COS 397: Computer Science Capstone

Blue Marble Geographics
Geospatial Data Portal
User Interface Design Document

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Client contact name?

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Type of document?
Logo?

Document History

Name	Date	Reason for Changes	Version
David Sincyr	11/8/2021	Initial Creation	1.0
All Team Members	11/27/2021	Added in all relevant information	1.1
All Team Members	11/29/2021	Finalized the document	1.2

1. Introduction

Blue Marble Geographics® is a software development company that specializes in geographic information systems and geodetic desktop software. Their software is aimed towards all types of users who need a better tool to manipulate and visualize their geospatial data. In order to better serve their customers, a cloud based structure is needed. The dynamic web portal will allow its users to upload their geospatial data to an online database and provide them the ability to share, manipulate, and visualize their data with others. Additionally, users will be able to automate the visualization process by using Python scripts through a built-in Python script editor. This is a capstone project for Blue Marble Geographics®, in partial fulfillment of the Computer Science BS degree for the University of Maine.

1.1 Purpose of This Document

The purpose of this document is to specify the user interface design elements of the Geospatial Data Portal project along with guidelines on their appropriate usage. This specification details various screen layouts, common components such as menus and texts, and branding requirements. A walkthrough of the user interface with specifications and limitations on user-supplied data fields is also provided. The specifications detailed in this document conform to and extend those laid out in the Blue Marble Geographics® Brand Guide. The intended readership for this document are the stakeholders and the design team to analyze the user interface of the application prior to deployment.

1.2 References

1. LIDAR data information:
   https://www.bluemarblegeo.com/knowledgebase/global-mapper-20/LiDAR_Support_in_Global_Mapper.htm
2. Blue Marble Geographics Brand & Style Guide:
   https://docs.google.com/document/d/1Iflr8nXOnt-TJAx1LiOQN-m1cJYbrng-zUS5KTnHX38/edit
3. UI Prototype tool:
   https://framer.com
4. Google Colors:
   https://usbrandcolors.com/google-colors/
5. Global Mapper Pro Desktop Application

SRS? SDD?

2. User Interface Standards

This section will detail the design standards that will be adhered to for consistency in the user interface, such as the layouts, details of what each page will contain, common components, colors, typography, and slogans. Illustrations will be used to show the more important aspects of the application.

2.1 Layouts

2.1.1 Standard Layouts

This application will utilize three primary layouts (Single Column, Multi-Column, and Modal). Additional layouts will be used as necessary and where reasonable on specific pages, such as code editor pages. The following paragraphs provide guidelines for appropriate use of the primary layouts.

Pages of the web application may consist of multiple layouts, and layouts may comprise other layouts. For example, a page may use a Single Column layout where the main Content Container consists of a Multi-Column layout. To minimize the complexity of the user interface, fewer layout compositions are preferred unless the additional compositions significantly increase clarity or provide some other traceable benefit to users.

Single Column

The single column layout consists of a series of containers stacked vertically. This layout is the wrapper for most but not all pages of the application. In a page context, the Single Column layout begins with the Page Header and ends with the Page Footer. The Navigation Menu is typically placed directly below the Page Header, followed by the main Content Container for the page, but forgoing the Navigation Menu is permissible on pages that require more specialized navigational controls.

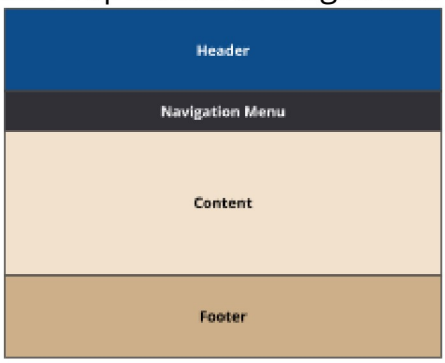


Figure 1: The standard form of the Single Column layout. This is representative of most pages of the application with variations occurring primarily in the Content Container.

Multi-Column

The multi-column layout consists of a series of containers stacked horizontally. This layout is generally (but not necessarily) a subcomponent of

other layouts. Columns with widths of simple percentage values, such as 30%, are preferred over arbitrarily-sized ones.

