain a lot of information. In correlation with good UX practices, the first information displayed to an individual visiting a project webpage should be immediately relevant and grab attention. Geographic information about project location and integrated features for contacting project coordinators were two additional observed assets that could be added to our final product to encourage involvement from website visitors. Finally, differences in how information was presented, specifically either heavy emphasis on images or graphic data

breaking up substantial amounts of text or the notable lack of interactive media gives insight into how different approaches may be taken for our final deliverable.

3.0 Methodology

This project seemed, at first, to be very broad in scope and scale. However, through consistent dialogue with our sponsors and some team-wide brainstorming, we established a mission statement for our efforts: Create a website that fosters interaction from students, teachers, and the local community while also spreading awareness about the toxicity of the Ala Wai Canal. To best achieve this mission, we utilized an iterative approach that was easily repeatable, clearly defined, and readily understandable. This process followed the path of:

Step 1). Research

Step 2). Interview

Step 3). Design

Step 4). Implement

Step 5). Refine

By following these five steps, we were able to clearly establish a chain of command within our website design process and easily identify bottlenecks of information or design. Further, this system also assisted our team in delegating tasks and goals within our workflow process.

3.1 Research

To ensure that our team was not underprepared during the latter stages of our project work, we chose to independently research topics for background research. Research topics included learning about the Genki Ala Wai Project itself, as well as the history of the Ala Wai Canal and its surrounding watershed, the business plan of nonprofits and how they interact with the community and government, informal education and digital content engagement for children, and digital conservation and user-interface design. By having our team conduct research on such a varied range of topics, we enabled ourselves to step into the next phase of our project work with a holistic understanding of what the Genki Ala Wai Project could entail and ensure we did not miss the finer details.

3.2 Interview

After performing our initial research for this project, we followed our process to conduct our first interview with the team from the Genki Ala Wai Project. To ensure we did not leave information on the table, we found it helpful to brainstorm possible questions for this initial interview about the Genki Ala Wai Project, its' team members, and the surrounding area's culture and history to allow our team to get a full-scale view of the work ahead. Our interview was conducted via Zoom and attended by Hiro Nago, Technical Advisor of the Genki Ala Wai Project, Dr. Kenneth Kaneshiro, President of the Hawaii Exemplary State Foundation, and Sean Nathan, Website Manager; our team was able to ask several pointed questions regarding their

desires for the project. Topics discussed during the meeting ranged from project-specific details i.e., “what goes into making Genki Balls?”, to further environmental issues affecting the surrounding ecosystem. Out of this discussion, our team was able to develop five key objectives for our project:

Objective 1: Create a website that meets the needs of our sponsor.

Objective 2: Create an individualized donation mechanism for the website.

Objective 3: Tell the story of the Genki Ala Wai Project and the Ala Wai Watershed’s history effectively through the website.

Objective 4: Effectively display applicable data for the community to see.

Objective 5: Effectively portray the capabilities and benefits of watershed conservation through the Genki Ala Wai Project.

In developing these objectives, we sought to create easily distinguishable benchmarks for creating the new website. Also, each of the aforementioned objectives allowed us to build the next off the success of the previous one. What this means is that the completion of one objective allowed us to further develop the next objective, and so on, eventually leading us to the completion of Objective 1 and the implementation of our final deliverable.

3.3 Design

Fresh from the initial meeting with our sponsors, our team was able to begin making several creative designs that would lead us along in the development of the new website. The first decision our team made was to use Squarespace as the website provider for this project. We believed, due to their numerous technical resources and informative guides for website design, that Squarespace would provide the best platform to deliver our objectives. As for the website itself, our initial meeting with our sponsor yielded the information that the new website was truly a blank slate. This allowed our team to think big about our vision for the final product, while remaining true to the website's content and its intended mission. This part of the design process, however, often required our team to ask ourselves one question: Is this content new or carried over? If the content was carried over from the Genki Ala Wai Project's previous website, we wanted to respect the sponsor by keeping the content the same, but only change the format to fit the new website's design. If the content was new, then our team truly had a metaphorical "blank slate" to design the new concept. By asking this question of ourselves, we were able to streamline our design process for the new website, with each team member choosing a page to carry over and reformat to the new design scheme, as well as one page to design from scratch and use their imagination for. Once these creative decisions had been made, we allowed ourselves to move on to the next step in the process.

