

# **Sustainability Values: Interactive Website for Values Diagnostic Reporting and Analysis**

CS 4624: Multimedia, Hypertext, and Information Access  
Final Report

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## Executive Summary

Sustainability Values Diagnostic, an Interactive Website for Values Diagnostic Reporting and Analysis, is a project for CS 4624 with Dr. Fox. The goal of this project is to develop a website that supports a survey created by our client, Dr. Hull. This survey is designed to help sustainability professionals and students learn about their own preferences, values, and opinions as well as how they compare to others around them. This will in turn help them understand themselves, become better listeners, build productive collaborative efforts, and manage conflict. This website must allow users to take Dr. Hull's survey, analyze their answers, and provide them with feedback about where they fit in relation to their sustainability values. After giving the user their results, all the data needs to be compiled in such a way that Dr. Hull can download and analyze it for his own research. All of the data accumulated will be kept anonymous to maintain the user's privacy. This data will allow Dr. Hull to see where his students' and colleagues' values lie and how to tackle these sustainability issues in the future.

The survey was created by Dr. Hull to analyze a person's sustainability values and compare them to other people who have also taken the survey. There are two types of questions in the survey. The first asks the user to divide \$100 among different options to determine outcomes of sustainable development efforts. The second question type asks users to react to a scenario with a degree of agreement from strongly disagree to strongly agree. These answers are used to perform data analysis and give the user a report, as a downloadable PDF file, that clearly states the user's values and biases. In addition to this, the report displays how the user compares to previous users' responses.

The website is hosted on the PythonAnywhere platform, which is very easy to use and manage, for both ourselves and Dr. Hull. It also allows us to have a lot of functionality without having to set up the server, database, and other components ourselves. The website's current URL is <https://www.sustainabilityvalues.com/>.

This project was started by a CS 4624 group in 2018, by Brizuela, X., Stewart, C., Mistry, H., & Eltepu, S. That group's effort is the base for the current project. We have used some of their previous work for our project, but have also rebuilt the website to better fit our goals. This project will also be passed on at the end of the semester to Dr. Hull, and if needed to another CS 4624 group. This increases the need for detailed and thorough documentation. With this project we will be creating a User Manual, Developer's Manual, and well commented code on Github. This will allow for easy editing of the website if needed.

# 1. Introduction

## 1.1. Objective

The objective of this project is to develop a website to help sustainability professionals and students learn about their values and opinions related to sustainability. The website will host a survey created by Dr. Hull and collect the user's answers for analysis. It should generate a report for the user showing what their sustainability values are and how they compare to others who have taken the survey. The collective responses should be exportable for analysis by Dr. Hull. The project was begun but not finished in 2018 by a CS 4624 student team.

## 1.2. Client

The client for our project is Dr. Bruce Hull, a professor of Sustainability in the Department of Forest Resources and Environmental Conservation. Dr. Hull is also a Senior Fellow in the Center for Leadership in Global Sustainability, President of Board of Directors: Climate Solutions University, Curriculum Committee Chair: Interfaces for Global Change Interdisciplinary Graduate Education Program, and is on the advisory committee for the Global Change Center. (Bruce Hull, 2017)

## 1.3. Constraints

The main constraint for this project is to develop a website that allows users to take Dr. Hull's survey and receive immediate results. With this, the website must be easily manageable and transferrable to Dr. Hull at the end of the semester. Part of being easily manageable is providing detailed documentation so the site may be updated in the future.

Another constraint of the project is the ability of users to remain anonymous. The survey is taken without the user's name or personal information being recorded. However, Dr. Hull would still like user's to be able to re-access results after exiting the survey. The database must be designed to record an identifying number that the survey taker can use to regain access to their past results.

## 1.4. Roles

There are two types of roles for this project: user roles and project roles. User roles are that of the person taking the survey. Project roles are those taken by the individuals involved in the development of the website. We will go into more detail how these roles interact in the following sections.

### 1.4.1. User Roles

Users for this project are the individuals that are visiting the website to take the survey and analyze their results. Survey takers can see where they fall on the sustainability scale and grow from seeing their results. Dr. Hull is also a user as he is taking the results from the survey takers and is using them for his research. He can use the data from survey takers to better understand why people fall into different sustainability categories.

### 1.4.2. Project Roles

To complete this project, our group has divided ourselves into small teams based on our individual skills. Each group member is the lead in at least one group and secondary on one or more groups. This allows us to evenly spread out workload based on personal skills. These roles are as follows:

*Table 1: Group Roles*

Group Member	Roles
Triplett, Leah	Team Lead, Design Lead, Communications Secondary, Writing Team
Miksovic, Will	Web Dev Lead, Research/Analysis Team, Writing Team
Paulonis, Andrew	Presenter Lead, Database/Back-end Secondary, Research/Analysis Team
Haninger, Mary	Communications Lead, Design Secondary, Web Dev Secondary, Research/Analysis Team
Jubar, Kaleb	Database/Back-end Lead, Presenter Secondary, Writing Team



*Table 2: Role Responsibility*

Role/Team	Responsibility
Team Lead	Manage team meetings and collaboration
Design	Create and organize the website design, and design user testing methods
Communications	Lead communications with the Client and other involved parties
Writing	Lead the writing of documentation and papers
Research/Analysis	Research content and competing designs for the website, analysis user testing
Web Dev	Develop the website front-end and integration
Presenter	Create and give the in-class presentations
Database/Back-end	Create, organize, and manage the database and back-end development

## 1.5. Scope

This Sustainability Values Diagnostic project is a semester long project for CS 4624. This project will follow the key principles of software design: requirements, design, prototyping, implementation, and testing. In order to complete our project in an organized fashion, we created milestones in the form of two week sprints. A complete milestone schedule is included in Appendix 1. At the end of each sprint we meet with Dr. Hull to discuss our current progress and any issues we are having. This gives us the opportunity to make sure we are meeting the expectations of the project. On the weeks that we do not meet with Dr. Hull, we write up a biweekly progress update. This report summarizes the work we completed, any goals we did not meet and why they were not completed, and any questions we have for Dr. Hull. This report is sent by email at the end of the week.

## 2. Requirements

The group talked with our client and analysed the previous year's project to determine the requirements for reworking the website that was created last year. The requirements are split up in two main categories: aspects of the website that must be maintained from the original, and new requirements that will improve upon last year's design. The primary

components to be maintained are having the website hosted on a web server and publicly available, and general structure of the survey and its questions. In terms of new requirements, we decided that we need to be able to provide automated survey results, allow users to enter a group code to see how they compare against a smaller subset of people, the ability for both users and sustainability professionals to download survey results, and the ability for users to re-access their survey results.

## 2.1. Web Hosting

The most important requirement of this project is to make sure that is accessible to as many people as possible as easily as possible. This means that the project must be hosted on the web so it can be accessed by anyone who wants to learn more about their sustainability preferences and see how they compare to others. The platform also needs to be efficient enough to handle at least a medium load of traffic. We are not expecting a large number of simultaneous users, but it could be used in classes in the future so the website needs to be efficient enough to handle the whole class taking the survey at once. Upgrading the power and bandwidth of the server could be a consideration for the future if it becomes a problem.

Dr. Hull does not have a preference when it comes to a specific platform, and he is also fine with moving away from hosting on WordPress if it allows us to make a more efficient and robust system. This gives us a lot of options when it comes to choosing a platform and tech stack.

## 2.2. Survey

The primary focus of the website is the survey that is designed to determine the user's thoughts on sustainability and what they personally find most important. This has not changed from last year's project, but we plan to change how the survey is implemented and delivered to the user. The main requirement here is to maintain the format and data output of the survey while creating a more robust back-end that can be used for better analysis.

Through discussion with Dr. Hull, we also identified some smaller requirements for the survey. It needs to be able to keep the user results anonymous but also collect a reasonable amount of demographic information for further analysis.

### 2.2.1. Anonymity

A major issue that Dr. Hull wants us to focus on with the survey is to make sure that users taking the survey remain anonymous. This can be accomplished in many different ways. Dr. Hull suggested that we do not collect any personal information about the user. This could be a problem if user accounts are implemented to allow users to access their results later as we then tie personal information to a set of results, so that is something to consider.

### 2.2.2. Demographics

On the other side of the coin, to have information that will be useful for future research some data needs to be collected about the users taking the survey. This can give researches more insights to patterns of what types of people have specific sustainability preferences. However, we do not want this information to be specific enough to link a specific survey result with the user who took the survey. This will be a critical balance that has to be struck when designing the demographic questions.

## 2.3. Automated Results

One highly desired update to last year's website by Dr. Hull is the addition of automated results. This means that after any user takes the survey, they get a report of their results immediately and have all the calculations needed to report these results handled by the website. In last year's project, the site could only collect the raw data from the survey. This meant that Dr. Hull would have to go back through the data and create individual reports by hand for users who took the survey and email it himself. As is to be expected, this is a very lengthy process and is not scalable in any capacity. Therefore, an important requirement is to update the site so that all the report information can be automatically generated for the user by the site. This will lower Dr. Hull's workload and allow users to get a report on their results almost immediately.

### 2.3.1. Group Functionality

Along with the ability to compare results of the survey to all other users, we want to be able to use group tags to specify subsets of users to compare on the results page. This means that in addition to comparing the current user's results to all previous results, we would be able to compare it to members in the same group as the user. This feature should remain

optional and should not take away from general automated results so people who join a group should still be able to see general results and everyone who takes the survey should not have to join a group to take it.

## 2.4. Downloadable Results

When discussing the automatic generation of result reports, Dr. Hull also expressed a desire for the ability to download the survey results. With the user receiving feedback immediately from the site, there is no need for Dr. Hull to email them anything. This means that they would have no record of their results once they leave the page, which does not seem acceptable. Dr. Hull also wants a way to download all of the survey data as one large file.

### 2.4.1. User Results

As discussed above briefly, we want the user to have a way to download their results after they take the survey. Because anonymity is an important requirement for the survey results as talked about in section 2.2.1, we don't want to have a system of user accounts or keep any personal information. Allowing the user to download the report of their results will allow them to revisit their survey answers without needing this.

We also want users be able to re-access their results within the website without needing them to log in as an alternative to downloading them. Having both options will give our users a much better chance of successfully viewing their results at a later date through whichever method works better for them at the time.

### 2.4.2. Full Dataset

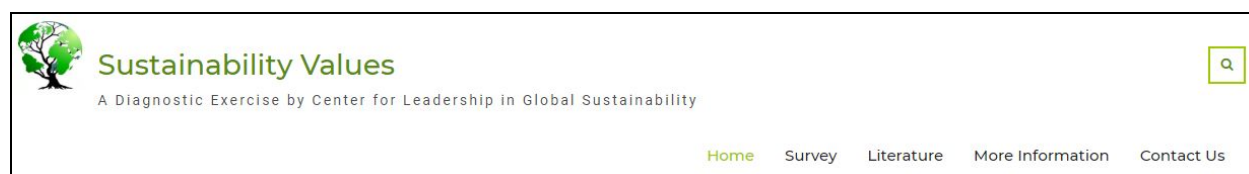
The site also needs a way for Dr. Hull or other sustainability professionals to download all of the data collected by the site in its full form. This data would preferably be downloadable in a easy to use format such as Microsoft Excel files for the professionals to use in their research. For security purposes, we want to make sure this feature is only accessible to specific admins that are assigned by Dr. Hull. Therefore, this section of the site should be under admin privilege-based protections so that only authorized users can access the full data set.

### 3. Design

We began our design phase by starting from the previous semester's Sustainability Values Diagnostic project design. Rather than creating an entirely new design, we decided revamping their design would allow us to dedicate more time to the implementation phase of the project. We examined their designs and evaluated aspects we wanted keep and/or update, as well as aspects we wanted to remove. From there, we altered the existing designs to represent our desired changes. We presented several designs to our client, Dr. Hull, to ensure the changes we made still met his needs and specifications. Ultimately, we settled on a final design that would accomplish our requirements and meet our client's goals.

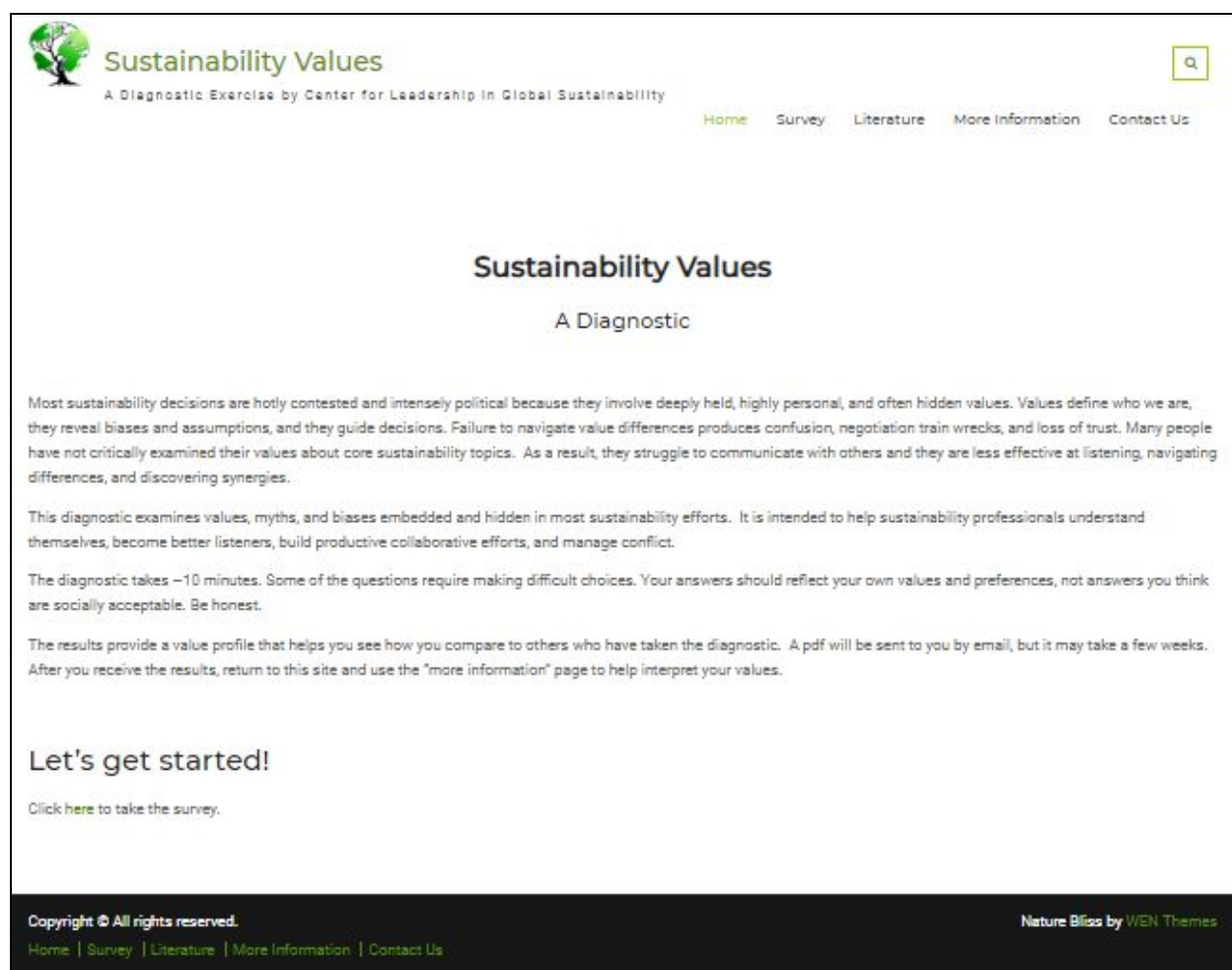
#### 3.1. Previous Design

The previous semester's design included a homepage, a survey page, a literature page, a more information page, and a contact us page; as well as a search bar functionality (*Figure 1*). First, we identified a need for page consolidation. Much of the information presented throughout these pages was unnecessarily separated. The homepage had a link to the survey making the survey page redundant and the separation of the literature and more information pages seemed counterintuitive as they both presented additional information. Once this need for consolidation was established, we addressed each page design one by one.