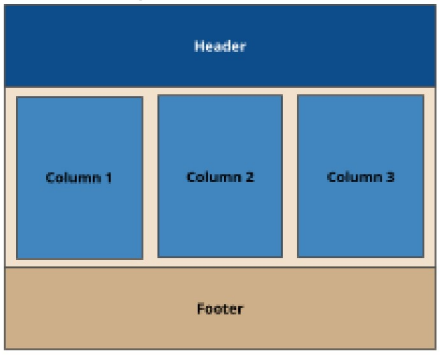


Figure 2: A variation of the Single Column layout which forgos the Navigation Menu and includes a Multi-Column layout as a subcomponent.

Modal

The modal layout consists of a horizontally centered container overlaying a background, a page, or other elements. The container may be any width, but should generally be no more than 90% nor less than 20% of the parent container's width. Appropriate uses for modal views include displaying notifications, presenting prompts and forms, and focusing attention on a feature or component.

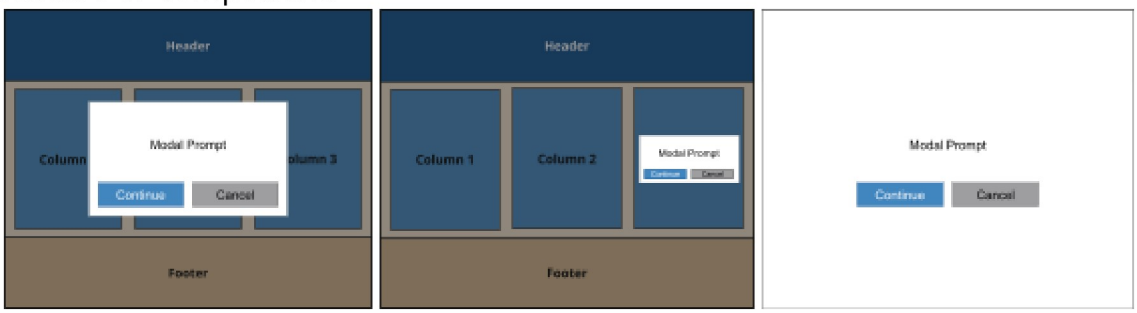


Figure 3: Examples of modal layouts (from left to right) overlaying a top-level layout, overlaying a subcomponent layout, and used as the top-level layout.

2.1.2 Signup, Login, and other Authentication Pages

The signup and login pages of this application will use a modal layout with horizontally centered form that includes fields for username and password text input, buttons for "Log In", "Log In With Google", "Forgot Username/Password", and

“Create An Account”. Other authentication pages, such as the account recovery page, will use a similar format.

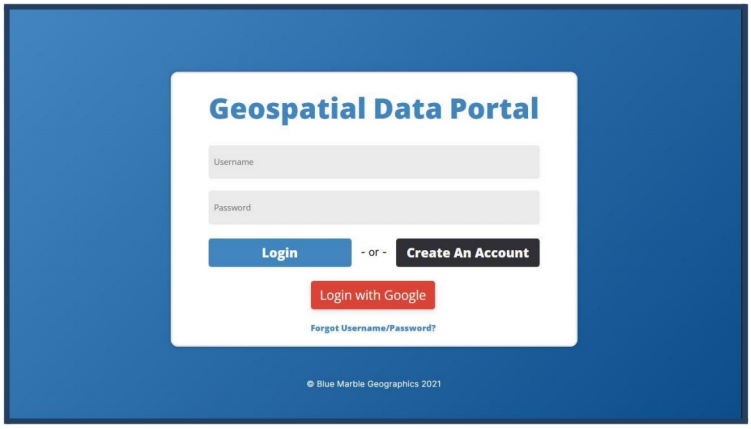


Figure 4: An example of the authentication and signup page with text fields for username and password, alongside these buttons for “Login”, “Create an Account”, “Login with Google” and an extra link for users who lose their credentials.

2.1.3 Dashboard Page

The dashboard page will use the standard Single Column layout and will provide users access to all other areas of the application.