3.4 Implement

After brainstorming the design-related questions on each part of the new website, we began implementing the new design creatively and effectively within the new website. As our

team carried out this step, we wanted to ensure that each piece of the project fit cohesively within our overall design scheme. At the same time, we also wanted each piece to maintain its independence as a singular piece of the overall objectives we had aimed to complete. By creating each aspect of the website to these parameters, we allowed for each piece of both new and carried over content to speak for itself, as well as inform the viewer on the greater picture we sought to deliver. It was at this stage of our process, too, that we would conduct all of our final formatting efforts to make sure that the entire new website stayed consistent. With a consistent website, we would enable the viewer to easily navigate, discover, and interact with our finished product.

3.5 Refine

Our team believed this stage of our process to be our most important, and certainly our most informative. During the final step of our team's process, we would conduct an interactive presentation of the website as it had been currently designed. During this presentation, we would showcase all the included features, highlight some of the problem areas where we desired feedback, and discuss what was to be completed next, as we would begin our process anew for the next piece of content for the project. Through these meetings, we would receive necessary feedback and input from the Genki Ala Wai Project team about their likes, dislikes, suggestions, and any further requests for building upon what had been presented. After receiving all the feedback, our team would begin a thorough redrafting process for each highlighted area for improvement. While these suggestions often were very small in the overall scheme i.e. "Could

you please increase the font size?", they were important and relevant pieces of feedback that ultimately influenced the design of future content for the website. On several occasions, however, the feedback our team received required us to repeat our full five-step process again to reach the sponsor's desired outcome.

3.6 Adjusting our Process to Scale

Our team's five-step process greatly influenced and guided every step of our website design project. What we found to be especially useful in developing this process was its scalability, meaning that we could apply it to a variety of steps along our overall project. While this procedure was the overall step-by-step guide, we could also easily scale this process to apply it to a specific piece of content. This enabled us to use our techniques to intently focus on some of the sponsors' most crucial aspirations for the project, and ensure we delivered them to the highest possible degree. Furthermore, our team followed this process on a week-by-week basis as well. Our project work on this cycle would begin, in earnest, on Thursdays, when our team would begin our research for the projects' upcoming steps. On Fridays, when needed, we would conduct one-on-one interviews with key members of the Genki Ala Wai Project team. These interviews were specific and strategic in nature, as they often involved the team member(s) who would be most directly affected by the implementation of a new feature for the website. Design would follow shortly after, with us implementing the new pieces of content on Mondays for our Tuesday Sponsor meetings. After these meetings, we would begin our fifth step, Refine, and work to begin the process anew for the following week.

Through this process of researching, interviewing, designing, implementing, and refining we created a functional website with many engaging features. A substantial part of our process was refining, and that step was what defined our deliverable and results.

4.0 Results

Following a collection of meetings to identify the key needs of the website, we began our work by migrating as much information from Genki Ala Wai's previous website as we could. This included static information such as the history of the canal, basic information about Genki Balls and EM, and a project statement. During this starting phase, the layout of the website was identical to the previous one with both our pages and headers being replicas of the original. As we formed a clearer concept of the website, its contents, and appearance, we were able to dedicate more time to making the various pages flow together as seamlessly as possible.