*Figure 1 : Previous Design, original header*

The homepage had a clean layout with a green color scheme that we wanted to maintain. We deemed the search functionality unnecessary due to the minimal information provided within this site. We also found that the repetitive header and the large block of text was not ideal for the user. It is likely a user would overlook a condensed section of text altogether. In addition, the link to the survey was small and at the bottom of the text. Thus, this link also faced the possibility of being overlooked (*Figure 2*).

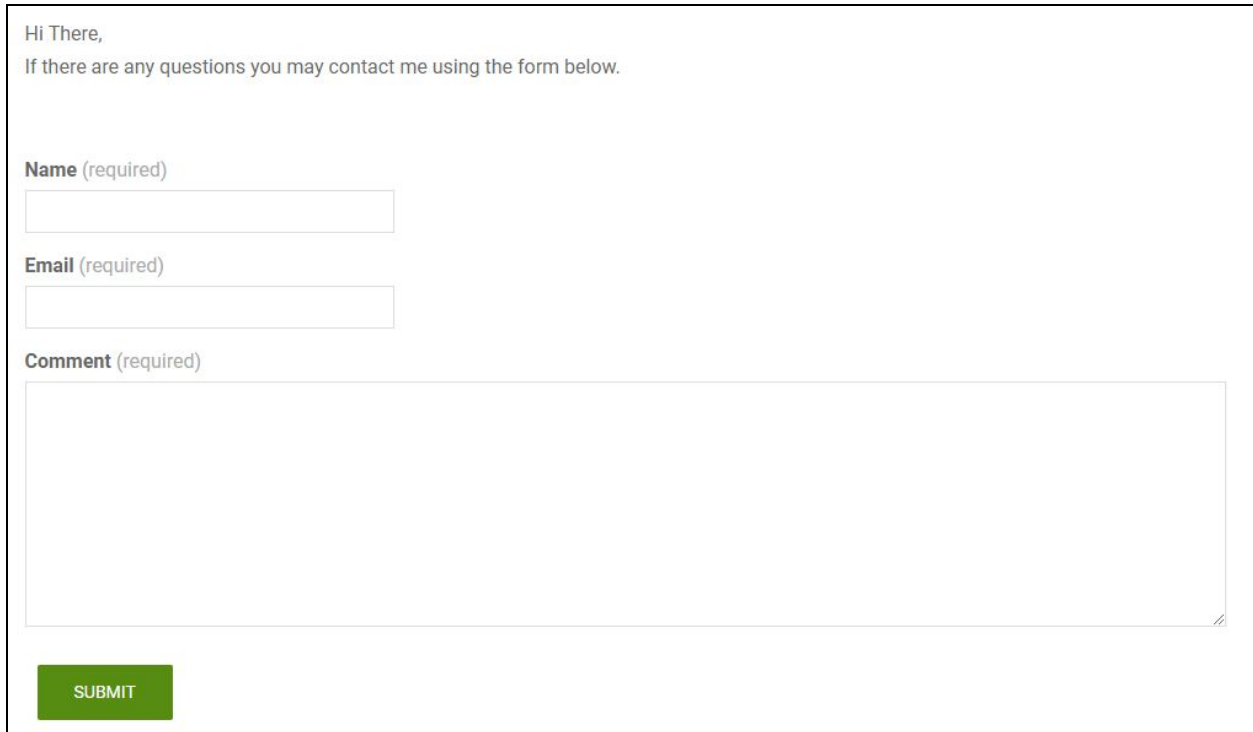


*Figure 2 : Previous Design, original homepage*

The survey itself was hosted by Qualtrics and therefore appeared disjointed from the site itself and only displayed one question at a time. This design lacked cohesion with the rest of the site and made navigating through questions or returning to previous questions inconvenient for the user. In addition, their design did not have any means of interpretation and analysis of the survey. All of these diminished the quality of the survey experience.

The more information page contained an explanation of why this diagnostic was important and a single link to the The Center for Leadership in Global Sustainability website, and the literature page contained sources for additional information. Both of these pages did not contain enough information to be classified as separate, and the explanation of importance could be represented on the homepage. The contact us page hosted a built-in contact form (*Figure 3*). This

form made it unclear who the user was contacting and could be a source of confusion overall.



Hi There,  
If there are any questions you may contact me using the form below.

**Name (required)**

**Email (required)**

**Comment (required)**

**SUBMIT**

*Figure 3 : Previous Design, original contact us page*

### 3.2. Updated Design

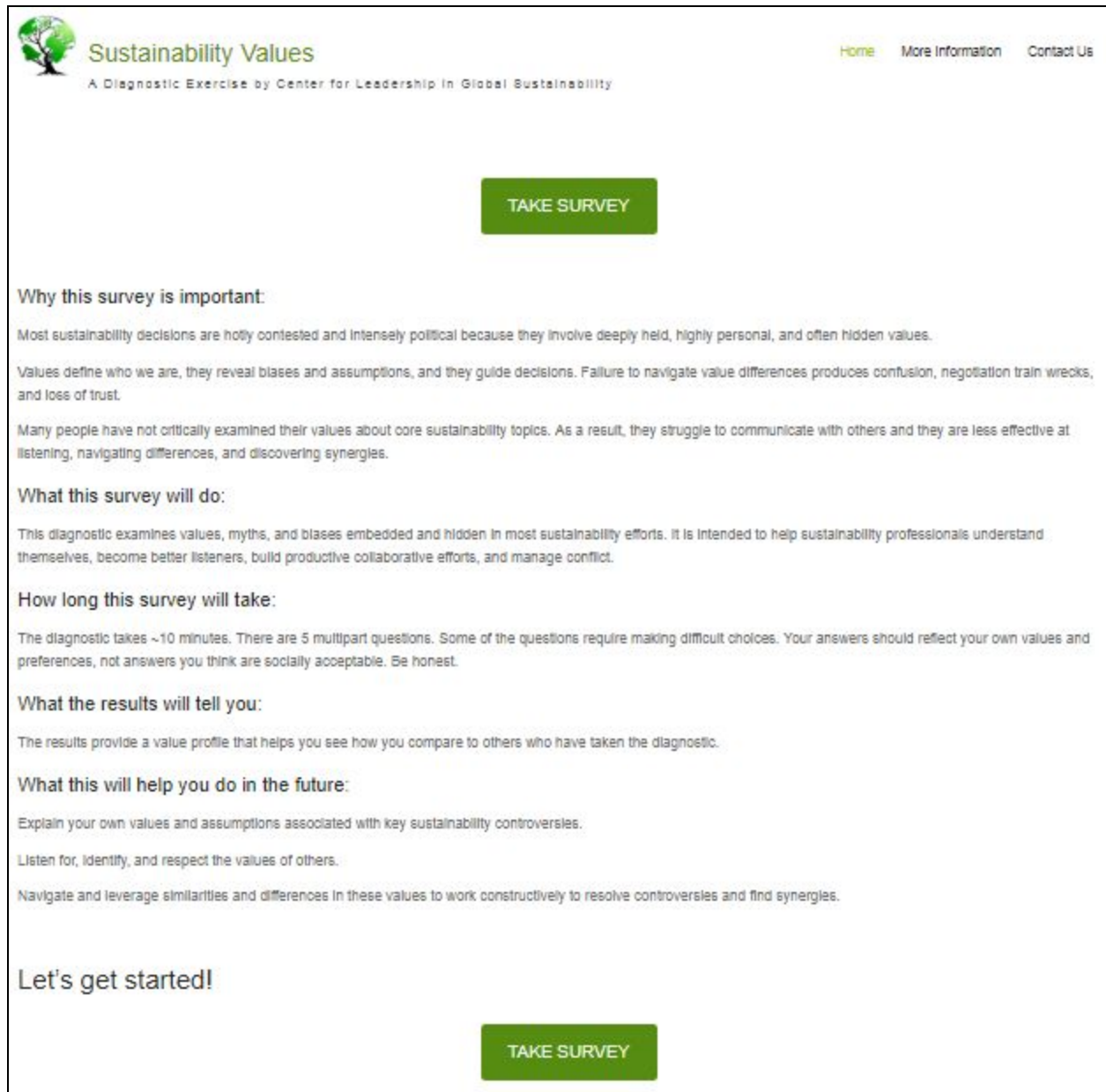
We addressed each of these issues in our updated design. We eliminated the survey and literature page and therefore condensed the amount of tabs in the header. We also eliminated the search capability, which we deemed unnecessary. These changes simplified the navigation and the overall appearance of the website header (*Figure 4*).



*Figure 4 : Updated Design, new header*

We made the most significant design changes on the homepage. The survey page would now only be accessible through the homepage. Due to this change, we decided to make the survey link more prominent. To do this, we added a large green button at the top of the page that linked directly to the survey. We then

broke the large chunk of text into smaller sections and gave each section a meaningful header. This made the information more readily accessible to the user. We also added the importance explanation to the homepage that previously existed on the more information page. Finally, we added an identical button to access the survey at the bottom of the page (*Figure 5*). This provides a more convenient path for a user to take the survey after reading the provided information, without having to scroll back up to the top of the page.

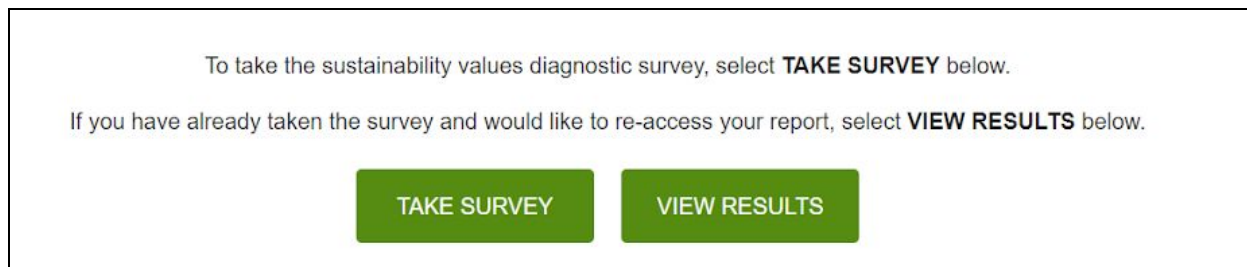


*Figure 5 : Updated Design, new homepage*



After we created this design, we added minor changes based on additional functionality and our user tests. Our user testing methods and results can be found in the [Testing and Evaluation](#) section.

Once we implemented the ability for users to re-access their results, we needed to include this in our design. We added a “View Results” button next to the top “Take Survey” button. We did not include this additional button at the bottom of the page as a user who has previously taken the survey is unlikely to scroll to the bottom of the page to access this button. In addition, we wanted to clarify the purpose of these two buttons to avoid any confusion. To do this, we added two instructions above the buttons explaining their purpose (*Figure 6*) and one below with an input box and “Submit” button to appear when the “View Results” button is clicked (*Figure 7*).

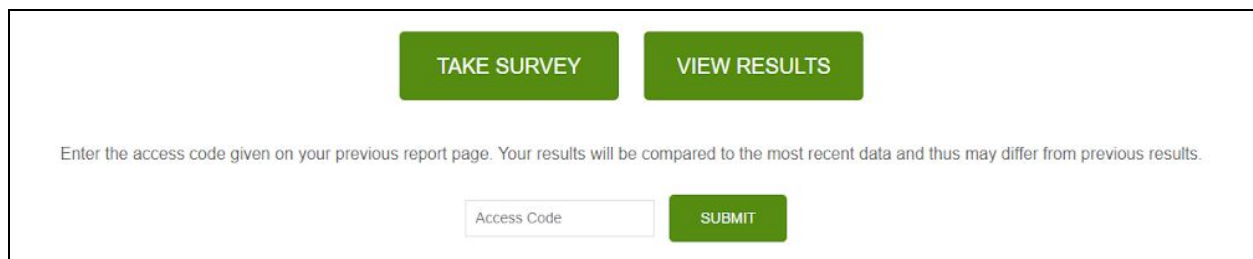


To take the sustainability values diagnostic survey, select **TAKE SURVEY** below.

If you have already taken the survey and would like to re-access your report, select **VIEW RESULTS** below.

**TAKE SURVEY** **VIEW RESULTS**

*Figure 6 : Updated Design, additional button/instructions*



**TAKE SURVEY** **VIEW RESULTS**

Enter the access code given on your previous report page. Your results will be compared to the most recent data and thus may differ from previous results.

Access Code **SUBMIT**

*Figure 7 : Updated Design, access code entry*

Finally, we changed minor aesthetics according to our user comments. Some users had issues with the various text sizes and division between sections. We resolved these issues by making all text consistent in size. In other words, we made all the headings the same size and all the normal text the same size. Therefore, we had two consistent text sizes on the page. In addition, we added dividers between the sections to add a more clear division between text (*Figure 8*).

**Why this subject is important:**

Most sustainability decisions are hotly contested and intensely political because they involve deeply held, highly personal, and often hidden values.

Values define who we are, they reveal biases and assumptions, and they guide decisions. Failure to navigate value differences produces confusion, negotiation train wrecks, and loss of trust.

Many people have not critically examined their values about core sustainability topics. As a result, they struggle to communicate with others and they are less effective at listening, navigating differences, and discovering synergies.

---

**What this survey will do:**

This diagnostic examines values, myths, and biases embedded and hidden in most sustainability efforts. It is intended to help sustainability professionals understand themselves, become better listeners, build productive collaborative efforts, and manage conflict.

---

**How long this survey will take:**

The diagnostic takes ~10 minutes. There are 5 multipart questions. Some of the questions require making difficult choices. Your answers should reflect your own values and preferences, not answers you think are socially acceptable. Be honest.

---

**What the results will tell you:**

The results provide a value profile that helps you see how you compare to others who have taken the diagnostic.

---

**What this will help you do in the future:**

Explain your own values and assumptions associated with key sustainability controversies.

Listen for, identify, and respect the values of others.

Navigate and leverage similarities and differences in these values to work constructively to resolve controversies and find synergies.

---

*Figure 8 : Updated Design, section dividers*

The overall layout of the survey changed while the content remained mostly the same. We adjusted the survey to display all of the questions on one page. This design will allow users to easily navigate through the entire survey with easy access to previous questions. We also added color to help users know when they have allocated the correct amount of money. As far as content, we changed the wording of one of the questions slightly after conducting our user tests. We found that the wording of our third question caused some users confusion (*Figure 9*). We then conferred with our client Dr. Hull and changed the wording accordingly (*Figure 10*).

Money for the organization with a mission to sustainably develop the proposed land use in the community where I live.	\$ <input type="text" value="0"/>
Money for the organization with a mission to stop the proposed land use in my community (even if that means locating it where other people live).	\$ <input type="text" value="0"/>
<b>Total</b>	<b>\$ <input type="text" value="0"/></b>

*Figure 9 : Updated Design, original question wording*

Money for the organization whose mission is to monitor, advise, and help the proposed land use be developed in my community in ways that best protect the people and environment in my community.	\$ 0
Money for the organization whose mission is to stop the proposed land use in my community (even if doing so relocates it to another community).	\$ 0
<b>Total</b>	<b>\$ 0</b>

*Figure 10 : Updated Design, new question wording*

The only other change we made to the content of the survey was the ability to add a group code. This was a small addition to satisfy the implementation of our group functionality. We added a question above the survey to ask whether or not they had a group code, and if they selected yes, we would provide them with the option to input their group code (*Figure 11*). However, the rest of the content on the survey remained the same.

