Requirements Specification

Project Name: Ice Cream Ordering System

Team Number: 9

Team 9	**Specification Document**	19/03/2021

Document Information

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Ver. No.	Ver. Date	Revised By	Description
1	13/03/2021	Katy David	Analysis Process, Analysis, Scope
2	14/03/2021	Katy David	Functional Requirements, Assumptions, Constraints
3	16/03/2021	Katy David	Non-Functional Requirements, GUI
4	17/03/2021	Katy David	GUI, User Cases, Analysis, References
5	18/03/2021	Katy David	Formatting
6	19/03/2021	Katy David	Purpose, Proof reading
7	20/03/2021	Qi Yang	Hardware and Software Platforms.
8	20/03/2021	Katy David	Hardware and Software Platforms editing, Definition of terms.
9	21/03/2021	Liam Carr	Checking and contents page.

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Contents

Purpose (Executive summary)

This document is outlining the software requirements for Cavallo's ice cream ordering system, describing how the software is intended to behave and what the user and client can expect from this system. A prototype of the system will be developed, producing a web-based interface which will allow users to place orders for collection or delivery.

The client's staff will be able to login to the system, giving them access to reports and statistics about how well the shop is performing. For example, graphs showing the number of orders per day/week/month and the popularity of ice cream flavors. By having these graphs, the client can analyze their performance, finding trends within the data which will help them maximize their sales and efficiency.

An online ordering system will help the client reach new customers who want the ease of ordering ice cream online, without having to queue or wait in the shop for the order to be made. There are many objectives for this project some of which I have stated above, but the goal we are working towards is creating a system that is easy to use, meets all the client's requirements and expectations and creates returning users.

Background & Analysis

1.1 Analysis Process

As a team, we were given a project brief specifying what the client required from the ordering and delivery system. Online ordering systems are used by a large majority of restaurants, due to this there are many ways that this system could be created, as a group our main priority was to decide how we were going to approach this task. All the team members had at some point used an online ordering service, because of this we had some initial ideas as to what we believed the system should look like and how it should perform.
To start, we shared which online ordering systems we had previously used and how we could take inspiration from these systems to create our own. Specifically, we were looking at Just Eat[1] and Dominos[2]. We chose to take inspiration from these systems because they were set out in a similar way to what we wanted to create. Both systems allowed for the user to input their postcode for delivery, alerting the user if they were out of the maximum delivery distance. Dominos[2] allowed for the user to choose if they wanted delivery or collection, place items into a basket and checkout out securely.

Summary
The client has asked for the development of a web based online ordering and delivery system, which will allow for users to place ice cream orders for delivery or collection. If the user chooses the delivery option, the system should allow for the user to input their postcode and calculate whether the user's postcode is within the maximum delivery distance from the client's shop. The prototype must be as realistic as possible, so that the client is able to evaluate the system clearly. The website must be accessible to the majority of the population, meaning the layout of the website is easy to understand and follow.

1.2 Analysis

Environment:
For the prototype, the client is selling 9 ice cream flavors one of which is dairy free. They charge prices based on the sizes of the ice cream, apart from one of the flavors which has a surcharge, there are 5 sizes available to the user. The ice cream is served to the customer in a tub. The shop does offer cones, but they do not want this to be included in the prototype.

In the UK there has been a 39% increase in the number of food deliveries over the last 3 years[3], ordering food is all about convenience. Websites should include enough information and images to ensure the user places an order at their shop. Delivery/Collection websites are very common and advanced, an example is the Papa John's website[4] which allows a user to input their postcode and choose between delivery or collection and it is similar to what the team want to accomplish with the design.

Stakeholder Summary
External Stakeholder – End user, which is the person using the online system to place an order for collection or delivery. The design must be appealing and easy to follow, so that they will become repeat users.
Internal Stakeholder – The client's staff, some of the staff members will be logging into the system to observe data such as which ice cream flavor is most popular and reports about the number of orders per day/week/month. These statistics must be clear, so the staff can observe the trends and how well the users are engaging with the system.

1.3 Scope

In Scope

- To develop a web based online ordering system for the client, allowing users to place orders for collection and delivery.
- The website should be able to calculate how far a user's postcode is compared to where the client's shop is located when a user inputs their postcode into the system.
- The website will only allow users to place orders for collection 15 minutes before closing time of the client's shop, which is 18:00.
- The website will only allow users to place orders for delivery by the closing time of the client's shop, which is 18:00.
- The website will provide reports to the staff once they have logged in to the system, about the number of orders per day/week/month.
- The website will provide statistics to the staff once they have logged in to the system, regarding the popularity of the flavors.

- To ensure the prototype is as realistic as possible, a dummy merchant system will be used to simulate users paying with their card.

- Most customers should find the website easy to use and to follow.

- Ensuring that the project is finished within the required timeframe set out by the client, with tasks being prioritized and the team being aware of any changes or setbacks and adapting to them.

These are the goals that we want to achieve within our system, ensuring the client is aware of the deliverables of the project. However, there are functions which will not be included within the system and these are stated below.

Out of Scope:

- Delivery is for users within the maximum delivery distance only. The system cannot place orders for delivery for any users who live outside of this boundary. This is a constraint within the system, as if the user's postcode is outside of the boundary, they will be notified that they can only order for collection.

- Orders for collection and delivery cannot be placed after the shop has closed, which is after 18:00. If the user attempts to do this, they will be notified that if they want to place an order is must be within the client's opening hours of 11:00-18:00 Monday-Sunday.

- Order for collection cannot be placed after 15 minutes before closing time, which is 17:45. If this is done, the user will be alerted they either must change their order to delivery or order for collection another day within the opening hours.

- Once the order has been placed, the software has no interaction with the client keeping a live update of when the order is going to be ready for collection or sent out for delivery. Therefore, the team does not have to implement the system with any real time adjustment software, factoring in any delays with the order or if an order is lost.

- As this system is a prototype, the software is for 9 flavors of ice cream with 5 prices corresponding to the size of the ice cream chosen. In the future when creating the real-life system, the client may want to sell cones of ice cream alongside their tubs. This system is not being designed for these different options.

- The client will always have sufficient stock to fulfil orders, the system does not have to account for an ice cream flavor going out of stock or running low.

2. Hardware and software platforms to be used for developing and running your solution.

Hardware Platforms

Within the project brief, the hardware that is available to the client is not properly specified and therefore we as a team decided on what we thought the best types of hardware to use would be. Before making this decision, we discussed the hardware that we believed would be readily available to the client and what would be most effective for the system and the business.

As this is a web-based system, we are assuming that the client and users have the required devices to run the system for example mobile phone, computer, or laptop. The website will be using a MySQL database which will store and retrieve data, this data will also be used to produce the graphs on the analytics page. The minimum requirement for the CPU is an Intel i3 dual core, this has a clock rate of 2.04GHz and includes a built-in graphical processing unit. The system has a 2 GB single rank DDR3 1600mHz memory, for the business users they may need 500GB for data storage or users with a central data warehouse may require around 180GB for storage.

This hardware that the team have chosen was decided so that the requirements on the system could be met and are based on the test environment.

Software platforms:

As this project is for an online ordering system, it was essential that all users would be able to access the website and place an order. When deciding on the type of software that we were going to use, we had to keep this at the forefront of our decision as one of the requirements is for accessibility to most users. Therefore, we needed to ensure that the website worked on all browsers and that the user could zoom in if they were unable to see the font. Also, we knew from our research that many people order food online using their phones[4] and that this is a large market, therefore we wanted to make the website accessible on mobile devices.

As a team we decided to split the tasks into front-end and back-end to maximize efficiency. We used JavaScript and took advantage of the JavaScript libraries available to us to develop the web pages. We also used HTML to create files and included the JavaScript within these depending on the functionality of the webpage. CSS and JavaScript were used applying them on Vue.js as an open-source framework to create the user interface. For the front-end to start running, the tester or programmer must download the npm as the JavaScript package manager. The Java programming language was used to develop the class and methods with the Spring boot framework for the back-end task.

The system is fully supported by any browser, such as Safari or Chrome. We did this to ensure that the web page can be viewed by a large number of people and fits with the business requirements. Also, as we were working towards a deadline, we wanted to use platforms that the developers had some previous experience with to ensure time efficiency. The user can download the system and run it anytime on their computer or run it by the server-side with an individual database.

3. References

Just Eat. Available at: https://www.just-eat.co.uk/

Dominos. Available at: https://www.dominos.co.uk/

Town Square. (2020). 2021 Food Delivery Service Statistics You Need to Know. Available at: https://beambox.com/townsquare/food-delivery-service-statistics

Papa Johns. Available at: https://www.papajohns.co.uk/

4. Definition of terms

Central Processing Unit (CPU) - The hardware device within a computer in which operations are controlled and executed from the software.

Clock rate - CPU's are measured in Hertz to measure performance. The clock rate refers to the speed the electrical voltage changes from low to high and back.

Cascading Style Sheets (CSS) – Computer language for laying out and structuring web pages.
Database - An organized collection of data, generally stored and accessed electronically from a computer system.

Deliverables - A tangible or intangible good or service produced as a result of a project that is intended to be delivered to a customer.

Efficiency - Signifies a peak level of performance that uses the least number of inputs to achieve the highest amount of output.

End User – The person who will be using the website to place an order.

External Stakeholder - Those who do not directly work with a company but are affected somehow by the actions and outcomes of the business.

General Data Protection Regulation (GDPR) - A regulation in EU law on data protection and privacy, addresses the transfer of personal data.

Graphical Processing Unit (GPU) - A processor designed to handle graphics operations, this includes both 2D and 3D calculations.

HTML - Hypertext Markup Language is the standard markup language for documents designed to be displayed in a web browser.