Updated Website	Previous Website

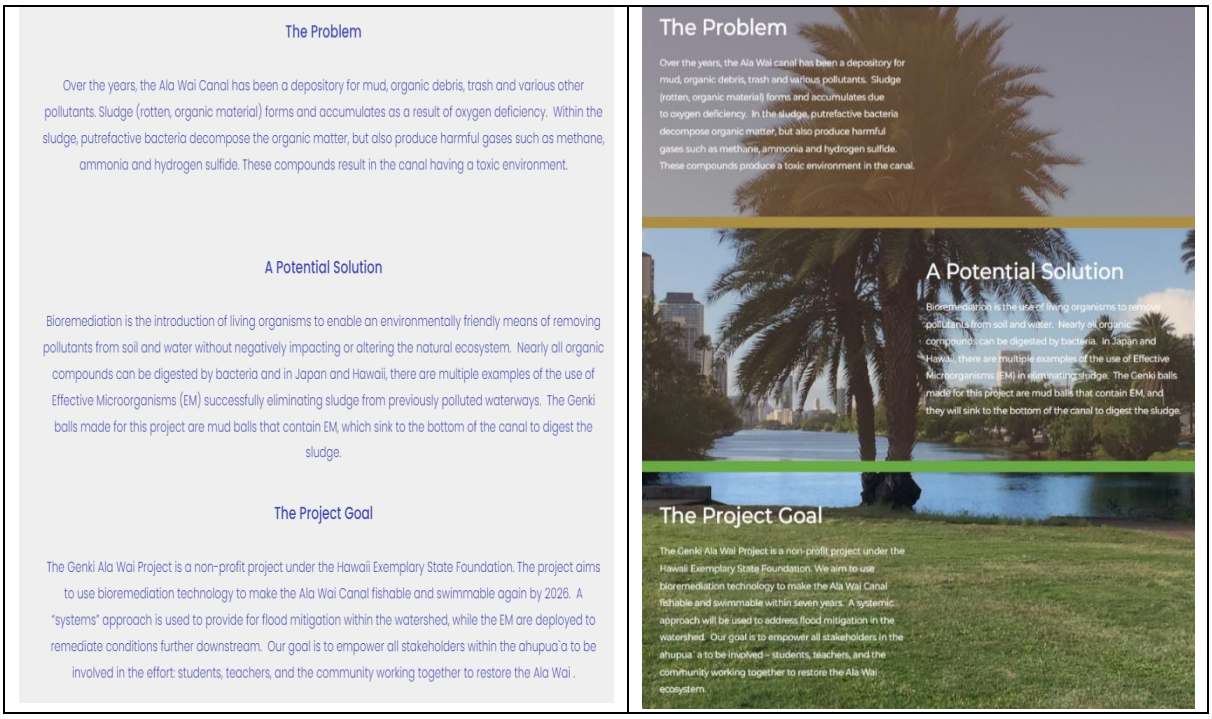


Figure 5. A before-and-after comparison of copied-over material.

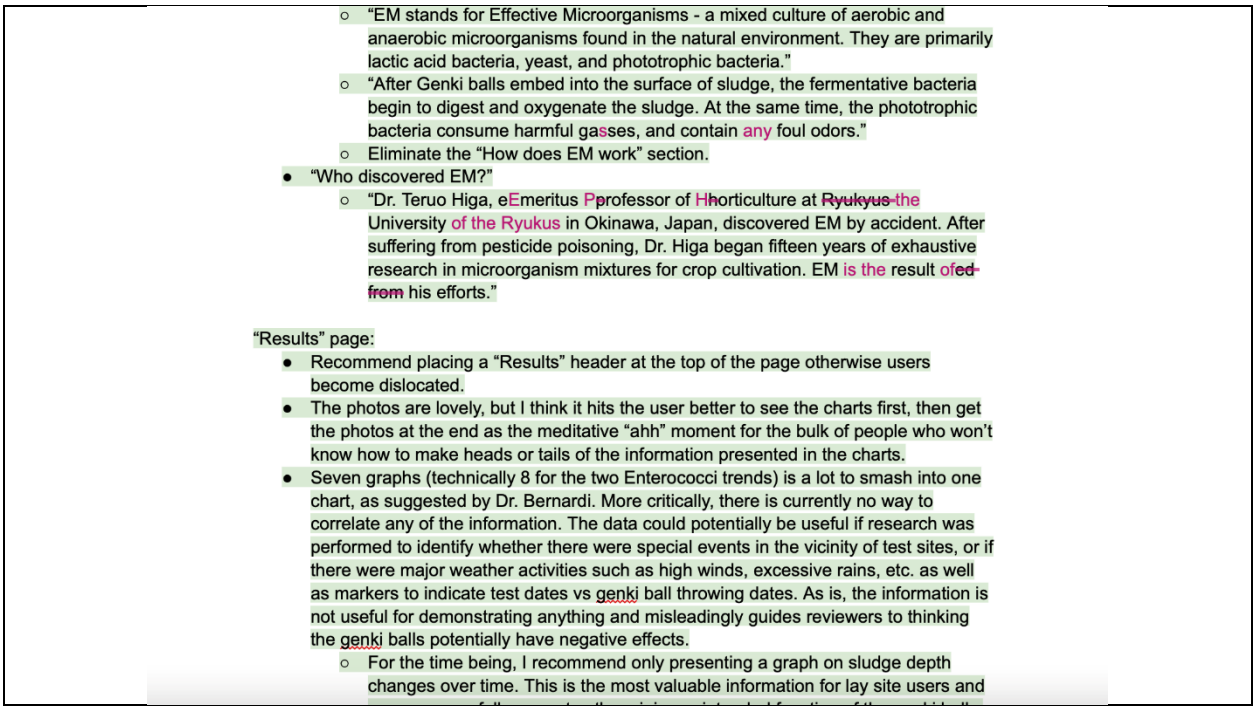
Upon finishing the transfer and organization of the information we did not expect to alter, we moved onto inserting placeholders for the more interactive features of the website. We were on a free trial of Squarespace and were not yet able to add interactive calendars, functioning donation buttons, or mailing lists at this point. While we worked on upgrading our Squarespace plan to one which could support those features, we inserted blank calendars, donation buttons, and a mockup email prompt to sign up for the mailing list. This worked as a great place holder for presenting the website to the Genki Ala Wai team, and to keep track of where features would reside.