## Sustainability Values

### A Diagnostic

Anonymity and confidentiality will be protected.

Do you have a group code?

☒ Yes
 ☐ No

Group Code:

*Figure 11 : Updated Design, group code entry*

In addition, our implementation will provide immediate results in the form of Dr. Hull's analysis with a link to a guide to help users interpret their results. We took Dr. Hull's original design for the report page (*Figure 12*) and tweaked it to convey the results to the user as clear as possible. We added sentences above the first two charts to further explain what each range and percentage means, as well as additional clarifications to the top of the page for the entire report. We also added more color to make the shaded cells stand out from the rest (*Figure 13*). This change was done in between our user testing and proved to be more effective.

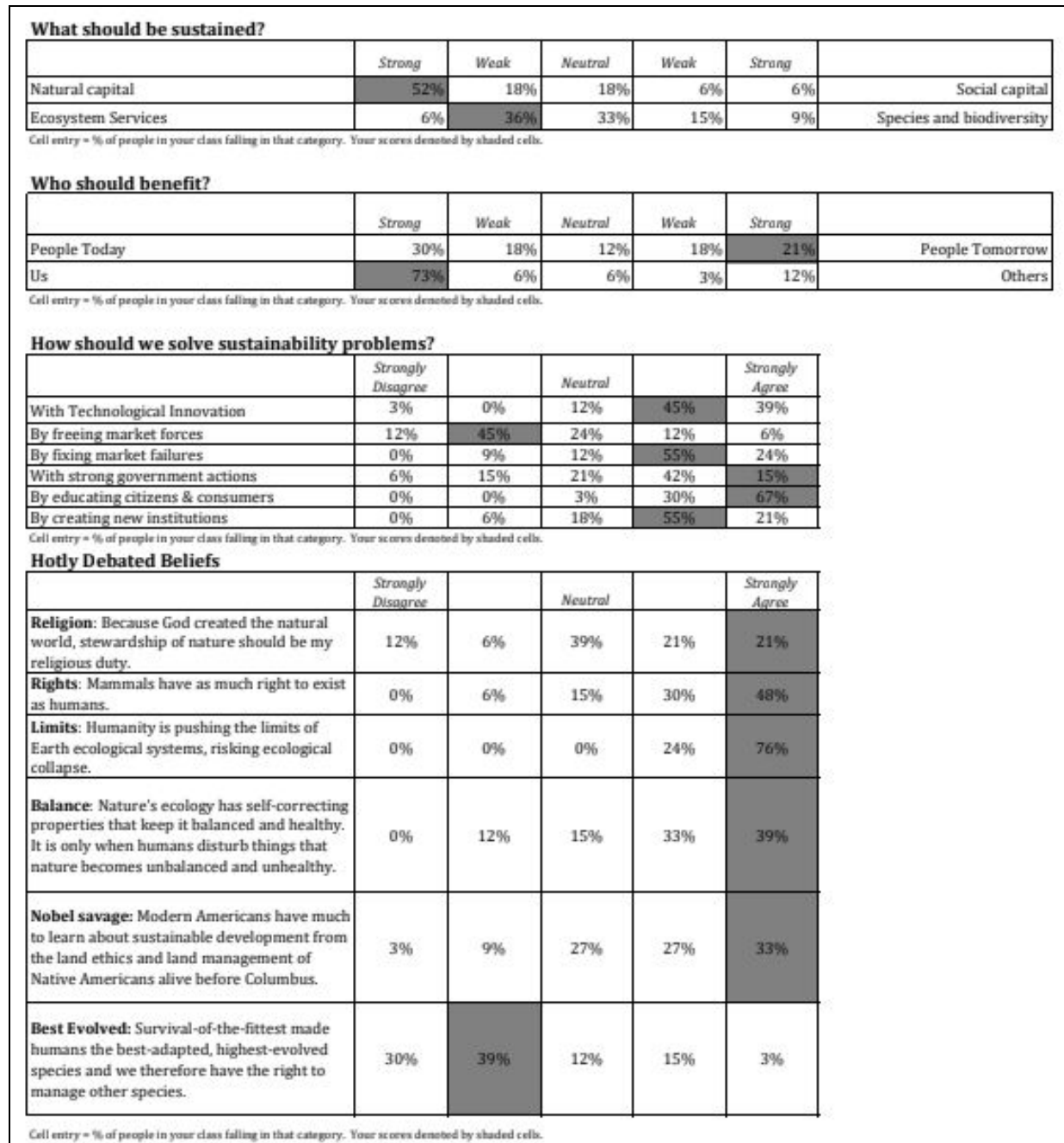


Figure 12 : Updated Design, original report page

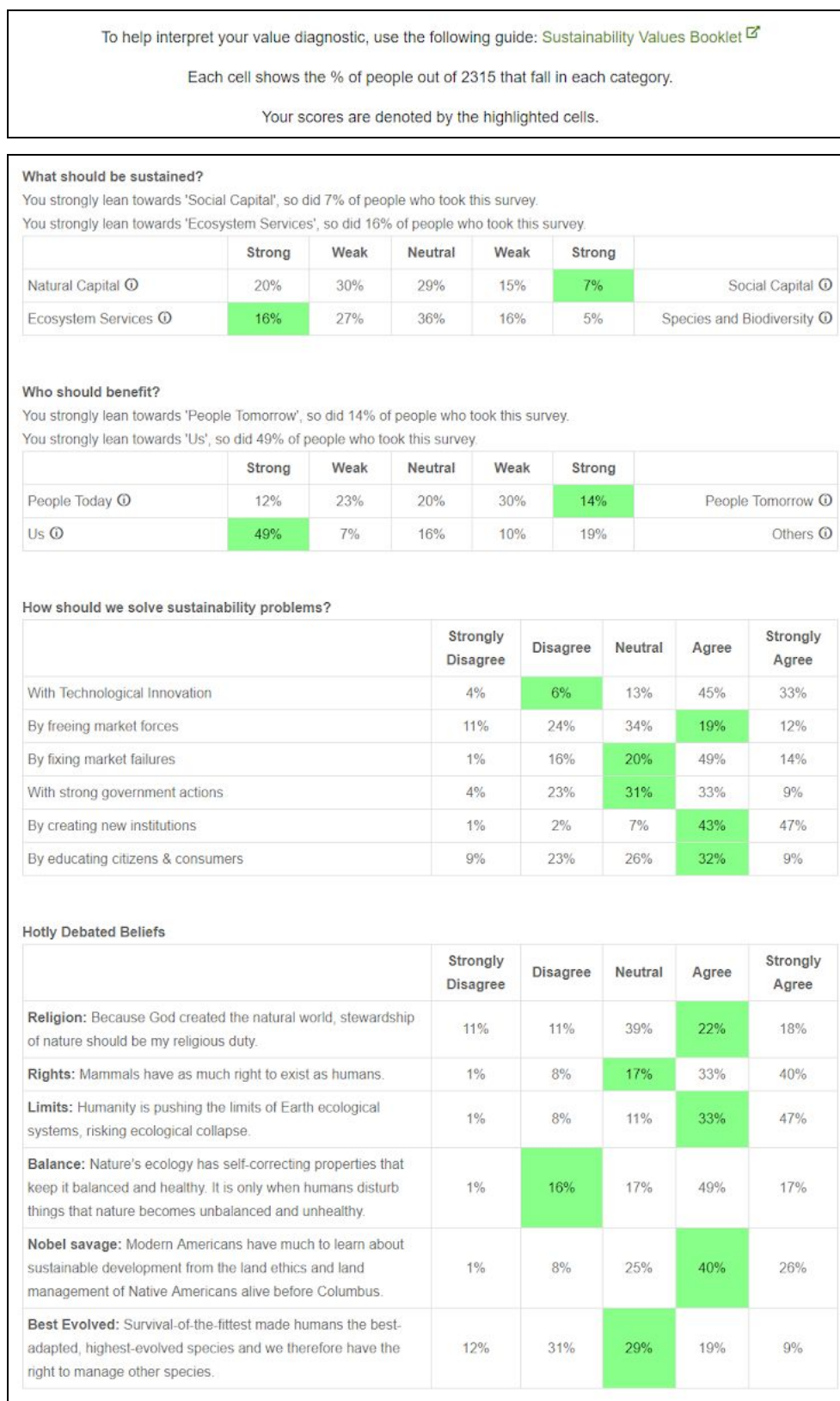


Figure 13 : Updated Design, new report page

We also needed to consider the addition of a possible group code to the survey page. This would cause the user to have two options for their report page, either with their group or overall. To remedy this, we simply added a toggle capability at the top of the report page to view wither the group results or the total results (*Figure 14*). If a group code was not provided this option will not appear. Lastly, we included an access code for our re-accessible results functionality and a “Print Results” button for our downloadable results functionality at the bottom of the page (*Figure 15*).

Since you took the survey as part of a group, select how you would like to compare your results:

☒ Total Scores
 ☐ Group SampleGroup Scores

*Figure 14 : Updated Design, group toggle option*

To re-access your results use the following access code:

24

PRINT RESULTS

*Figure 15 : Updated Design, access code and print button*

We condensed the literature into the more information page to remove any ambiguity between the two. This page now lists the appropriate additional information with other resources below (*Figure 16*). This consolidation of pages will limit the amount of pages the user has to look through to locate desired information. The contact us page changed from a built in contact form to the information needed to contact our client. This design simplified the look of the contact us page, while providing additional information about who they may be contacting (*Figure 17*).



The guide to help interpret your value diagnostic is available at: [Sustainability Values Booklet](#) 

Additional information about the diagnostic, coaching, workshops, and research on the topic can be found at: [The Center for Leadership in Global Sustainability](#). Their mission is to educate, inspire, and empower professionals to create a better future for people and our planet.

Literature you may find useful:

- Gregory, R. (2002). Incorporating Value Trade-offs into Community-Based Environmental Risk Decisions. *Environmental Values*, 11(4), 461-488. doi:10.3197/096327102129341181
- Haidt, J. (2013). *The righteous mind why good people are divided by politics and religion*. London: Penguin Books.
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*Figure 16 : Updated Design, new more information page*

Sustainability Values is a project by **Dr. R Bruce Hull** who can be contacted at [hullrb "at" vt.edu](mailto:hullrb@vt.edu)

You can also contact [The Center for Leadership in Global Sustainability](#), whose mission is to educate, inspire, and empower professionals to create a better future for people and our planet.



*Figure 17 : Updated Design, new contact us page*

Lastly, we designed a basic layout for our administrator portal page. This is a functionality the previous semester team did not include but we established would be necessary for our client to download the complete dataset. We wanted the design to be simplistic and easily understood by our client, but not readily available to the average user. To accomplish this we decided to add an admin login option on the right-side of the website footer (*Figure 18*).

Let's get started!

[TAKE SURVEY](#)

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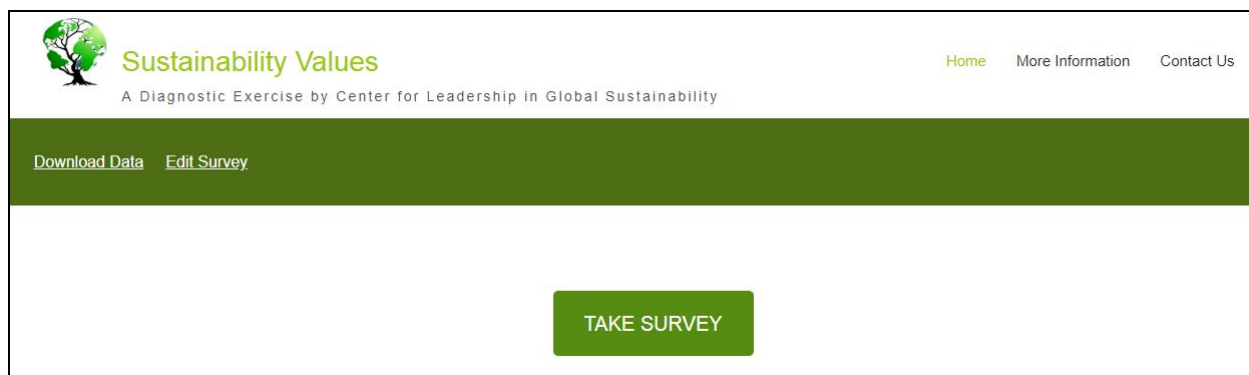
[Home](#) | [More Information](#) | [Contact Us](#)

Nature Bliss by [WEN Themes](#)

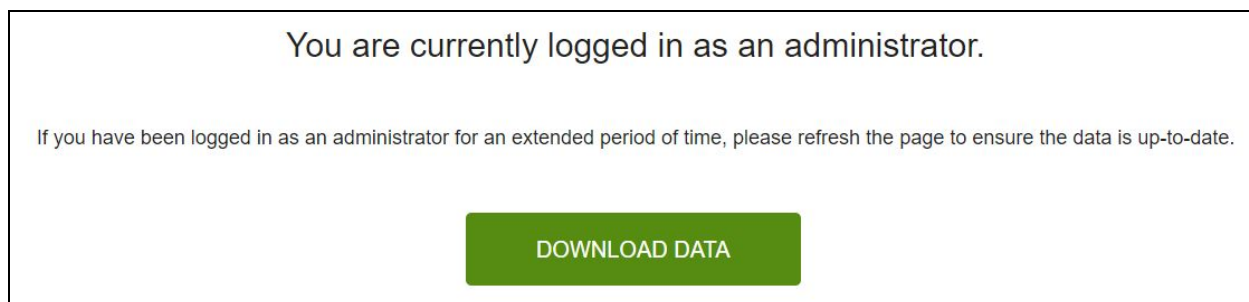
[Admin Login](#)

*Figure 18 : Updated Design, new footer*

Our original idea was to have the homepage display a bar with corresponding action links, once the admin logs in with their credentials (*Figure 19*). However, we changed this design to be a separate page to avoid crowding the homepage. Our admin portal design was simple and concise. We would include a confirmation statement assuring the user that they are logged in as an administrator, as well as a disclaimer to refresh the page if logged in for an extended period of time. Finally, it would include a button to download the complete set of data (*Figure 20*). This page will appear as a separate tab if and only if the user is signed in as an administrator.



*Figure 19 : Updated Design, possible admin page*



*Figure 20 : Updated Design, final admin page*

We ended with a final design for the homepage, more information page, contact us page, and admin portal page; as well as a clear layout for our survey and report page. Each design included all the necessary capabilities to achieve our desired functionality. After we established our updated designs, we began the implementation phase of our project.



## 4. Implementation

When approaching how to implement the project requirements, we decided that we would be willing to start from scratch in terms of back-end functionality. We were able to take the existing front-end design with some changes, as described in the design section, and write a completely new back-end to support it. This allowed us to circumvent some of the flaws with WordPress and Qualtrics, while also giving the capability for it to be more easily extended in the future if necessary.

### 4.1. Tools

The most important part of any implementation to consider is the tech stack: what kind of tools and what programming language(s) will be used. We realized that one of the core problems with the previous iteration of the site was how restrictive WordPress can be, so we knew that we wanted to use a different stack that gave us more control over the back-end.

