

Defense Documentation: Rivers Rise E-Commerce Website

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CSCI 498 Senior Project Construction

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1. Statement of Purpose

To give my client access to a website and cloud-based database that upholds a sophisticated level of security and usability to support the expansion of their business.

2. Research & Background

a. Website Structures

- i. Website platforms for a small business.
- ii. Building a hypothetical website for clients to improve for future endeavors
- iii. Integrating familiar web-based programming languages.

b. Database Structures

- i. Using PostgreSQL for the database to store the products.
- ii. PostgreSQL tutorials and practice.
- iii. PostgreSQL platform to connect to the website.

c. Website Development for Small Business

- i. The necessary laws and regulations to abide by for developing the website.
- ii. Administrative access for the client to adjust the website by making announcements to customers or market a new product.
- iii. Ensuring the functionality of each connected page is properly configured.
- iv. Maintaining user-friendly website capabilities and security.

d. Database Development for Small Business

- i. The necessary laws and regulations to abide by for developing a database.
- ii. Administrative access for the client to add products to the database.
- iii. Populating the table in the database to the website.
- iv. Store customer information from the sign-in page to the database.

3. Project Language(s), Software, and Hardware

- Implementation Languages: Ruby on Rails, HTML, JavaScript
- **Libraries, Packages, Development Kits:** Devise, Turbo, Hotwire, Tailwind CSS, CarrierWave, MiniMagick, ImageProcessing, Paperclip, Capybara, Stimulus, Stripe, PostgreSQL, Pagy, Brakeman, Bundler-audit
- **Software/Equipment Needed:** VMWare Virtual Machine

4. Project Requirements

a. Functional Requirements

i. Main Home Page: All Users

Requirement ID Number: CG_1	Requirement Type: Section 11: Usability	
Description: Main Home Page for the website.		
Rationale: This is the Front-End aesthetically and easy main home page for users to view the website.		

Fit Criterion: This is to maintain a sophisticated user-friendly level that the user is able to go to the Home page where there will be updates and access to all the information provided in tabs.
Priority: 5
Dependencies: Website Task

ii. Products Page: All Users

Requirement ID Number: CG_2	Requirement Type: Section 11: Usability	
Description: This is a display of all the products that any user can view on the Products Tab on the Home page the content is generated from the database.		
Rationale: This is a display of all the products that Rivers Rise provides.		
Fit Criterion: This requirement can be accessed by any user when the user clicks on the Products tab on the Home page it will successfully present all the products to the user.		
Priority: 5		
Dependencies: Website Task		

iii. "About Us" Page: All Users

Requirement ID Number: CG_3	Requirement Type: Section 11: Usability	
Description: This is the "About Us" page that provides details of the business to create a more personal relationship to e-customers.		
Rationale:		
Fit Criterion: This requirement can be accessed by any user when the user clicks on the About Us tab on the Home page it will successfully present all the information to the user.		
Priority: 5		
Dependencies: Website Task		

iv. Contact the Business: All Users

Requirement ID Number: CG_4	Requirement Type: Section 11: Usability	
Description: This allows any user to contact the business with any questions or concerns that they have and view social media platforms that the business is on.		

Rationale: The user is allowed to bring up any concerns or questions that the business can answer for the user.
Fit Criterion: This allows the user to be able to contact the business if there are any issues or learn more about the business itself.
Priority: 5
Dependencies: Website Task

v. Sign-Up Account Page: All Users

Requirement ID Number: CG_5	Requirement Type: Section 11: Usability	
Description: This allows a user to sign-up for an account on the website.		
Rationale: The user is able to sign-up for an account that will allow them to receive notifications about sales or deals and new information from the business.		
Fit Criterion: This allows any user to sign-up for an account and the user does not have to be a paying customer to sign-up for an account.		
Priority: 5		
Dependencies: Website Task		

vi. Sign-In: Registered Users

Requirement ID Number: CG_9	Requirement Type: Section 11: Usability	
Description: This allows any registered user to sign into their account.		
Rationale: The user can sign into their account that will be recorded in the database.		
Fit Criterion: The user can sign in and out of their account whenever they need too and the business can see the amount of people who register for an account.		
Priority: 5		
Dependencies: User has signed up for an account.		

vii. Forgot Password: Registered Users

Requirement ID Number: CG_10	Requirement Type: Section 11: Usability	
Description: The user may forget their password, so this allows them to enter a new password		
Rationale: The user may forget their password which this allows them to input a new password that will be updated in the database.		

Fit Criterion: This allows the user to feel that they can control their account and customize to their specifications.
Priority: 5
Dependencies: Website Task

viii. Change Password: Registered Users

Requirement ID Number: CG_11	Requirement Type: Section 11: Usability	
Description: During the sign-in process the user has the option to change their password.		
Rationale: The change password function is to allow the user to have more personalization in any given scenario the user may go through when interacting with signing into their account.		
Fit Criterion: Usability		
Priority: 5		
Dependencies: Sign-In		

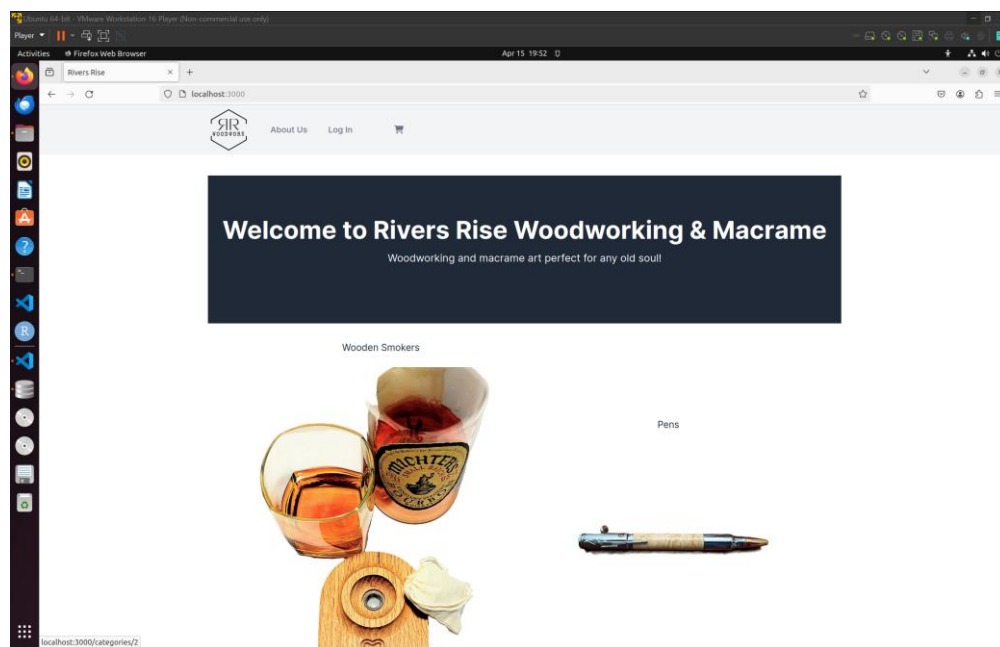
ix. Admin Updates Database to Products

Requirement ID Number: CG_23	Requirement Type: Section 11: Usability	
Description: The admin can add products to the database to control inventory of the products		
Rationale:		
Fit Criterion: The Back-End aspect of one of the tables that holds the products for the admin to see the amount of inventory.		
Priority: 5		
Dependencies: Database Task		

5. Project Implementation Description & Explanation

- a. All this data and information are strictly placeholders as a representation of a real product in the future. The only things that are related to the client are the name and product pictures. (See Functional Requirements and Future Enhancements for more information.) There are specific views for the users and admins; each view is distinctly labeled for restrictions between user and admin access (i.e., Figure 4: (User) Page). E-Commerce Website User Interface:

i. Figures 1-3: (User) Home Page



In Figure 1, displays the top of home page for the website for the user interface. The navigation bar span at the top of the page then the welcome banner and some of the products itself.

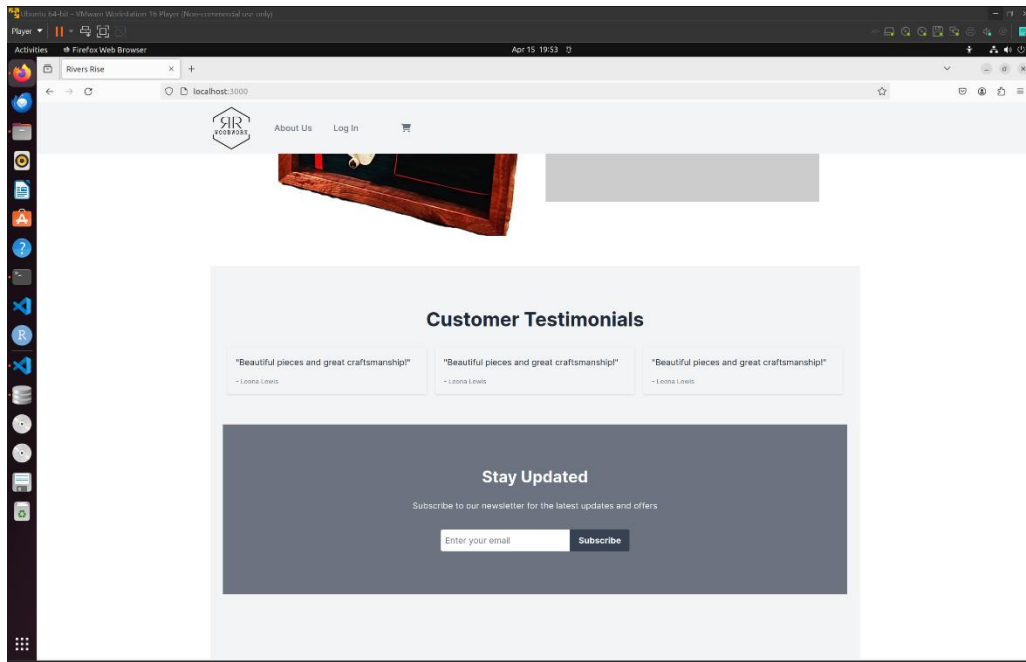


Figure 2 is the middle portion of the home page that will show customer testimonials of the products and a sign up for the company newsletter. The newsletter link will eventually allow a whole email blast of upcoming products and features for the company.

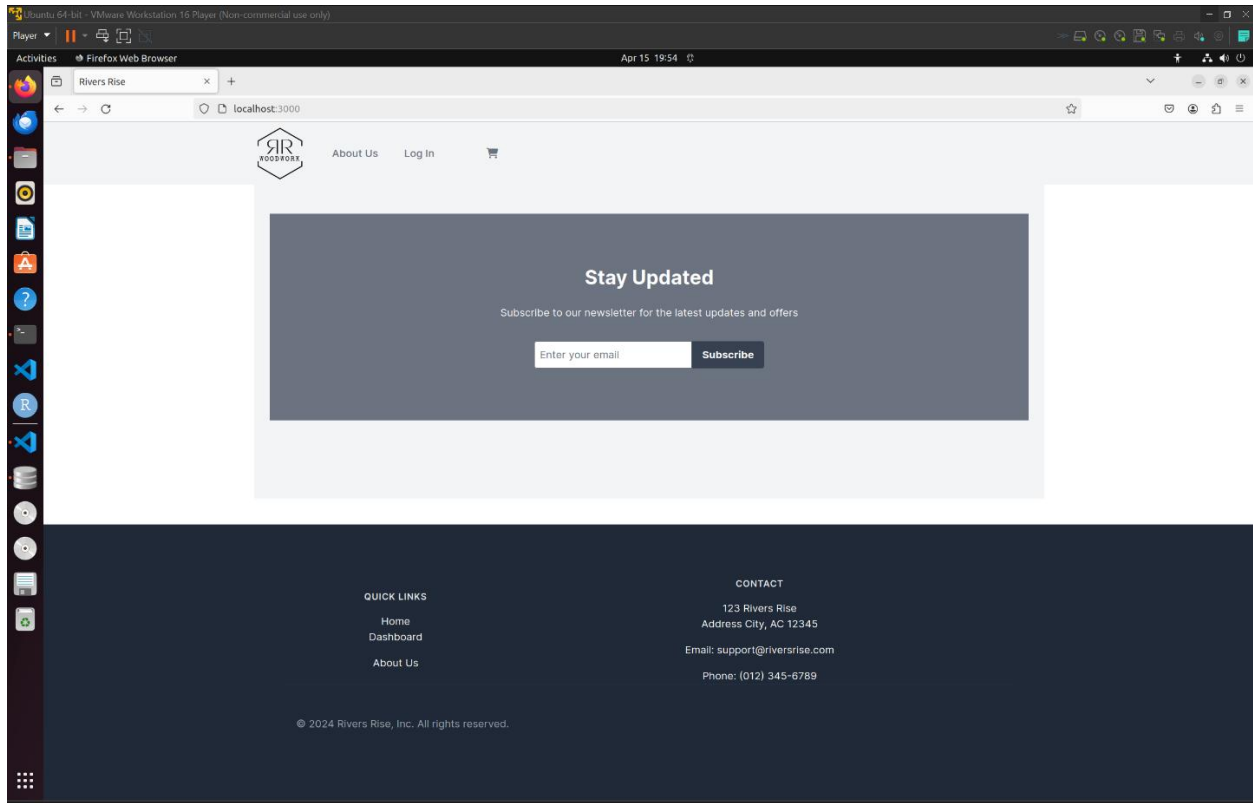


Figure 3 is finally the end of the home page with the footer. The footer displays all the quick links involved such as the Home and About Us page. It includes a way for customers to contact the company. The Dashboard link is strictly for the Admin to access the Admin Dashboard (Figure). The User is not able to just find their way onto the Dashboard because that link in the footer brings up a log in page where the Admin has an encrypted log in and password. There is also a watermark for the company to demonstrate that it is a real company and there are copyright restrictions.