After the process of inserting the "dummy versions" of the previously mentioned paid features was completed, we were unable to directly continue. As a result, we sought out a

meeting with our sponsors to get feedback on what we had created and access a paid Squarespace subscription to continue building the website.

4.1 Results I – The Initial Feedback

After implementing changes to the website based on the feedback we received, we presented an updated version of the website to the Genki Ala Wai Project Team again. The main team member present at this meeting was Sean Nathan, who serves as project's Website Manager; he supplied us with instructive feedback and changes to make in a Google document. Many of the proposed changes concentrated on the website's content and included editing the "Home" page along with the following pages: "About Genki Ala Wai," the "Results," the "The Ala Wai Canal," the "Partners," the "Events Calendar," the "FAQs," and the "Our Team & Mission" pages.



- "EM stands for Effective Microorganisms - a mixed culture of aerobic and anaerobic microorganisms found in the natural environment. They are primarily lactic acid bacteria, yeast, and phototrophic bacteria."
- "After Genki balls embed into the surface of sludge, the fermentative bacteria begin to digest and oxygenate the sludge. At the same time, the phototrophic bacteria consume harmful gasses, and contain any foul odors."
- Eliminate the "How does EM work" section.

- "Who discovered EM?"
  - "Dr. Teruo Higa, eEmeritus Pprofessor of Hhorticulture at ~~Ryukyus~~ the University of the Ryukus in Okinawa, Japan, discovered EM by accident. After suffering from pesticide poisoning, Dr. Higa began fifteen years of exhaustive research in microorganism mixtures for crop cultivation. EM is the result of~~ed from~~ his efforts."

"Results" page:

- Recommend placing a "Results" header at the top of the page otherwise users become dislocated.
- The photos are lovely, but I think it hits the user better to see the charts first, then get the photos at the end as the meditative "ahh" moment for the bulk of people who won't know how to make heads or tails of the information presented in the charts.
- Seven graphs (technically 8 for the two Enterococci trends) is a lot to smash into one chart, as suggested by Dr. Bernardi. More critically, there is currently no way to correlate any of the information. The data could potentially be useful if research was performed to identify whether there were special events in the vicinity of test sites, or if there were major weather activities such as high winds, excessive rains, etc. as well as markers to indicate test dates vs genki ball throwing dates. As is, the information is not useful for demonstrating anything and misleadingly guides reviewers to thinking the genki balls potentially have negative effects.
  - For the time being, I recommend only presenting a graph on sludge depth changes over time. This is the most valuable information for lay site users and

Figure 6. A screenshot of suggested edits from Sean Nathan.

The main point of feedback with the "Home" page was the content's wording. Sean Nathan proposed rewording multiple lines of content and changing "The Genki Ala Wai Project" to the project's Logo, which we accomplished. Additionally, some feedback included correcting errors that that escaped our focus, such as a broken link for the "Learn More" button.