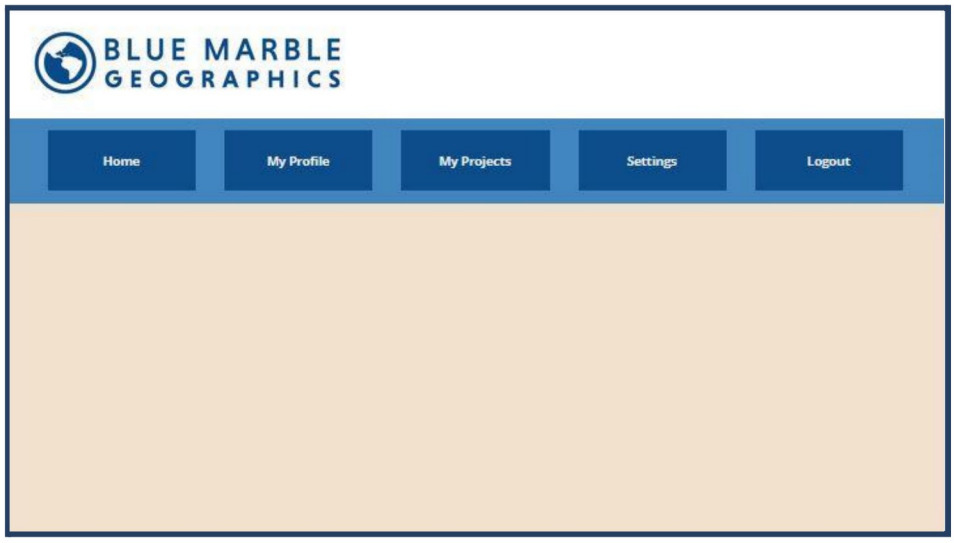


Figure 5: This is an example of the dashboard page and the buttons for “Home”, “Profile”, “Settings”, “Logout” and the two lower buttons which link the list of projects and built in script editor respectively.

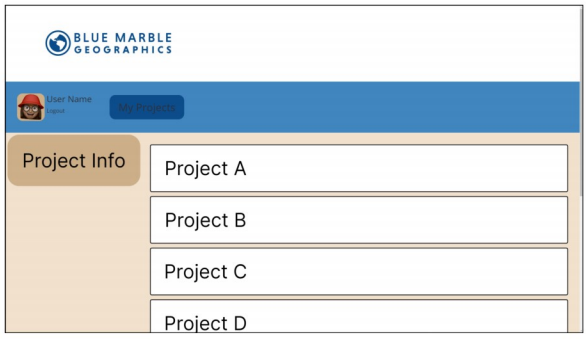
2.1.4 User Profile and Settings Pages

The user profile page will use a Multi-Column layout wrapped by the standard Single Column layout. Users will be able to adjust their information by clicking “Edit” within the profile view. The settings page, which will utilize a similar layout, contains display and permissions settings.

Figure 6: This is an example of a User Profile page with the user’s Icon, Username, First Name, Last Name, Email and current groups being presented for viewing purposes.

2.1.5 Geospatial Data Projects

The project view will utilize a Multi-Column layout wrapped by the standard Single Column layout. The first column shows information about the currently selected project, while the second, wider column provides a list of the user’s projects for them to select from.



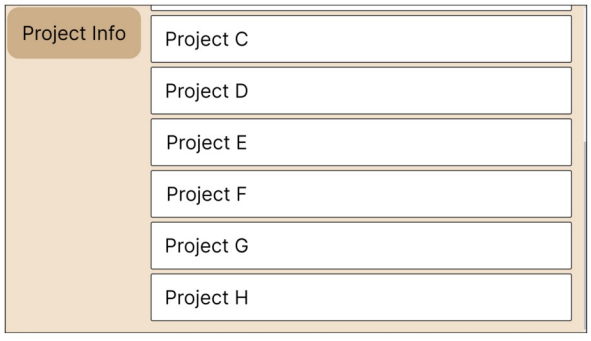


Figure 7: An example of the users project data selection screen. It is split up into two different images here but the project's window is scrollable.

2.1.6 Script Editor

Custom layout (multi-column w/ code editor).

