# Done - Project Proposal

Laser Mate! is a self-defined start-up dissertation project that has the potential to hit over a £2.5 billion annual profit. The goal of the software is to provide a platform for restaurant customers to order and pay for their meals online.

The unique prospect of this new system is the fact that it suppresses traditional ordering methods by the costs needed to perform the ordering duty, resulting in a saving of £16,800 - £33,600 per year for the restaurant owners. This comes from the fact that they will not need to take, record, and deliver the orders and give and take meal’s payment as customers will perform these tasks instead. Since restaurant waiters will only require taking the customers to the table and deliver the meals, they will save at least 50% of the work. By reducing the number of people needed to maintain the restaurant waitering operations by 50%, restaurant owners would save an annual staff cost of 50%. A typical restaurant will have two waitering staff. Therefore, we could help restaurant owners save an annual cost of £8 x 6 hours x 350 days = £16,800. Furthermore, restaurant owners will save additional work on managing staff rota, training, supervision, and accounting.

The revenue-cost analysis indicates that each restaurant account signup would attract a £5,500 profit each year. Firstly, the transaction cost in mobile web is 1% lower than that in bank card (0.39% + 2p vs. 1.75% per transaction), allowing us to have an additional 1% profit. Taking this 1% fee difference with 20% of the £16,800 staff-saving cost as discussed above, we would earn £7,000 per year per restaurant. Consequently, it would result in a £5,500 profit after 20% tax and costs deductions.

In terms of the annual profit analysis, given we have 1.5 million restaurants in the E.U. and U.S., we will hit £2.5 billion at 30% market penetration (30% x 1.5m x £5,500).

Our calculation neglects the start-up cost. These include software expert costs, business registration, legal policies, terms and conditions, cookies, deployment cost, Q.R. code generators, post-marketing, and base salary. Our utmost priority is to prevent data breaching and software breakdown due to high user traffic. To maintain the platform’s security and reliability, we are looking to partner with an experienced software engineer with a share option to take care of these software aspects.

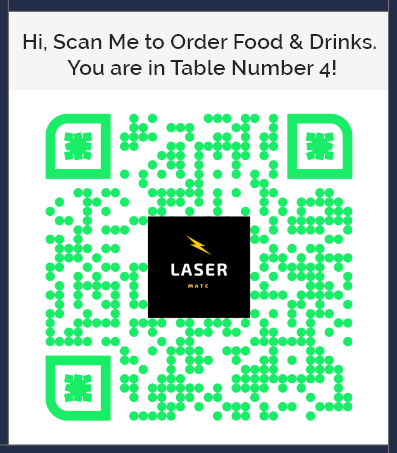
Literature review also suggests that this project idea present a market gap as only Dines have an adequate software design and implementation with a similar focus. Other companies, such as Yo! Sushi, and Starbucks, only have this project idea for their own business operations.

# Final Software Product

This section showcases the final software prototype and the company’s overall administrative operations, maintaining the coherence between the software design and the business activities.

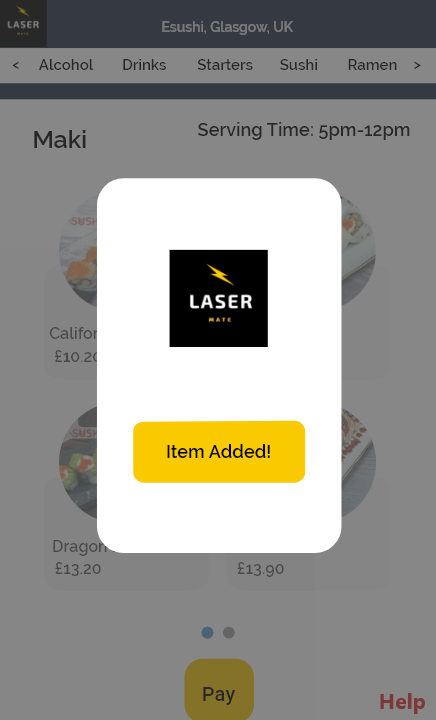
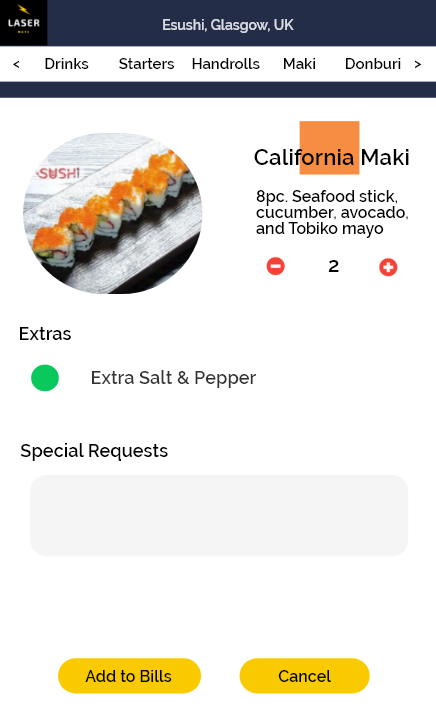
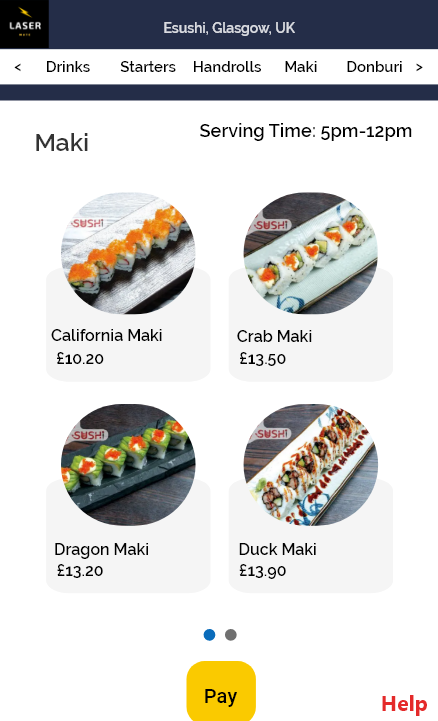
## Done - Restaurant Customer Interface

### Done - QR code



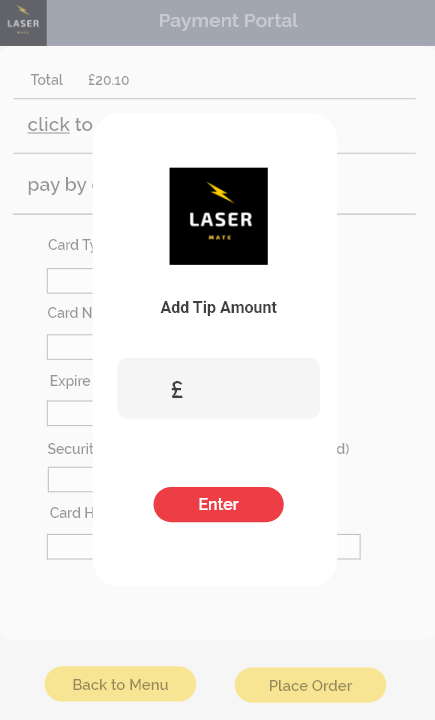
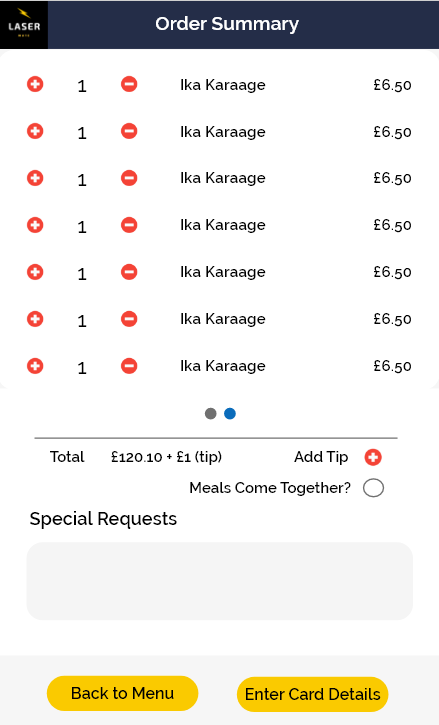
The first point of contact between the restaurant customers and the software is via the QR code. The user will scan it using their phone and get redirected to the meal ordering platform.

### Done - Meal Ordering Page



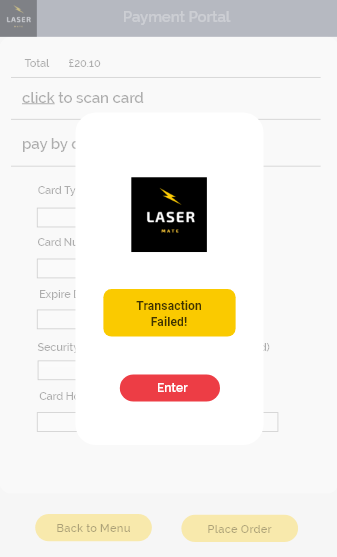
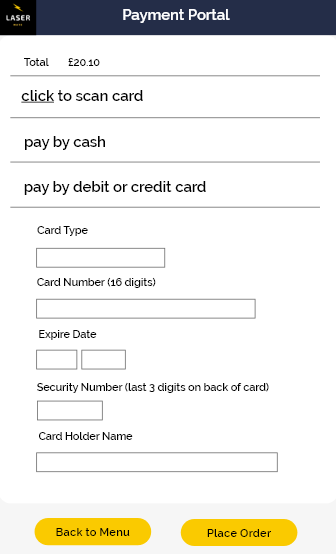
The customer ordering platform clearly shows the restaurant’s name and address, ensuring the customer has entered the correct ordering platform. In the case that the restaurant name doesn’t render correctly, we can rectify from the issue straightaway. The serving time feature is an indicator for the restaurant owner and customer to know when this particular mealtime finishes. Hopefully, customers will find it easy to navigate between meals within different categories using horizontal swipe. Ideally, when they first get redirected to the platform, they will have a 3 second video animated tutorials on how to use the app. In the case that they need repeating help tutorial, they can use the help button in the bottom-right corner to revisit the tutorial video. The customers will repeatedly find and select the meals they want to order, with additional functionalities, such as adding meal quantity, adding extras, and asking for special requests. Once they have added a meal item, they will see a 2 second notification and get redirected to the previous ordering platform. We will now discuss the pay feature – the order summary portal.

### Done - Order Summary



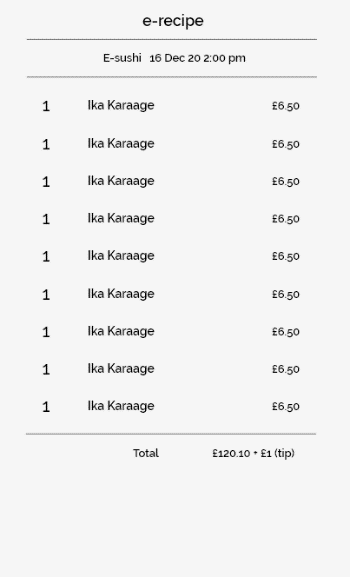
Once the customer orders all the meals they want, they will click the pay button in the meal ordering platform above and view all the meals they have ordered. To account for infinity page scrolling, we have the horizontal swiping option, allowing customers to view as many meals as possible. Other app features include the ability to add meal quantity, view total price, add tips, and decide if the meals come together or separately. They can also send special requests for the restaurant owners to cater for their specific requirements.

### Done - Payment Portal



The next meal ordering process is payment. Customers can opt to pay for the meals by cash or, by typing or scanning the card details using their phone. Prior to software deployment, we will ensure that we will partner with a payment firm that can offer the lowest transaction fees. A transaction failed notification will appear if the card details are incorrect.

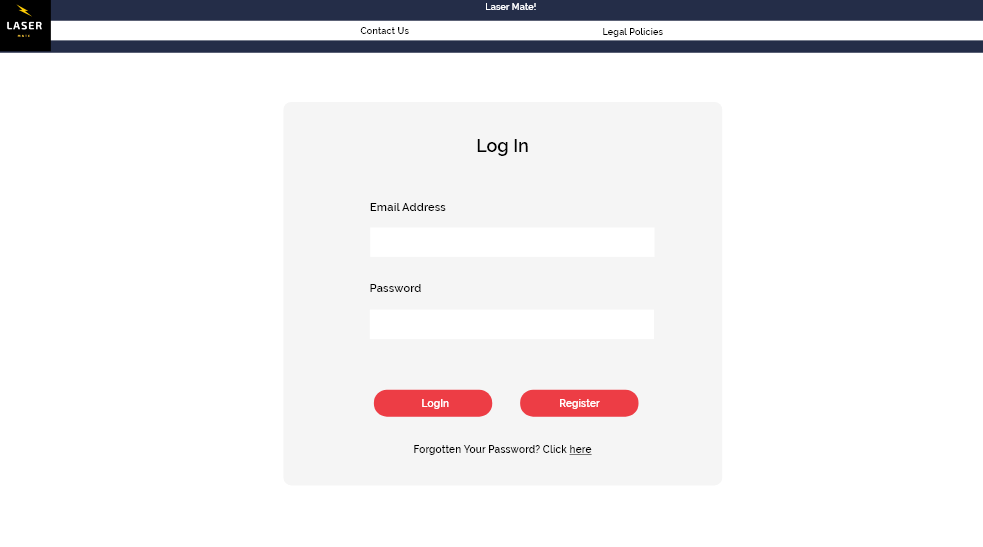
### Done - Order Complete

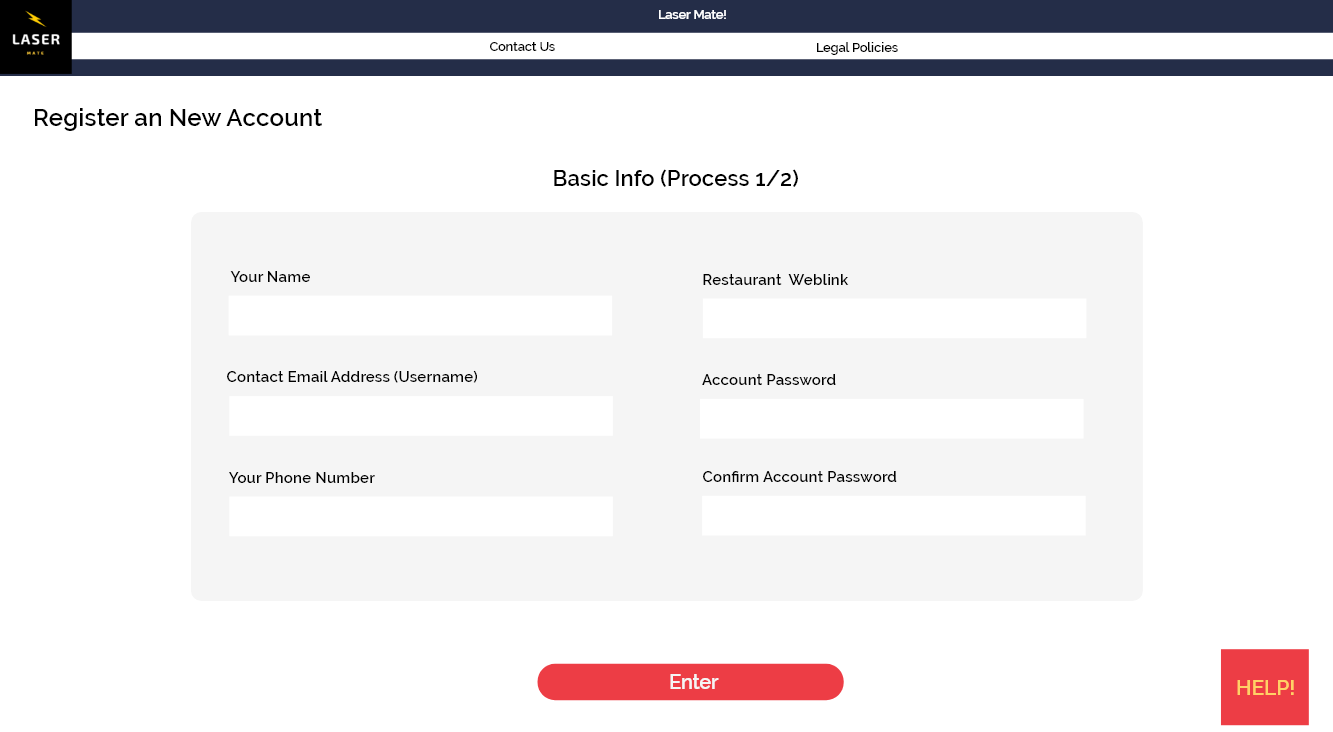


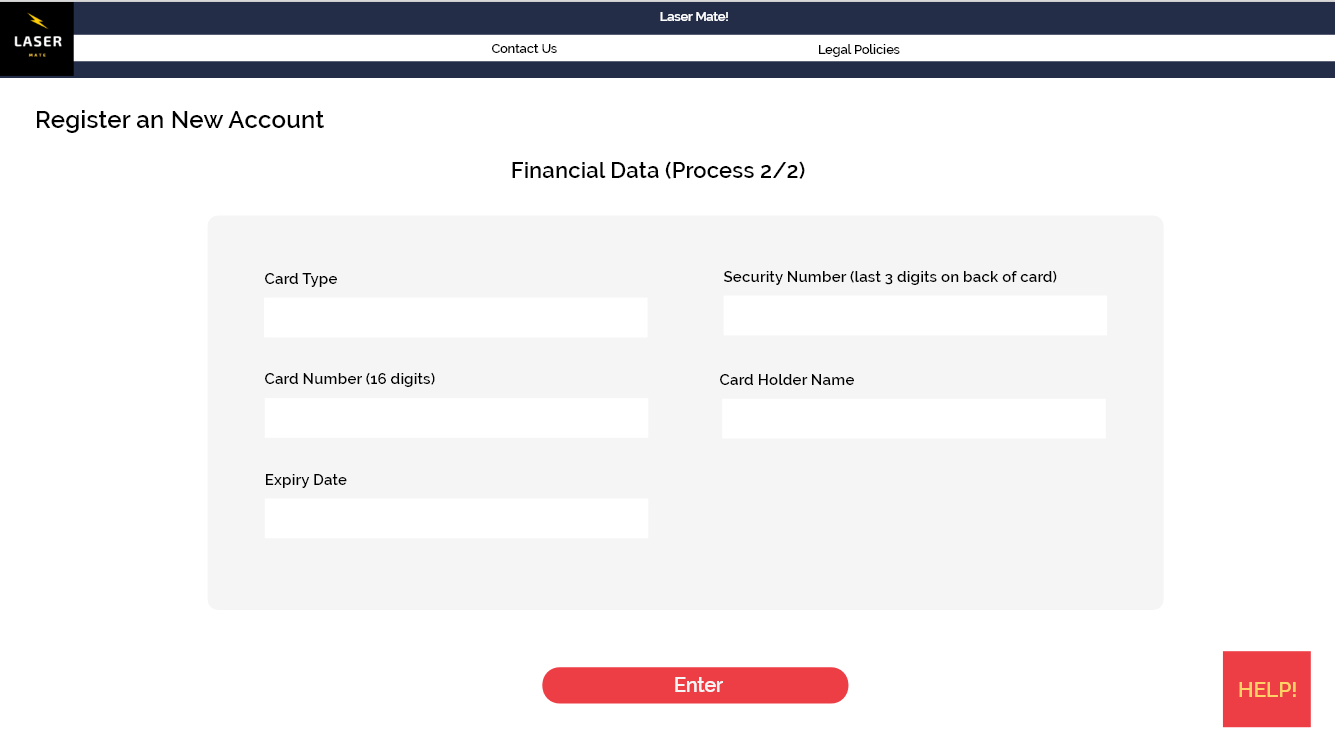
Once the transaction is completed, the system will produce a 5 second order complete notification and automatically display the meal recipes.

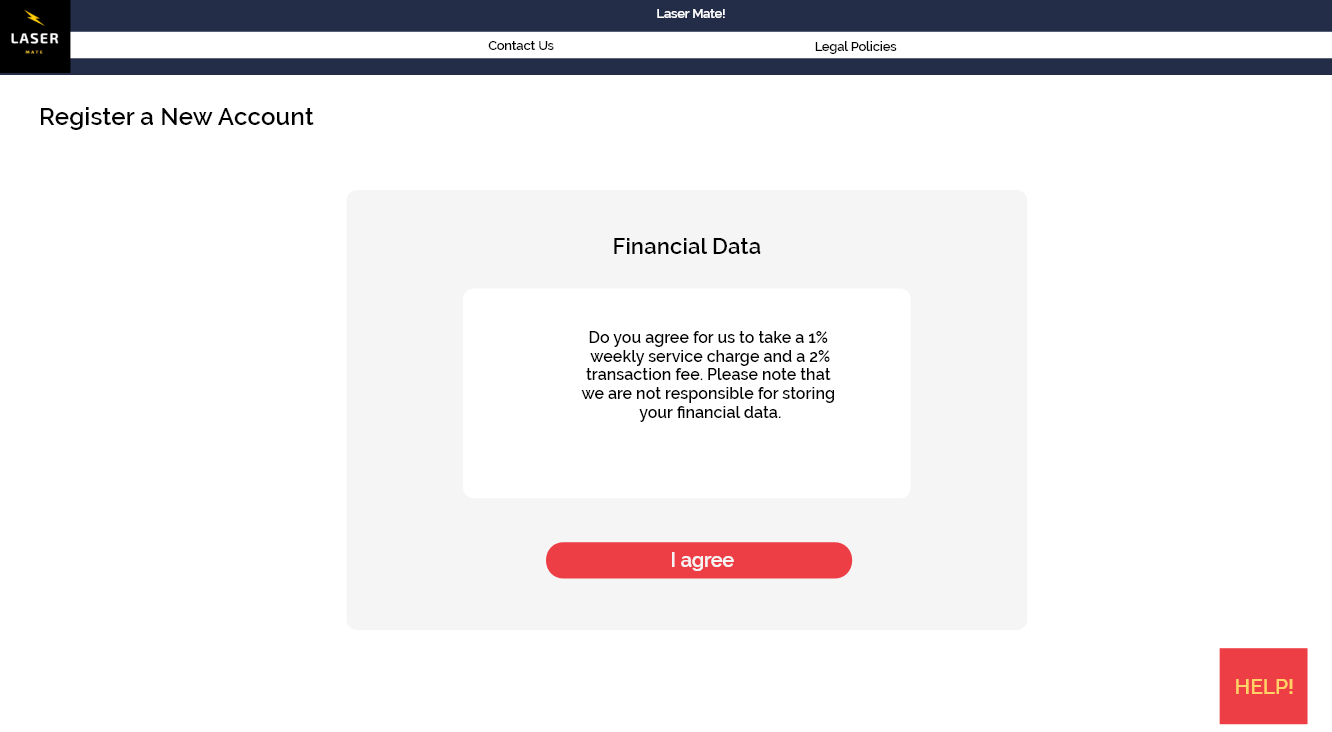
## Done - Restaurant Owner Interface

### Done - Account Registration





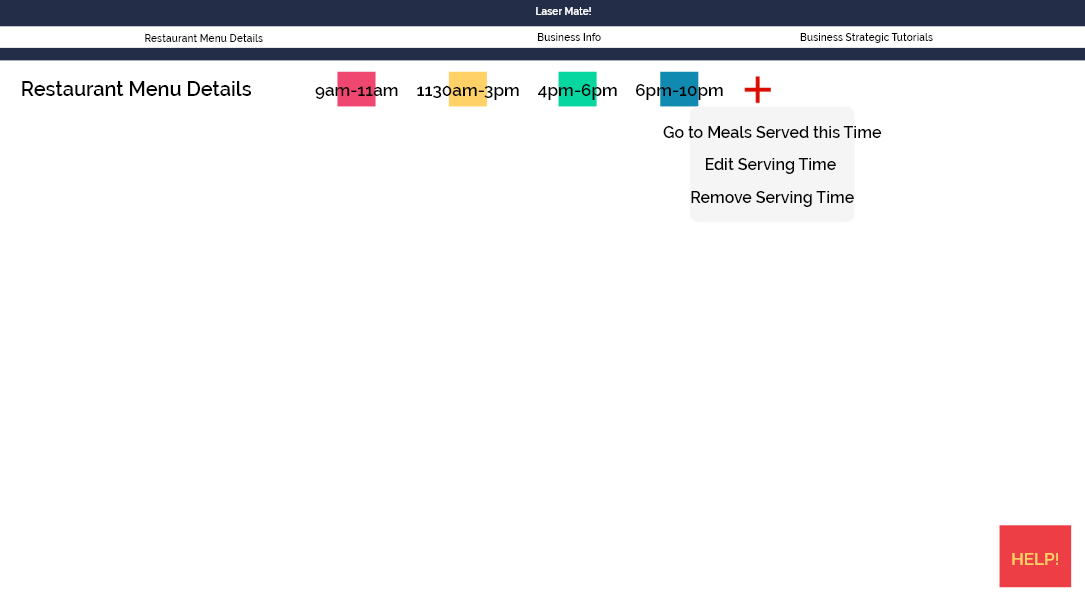


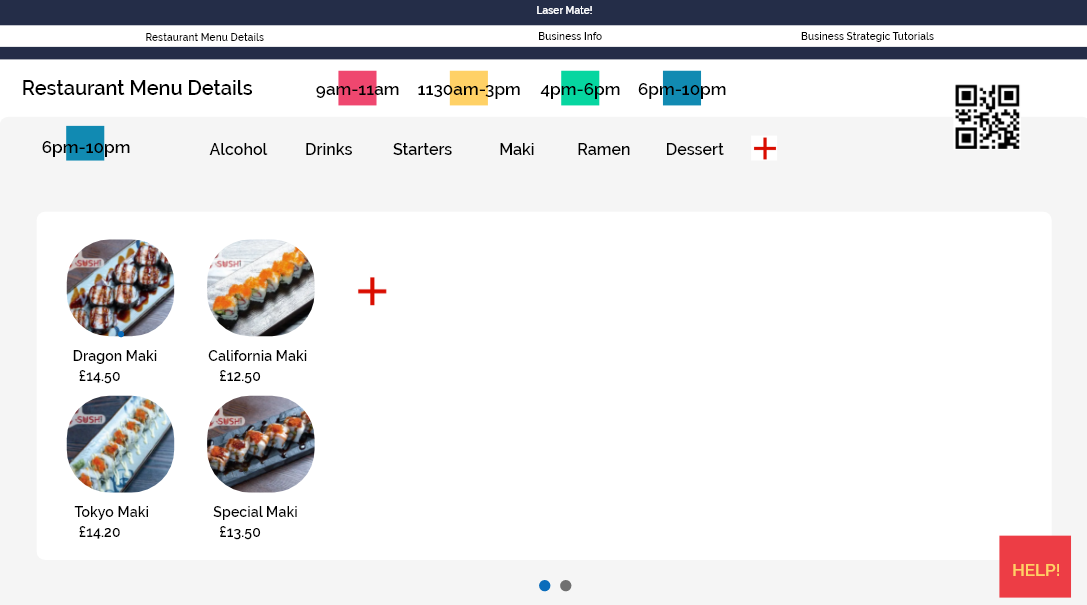


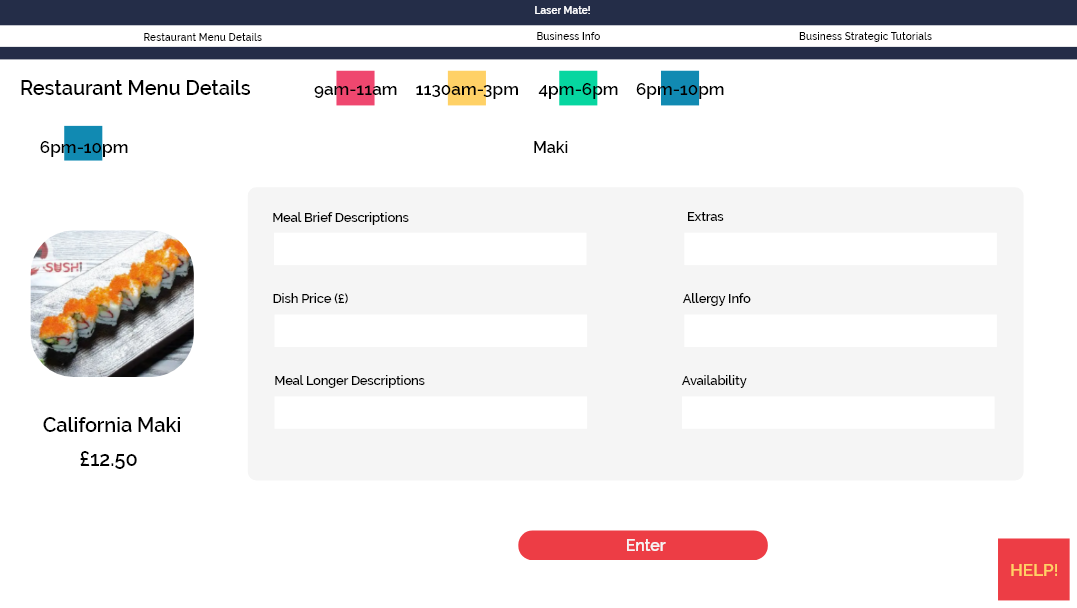
The final software product will not deploy until it passes the scalability and security tests. After the system has undergone sufficient evaluation and refinement, we will begin our customer acquisition process. Mass post-advertisement will act as the first-wave service marketing. It is a practical advertisement medium, as it almost guarantees that all restaurant owners will read letters with their names. Each post will cost around £1.50. We will only need to create and send high volume of letters using stamps, envelop, paper, and printing. The final design will be a formal letter demonstrating some final designs as people would generally take formal presentation seriously. The letter consists of several QR codes that redirects users to our YouTube product demo and the landing page, to show them the benefits to become a member.

Restaurant owners who express an interest to the platform could register an account using our webpage, or via other methods, such as email, and telephone. We will prepare a company procedural documentation to refine the recorded telephone conversation. We are able to sign up a new member using 11 text entries within 2 pages, minimizing customer’s cognitive workload when signing up for an account. The help icon is to help users when registering their account details. The financial data section confirms the weekly payment transactions and their compliance agreement.

### Done - Menu Admin Platform



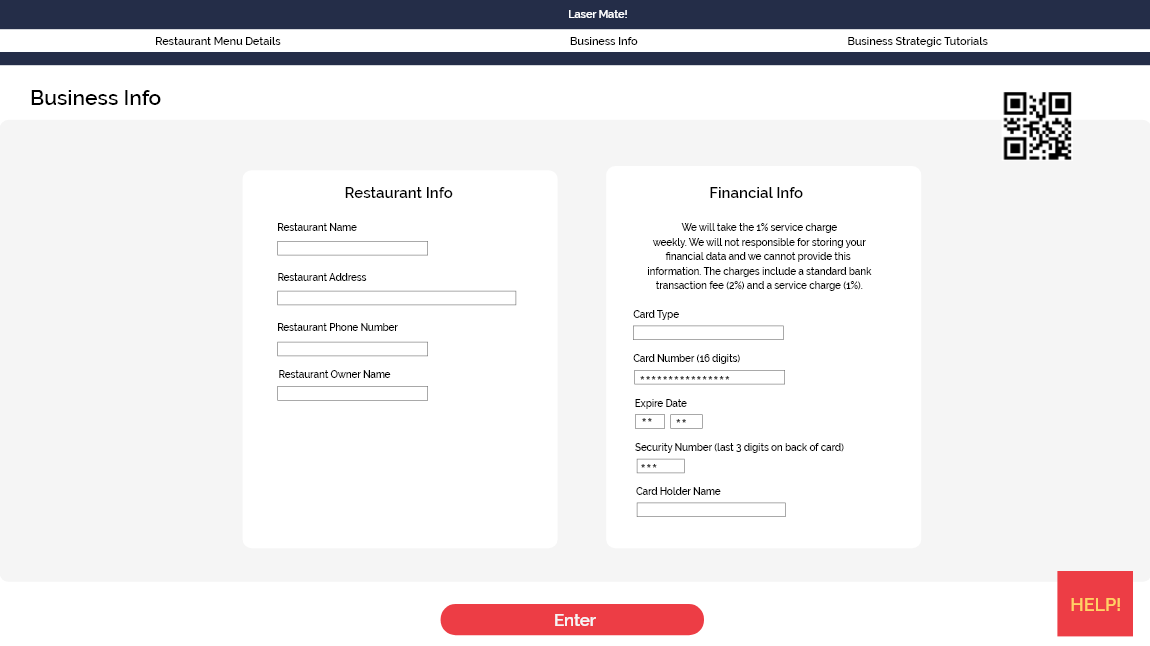


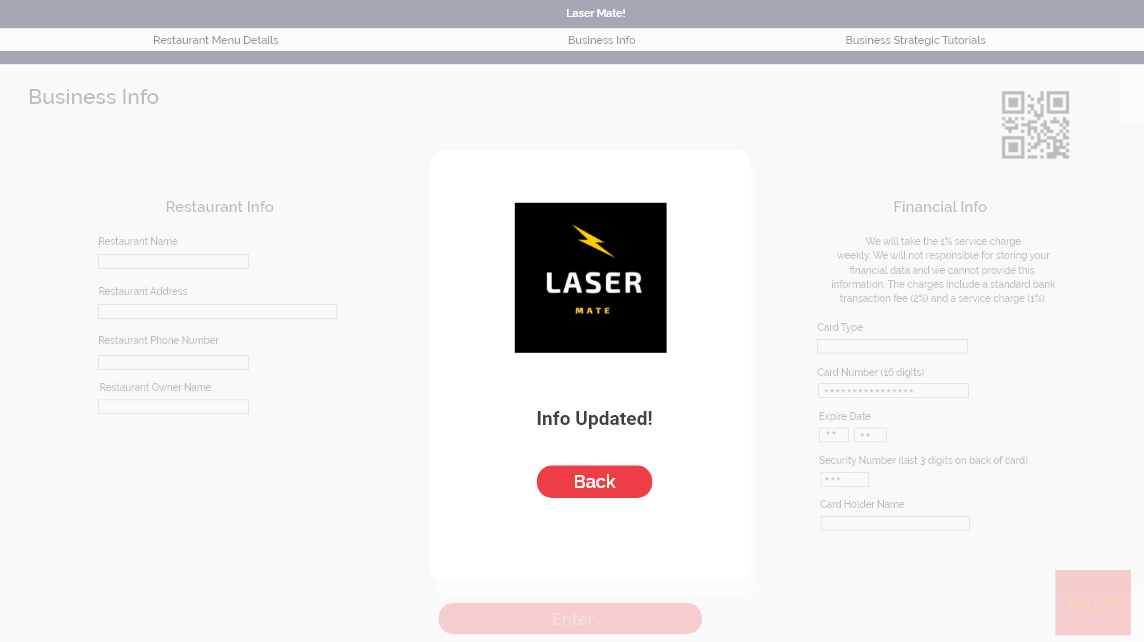


An integral signup and account maintenance process is the menu admin platform that allows restaurant owners to add, remove, and edit serving times, meal categories, and meal descriptions. The QR code on the top right redirects account holders to the restaurant meal ordering platform, enabling them to see immediate menu changes on the real site. The other function is the help section, which guides the users with all account functionalities. We hope to minimize client’s interactions with this section since the administrative processes can feel frustrating.

Following client account registration, we will upload their meal details using the provided menu link on their restaurant website. To allow for customer platform access, we will print out and deliver the table Q.R. codes by post. All the Q.R. codes will have lamination to protect damage against long-term use. To ensure appropriate number of replacements codes, we will prepare the number of Q.R. codes three times the number of the tables. Once the restaurant owner receives the posts, they will now be able to enjoy our software platform. Restaurant customers can also access to the menu online using the Q.R. codes and start the ordering and payment process. Hopefully, owners will need minimal support and intervention as we will upload help and video tutorials to guide them with the platform’s use.

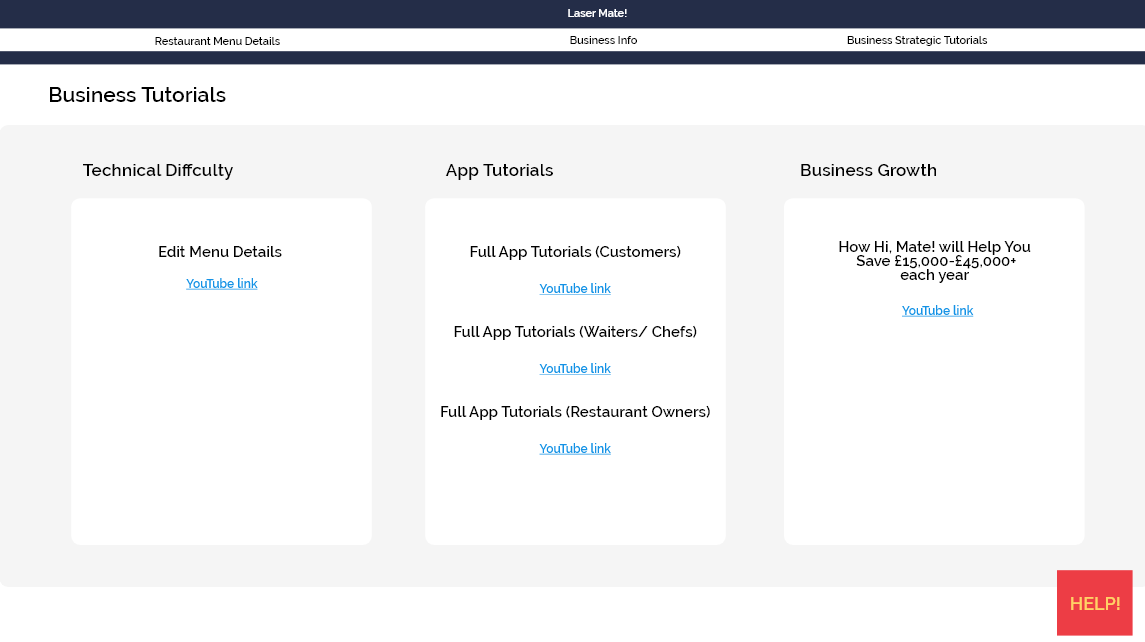
### Done - Business Info





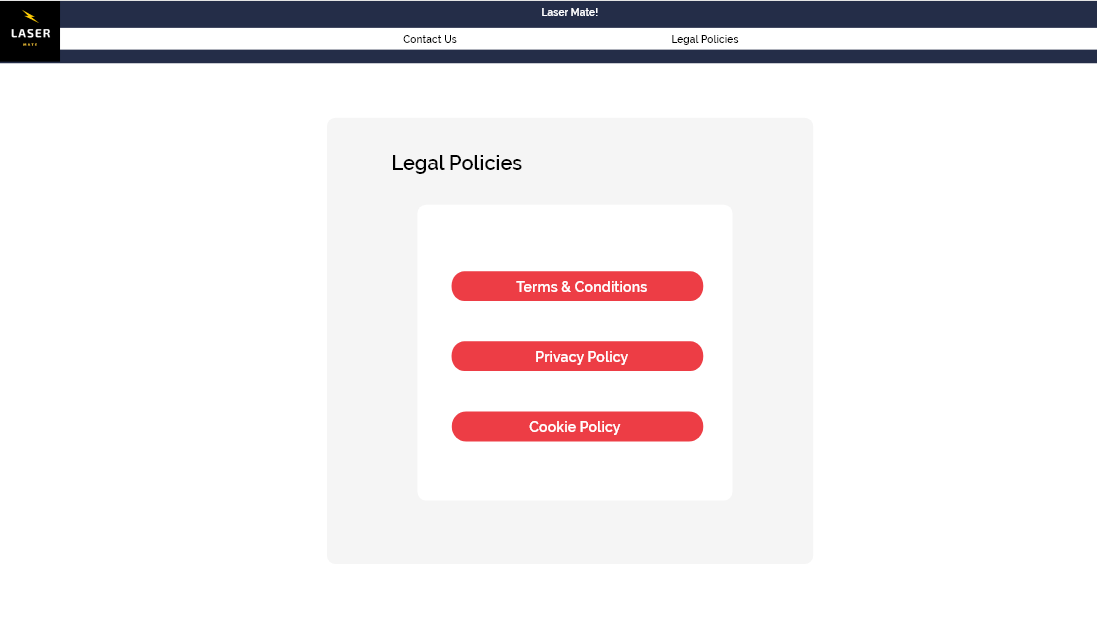
We understand that owners may experience the need to change restaurant details and transaction data. Therefore, we synced these data with the restaurant ordering platform and the payment company, ensuring simultaneous information updates.

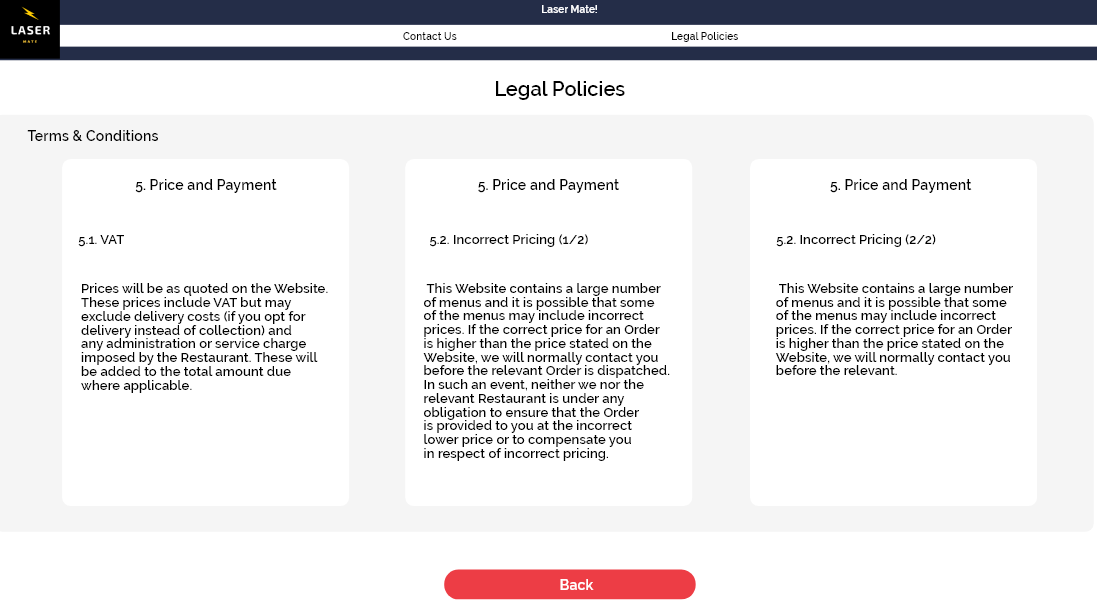
### Done - Business Tutorials



Understanding customer requirement is our company focus. Our business provides YouTube video tutorials when user experiences technical difficulty and requires app tutorials. Another important business aspect is to develop restaurant growth strategy, aiming to attract additional customers.

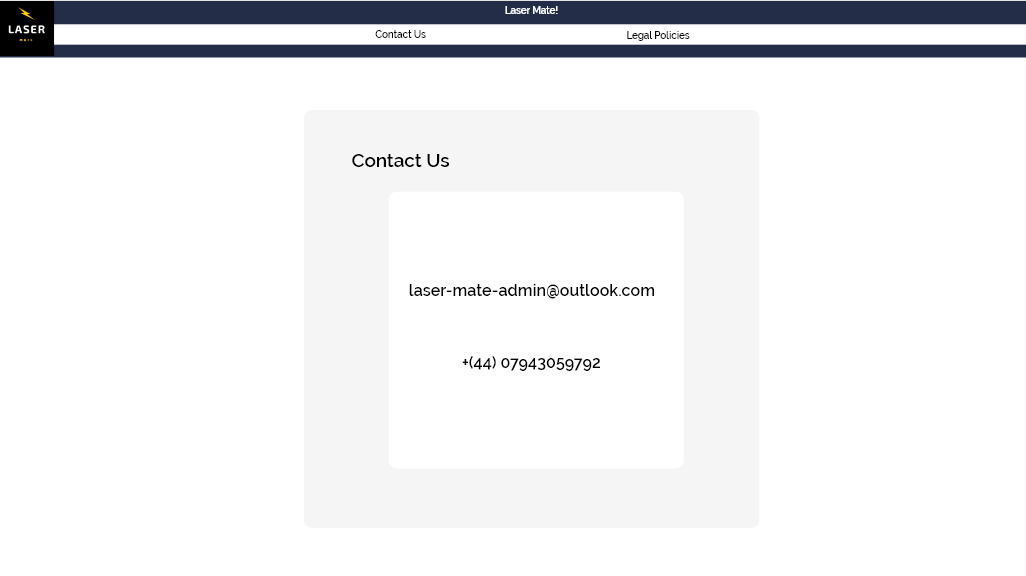
### Done - Legal Policies





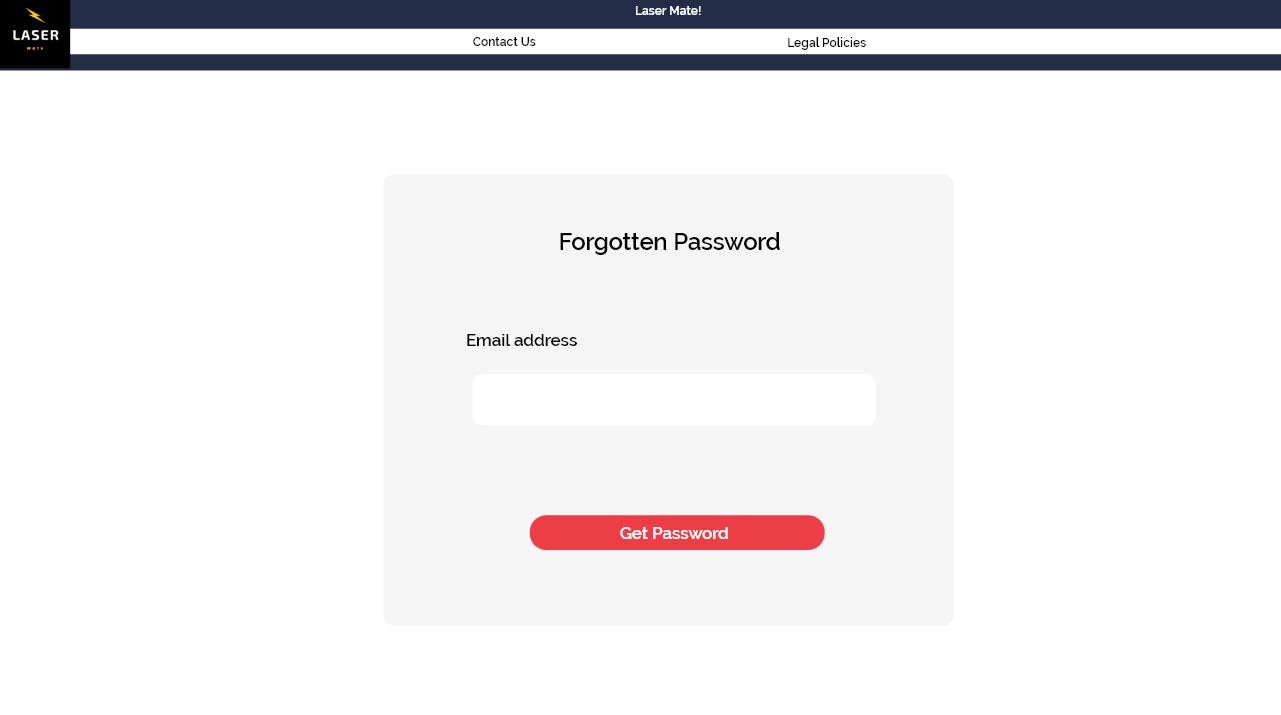
Adhesion to national regulations is our utmost priority. Prior to software deployment, we will outsource relevant solicitor service to establish our legal policies. Namely, they are the terms and conditions, privacy policies and cookie policies. Note that the following T&C are copied from Just Eat for preliminary designs, not a final product.

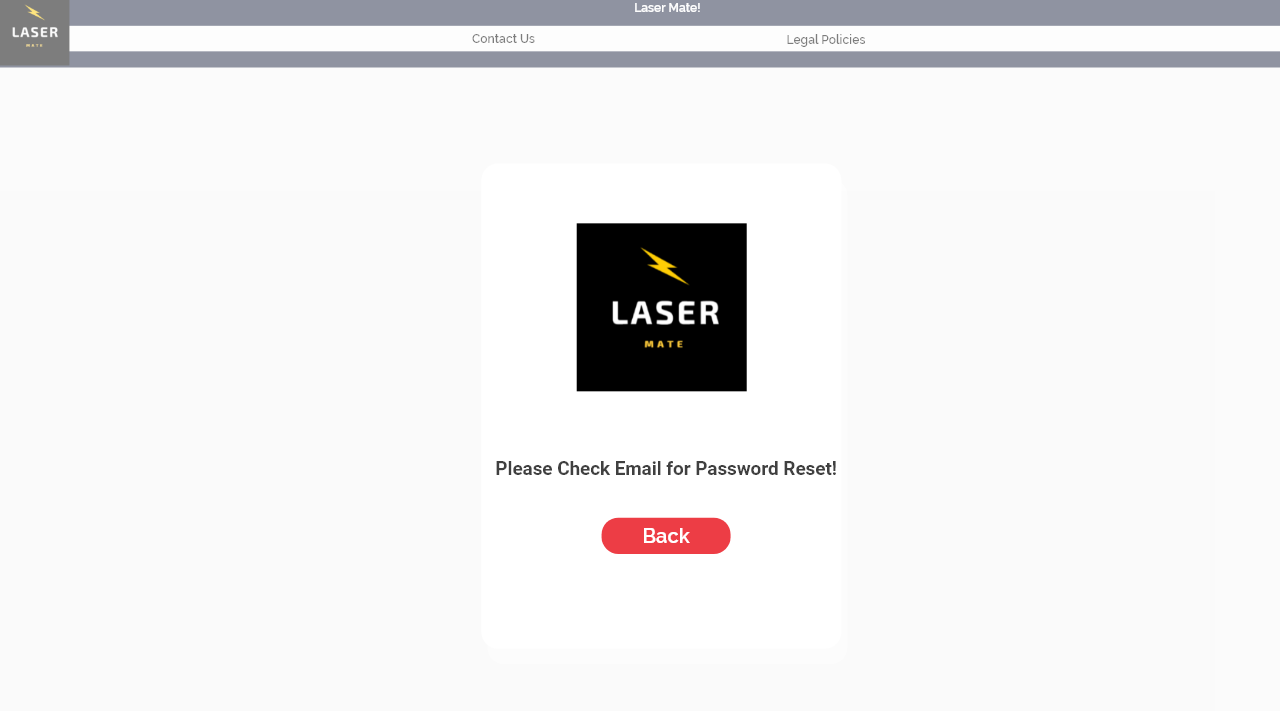
### Done - Contact Us

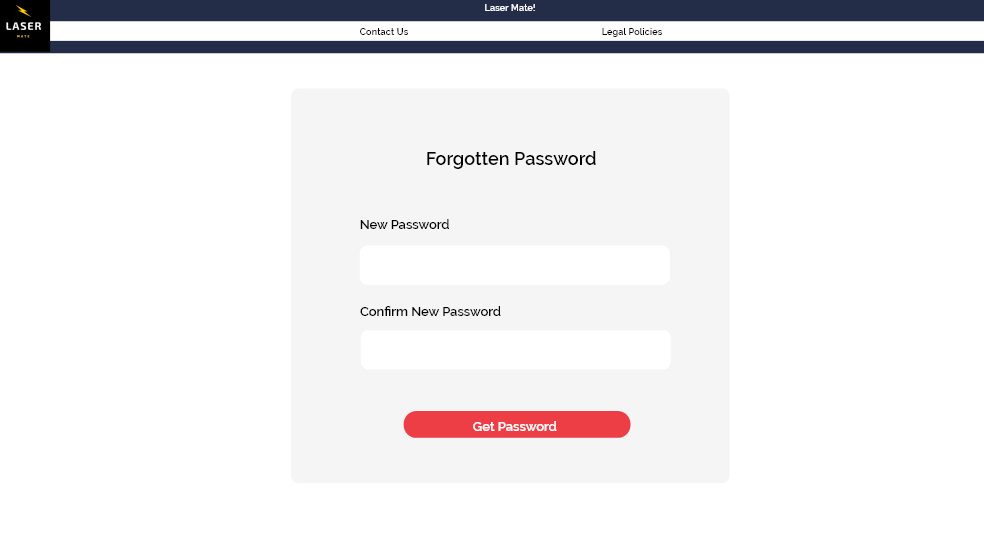


We have designed a “contact us” page, for customers to speak to us using email or telephone.

### Done - Forgotten Password



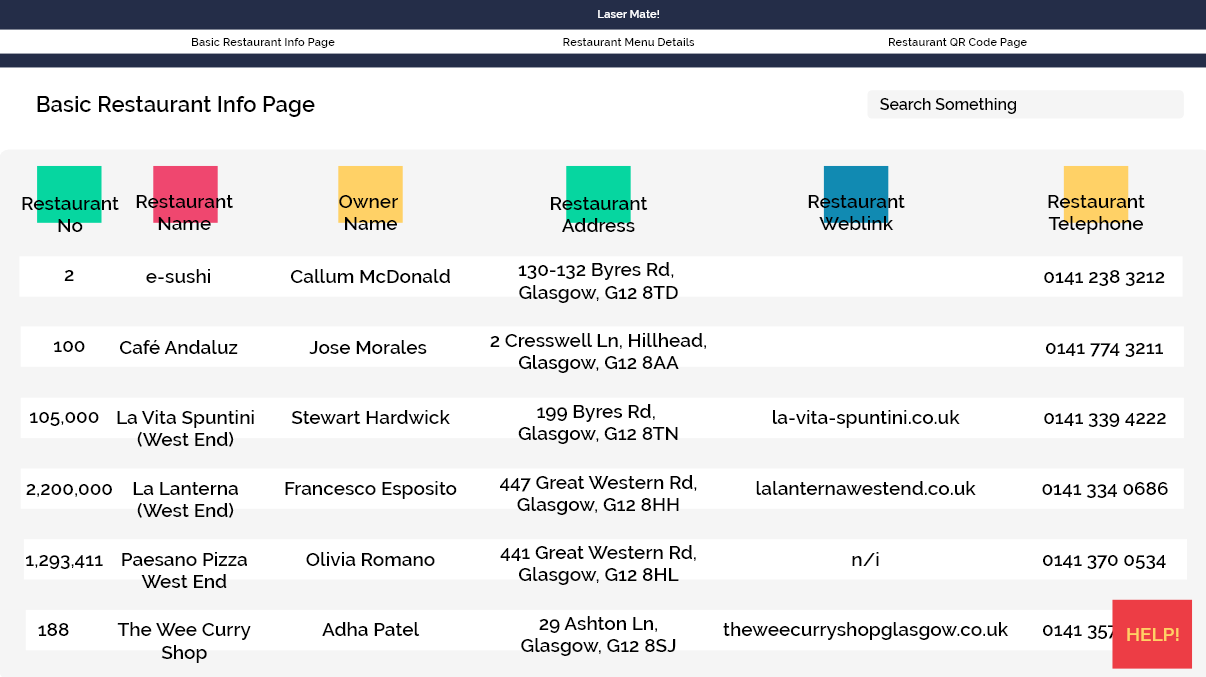




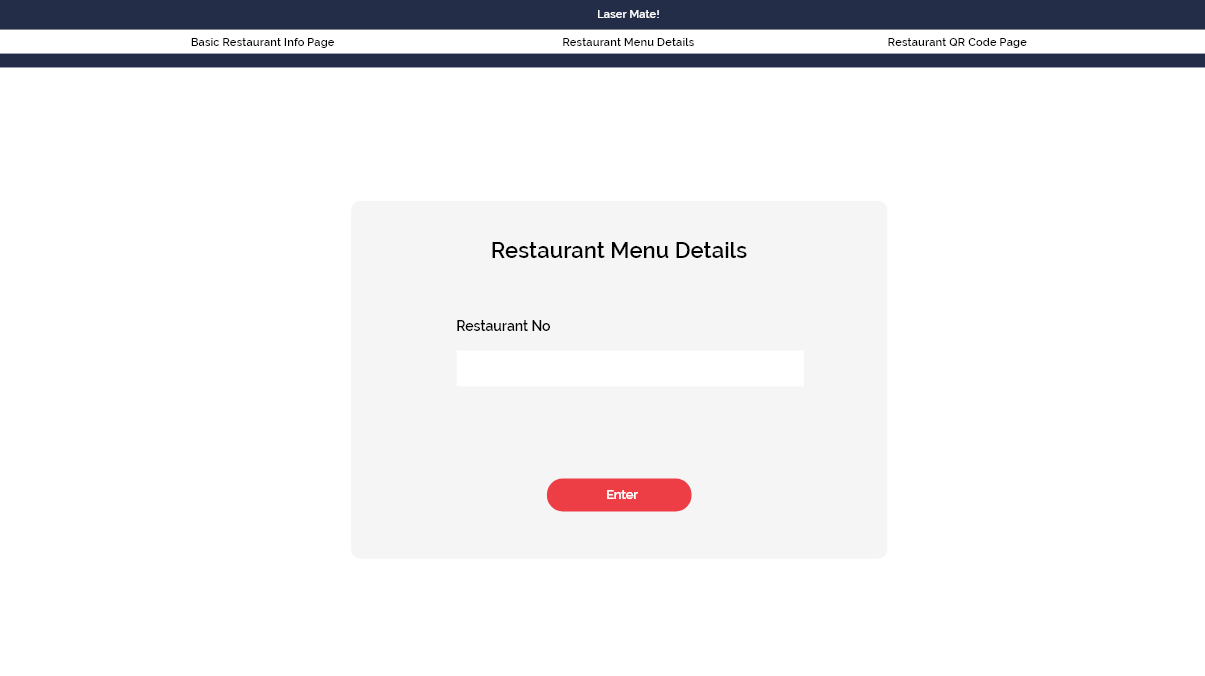
We have a forgotten password section for clients to change their passwords. They will enter their email address and receive a message that asks them to check an email in their account inbox. The automated email they found will redirect them to the reset password platform that allows them to change their password.

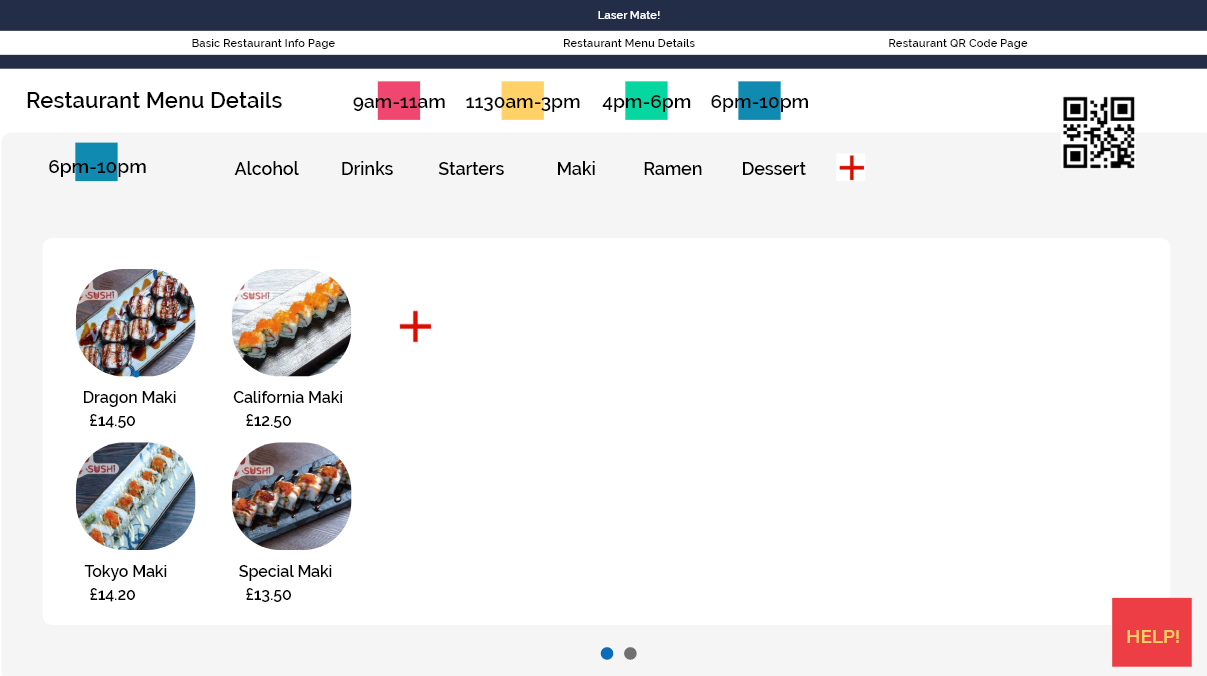
## Company Staff Interface

### Basic Restaurant Info Page



### Restaurant Menu Details





### Restaurant QR Code Page



## Company CEO Interface

# Done - Software Requirement Statements

## Done - User Stories

|  |
| --- |
| Restaurant Customer |
| View, select, and tailor the meals available using a QR code  So that I can order the food and drinks that I want  View and adjust all the meals I ordered  So that I can confirm if these are the meals I want to order  Decide if the meals should come together or separately  So that the meals come in the way I expect  Tip and pay for the meals I ordered  So that the restaurant will receive the payment they require  Get a e-receipt  So that I can claim the money back from my employer |

|  |
| --- |
| Restaurant Owner |
| Register an account  So that I can use the platform  Edit menu details  So that I can customize the details in the restaurant ordering platform  Have help documentations  So that I can resolve any technical difficulties myself and go through the app tutorials with my employees. I can also get advice with restaurant business growth strategies. |

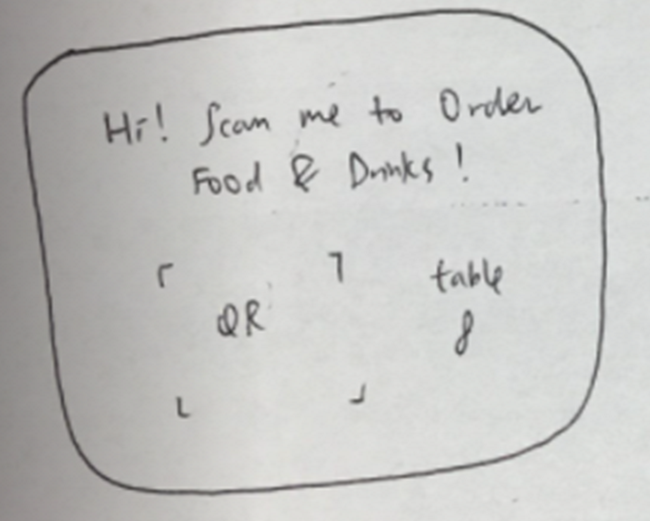
|  |
| --- |
| Company Staff |
| Have a database to record all the restaurant basic details  So that I can confirm a person’s identity before helping them with a business enquiry  Edit the menu details for all the restaurant platforms  So that I can set up and update the restaurant ordering platform for the clients  Have a database to record all the restaurant QR codes  So that I can post a restaurant owner additional QR codes when they lost the ones they have obtained |

|  |
| --- |
| Company CEO |
| Have a database to record all the employee details  So that I can contact them when organizing team work and arrange staff payroll  Have a database to record the weekly restaurant business transactions  So that I can automatically organize weekly service charnges for the restaurant owners  Have a database to record the weekly company revenue and the number of active users  So that I can monitor and evaluate company performance and devise customer retention strategies |

## Done - MOSCOW

# Software Design

## Doing - Paper Prototyping



## Doing – Related Software Products

X

## Done - Justifying Design Options

<https://razorware.wordpress.com/2012/01/04/task-3-the-fundamental-principles-of-hci/>

https://coolors.co/palettes/trending

Prior to software development, we have refined a list of design criteria to ensure that our platform design is consistent and adhere to industrial standards. Users will only want to reuse the app if it is comfortable and engaging to use.

Inclusive Design – Understanding that many people could have difficulty using mobile devices, we design the system considering specific difficulty and conditions. We closely adhere to the colour-blind design criteria, including the use of high contrast colours, particularly in the food category, price, and menu description sections. The system also adopts simple word options for people with language barriers. Another issue is eye-sight issue – all the texts are at least 16px. Secondary texts are also at least 2px smaller than the upper text sections.

Ethical Design – Our app also follows the ethical principles set out by the University, protecting the rights and wellbeing of our evaluation participants and app users. In the Appendix, you can see the ethical consent form for all our evaluations. In the evaluation section below, you can also see the ethical consent section. Furthermore, our landing page will include the company’s terms and conditions, legal policies, and cookies, establishing mutual agreement through our liability limitation statement. This section is currently fictious since our lawyer are more adequate in this domain.

Multimodal Interaction - The software would have an optional sound notification each time a customer places an order since the waiter could not possibly pay attention to incoming orders all the time.

<https://www.colourblindawareness.org/colour-blindness/>

<https://www.designmantic.com/community/website-design-guide-color-blind.php>

<https://learnui.design/blog/mobile-desktop-website-font-size-guidelines.html>

Search Engine Design – As we are possibly dealing with over 100,000 tuples in most database interfaces, we would need to deploy a search functionality. Once the system returns a search result based on a key term, the database within our system will display all the data entries exhaustively to the end of the list, facilitating the use of CTRL+F keyword. After considering the database design with the practical system’s use, it turns out that the possible search outcomes will not lead to crashing. The search results can only base its outcome on one data header. For example, in the basic restaurant info page, the possible search terms are restaurant no, restaurant name, owner name, restaurant address and telephone number. The pattern of data entries is number, text, postcode, and telephone number, respectively. As a result, due to their natural text patterns, it is impossible that the complete search results will base on two different database headers. Therefore, we do not need to consider higher level search techniques, such as isolating search term to a specific header.

Scenario Documentations - One of the business protocols is to refine our help documentations. This is a record that provides case analysis and mitigation methods for all company staff, ensuring that we counter for most repetitive incidence and potential breaches. We will regularly create and update cases to increase our scenario coverage.

Internationalisation – Globalisation is one of the agenda of Laser Mate!. We aim to abstract the platform so that the database will render all the texts in the platform, such as the company name, category name, and pay button. This will allow for easy text alternation into different languages, compared to creating a new platform and hand coding each word when reaching to a country whose primary language is not English.

Capitative Design Principles – Our platform design adopts a balanced consideration between software components, in terms of information, spacing, colour and font. It emphasises the importance of images over texts and minimal information representation. A design criterion we follow is information hierarchy. We place important information at an outer area of the app with a larger font size, guiding users to understand the software. We leave sufficient spacing between software components, increasing the system’s clarity and comfortability of use. Another design consideration we take is the adoption of the colour palette [?]. Coolors is a website that collects complementary colours our website designs base.

## XXXX Front-End Design and Coding

The strategy for converting paper prototype to digital wireframe and subsequently React.JS codes is the use of several platforms. Namely, they are Adobe XD, Anima and YouTube.

The main reason to use Adobe XD, other than the common functionalities, is the new feature Anima. Given a complete digital design, it allows for direct code conversion from digital wireframes to codes within 3 minutes. Compared to traditional methods, such as Bootstrap and material designs, which could take weeks, you could say an astronautical elevation of working pace since you have a completely auto-generated codes without any human intervention. Having said that, you still need to program parts of the platform, such as those depending on the database and page interactions.

Consequently, component naming and merging becomes critical in the digital wireframe’s design, as they will be automatically converted to SCSS and JS codes. Meaningful naming in the program could help future code editing and reviews by other colleagues. Furthermore, another impressive function of Adobe XD is the “make component”, in which you can group several related items together. This will enable you to replicate the entire merged components across the platform, for example, you could merge all the components for the navigation bar and apply the same design across the meal platform. By ensuring that your designs are not slightly different (by a couple of spacing), you will not have minor code deviations within your program, enhancing code convertibility and consistency.

Another feature in Adobe XD is responsive design, in which each design components change placement according to all possible screen sizes, ranging from 320px to 414px. It controls how each software components move with respect to the four directional changes, in terms of its placement and size. A four axial icon (Figure) denotes whether the distance of the center of the icon from the side should be constant. If the distance should not change when screen resizing, it should be blue; otherwise, it should be black. The two width and height fixed icons (Figure) changes the icon’s size (in terms of width and height) when resizing the screen.

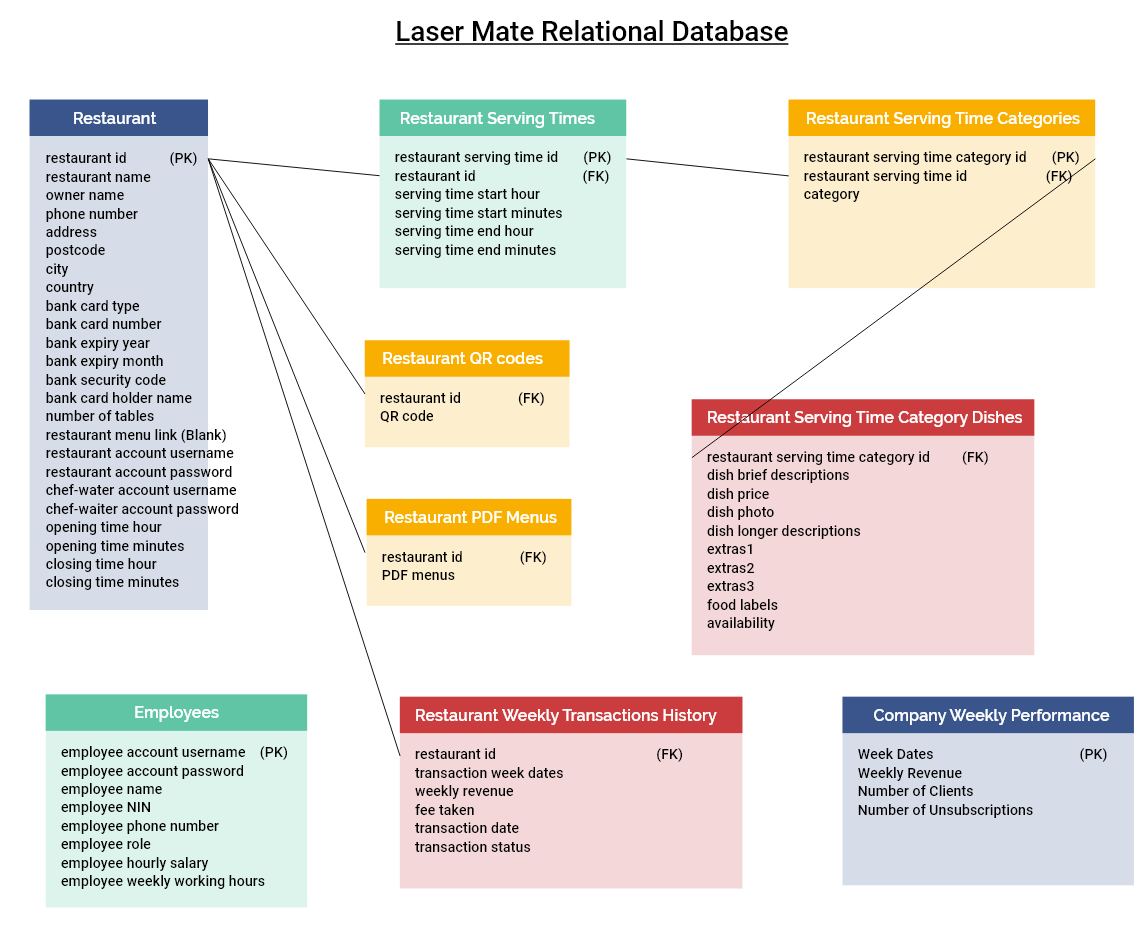
Our platform design also includes animated page interaction, enhancing system’s usability. These include horizontal swiping within the same interface and across different pages, button animation, and timed animation for the “item added” page.

Another essential aspect of digital prototyping is the adoption of the design principles stated above. By applying the aforementioned metrics, hopefully, we have further improved the customer software journey.

You could learn these techniques in YouTube. You could search and filter relevant contents by the channel and the specific topic.

## Doing - Database Organization

PostgreSQL is the final database platform option since it could manage intensive volume of user traffics and data processing, such as photos, text, and bank transactions. Examples of similar platforms that use PostgreSQL includes Instagram, Netflix, Trivago, and Figma.



The database design for our software implementation follows the standard relational mapping. Each relation will have a primary/foreign key that uniquely identifies a tuple. Data fields that share a one-to-one relationship under the same data category will place in the same relation.

For data sets that share a one-to-many relationship, we will create a new relation which brings the primary key of the “one relation” as a foreign key. This will allow us to have many tuples based on that unique foreign key. If a relation requires a unique identification for further primary-foreign key mapping, the tuple will create a primary key that uniquely represents the full tuple, including the foreign key of the mapping relation.

Our database design does not contain a many-to-many relationship.

# Evaluation

A crucial aspect of the project is to perform evaluations after the paper prototyping, written up the digital wireframe and developed the software, respectively.

## Evaluation for Paper Prototype

Use words to describe the evaluation methods not a image of all google forms

The evaluation process for the paper prototype involves the Jakob Nielsen’s Heuristic Evaluation [1]. Using the 10 standard system usability criteria, we identify and alter the software aspects that could enhance the user experience. You can find the applicable principles in the “Justifying Design Options” section.

<https://www.nngroup.com/articles/ten-usability-heuristics/>

Subsequent to heuristic evaluations, we conduct a literature review to evaluate and integrate the relevant software components into our app design. A brief google search suggests that there are 2 companies from which we consider our designs. They are Dines, and Yo! Sushi. Relevant feature extractions in Dines include the allergy section, and the extras options. Yo! Sushi present an important design suggestion as their way to display the four meals looks extremely appealing.

Semi-Structured Interview & Questionnaire

* Supervisor
* Family member

## Evaluation for Digital Prototype

* Paste your google form here

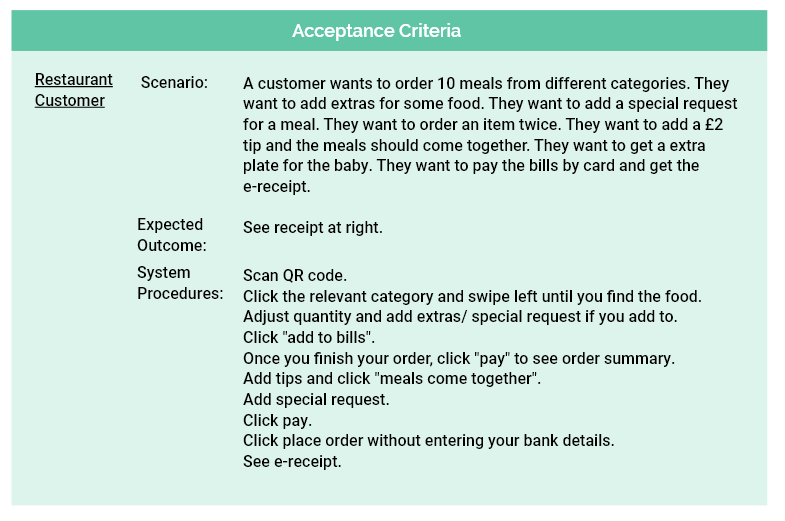
Cognitive Walkthrough & Semi-Structured Interview & Questionnaire

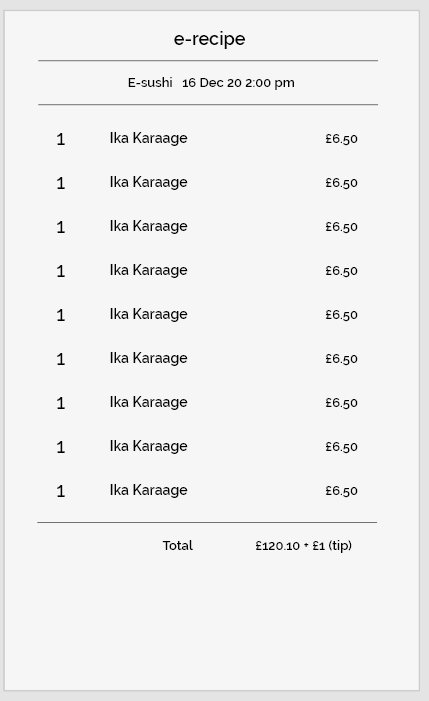
* Supervisor
* Family member
* Friends

## Testing Documentations

* Paste your expected and actual outcomes here
* Postman – teach the reader how you use it for API testing

Acceptance criteria describes an example of practical tasks the system could perform. As this scenario will feed into software testing, it will also include an expected outcome which compares with the system’s actual outcome. System procedures is another aspect of the acceptance criteria that describes the instructions that implements the aforementioned scenario.





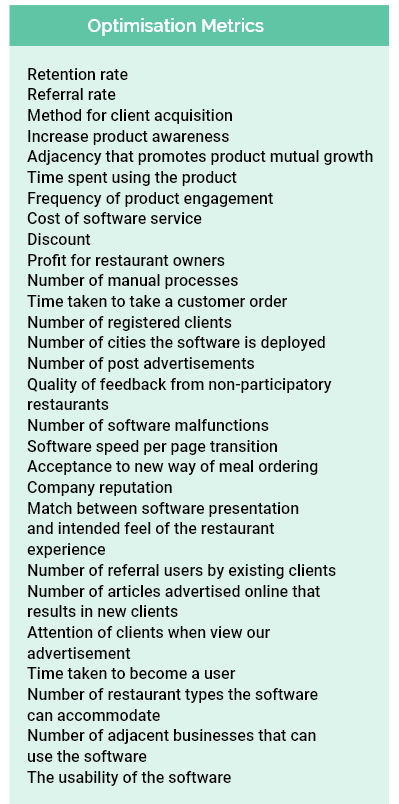
## Evaluation for Software Product

Cognitive Walkthrough & Semi-Structured Interview & Questionnaire

* Supervisor
* Family member
* Friends

## Future Work v1

The company should identify future work to outperform existing practices. By understanding the optimization metrics that determine the product’s success, it would make it harder for other ventures to build a better product. The critical aspects for consideration include keeping customers continue using the system and will not leave; how we can grow the business internationally; and how to maintain system capability. Furthermore, we could consider the points mentioned in the “Value Proposition Canvas” and apply some relevant growth strategies.



# Bibliography

# Appendix