Once we had our roles in place, the back-end team decided that we wanted to use Python for our server logic and calculations because it is easy to use, pretty efficient for small applications, and we were already familiar with it. One of our team members also has experience with PythonAnywhere, which is a web hosting platform that uses the Python-powered Flask web framework. This also has support for the SQLAlchemy API, which allows us to use a MySQL database for storing all of our data. Additionally, we use GitHub to store all of our code, practice good version control, and create issues and tasks for project management.

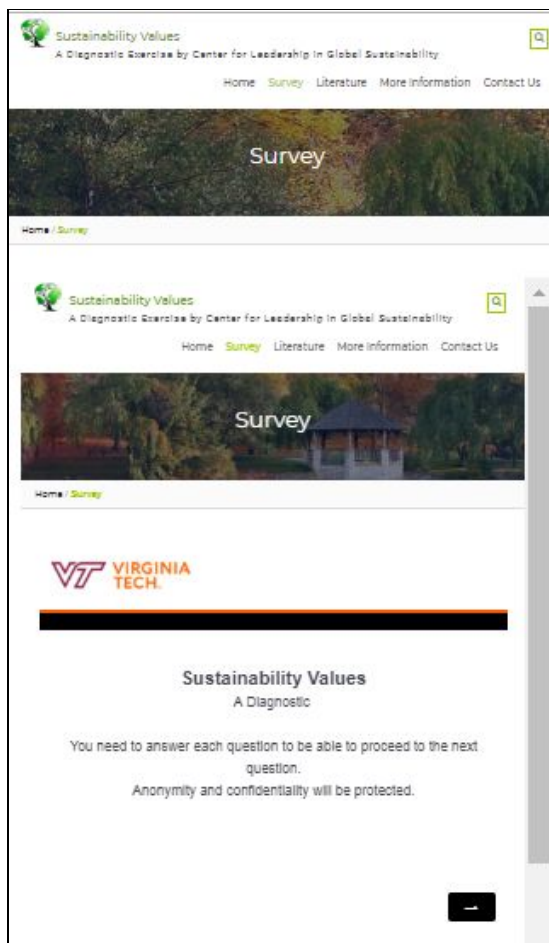
### 4.2. Web Hosting

As mentioned in the tools section, we have our website hosted on the PythonAnywhere platform. This is very nice, as it sets up all of the server management and domain name services but still lets us create our own website and have full control. It also allows us to open consoles for Bash, Python, and MySQL and access the file structure with an easy to use web interface.

We were able to migrate the domain name from the previous website to our new one using Bluehost, the hosting platform that Dr. Hull bought the domain name on. Through their built-in functionality we were able to have the domain redirect with or without the www prefix.

### 4.3. Survey

The core functionality of the website is the diagnostic survey, which was originally implemented through an embedded survey hosted on the Qualtrics system. This caused the other main problems with the website. It is somewhat difficult to get the data from Qualtrics in a manner that can be automatically processed and by embedding the survey within the site, you can encounter issues with nesting pages (*Figure 21*).



*Figure 21 : Implementation, nesting issues*

We decided that it would be best to create our own version of the survey so that we can collect data and perform our analysis more easily. Initially, we set it up using a forms module within Flask that allowed us to define Python objects to store the results of each question. However, this proved to be needlessly complex and convoluted the way that we structured our code and database, in addition to requiring odd workarounds to get it working properly. We switched to using

simple HTTP POST requests that hold all of the survey data in the body as a JSON dictionary, from which data can be extracted upon submitting the survey.

The other main consideration when creating the survey was how to structure the data collected from the users. We decided that it would be simpler to just create a large, inline database that holds everything from each question in a single entry instead of having a table for each question and linking them through relations. This makes aggregating the data easier for calculating results and will also make creating the downloadable file of the survey data simpler. Our initial database structure can be found in Table 3 below, formatted to fit.

*Table 3: Initial Database Structure*

<u>Survey_ID</u>	<u>Group_ID</u>	Q1NC	Q1ES	Q2PT	Q3Us
UNSIGNED INT	STRING 64	SIGNED TINYINT	SIGNED TINYINT	SIGNED TINYINT	SIGNED TINYINT

Q4TI	Q4FM	Q4FMF	Q4SG	Q4NI	Q4Ed
UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT

Q5Rel	Q5AR	Q5EL	Q5HP	Q5Bal
UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED TINYINT

Q5NS	Q5Evol	Age	Gender	WL	PA	IT
UNSIGNED TINYINT	UNSIGNED TINYINT	UNSIGNED INT	STRING	STRING	STRING	STRING

In implementing the report page, we found that it made it easier to store some additional data in the database that represents sums and categories for certain questions to minimize re-calculation later on. Additionally, while conducting our user testing, we realized that some of the user results were improperly stored in the database or displayed on the report page because of some confusion with the acronyms used in the field names. We initially based these column names on the key for interpretation given to us by Dr. Hull, but it was easier for us to resolve the issues and have a standard data format by simply labeling them as the different question parts. Our updated database structure can be found in Table 4.

Table 4: Updated Database Structure

Field	Type	Null	Key	Default	Extra
survey_id	int(11)	NO	PRI	NULL	auto_increment
group_id	varchar(64)	YES		NULL	
Q1Part1	tinyint(3) unsigned	YES		NULL	
Q1Part2	tinyint(3) unsigned	YES		NULL	
Q1Part3	tinyint(3) unsigned	YES		NULL	
Q1Part4	tinyint(3) unsigned	YES		NULL	
Q1Part5	tinyint(3) unsigned	YES		NULL	
Q1Part6	tinyint(3) unsigned	YES		NULL	
Q1Sum1	tinyint(4)	YES		NULL	
Q1Sum2	tinyint(4)	YES		NULL	
Q1Sum1Cat	tinyint(3) unsigned	YES		NULL	
Q1Sum2Cat	tinyint(3) unsigned	YES		NULL	
Q2Part1	tinyint(3) unsigned	YES		NULL	
Q2Part2	tinyint(3) unsigned	YES		NULL	
Q2Sum	tinyint(4)	YES		NULL	
Q2SumCat	tinyint(3) unsigned	YES		NULL	
Q3Part1	tinyint(3) unsigned	YES		NULL	
Q3Part2	tinyint(3) unsigned	YES		NULL	
Q3Sum	tinyint(4)	YES		NULL	
Q3SumCat	tinyint(3) unsigned	YES		NULL	
Q4Part1	tinyint(3) unsigned	YES		NULL	
Q4Part2	tinyint(3) unsigned	YES		NULL	
Q4Part3	tinyint(3) unsigned	YES		NULL	
Q4Part4	tinyint(3) unsigned	YES		NULL	
Q4Part5	tinyint(3) unsigned	YES		NULL	
Q4Part6	tinyint(3) unsigned	YES		NULL	
Q5Part1	tinyint(3) unsigned	YES		NULL	
Q5Part2	tinyint(3) unsigned	YES		NULL	
Q5Part3	tinyint(3) unsigned	YES		NULL	
Q5Part4	tinyint(3) unsigned	YES		NULL	
Q5Part5	tinyint(3) unsigned	YES		NULL	
Q5Part6	tinyint(3) unsigned	YES		NULL	
Q5Part7	tinyint(3) unsigned	YES		NULL	
age	tinyint(3) unsigned	YES		NULL	
gender	varchar(64)	YES		NULL	
where_live	varchar(64)	YES		NULL	
political	varchar(64)	YES		NULL	
international_travel	varchar(128)	YES		NULL	

#### 4.3.1. Anonymity

One of our biggest concerns when developing our in-house survey is that the previous iteration was far from anonymous. It asked survey-takers to input their full name and contact information, which was only necessary because of the fact that the results were not automatically calculated and given to them immediately. Because our system will be able to automatically and nearly instantly return results to the user, we were able to eliminate the collection of names and contact information altogether.

#### 4.3.2. Demographics

We maintained the categories of demographic information from the previous survey like age, gender, and general political stance. We were initially concerned that some of the categories would not be able to

adequately represent everyone taking the survey because some of the options were very limited. For example, it only had the option to select male or female for gender and only had conservative- or liberal-leaning as options for political stance. We added an “other” option for the gender question with a text box that the user can fill in if they choose. The political question remained unchanged because Dr. Hull did not want to have too many options available because he wanted to force users to make a decision on it. These demographic options are stored as a stripped-down plaintext string that represent the various possible answers.

#### 4.4. Automated Results

One of the biggest changes that we set out to complete compared to the previous group was to provide automated result calculations for users. Previously, Dr. Hull and his wife would have to calculate everything through Excel spreadsheets and manually email them to each person who took the survey. This was very inefficient, made users wait to see their results, and de-anonymized the survey.

When calculating user results, the main point is that their answers will be compared against everyone else who has taken the survey so that they can understand where they fall. We wanted to start with a base set of data so that the first surveys taken with our new system would not be against an empty dataset, but the existing data given to us by our client consisted of the total number of surveys taken and various numerators counting how many people were in each category for each question. This did not match how we stored the survey data, so we had to implement an additional system for keeping track of these totals and using them in the results calculations. We determined that the easiest and most time-efficient method of storing these would be using a structured JSON file that gets updated when someone finishes the survey. By keeping the database but also implementing this collection of category totals, we are able to get a much better look at the survey results and more easily create downloadable reports for the users and sustainability professionals.

The first three questions of the survey involve asking the user to allocate \$100 to a variety of categories, which are then summed according to our client’s specifications to get an idea of values in those areas. When the survey is submitted, we calculate those sums as shown in Table 5 and store them alongside the survey results in the database. We also determine the category that they fall into based on the table and save it with the results. The last two questions just

store a value from 1 to 5 that represents the category they chose from strongly disagree to strongly agree. The corresponding numerators in the JSON file are then updated based on their answers for each question.

*Table 5: Analysis Calculations*

	Strong	Weak	Neutral	Weak	Strong	
Natural capital (R+LS+N)- ((P+I+C)	100-25	24.999 - 5	4.99- -4.99	-5- -24.9	-25- -100	Social capital
Ecosystem Services (LS-N)	100 - 12	11.99 - 2	1.99 – -1.99	-2 - -11.9 9	-12 -100	Species and biodiversity
People Today (CG –FG)	100-25	24.999 - 5	4.99- -4.99	-5- -24.9	-25- -100	People Tomorrow
Us (us – Oth)	100-25	24.999 - 5	4.99- -4.99	-5- -24.9	-25- -100	Others

After the survey has been submitted, validated, and these calculations have been performed, we store the user’s survey ID in a server-side session variable and redirect them to the results page. The results page uses this variable to grab their results from the database, the totals information from the JSON file, and totals related to their group results if applicable. It then calculates percentages for each category based on the number of people in the category and total number of surveys taken and highlights the cell that represents the category the user belongs to.

#### 4.4.1. Group Functionality

Implementing a group feature became a lot easier when we decided to store the totals for each category in a JSON file. The survey has an optional field for the user to enter a group code that can be any valid string. When the user submits the survey, an “empty” JSON file for the group is created if it doesn’t exist yet, and it is updated according to the user’s results in the same manner as the totals.

Upon navigating to the results page, either from the survey or through the re-access feature, this file is loaded and used to display percentages in the same way as the overall totals file. If a group for the user exists, a toggle at

the top of the page appears to switch between comparing against the full dataset and their group.

## 4.5. Downloadable Results

Another key feature of the website is to provide downloadable reports, both for the user and our client or other professionals that may be using the site. These features provide an easy way for users to review their results and for administrators to access the full survey dataset.

### 4.5.1. User Results

The user report page that is generated after submitting the survey displays percentages of people in each category for each question with highlights for the user's results, as described in section 4.4. Additionally, we have extra information and links to external websites that help the user interpret their results. There is a "Print Results" button on the page that brings up the default print option for the user's browser and allows them to either print out the webpage or save it as a PDF file. If the user is in a group, they will have to switch to the group results view to download those results because the overall and group results are not displayed simultaneously.

If the user does not want to download or print their results but still wants to be able to view them later, they can use the re-access results functionality that we added to the homepage. Clicking the button brings up a text entry field where they can enter their survey ID that is listed on the results page, and once submitted will redirect them back to the report page. The primary difference between this and the downloadable version is that this will recalculate percentages based on the current totals for the overall population and their group, if applicable.

### 4.5.2. Full Dataset

We added a small administrator portal so that Dr. Hull and other sustainability professionals can log in and download all of the results. This uses traditional password hashing to maintain login security, but only has support for one account because we determined by talking to Dr. Hull that it was not necessary to create an entire account system.

After the admin logs in, they are redirected to the portal that has a download link for the full dataset. Upon visiting the portal page, some back-end work is done to dump the data to a series of Excel files and zip them up, which is then provided through the download link. We use a data manipulation and transformation library called Pandas to dump the entire database into the first sheet of an Excel file and the JSON totals into a second sheet of the same file. After that, all of the group JSON files are dumped into separate sheets on a second Excel file. Finally, these generated files are added to a zip file and returned for download.



## 5. Testing and Evaluation

Since this website will be used by our client Dr. Hull, his students, and professionals after the semester is over, we need the website to be thoroughly tested to ensure longevity.

Testing has been conducted in three categories: developer testing, client testing, and user testing.

We conducted developer testing to ensure the website functions correctly in regards to all static web pages, the database, and any scripts that are used to enhance the user or client's experience. To start, all static web pages have been analyzed for correct site navigation and any further usability. For example, the home page has all navigation working properly, both 'Take Survey' buttons function properly and identically, and the 'View Results' button functions correctly. This testing ensured that the website was usable for the other testing categories. After a user takes the survey and new data is acquired, the database correctly handles the given data so that it is stored properly. As mentioned before, we found an issue with this from our user testing but fixed it immediately. Furthermore, the database also correctly outputs the necessary data for the user's personal analysis. Another bug was found during user testing related to this, but was also immediately fixed. Finally, any scripts that are used on the 'Survey' and 'Results' pages have been tested to ensure they are correct. The scripts function correctly, which is measured by the number of console errors in the browser and if the desired outcome of each script is produced. This testing ensured that all scripts that are used to enhance the user experience are functioning correctly.

We conducted client testing to ensure that the website's admin feature works correctly. The website provides a way for the client to access the survey results for everyone that has taken the survey. This testing ensured that our client has an easy, accessible option to download the information from the database. The client testing was accomplished during one of our biweekly meetings with our client. Our testing method involved several tasks for our client to accomplish and comment on but also a heuristic evaluation on the aesthetics of the pages. For more details, our client testing form can be found in Appendix 12.3. No large issues were found with the admin feature, but we got feedback on other aspects of the website we asked our client to review. These small changes were added to the website to clarify survey questions and improve the visual aspects of the site.