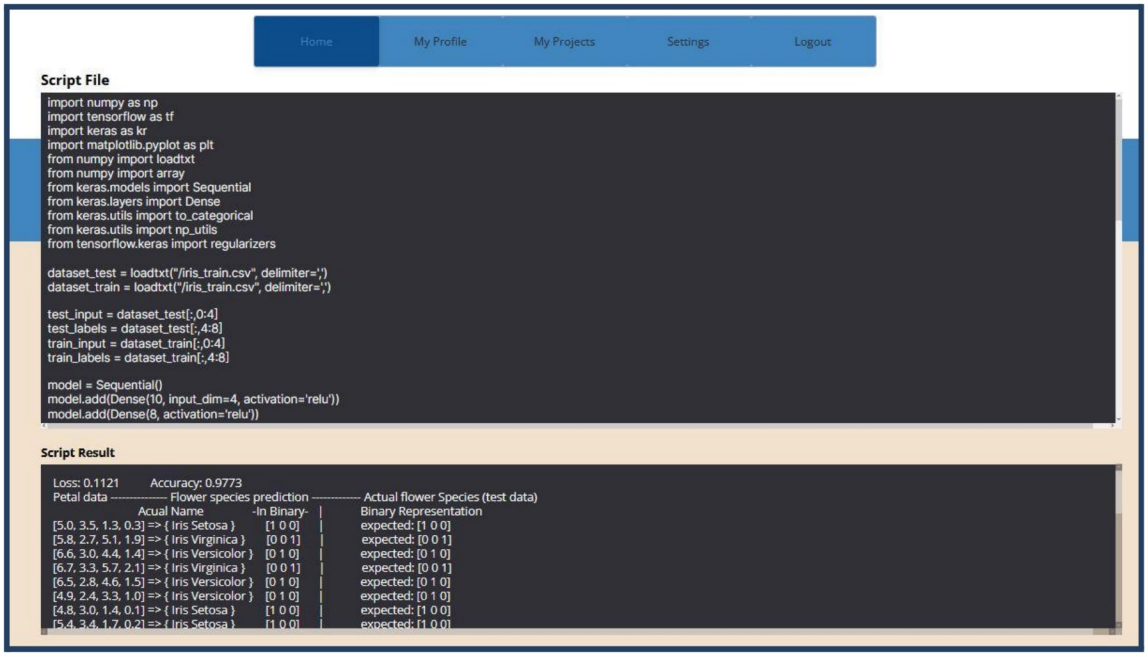


Figure 8: This is an example of how the script editor will be laid out for the user to access, showing two boxes with actual script occurrences and then the result from said script.

2.1.7 Error Pages and Notifications

Error Pages such as 403 and 404 pages, shall utilize the modal layout. UI notifications of any kind, including error notifications will also be using the modal layout as its base design.

2.2 Common Components

2.2.1 Form Elements

Form Elements, best described as a container for input elements, are used for login input fields (text boxes for username and password). Form Elements are also used for the functionality of sharing permissions with individuals, groups, or to the overall public. The type of permission (read/write) is itself a Form Element, although a radio button rather than text field.

2.2.2 Menus

Method for moving to different areas in the Data Portal. Primary menu component is the navigation bar and its associated dropdown menus. Home, My Profile, Settings, and Logout are examples of navigation bar buttons.

2.2.3 Prompts and Dialogues

File Upload

Unique prompt upon selecting to upload a file. The prompt takes an input in the form of a file from the user.

Notices
Assortment of dialogues that appear in reaction to user actions. Commonly these are in response to potential errors. Example, failed login. Another example, failed file upload. These special errors are the standard use case for notice prompts in the Data Portal. Certain success notices may also appear as dialogue to confirm certain results to the other. Note that non prompt/dialogue notices do exist.

Permissions
Whenever a user attempts to add or adjust permissions, for a project, this creates a prompt. User input is taken in order to adjust/add permissions.

2.2.4 Lists of Documents, Projects, and other Objects
Content components for the Data Portal. These components have a range of accessibility (public, shared, private), alongside differing permission levels (i.e. if an individual was responsible for the item's creation). These components are held within "My Projects" and similar Data Portal tabs.

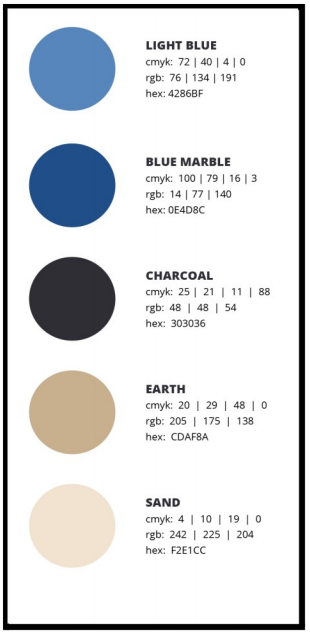
2.2.5 Footer
The footer will be empty except for a small image of the "Blue Marble Geographic" logo for identification purposes and copyright.

2.2.6 Buttons
Buttons are used in a variety of places. One such place is the navigation bar, while another is login. Buttons take two primary forms, static and responsive. The former of the two represent one click buttons that provide no visual feedback and instead purely perform their action. "Continue with Google" is an example of the former. The latter responds visually to users by changing from the default Blue Marble blue to a darker shade. The nav bar offers an example of this type. Buttons are used in many places to confirm inputs or in use of portal navigation.