Like the "Home" page, the "About Genki Ala Wai" page predominantly had content editing requests. Most of the page's content was either reworded or shifted around to other sections. Furthermore, a few sections were eliminated, like the "Why do we use Genki Balls?" section, to improve the overall flow and cohesiveness of the text. Due to the context revisions, the text boxes were reorganized to a symmetrical and pleasant cosmetic feel. Following the "About Genki Ala Wai", we received succinct direction for the "Results" page. Sean Nathan requested the charts be at the top of the page, to insure they are seen first, and re-locate the canal

photos under the charts. This made sense, as the information on the graphs could be underlined by a visual of the canal's progress. Another editing request we received was to only display the graph representing sludge depth. Having one singular graph helped with the organization and cosmetics of the "Results" page, while also showing data that proved the project's progress. By implementing all these changes, we believe the page will help increase awareness about the project's objective. Alongside the previous pages, "The Ala Wai Canal" page and "Partners" page were also improved. These pages had the least amount of feedback, and the requests associated with "The Ala Wai Canal" page consisted of rewording content. Specifically, adding a registered trademark symbol on the EM•1® solution, Effective Microorganisms. The "Partners" page, like the page prior, had minute rewording issues. Out of the partner lists, two educational partnerships were absent and then added. The partners were Honolulu Community College and Hawaii Pacific University. These two pages had little feedback but were changed for the better.

Implementing the detailed changes suggested by Nathan helped the flow and conciseness of the website's content, as well as ameliorating the website's extensive appearance and navigation.

4.2 Results II – Refining to Meet Specific Needs

From our previous meeting, we realized that we needed more feedback from Fumiko Sato-Chun, the project's Community and Media Liaison, and Chikako Nago, the project's Business Liaison, to address small issues with the website's calendar feature. This was determined due to confusion on how the calendar system would operate. During the subsequent

meeting with Sato-Chun and Nago, we presented the updated website and received additional feedback and clarification about its scheduling and calendar features, alongside updated thoughts about specific assets. The primary result was a clearer description of where the event and booking capabilities would be, and how much information was desired to accompany them. The proposed changes most heavily fell under the "Events" tab including the "Events Calendar," "FAQs," and now removed "Past Events" pages, as well as the "Home" page.

The proposed changes primarily made the "Events" page a singular source of all events and booking information. We were advised to coalesce the previous and upcoming events together, which resulted in the removal of the "Past Events" page entirely. We were also advised to add and alter information on the "Events Calendar" page to improve the booking and scheduling process for all parties. These proposed changes included making it clearer who could sign up for events, who would have priority in signing up, how many slots were still available, and when it was appropriate for potential clients to reach out for further information. Both Sato-Chun and Nago additionally requested a more streamlined way to handle incoming requests, proposing the addition of an intake form. This intake form would be accessible from the calendar which included a way to distinguish interested parties as a "priority" or not. It was also proposed to have a "Testimonials" page, so that pictures and testimonials could be gathered and shown to promote the events. Additionally, brief discussions and feedback about the "FAQs" occurred, leading only to minor changes regarding the page's location and the inclusion of additional, non-scheduling questions.

The "Home" page also received some immediate and proposed edits. An updateable count of thrown Genki Balls was added at the bottom of the page. Additionally, it was requested

that we consider moving the event calendar, or at least one version of it, to the home page. Some additional discussion of moving some assets to the home page happened, but no official request or plan to do so was made.

In the website's final stage, we have the following sections on the "Home" page; "The Project & Canal", "Partners", "Events", "About Us", and "Contact". These sections have multiple pages that correlate to them. For example, under "The Project & Canal" section we have pages that speak to the Canal's history and The Genki Ala Wai Project, as well as lab results and an educational page. The website has many photos of the Ala Wai Canal, project members, and Genki Ball Toss events. This allowed the website to show all the important events while bringing life and extra color to the pages. The website also has many buttons that are either linked to other pages on the website or Google forms that can be filled out to ensure easy navigation for viewers. Overall, all the features and content created an engaging website that will bring awareness about the Ala Wai Canal's pollution and toxicity, while also helping The Genki Ala Wai Project further its goal to clean the Canal.

