Software Requirements Specification for Viper Rocks!

Version 2.0.0

Group 2

Contents

Revision History

Name	Date	Reasons for Changes	Version
Tony Lau	2/20/25	First Draft	1.0.0
Tony Lau	3/20/25	Checkpoint 1; mainly wording update	1.1.0
Tony Lau	4/20/25	Checkpoint 2; Mockups updated, collaboration with NASA added, UI components updated, clearly defined checklist of Americans with Disabilities Act	1.2.0
Everyone	5/02/25	Finalize SRS; updated UI components, legal and ethical considerations updated	2.0.0

1 Introduction

The VIPER Rocks! project is a thrilling initiative that empowers citizen scientists, both amateur and expert, to participate in unraveling the mysteries of lunar geology. This project, developed in collaboration with NASA's Volatiles Investigating Polar Exploration Rover (VIPER) mission, leverages the power of citizen science to map and classify lunar rocks encountered during VIPER's historic exploration of the Moon's South Pole.

Ultimately, VIPER Rocks! plays a vital role in supporting NASA's long-term vision: establishing a sustainable presence on the Moon. By mapping and analyzing the distribution of ice and other resources near the Moon's South Pole, VIPER Rocks! paves the way for future missions to Mars and beyond.

This Software Requirements Specification (SRS) serves as a comprehensive guide to the technical aspects of the VIPER Rocks! project. It outlines the requirements, features, and functionality of the software that will enable citizen scientists to contribute to lunar geology research. The document also contains the project's objectives, user interfaces, technical approach, and testing strategies to ensure the successful development of VIPER Rocks!

1.1 Purpose

This SRS is intended for various stakeholders involved in the VIPER Rocks! project, including software developers, project managers, data analysts, beta testers, and anyone interested in the technical details of the application. It provides a reference for understanding the project's scope, technical requirements, and functionality. It is organized for various types of readers, and each type of reader may interpret this document differently:

1.2 Internal Audience and Reading Suggestions

Our intended audience includes:

- Software Developers: May focus on the detailed technical requirements outlined in the document
- Project Managers: May focus on the document to reference scope and technical aspects
- Data Analysts: May focus on the specific data requirements, formats, and process of data collection
- General Audience: may focus on the overall description of the system as well as the technical approach for a comprehensive understanding

1.3 Product Scope

1.3.1 Product

This product is the "VIPER Rocks!" citizen science website

1.3.2 Description

The VIPER Rocks! software will enable citizen scientists to actively participate in mapping and classifying lunar rocks encountered during NASA's VIPER mission. It will facilitate the scientific analysis of lunar rock populations and enhance our understanding of lunar geology. The software will allow users to measure rock size and classify rock shape, on both mobile and desktop displays.

1.3.3 Objectives

The software aims to enhance the science return of the VIPER mission and engage the public in lunar exploration. The objectives include creating this citizen science platform and improving our understanding of lunar rock populations.

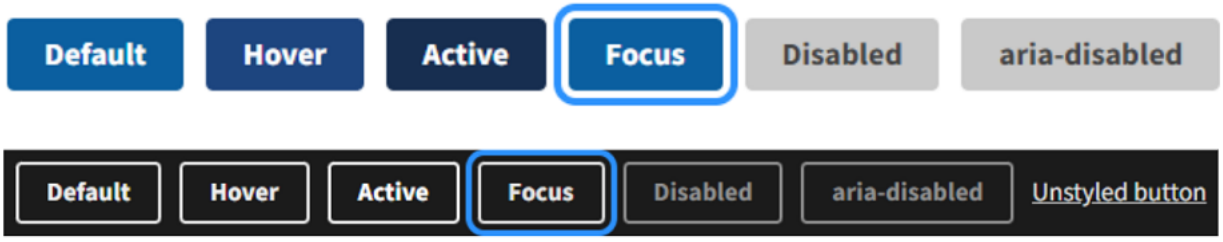
1.4 Definitions, Acronyms, and Abbreviations

- VIPER - Volatiles Investigating Polar Exploration Rover
- SRS / SRD - Software Requirements Specification (Document)
- UI - User Interface
- NASA - National Aeronautics and Space Administration
- Selenology - Term for lunar geology
- GDPR - EU general data protection regulation
- COPPA - Children's Online Privacy Protection Act