Finally, we conducted user testing to ensure that the website works correctly from a user's perspective. Some of the testing here overlaps with the developer testing, but we got input from non-developers, which helped us get better feedback. The user testing form can be found in Appendix 12.4. Similarly to the client testing, the user testing

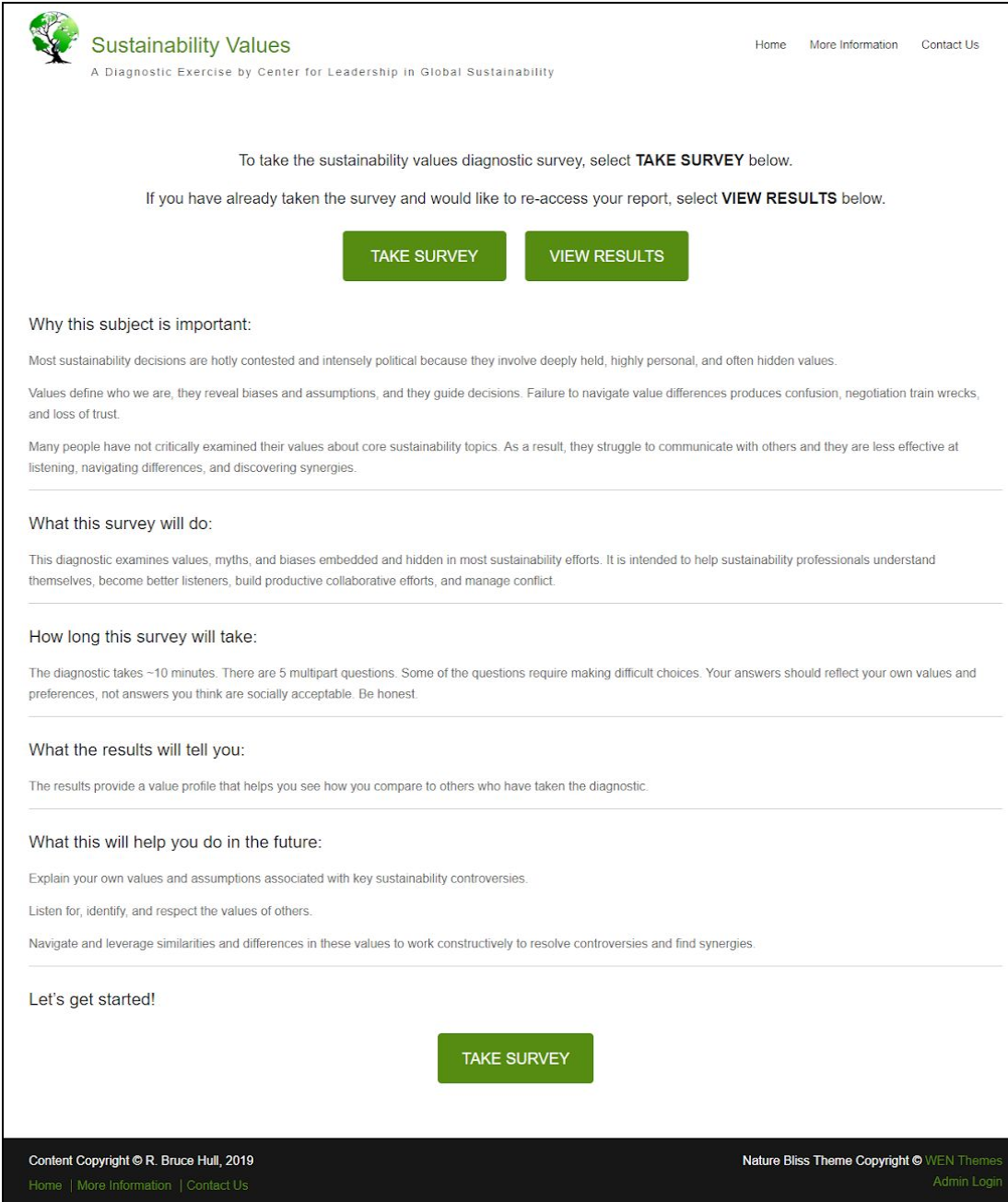
involved having the subjects accomplish different tasks, answer some basic questions about each task, and analyze the visual aspect of the site. This testing focused on ensuring that the 'Survey' and 'Results' pages were easy to use and understand, but also had small tasks for the other webpages. As mentioned previously, we got several comments on all of the pages, mostly focusing on the aesthetics but also some on the content of the webpage. This feedback was used to revise our initial and intermediate website design and content.

Based on the three types of testing we used, our final website is thoroughly functional and correct. We feel confident that the website is now able to function without our supervision and will continue to function correctly.

## 6. User Manual

This website will be used by our client Dr. Hull, students, and other professionals that want to take the diagnostic survey. Here we will show the process of navigating the website to take the survey and find more information about the Sustainability Values Diagnostic.

### 6.1. Homepage



**Sustainability Values**  
A Diagnostic Exercise by Center for Leadership in Global Sustainability

Home   More Information   Contact Us

To take the sustainability values diagnostic survey, select **TAKE SURVEY** below.

If you have already taken the survey and would like to re-access your report, select **VIEW RESULTS** below.

**TAKE SURVEY**   **VIEW RESULTS**

**Why this subject is important:**

Most sustainability decisions are hotly contested and intensely political because they involve deeply held, highly personal, and often hidden values.

Values define who we are, they reveal biases and assumptions, and they guide decisions. Failure to navigate value differences produces confusion, negotiation train wrecks, and loss of trust.

Many people have not critically examined their values about core sustainability topics. As a result, they struggle to communicate with others and they are less effective at listening, navigating differences, and discovering synergies.

**What this survey will do:**

This diagnostic examines values, myths, and biases embedded and hidden in most sustainability efforts. It is intended to help sustainability professionals understand themselves, become better listeners, build productive collaborative efforts, and manage conflict.

**How long this survey will take:**

The diagnostic takes ~10 minutes. There are 5 multipart questions. Some of the questions require making difficult choices. Your answers should reflect your own values and preferences, not answers you think are socially acceptable. Be honest.

**What the results will tell you:**

The results provide a value profile that helps you see how you compare to others who have taken the diagnostic.

**What this will help you do in the future:**

Explain your own values and assumptions associated with key sustainability controversies.

Listen for, identify, and respect the values of others.

Navigate and leverage similarities and differences in these values to work constructively to resolve controversies and find synergies.

**Let's get started!**

**TAKE SURVEY**

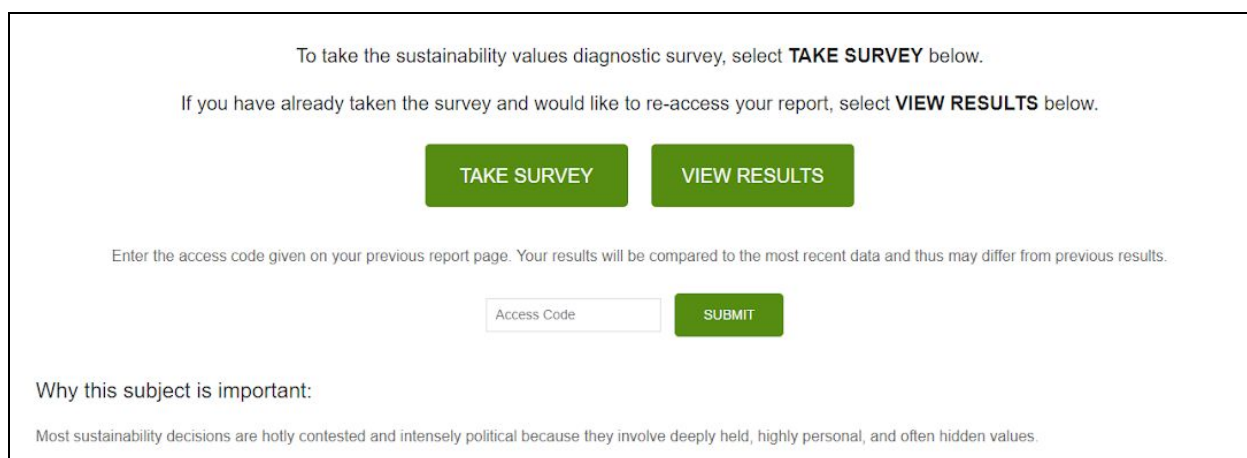
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Home | More Information | Contact Us   Admin Login

Figure 22: User manual, homepage instructions

To get to the website, the current URL is '<http://www.sustainabilityvalues.com/>'. Once the user types in the URL, they will see the webpage above (*Figure 22*).

With the navigation bar located at the top of the webpage, the user has three options: 'Home', 'More Information', and 'Contact Us'.

If the user does not choose to navigate the site, they have access to take the survey with two 'Take Survey' buttons located at the top and bottom of this page. The user can also learn more information about the survey between the two buttons.



To take the sustainability values diagnostic survey, select **TAKE SURVEY** below.

If you have already taken the survey and would like to re-access your report, select **VIEW RESULTS** below.

**TAKE SURVEY** **VIEW RESULTS**

Enter the access code given on your previous report page. Your results will be compared to the most recent data and thus may differ from previous results.

Access Code **SUBMIT**

Why this subject is important:

Most sustainability decisions are hotly contested and intensely political because they involve deeply held, highly personal, and often hidden values.

*Figure 23: User manual, homepage view results instructions*

In addition to these 'Take Survey' buttons, the user has the ability to re-access previous results using the 'View Results' button. When the button is pressed, a secondary dialog appears below the buttons (*Figure 23*). This dialog prompts the user to enter their access code that was given to them when they took the survey. Once the 'Submit' button is clicked, the user is redirected to the Results page (Section 6.3).

On the left side of the footer, the user has the same options as the navigation bar at the top. On the right side of the footer, the admin user (only Dr. Hull) will have access to login and explore other features, discussed in Section 6.6.

## 6.2. Survey

### Sustainability Values

A Diagnostic

Anonymity and confidentiality will be protected.

Do you have a group code?

☒ Yes    ☐ No

Group Code:

Assume the total global budget for worldwide sustainable development efforts is \$100, that you are the person to allocate it, and that you must allocate all of it. Assume your allocations will determine the outcomes that get emphasized by sustainable development efforts. Allocate ALL \$100 among the following 6 choices.

<u>Resources</u> : Money for programs that promote & sustain renewable & non-renewable resource inputs into the economy, including energy, biomaterials, water, fish, minerals, oil, and soil.	\$ <input type="text" value="0"/>
<u>Life Support</u> : Money for programs that promote and sustain ecosystem functions and services such as water filtration, climate moderation, crop pollination, and protection from solar radiation.	\$ <input type="text" value="0"/>
<u>Nature</u> : Money for programs that promote and sustain species, habitat, and conditions such as biodiversity, wilderness, parks, and free-flowing rivers.	\$ <input type="text" value="0"/>
<u>People</u> : Money for programs that end poverty, disease, and illiteracy so as to increase people's capacity to meet challenges such as sustainable development.	\$ <input type="text" value="0"/>
<u>Institutions</u> : Money for programs that promote and sustain markets, governments, media, civil society, military, health care, art, religion, and other institutions that have the capacity to meet challenges and solve problems.	\$ <input type="text" value="0"/>
<u>Culture</u> : Money for programs that promote and sustain values and traditions such as freedom, equality, democracy, art, music, family values, capitalism, religion, small family farm, rural jobs, property rights, discipline, honor parents, tolerance for diversity, inclusion, opportunity, etc.	\$ <input type="text" value="0"/>
<b>Total</b>	\$ <input type="text" value="0"/>

Assume the total global budget for worldwide sustainable development efforts is \$100, that you are the person to allocate it, and that you must allocate all of it. How would you allocate the \$100 between the following two choices? You must allocate ALL of the \$100.

Money for programs to help people living today who lack basic necessities such as sufficient food, shelter, economic opportunity, clean air, and clean water.	\$ <input type="text" value="0"/>
Money for programs that ensure future generations have environmental and social conditions to meet their basic needs.	\$ <input type="text" value="0"/>
<b>Total</b>	\$ <input type="text" value="0"/>

Assume an unwanted land use (such as a pipeline or hazardous waste dump) were proposed for the community where you live and two organizations were asking for your donations. You have \$100. Allocate it between two organizations. You must allocate ALL of the \$100.

Money for the organization whose mission is to monitor, advise, and help the proposed land use be developed in my community in ways that best protect the people and environment in my community.	\$ <input type="text" value="0"/>
Money for the organization whose mission is to stop the proposed land use in my community (even if doing so relocates it to another community).	\$ <input type="text" value="0"/>
<b>Total</b>	\$ <input type="text" value="0"/>

Figure 24: User manual, survey instructions, group code & money allocation

The Sustainability Values Diagnostic survey starts with a simple question on whether the user has a group code. In the case that the user is part of a group (i.e. guest lectures, classes, organizations), the user can use a unique identifier to evaluate their results in relation to their peers. By default, this question has the 'No' option checked. When the 'Yes' option is clicked, the dialog for entering the group code appears below.

Following the group code question, there are three questions of a similar format, shown in *Figure 24*. For these questions, the user must allocate a total of \$100 to the group of options. To successfully submit the survey later, each 'Total' field must be exactly \$100. If the user inputs more than \$100, the 'Total' row will change to a slight red color, signifying the input is wrong. If the user inputs exactly \$100, the row will similarly be green, signifying the input is correct. After completing each question, the user must scroll down in the browser to continue to the next question.

How Should Sustainability Be Achieved?					
Six broad strategies exist. Which strategies do you most support?					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I believe <u>technological innovation</u> is the best way to address sustainable development challenges. Human ingenuity knows no bounds. Necessity is the mother of invention. As challenges become critical, innovators offering solutions will be rewarded.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe <u>unleashing the free market</u> is the best way to address sustainable development challenges. Businesses will overcome sustainability challenges such as degraded ecosystem services, climate change, resource scarcity, and social unrest if and when these challenges threaten business operations and profits. We need to minimize burdensome government regulations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that <u>fixing market failures</u> is the best way to address sustainable development challenges. Market failures include externalities (such as pollution) and free-ridership (such as benefiting from a stable climate that others pay to maintain). These market failures wrongly reward business decisions that harm people and planet. Market fixes will require some government intervention and the cooperation of businesses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe <u>strong government</u> is the best way to address sustainable development challenges. Government agencies with clear performance metrics and competent staff offer the best solutions for some sustainability challenges such as climate change. Solutions to Tragedies of the Commons, such as climate change, often require mutual coercion mutually agreed upon.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe <u>new institutions</u> will be the best way to address sustainable development challenges. New partnerships and programs, many led by civil society organizations (i.e., NGOs), will emerge to replace 20th Century institutions and solve 21st Century problems. Distinctions will blur between business, government, and civil society as new institutions emerge through crosssector partnership and collaboration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe <u>education of consumers and citizens</u> is the best way to address sustainable development challenges. Sustainable development ultimately boils down to the hearts, minds, and behaviors of individuals—the daily decisions people make. People will make good decisions if they have the right information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Values and Beliefs					
Rate how much you agree with each of the following statements.					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My religious faith and practice motivate my environmental stewardship.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other mammals have as much right to exist as humans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humanity is pushing the limits of Earth's ecological systems, risking ecological collapse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The human population explosion presents the greatest threat to sustainable development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nature's ecology has self-correcting properties that keep it balanced and healthy. If humans disturb this balance, then nature becomes less healthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The land ethics of native and aboriginal people (i.e., Native Americans alive before Columbus) were more "sustainable" than the land ethics of middle class people alive today.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evolution (survival-of-the-fittest) made humans the best-adapted, highest-evolved species and we therefore have earned the right to manage other species.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 25: User manual, survey instructions, beliefs

After the first three questions, the survey continues with two questions of a different format. These two questions have a belief or value associated with each part. The user has to select from ‘Strongly Disagree’, ‘Disagree’, ‘Neutral’, ‘Agree’, or ‘Strongly Agree’ based on how strongly they agree or disagree about that particular belief or value. Each row in these tables is a question, so the user may not select more than one button in a row.

### Demographics

Several simple demographic questions follow: they will be used only in the aggregate data to show how people's sustainability values differ by age, political orientation, travel, and where they grew up. All of this information remains completely confidential and will not be reported.

Age

Gender

☐ Male  
☐ Female  
☐ Other  Optional

For most of my life I lived...