5.0 Recommendations

The recommendations for this project are additional features and aspects of the website that we did not complete due to the term's time constraints. The following topics have been discussed and recommended for the next IQP group and The Genki Ala Wai Project Team: Domain Changes, News Page, Photo Hashtag, Events FAQs Page, and the Education Page.

5.1 Domain Changes

Our team would recommend changing the domain name of the newly produced website to the domain name from the old website. We believe that this would allow for consistency and retained viewership, and aid in limiting any confusion regarding what website to view. The old website's domain name was "genkialawai.org". When the domain name is transferred, the old website will be archived, and Google Search will make the archived site unavailable and direct all users to the new site.

5.2 News Page

After multiple meetings with The Genki Ala Wai Project team, we would recommend creating a "News" page to display current project-related news. As for the turnover of the website to the sponsors, a sample page has been built, including the most recent news links available. A potential issue to consider is that a "News" page becomes dated the second a new article is written. As such, it would need to be regularly updated at the start of every month to ensure that the content is current. This will help promote the project's progress in restoring the Ala Wai Canal and surrounding watershed. The hope is that this page will also foster increased interaction and create a "buzz" for more people to start volunteering.

5.3 Photo Hashtag

A request from our sponsor was to implement some way for people to send photos of the wildlife in the Canal, since thus far they have sourced most marine life photos from the community. We implemented a button on "The Ala Wai Canal" page that opens to an email page for folks to send their photos.

Additionally, we recommend that The Genki Ala Wai Project creates a hashtag people can use when posting photos on social media platforms. We think that "#GenkiHou," which means "Clean Again" is a good choice since this phrase is heavily tied to the Genki Ball toss events; "#GenkiHou" will have the added benefit of promoting both conservation and project events.

5.4 Events "FAQs" Page

To garner more awareness about Genki Ball Tossing events, an event-specific FAQ page was discussed. This page would help answer questions regarding how events can be sponsored and organized, as opposed to what the Genki Ala Wai project is about.

This would cut down on emails from potential sponsors asking repetitive questions and would further serve as motivation for those who are indecisive about whether to sponsor an event. We have already created an FAQs page and our recommendation is to add some frequently asked questions about booking events. Currently, there are not any questions and answers displayed, but there is a model of support on that page which is shown below.