ii. Figure 4: (User) About Us Page

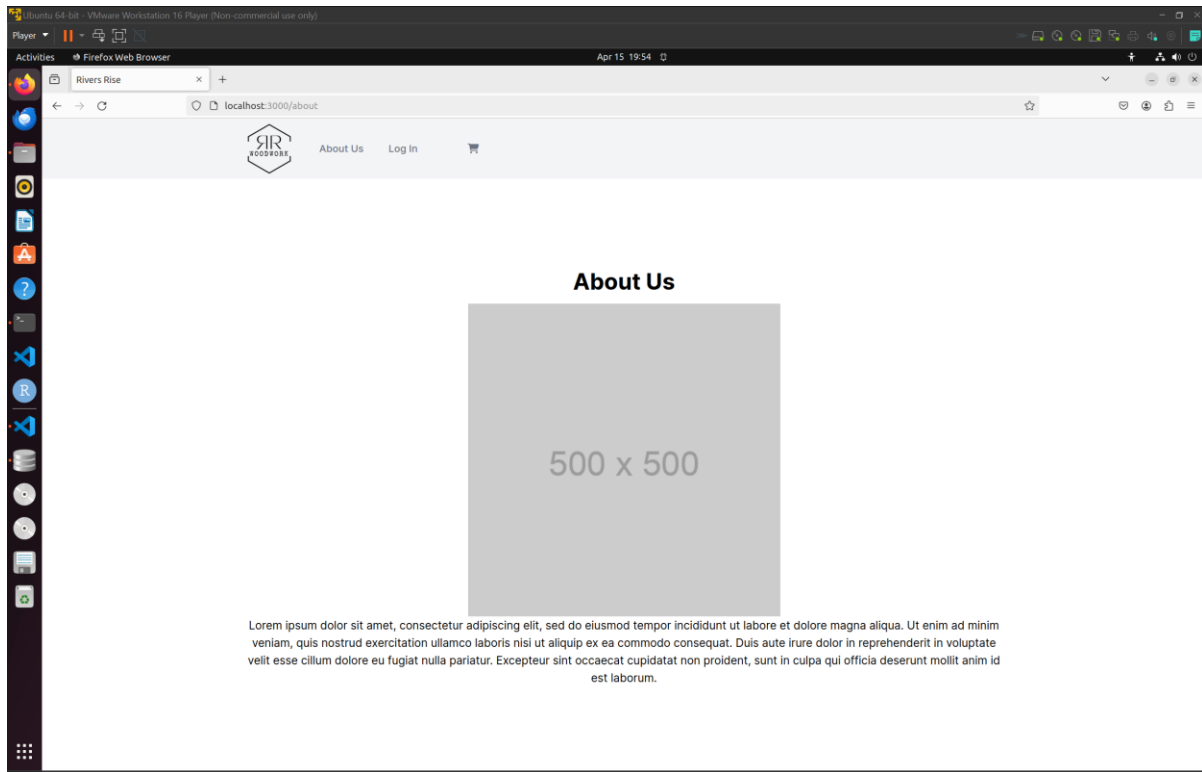


Figure 4 shows the About Us page. All the details of this page are strictly page holders due to client confidentiality. When the actual interface is fully implemented this will show a brief description of the owners, what the company is about, and a face to the company.

iii. Figures 5-6: (User) Products Page

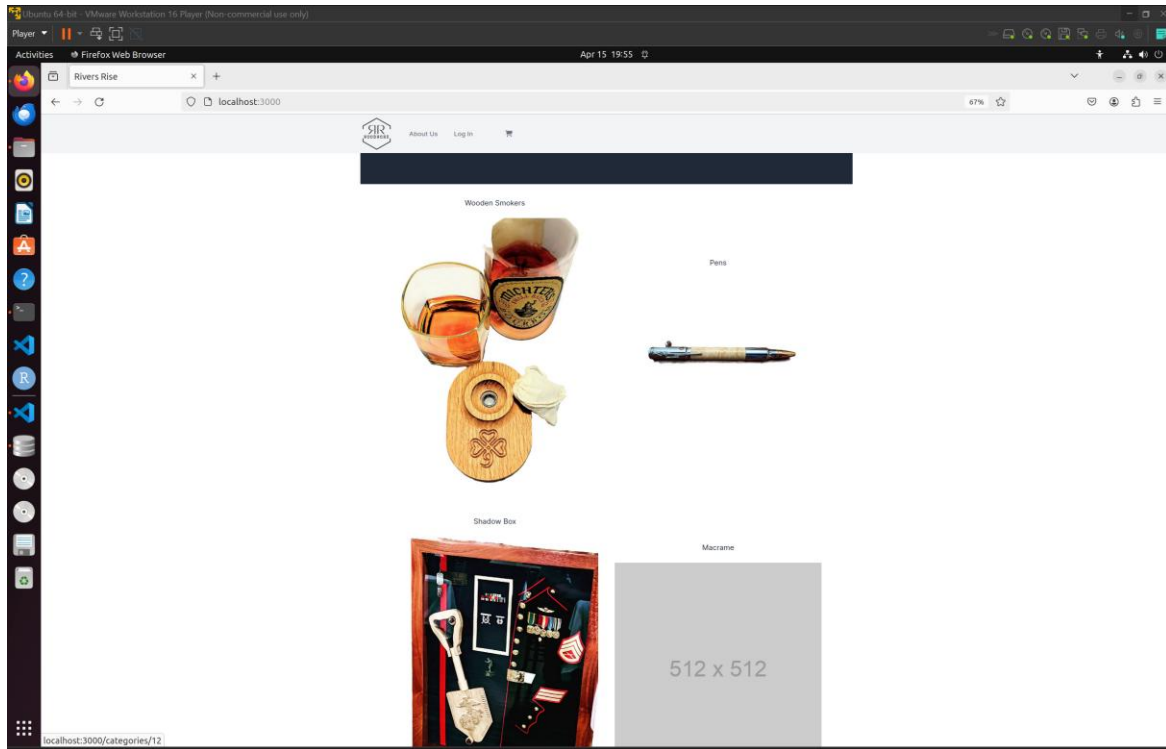


Figure 5, on the home page are a couple of products that the company offers these are all labeled for the user to click on any image, and it takes them to that specific product page. If the user wants a purple heart pen they can find it by clicking on the pens. This is meant to implement a new standard of user-friendliness for any user that is quick and easy to find.

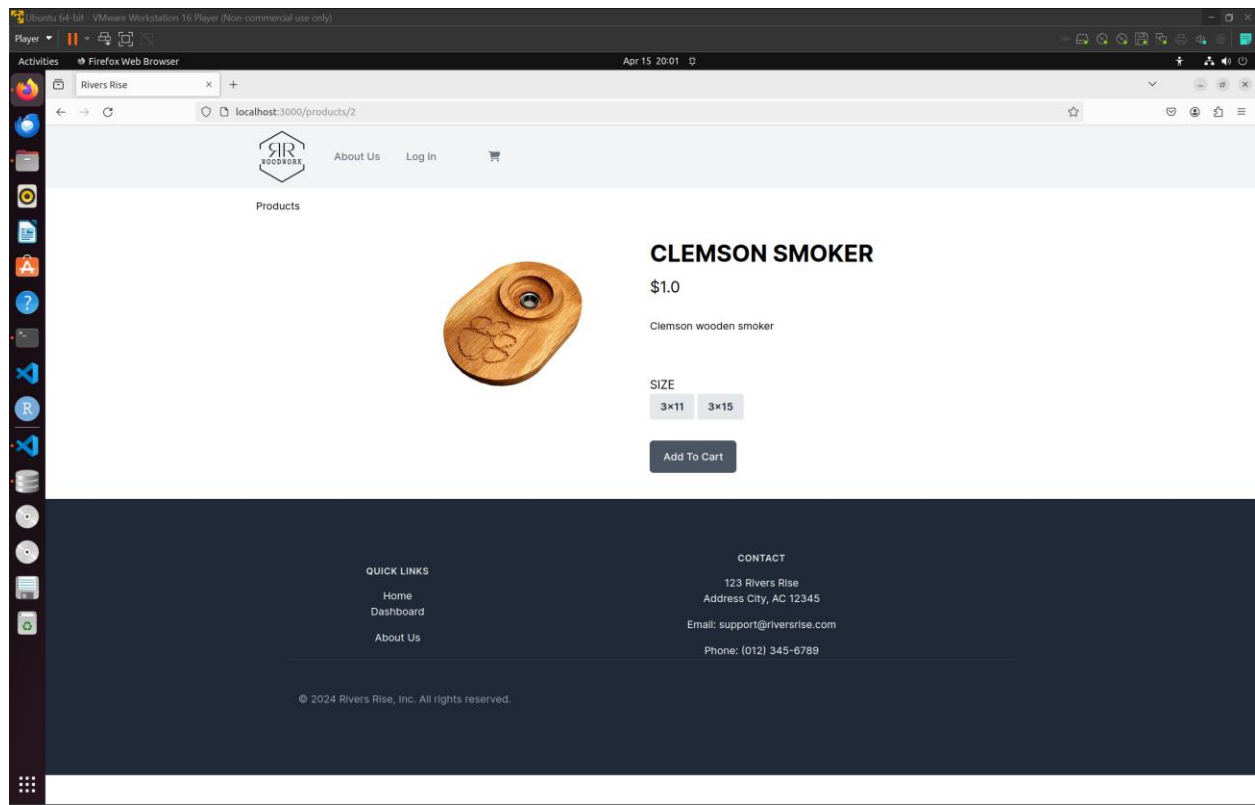


Figure 6 is a full description and price of the product itself. This can be viewed in exactly three clicks from the home page. The user can click on the product, find the desired design that suits their needs, and then add it to their cart.