☐ in rural areas  
☐ in suburban areas  
☐ in urban areas

Politically, I tend to be...

☐ more conservative than liberal on most issues  
☐ more liberal than conservative on most issues

In terms of international travel experience, I have...

☐ not traveled outside my country of birth  
☐ visited 3 or fewer different countries  
☐ visited more than 3 different countries

Thank you!

SUBMIT

*Figure 26: User manual, survey instructions, demographics*



After the user completes the second set of questions, the user is prompted to enter demographic information. This information remains completely anonymous but is needed for Dr. Hull's research. The user must enter their age as a number, pick their gender, and answer a few more questions about where they have lived, their political stance, and their international travel. Again, this information is completely confidential and anonymous since we do not ask for a name or identifier that is representative and distinguishable of the user.

After the user is done with the entire survey, they must hit the 'Submit' button to submit their answers. This action will check that all questions are answered completely and correctly.

For most of my life I lived...

☐ in rural areas

☐ in suburban areas

☐ in urban areas

Politically, I tend to be...

☐ more conservative than liberal on most issues

☐ more liberal than conservative on most issues

In terms of international travel experience, I have...

☐ not traveled outside my country of birth

☐ visited 3 or fewer different countries

☐ visited more than 3 different countries

Thank you!

Please answer the highlighted sections above.

SUBMIT

*Figure 27: User manual, survey instructions, invalid answers*

If all questions are not answered, the user will be prompted to modify their answers, as shown in *Figure 27*. If all questions are answered, the user's answers will be sent to the website's database.

## 6.3. Survey Results

### Sustainability Values Diagnostic

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

Each cell shows the % of people out of 2315 that fall in each category.

Your scores are denoted by the highlighted cells.

Since you took the survey as part of a group, select how you would like to compare your results:

☒ Total Scores   
 ☐ Group  Scores

**What should be sustained?**

You strongly lean towards 'Social Capital', so did 7% of people who took this survey.

You strongly lean towards 'Ecosystem Services', so did 16% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
Natural Capital <input type="text"/>	20%	30%	29%	15%	7%	Social Capital <input type="text"/>
Ecosystem Services <input type="text"/>	16%	27%	36%	16%	5%	Species and Biodiversity <input type="text"/>

**Who should benefit?**

You strongly lean towards 'People Tomorrow', so did 14% of people who took this survey.

You strongly lean towards 'Us', so did 49% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
People Today <input type="text"/>	12%	23%	20%	30%	14%	People Tomorrow <input type="text"/>
Us <input type="text"/>	49%	7%	16%	10%	19%	Others <input type="text"/>

**How should we solve sustainability problems?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
With Technological Innovation	4%	6%	13%	45%	33%
By freeing market forces	11%	24%	34%	19%	12%
By fixing market failures	1%	16%	20%	49%	14%
With strong government actions	4%	23%	31%	33%	9%
By creating new institutions	1%	2%	7%	43%	47%
By educating citizens & consumers	9%	23%	26%	32%	9%

**Hotly Debated Beliefs**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Religion:</b> Because God created the natural world, stewardship of nature should be my religious duty.	11%	11%	39%	22%	18%
<b>Rights:</b> Mammals have as much right to exist as humans.	1%	8%	17%	33%	40%
<b>Limits:</b> Humanity is pushing the limits of Earth ecological systems, risking ecological collapse.	1%	8%	11%	33%	47%
<b>Balance:</b> Nature's ecology has self-correcting properties that keep it balanced and healthy. It is only when humans disturb things that nature becomes unbalanced and unhealthy.	1%	16%	17%	49%	17%
<b>Nobel savage:</b> Modern Americans have much to learn about sustainable development from the land ethics and land management of Native Americans alive before Columbus.	1%	8%	25%	40%	26%
<b>Best Evolved:</b> Survival-of-the-fittest made humans the best-adapted, highest-evolved species and we therefore have the right to manage other species.	12%	31%	29%	19%	9%

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

To re-access your results use the following access code:

24

[PRINT RESULTS](#)

Figure 28: User manual, survey results instructions

After successfully submitted the survey, the user will be redirected to the ‘Survey Results’ page. This page shows how the user’s answers compares to other survey entries recorded before. Each cell in the tables above in *Figure 28* holds a percentage that represents the percentage of people that fit in that column. The user’s choice is highlighted in green. To help the user understand the first two tables, sentences have been added to explain where the user fell in the spectrum and how many others also fell in that category.

Additionally, since users can also see how their answers compare to other users in the same group, there is a button for showing that. After clicking the other button, the percentages in each table cell re-adjust to show the correct values.

## Sustainability Values Diagnostic

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

Each cell shows the % of people out of 3 that fall in each category.

Your scores are denoted by the highlighted cells.

Since you took the survey as part of a group, select how you would like to compare your results:

☐ Total Scores   
 ☒ Group SampleGroup Scores

**What should be sustained?**

You strongly lean towards 'Social Capital', so did 100% of people who took this survey.

You strongly lean towards 'Ecosystem Services', so did 100% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
Natural Capital	0%	0%	0%	0%	100%	Social Capital
Ecosystem Services	100%	0%	0%	0%	0%	Species and Biodiversity

**Who should benefit?**

You strongly lean towards 'People Tomorrow', so did 100% of people who took this survey.

You strongly lean towards 'Us', so did 100% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
People Today	0%	0%	0%	0%	100%	People Tomorrow
Us	100%	0%	0%	0%	0%	Others

**How should we solve sustainability problems?**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
With Technological Innovation	0%	100%	0%	0%	0%
By freeing market forces	0%	0%	0%	100%	0%
By fixing market failures	0%	0%	100%	0%	0%
With strong government actions	0%	0%	100%	0%	0%
By creating new institutions	0%	0%	0%	100%	0%
By educating citizens & consumers	0%	0%	0%	100%	0%

**Hotly Debated Beliefs**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Religion:</b> Because God created the natural world, stewardship of nature should be my religious duty.	0%	0%	0%	100%	0%
<b>Rights:</b> Mammals have as much right to exist as humans.	0%	0%	100%	0%	0%
<b>Limits:</b> Humanity is pushing the limits of Earth ecological systems, risking ecological collapse.	0%	0%	0%	100%	0%
<b>Balance:</b> Nature's ecology has self-correcting properties that keep it balanced and healthy. It is only when humans disturb things that nature becomes unbalanced and unhealthy.	0%	100%	0%	0%	0%
<b>Nobel savage:</b> Modern Americans have much to learn about sustainable development from the land ethics and land management of Native Americans alive before Columbus.	0%	0%	0%	100%	0%
<b>Best Evolved:</b> Survival-of-the-fittest made humans the best-adapted, highest-evolved species and we therefore have the right to manage other species.	0%	0%	100%	0%	0%

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

To re-access your results use the following access code:

24

PRINT RESULTS


Figure 29: User manual, survey group results instructions

As you can see between *Figure 28* and *Figure 29*, the percentages change based on if the user is viewing the total results or the group results, respectively.

At the bottom of the Results page, the user is given their access code. This access code is used for re-accessing results at a later date. This code is entered on the home page, shown in *Figure 24*. Additionally, there is a ‘Print Results’ button. If the user wishes to save or print their results, they can click this button. The user’s browser’s built-in print feature is invoked, in which the user can then choose to ‘Save as PDF’ or print their results to a printer. The PDF version of this report can be found in Appendix 12.2.

## 6.4. More Information

More Information

The guide to help interpret your value diagnostic is available at: [Sustainability Values Booklet](#) 

Additional information about the diagnostic, coaching, workshops, and research on the topic can be found at: [The Center for Leadership in Global Sustainability](#). Their mission is to educate, inspire, and empower professionals to create a better future for people and our planet.

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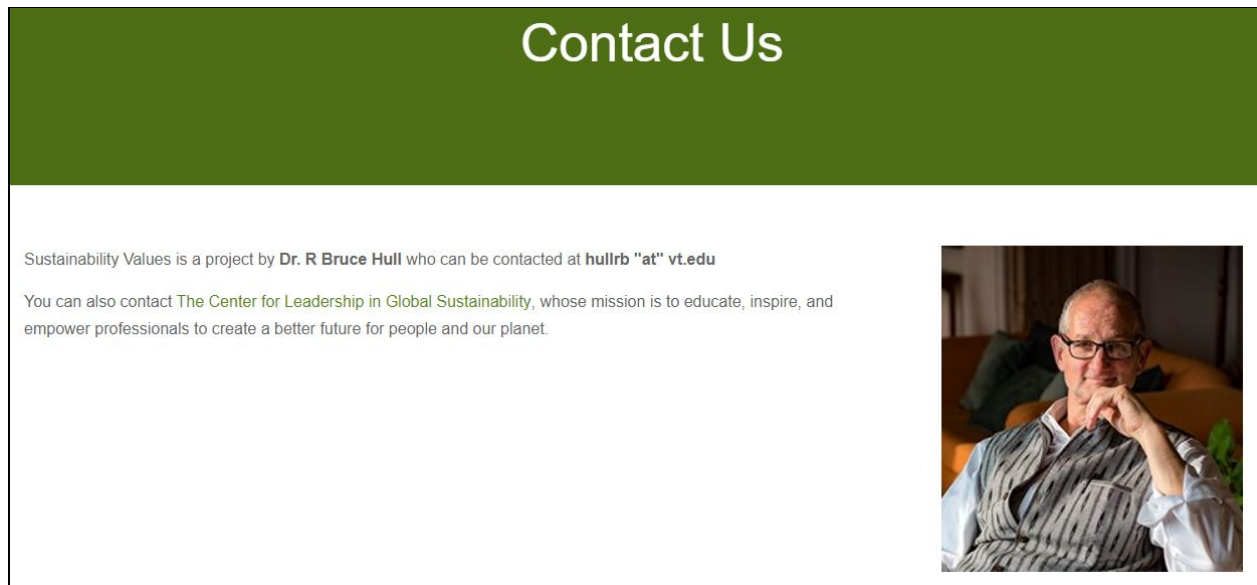
Literature you may find useful:

- Gregory, R. (2002). Incorporating Value Trade-offs into Community-Based Environmental Risk Decisions. *Environmental Values*, 11(4), 461-488. doi:10.3197/096327102129341181
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*Figure 30: User manual, more information instructions*

From any of the previous pages, if the user clicks on the ‘More Information’ tab of the navigation bar or footer, they will be redirected to this page. This page only holds information for users to explore what their survey results mean, the Center for Leadership in Global Sustainability, or resources to further study sustainability.

## 6.5. Contact Us



*Figure 31: User manual, contact us instructions*

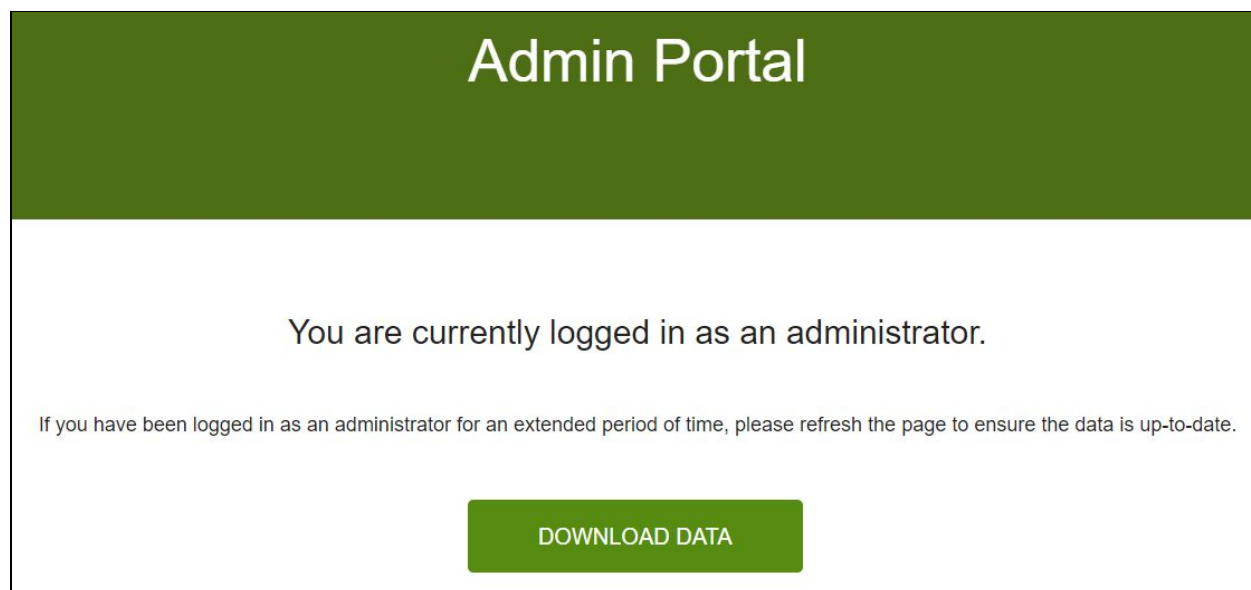
If the user clicks the ‘Contact Us’ tab of the navigation bar or footer, they will be redirected to this page. This page only holds information on how to get in touch with our client Dr. Hull by email or the Center for Leadership in Global Sustainability.

## 6.6. Admin Portal

*Figure 32: User manual, admin login instructions*

If the user clicks on the ‘Admin Login’ tab in the right side of the footer, they will be redirected to this page. This page is used only for the user to input a username and password for an administrator account. If the user inputs a wrong username

and password combination, an error message will display and let the user try again. If the user inputs a correct combination, they will be redirected to the 'Admin Portal' page.



*Figure 33: User manual, admin portal instructions*

This page is accessible only if the user has logged in to the administrator account. In theory, this should only be our client, Dr. Hull. This page gives Dr. Hull the ability to download the website's database structure and any separate group survey result information.

After clicking the 'Download Data' button, an Excel file is downloaded. This Excel file has two components: the database and group numbers. The database information has the raw survey data for each question and part for all surveys taken. The Excel file formats this nicely for Dr. Hull to interpret. The group number information has the number of people in each category for each group code that has been used. This is also formatted nicely in Excel for Dr. Hull.