2.2.7 Dropdown
Dropdowns are used primarily for the navigation bar. The dropdown menu allows for condensing standard menu features in order to simplify the visual noise users must handle. The visual noise, in too great a quantity, would severely handicap the ability to find the desired button (or speaking for example, the desired navigation path).

2.3 Branding
The subsequent sections provide a brief overview of the branding guidelines and requirements that apply to this project. Permissible deviations from these branding

standards are noted as necessary. For more information, refer to the Blue Marble Geographics Brand Guide.



2.3.1 Colors

Blue Marble Geographics uses a standard color palette consisting of five colors: Light Blue, Blue Marble, Charcoal, Earth, and Sand. In the Geospatial Data Portal project, the colors are purposed as follows:

- *Charcoal as the background.*
- *Blue Marble as the secondary background.*
- *Light Blue for primary buttons and actions.*
- *Sand for secondary buttons and actions.*
- *Earth for tertiary buttons and actions.*

Figure 9 (on right): The Blue Marble Geographics color palette, for reference.

2.3.2 Typography

Open Sans is the standard font for this project and shall be used for all non-code text, while ***Open Sans Bold*** shall be reserved for H1, H2, and H3 HTML tags. Any text representing code, code segments, or code comments shall use ***Courier New***.

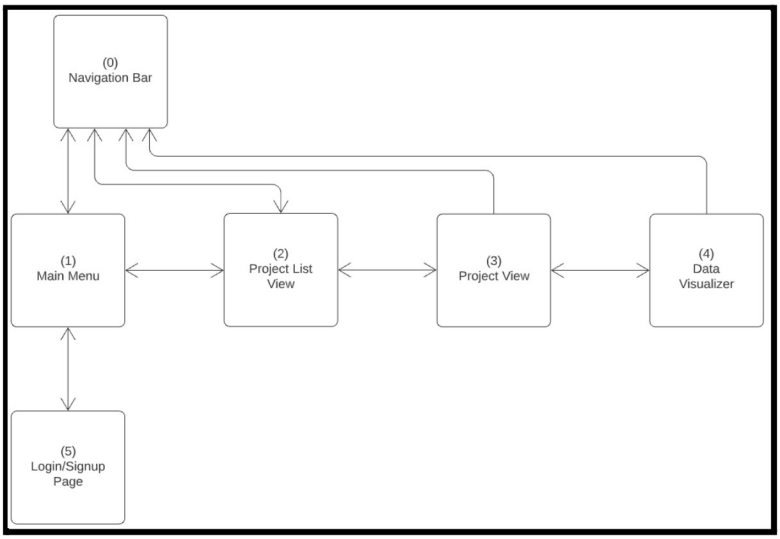
2.3.3 Logos and Slogans

Figure 10 (above): The Blue Marble Geographics current logo.

There are no current plans to include any slogans for the project, but there will be a Logo drafted in the later stages which will bear similarities to the logo used by "***Blue Marble Geographics***".

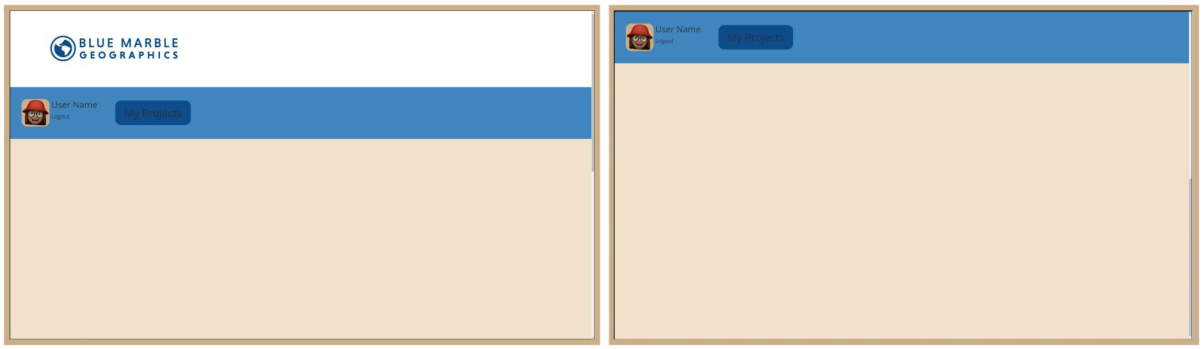
3. User Interface Walkthrough

This section will go over how the user will see the website. First a diagram of the navigation, then screenshots of mockup images made in Framer alongside a description of said images.