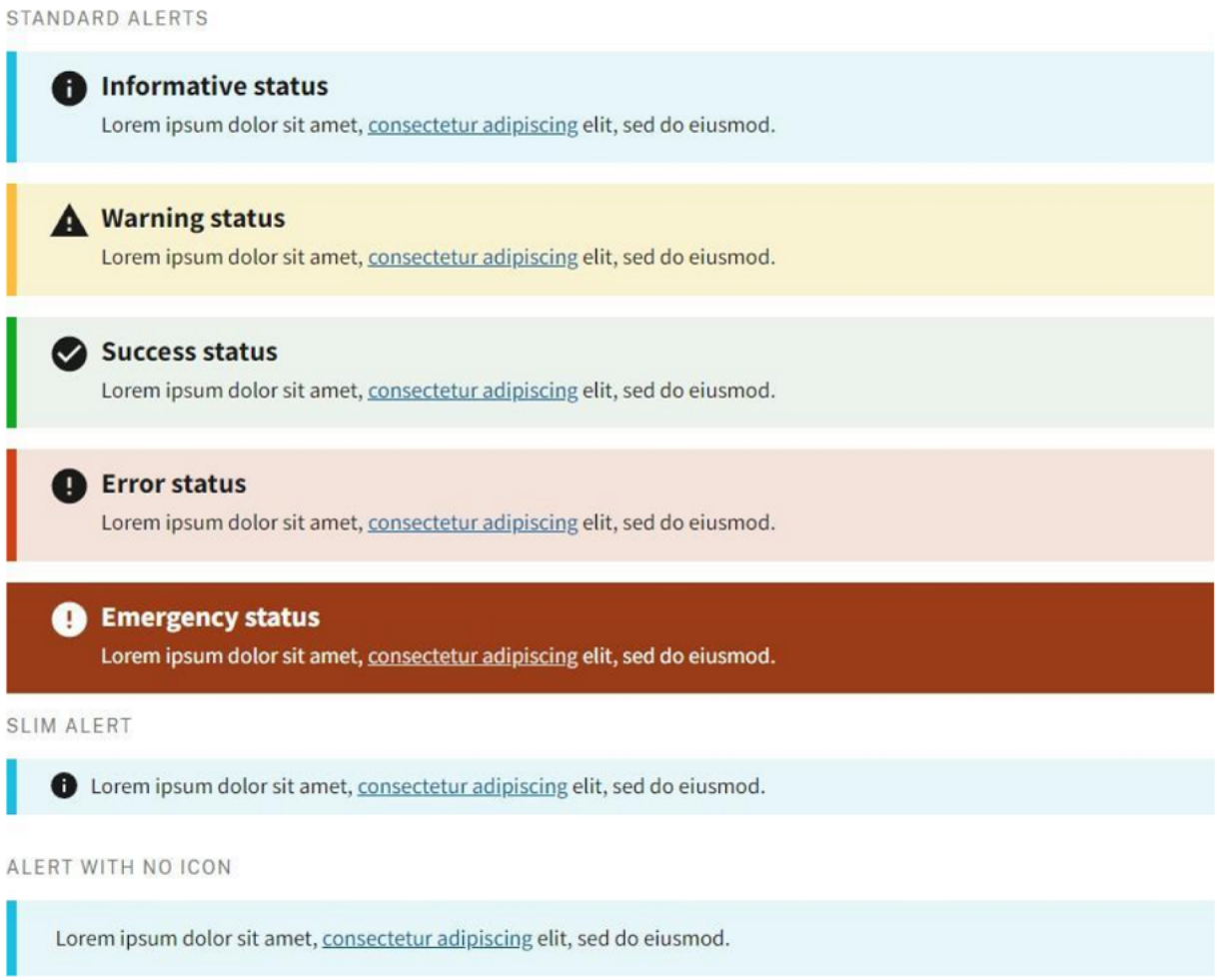
2 External Interface Requirements

2.1 User Interfaces

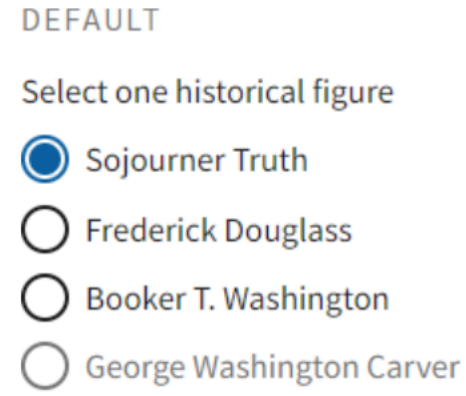
USDS: https://designsystem.digital.gov/
NASAWDS: https://github.com/bruffridge/nasawds
We will be sticking with a dark and blue color scheme. Below are the components we will make use of:
Buttons:



Icon List: https://designsystem.digital.gov/components/icon/
Alert List:

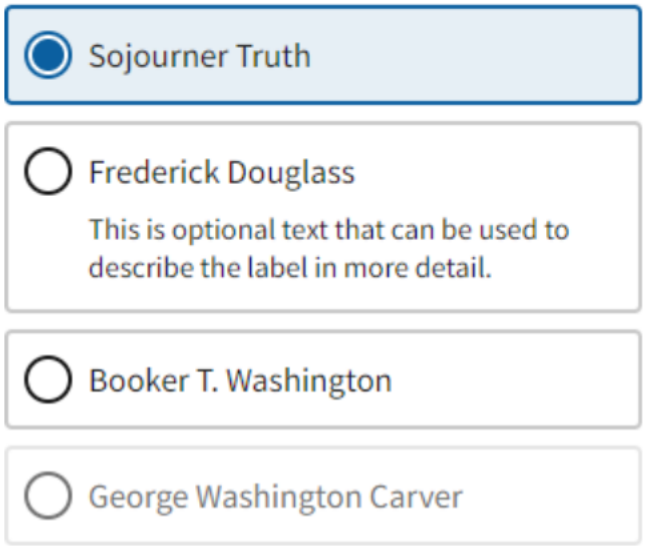


Headers, Footers, Radio Buttons:



TILE

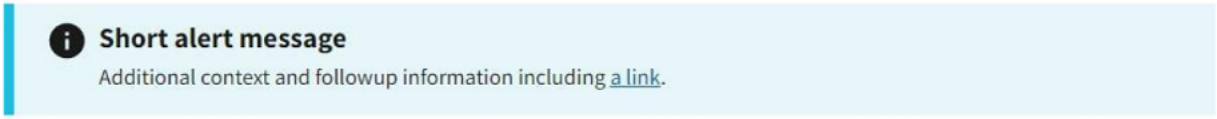
Select one historical figure



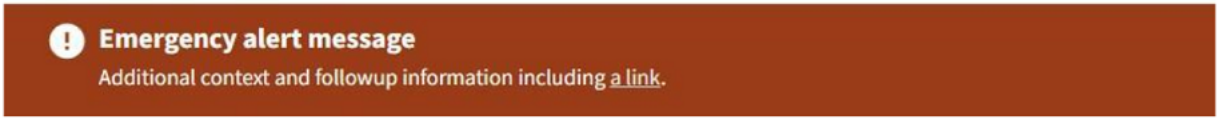
Select:

Site Alerts:

STANDARD INFORMATIONAL SITE ALERT



STANDARD EMERGENCY SITE ALERT



Step Indicators:

Tags:

DEFAULT TAG

INFO

BIG TAG

BIG

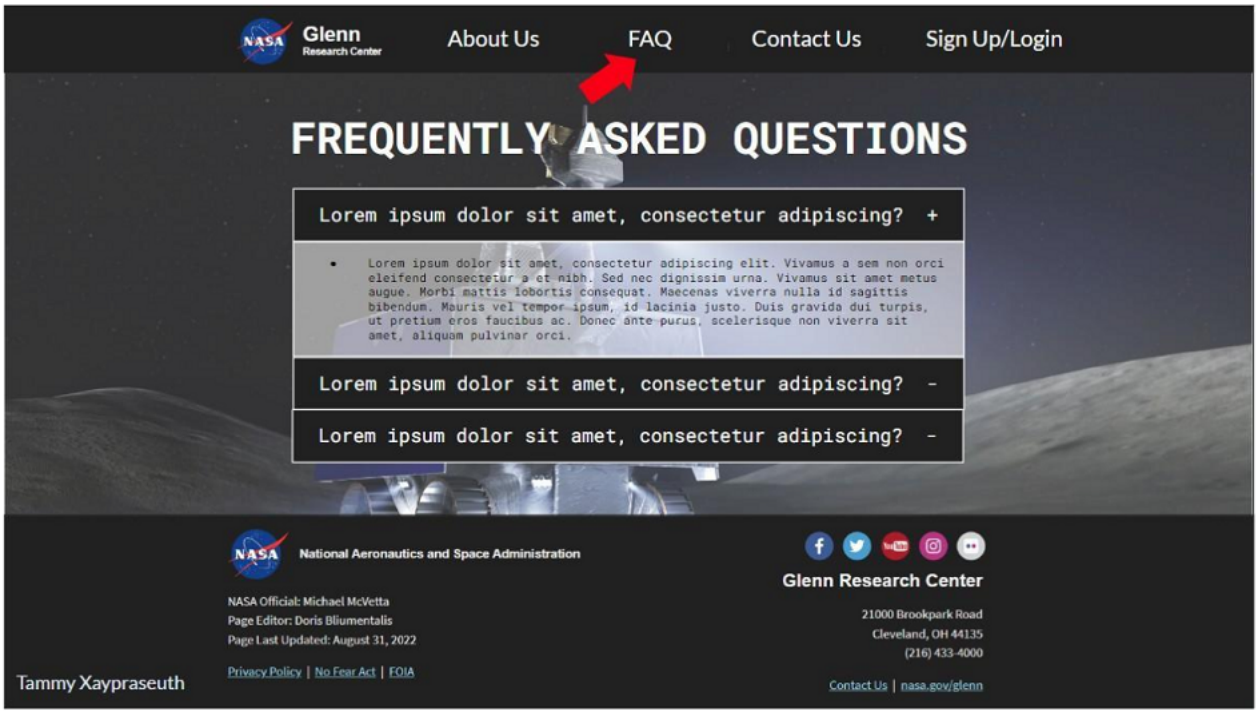
Text Inputs:

Text input label

Text area label

Typefaces: Source Sans Pro, Public Sans, Roboto Mono, Merriweather

The following images are draft mockups of the landing and scouting pages (not all mockups are finished yet):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NASA Official: Michael McVetta
Page Editor: Doris Bliumentalis
Page Last Updated: August 31, 2022
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Glenn Research Center
21000 Brookpark Road
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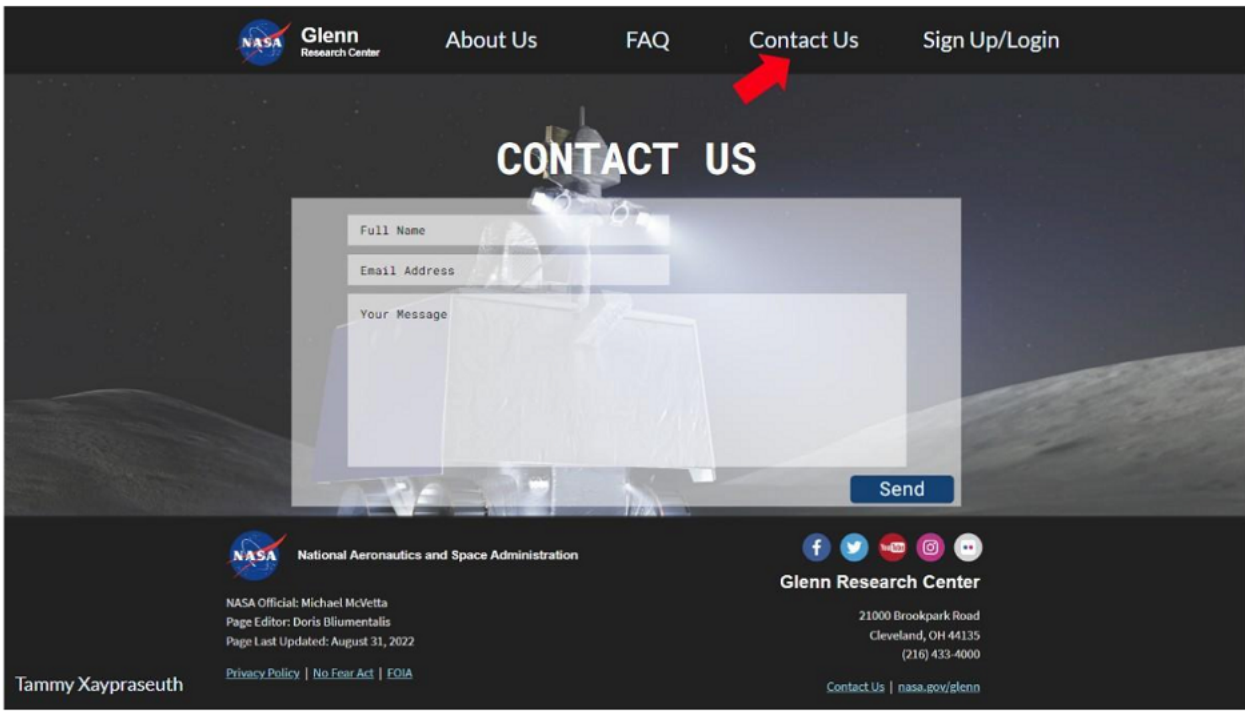
Contact Us | nasa.gov/glenn
Tammy Xaypraseuth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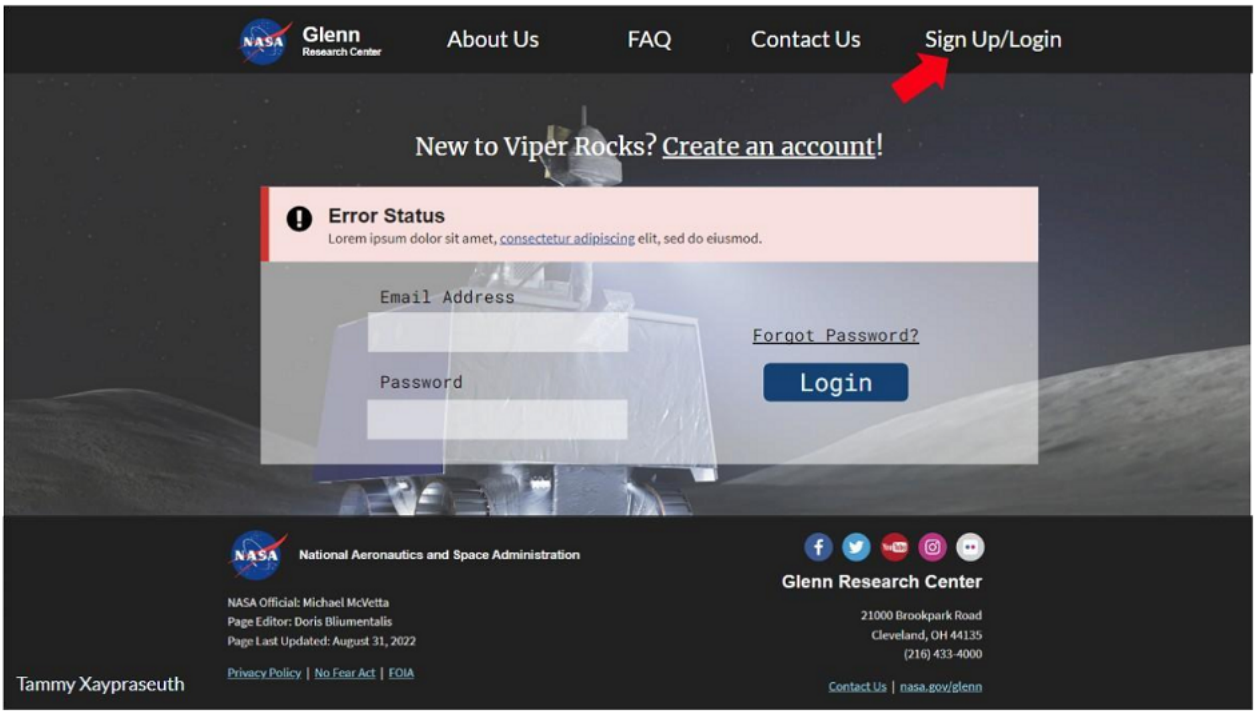