iv. Figure 7: (User) Categories Page

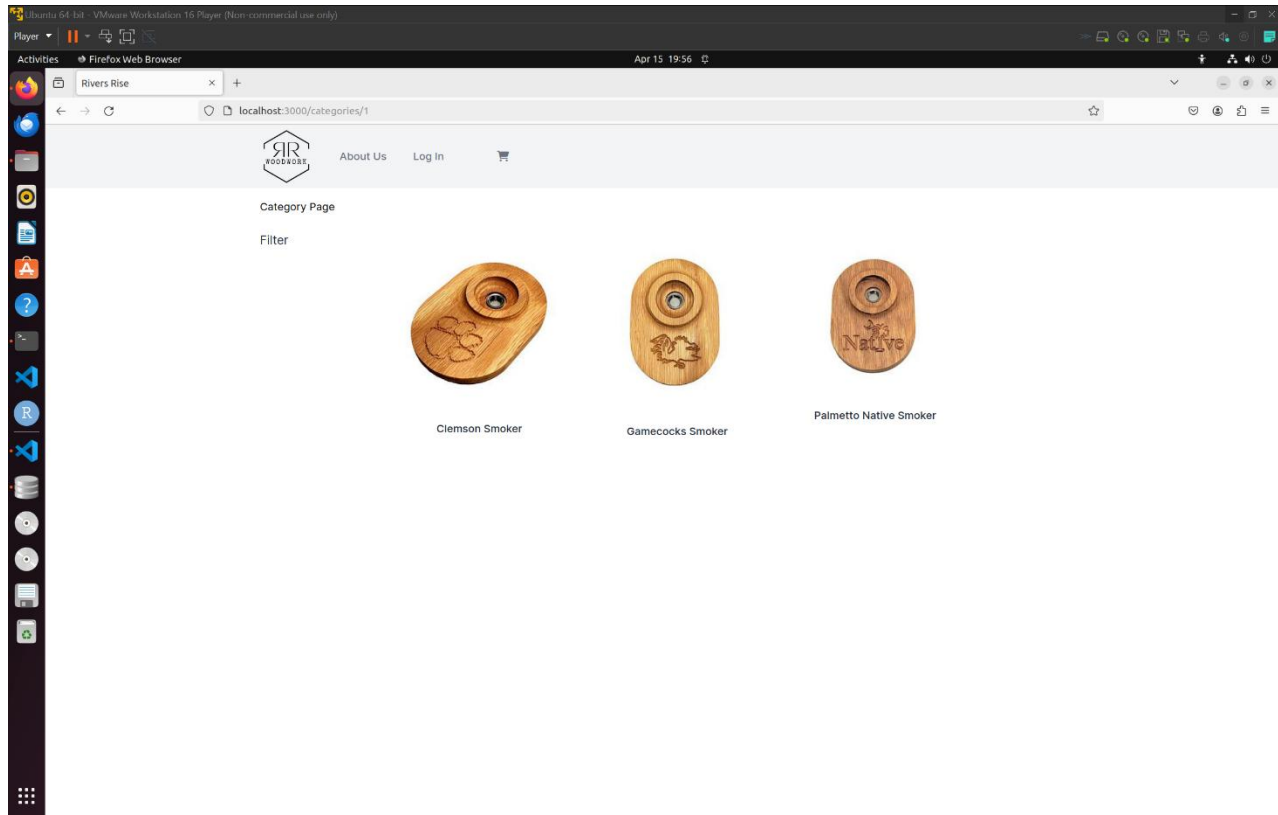


Figure 7 is the entire categories page. All the products are split into categories not only for inventory purposes and easy upload from the Admin it makes shopping a lot simpler than other websites. In this case, I clicked on the Wooden Smokers then it brought me to a selection of designs that I can chose from.

v. Figure 8: (User) Cart Page

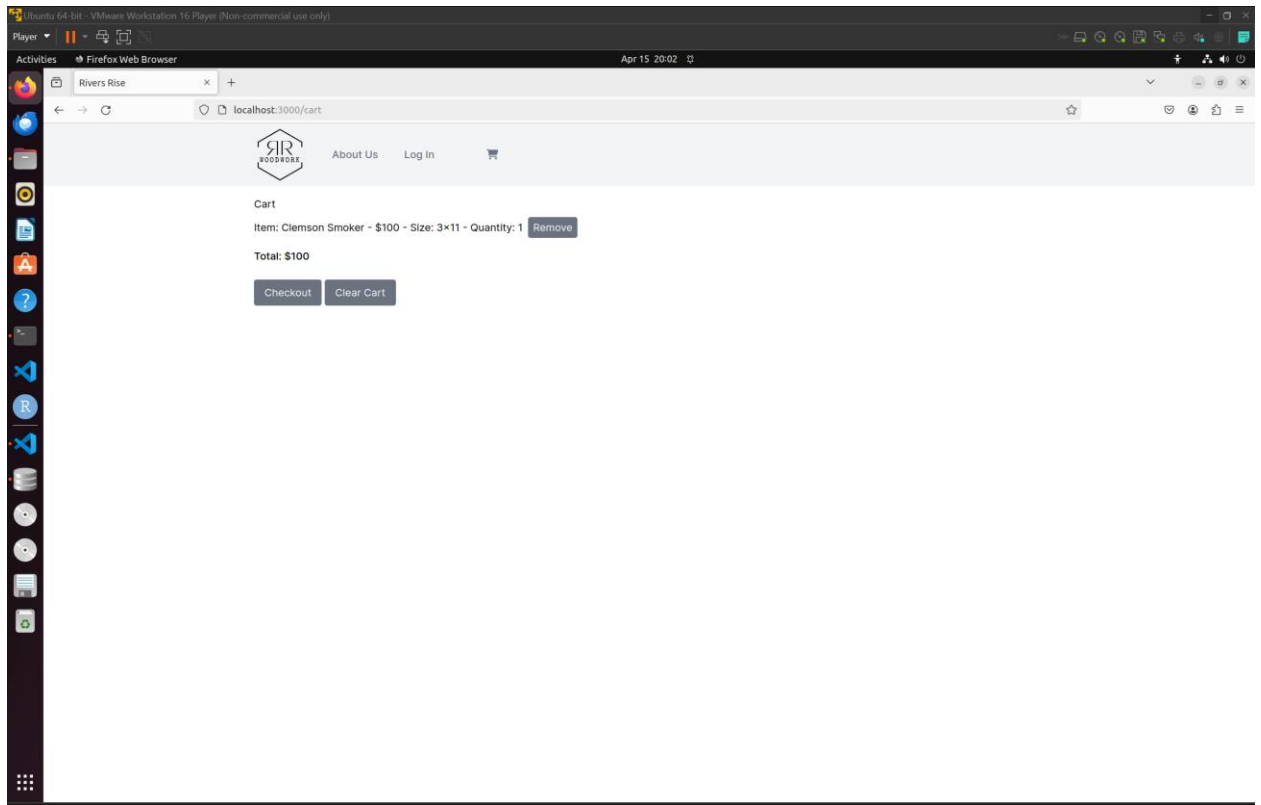


Figure 8 shows the cart page for the user after they make their selection and add it to the cart. The cart is on the navigation bar, so no matter what product or category they are in, they can check their selections or remove them.

vi. Figure 9 (User) Stripe Checkout Page

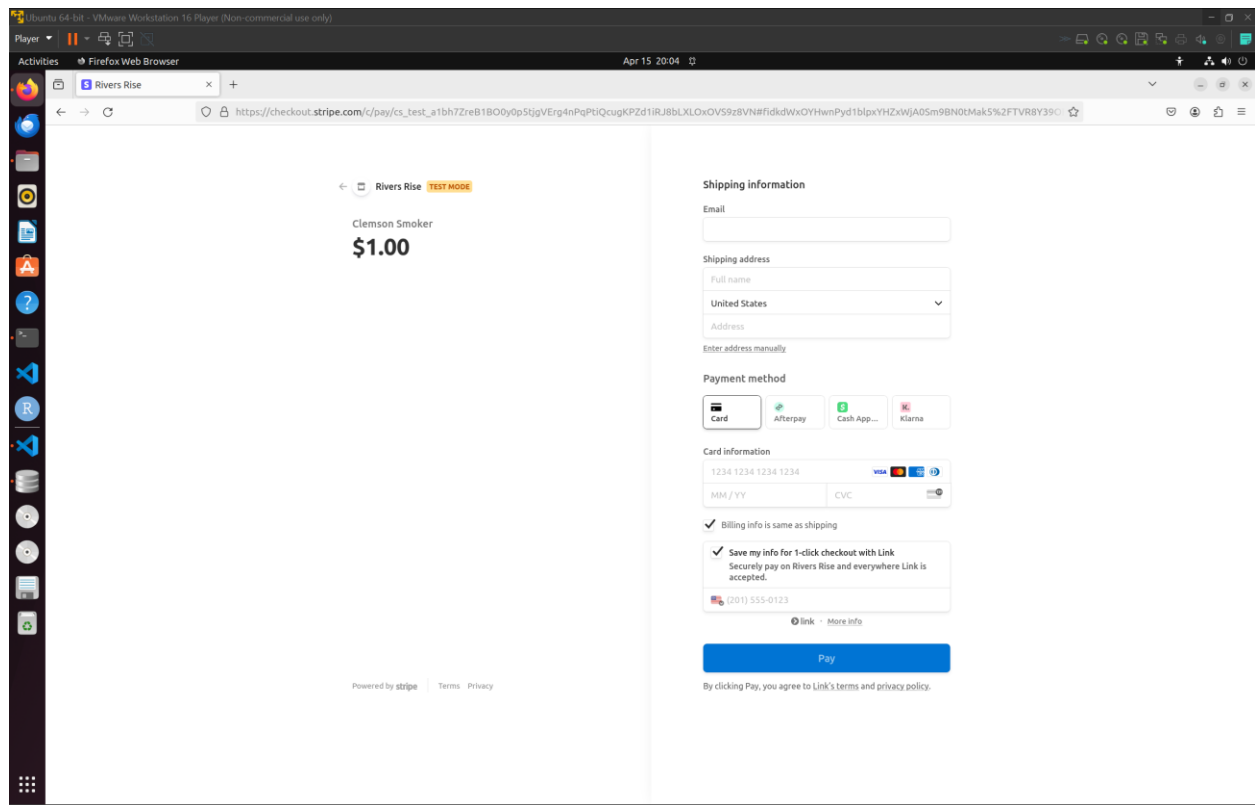
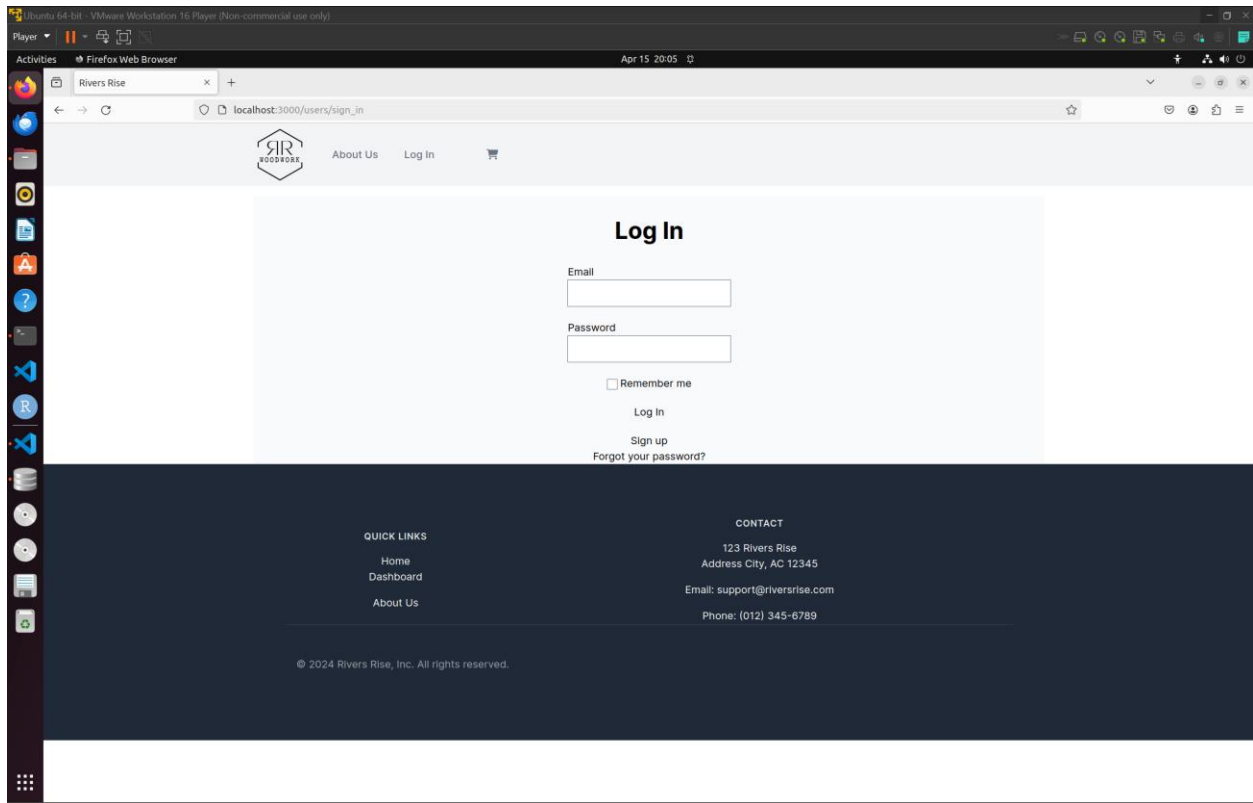


Figure 9 shows that after the user clicks “checkout” on the cart page, it will allow them to enter their personal information and pay for their chosen product. This checkout process is done through software called Stripe that creates an encrypted checkout that works extremely well with Ruby on Rails and Devise to protect user data.