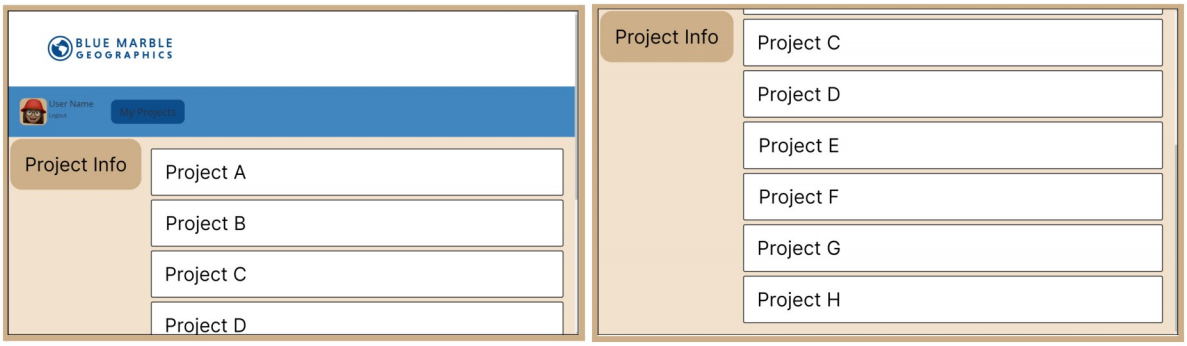


Good section

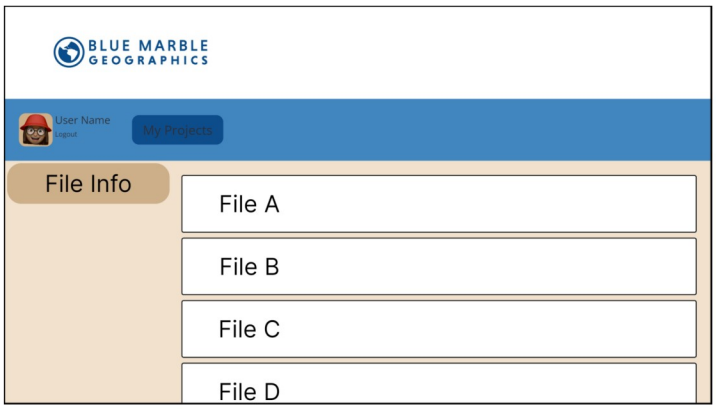
This diagram represents the navigation between screens on the website. Screens 1 through 4 are the primary screens the user will interact with. These screens will allow the user to interact with the data structure that screen is scoped to. Screen 0, the navigation bar, will appear on every screen to provide easy access to other screens. Screen 5, the login/signup page, will allow the user to login to an existing account or create a new account using an external authentication service.



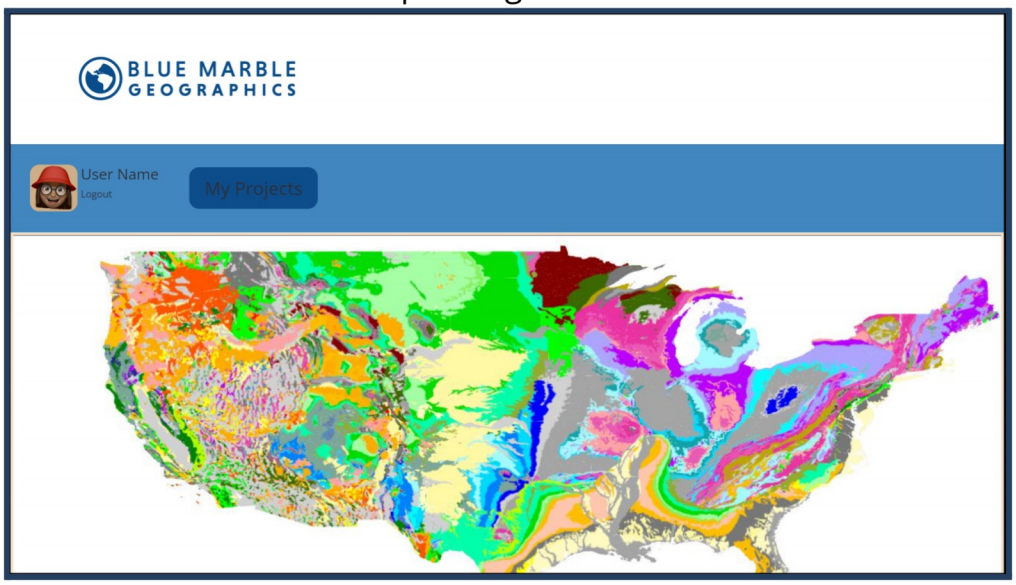
The Main Menu's primary purpose is to be a landing page for all traffic and user activity, within this menu is a “Profile Icon” with the “Username” viewable alongside so that users can know which account they are accessing at a glance; underneath the username is a “logout” button (link) which will allow them to sign out of their account. Alongside this is the “Projects” button which allows a user to view which projects they are currently associated with.



