



# Software Project

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Software Project

Develop a dynamic brewery website and online store.

Year 2 2022-23

DL836 BSc (Hons) in Creative Computing

Link to resources created as part of the project.

GitHub	<a href="https://github.com/y2-SW-project/swproject23-ConnaaaR69">https://github.com/y2-SW-project/swproject23-ConnaaaR69</a>
Miro	<a href="https://iadt.sharepoint.com/:w:/s/DL836Y22022_dafaf6e4-2ac9-11ed-bc4c-836ae3d74349/Eftm9qCA-INFgnN3lqMxBkoB4MwUZJkHNBZ4Pp4jCMjDtA?e=OPL9eg&amp;nav=eyJljoXNDkzODI5NDE4fQ%3D%3D">https://iadt.sharepoint.com/:w:/s/DL836Y22022_dafaf6e4-2ac9-11ed-bc4c-836ae3d74349/Eftm9qCA-INFgnN3lqMxBkoB4MwUZJkHNBZ4Pp4jCMjDtA?e=OPL9eg&amp;nav=eyJljoXNDkzODI5NDE4fQ%3D%3D</a>
Figma	<a href="https://www.figma.com/file/JxeHVQyFbVmRFFLxshC8el/Software-Project?node-id=0%3A1&amp;t=6Dc03AVmNumdN5bC-1">https://www.figma.com/file/JxeHVQyFbVmRFFLxshC8el/Software-Project?node-id=0%3A1&amp;t=6Dc03AVmNumdN5bC-1</a>

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# 1 Introduction

## Overall aim

This project's aim is to create a website and web store for a small brewery using Laravel and associated technologies.

## Application area

Web Application with E-Commerce

## Technologies

PHP, MySQL, Bootstrap, CSS, HTML, Laravel, Node, SCSS, JavaScript

## Tools

IDE, phpMyAdmin, Miro, XAMPP,

## Project management

GitHub, Trello, Excel

## Business Concept

Micro-Brewery (Craft brewery)

## Requirements

## Design

## Implementation

## Testing Reflection

## 2 Business Concept

### 2.1 Business Idea

A small craft brewery with a local shop and website to advertise and an online store.

### 2.2 Business model

The business model of the brewery will be to sell small batch beer and ale to consumers in the east of Ireland. Local sales will be facilitated through a small shop front at the brewery and customers further afield can purchase products online and have them delivered.

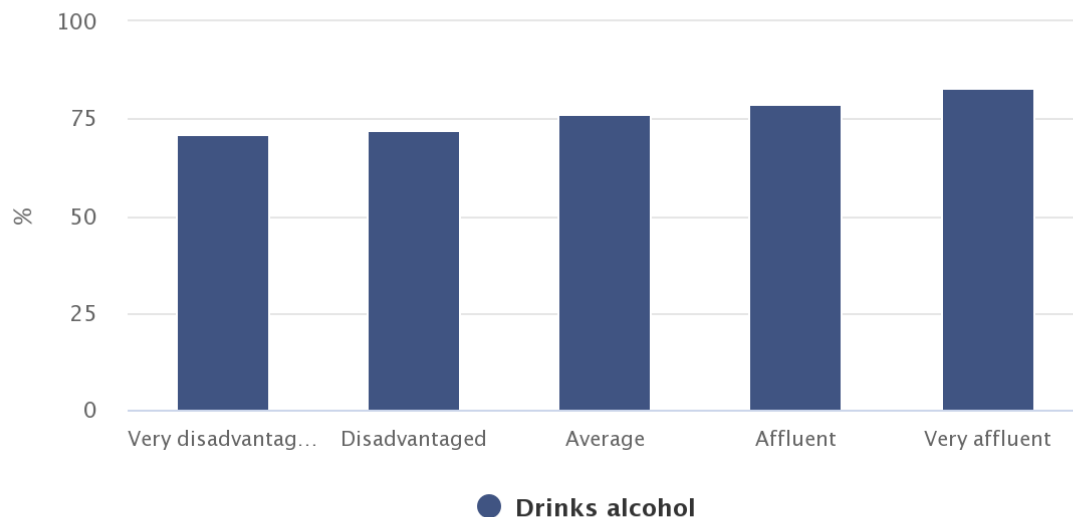
A website will be used to both advertise the local store and to facilitate and drive sales online.

### 2.3 Market Research

The market for craft beers and ales have seen significant growth in the last decade with market share of craft beer increasing from 2.6% in 2017 to 3.4% in 2019 as well as consumers are trending to choose “less but better” regarding alcohol consumption (*Spillane, 2020*). This could mean that craft beers and ales will become a more popular choice in the future as people, in general, are looking for a high quality or more interesting beverage instead of cheap mass-produced beers.

The main demographic for craft beer has shifted over the last decade from having the median consumer as a middle-aged male with high income to a diverse audience including an increase in women choosing craft beer over more ubiquitous brands. The sector has also seen a general youthening of the consumer base with the coming of age of the millennial generation (*Watson, 2020*). Another Demographic which could indicate a potential consumer base is affluence as wealth was weakly correlated with increased spending and consumption of alcoholic beverages (*Central Statistics Office, 2020*). This paired with the

higher-than-average cost of craft beer when compared to mainstream beers could indicate a potential market.



Source: CSO Ireland  
Highcharts.com

Figure 1 - Affluence has a slight correlation to consumption of alcohol.

## 2.4 Marketing/Advertising

Marketing for the small business will primarily be done through social media driving people to the website where they can find more information and purchase items from the online store. Offering the products through local hospitality businesses and pubs will allow the business to expand its reach and allow an element of 'word of mouth' to help organically advertise the business.

## 2.5 Suppliers

Supplies for the business consist primarily of grains to ferment and bottles for the finished product. There are a few suppliers of these items in Ireland that have an online presence such as [Home Brew West](#) who sell all the equipment and supplies needed to create beer on the scales that a microbrewery would need. It is also possible to import supplies if greater



quantities are needed in the future. An example of a wholesaler would be [Get Er Brewed](#) or [Baltic Brewing](#) who both sell wholesale brewing supplies and are based in Europe, avoiding import and customs charges for the items.

## 2.6 Competitors

As stated in the market research section, the micro brewing business has been undergoing considerable growth in Ireland for the last few years. As a result, there are quite a few competitors in the market. An example of such competitors would be brands like Wicklow Wolf who are a larger independent brewery, as well as numerous other much smaller operations being run like Larkin's Brewing Company to name one of many.

## 2.7 Employees

The web application for this project would need to be easy to maintain for the business or no maintenance at all and be administered outside because the company only has 3 people that must handle everything in the business.

## 2.8 Environmental Impact

The process of brewing can have an impact on the environment at every stage. The process consumes a large amount of energy that is often not in surplus. At a macro level the process for growing the hops and grains used in the brewing process uses vast amounts of water which can be unsustainable and lead to supply issues.

Additionally, the wastewater produced by the brewing process can have adverse effects on local waterways if the water is not treated and is instead let into rivers, lakes, and other waterways untreated, potentially causing a mass die off in the local ecosystem due to decreased oxygen levels in the water (Agyingi et al., 2020).

# 3 Requirements

## 3.1 Introduction

At its core, the brewery web application is a quite simple project. Consisting of a website with an online store attached. In this section of the report, I will go over my research into similar applications and what users of such services look for in an online store.

## 3.2 Requirements gathering

To find what my app should be able to do I looked for common themes and features in similar applications. I also conducted some interviews with two potential users to find out what they look for in a web application and what they think makes a pleasant experience for them.

### 3.2.1 Similar applications

There were quite a few similar web applications doing what my application will be doing so I focused on looking at local businesses that would be in direct competition with my business.

The first application I looked at was [O Brother Brewing](#).

The main advantages of this site were that information about the business was extremely easy to access as it was presented as the first thing the user sees when visiting the site. It was also easy to find out what outlets and businesses I can buy the craft beer from.

The desktop site is also quite aesthetically pleasing with a visually interesting hero background video underlying the company logo. (Figure 2)

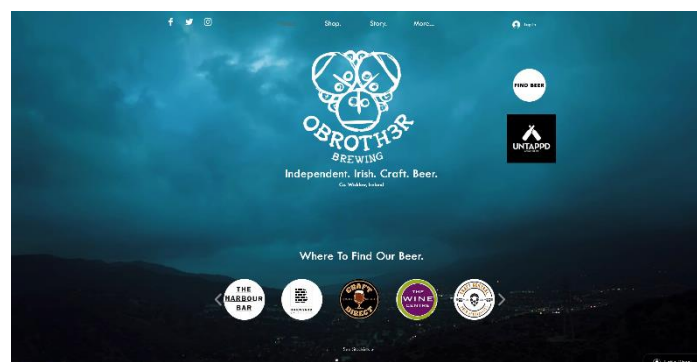
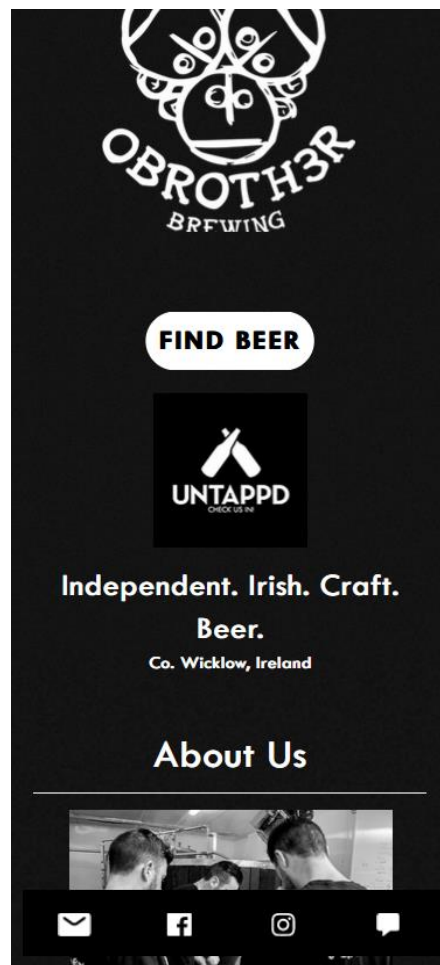


Figure 2 OBrother Hero image



*Figure 3 Mobile Site for OBrother*

The site has a few disadvantages such as the shop not stocking any of the company's actual products, just glassware (Figure 4). The site also does not work well on intermediate screen sizes such as on an iPad or other tablets. There are also other visual bugs with the mobile site, for example, a large empty space underneath the main content and before the footer (Figure 5).

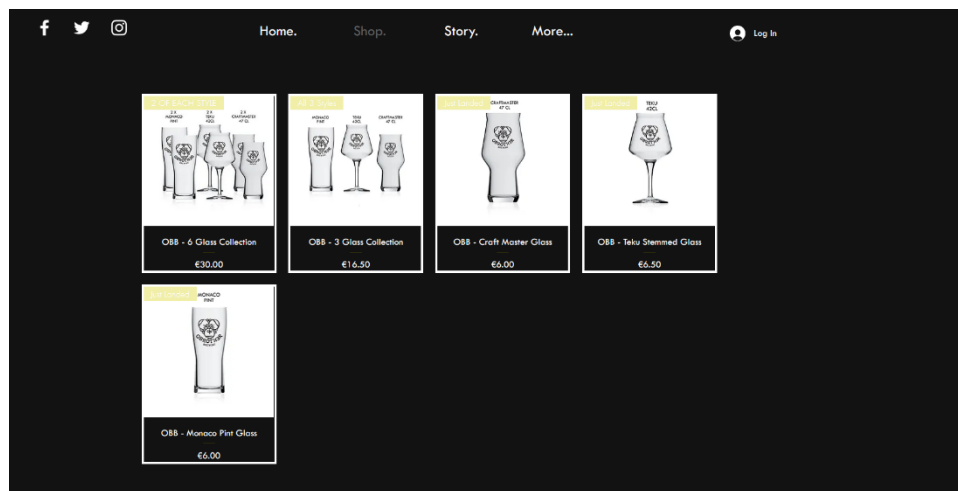


Figure 4: OBrother Products page

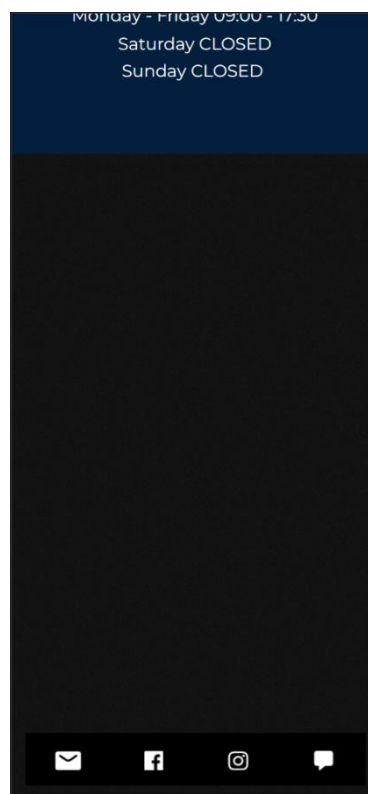
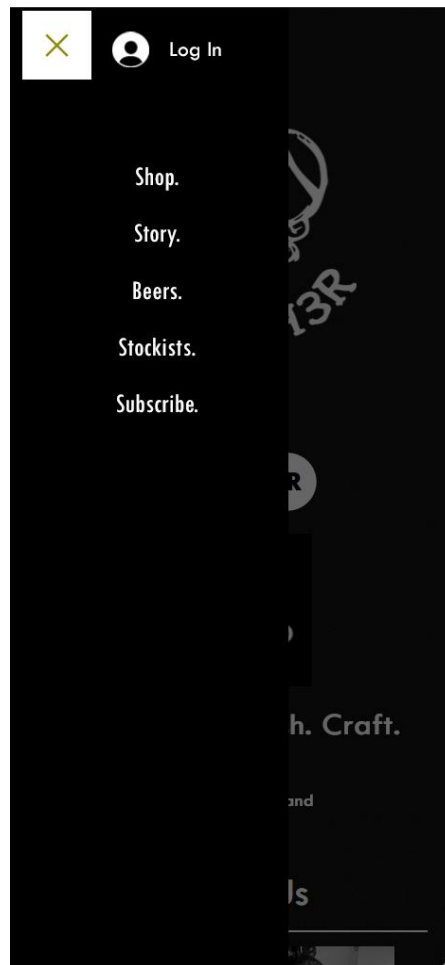


Figure 5: OBrother site empty space



*Figure 6: OBrother Mobile Navigation*

I also found the navigation of the site to be quite cumbersome, as they have used a nav bar to provide external links to their social media accounts rather than for quick navigation of the site itself. Opting to use a hamburger menu that is fixed at the top of the page instead.

The second site I looked at is a comparatively large independent brewery, Wicklow Wolf. Wicklow Wolf, similarly, to the previous site, uses a large image of the local area for a hero image with the company logo front and centred. (Figure 7)



Figure 7: Wicklow Wolf Nav Bar and Hero Image

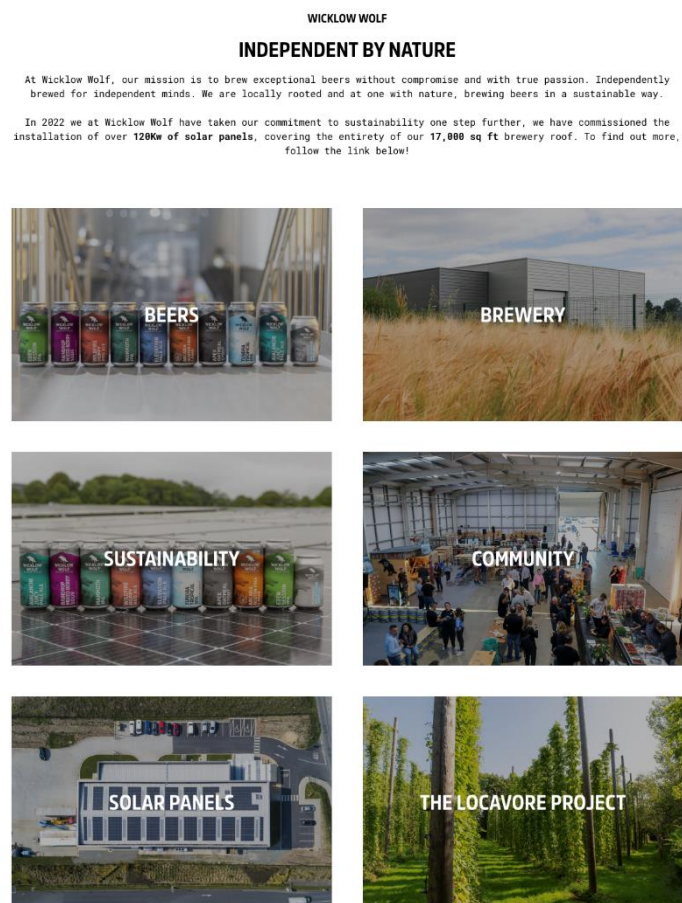


Figure 8: Wicklow Wolf Secondary Navigation

This website provides easy navigation around the site and a clear hierarchy of content as well as additional links to pages and blog posts.

Some of the disadvantages of the site are that there is no way to filter or sort products in the shop. This results in a large grid of products that the user must look through to find the item that they were looking for. (Figure 9)

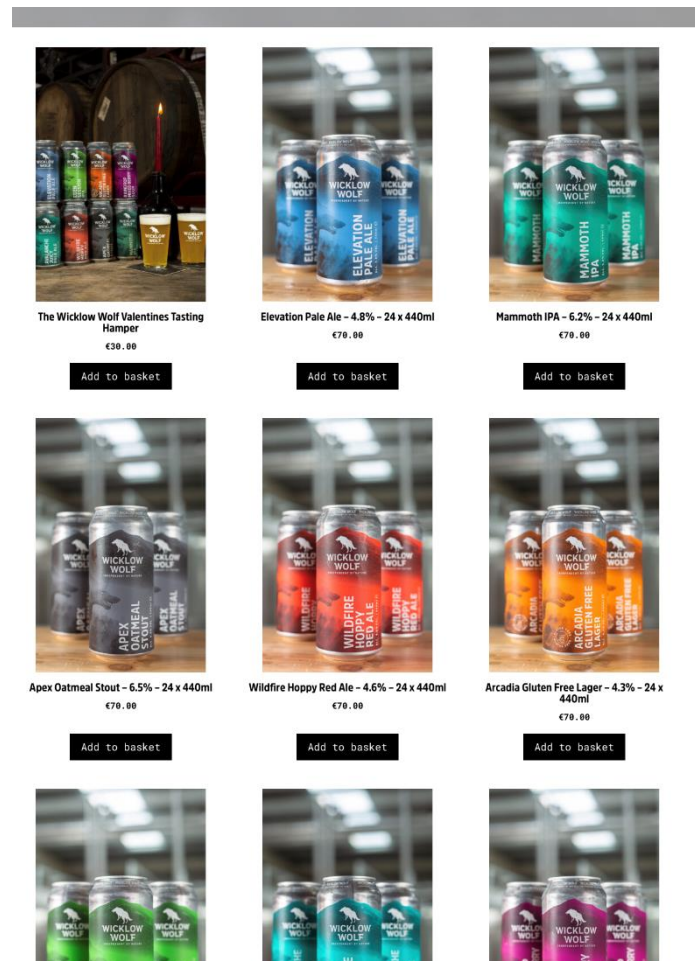


Figure 9: Wicklow Wolf Products Page

### 3.2.2 Interviews

I interviewed a couple of people. A main theme amongst the small subset of people that I interviewed was that none of them drank craft beer regularly. This was mostly due to the cost of entry. Despite this I did learn some valuable information about how they shop online and what some of the key factors for an enjoyable online shopping experience are.

(Questions included in Appendix Section)

From my interviews I learnt that potential customers want to be able to compare and see reviews for the products that they are looking at so they can best determine if they are getting a good product. Another feature that came up in both of my interviews was that they wanted some way to filter and search through all the items so that they could find what they were looking for without having to scroll through the whole catalogue.

In the future, if I were to conduct this type of interview again, I would look for a more diverse age range because I found that because I interviewed mostly young people I encountered the kind of answers and the people that I interviewed were not the prime demographic for the product that the site will be selling.

### 3.3 Requirements modelling

#### 3.3.1 Functional requirements

1. **Login**

The application will need a login system to have users track orders and administrators able to CRUD for products and posts on the website. This project will use the built in Laravel authentication package.

2. **Store front**

This should let users purchase products from the website by creating an order viewable by the administrators.

3. **Posts**

The website should have a feature that allows the administrator to post updates and other information in a blog format to allow quick communication with the customer.

4. **User Roles**

As mentioned previously the site should implement roles and permissions to allow specific users to control and edit the site.



### 3.3.2 Non-functional requirements

1. **Form sanitation**

All inputs should be authenticated and sanitized so that attacks such as SQL injection do not work.

2. **Filters and Tags**

Products and tags should be able to be filtered by name and associated tags to allow users to quickly find what they are looking for in the store.

3. **Admin Dashboard**

Admins should have access to a dashboard that allows them to see recent orders and be able to see user's orders as well as manually create, read, update, and delete them.

4. **QoL (Quality of Life) Improvements for users**

Functions that make the user experience more refined, such as 'back to top' buttons and 'power user' controls that allow more experienced users to use the web app in an efficient way.

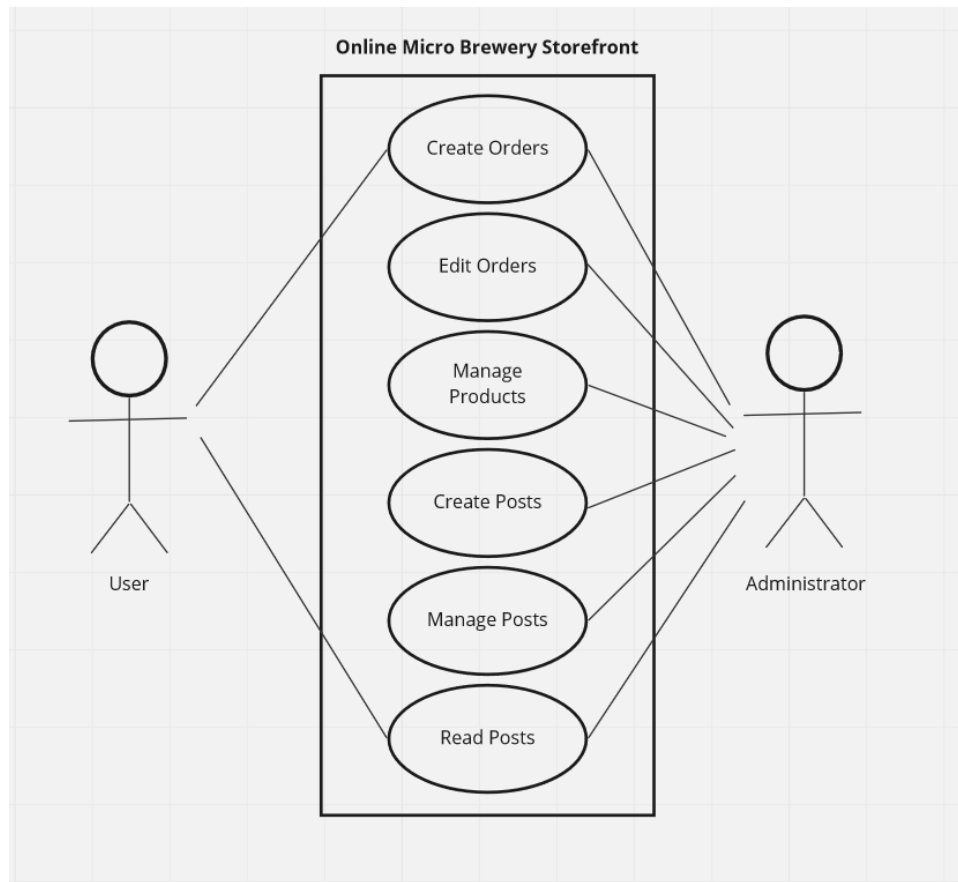


Figure 10: User Permissions

### 3.4 Feasibility

There should not be any technical compatibility issues with Laravel, PHP, the DBMS or any of the packages being used because I will continue to use a recent (as to avoid security issues), but previously used development stack. When initially conceptualising this project, it was planned to use the Breeze package with Laravel but the decision to use Bootstrap has meant that Breeze would no longer work correctly.

## 4 Web application Design

### 4.1 Layout

The layout for the application will be grid based and fully responsive. For the main site I will use full bleed columns so that the background of the site fills the entire page and then have the content of the site centred so that it works on larger screen sizes better than full width

content. To achieve this the application will use Bootstrap classes and components as well as custom SCSS classes and mixins.

The online store will also use a grid system, but the individual products will be card based so that many products can be displayed in a clear, tidy, and dynamic way.

## 4.2 Interaction

The navigation will be achieved through a navigation bar at the top of the site, on mobile devices this will be compacted down into a 'hamburger' menu for ease of use. Usage of hover effects and click effects such as colour changes will help to provide the user with interaction feedback.

There will be a couple of form elements, for example, there will be a form to register an account and to login, a 'Contact Us' page with a form to leave feedback or ask questions, and a form when purchasing items to enter the user's payment details.

## 4.3 Colour schemes

For the colour scheme of the application, I wanted to choose colours that were reminiscent of a brewery and beer itself. For the specific colours I used a combination of two websites to generate the colours. First, I used [Coolors](#) to quickly generate a few colours of which to base the colour scheme on, then using [Adobe Color](#) I was able to modify and fine tune the colours until I had found a combination that was visually pleasing and worked well together.

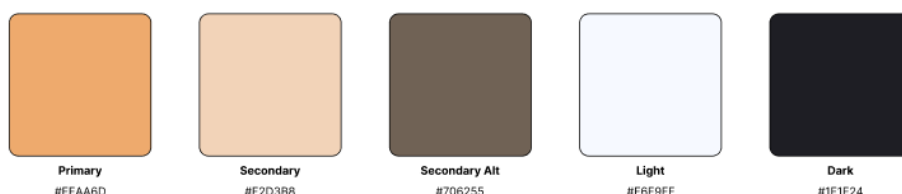


Figure 11: Colour Palette

## 4.4 Font choices

The primary font for the application is 'Poppins.' I chose this font because it is sans-serif and easy to read. I chose not to have a secondary font as it is not necessary in the scope of this project. I will instead use font weights to give elements emphasis or for stylistic choices.

When making my typographical scale I used a tool called [TypeScale – A Visual Calculator](#) which provided me with tools to create a type scale with options for different ratios. In addition to this I also used a tool called [The good line-height](#) which helped me to calculate what the line height should be for each size in my scale.

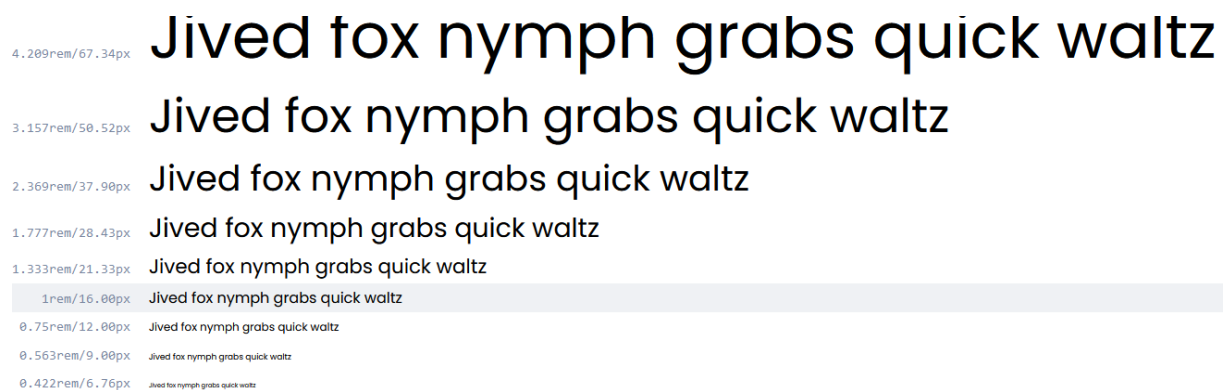


Figure 12: Typographic Scale

## 4.5 Wireframes

Users will navigate between the main pages of the site primarily by clicking on elements in the navigation bar. Navigation to the individual product pages will be done by clicking on the card in the store. Due to the nature of using bootstrap the mobile versions of the pages shown will be created with little input. This is because Bootstrap 'stacks' the containers when a breakpoint is used.

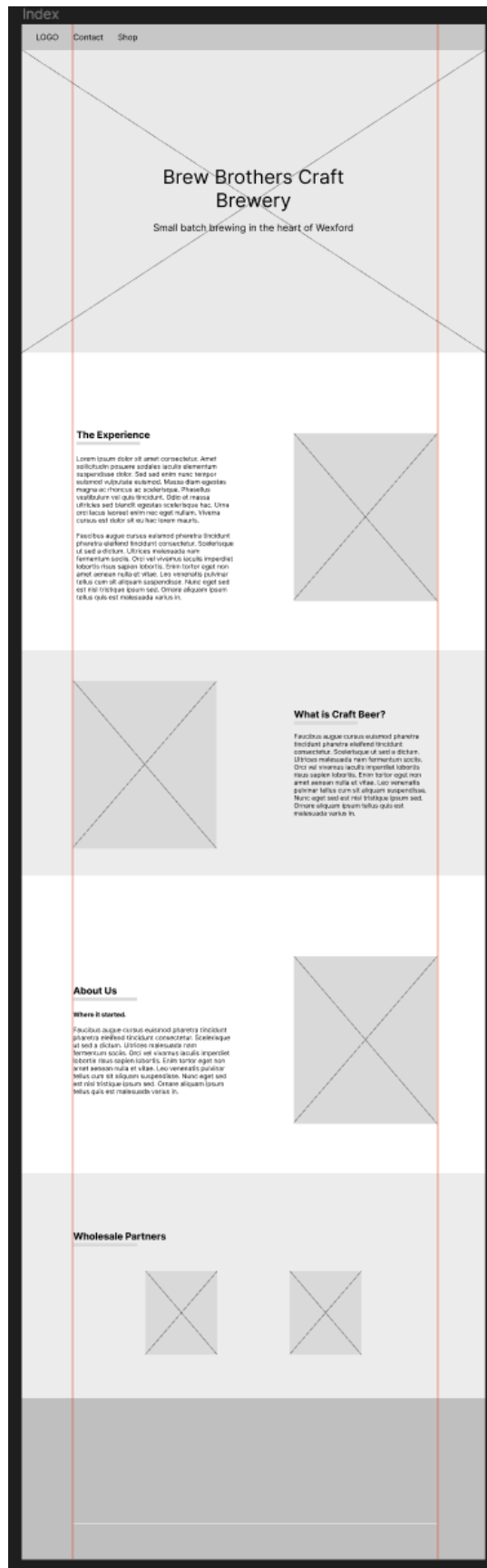


Figure 13: Home Page Wireframe

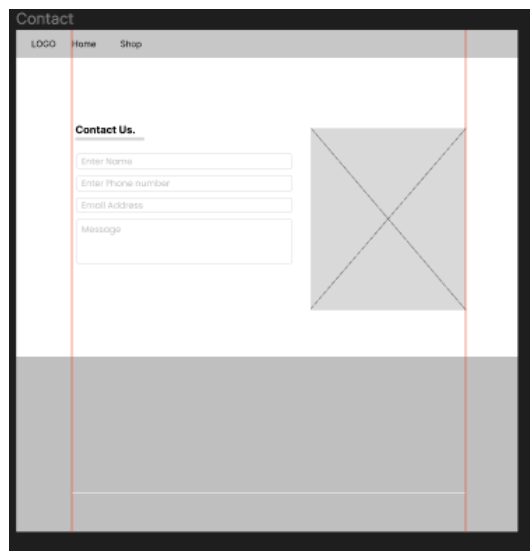


Figure 14: Contact Page

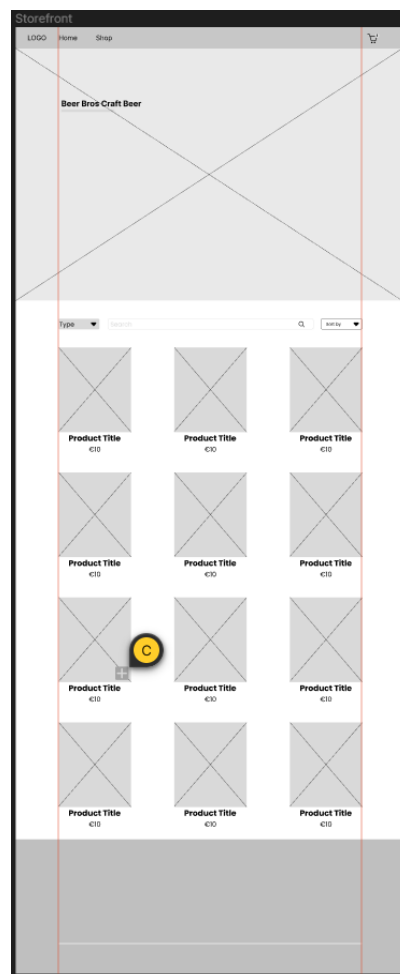


Figure 15: Storefront Page

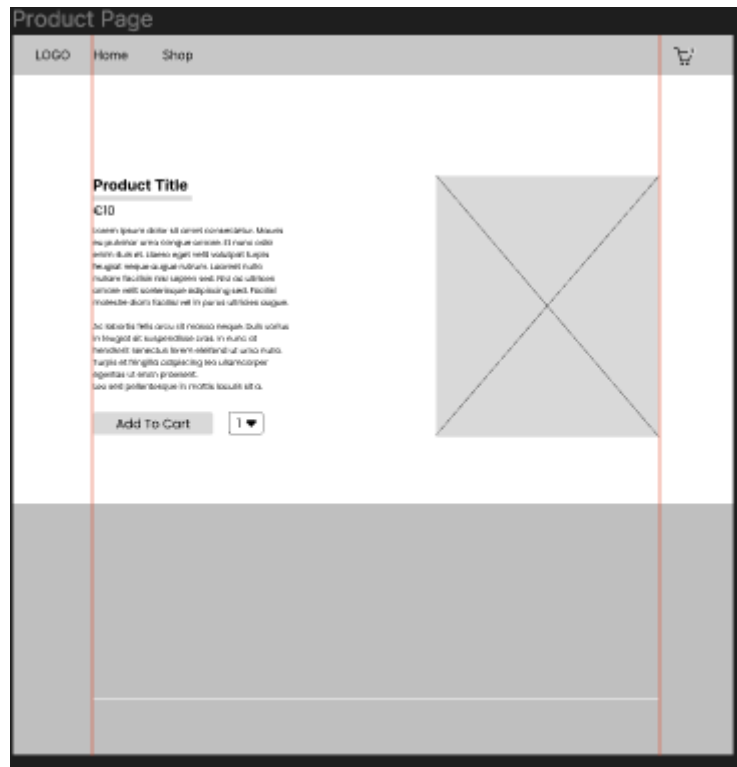


Figure 16: Product Description

## 5 Database Design

### 5.1 Description

A Small craft beer brewery has a website that they use to promote and sell their products and merchandise. They would need a database for all their products customer accounts, and customer orders.

For each product they would need the product name, price, description, possibly tags for content filtering and an image. The customer will have to create an account to complete an order.

### 5.2 Business Reporting Requirements

1. Administrators need to be able to create, read, update, and delete products and orders from the store.
2. Administrators need to be able to edit, read and delete user accounts.

3. Administrators need to be able to Create, Read, Update, and delete orders.
4. Users should be able to edit and delete their own account.
5. Users need to be able to filter the items on the store using the search feature.
6. Users may want to refine the listed products by category.
7. Users need to be able to sort by price from high to low or vice versa.
8. An administrator should be able to make other users administrators

### 5.3 Textual Representation of Dataset

**USER** (id, First\_Name, Last\_Name, Street, City, County, Eircode, Email, Phone\_number)

**ORDER** (id, uuid, user\_id)

**ORDER\_PRODUCT** (id, order\_id, product\_id)

**CART** (id, user\_id)

**CART\_PRODUCT** (id, cart\_id, product\_id)

**PRODUCT** (id, title, image, description, price, quantity)

**ROLE** (id, name, description)

**USER\_ROLE** (id, user\_id, role\_id)

### 5.4 Business Rules

A User has many **Orders**.

A **User** has one **Cart**.

A **Cart** has many **Cart Products**.

A **Cart Product** has a **Product**.

An **Order** has one **User**.

An Order has many Products.

A **Product** has many **Orders**.

A User can have many Roles.



A Role can have many Users.

## 5.5 Entity Relationship Diagram

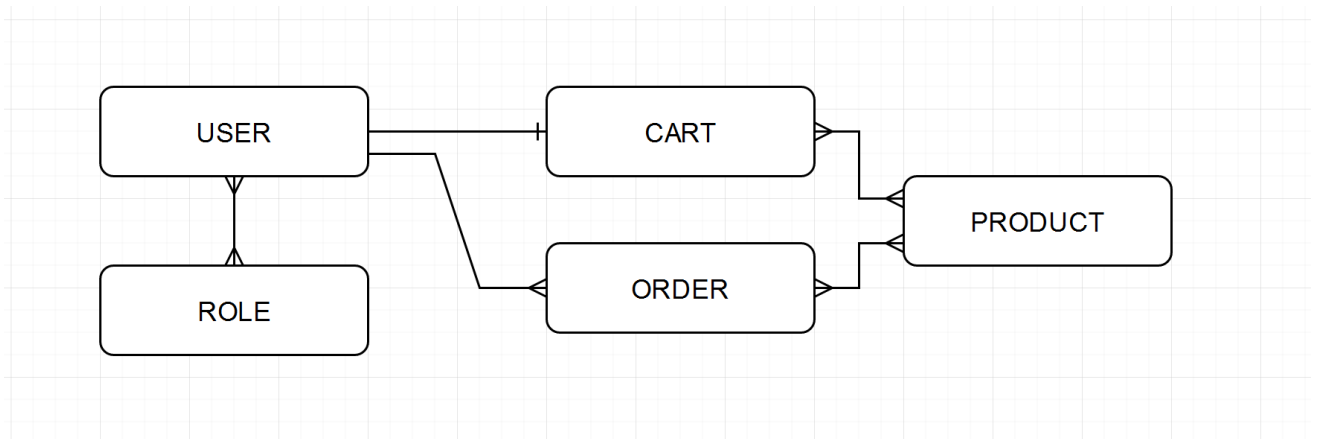


Figure 17: Database ERD

## 5.6 Tables

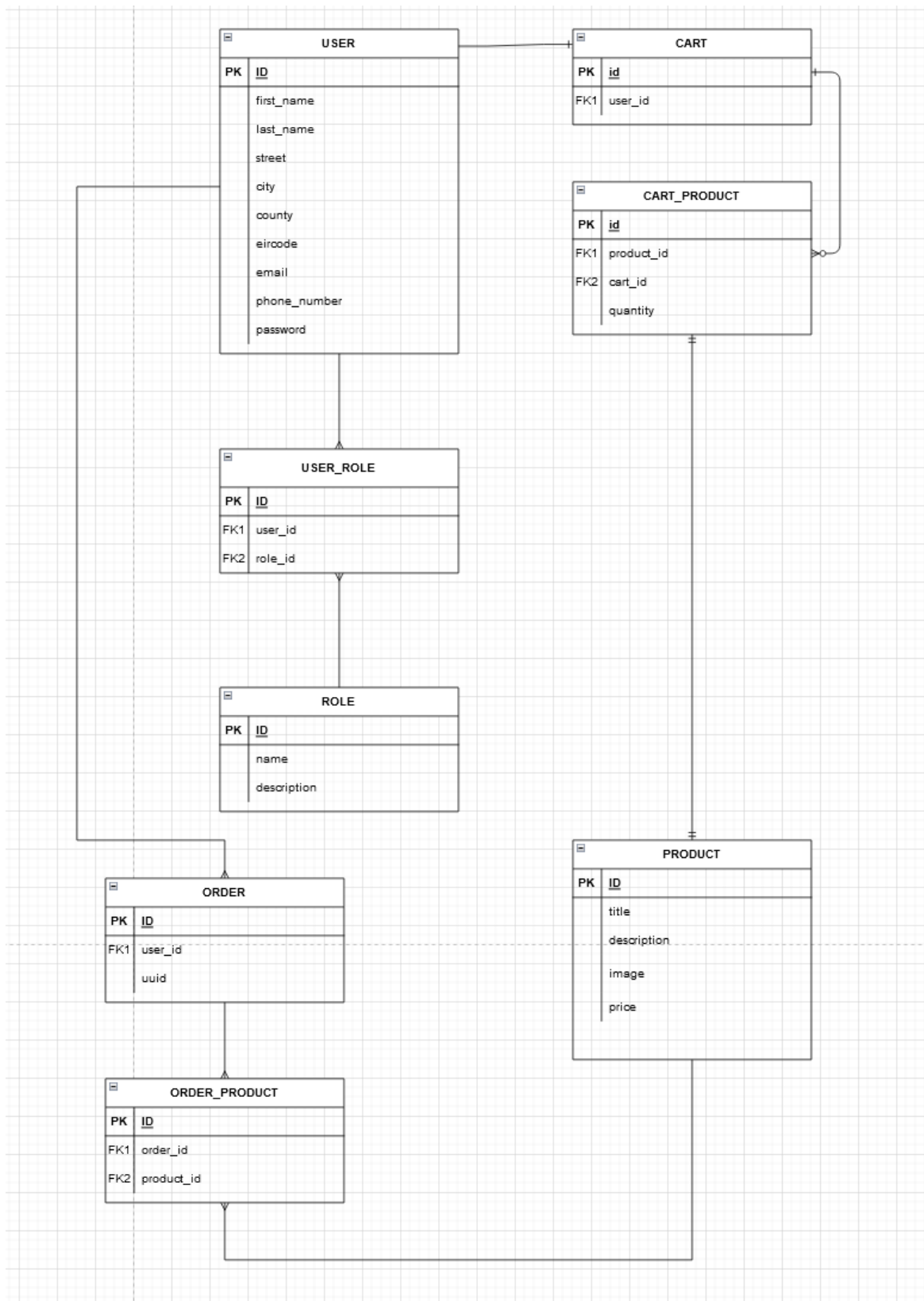


Figure 18: Database Schema

## 5.7 Database Dictionary

### carts

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
user_id	bigint(20)	No		users -> id		
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 19:cart table

### cart\_products

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
cart_id	bigint(20)	No		carts -> id		
product_id	bigint(20)	No		products -> id		
quantity	int(11)	No				
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 20: cart products table

### orders

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
user_id	bigint(20)	No		users -> id		
uuid	char(36)	No				
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 21: orders table

## order\_product

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
order_id	bigint(20)	No		orders -> id		
product_id	bigint(20)	No		products -> id		
quantity	int(11)	No				
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 22: order product table

## products

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
uuid	char(36)	No				
title	varchar(255)	No				
tags	varchar(255)	No				
text	longtext	No				
image	varchar(255)	Yes	<i>NULL</i>			
price	int(11)	No				
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 23: products table

## roles

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
name	varchar(255)	No				
description	varchar(255)	No				
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 24: roles table

## users

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
name	varchar(255)	No				
email	varchar(255)	No				
email_verified_at	timestamp	Yes	<i>NULL</i>			
password	varchar(255)	No				
remember_token	varchar(100)	Yes	<i>NULL</i>			
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 25: users table

## user\_role

Column	Type	Null	Default	Links to	Comments	Media type
id ( <i>Primary</i> )	bigint(20)	No				
user_id	bigint(20)	No		users -> id		
role_id	bigint(20)	No		roles -> id		
created_at	timestamp	Yes	<i>NULL</i>			
updated_at	timestamp	Yes	<i>NULL</i>			

Figure 26: user role table

## 6 System Design/ Architecture Overview

### 6.1 Introduction

This project will be created using the Laravel 9 PHP framework. Using this framework allows rapid development of the backend structures of the web application. Laravel uses Model, View, Controller (MVC) methodology which will be explained in this section.

### 6.2 Model View Controller

This project uses Model, View, Controller methodology. A model is a 'object' that interacts with the application's database. A view is where the HTML code for the site is stored. In Laravel these are Blade files. Blade is a PHP templating engine that allows PHP to be executed in the view. A controller contains all the routes for the models as well as any other functions that may be needed. It is the controller that passes the data from the database / model to the view to be seen by the user.

### 6.3 User Authentication

User authentication in this project is provided by the Laravel framework, when setting up the project I imported the authentication scaffolding when telling setting up Laravel for using Bootstrap 5.3. I did this by running this command: `php artisan ui bootstrap -auth`. The Auth scaffolding created controllers, views and models that are necessary to have user authentication in the project.

I then used Bootstrap sass to customise the boilerplate components and views to fit the site's theme.

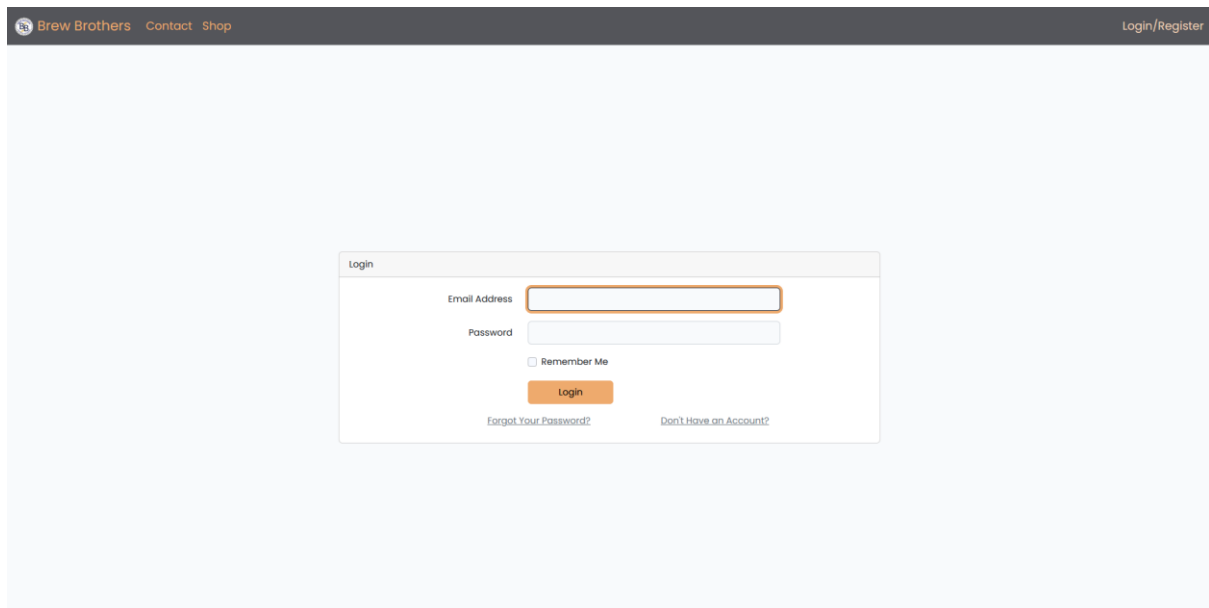


Figure 27: Login Page

## 6.4 Routing

Every controller that I have created in the project has routes that are registered in the `web.php` file. This includes the standard CRUD functionality that are registered as resource routes as well as special routes that are specifically defined, such as the product search functionality etc.

## 6.5 Templating

Laravel uses Blade as its templating engine. As mentioned in section 6.2 Blade is a PHP templating engine, that unlike some other engines allows PHP to be directly ran in the Blade file. In my usage of Blade, I separated the elements of the web pages down into components like the general layout of the website so that I did not have to repeat HTML code over each view that I was creating. I also used the components for elements such as cards and search bars.

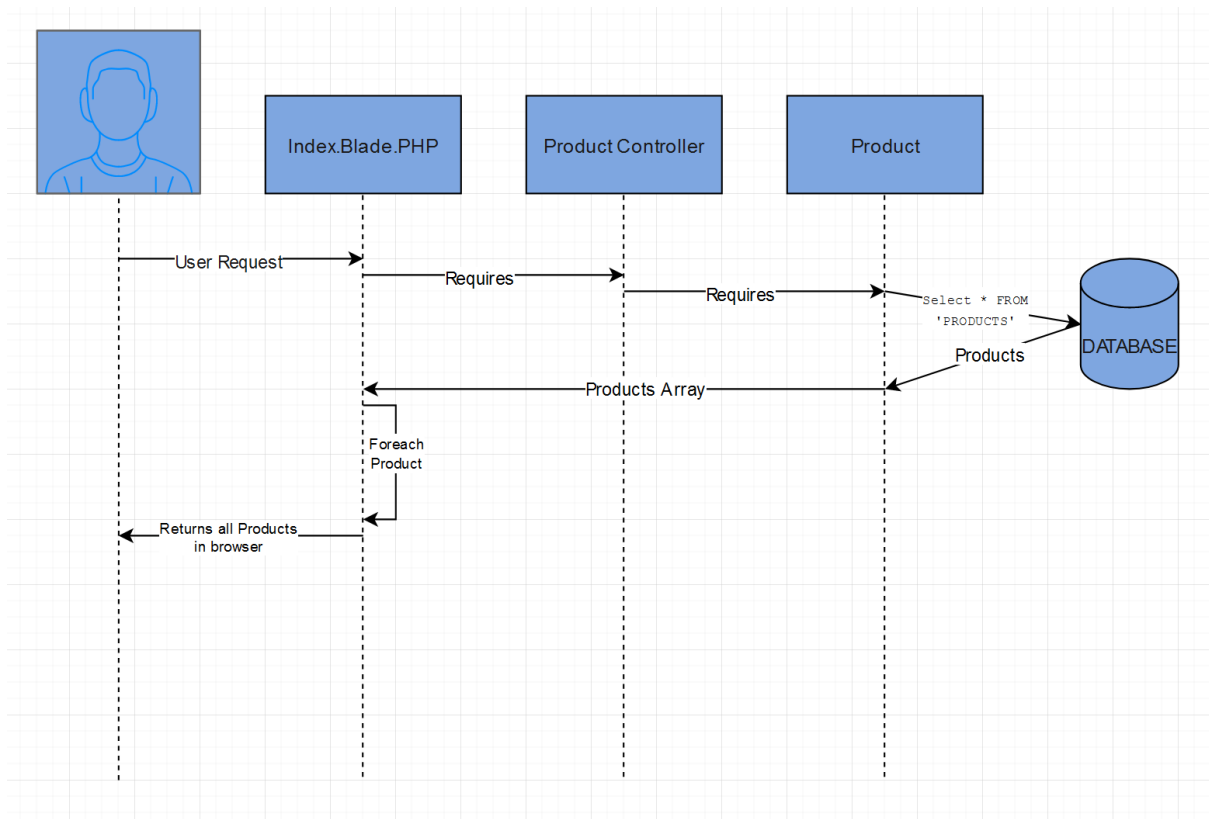


Figure 28: Laravel Architecture

## 7 Testing

### 7.1 Introduction

This section will underline the testing that has been performed, both functional and user testing.

Functional testing is concerned with the application's functioning. It entails testing software features or functions to make sure that it works as intended and complies with the specifications stated in the design document. Functional testing is mostly carried out by automated testing tools. Functional testing cannot, however, tell the developers how easy it is for a user to interact with.



Types of functional testing include unit, integration, and system testing. For the purposes of this project most of the functional tests will be unit tests due to time constraints.

User testing, on the other hand focuses on assessing the application from the viewpoint of the end-user. It entails putting the application through real-world tests to see how it functions, behaves, and satisfies its intended design principles and to assess how the end user will interact with the UI elements of the application.

## 7.2 Functional Testing

The functional tests that I wrote consist of making sure that a given systems view can be rendered and then testing the output of each system. Making sure that the output matches what is expected.

I broke my tests down into the following categories:

- Page render tests
- Authorization tests
- User tests
- Product Tests

All the functional testing was automated in my project.

### 7.2.1 Authentication

Test No	Description of test case	Input	Expected Output	Actual Output	Comment
1	Tests if a new user can create a new account	Name, email, password, password confirmation	User is authenticated and returned	As expected	

			to the homepage		
2	Tests that a new user cannot be created if matching passwords are not provided	Name, email, password, and non-matching password confirmation	User is still authed as a guest and is not returned to homepage	As expected	
3	Test that user can login	User model, posts email & password of model to '/login' route	User is authed and is returned to homepage	As expected	
4	User cannot login with bad credentials	User model, email, and wrong password	User is treated as guest	As expected	

### 7.2.2 User Model

Test No	Description of test case	Input	Expected Output	Actual Output	Comment
1	Tests that the admin user exists in the database	Test that a user with the name 'Connor Mattless'	true	As expected	

2	Tests user has a cart	Creates a user and cart and links them.  Asserts that cart is instance of user	true	true	
3	Tests that user can be seeded.	Creates user and tests to see if user is present in DB	true	true	
4	Tests that cart has products	Creates a cart with a random number of products	Asserts that the given cart exists	true	

### 7.2.3 Product Model

Test No	Description of test case	Input	Expected Output	Actual Output	Comment
1	Tests that product can be created	Uses a factory to create a model	Asserts that created model exists in database	true	
2	Tests that a product can be updated	Uses a factory to create a model and then changes an attribute of the model	Uses old attribute value to search database to check value is missing, should return true	true	

3	Tests that a product can be deleted	Creates a model using a factory then deletes the model.	Checks if the model is missing from the database, returns true	true	
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#### 7.2.4 Page Render

Test No	Description of test case	Input	Expected Output	Actual Output	Comment
1	Tests if login screen can be renders	Gets /login	Assert status 200, true	true	
2	Tests if register screen can be rendered	Gets /register	Assert status 200, true	true	
3	Tests if index can be rendered	Gets /	Assert status 200, true	true	
4	Testis if store can be rendered	Gets /store	Assert status 200, true	true	
5	Testis if contact can be rendered	Gets /contact	Assert status 200, true	true	

#### 7.2.5 Discussion of Functional Testing Results

As this was done using automated testing rather than manual testing of features the expected results was always the same as the intended result. Additionally, the test code

coverage for this project is not great as I had to move on from the testing phase of my project due to time constraints. If I were completing this project in a professional setting or manner, I would spend much longer on writing tests so that more features were covered.

### 7.3 User Testing

As part of my testing because I have a limited time frame I could only do user testing with the people I had immediately available to me so that did introduce some inherent biases into my testing and that is evident in the feedback as because I knew all the people personally they were more likely to give positive feedback than negative and maybe be less critical of the design and usability for overall

I primarily conducted my user testing over Discord, a communication service that allows screen sharing and voice communication. I presented each tester with a scenario and then a series of tasks to complete on the site. An example of some of these tasks are as follows:

- “From the home page, create a new account and then purchase any number of items of your choosing from the shop.”
- “Log out from your account, log back in, and check your previous order. If the order is present, cancel the order.”
- “Add some items to the cart then try and see the items in your cart.”
- “Imagine you are the administrator of this website, add a new product and then delete the product you previously created.”

### 7.4 Conclusion

The user testing phase helped to reveal some bugs and issues with the site’s functionality that I had not previously found and provided an excellent opportunity to observe how a user may interact with the sites UI and design.

## 8 Project Management

### 8.1 Introduction

Throughout this project I broke down tasks into loosely planned segments that would allow me to complete features to a workable degree before moving on to the next feature. I tracked my progress by writing out what features and jobs had been completed, were on-going or not yet started on a whiteboard. I chose to track the jobs this way because it allowed me to better understand and keep track of what had to be done over digital solutions to this problem.

### 8.2 Project Phases

#### 8.2.1 Requirements

The focus of the requirements phase of the project was to explore what the project was going to be capable of and what it would require to be fully functional. The requirements phase took approximately a week to compile all the requirements. I looked at websites and application that fulfil the same market sector as this project. The main issue that occurred in this phase was that because most of the small craft beer websites are independently owned a lot of the websites appear to be somewhat of an afterthought as thus were either flawed functionally or aesthetically in a critical way. Despite this I did manage to find a couple of websites that had at least some good functionality.

#### 8.2.2 Design

In the design phase I took what I had learned from the previous phases and spent approximately a week looking at design inspiration from different websites and web design sites like Awwwards and Dribbble. I then took the elements of my research and implemented it into a design / wireframe to develop my site from.

### 8.2.3 Implementation

During the implementation of my site was the most technically challenging and time-consuming phase of the whole project and took about 6 weeks all together with the backend implementation taking up most of that time, so as to make sure that the core functionality of the application was working well and provided a good foundation to build upon.

### 8.2.4 Testing

The testing phase was an incredibly important phase for the project as it revealed issues with the project that had been previously unnoticed.

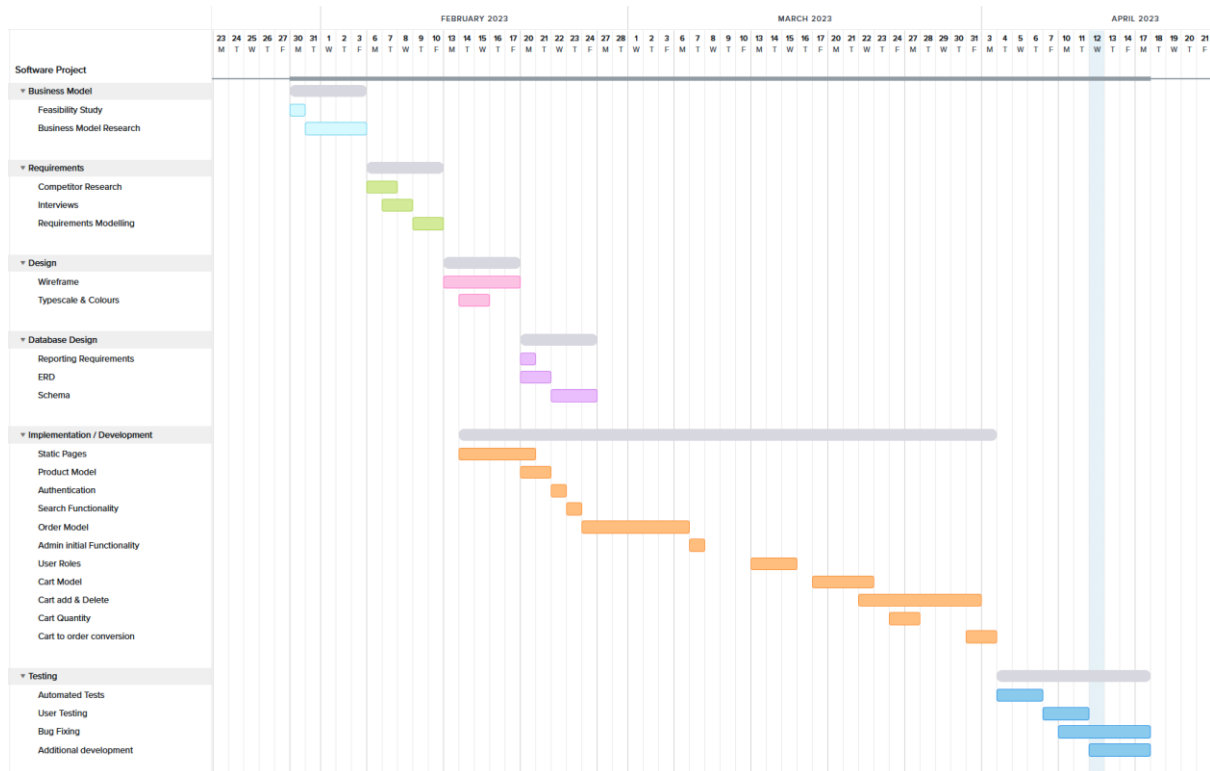


Figure 29: Gantt Chart

### 8.3 SCRUM Methodology

SCRUM is a method of project management that allows a team to break down the needed tasks for a project into segments called 'Sprints'. A sprint is a period of a defined length.

Often one or two weeks, where a specific project feature, functionality etc is created.

The sprints will be planned and a clear goal for each sprint will be defined from items in the Project backlog.

During each sprint there will be SCRUM meetings daily that check on the progress being make in the sprint, the items still to do being added to the sprint backlog. (Figure 22)

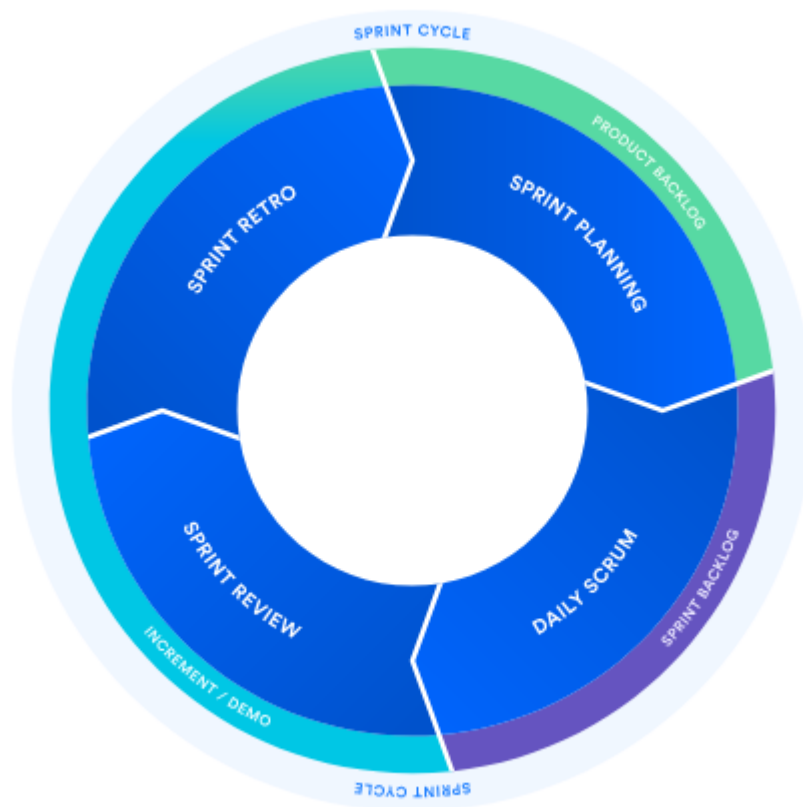


Figure 30: Scrum Cycle, (Rehkopf, 2019)



## 8.4 Project Management Tools

With a project of any size, it is important to keep track of what needs to be done, what is currently in progress and what has been completed, especially so if working in a team. As I was working alone I had greater flexibility in how the project was managed and so instead of using a program or service to keep track of tasks I used a whiteboard that I keep at my desk at home as it allowed me to better keep track of, update and understand the status of the project.

### 8.4.1 Task Management

Using a whiteboard for project management did work well but, in the future, I would use a kanban board or similar as it would make it easier to look at tasks no matter where I was working on the project. Similarly, if I was working on a team a physical project management medium such as my whiteboard would introduce issues into a development team and could slow down development. (Figure 23)

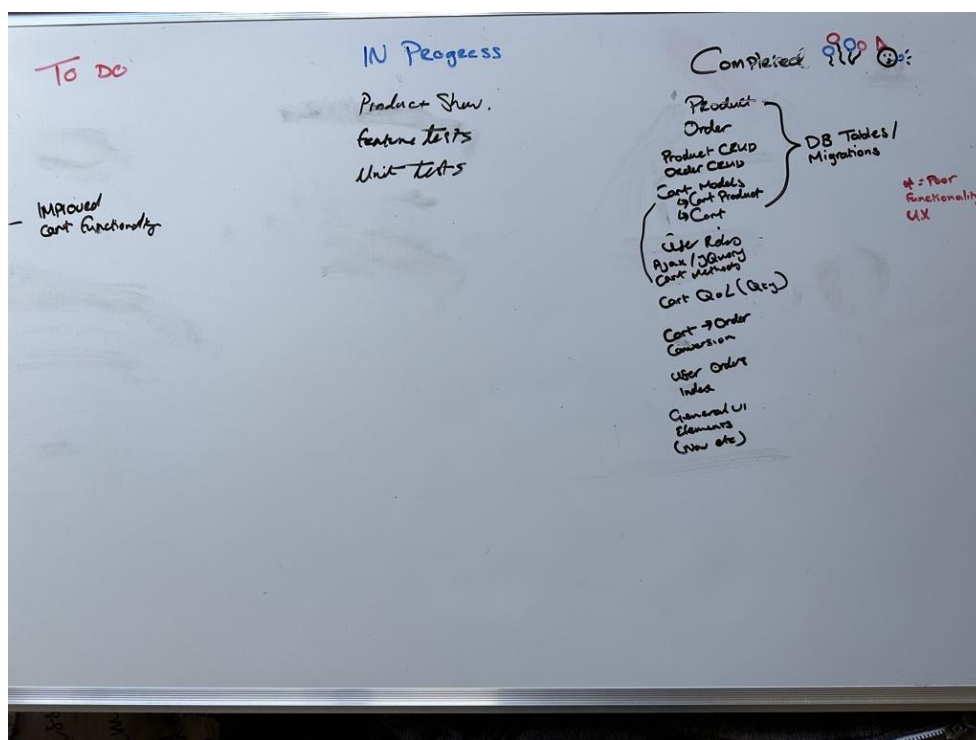


Figure 31: Task Whiteboard

### 8.4.2 GitHub

GitHub enables the administration, sharing, and storing of code. It is a Git-based version control program. GitHub enables developer collaboration on projects without erasing other people's work. Code may be tested, fixed for bugs, and developed using GitHub and Git without having to worry about altering other versions of the code by using branches and merging.

One of GitHub's key features is its commit system, which enables programmers to keep track of changes to the code and, if required, roll back to earlier versions should crucial errors be made during development, providing a safety net for the project.

## 9 Reflection

### 9.1 Your views on the project

Overall, I feel that the project went extremely well as I faced little issues in progressing at any stage of the project. In the project I found the design and project management aspects harder than the technical aspect of the project which was a interesting learning experience.

### 9.2 How could the project be developed further?

This project could be extended in several ways, for example the cart system is still not a great user experience and with more time on the project I feel that I could get it working and an elegant and more functional way. There are also some secondary pages of the site that could be 'fleshed out' more like the profile page as it is very bare bones and could be extended to allow profile picture and the editing of the user's profile for example.

### 9.3 Assessment of your learning.

The most critical skill I developed over the course of this project was project and time management. I set out to progress in a linear fashion and for the most part succeeded in this objective.

I did find that scope creep became a bit of an issue during the development of the application and at one point had to stop planning to add features due to time constraints.

As mentioned in section 9.2 I believe that the cart functionality needs further development to work in a satisfactory way and the sorting drop down on the store front was not implemented despite being in the design.

Despite these shortcomings I am confident that I have satisfactorily fulfilled all requirements of the continuous assessment to a high standard.

#### 9.4 Completing a large software development project

Despite this not being my first sizable development project I still learned some valuable lessons that I will bring forward with me into future projects. As mentioned previously scope creep was a major issue throughout the project and had it not been corrected could have caused the project to not be in a fully functional state by the deadline.

During the project I found the research phase invaluable to the progress of the development as the portions of research I did helped inform the choices I was making throughout the development for as to how different aspects of the site should function, like the cart and the search functions.

#### 9.5 Technical skills

I built upon skills that I already possessed and continued to improve how I implement features and functions in to web apps as well as expanding my knowledge of Laravel and PHP methods and functions. I also refreshed my knowledge of jQuery and JavaScript DOM manipulation.

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## 11 Appendix

### 11.1 Interview Questions

**Do you prefer to buy items in person or online?**

**(If in person) What could persuade you to buy online?**

**How often in any given month do you buy products online?**

**Are there any features that you have found or used when shopping online that you found particularly helpful or useful?**

**Do you have any dislikes or 'pet peeves' when purchasing items online?**

**How often do you drink in an average week?**

**Does price have a significant impact on what you drink?**

**Are you willing to spend more money on a better-quality product?**

**Do you ever drink craft beers?**

**Is there anything that would persuade you to buy craft beer regularly?**

**If yes, what are some criteria for you picking a particular craft beer?**