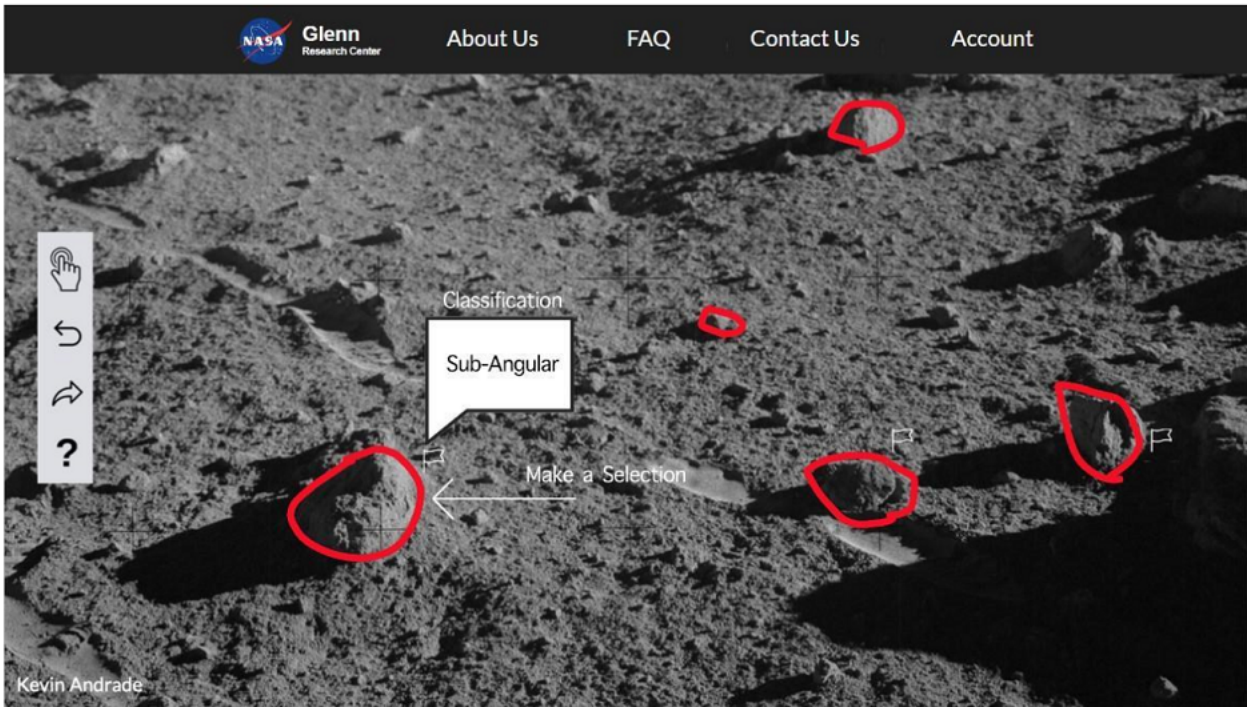

As per the Americans with Disabilities Act, we will adhere closely to the following checklist based on the Act's guidelines:

1. Read the law documentation
2. All media files and maps should have an "alt" tag
3. All your online forms should have descriptive html tags
4. All hyperlinks should have a descriptive anchor text
5. All pages on your website have "skip navigation" links
6. All the text content should be structured using proper heading tags
7. All PDF files should be accessible

8. All videos should have subtitles, transcripts, and audio description
9. The color contrast of your web pages should be sufficient according to WCAG
10. All fonts should be accessible
11. All HTML tables should be populated with column headers, row identifiers, and cell information
12. All audio files on your website should have a written caption
13. All call-to-action buttons on your website should have an accessible name and an ARIA label
14. All your website should be accessible with keyboard navigation
15. Have a website accessibility policy page
16. Have easily locatable contact information to allow users to request accessibility information
17. Test your website accessibility according to the Website Content Accessibility Guidelines
18. Automate your website accessibility check to prevent missing critical accessibility issues

We will also look to and reference the USWDS and NASA Guidelines for guidance on accessible designs.

2.2 Hardware Interfaces

The following are different input systems that will be kept in mind while developing this web application. Users will need a mobile device or personal computer. If they have a personal computer, they will require a mouse and keyboard or a trackpad.

2.3 Software Interfaces

The following are software interfaces that will be used for this product

- React 18.2.0
- MySQL 8.0
- MongoDB 7.0
- Javascript - version TBD
- Node.js 20.17.0 LTS

2.4 Communications Interfaces

Users will need an email if they choose to contact the team. The team's emails are listed on the website for anybody to contact.

3 Legal and Ethical Considerations

The VIPER Rocks! citizen science project aims to engage the public with lunar science research by collecting and analyzing user-generated data. However, this raises various legal and ethical considerations that must be addressed to ensure the protection of users and the responsible conduct of scientific research.

Privacy:

- The project must clearly inform users about the types of data collected through the application and how it will be used.
- User consent must be obtained explicitly before collecting any personal information.
- Secure data transfer protocols and robust data storage systems must be implemented to prevent unauthorized access.

Security:

- The security of the user's data must be maintained. Methods will be implemented to ensure it stays secure and private.
- The project will implement secure user authentication mechanisms to prevent unauthorized access to accounts and data.

The legal and ethical considerations outlined above highlight important issues that must be addressed. It is crucial for us to ensure these concerns are handled properly for the development and operation of the VIPER Rocks! project.

4 Appendix A: Glossary

- LUNAR - Lunar Uplink for Navigation and Analysis of Reconnaissance