The Project List View's primary purpose is to show the user which projects they are assigned to, in addition to providing them access to the project view screen for those projects. This is easily done through multiple boxes which show the name of the project, as an example the user could press on “Project A” and be taken straight into the project view for said project.



The Project View's primary purpose is to show the user all files within the project, providing them access to the data visualizer screen for those files. This likewise uses a “box” method to show a list of files within a project which can then be clicked on to either view or edit depending on what the user needs to do.



The Data Visualizer's primary purpose is to visualize whatever data is contained within a file to the user, the user will be able to modify certain elements of the file from within this screen. This will easily be done through a interactive map which allows the user to toggle between various uploaded layers as to get unique information about various thing such as topography.

The Navigation Bar's primary purpose is to provide easy navigation to other screens. Not all screens can be accessed from the Navigation Bar. For example, the data visualizer cannot be reached from the navigation bar as it requires a file to visualize. The Main Menu, Project List View, and Login/Signup Page can be accessed from the navigation bar.

The Login/Signup Page will provide the external authentication services to the user which includes a “Google Login”, “Create An Account”, “Manual Login” and a small link for beginning the password/username troubleshooting process.

4. Data Validation

This section is a description of various data information that the project will need to use, modify or access as to function in its completion. This also includes who is modifying the information, how it's being modified and the constraints to its entry for its usage.

Description of Data	Data Type	Constraints	Handled or Authentication	Unique Identifier
Email	string	Valid email (includes @, ends with a domain), not empty	*This information will be handled by Google's authentication services.*	auth_email
Username	string	Includes only letters and numbers, longer than 3 characters	*This information will be handled by Google's authentication services.*	auth_username
Password	string	Longer than 8 characters	*This information will be handled by Google's authentication services.*	auth_password
FirstName	string	Not empty	*This information will be handled by Google's authentication services.*	auth_firstname
LastName	string	Not empty	*This information will be handled by Google's authentication services.*	auth_lastname
Python Script	.py file type	> 0 bytes, < 1 GB, includes python file header	This information will be stored on an Amazon S3 bucket and paired with a unique token used for authentication purposes. This information may then be accessed by users, the Project Management	upload_pscript

			subsystem, and AWS Lambda following successful authentication and permission verification.	
Raster Imagery	.tif file type .png file type	Includes tif or png file header	This information will be accessed from the user's system before being presented for viewing or augmentation in the user's database.	upload_raster
Vector Information (Vertices, Paths)	.svg file type	Includes svg file header	This information will be accessed from the user's system before being presented for viewing or augmentation in the user's database.	upload_vector
Point Cloud Information	.PCD file type .LAS file type .LAZ file type	Includes PCD, LAS, or LAZ file header	This information will be accessed from the user's system before being presented for viewing or augmentation in the user's database.	upload_pointcloud
Project Name	string	Includes only letters	This information will be given to the system for labelling purposes and viewing from users.	project_name
Project Description	string	Includes only letters and numbers	This information will be given to the system for labelling purposes and viewing from users.	project_description

This table needs a number, title, and descriptive caption.

5. Report Formats

The data access portal will not generate any hard copy reports.

1. Appendix A – Agreement Between Customer and Contractor

What is being agreed to when this document is signed.