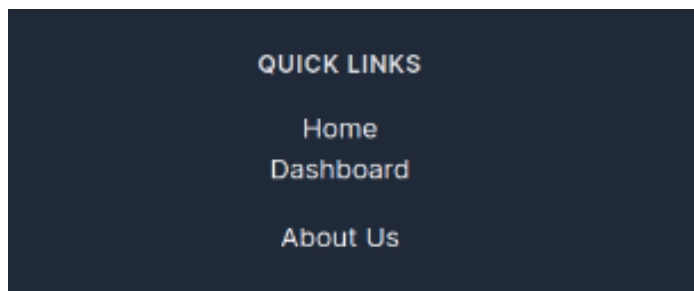
vii. Figure 10: (User) Login Page



This is the user's log in page shown in Figure 10 that allows a user to log in to check their order status. There is also a sign-up page link along with a forgotten password to make the user's access to their order or account easier to reach. "Remember Me" stores the user cookies in Active Storage, which is a Ruby on Rails implementation in the database.

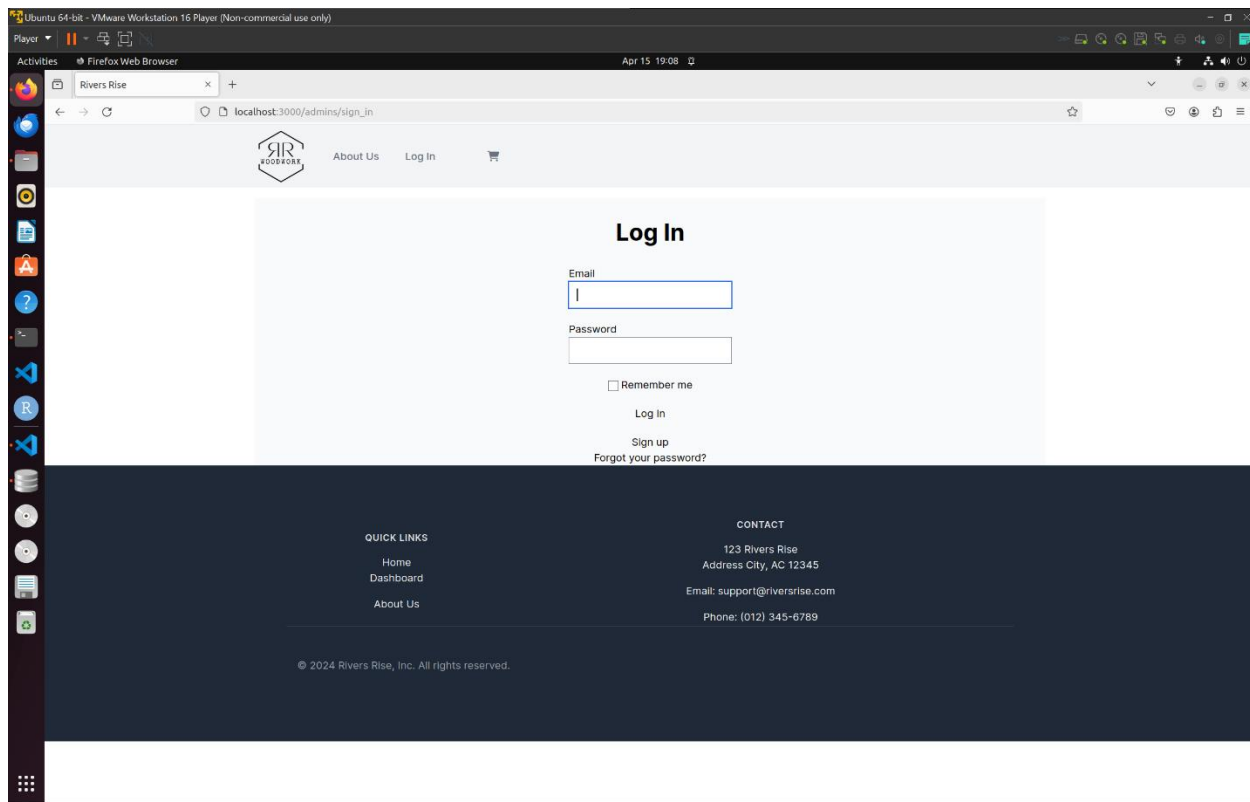
viii. Figures 11-12: (Admin) Login Page

Figure 11 shows the Dashboard link in the footer that allows the admin to access the



Dashboard. The Dashboard link takes the admin to their log in page, which only allows their encrypted username and password to be entered. Unfortunately, this is not the best method to have admin access to their dashboard. There are so many vulnerabilities that a user can accidentally find their way onto the dashboard, where sensitive data is stored. The main thing is that the admin can update the products and categories so much easier with this connection that can simply be done with this link. This area can certainly be improved and is featured in the Future Enhancements section.

Figure 12 is this log in page specifically for the Admin. There is only one route for the Admin to find this log in page.



ix. Figure 13: (Admin) Dashboard

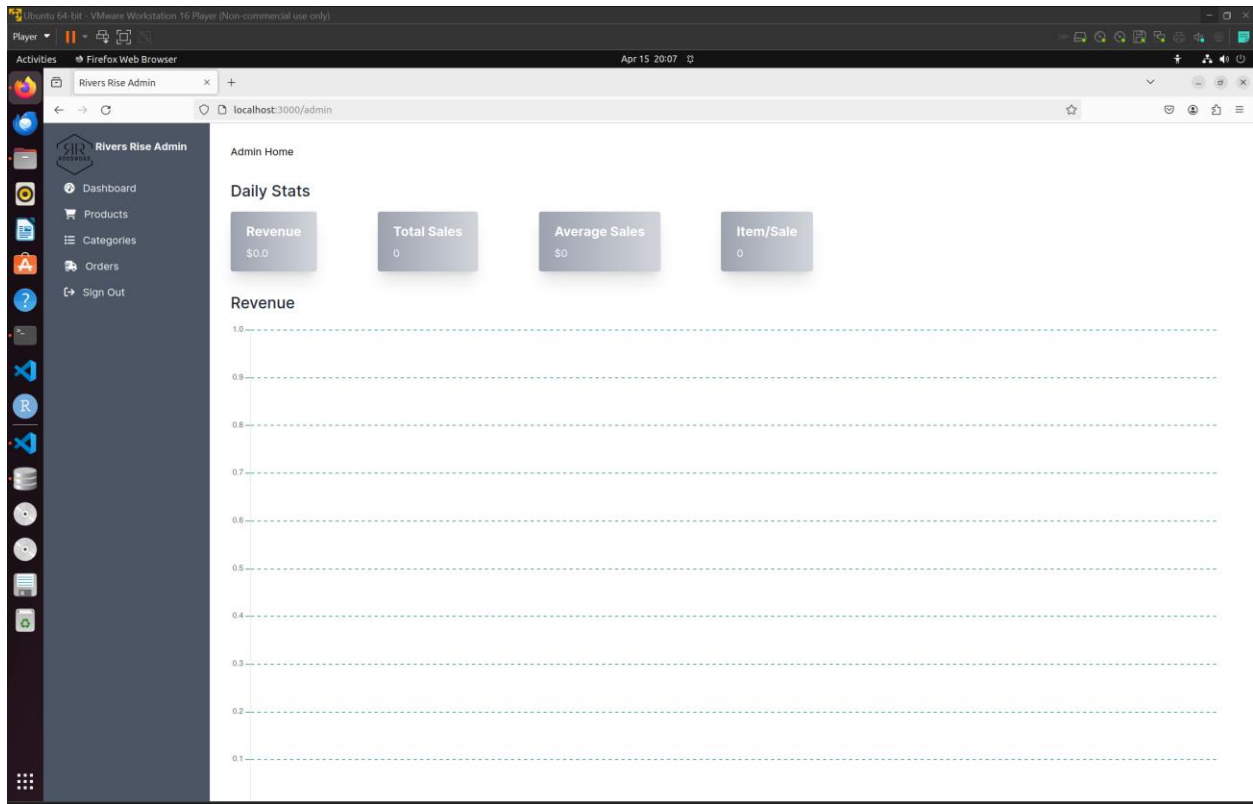


Figure 13 is the Admin Dashboard is the pinnacle of this entire project. After the Admin logs in they are taken to the Dashboard that shows a view of Daily Stats. These statistics show all the sales and revenue made. Along with fulfilled orders that the statistics come from. The navigation bar on the left side shows all the pages that the Admin can go to in order to update products, create a new category, view unfulfilled orders, and sign out of the Dashboard to see their updates on the home page.

x. Figures 14-16: (Admin) Products

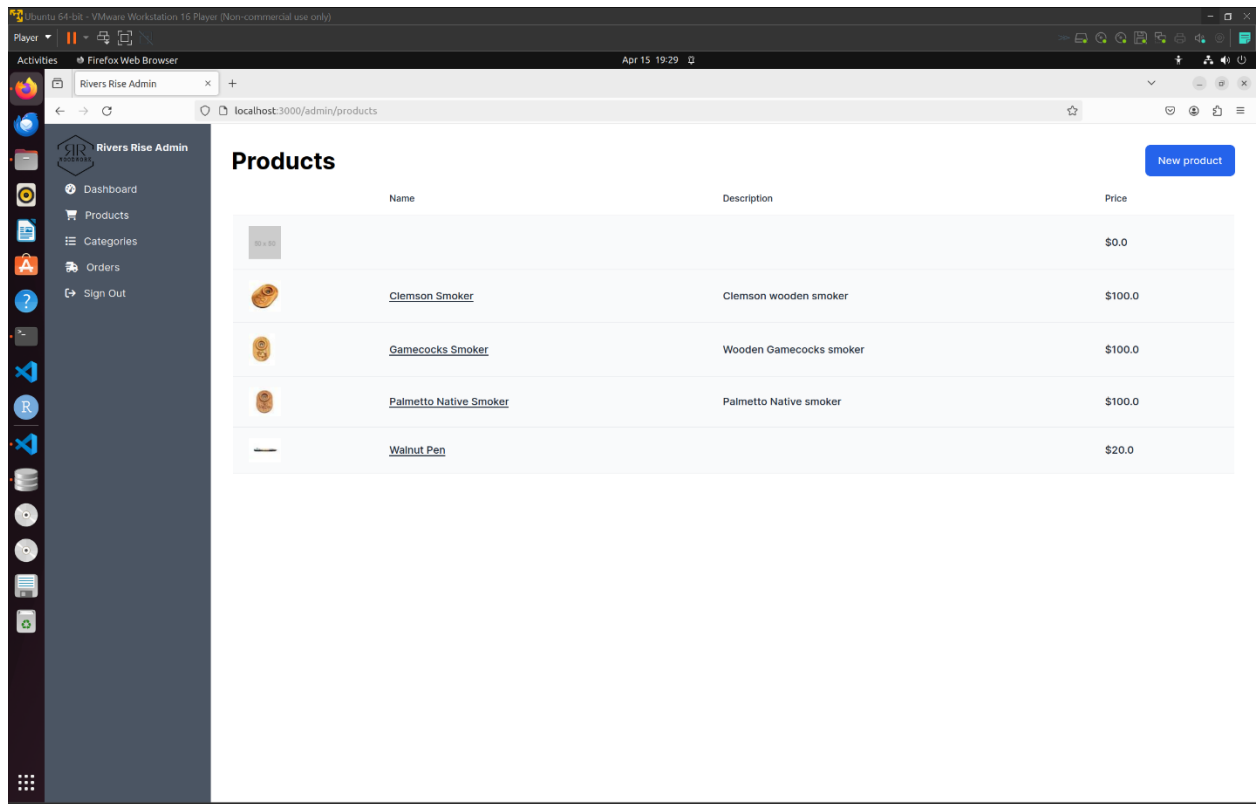


Figure 14 shows the products after the Admin click on the “products” tab. It shows a list of products with their name, description, and price.