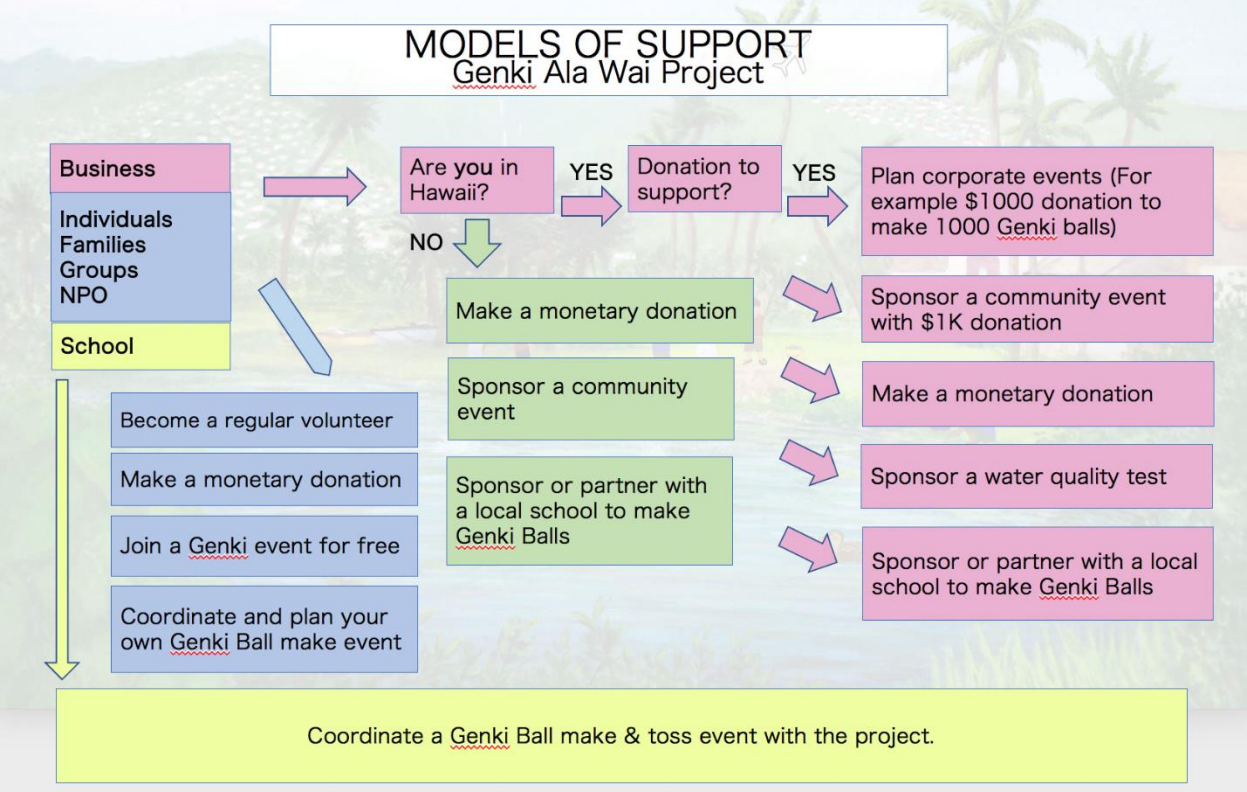


Figure 7. *Model of Support provided by Fumiko Sato-Chun*.

5.5 "Education" Page

Throughout our meetings with the Genki Ala Wai team, it was apparent that they wished to expand their website's reach in education. Currently, Mary Ann Kobayashi serves as the Educational Coordinator for the team, working as a liaison between the project and area schools. Our recommendation is that, to help further educate the public, as well as assist Ms. Kobayashi in her efforts, an extensive build-out of the "Education" page is necessary. We believe that a coordination effort between the project team and the Hawaii Department of Land & National Resources (DLNR) would be especially beneficial. The Hawaii DLNR has a variety of informational posters, videos, diagrams, and activities that provide a wholistic view to the biology and wildlife of Hawaii, something that the project team is actively trying to save.

Through this proposed partnership, teachers and students alike would receive greater access to educational resources before taking part in the project itself. This would allow a thorough evolution of learning to be achieved, from identifying the problem, to advancing students' own knowledge, learning how to help, and, finally, actively participating in the solution.

6.0 Conclusion

In conclusion, through feedback and rigorous re-working, we have created a website to help foster interaction and awareness for the communities surrounding the Ala Wai Canal. Bringing awareness is one of the most important aspects of this website, because without the community's help the Ala Wai Canal will stay in a polluted state. To create a functional website that achieved these goals, we sat down and conducted in person meetings with some key team members of The Genki Ala Wai Project Team and sent out a Qualtrics survey to the students in our cohort.

During the meetings with The Genki Ala Wai Project Team, we asked each team member what they wanted and needed from the new website. We received a list of features the team was interested in having on their new website and prioritized them based on those interviews. We concluded that there were three features that were most important: donation, calendar, and promoting components. Through a highly iterative process, consisting of showing The Genki Ala Wai Project team our progress and tweaking the feature based on their feedback, we were able to incorporate these features. The trial-and-error process was repeated until our sponsors, our advisors, and ourselves were content with how each feature operated.

All feedback and ideas have been compiled into our recommendations section and will be shown to Sean Nathan, the project's Website Manager, and Fumiko Sato-Chun, the project's Community and Media Liaison. We hope these will aid them in incorporating new ideas and updates to the website.

Our recommendations focus on the following: a news page, the photo hashtag, the events page, and the education page. We have commented that the project team should expand the events page and the education page, since there is not a lot of information currently present. Also, we have discussed that there should be a media/news page so the project team can promote their mission and project. One of the last points of recommendation was the photo hashtag which would help with the marketing and promotion of the project's progress in cleaning the Ala Wai Canal.

In conclusion, through multiple rounds of feedback and re-working the website, we have created a product that will aid The Genki Ala Wai Project's mission. We hope that all our recommendations help to further the progress on the website and continue to bring awareness to the communities around the Ala Wai Canal.

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