Upon signing this document, the signer agrees to the terms and conditions presented in Appendix A and Appendix B, with any future amendments requiring an updated signature. The signer also agrees to provide assistance with the creation and any tasks related to the Geospatial Data Portal as agreed by the signer and either Team Undershrub or Blue Marble Geographic®. Additionally, the signer agrees to do everything needed to ensure that this agreement is upheld in good faith, alongside agreeing to treat any designed or developed material as “work made for hire” for Blue Marble Geographic®. Except as otherwise stated within this agreement, the signer will have full control over working time, methods, and decisions related to the project until either the Blue Marble Geographic® or Team Undershrub deem to end the arrangement. However, the signer will be responsive to the reasonable needs and concerns from either aforementioned group throughout the duration of the arrangement.

Procedures to be used for future changes to this document.

When a member of Team Undershrub or an employee of Blue Marble Geographic® wishes to commit any changes to this document, they must first address them in a comment underneath their signature below, then must alert either the UIDD document manager or the Geospatial Data Portal project lead. The alerted individual will notify all signing parties. Subsequently, all signing parties will discuss via email or a meeting the proposed changes to the document. Implementation of proposed changes requires support from the Geospatial Data Portal project lead along with a majority of the development team. These procedures shall be followed for any future additions, deletions or modifications of material within this document.

Name: Victor Minor	**Date:** 1
Signature:	

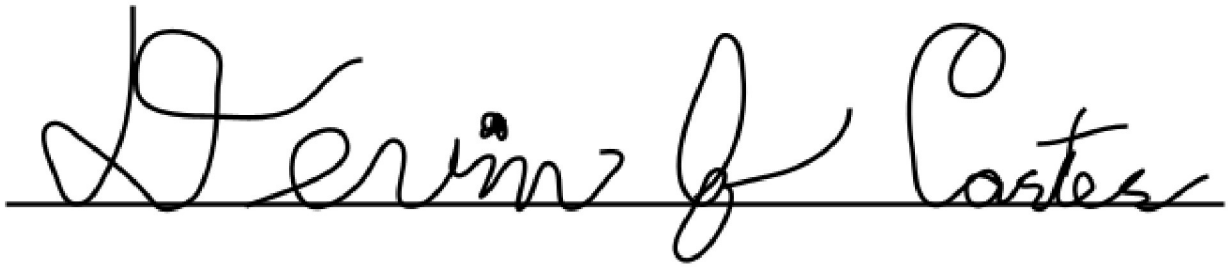
Comments:

2. Appendix B – Team Review Sign-off

Within this section of the UIDD document you will find the signatures, names and date of the documental approvals for each acting member of “Team Undershrub ". These signatures acknowledge and authenticate the approval and review of this document. This authentication includes the overall content, formatting, identification of contributed material and development directions presented within. These signatures must be updated alongside the date and comments when there is a subsational update to the document, which in this case includes any formatting, editing, grammar and change of materials within.

Name: Anthony Jackson	**Date:** 11 - 29 - 21
Signature: 	
Comments:	

Name: David Sincyr III	**Date:** 11 - 29 - 21
Signature: 	
Comments:	

Name: Devin Carter	**Date:** 11 - 29 - 21
Signature: 	
Comments:	

Name: Stephen Kaplan	**Date:** 11 - 29 - 21
Signature: 	
Comments:	

Name: Grant Shotwell	**Date:** 11 - 29 - 21
Signature: 	
Comments:	

3. Appendix C – Document Contributions

Identify how each member contributed to the creation of this document. Include what sections each member worked on and an estimate of the percentage of work they contributed. Remember that each team member must contribute to the writing (includes diagrams) for each document produced.

Grant Shotwell	- Made Framer mockups for Section 3, added screenshots. - Wrote the general overview description for Section 3. - Assisted with descriptions and design commentary for Section 3. - ***20% of work completed.***
Stephen Kaplan	- Assisted with section 2. - Created multiple figures in section 2. - Helped develop mock-ups of the UI for section 2. - Assisted with section 4. - ***20% of work completed.***
Devin Carter	- Assisted with definitions for Section 2. - Assisted David with Section 5. - Gave advice and assisted with sSection 4. - Helped develop some mock-ups of the UI for section 2 & 3. - ***20% of work completed.***
David Sincyr III	- Completed the Introduction section - Created an initial UI illustration - Assisted Devin Carter with Section 5 - Created multiple mock-ups of the UI - Wrote the Introduction section to section 2 - Formatted the document - ***20% of work completed.***
Anthony Jackson	- Completed and updated Appendix A, B & C. - Created Section 4 and filled in a majority of the table alongside its description. - Assisted with definitions for Section 2. - Assisted with descriptions and design commentary for Section 3, also modifying the description. - ***20% of work completed.***