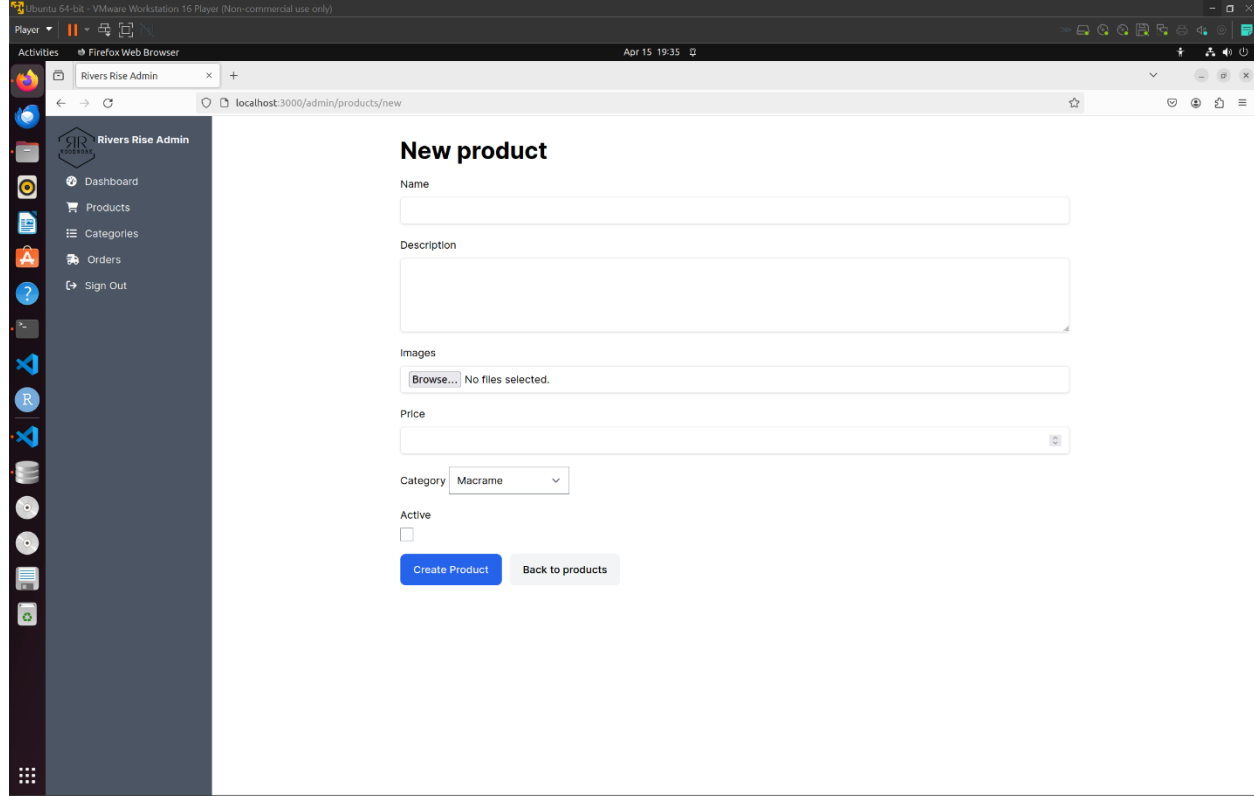


Figure 15 is the new product when the admin wants to add a new product to a category. The name, description, and price are stored on the products page for the admin. The other information is adding an image. Using MiniMagick, ImageProcessing, and Paperclip allows file uploads to be secure, which removes the vulnerability of unsecure file uploads for web applications. These software packages require specific.jpg files and sizes to remove this vulnerability. Then the admin can select a category for this product to be shown on the home page. Then select active to make this product completely active for the front-end of the website. A lot of e-commerce websites release new products in phases, and this feature allows the product to be stored and then active for specific purposes. Release dates are based on marketing strategies.

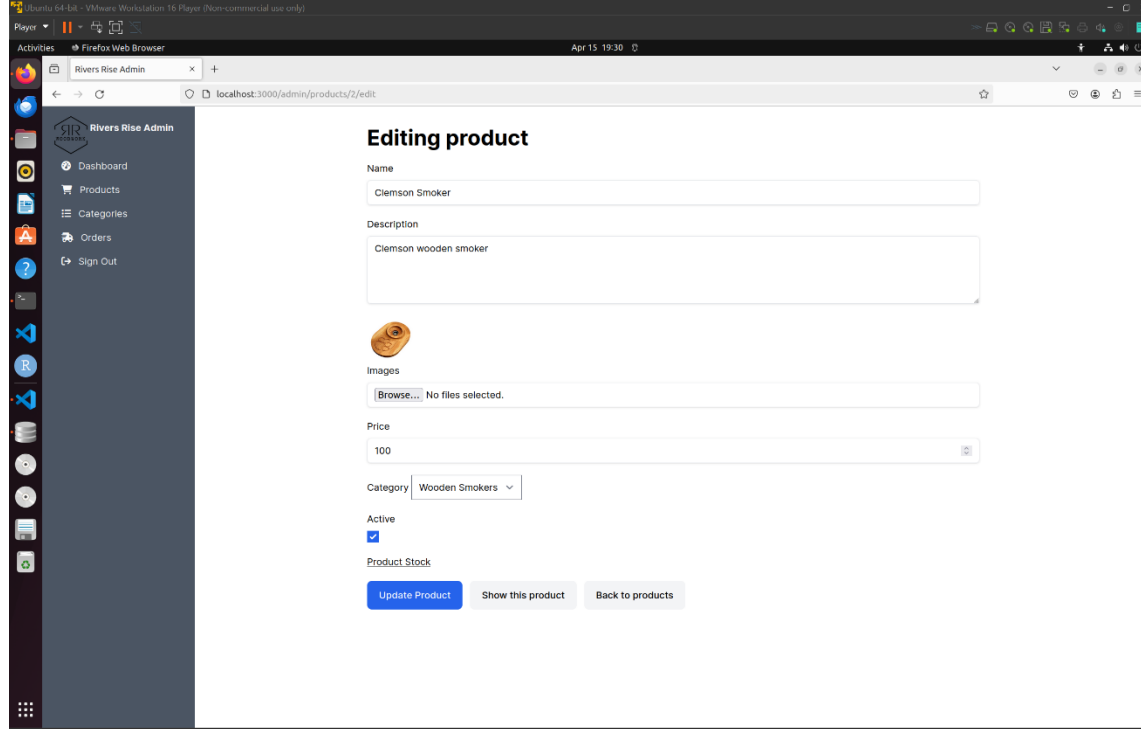


Figure 16 is when the Admin wants to edit a specific product. When they are viewing the list of products they can simply click on a product to add a description, another image, adjust the price, or change the category. Then there is the product stock link which takes the Admin to the stocks page for that specific product.

xi. Figures 17-20: (Admin) Product Stocks

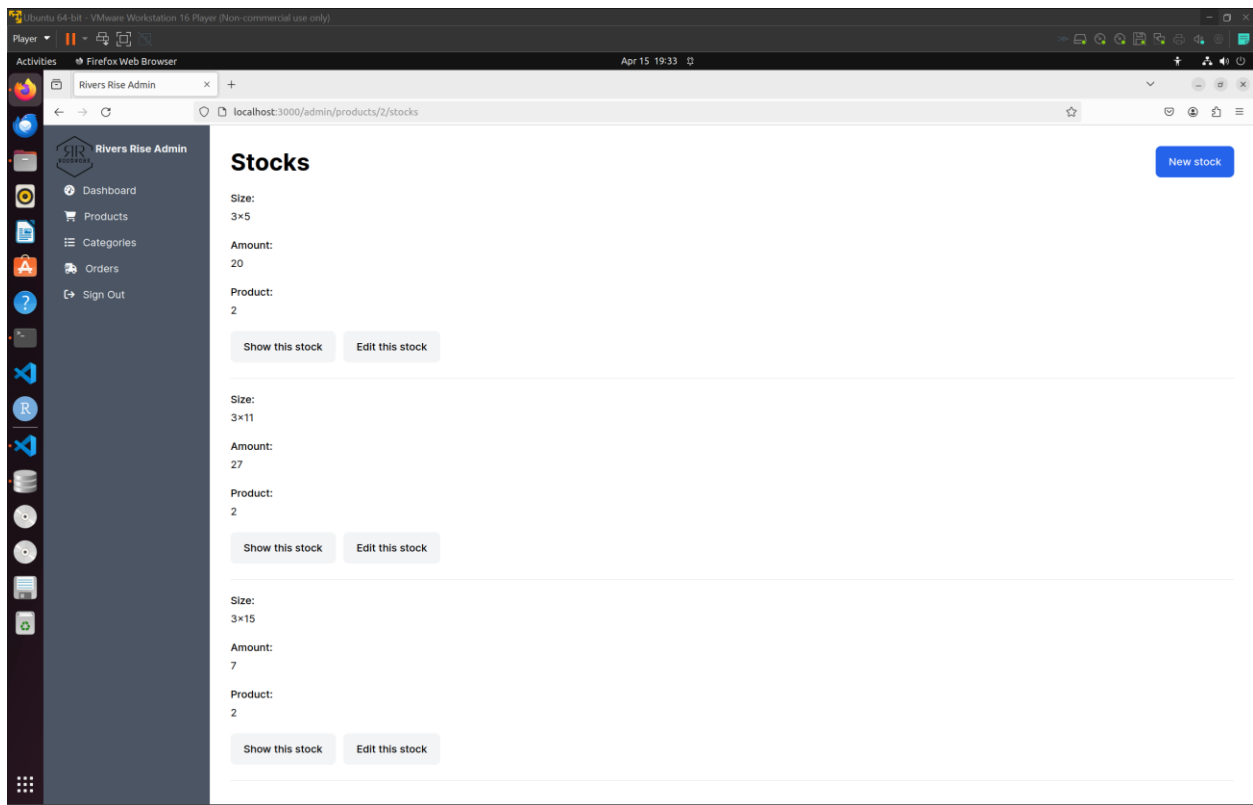


Figure 17 shows the Stocks page for a specific product. This page allows the Admin to add different sizes, add to inventory, or make a certain size out of stock. This allows the user to see if something is out of stock on that products page.