## 7. Developer's Manual

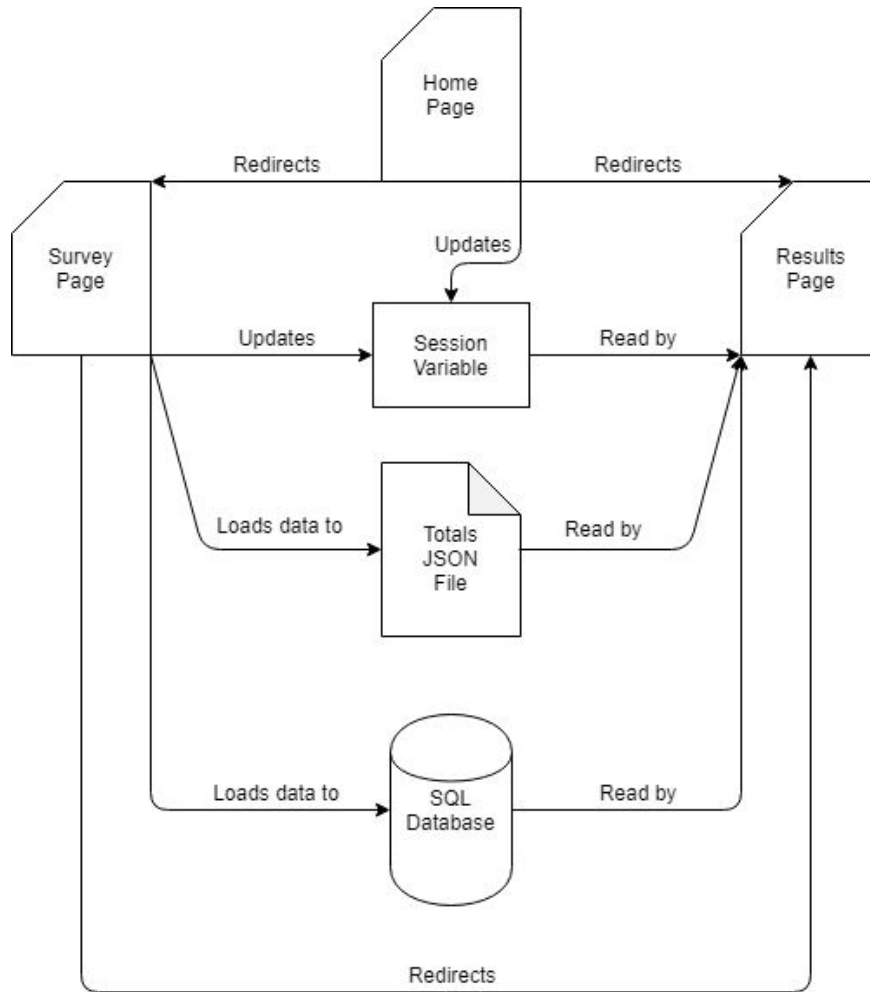
Since the semester is ending, we have stopped implementing additional major functionalities for the website. A list of future work for the website can be found in Section 9, but any future work needs to build off of the existing platform we have created. This section will summarize the organization and layout of our project for further development.

The website is hosted on PythonAnywhere, which allows us to seamlessly merge the front-end web design with the back-end database with Python and MySQL. Furthermore, PythonAnywhere holds all the code needed to recreate or modify the website. In addition to PythonAnywhere, our team has used GitHub for version control, branching, and collaboration. The repository is private for security, but any future work is recommended to use a similar platform for code management if PythonAnywhere is not sufficient.

This account has been fully transferred to our client Dr. Hull.



## 7.1. Data Flow



*Figure 34: Developer's manual, data flow*

Any new developer should first familiarize themselves with the data flow of the website. *Figure 34* summarizes how the major functions connect. From the Homepage, the user can navigate to the Survey page or the Results page (using a re-access code). Once the user fills out the survey, the answers are transferred to a JSON file and the SQL database. The session variable that was assigned to the user when they arrived at the home page is updated with a flag telling the site that the survey was taken. The user is also redirected to the Results page automatically. Here the same JSON file and SQL database is accessed to get information on other user results. This information is used to create the percentages in each table cell and highlight where the user falls in each table row.

## 7.2. File Inventory

For any file editing or additions, a new developer should use this section to become familiar with our file structure. To start, PythonAnywhere has a built-in editor for files in the project directory. To navigate to the file selector from the dashboard, click either the ‘Browse files’ button or the ‘Files’ tab.

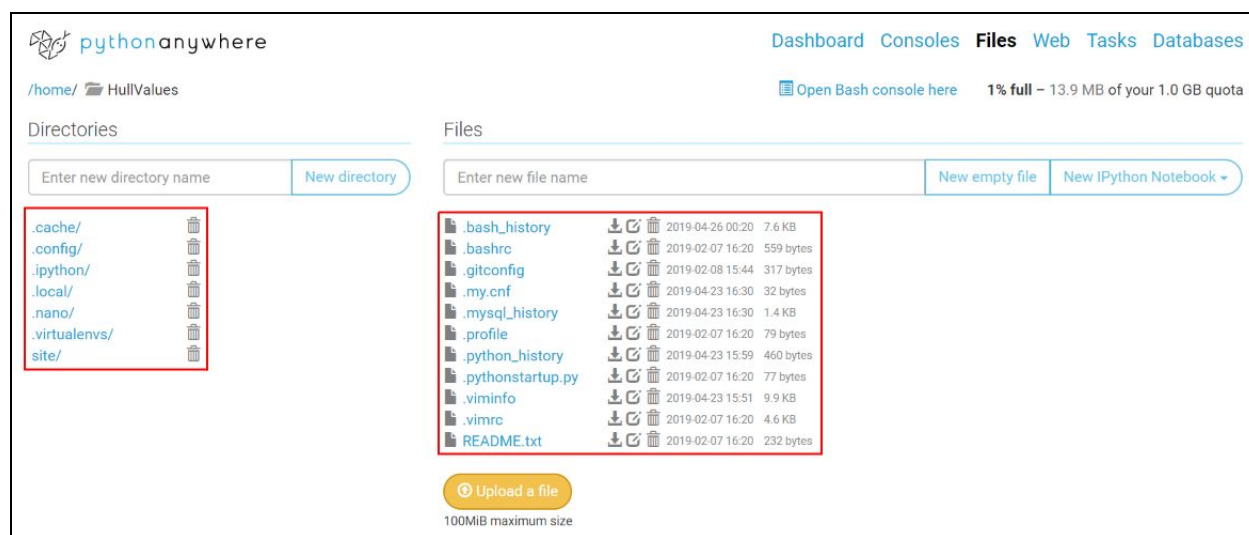


Figure 35: Developer’s manual, file directory instructions 1

The page shown in *Figure 35* will appear, which shows the highest directory for the project. Almost all of the files and directories highlighted here are not important for someone wishing to edit the site. To do so, navigate to the ‘site/’ directory.

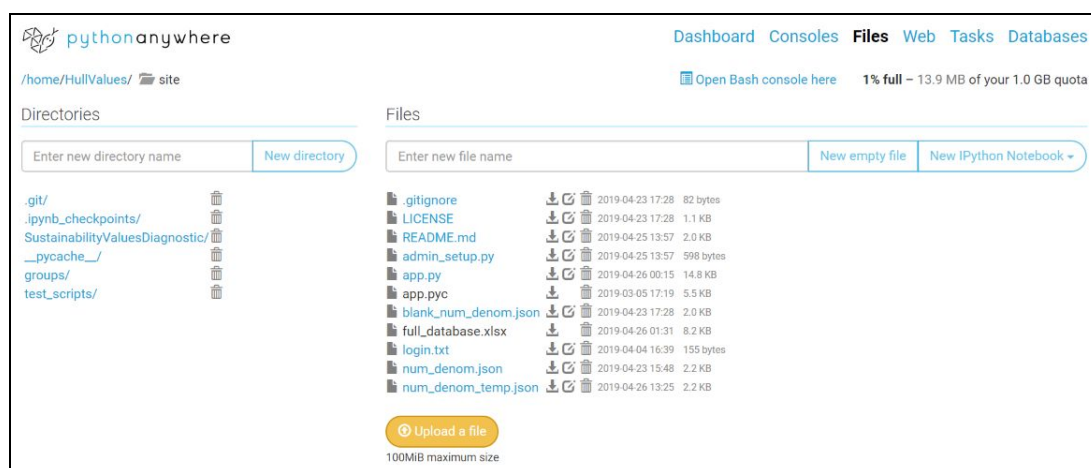
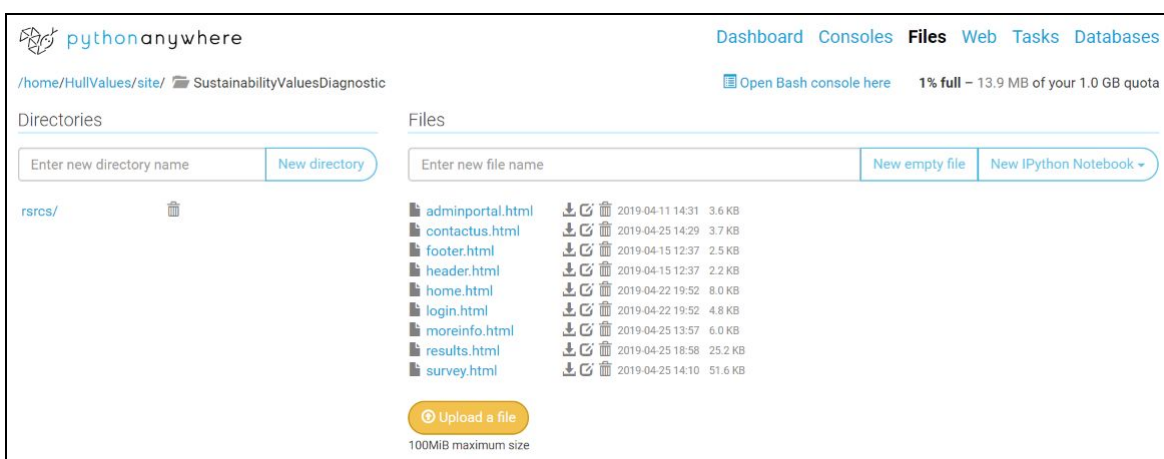


Figure 36: Developer’s manual, file directory instructions 2

This directory holds a lot of crucial files for the website. The ‘app.py’ script is used by the website to handle site navigation, survey collection, database access, survey results creation, admin login, and database download. This file is essentially the controller for the website, which handles access to the back-end and front-end. The ‘admin\_setup.py’ file is the script given to Dr. Hull to reset the username and password of the administrator account. The ‘full\_database.xlsx’ file is the Excel file created upon an admin downloading the database contents. Encrypted administrator credentials are held in ‘login.txt.’ Finally, ‘num\_denom.json’ holds the number of people that fall in each category of the survey questions. In addition to this file, when a group code is used by survey users, a similar file is created in the ‘groups/’ subdirectory. The final item to note is the ‘SustainabilityValuesDiagnostic’ subdirectory.



*Figure 37: Developer’s manual, file directory instructions 3*

As shown in *Figure 37*, this subdirectory holds the HTML files and other files needed for the front-end of the website. Each file is named to correspond to the webpage titled similarly (i.e. ‘contactus.html’ is the ‘Contact Us’ page). The header and footer of each page is constant and independent of which page the user is on, so it was broken up into separate files in case a change needs to be made to all headers or footers. The HTML code is inserted into each webpage at the top and bottom using the Jinja2 tool. Another subdirectory to note is the ‘rsrscs/’ directory, which holds the rest of the files for the front-end.

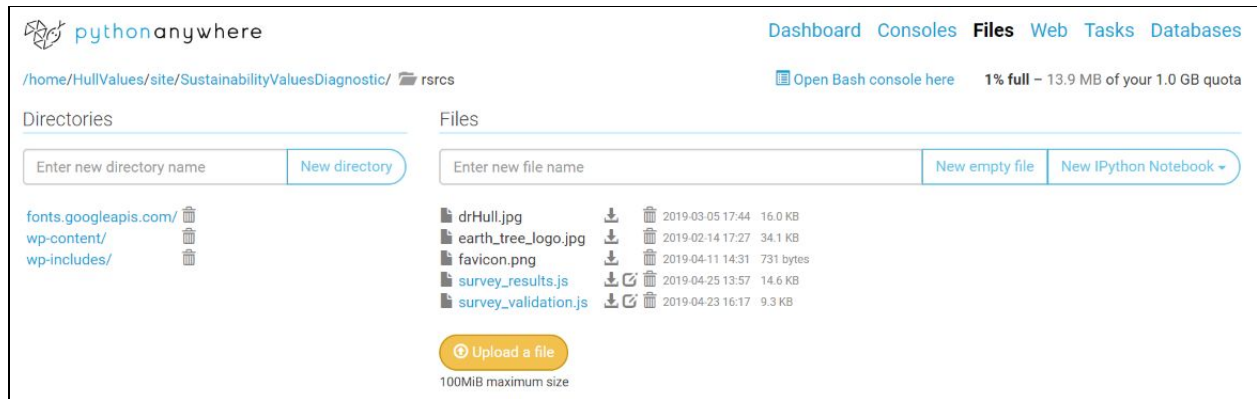


Figure 38: Developer's manual, file directory instructions 4

This directory holds three types of files, as shown in Figure 38. The first is the collection of images used in the website. In the header, the logo for the website is the 'earth\_tree\_logo.jpg' file. The icon in the user's browser tab is the 'favicon.png' file. Finally, on the Contact Us page, the 'drHull.jpg' file shows an image of our client. The second type of file is the two remaining files at this level, 'survey\_results.js' and 'survey\_validation.js.' The 'survey\_validation.js' JavaScript file is used on the Survey page to highlight table rows, ensure the sum is 100 for the first questions, increase ease-of-use for the user in the remaining questions, and ensure that each question is answered correctly. The 'survey\_results.js' JavaScript file is used on the Results page to fill in the table cells with percentages, add sentences for understanding the table content, add highlighting based on the user's answers, and print the results page.

## 8. Lessons Learned

Throughout this process there were several lessons we initially kept in mind for project management and execution. To avoid ambiguity in our schedule, we created a detailed roadmap that broke down everything we needed to accomplish by the end of this project. We split up our tasks into two week increments, or sprints, to ensure we were constantly on track. We then assigned roles to each of our team members based on careful skill assessment to ensure each member was playing to their individual strengths. We also wanted to ensure we had constant team collaboration and client communication, so we built meetings into each sprint to establish time for just that. In addition, we planned for constant documentation to reduce ambiguity in our project. This allowed us to avoid common issues and setbacks as our project progressed.

However, we encountered certain user experience (UX) issues that we did not initially consider. We originally were using the exact content from the previous semester's final project. This content contained issue we had yet to notice. These issues included grammar, spelling, consistency, and overall sensitivity/demographics. We were too heavily focused on implementation and functionality in first half of our project development and therefore could have missed these important factors.

These issues came up in the beginning of Sprint 4 and therefore we were able to address them early. We added identifying these occurrences and correcting them into our schedule with little conflict. We had originally planned to conduct user testing in Sprint 5 but agreed that this needed to be addressed sooner. This taught our group that user testing should have been done more periodically throughout our earlier sprints. While we were working on implementation, we should have also devoted time to reviewing the content we were providing.

When developing a website that will be presented to a wide range of users it is important to consider the usability in terms of function but also content. The functionality of the website must be intuitive and straightforward, but the information must be easily understandable and apply to the entire audience. To ensure this is accomplished, user testing must be done with possible audience members. Therefore, we conducted user testing with our client and other possible users.

Following our user testing, we learned that it may have been beneficial to conduct said user testing earlier. While we were able to remedy almost all of the issues we encountered during our user testing, there are bugs we could have found sooner, as mentioned in the [Implementation](#) section, if we had conducted our user tests earlier on.

We also encountered a small issue when organizing our user testing schedule. We opened an excel sheet for Dr. Hull's students to sign up for designated time slots, however, we had an issue with students writing over each others names. Since Dr. Hull offered extra credit to attend our user tests, there was a large demand with limited availability. We had assumed students would be respectful of other students' sign-ups but we were mistaken. In the future, we would need a more structured sign-up method to ensure an organized sign-up process.

Lastly, we were only able to complete two out of our five stretch goals. While we are proud of our accomplishments for this project, we might have been able to complete our additional stretch goals if we had assessed the difficulty of these stretch goals earlier in the project. In addition, we added some of these stretch goals later on as the concepts arose. Due to the late addition of these goals, we had a limited time for implementation. In order to avoid late addition of stretch goals, we could have brainstormed any additional features we may have wanted sooner.

In the end, our biggest lesson learned was to have earlier assessment and implementation. This may have benefited the overall user experience and functionality of our site. We could have found issues and bugs sooner and possibly added additional functionality. However, for the most part, our scheduling and planning was exceptional and we were able to accomplish the main goals for this project.