Internal Stakeholders - People whose interest in a company comes through a direct relationship.

Java - Class-based, object-oriented programming language.

JavaScript - An object-oriented computer programming language commonly used to create interactive effects within web browsers.

MySQL - An open-source relational database management system.

Npm - Package manager for the JavaScript programming language.

Prototype - An early sample, model, or release of a product built to test a concept or process.

Real-time adjustment software - Guarantee response within specified time constraints.

Surcharge - An additional charge or payment.

Vue.js - Open-source view model front end JavaScript framework for building user interfaces and single-page applications.

Web-based interface/system - Allows the user to interact with content or software running on a remote server through a Web browser.

5. Solution requirements

The following tables show the functional and non-functional requirements for the project, each of which have a priority rating of high, medium, or low.

5.1 Functional Requirements

Requirement	Priority (H, M, L)
Provide a web-based interface for the user that is easy to use and navigate.	High
The system shall allow users to choose either collection or delivery.	High
When delivery is chosen, the user shall be able to input their postcode to find out if they are within the delivery distance.	High
The system shall calculate the distance between the user's postcode and the client's shop's postcode.	High
An alert shall be made to the user notifying them if their inputted postcode is outside the delivery distance.	High
Allow users to only place delivery orders between 11:00-18:00, if user tries to order after the closing time notify them that an order cannot be placed.	High
Allow users to only place collection orders between 11:00-17:45, if user tries to order after the cut off time notify them that an order cannot be placed.	High
Display the menu to the user, listing the different flavor's available and the prices.	High
The system shall allow users to add their order to a basket.	High
Display the full order to the user when they wish to view their basket.	High
Allow the user to checkout securely using their card information.	High
Display to the user when the order has been placed.	High
Provide reports to the client about the number of orders per day/week/month.	High
Provide statistics to the client's staff regarding the popularity of flavors.	High

Display all the relevant information to the user about the client's shop, such as contact information and opening times.	Medium
Provide advanced analytical presentations for the client, providing graphs showing popularity of the different ice cream flavors.	Medium
When collection is chosen, notify the user that their order shall be ready within 10 minutes of the order being placed.	Medium
Display a secure login system for the client's staff members for them to have access to the available statistics and reports.	Medium
System allows for users with visual impairment/disabilities.	Medium
Generate a delivery schedule for a delivery driver, including the order number, customer contact details and address for each order placed.	Low

5.2 Non-Functional Requirements

Requirement	Priority (H, M, L)
The pages on the website shall load within 3 seconds when the new page has been selected.	High
The system can be accessed by the common browses these include Safari, Chrome, Microsoft Edge, Firefox.	High
The system will be able to be viewed on mobile devices.	High
The website will be functional 24 hours 7 days a week.	High
The system will comply with the GDPR (General Data Protection Regulation).	High
Conformation of the order will be received by the user within 3 seconds of placing the order.	High
Reports about the number of orders per day/week/month will be shown to an accuracy of + or – 5 orders.	High
The system will update the reports and statistics every time an order is placed, to ensure the data is performing in real-time.	High
For staff and user login, access will be provided within 3 seconds when the correct login and password are input.	High
The system will be completed by the 26th of March 2021.	High

6. Other considerations

6.1 Assumptions

Below is a list of the assumptions that the team have made regarding the ice cream ordering system:

- The shop is open 11:00-18:00 every day.
- The shop will not accept delivery orders placed by users over 5 miles away.
- The shop will always have sufficient stock to fulfil orders.
- The shop will operate without any delays or unexpected situations such as the shop not receiving the order once it has been placed by the user.
- The shop only has 5 sizes for their ice cream, and these have 5 corresponding prices.
- The shop only charges a surcharge for one flavor of ice cream which is for salted caramel.
- The shop only sell tubs of ice cream, not cones.
- The staff have a login and password for the website and have the authority to look at the reports and statistics.

As this system is a prototype, the design will allow for future development and additional addons so that the program can be changed to include these assumptions if they are modified. If during the coding phase of the project, the project brief was to change and some of these assumptions were not valid anymore, the team would try to accommodate these within the system.

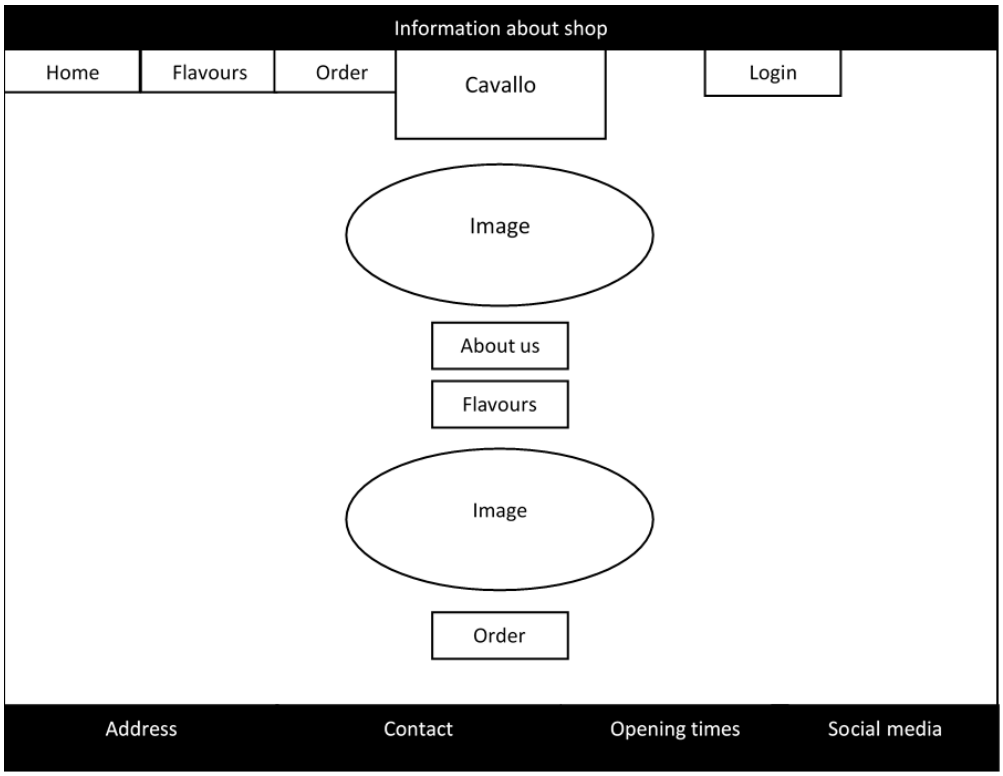
6.2 Constraints and Dependencies

- The project is expected to be delivered by the 26th of March 2021, as a team we are all working to stay on track to complete the system, meeting the functional and non-functional requirements and producing the documents by this deadline. If any unanticipated situations were to happen, we would adjust our workload to accommodate for this so that we can still meet the deadline.
- Testing of the system will be done by the members of the team, to test the system on a wider scale of people would be extremely difficult. However, the system will be shown to a small audience at a trade fair to obtain user feedback.

7. Initial requirements analysis of user interaction

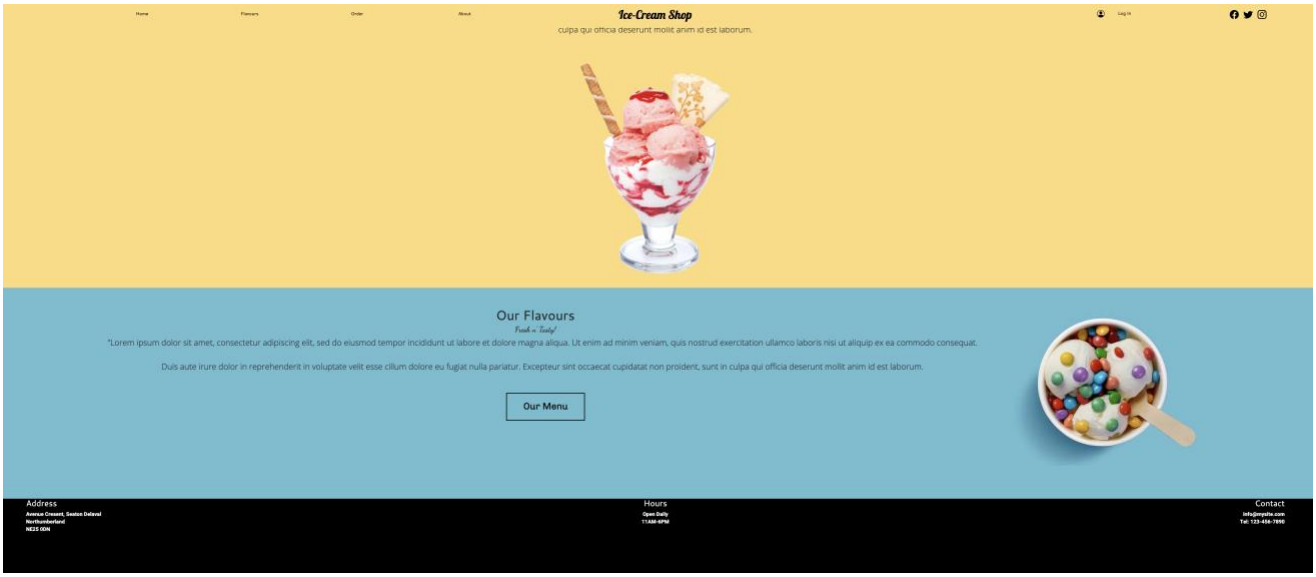
7.1 Web design – Initial Ideas

Home page:



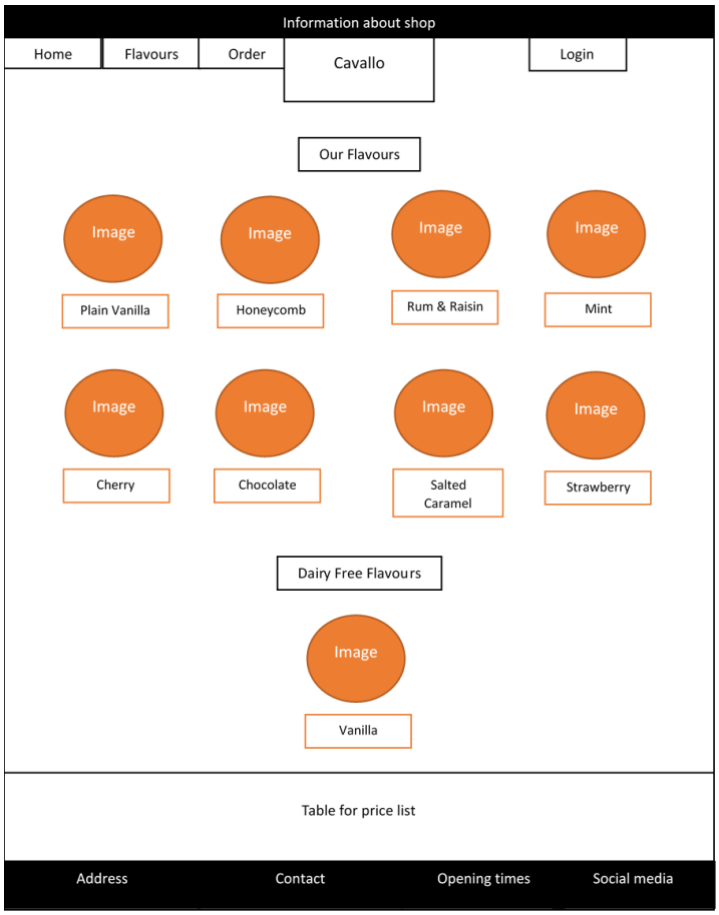
- Login: Each page will have the login option for users and staff members. When the login option is selected, there will be the option to choose customer or staff login. Once the staff have logged on, they will have access to the number of orders places per day/week/month and the popularity of flavors. The staff will not be able to place orders when in their staff account.
- Navigation bar: This is located at the top of the page and will be available on each web page. This bar includes the following functions: Home, Flavors, Order, Login.
- Images: Showing images of ice cream, making it visually appealing for the user.
- About us: Information about the client's shop, letting the user know more about where they might place an order from.
- Flavors/Order links further down the web page, allowing the user to access these web pages anywhere on the home web page.

- Footer - This includes the address, contact details and opening hours for the client's shop. Hyperlinks attached to the social media section, allowing users to access the different social media platforms for the client's shop. This section will be included on every page.



The image above shows the home page that has been developed for the system.

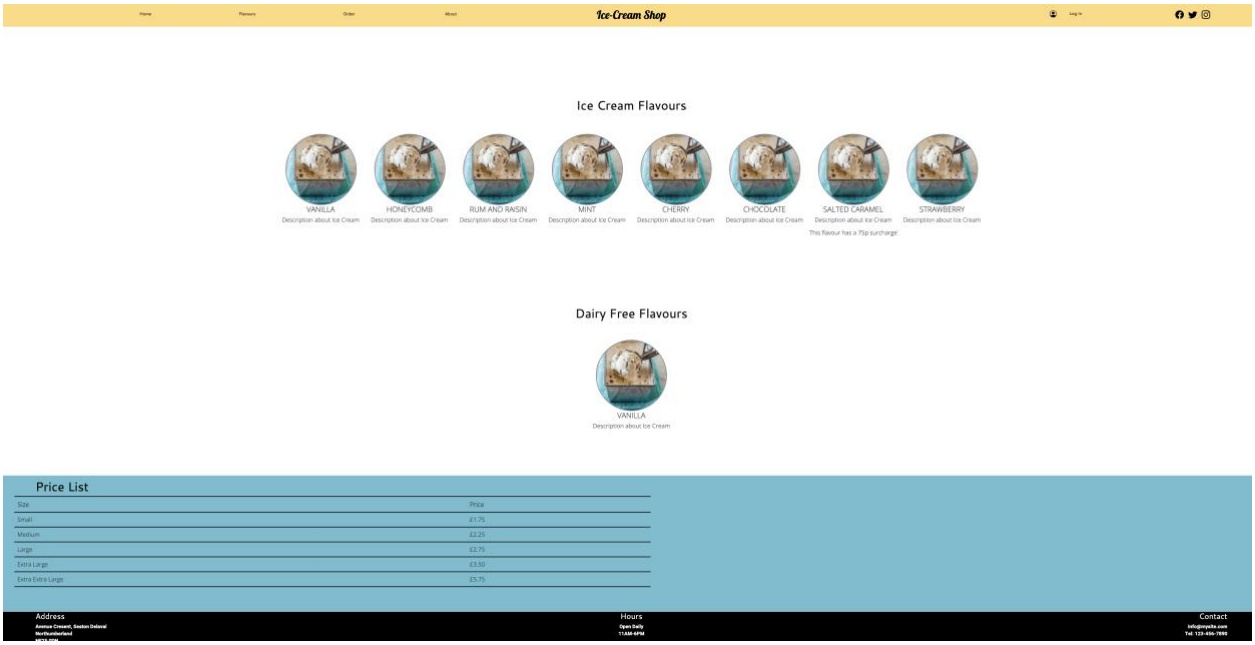
Flavor:



- Our Flavors – This section will show the different ice cream flavors available to the user with a brief description about the flavor. There will be an image with the corresponding flavor showing the user what the ice cream looks like.

- Dairy Free Flavors – This will show the only dairy free flavor available to the user, having this as a section will make it very clear to the user that this ice cream is dairy free so people who have allergies have options too.

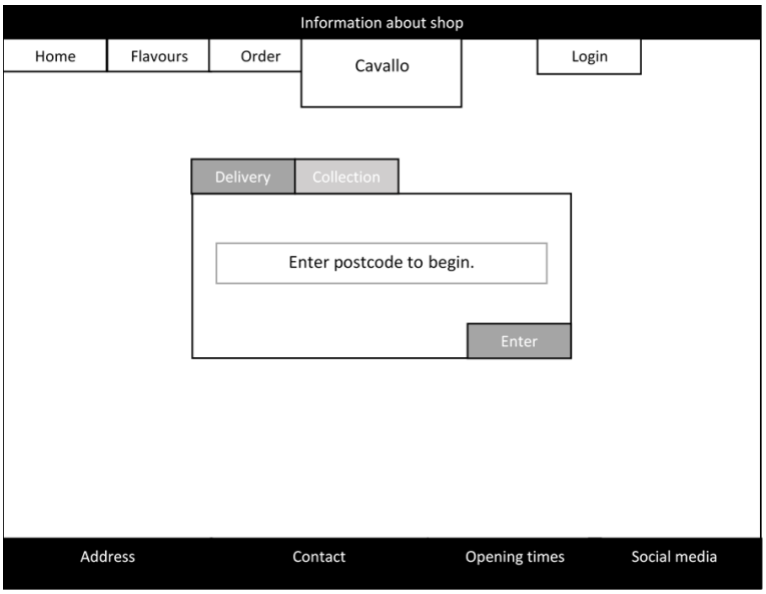
- Price List – As the prices are based on sizes not the actual flavor there is a separate price list stating what the prices are for the different sizes. Allowing users to see prices before placing an order.



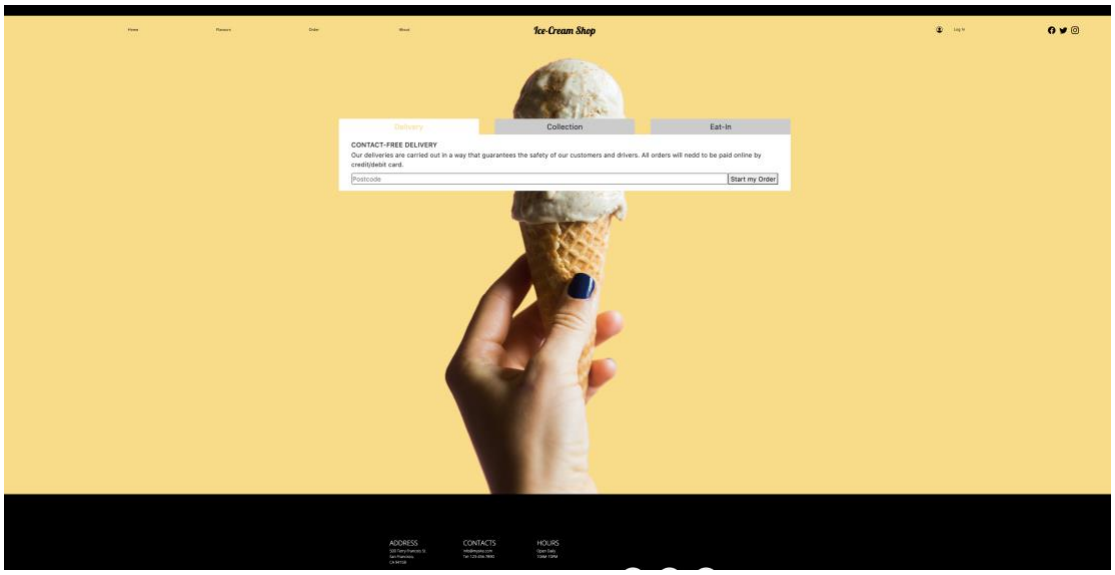
The image above shows the Flavor page that has been developed for the system.

Order:

Delivery Option:

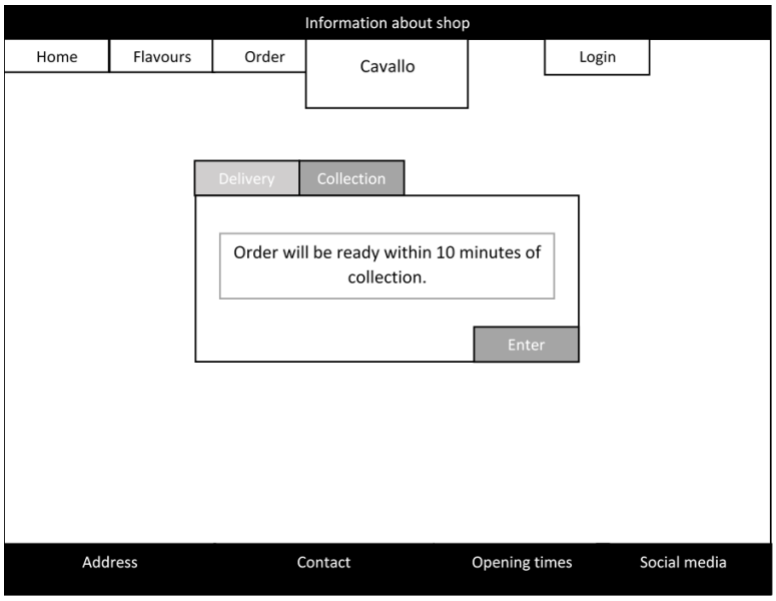


- Order – When this is selected from the navigation bar, a pop-up window will appear asking the user to select delivery or collection. When delivery is selected the user will have to input their postcode to begin. This pop-up window will be over the home page.

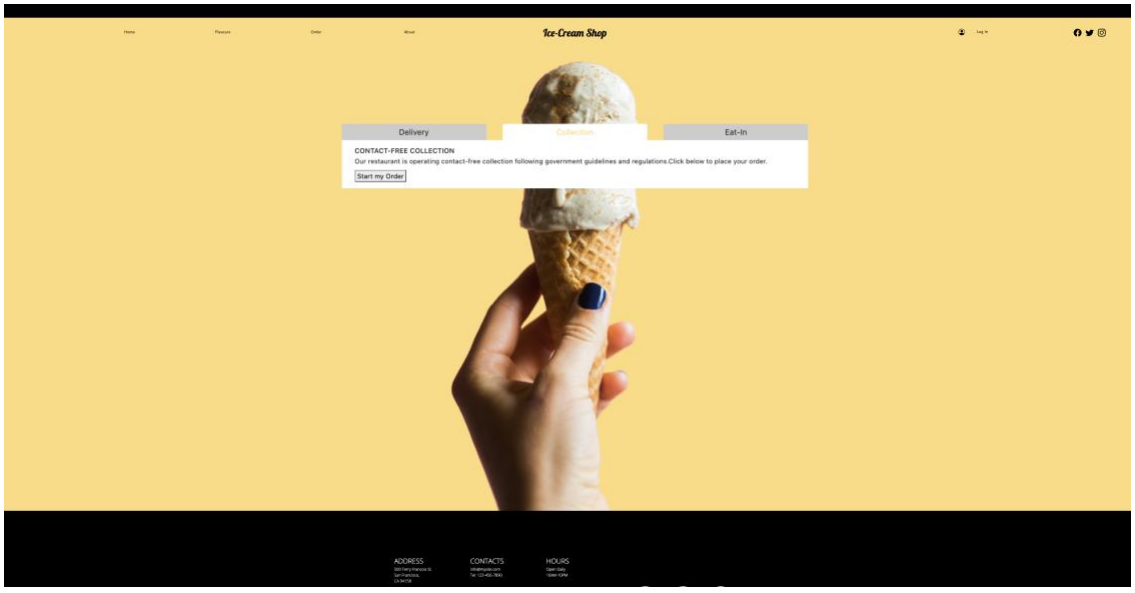


The image above shows the delivery option that has been developed for the system.

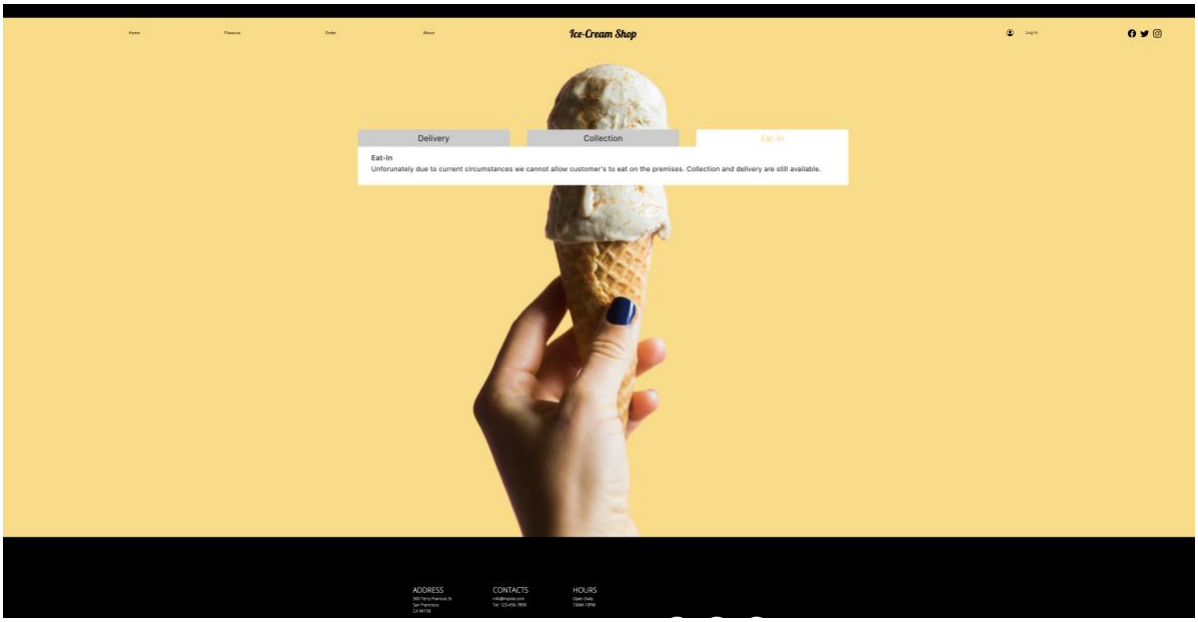
Collection Option:



- When collection is selected, no further information needs to be collected from the user. Information about when the order will be ready to collect can be shown.

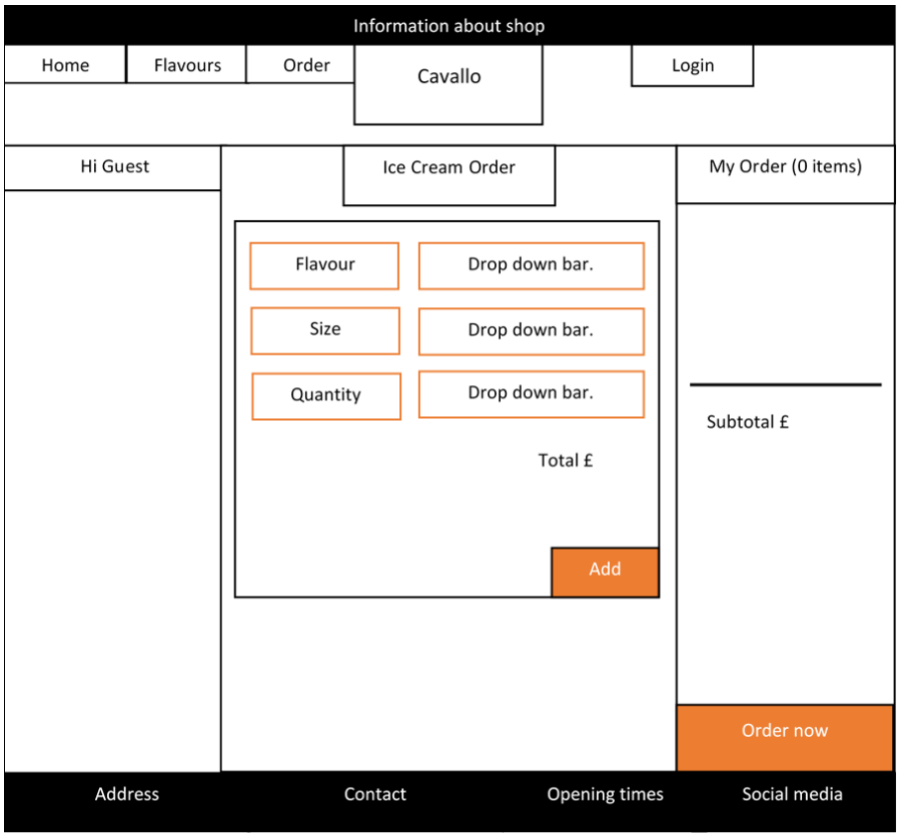


The image above shows the collection option that has been developed for the system.



The image above shows what the user would see if they chose the eat-in option, due to Covid restrictions users are unable to go in store and therefore must choose either delivery or collection.

Choosing the order:

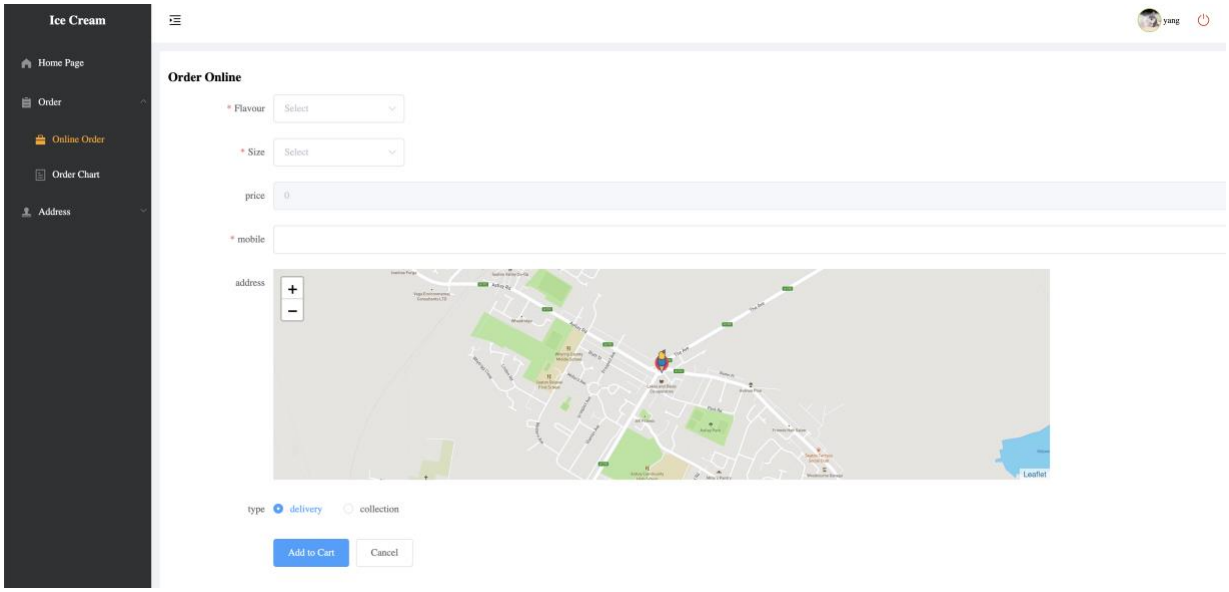


- Hi Guest -This section will say guest if the user has not logged into the system. If the user has logged in, it will say the user's name.

- Ice Cream Order – This section is a form where you can choose the flavor, size and quantity of ice cream and add it to the order. The user will be able to add multiple items to the overall order. All these options will have a drop-down option that the user can choose from. The price will be automatically calculated depending on the options the user chooses.

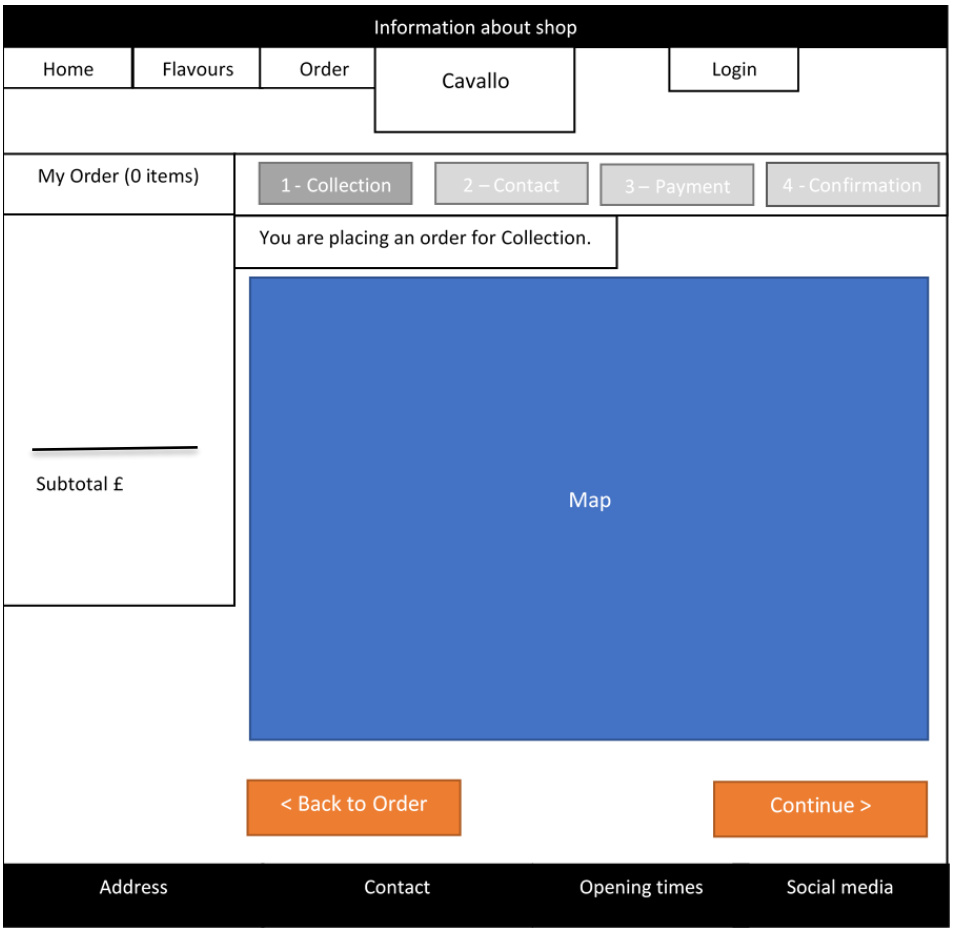
- My Order – This section will show the user the total number of items that are in the basket at that time, it will be updated every time a user adds or removes an item from the section. In this section the user will be able to remove the item from the basket if they no longer want that flavor/size/quantity. The overall total of the order will be shown in this section, this will be automatically calculated.

- Order now – Once the user is happy with their order, they will then press the order now button which will take them to another web page.



The image above shows the ordering system that has been developed.

Collection/Delivery options:

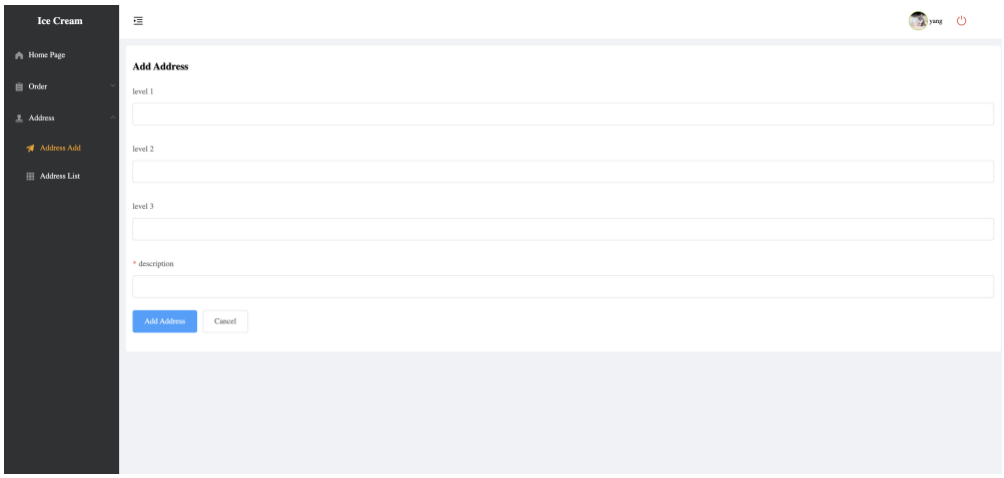


- Collection/Contact/Payment/Confirmation – This is not a navigation bar but an indicator to the user as to what stages they must go through to place the order. The collection box may change to delivery if the user previously chose delivery, this is all dependent on the delivery/collection option the user chose.

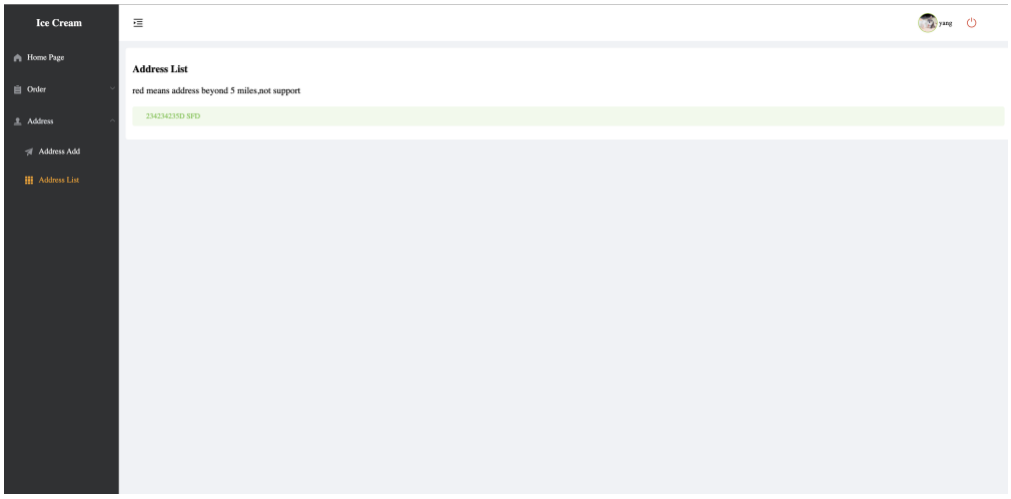
- Map – For the collection option, this map will just show the location of the client's shop. However, for the delivery option it will show the location of the client's shop and the location of the postcode the user input.

- Back to Order – This button will take the user back to the choosing their order page. A button like this will be on the Collection, Contact, Payment pages allowing user to go back to the previous page.

- Continue – This button will take them to the contact page.

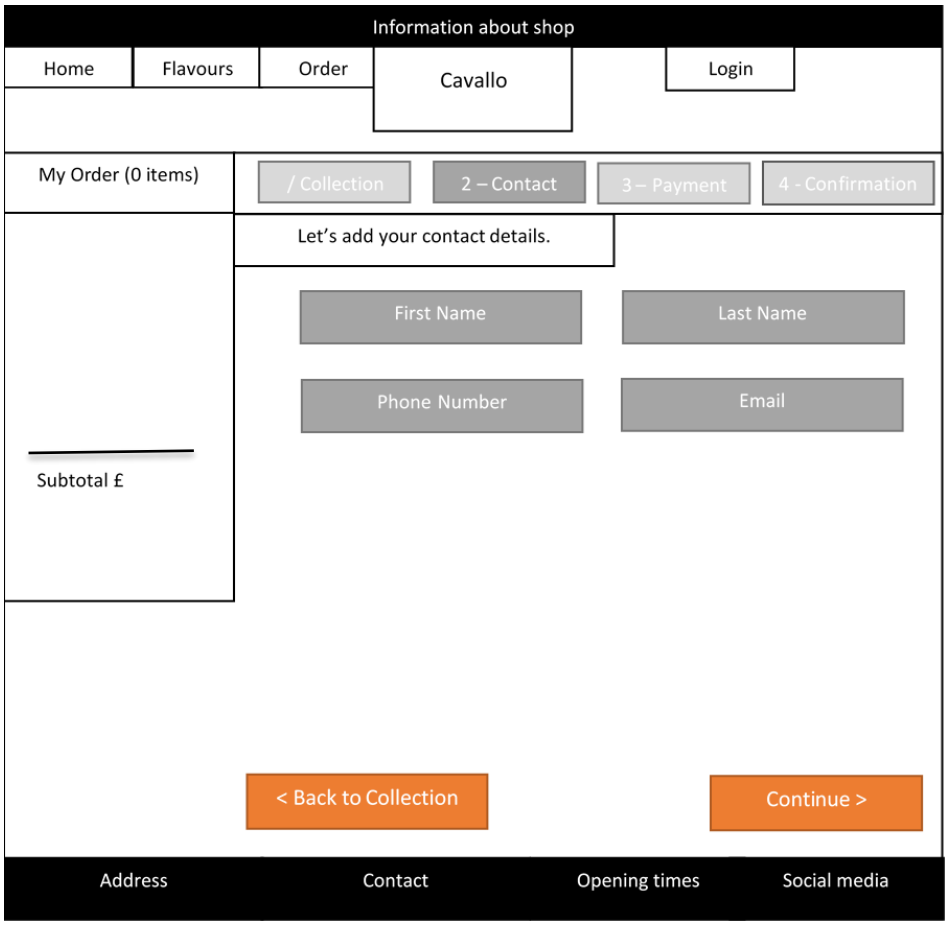


This image above shows page that the user will input their address into for delivery.



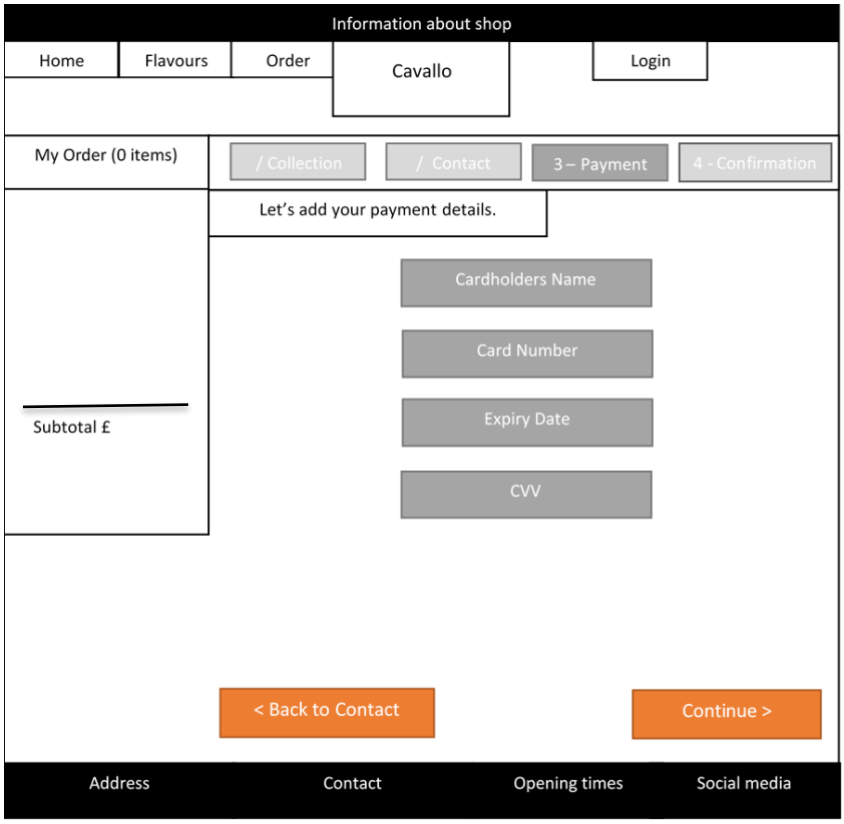
This image above shows what the user will see if their address is within the range.

Contact:

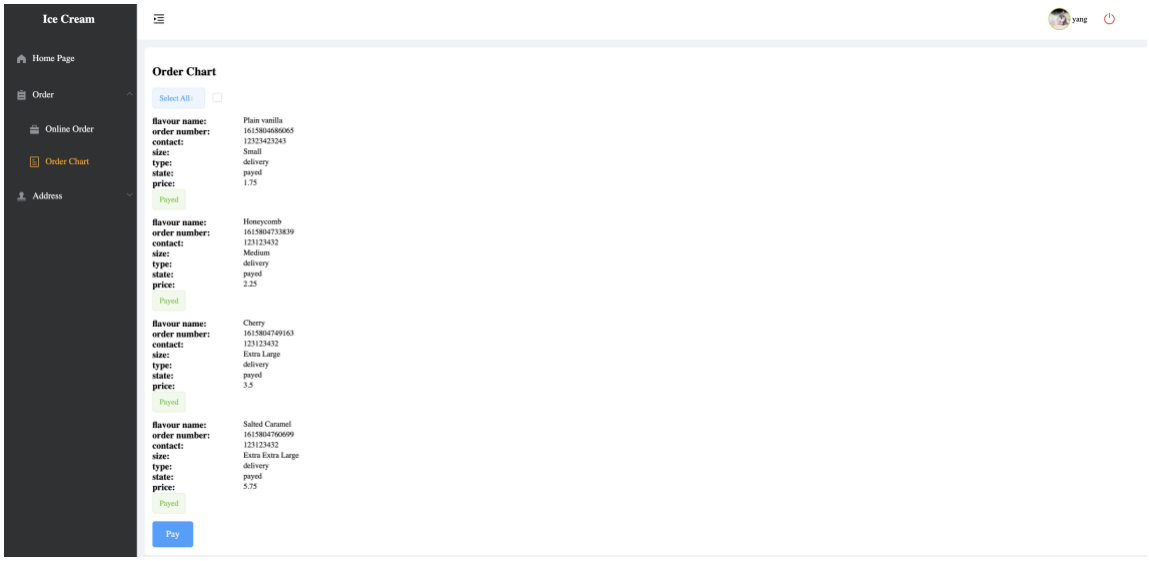


- Let's add contact details – Allows user to input first and last name, phone number and an email address.

Payment:

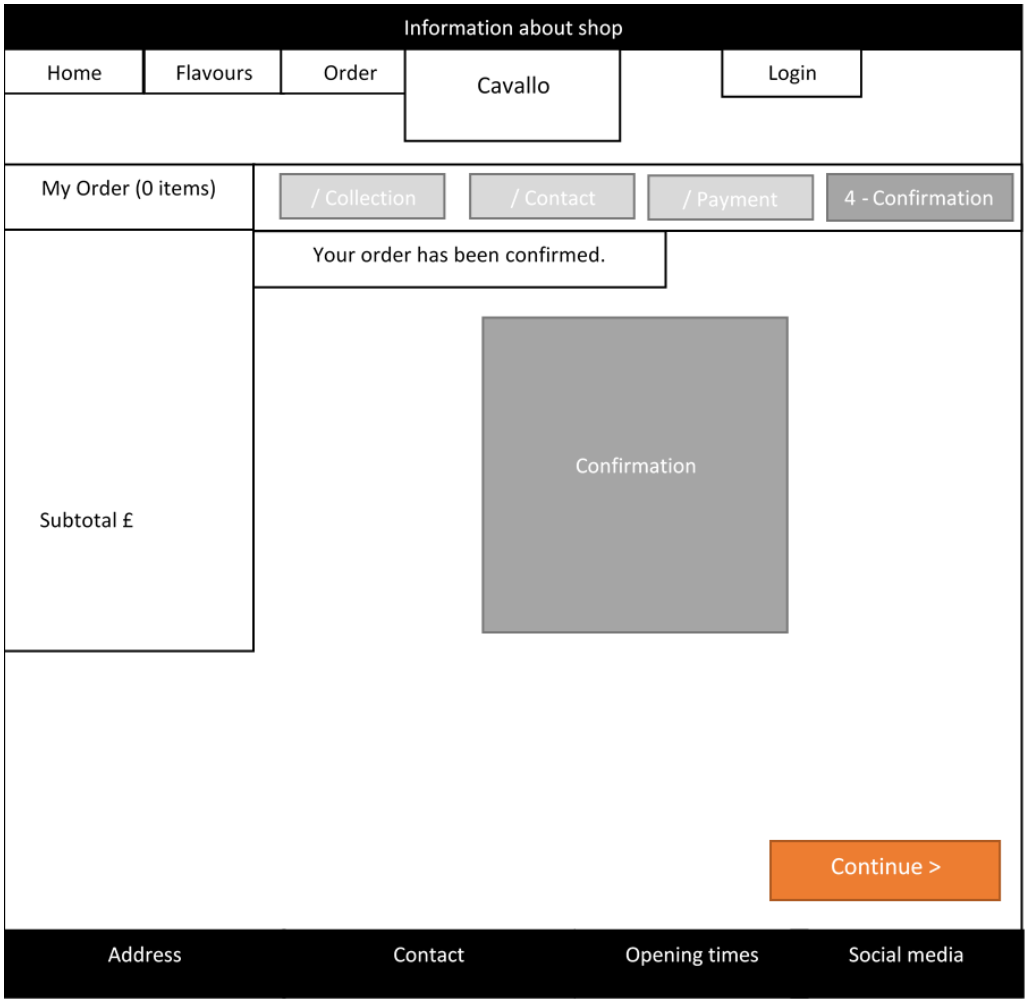


- Let's add your payment details – The user will input their card details, there will be no option to pay with cash due to Covid.



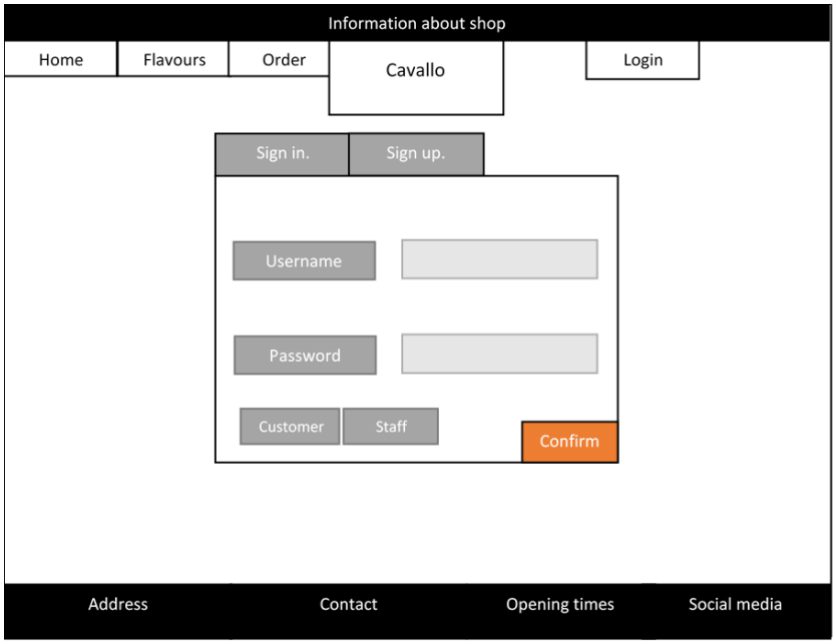
This image shows the basket and the payment page that has been developed for the system.

Confirmation:



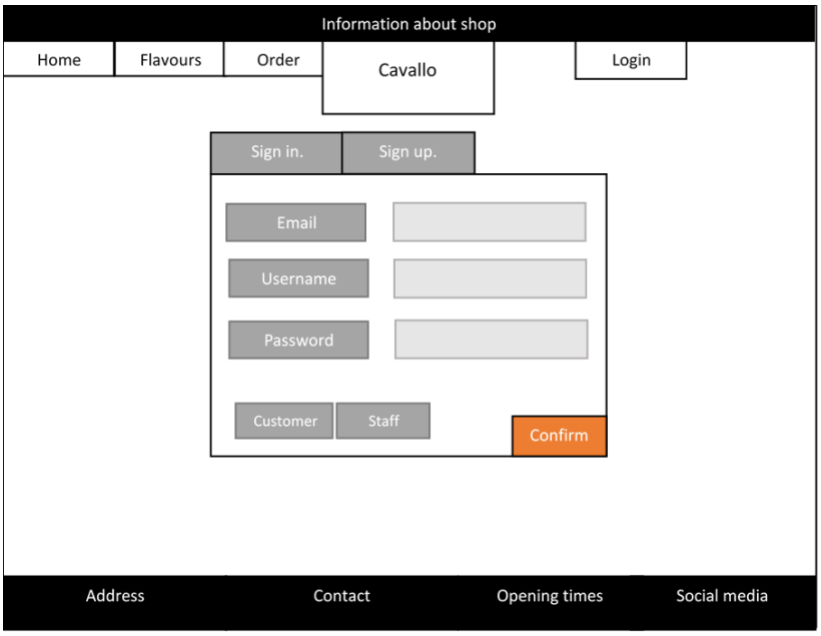
- Confirmation section – This will give the user an order number, confirming that the shop has received the order. It will say that the payment was successful and thanking the user for ordering from the shop.

Login Section:



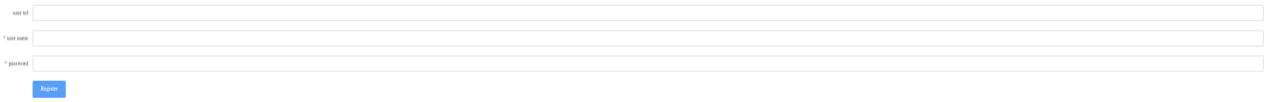
- Sign in section – Customer and staff buttons, user chooses which they are before logging in. Username and password sections, password will be private. Confirm button, user will press this once they have input their details. For the customer once they have logged into the system, it will just take them to the choosing the order page and once logged in it will say Hi (User's name). For staff, it will take them to the staff page.

Sign up:



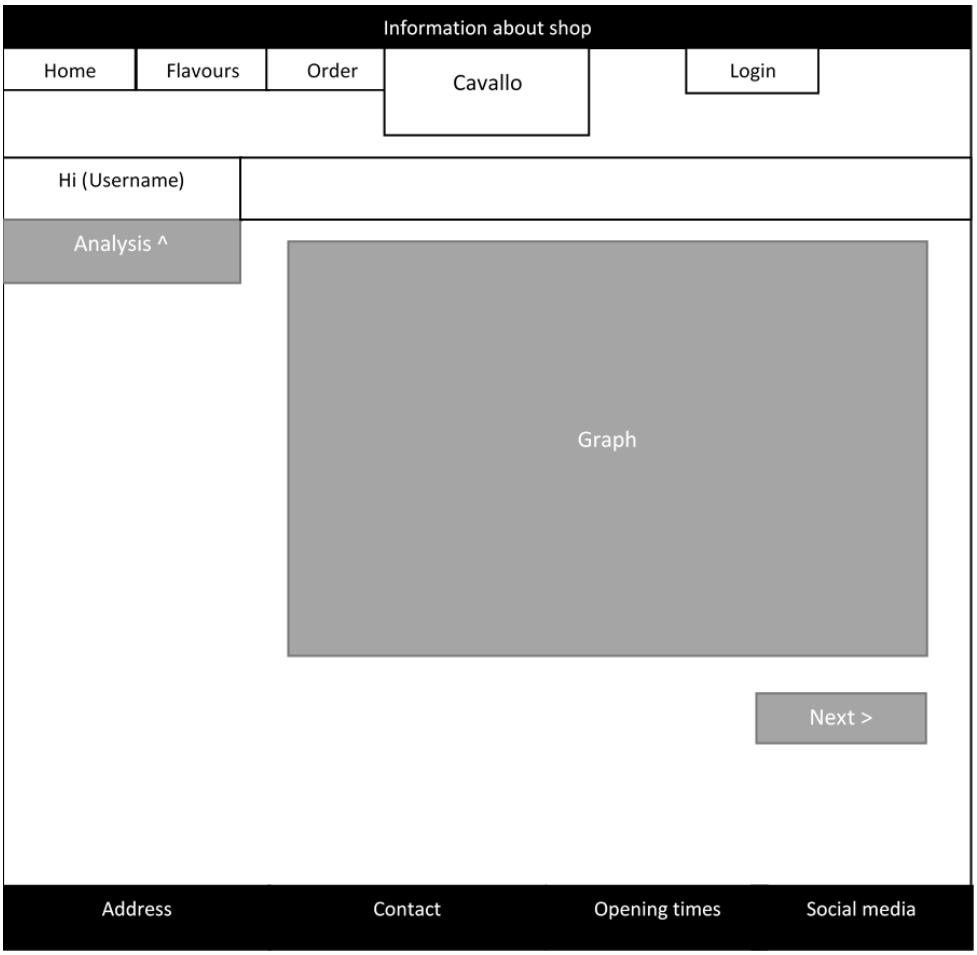
- Sign up – The user can input their email, username, and password to create an account.

This image shows the login page for both user and staff that has been developed.

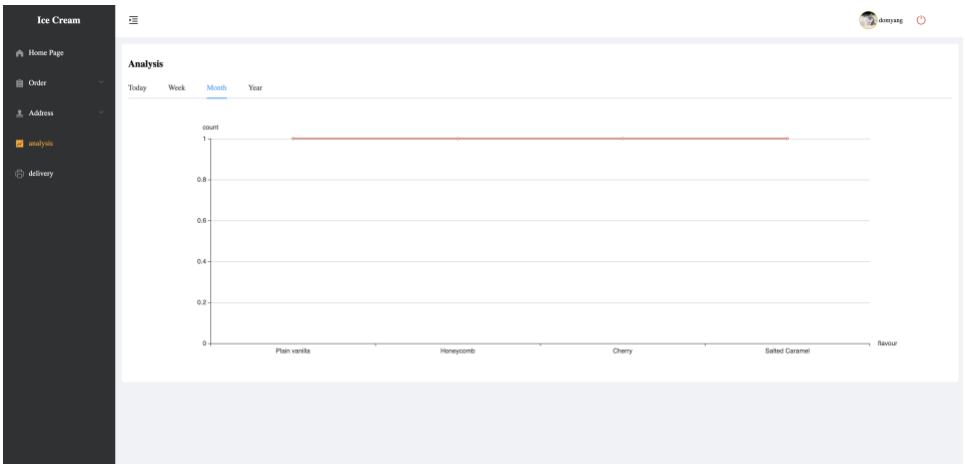


This image shows the sign-up page that has been developed for the system.

Staff Section:



- Hi (Username) section – Analysis button which will drop down to multiple buttons these will include number of orders per day, week, month, and the popularity of the flavours.
- Graph – This will show a graphical interpretation of the data which is from the database.
- Next – This button once pressed will show the next graph.



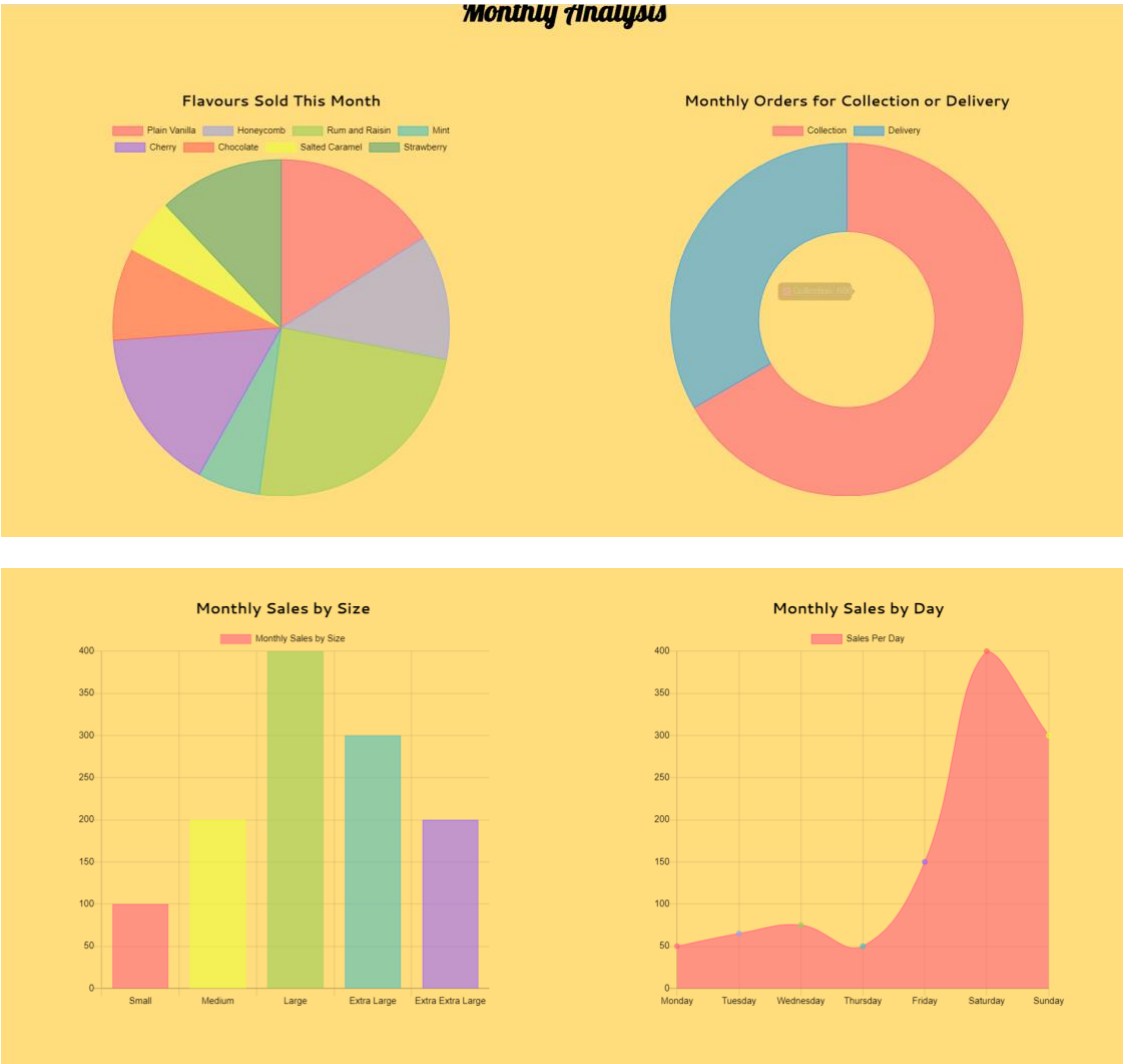
This image shows the analysis page that has been developed for the system.

This image shows the delivery schedule that has been developed for the system.

Weekly and monthly analysis

The user can access the extra analysis pages too. These pages show a visualization of the sales data on a weekly and monthly basis.

The graphs appear automatically when the user enters the analysis section.



7.2 User Access

The following actions are influenced from the functional requirements section, which have been ordered from high priority to low priority.

1. Provide a web-based interface for the user that is easy to use and navigate.

User Action	System Response
User uses the web-based functions.	1) Carry out web-based interface. 2) Display the output.

2. Allow users to choose either collection or delivery.

User Action	System Response
User presses order button in navigation bar, user presses either the collection or delivery.	1. Display either the collection or delivery information to the user, different tasks are associated with each choice.

3. When delivery is chosen, user will find out if their postcode is within the delivery distance.

User Action	System Response
User chooses delivery option and then inputs their postcode into the box. User then presses confirm.	1) Check the system to discover if the user's postcode is within range. 2) Allow the user to progress to the next web page if the user is within range.

4. The system shall calculate the distance between the user's postcode and the shop's postcode.

User Action	System Response
User chooses delivery option and then inputs their postcode into the box. User then presses confirm.	1) Check the system which will be calculating the distance between the user's postcode and the shop's postcode. Calculating if the user's postcode is within the 5 miles (radial distance).

5. Alert shall be made to the user notifying them if their inputted postcode is outside the delivery distance.

User Action	System Response
User is waiting for response from system, after they have pressed the confirm button.	1) Once distance is calculated, it will alert the system that the postcode is outside of the delivery distance. 2) Displays a message to the user stating the shop cannot deliver to that address.

6. Allow users to only place delivery orders between 11:00-18:00, if user tries to order after the closing time notify them that an order cannot be placed.

User Action	System Response
1) User attempts to place an order for delivery during the opening hours. 2) User attempts to place an order for delivery during the closing hours.	1) Order is processed and confirmed when user places order within opening times. 2) Order is rejected when user places order outside of opening times, message is shown to user stating the shop is closed.

7. Allow users to only place collection orders between 11:00-17:45, if user tries to order after the cut off time notify them that an order cannot be placed.

User Action	System Response
1) User attempts to place an order for collection during the opening hours. 2) User attempts to place an order for collection during the closing hours.	1) Order is processed and confirmed when user places order within opening times. 2) Order is rejected when user places order outside of opening times, message is shown to user stating the shop is closed.

8. Display the menu to the user, listing the different flavour's available and the prices.

User Action	System Response
User presses menu button on home page or navigation bar.	1) Display the menu page, showing the flavours and prices.

9. The system shall allow users to add their order to a basket.

User Action	System Response
User has selected the order button; they find the flavour they want, input all the relevant information and presses the add button.	1) Save the items added to the basket. 2) Display the items within the basket to the user. 3) Update the basket if an item is removed.

10. Display the full order to the user when they wish to view their basket.

User Action	System Response
User has placed all items in the basket and has pressed the order now button.	1) Display all the items the user has added with the corresponding prices. 2) Calculate the total price of all the items. 3) Display the total price.

11. Allow the user to checkout securely using their card information.

User Action	System Response
User has input their card details and pressed the continue button.	1) Card details will be processed using Horsepay. 2) If payment is accepted the system will load the next web page.

12. Display to the user when the order has been placed.

User Action	System Response
User has pressed the continue button on the payment page.	1) The system will show a confirmation message once the order has been accepted.

13. Provide reports to the client about the number of orders per day/week/month.

User Action	System Response
User has entered their username and password into the staff login system. Pressed analysis button.	1) Check the database. 2) Display the report as a graph showing the number of orders per day/week/month.

14. Provide statistics to the client's staff regarding the popularity of flavours.

User Action	System Response
User has entered their username and password into the staff login system. Pressed analysis button.	1) Check the database to find the statistics.

15. Display all the relevant information to the user about the client's shop, such as contact information and opening times.

User Action	System Response
User has loaded the webpage and is scrolling through the information on the pages.	1) Display all the relevant information on the header and footer of the webpage.

16. Provide advanced analytical presentations for the client, providing graphs showing popularity of the different ice cream flavors.

User Action	System Response
User has entered their username and password into the staff login system. Pressed analysis button.	1) Check the database. 2) Display the statistics in a graphical way to the user.

17. When collection is chosen, notify the user that their order shall be ready within 10 minutes of the order being placed.

User Action	System Response
User has pressed the order button, then chosen the collection button from the pop-up screen.	1) Display a message to the user about wait time.

18. Display a secure login system for the client's staff members for them to have access to the available statistics and reports.

User Action	System Response
User is entering their username and password into the login system. Presses the confirm button.	1) Check the database. 2) If user is registered in the database, the system will accept them to the staff page.

19. System allows for users with visual impairment/disabilities.

User Action	System Response
User zooms in to enlarge the text on the webpage.	1) System will adjust the sizing of the font and images to fit to the required zoom.

20. Generate a delivery schedule for a delivery driver, including the order number, customer contact details and address for each order placed.

User Action	System Response
User logs in to the system, presses the schedule button.	1) Check database. 2) Display the relevant information to user.