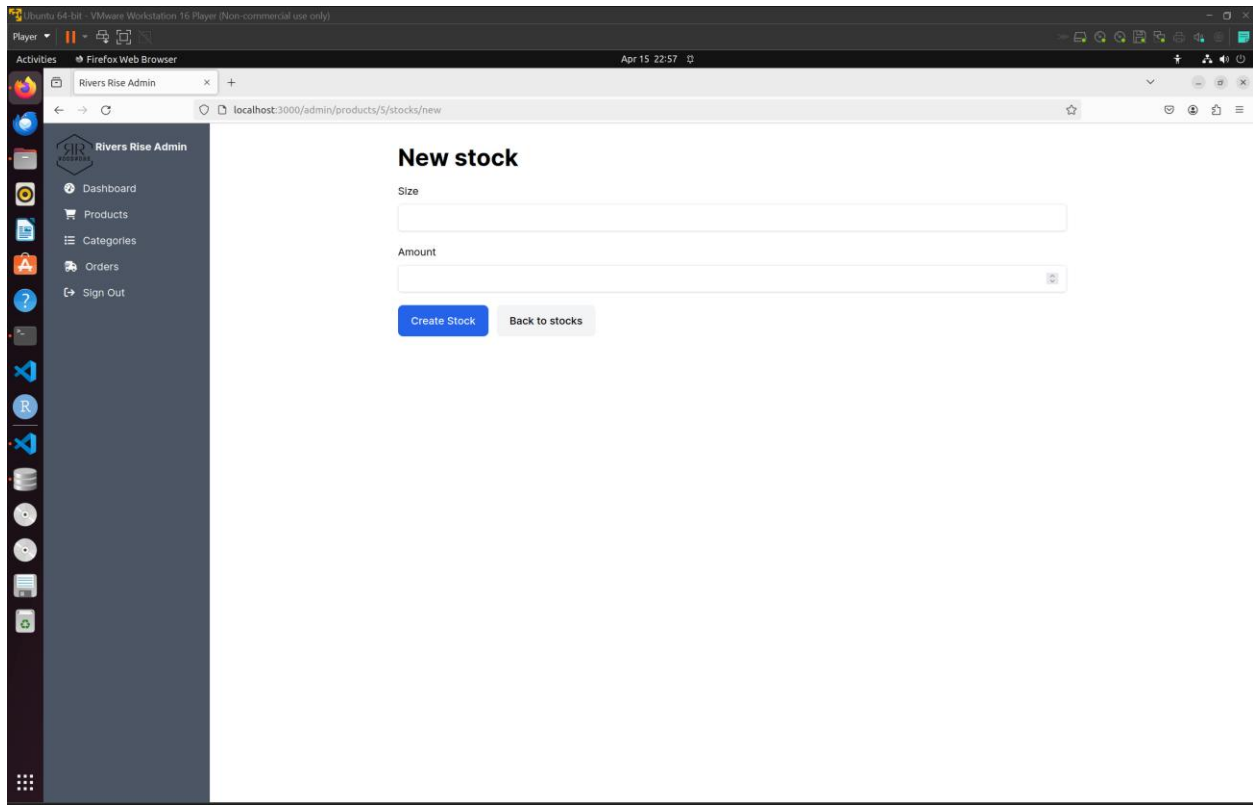


Figure 18 is the new stock page. After the Admin clicks “New Stock” it will allow them to add a size and amount to that product. Basically, adding products into inventory. The Admin can set the amount as zero if something is out of stock.

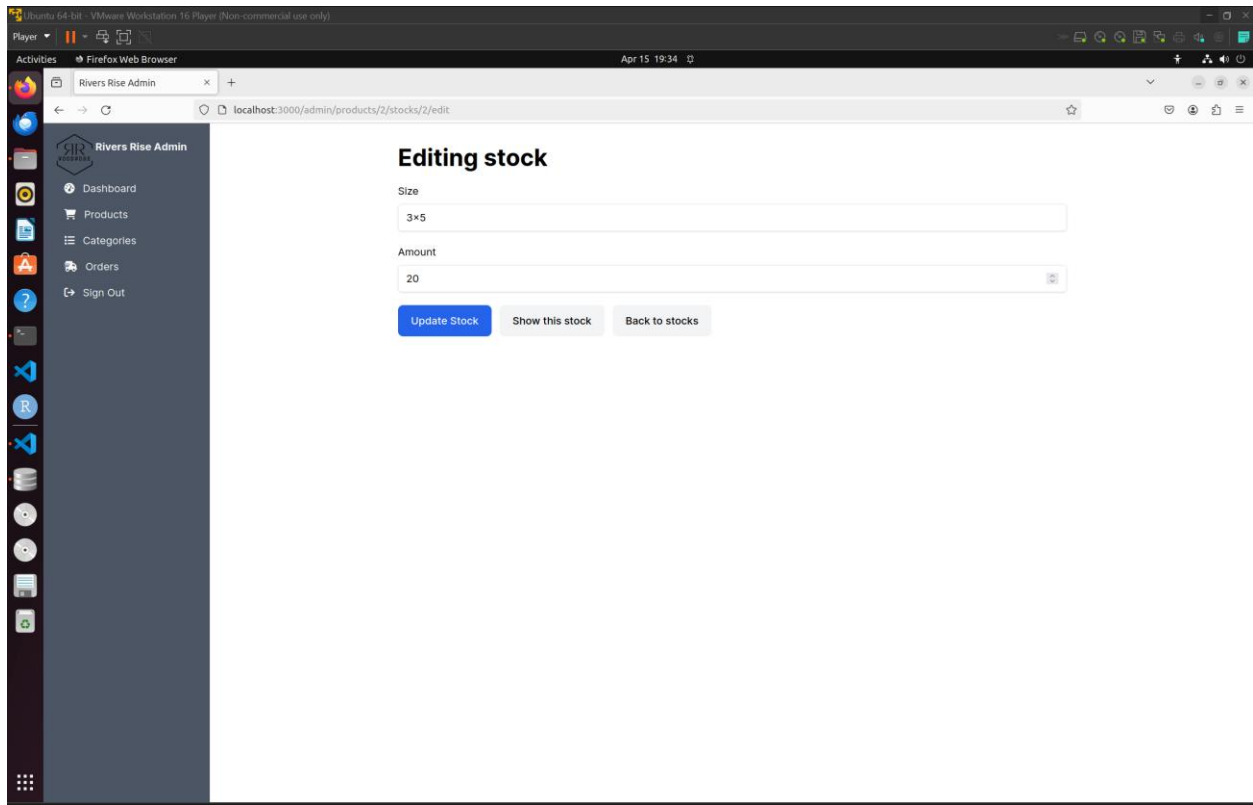


Figure 19 is the editing stock page. The Admin can adjust the size and amount of a product that is already on the stocks page. This allows the Admin to not have to create a whole new stock for inventory purposes in the database.

xii. Figures 21-22: (Admin) Categories

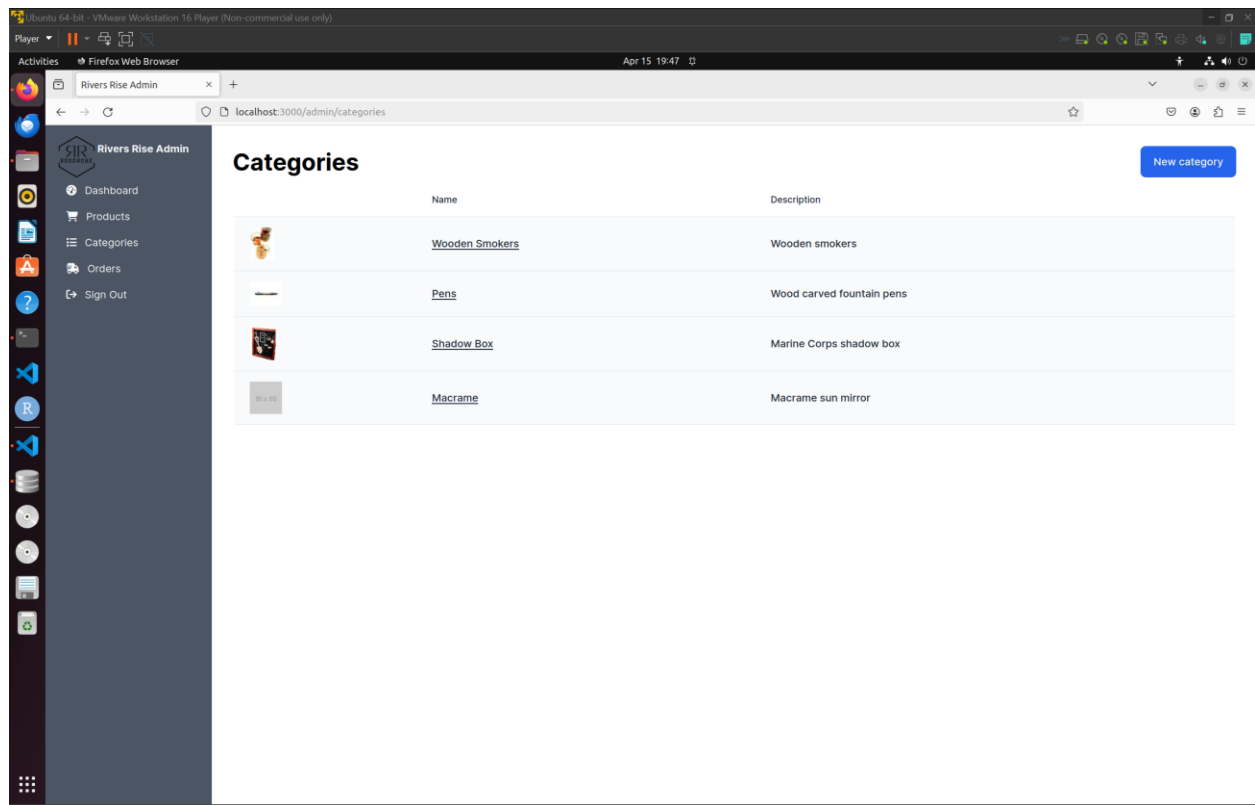


Figure 21 is the category page. This is where the Admin can populate specific categories to the home for the user to click on to view the various products in that category.

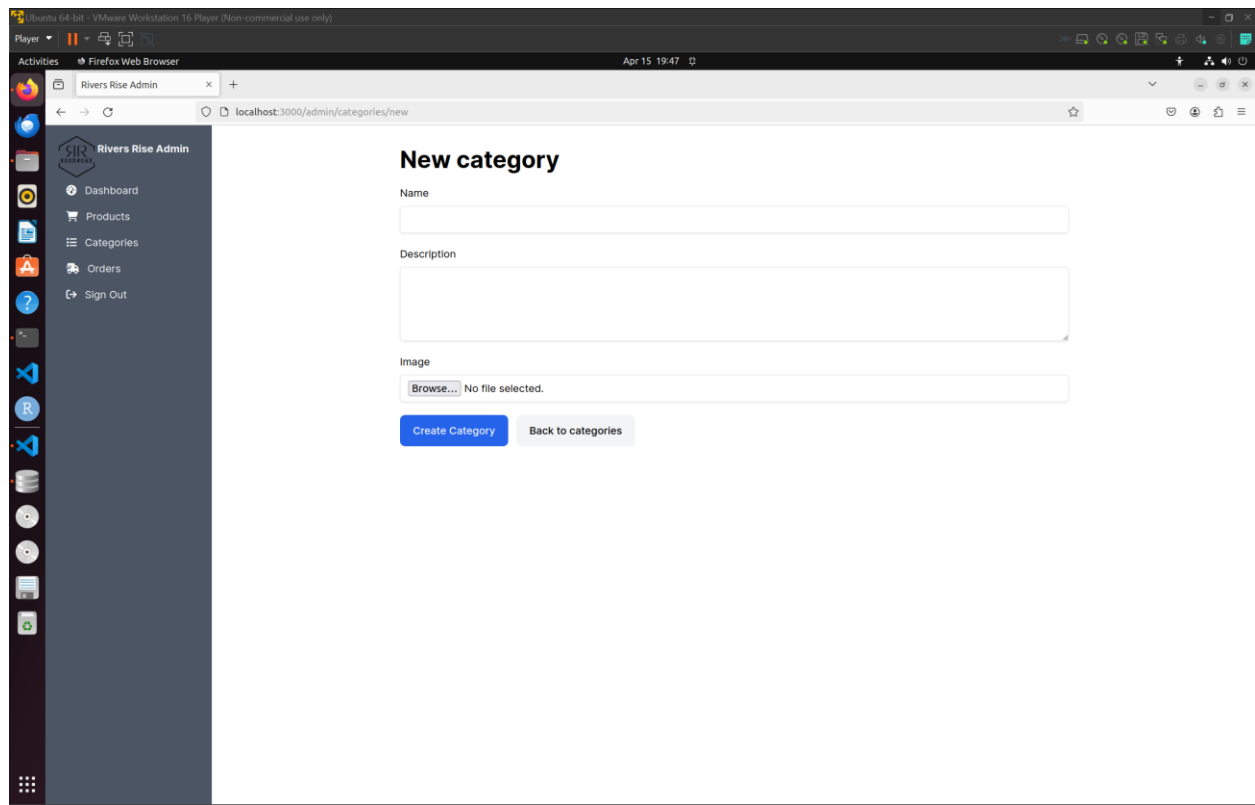


Figure 22 is the new category page. This is where the Admin can add a name, description, and image for a new category on the home page.

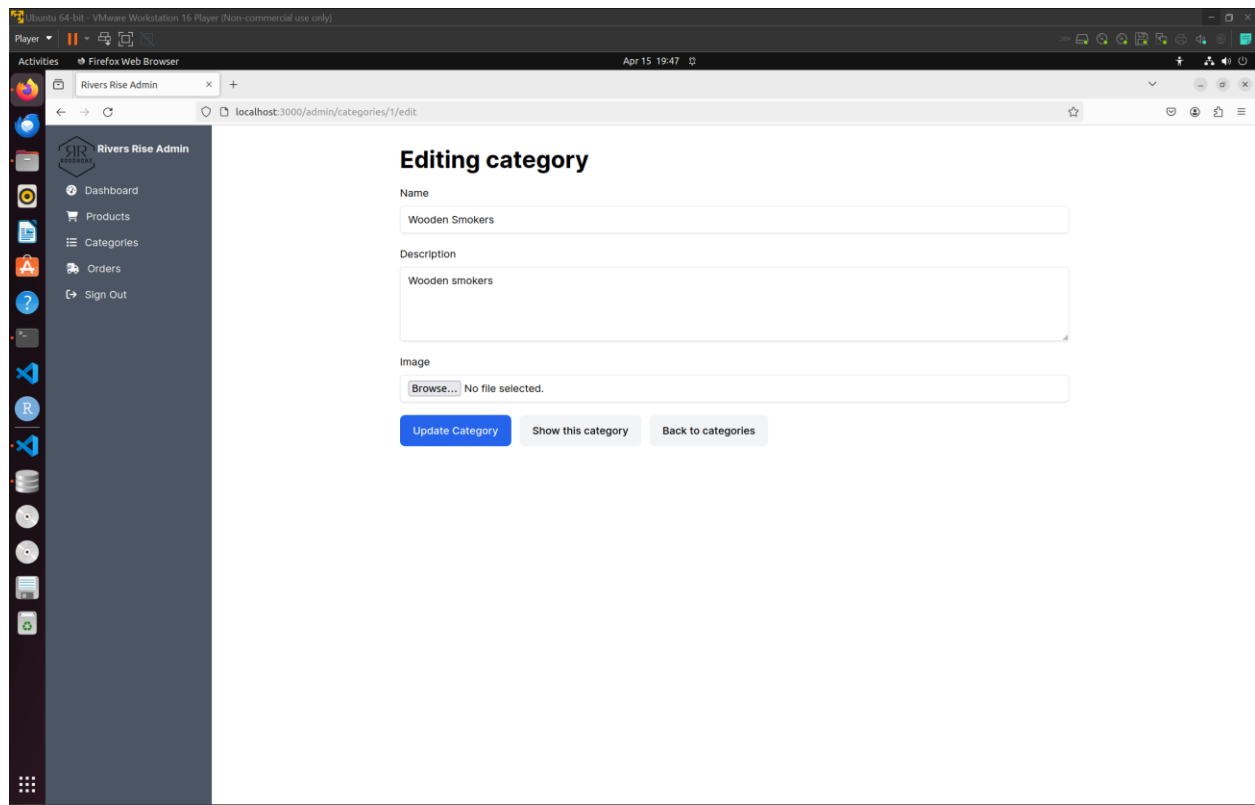


Figure 23 is the edit category page. The Admin can edit a category with a new description or upload another image.

xiii. Figure 24-26: (Admin) Orders

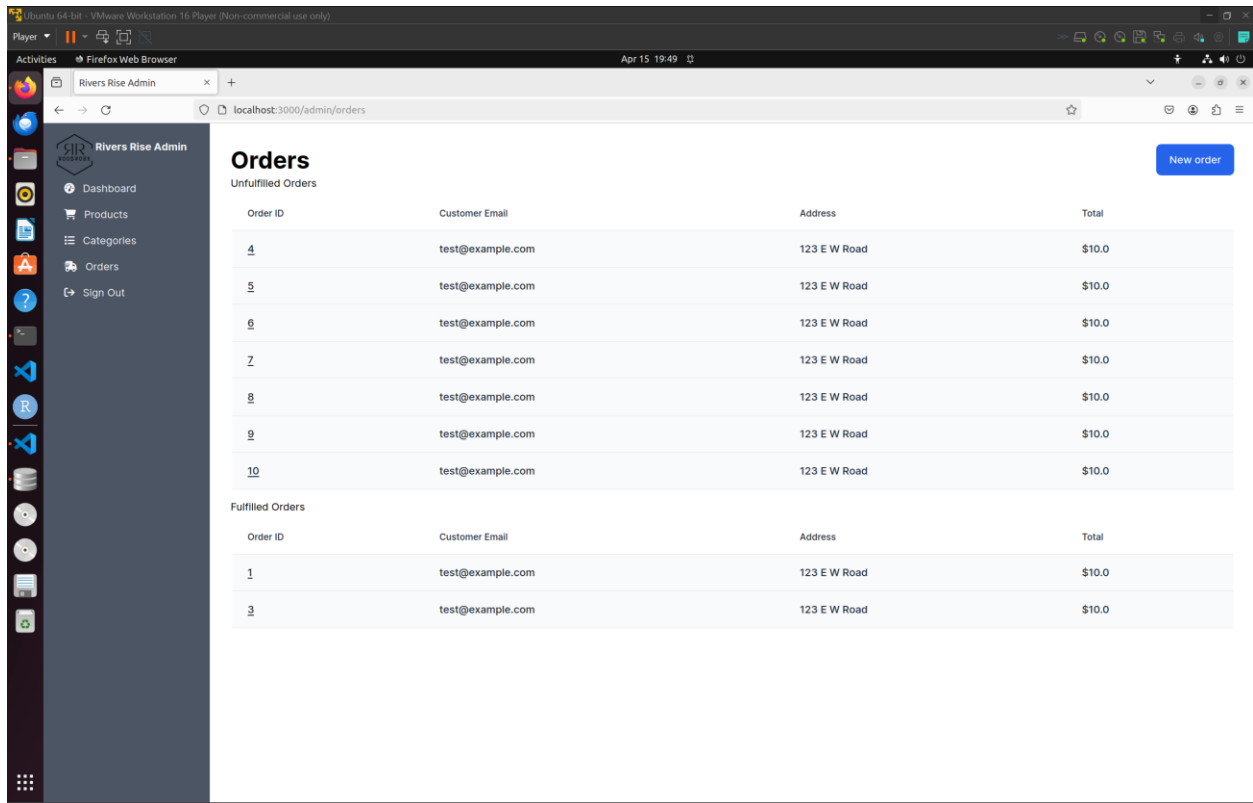


Figure 24 is the orders page. This page populates the orders into two section fulfilled and unfulfilled. As orders are received the Admin can view current and past orders.

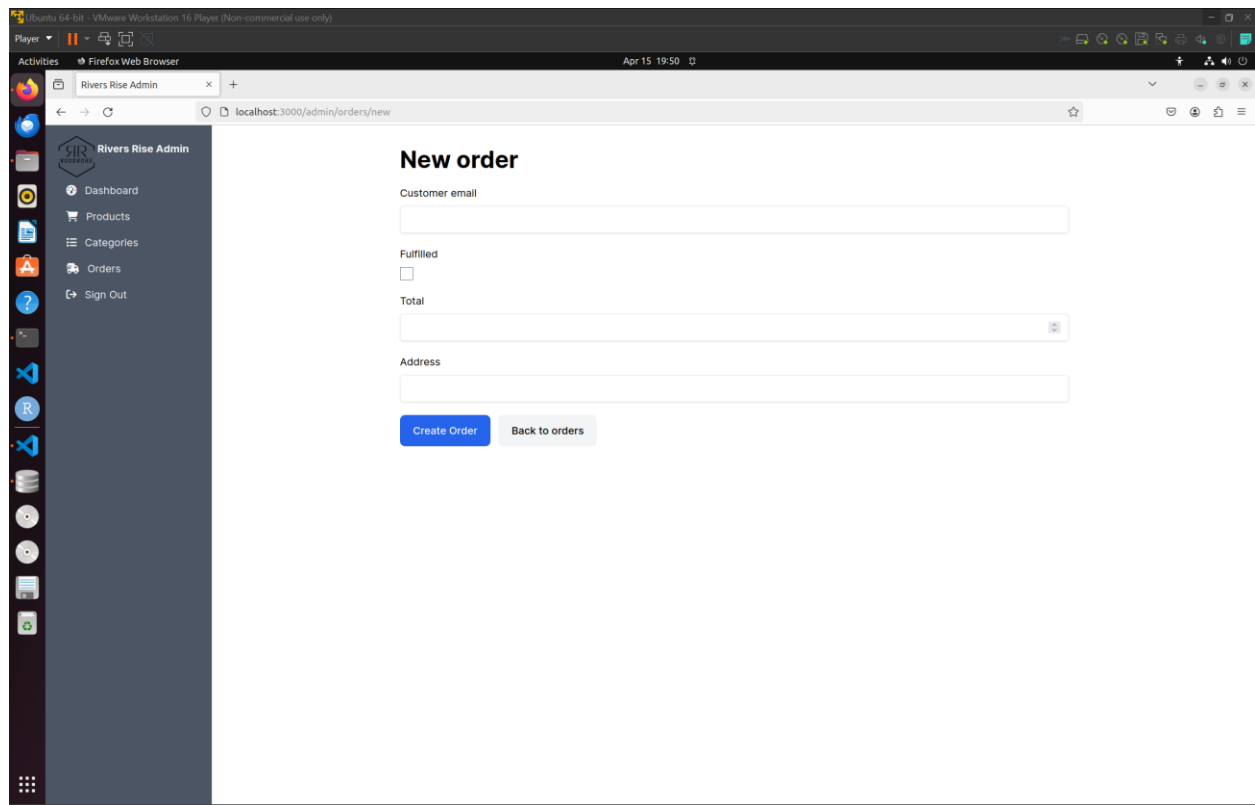


Figure 25 is the new order page. If the Admin has to create a new order for a customer or has a custom order they can create a new order. This is where the Admin can input the customer email, total, and address. Then mark if has been fulfilled or not that will be stored in the database.

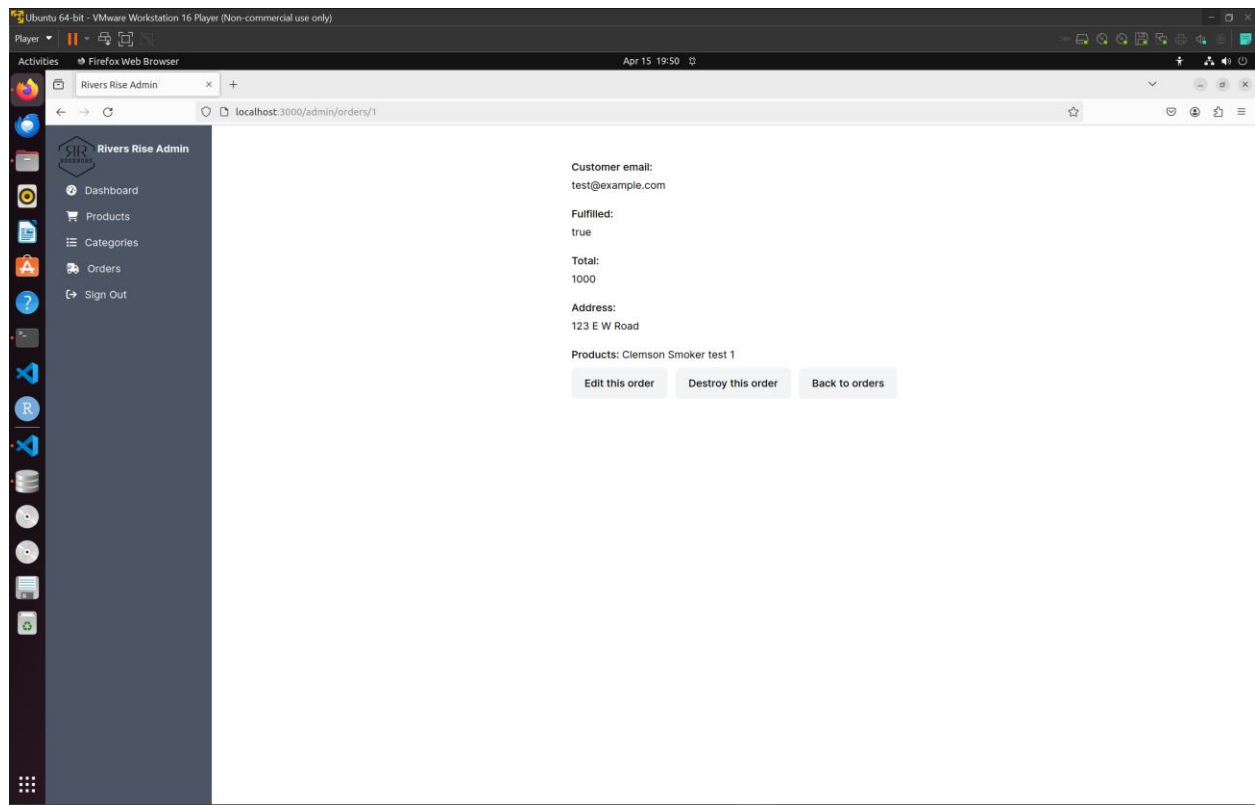


Figure 26 is when the Admin wants to view an individual order. It will show all the details of the order. Then the Admin can edit the order, destroy the order, or go back to the orders page itself.

6. GitHub: <https://github.com/chamberlain-gibson/RR-Project>

7. Test Plan

1. Usability Tests Overview

- a. Evaluate product's ease of use and user-friendliness.
- b. Involves observing real users' interactions.
- c. Identifies usability issues or improvement areas.
- d. Includes task definition, user observation, feedback collection, and analysis.
- e. Aids in understanding user perception and interaction.

- f. Leads to enhancements improving user satisfaction and experience.

2. Brakeman Configuration:

- a. Configure Brakeman settings, including any custom rules or exclusions tailored to the applications requirements.
- b. Ensure that Brakeman is integrated into the development workflow, such as being included in continuous integration pipelines.
- c. Run Brakeman against the Rails application to scan for security vulnerabilities.
- d. Review the generated report to identify any potential issues detected by Brakeman.
- e. Prioritize and categorize the identified vulnerabilities based on their severity and impact on the application.

8. Test Results

1. User Feedback :

1. Bobby Gibson (Client)

2. Overall Satisfaction:

Overall, I'm quite satisfied with my experience on the website. The useability of the features available and the ease of navigating through different sections contribute to my positive impression.

3. Ease of Use:

The website was super easy to use. I was able to navigate through the different pages effortlessly and find exactly what I was looking for. The layout was clean and organized, making it simple to locate information. Overall, my experience on the website was seamless and enjoyable. Along with all of the Admin functionality

with viewing revenue and sales all at once.

4. Features and Functionality:

There were some areas of the website that could be adjusted with further prototyping and development. For example, the overall visual design could be enhanced to improve the user experience and make the website more visually appealing. With continued prototyping and development, these adjustments could help optimize the website for better functionality and user engagement. The Admin features are intuitive and functionally engaging. It is mainly the front-end that needs some work.

5. Design and User Interface:

The design is super easy to use, and there are more ways to make the design even simpler in future development. By continually seeking feedback and iterating on the design, future updates can continue to enhance the user experience and make the design process as straightforward as possible.

6. Future Improvements:

In future improvements to the website, having a more user-friendly interface will be a top priority. This will include streamlining the navigation and search functions to make it easier for users to find the information they are looking for quickly and efficiently. Additionally, incorporating interactive features such as chatbots or virtual assistants could further enhance the user experience and provide more personalized assistance. Overall, the goal is to create a website that is not only visually appealing but also highly functional and intuitive for all visitors.

7. Additional Feedback: None.

1. Narie Gibson (Client)

2. Overall Satisfaction:

My experience using the website was very positive. The design was visually appealing, and the user interface made it easy to navigate and find what I needed. The color scheme and layout enhanced my overall experience as well. Customer support was prompt and helpful, resolving any technical issues in a timely manner. I would definitely recommend this website to others and have no suggestions for improvement at this time.

3. Ease of Use:

The website is simple to use, and all the information was easily found. Whether there are first-time visitors or regular users, the layout and navigation are intuitive, making it a breeze to find what you are looking for. The clear headings and organized categories help streamline the user experience, ensuring that you can quickly access the information you need without any hassle.

4. Features and Functionality:

Features and functionality of the website include a user-friendly interface, seamless navigation, and a variety of interactive tools to enhance the overall user experience. Additionally, the website regularly updates its content to provide users with the latest information and resources in their area of interest. Overall, the features and functionality of the website are designed to meet the diverse needs and

preferences of its users, making it a valuable and dynamic online platform.

5. Design and User Interface:

In terms of design, I personally find the website to be quite visually appealing. The color scheme is modern and easy on the eyes, and the layout is clean and organized. However, I do think that there could be some improvements made to the user interface. For example, I found it a bit confusing to navigate through the different sections of the website, and I think that some clearer labeling and navigation tools could help make the user experience more seamless. Additionally, I think that adding some interactive elements or multimedia content could enhance the overall user experience and make the website more engaging.

6. Future Improvements:

Overall, I found the website to be user-friendly and easy to navigate. The design was visually appealing, and the features were quite useful in helping me accomplish my goals. However, I did encounter a few difficulties with certain features not working properly. In terms of performance, the website was fast and reliable, providing accurate information. Moving forward, I would suggest improving the functionality of certain features and possibly enhancing the overall design for a more modern look.

7. Additional Feedback: None.

I would also recommend incorporating more interactive elements to engage users and make the website more dynamic. Additionally, providing clearer instructions or tutorials for utilizing certain features could be beneficial for

users who may be unfamiliar with the platform. Overall, I believe that with some minor adjustments and enhancements, the website has the potential to become even more user-friendly and appealing to a wider audience.

1. Madison Marshall
2. Overall Satisfaction: I'm somewhat satisfied, but there's definitely room for improvement.
3. Ease of Use: It's fairly easy to use, but I had trouble finding certain features.
4. Features and Functionality: The product descriptions could be more detailed.
5. Design and User Interface: The design is decent, but it feels a bit cluttered. Simplifying the layout would be beneficial.
6. Future Improvements: Adding more filter options and improving product descriptions would enhance the user experience.
7. Additional Feedback: None.

1. Evan Hack
2. Overall Satisfaction: I love the website! It's so easy to find what I need.
3. Ease of Use: Learning to navigate it was a breeze. However, sometimes the adding things to the cart function doesn't yield accurate results.
4. Features and Functionality: I really appreciate the wishlist feature. It helps me keep track of items I'm interested in.

5. Design and User Interface: The design is sleek and modern. I do think the checkout process could be more streamlined.
6. Future Improvements: I'd love to see more variety in product offerings
7. Additional Feedback: None.

1. Grace Molloy
2. Overall Satisfaction: I'm generally satisfied, but there's room for improvement.
3. Ease of Use: It took me a bit to get the hang of it, but once I did, it was smooth sailing.
4. Features and Functionality: The footer came in handy when I forgot how to go back to the home page.
5. Design and User Interface: It's decent, but some sections feel cluttered. Simplifying the layout would be beneficial.
6. Future Improvements: Adding more detailed product descriptions would be helpful.
7. Additional Feedback: None.

1. Dylan Bettencourt
2. Overall Satisfaction: I'm extremely satisfied! It is a great start for a future product.
3. Ease of Use: It's incredibly easy to navigate. I've never had any issues.

4. Features and Functionality: I love variety of products. The feature is super easy to use.
5. Design and User Interface: The design is beautiful and user-friendly. I have no complaints.
6. Future Improvements: Maybe adding more variety in product offerings would be beneficial.
7. Additional Feedback: None.

1. Ruby Allen
2. Overall Satisfaction: I'm satisfied, but there are some areas that need attention.
3. Ease of Use: It's relatively easy to use, but I encountered some bugs while navigating.
4. Features and Functionality: The product size options are helpful. However, the loading times are quite slow and did not work for all the products.
5. Design and User Interface: The design is clean, but the layout could be more intuitive.
6. Future Improvements: Improving site speed and fixing bugs should be prioritized.
7. Additional Feedback: None.

1. Jocelyn Lillie
2. Overall Satisfaction: It's alright, but I've seen better.
3. Ease of Use: It's not the most intuitive website I've used. I had to spend some time figuring things out.
4. Features and Functionality: The product categories options are helpful. However, the home page just seems really long.
5. Design and User Interface: The design is a bit dated. It could use a modern overhaul.
6. Future Improvements: Improving site speed would enhance the user experience.
7. Additional Feedback: None.

1. Emily Knox
2. Overall Satisfaction: I'm very pleased with the website. It is an simple website for shopping.
3. Ease of Use: It's incredibly user-friendly. I had no trouble navigating it from the get-go.
4. Features and Functionality: I love the 'cart' feature. It makes it easy to pick up where I left off.
5. Design and User Interface: The design is clean and attractive. Everything is where it should be.
6. Future Improvements: Maybe incorporating customer reviews directly on the product pages would be beneficial.

7. Additional Feedback: None.

1. Maggie Parker
2. Overall Satisfaction: I'm extremely satisfied! It's exceeded my expectations.
3. Ease of Use: It's incredibly easy to navigate. I had no issues whatsoever.
4. Features and Functionality: I absolutely love the products page. It's a game-changer.
5. Design and User Interface: The design is stunning. It's visually appealing and well-organized.
6. Future Improvements: Maybe adding more payment options would be beneficial.
7. Additional Feedback: None.

9. Challenges Overcome

The most difficult aspect of this endeavor has been time management, as I am reporting to myself and doing everything myself. The entire endeavor helped me respect collective projects. One of the most challenging issues was time management, which was put on the back burner for most of the project because there were so many stages to it. However, I learnt a lot about work prioritization and self-imposed deadlines to keep on track. I had to divide the job into smaller, more achievable tasks and construct a timeline to guarantee that everything was done on time. Despite the obstacles, I am proud of how I

overcame time management challenges and completed the assignment effectively. It was an invaluable learning experience that will undoubtedly aid me in my future endeavors.

The development was another primary obstacle; this project goes beyond what was covered in the User Interface Programming course. The Ruby on Rails lesson was somewhat sophisticated for a beginner Ruby on Rails programmer because of the many software applications (Devise, among others), yet it was helpful in certain ways. Devise made everything encrypted, which is highly sophisticated to deal with and excellent for security reasons. All things considered; this project had a steep learning curve but was also quite gratifying. I became a more skilled programmer because of being compelled to increase my knowledge and proficiency with Ruby on Rails. Even if the obstacles were formidable, it was all worthwhile when you succeeded in conquering them and saw the finished result come together. I'm grateful for the opportunity to use this assignment to push myself and develop my skills.

There was also a limited amount of Ruby on Rails software available, making security measures difficult to understand, study, or even use. I wish I could have exploited some of the many limits in this area—even in a client prototype. Unfortunately, it was challenging to guarantee that the application was completely safe from possible attacks without access to the most recent security tools and resources. In hindsight, I realize the importance of investing in robust security measures to safeguard sensitive data and prevent any breaches. Moving forward, I will make sure to prioritize security considerations in all future projects to avoid similar limitations.

10. Future Enhancements

There are plenty of future enhancements that I would love to implement to produce a better-quality interface for the client. There are many interface choices that could be improved within a software development team that has a better brainstorming session than individuals would be due to a collective understanding of the software itself. In a group setting, time management will be more effective. Additionally, collaboration within a team can lead to more innovative ideas and creative solutions that may not have been thought of by individuals working alone. By harnessing the diverse skills and perspectives of team members, we can create a user interface that is not only visually appealing but also highly functional and user-friendly. Ultimately, through effective teamwork and communication, we can ensure that the final product meets the needs and expectations of our clients.

Along with better time management, security measures will be significantly increased, resulting in a more robust website and database. By implementing encryption protocols and regular security audits, sensitive information will be better protected from potential cyber threats. Additionally, user authentication processes will be strengthened to prevent unauthorized access to the system. These measures will not only safeguard user data but also enhance the overall user experience by providing peace of mind to the website's visitors. With these enhanced security measures in place, the website will be able to build trust with its users and ensure that their information is safe from any malicious attacks. Regular monitoring and updates will also be conducted to stay ahead of any emerging threats in the ever-evolving cyber landscape. By prioritizing security and user privacy, the website will be able to maintain its reputation as a reliable and secure platform for users to engage with.

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11. Defense Presentation Slides