## 9. Plans for Future Projects

Although our website is fully complete, there were stretch goals that we initially had planned, as mentioned above, that we were not able to accomplish. In the beginning of the project, we had three defined stretch goals. One of these was an idea posed by our client, Dr. Hull. He wanted to give users the ability to re-access their results once completing the survey. This was not at the top of our clients priorities as long as students were able to download their results. In addition, he wanted some sort of group functionality to allow his students to take the survey in a group and see how they compare to one another. This was also not high on our client's priority list, so we left both of these goals as stretch goals. Fortunately, in the end, we were able to accomplish both.

However, we had another idea in the beginning of the project. This idea involved adding additional visualizations to the report page to increase the users' ability to interpret their results. When we completed the implementation of our website, we came to the conclusion that this task would take longer than the allotted time we had left.

Additionally, we came up with a couple more stretch goals as we got further into the project. One of which was to allow the administrator to edit certain text within the site. This would include text on the homepage, more information page, and contact us page. We thought this might be beneficial to our client if any of the information on these pages fell out-of-date. We discussed this with him and he agreed it would be helpful but not necessary.

Our last stretch goal idea was to simplify the administrator credential change process. This is a process that we documented for our client because of its complicated nature. The overall complexity of this process was to ensure the security of the site. However, we wanted to look into the possibility of making it easier on our client. This proved to be a challenge if we wanted to keep the administrator access secure. We assessed that the trade-off of ease versus security was not worth it and decided the difficulty level would be too high for our remaining time. Thus, we were unable to complete this stretch goal as well.

While we were not able to accomplish the aforementioned stretch goals, it is clear their functionality would still benefit our client. Therefore, the implementation of additional visualizations, edit functionality, and an easier credential change could be tasks for future projects. If these additions were made, it would improve our client and user experience.

Other than our incomplete stretch goals, future projects could add aesthetic changes and/or future updates to the information and survey provided on the site.

Lastly, an improvement could be made to our database design to ensure the longevity of the project. We currently store totals for each category in a JSON file, but adding groups to this complicated the functionality as each group's total is in a separate file. One way of handling this is simply to leave it as is and upgrade PythonAnywhere to have increased file storage capacity. This will work, but the data is still spread out and harder to work with than an Excel file. A better way of fixing this would be to add an additional database table that has the same format as the JSON files with entries for the overall totals and group codes. This requires refactoring work that we do not have time to complete, but could be completed in the future.

With the additional implementation of our stretch goals, aesthetic changes, possible information updates and database design changes, this project could progress even further in the future. In all, this project has made great progress but still has clear room for improvement.



## 10. Acknowledgements

All of this was made possible due to the previous Sustainability Values Diagnostic team efforts and our client, Dr. Hull. The previous semester team had a well laid out design with varying levels of functionality. Due to this initial design scheme we were able to enhance the functionality with less effort towards design improvements. They proved their original content and implementation, saving us a huge portion of work in the beginning of our project. We worked with their HTML files to improve the design and incorporate a working survey and analysis into the site. Without their efforts we would have had much less time to devote to implementing these functionalities.

Our client, Dr. Hull, had the original vision for this project. His main purpose for this project is to help sustainability professionals learn about the values and opinions that impact their work as facilitators and collaborators. In addition, this project will allow individuals to navigate their own values and work to resolve the controversies that surround sustainability. His constant communication and efforts in guiding our designs and implementation ensured our project was on par with his goals. This project would not be possible without Dr. Hull's desire to pursue this field and express its importance to others.

## 11. References

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## 12. Appendix

### 12.1. Roadmap/milestones

Sprint	Week	Tasks
1	Week of 02/03-02/09	<ul style="list-style-type: none"> <li>✓ Setup PythonAnywhere</li> <li>✓ Setup Git repository</li> <li>✓ Initial database design</li> <li>✓ Initial front-end design               <ul style="list-style-type: none"> <li>✓ Wireframes/changes to template</li> </ul> </li> </ul>
	Week of 02/10-02/16	<ul style="list-style-type: none"> <li>✓ Upload initial HTML and supplementary code to PythonAnywhere</li> <li>✓ Refine designs</li> <li>✓ Presentation 1 (Due: 02/25)</li> <li>✓ Dr. Hull Meeting (02/14)               <ul style="list-style-type: none"> <li>✓ Setup PythonAnywhere payment</li> </ul> </li> <li>✓ Documentation/Weekly update</li> </ul>
2	Week of 02/17-02/23	<ul style="list-style-type: none"> <li>✓ Implement initial database structure</li> <li>✓ Modify existing HTML template               <ul style="list-style-type: none"> <li>✓ Clean out functions we aren't going to use like Qualtrics</li> </ul> </li> <li>✓ Create and setup in-house survey</li> </ul>
	Week of 02/24-03/02	<ul style="list-style-type: none"> <li>✓ Finalize database structure</li> <li>✓ Additional modifications to HTML               <ul style="list-style-type: none"> <li>✓ Admin edit page design</li> </ul> </li> <li>✓ Continue setup for in-house survey</li> <li>✓ Practice presentation (02/25- Andrew and Kaleb)</li> <li>✓ Documentation/Weekly update</li> </ul>
3	Week of 03/03-03/09	<ul style="list-style-type: none"> <li>✓ Reply to Dr. Hull</li> <li>✓ Schedule meeting with Dr. Fox</li> <li>✓ Additions to database</li> <li>✓ Finish in-house survey setup</li> <li>✓ Integration between front-end and database</li> </ul>
	Week of 03/10-03/16 (SPRING BREAK)	<ul style="list-style-type: none"> <li>✓ Continue integration</li> <li>✓ Start incorporation of additional information and links</li> <li>✓ Explore alternative visualizations / site themes</li> </ul>
4	Week of 03/17-03/23	<ul style="list-style-type: none"> <li>✓ Load current numerators and denominators</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Design and begin implementing back-end survey result analysis</li> <li>✓ Implement survey report page</li> <li>✓ Continue incorporation of additional information</li> <li>✓ Presentation 2 (03/19)</li> <li>✓ Weekly update</li> </ul>
	Week of 03/24-03/30	<ul style="list-style-type: none"> <li>✓ UX review</li> <li>✓ Finish implementing survey result analysis</li> <li>✓ Finish implementing survey report page</li> <li>✓ Interim Report (03/28)</li> <li>✓ Dr. Hull Meeting (03/28)</li> <li>✓ Documentation</li> </ul>
5	Week of 03/31-04/06	<ul style="list-style-type: none"> <li>✓ Fix UX issues</li> <li>✓ Setup and implement admin page               <ul style="list-style-type: none"> <li>✓ Alter admin page design</li> <li>✓ Ensure downloadable results</li> </ul> </li> <li>✓ Design user tests               <ul style="list-style-type: none"> <li>✓ Student user tests</li> <li>✓ Dr. Hull user tests</li> </ul> </li> <li>✓ Setup ability for re-accessing results</li> <li>✓ Weekly update</li> </ul>
	Week of 04/07-04/13	<ul style="list-style-type: none"> <li>✓ Implement ability for re-accessing results</li> <li>✓ Setup VTURCS</li> <li>✓ Presentation 3 (04/11)</li> <li>✓ Dr. Hull Meeting (04/11)               <ul style="list-style-type: none"> <li>✓ Dr. Hull User Testing</li> </ul> </li> <li>✓ Documentation/Instructions</li> </ul>
6	Week of 04/14-04/20	<ul style="list-style-type: none"> <li>✓ Finish VTURCS and register (04/24)</li> <li>✓ Conduct student user tests (04/16-04/19)</li> <li>✓ Update/fix according to user testing (continue throughout following sprints)</li> <li>✓ Setup stretch goals               <ul style="list-style-type: none"> <li>✓ Group functionality</li> <li>✓ Ability to edit home/info pages</li> <li><del>✓ Visualizations</del></li> <li>✓ Easier credential change</li> </ul> </li> <li>✓ Weekly update</li> </ul>
	Week of 04/21-04/27	<ul style="list-style-type: none"> <li>✓ Implement stretch goals               <ul style="list-style-type: none"> <li>✓ Group functionality</li> <li><del>✓ Ability to edit home/info pages</del></li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>✓ <del>Visualizations</del></li> <li>✓ <del>Easier credential change</del></li> <li>✓ Dr. Hull Meeting (04/25)</li> <li>✓ Final user testing</li> <li>✓ Final Report (04/26)</li> <li>✓ Final Presentation Slides (05/02)</li> <li>✓ Documentation</li> </ul>
7	Week of 04/28-05/04	<ul style="list-style-type: none"> <li>✓ Final Presentation (05/02)</li> <li>✓ Finish implementing stretch goals</li> <li>✓ Weekly update</li> </ul>
	Week of 05/05-05/11	<ul style="list-style-type: none"> <li>✓ Finalize design/implementation</li> <li>✓ Documentation/Final update</li> <li>✓ Dr. Hull Meeting (05/09) <ul style="list-style-type: none"> <li>✓ Review documentation and functionality</li> </ul> </li> </ul>

## 12.2. Downloadable Results Page

4/25/2019

Survey Results

### Sustainability Values Diagnostic

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

Each cell shows the % of people out of 3 that fall in each category.

Your scores are denoted by the highlighted cells.

Since you took the survey as part of a group, select how you would like to compare your results:

☐ Total Scores ☒ Group SampleGroup Scores

#### What should be sustained?

You strongly lean towards 'Social Capital', so did 100% of people who took this survey.

You strongly lean towards 'Ecosystem Services', so did 100% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
Natural Capital ①	0%	0%	0%	0%	100%	Social Capital ①
Ecosystem Services ①	100%	0%	0%	0%	0%	Species and Biodiversity ①

#### Who should benefit?

You strongly lean towards 'People Tomorrow', so did 100% of people who took this survey.

You strongly lean towards 'Us', so did 100% of people who took this survey.

	Strong	Weak	Neutral	Weak	Strong	
People Today ①	0%	0%	0%	0%	100%	People Tomorrow ①
Us ①	100%	0%	0%	0%	0%	Others ①

#### How should we solve sustainability problems?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
With Technological Innovation	0%	100%	0%	0%	0%
By freeing market forces	0%	0%	0%	100%	0%
By fixing market failures	0%	0%	100%	0%	0%
With strong government actions	0%	0%	100%	0%	0%
By creating new institutions	0%	0%	0%	100%	0%
By educating citizens & consumers	0%	0%	0%	100%	0%

4/25/2019

Survey Results

**Hotly Debated Beliefs**

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>Religion:</b> Because God created the natural world, stewardship of nature should be my religious duty.	0%	0%	0%	100%	0%
<b>Rights:</b> Mammals have as much right to exist as humans.	0%	0%	100%	0%	0%
<b>Limits:</b> Humanity is pushing the limits of Earth ecological systems, risking ecological collapse.	0%	0%	0%	100%	0%
<b>Balance:</b> Nature's ecology has self-correcting properties that keep it balanced and healthy. It is only when humans disturb things that nature becomes unbalanced and unhealthy.	0%	100%	0%	0%	0%
<b>Nobel savage:</b> Modern Americans have much to learn about sustainable development from the land ethics and land management of Native Americans alive before Columbus.	0%	0%	0%	100%	0%
<b>Best Evolved:</b> Survival-of-the-fittest made humans the best-adapted, highest-evolved species and we therefore have the right to manage other species.	0%	0%	100%	0%	0%

To help interpret your value diagnostic, use the following guide: [Sustainability Values Booklet](#)

To re-access your results use the following access code:

## 12.3. Client Testing Form

### **Client User Test**

**User Test Method:** Click through method coupled with the think aloud method, followed by a heuristic analysis.

- Complete a task
- Describe thought process aloud
- Answer heuristic questions

**Website:** <https://www.sustainabilityvalues.com/>

#### **Tasks:**

1. Follow [instructions](#) to change account information.
2. Go to website, login as an administrator.
3. Download data.
4. Open data and view layout.
5. Log out as an administrator.

#### **Heuristic Evaluation:**

- Color-wise, are there things that you think should stand out more?
- Is the size of the text easy to read? (headers/tabs/buttons)
- Is the text spaced out appropriately?
- Does the layout of the information feel appropriate?
- Would you like to see any additional information/functionality on this page?



**Client Test Form**

Date: \_4/11/19\_\_\_\_\_

TASKS	NOTES
Task 1: Follow instructions to change account information.	<ul style="list-style-type: none"> <li>• He might just leave it the username and password it is now</li> <li>• It seems to be confusing to him</li> <li>• We might need to change it for him</li> </ul>
Task 2: Go to website, login as an administrator.	Heuristic Evaluation: Login successful
Task 3: Download data.	Heuristic Evaluation: Downloaded Change name of file?
Task 4: Open data and view layout.	Heuristic Evaluation: He gets the format of excel Leah suggesting text box with description Looks good to him
Task 5: Log out as an administrator.	Heuristic Evaluation: Easy

## 12.4. User Testing Form

### **Student User Test**

**User Test Method:** Click through method coupled with the think aloud method, followed by a heuristic analysis.

- Complete a task
- Describe thought process aloud
- Answer the information analysis and heuristic questions

**Explanation of project:** Our project is to design a website that will host a sustainability survey for students and professionals.

**Website:** <https://www.sustainabilityvalues.com/>

\*Since this is a user test we will not be directing your interactions with the site. We want to see how you interact with it on your own.\*

#### **Tasks:**

1. Visit homepage and analyze the information provided.
2. Take the survey.
  - a. Interpret results.
  - b. Download results.
3. Re-access results using access code.
4. Visit more information page and analyze information provided.
5. Contact the administrator of the survey.

### Information Analysis:

- Homepage: In your own words explain...
  - Why is the survey hosted on this site important?
  - What is the purpose of the survey?
  - How long will the survey take?
  - What do the results of the survey mean?
  - How will this help you in the future?
- Survey page:
  - What are the requirements for the first three questions?
  - What are the key differences between the first three questions?
  - How understandable are the 6 strategies presented in *How Should Sustainability Be Achieved* section?
  - How understandable are the 7 statements presented in *Values and Beliefs* section?
  - Do the demographic options seem inclusive?
- Survey Report page:
  - How do you interpret these results?
  - Where do you fall in each category?
  - What is your access code?
  - What is the purpose of the access code?
- More Information page:
  - What additional information is provided on this page?
- Contact Us page:
  - Who can you contact with any questions?

### Heuristic Evaluation:

- Color-wise, are there things that you think should standout more?
- Is the size of the text easy to read? (headers/tabs/buttons)
- Is the text spaced out appropriately, is there anything that is hard to read due to spacing?
- Does the layout of the information feel appropriate, is there anything that seems out of order?
- Is there any information on this page that you expected to see but did not?
- Would you like to do see any additional functionality on this page?

## **User Test Form**

User Name: \_\_\_\_\_

Date: \_\_\_\_\_

<b>TASKS</b>	<b>NOTES</b>
<u>Task 1</u> Visit homepage and analyze the information provided.	Information Analysis:  Heuristic Evaluation:
<u>Task 2</u> Take the survey.	Information Analysis:  Heuristic Evaluation:
<u>Task 2a</u> Interpret results.	Information Analysis:  Heuristic Evaluation:
<u>Task 2b</u> Download results.	Information Analysis:  Heuristic Evaluation:
<u>Task 3</u> Re-access results using access code.	Information Analysis:  Heuristic Evaluation:
<u>Task 4</u> Visit more information page and analyze information provided.	Information Analysis:  Heuristic Evaluation:
<u>Task 5</u> Contact the administrator of the survey.	Information Analysis:  Heuristic Evaluation: