# MIS 498 - SENIOR PROJECT I

## SYSTEM ANALYSIS AND DESIGN

## FLAVOURLAB

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# 1.INTRODUCTION

Today, rapidly developing technology causes transformations in many sectors. Restaurant and cafe management is also evolving in parallel with this trend. In this context, restaurants tend to use QR menu system in order to increase customer satisfaction, manage operations more efficiently, take customer requests into account and prioritize the customer, and comply with hygiene standards.

Flavourlab's aim is to provide a more advanced experience. Most order management systems offer the customer the ability to view the menus offered by the business and some have the ability to order. Flavourlab does not settle for this, but focuses on the users by providing them with the opportunity to choose the menu without wasting time by remembering the user's allergy information with a customized user registration system within a single structure. In addition, they can order and pay and then evaluate this order experience.

Flavourlab's operating process is as follows:

The customer directs the business's homepage by reading the QR codes on the tables to their devices. On this page, customers are offered the option of registering and detailing their profiles in order to have a more special experience. (personal information, allergy). In parallel with this, customers can also access the order screen without registering. System registered users log in or when users who do not want to register reach the order screen, they can specify the content they want or do not want in their order by choosing categories such as (food, drink, dessert), then they make a selection related to what kind of content they want or do not want on the screen that opens on this preference. (Users who do not have an account enter their existing allergens in this part). According to these choices, the user is offered a menu suggestion. The user chooses one or more of these suggestions. The selected products go to the basket section, the user chooses the delivery method (get it yourself - waiter brings it), chooses the campaign if any and makes the payment. After this step, if the business staff approves the order, the order is received. If desired, after the meal, the user can evaluate the meal and the restaurant by using the evaluate button from the past orders section in their profile. (Users who do not have an account cannot see this screen).

# 2. EXECUTIVE SUMMARY

## 1.Description of The Project

The "Flavourlab" project is a system that scans QR codes on tables to swiftly route customers to businesses. It allows registered clients to create personal profiles and set their preferences, while unregistered individuals can place orders instantly. The system recommends menu items based on ingredient preferences and allergens, and users can modify their orders and pay.

### 1.1. Main Features

- Fast forwarding via QR codes: Customers can access the business's homepage by scanning the QR code on the table.
- Profile creation and preference determination: Customers who register can enter their personal information and allergy information; those who do not register can go directly to the order screen.
- Quick order screen: Customers can create their orders by selecting categories according to their content preferences.
- Menu suggestion: The system offers menu suggestions according to the user's preferences and allergens.
- Delivery method and campaign options: Users choose the delivery method, can take advantage of the campaigns and pay.
- Evaluation and past orders: Users can evaluate the restaurant and food after the meal and review their past orders.

### 1.2. Scope of The Project

The scope of the project includes making the necessary software for the system, completing the documentation and integrating the system.

## 2. Detail of The Project

### 2.1. Target and Marketing

Flavourlab will be offered to restaurant owners by licensing, and this solution will help businesses improve the customer experience, optimize order management and increase customer loyalty.

The **documentation** of the project was completed within a **period of 3 months**, and a **period of 4 months** is planned for the **implementation** part. The system will be tested at regular intervals and its maintenance will be ensured. After implementation, it will be presented together with various training and support materials for restaurant owners.

## 3. SYSTEM REQUEST FORM

| System Request Form | |
|---|---|
| **Project Date** | 19 / 01 / 2024 |
| **Project Title** | FLAVOURLAB |
| **Project Owner/Sponsor** | Mazlum ÖZÇAĞDAVUL |
| **Project Description and Scope** | Order automation application is a software solution designed to facilitate customers' meal selection and provide fast and accurate order processing to cafe/restaurant businesses. The system aims to recommend the most suitable dishes to customers, taking into account the options and allergens on the menu.<br>The scope of the project is to develop an order automation application for the needs of cafes and restaurants. The application has the ability to recommend the most suitable dishes for customers, taking into account the products they choose and do not want to use, and will include functions for processing orders, taking payments and communicating with the kitchen.<br>The application will be available on any platform thanks to the QR code on the tables. |
| **Business Value** | Order automation application increases customer satisfaction by providing fast and effective service, increases business efficiency, attracts new customers, provides competitive advantage and supports strategic decision-making with data analytics. |
| **Organization Needs** | The organization's needs include improving customer satisfaction, reducing order processing times, and improving operating efficiency. |
| **Business Requirements** | This project includes business requirements such as streamlining customer orders, providing allergen information, improving order management, supporting mobile access, offering data analytics, adopting user-friendly design, and offering customization options. |

# 4. FEASIBILITY ANALYSIS

A feasibility study examines a proposed project or idea to see if it is realistic, practicable, and economically feasible. It includes investigating the project's technical, operational, financial, and legal elements.

Feasibility studies are classified into three types: economic feasibility, technical feasibility, and operational feasibility. We will go over each of these with appropriate feasibility.

## 3.1. Economic Feasibility

We calculate the monthly expenses for our project.

According to our budget calculation, costs such as software development, integration and marketing; we saw that if we sold our site to the business and continued its continuity, it would make a profit.

Since we will provide the software ourselves, we do not have any additional costs we have seen through the revenue model. We have considered that when we do the necessary marketing and install this system through a monthly subscription system for a company, it will pay off in approximately 6 months.

## 3.2. Technical Feasibility

Our project will make by a group of software developers. Flavourlab team consists of 5 people. 2 people are back-end, 2 people are front-end and 1 person is dealing with documentation and system analysis. We will develop this project using the necessary software in today's technology.

We just need to determine whether we can integrate the site into existing systems and whether there are any regulatory requirements. As a result, it is a technically suitable project.

## 3.3. Operational Feasibility

Our project will make by a group of software developers. Flavourlab team consists of 5 people. 2 people are back-end, 2 people are front-end and 1 person is dealing with documentation and system analysis. We will develop this project using the necessary software in today's technology.

We just need to determine whether we can integrate the site into existing systems and whether there are any regulatory requirements. As a result, it is a technically suitable project.

# 5. REQUIREMENTS

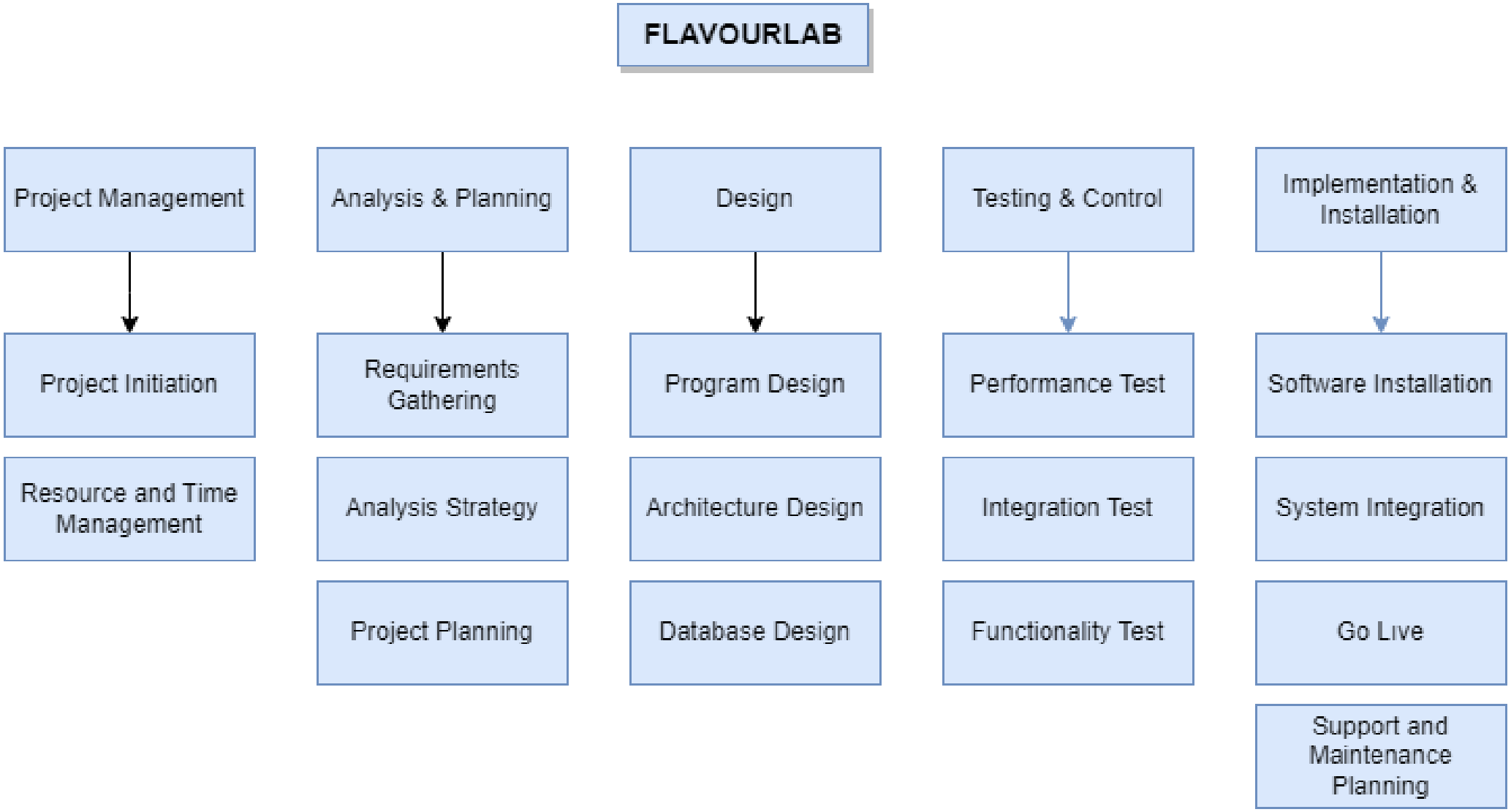
**Main Features;**

- Login via QR Code
- Profile Management
- Allergies and Disliked Products
- Product categories
- Product management
- Food Recommendation System
- Cart and Order Management
- Payment and Review

## Detailed Features;

- Users can quickly log in to the system with a QR code.
- Users can create and update profiles and manage their personal preferences.
- Users can add allergy information and disliked products to the system.
- Availability of products in different categories including Food, Beverage, and Dessert.
- A user-friendly interface where attributes (ingredients, calories, price, etc.) can be edited for each product and users can choose the products they like.
- An algorithm that can offer meal recommendations by taking into account the user's previous preferences, allergies and dislikes of products.
- Users can add items to the cart, manage the cart, and choose from table service or self service options.
- Users can pay securely and then review their ordering experience

## 6. WORK BREAKDOWN STRUCTURE



# 7. GANTT CHART

## Documentation of Project

**FLAVOUR LAB**

Project Start: Pzt, 11.6.2023

Display Week: 1


| TASK | ASSIGNED TO | PROGRESS | START | END |
|---|---|---|---|---|
| **Documentation of System Analysis and Design Process** | | | 11.6.23 | 1.1.24 |
| Introduction | Ezgi Ergül | 100% | 11.6.23 | 11.7.23 |
| System Request Form | Taha Tuncay | 100% | 11.7.23 | 11.9.23 |
| Feasibility Analysis | Ezgi Ergül, Yunus Bayhan | 100% | 11.7.23 | 11.9.23 |
| Gathering Requirements | Taha Tuncay | 100% | 11.9.23 | 11.11.23 |
| Work Breakdown Structure | Ezgi Ergül | 100% | 11.11.23 | 11.13.23 |
| RACI Matrix | Ezgi Ergül | 100% | 11.13.23 | 11.17.23 |
| Gantt Chart | Ezgi Ergül | 100% | 11.17.23 | 11.20.23 |
| Risk Identification | Yunus Emre Bayhan | 100% | 11.20.23 | 11.22.23 |
| Conduct Risk Analysis | Ezgi Ergül | 100% | 11.20.23 | 11.22.23 |
| SWOT Analysis | Taha Tuncay, Tolga Yeşilli | 100% | 11.22.23 | 11.24.23 |
| Market Analysis | Yunus Emre Bayhan | 100% | 11.24.23 | 11.28.23 |
| Budget Planning | Ezgi Ergül | 100% | 11.28.23 | 11.30.23 |
| Use Cases | Anıl Aygün, Yunus Bayhan, Tolga Yeşil | 100% | 11.30.23 | 12.6.23 |
| Use Case Diagrams | Ezgi Ergül , Taha Tuncay | 100% | 12.6.23 | 12.7.23 |
| Context Diagram | Anıl Aygün, Tolga Yeşilli | 100% | 12.6.23 | 12.9.23 |
| Process Flow Diagram | Ezgi Ergül | 100% | 12.9.23 | 12.11.23 |
| ER Model | Anıl Aygün, Tolga Yeşilli | 100% | 12.9.23 | 12.11.23 |
| ERR Model | Anıl Aygün, Tolga Yeşilli | 100% | 12.11.23 | 12.15.23 |
| Entity and Attributes | Anıl Aygün, Tolga Yeşilli | 100% | 12.15.23 | 12.17.23 |
| Data Model | Anıl Aygün, Tolga Yeşilli | 100% | 12.15.23 | 12.19.23 |
| User Interfaces | Ezgi Ergül | 100% | 12.19.23 | 12.22.23 |
| Software and Hardware Specifications | Anıl Aygün | 100% | 12.22.23 | 12.24.23 |
| Estimated Statistics | Oğuzhan Tolga Yeşilli | 100% | 12.24.23 | 12.25.23 |
| Revenue Model | Yunus Emre Bayhan | 100% | 12.25.23 | 12.28.23 |
| Executive Summary | Ezgi Ergül | 100% | 12.28.23 | 12.30.23 |
| Support Plan | Taha Tuncay, Ezgi Ergül | 100% | 12.30.23 | 1.1.24 |

## 8. RESPONSIBILITY ASSIGMENT MATRIX

| Project Tasks | Mazlum Özçağdavul (Sponsor) | Ezgi Ergül | Yunus Emre Bayhan | Taha Tuncay | Oğuzhan Tolga Yeşilli | Anıl Aygün |
|---|---|---|---|---|---|---|
| **Phase 1: Planning** | | | | | | |
| Project Initiation | A | R | R | R | R | R |
| Project Management | I | A | R | R | R | R |
| **Phase 2: Analysis** | | | | | | |
| Analysis Strategy | I | A | A | R | R | I |
| Requirements Gathering | I | R | R | A | R | C |
| System Proposal | I | R | R | I | A | R |
| **Phase 3: Design** | | | | | | |
| Design Strategy | I | R | A | I | C | A |
| Architecture Design | C | I | I | I | R | A |
| Database and file Specifications | I | I | I | I | A | R |
| Program Design | C | I | R | I | R | A |
| **Phase 4: Implementation** | | | | | | |
| System Construction | C | R | R | R | R | A |
| Installation | I | I | R | A | I | R |
| Support Plan | I | R | I | A | I | I |

**Legend:**

**R** – Responsible

**A** – Accountable

**C** – Consulted

**I** – Informed

# 9. RISK IDENTIFICATION

When developing a restaurant system like FlavorLab, we can consider the following steps for risk analysis of the project:

- **Technological Obstacles:** Risk of situations that may occur during the coding of the FlavorLab project (such as lack of information). Risk of the system reading QR codes or experiencing connection problems.

- **User Experience Problems:** The accuracy of the prediction algorithm or the risk of not fully understanding user preferences.

- **Cost Risk:** A risk may arise if the budget set for FlavourLab is exceeded.

- **Infrastructure and Performance Problems:** Risk of performance loss or speed problems under system load.

- **External Factors:** The risk that the FlavourLab project will not find enough buyers.

- **Privacy and Security Risks:** Failure to protect the security of user information, especially payment information and sensitive personal data.

- **Legal Compliance and Licensing Issues:** Failure to obtain the legal permissions for FlavorLab.

## 10. CONDUCT RISK ANALYSIS

| RISK TYPE | Possibility | Impact | Risk Level | Risk Management |
|---|---|---|---|---|
| Technological Barriers | **Low** | **High** | **Medium** | Continuous testing, alternative entry methods |
| User Experience Problems | **Medium** | **Medium** | **Medium** | Usability tests, real-time feedback |
| Budget Risk | **Medium** | **High** | **High** | Regular budget monitoring and control mechanisms |
| Infrastructure and Performance Issues | **Medium** | **High** | **High** | Scalable infrastructure, performance monitoring |
| External Factors | **Medium** | **High** | **High** | Market research, marketing strategies |
| Privacy and Security Risks | **High** | **High** | **High** | Strong encryption, regular security checks |
| Legal Compliance and Licensing Issues | **Medium** | **High** | **High** | Legal consultancy, obtaining the necessary permits |

# 11. BUDGET PLANNING

| Expenses | Planned Cost |
|---|---|
| Staffing (Software developers, database specialists, designers | 7.500 |
| Hardware and Server Infrastructure | 12.000 |
| Hosting Services | 250 |
| Outsourced Services | 5.000 |
| Advertising and Promotion (SEO etc.) | 500 |
| Social Media Marketing | 1.700 |
| | |
| Total ($) | 26.950 |

| Additional Expense (Optional) | Planned Cost |
|---|---|
| Emergency Budget | 5.000 |
| Extra Testing and Revision | 1.200 |
| More Quality Hardware | 17.000 |
| Better Host Device | 500 |
| | |
| Total ($) | 23.700 |

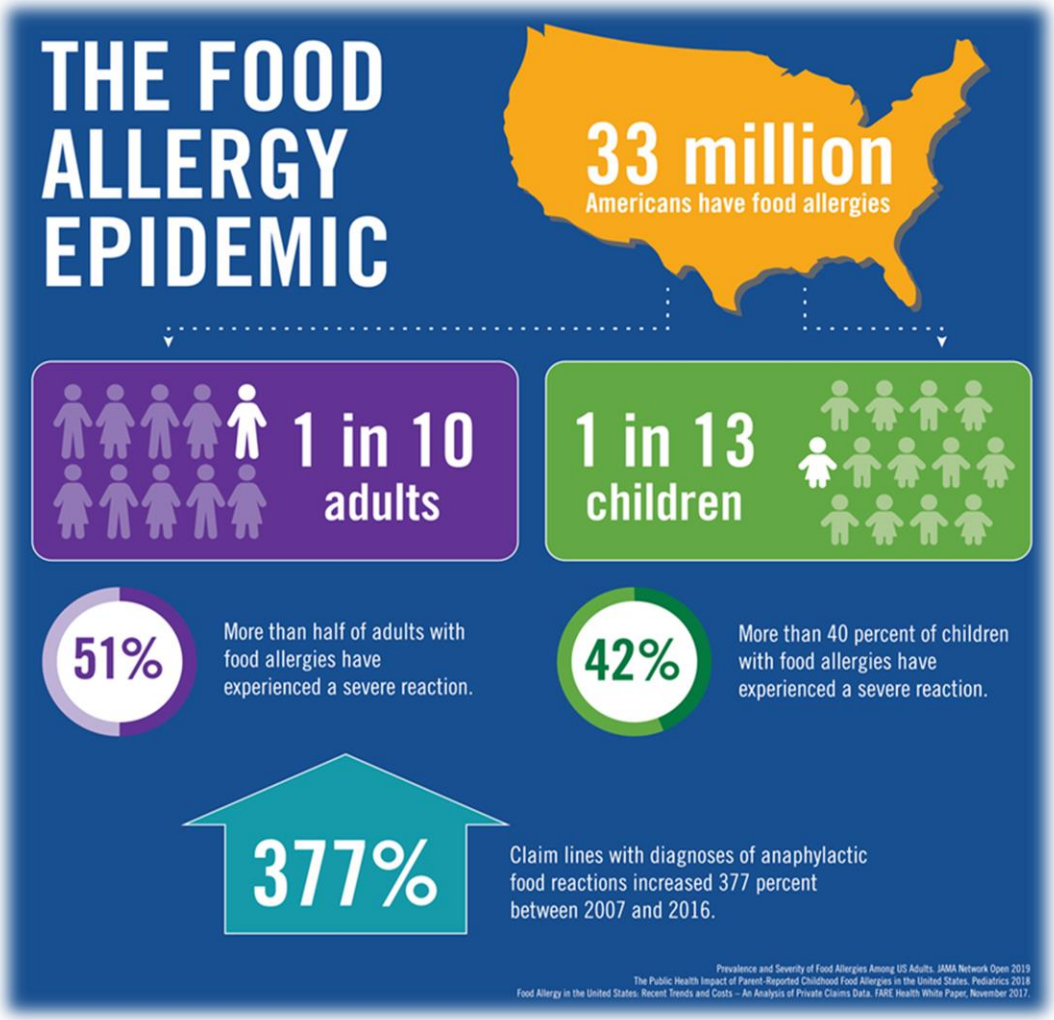
| Overheads | Planned Cost |
|---|---|
| Office Rent or Related Expenses | 1.200 |
| Equipment and Software | 2.000 |
| Utilities | 2.500 |
| | |
| Total ($) | 5.700 |

| TOTAL COST ($) | 56.350 |
|---|---|

## 12. SWOT ANALYSIS

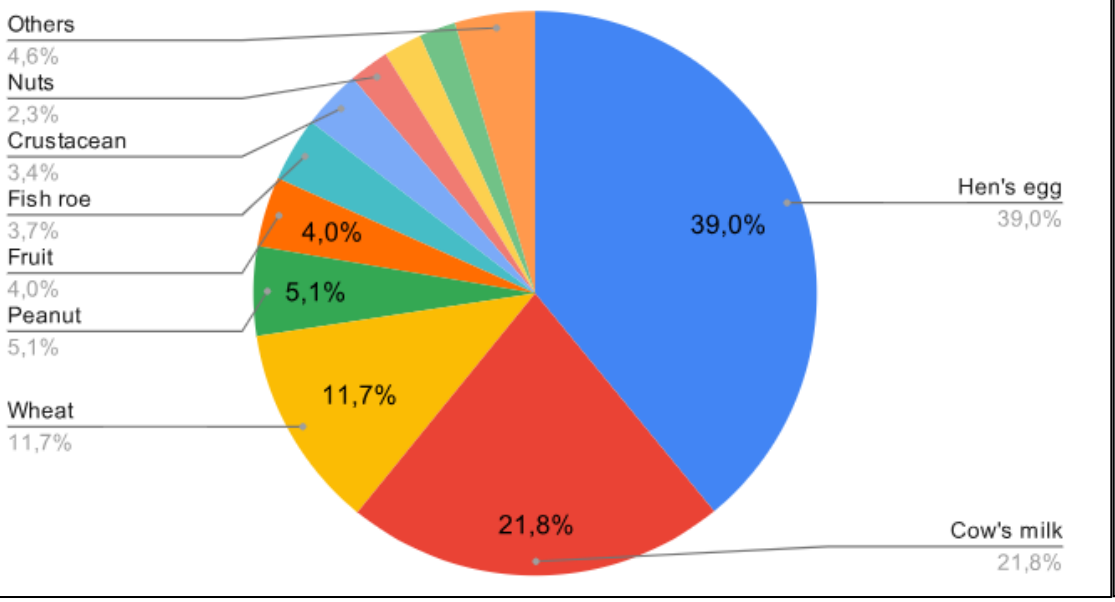
| Strenghts | Weaknesses | Opportunities | Threats |
|---|---|---|---|
| Customized User Experience | Limited experience for users who have not opened an account | Market expansion | Macroeconomic uncertainties and crises that could hinder the company's growth |
| Efficient QR Code based ordering system | Dependency to technology | Commercial collaborations | The presence of low-priced alternative solutions in the market |
| Menu Suggestions | Security of user information | Growth and development potential | Technological errors and interruptions |
| Integrated Allergy Information | | The development of technology and the increase in digitalization | |
| Easily know about food contents | | | |

## 13. ESTIMATED STATISTICS



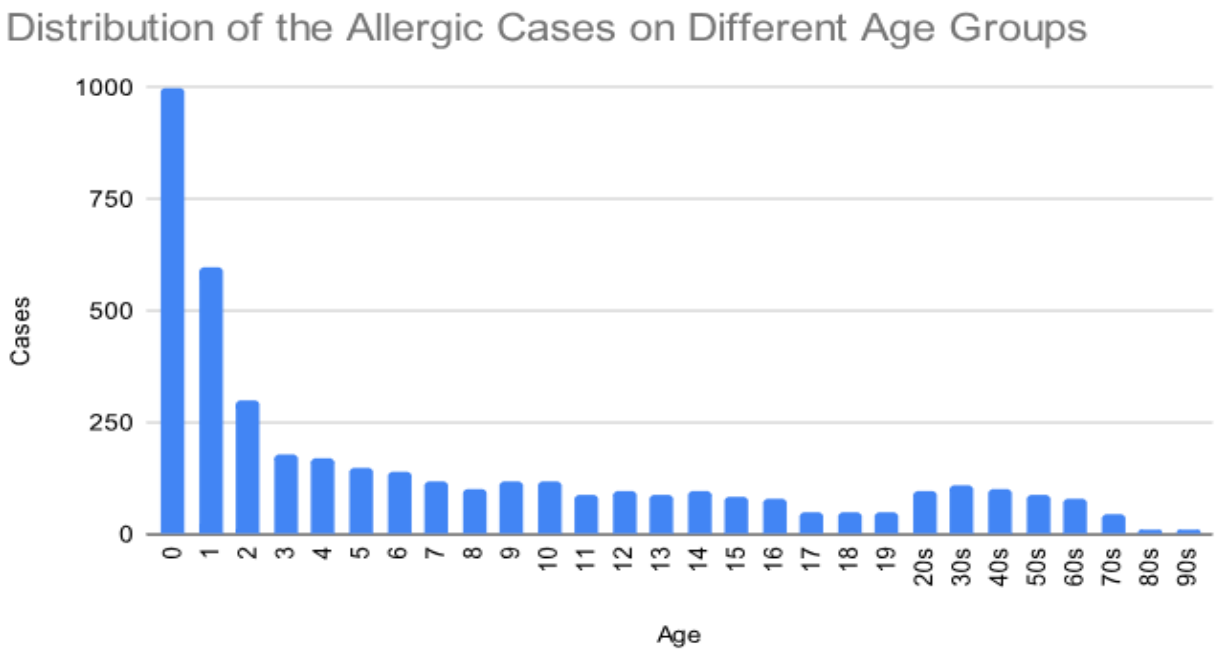

Source: *Facts and statistics*. FoodAllergy.org. https://www.foodallergy.org/resources/facts-and-statistics

Here we have some statistics about the allergies caused by foods in USA. 33 million of Americans have food allergies in total. Every 1 person in 10 adults and every 1 child in 13 children faces a food allergy problem. Between the years 2007 and 2016, it has increased 377% percent. Also, according to research made by Hacettepe University, 5.7% of children and 9.5% of adults in Turkey has food allergy. Lastly, in the European Union, 5% of adults has food allergies. By using our product, people can easily eat foods which excludes their allergies.




The pie chart beside shows us the most common food allergies that people has around the world. From the graph, we can easily see that the products that most commonly cause allergies in people are: Egg with 39%, milk with 21.8%, wheat with 11.7% and following by peanut, fruit, fish roe, crustacean, buckwheat and fish.

Source: (*Japanese guideline for food allergy* 2014 - Scientific Figure on ResearchGate.




Source: (*Japanese guideline for food allergy* 2014 - Scientific Figure on ResearchGate.)

The above graph shows us the allergic cases occured for the different age groups. As we can see from the graph, new born babies are more sensetive to allergies. By looking at the graphs we shared at this section, we can say that there are many people from different regions and different age groups who has various types of food allergies. Since the Flavourlab will help people to order products by eliminating their allergies, we are expecting that it will be a positive factor which will increase our sales.

## 14. MARKET ANALYSIS

| Competitor | Features | Price | Advantages | Disadvantages |
|---|---|---|---|---|
| MenuLab | QR code menu, online ordering, online payment, food rating, allergy filter, multilingual support | Free trial, then $29/month | Easy to use, powerful analytics, integrations | Limited menu customization, allergy filter only in premium plans |
| QR Bistro | QR code menu, online ordering, online payment, food rating, multilingual support | Free trial, then $39.99/month | Simple interface, affordable, Customers can receive their orders faster and more accurately, | High cost of the software, technical problems, update problems and difficulty of use, no allergy filter |
| MyMenu | QR code menu, online ordering, payment gateway, guest feedback | Free trial, then $30/month | Flexible menu customization, strong analytics, integrations | No allergy filter, no menu suggestion |
| Menulux | QR code menu, online ordering, online payment, food rating, allergy filter, | Free trial, then $49/month | Fast and Easy to Use, Mobile Ordering and Payment Ease, Customer Analytics and Feedback | Expensive, system setup cost, no menu suggestion |
| FLAVOURLAB | QR code menu, online ordering, online payment, allergy filter, menu suggestion, food review | Free trial, then $15/month | Menu suggestion feature, allergy filter, menu customization, pick-up for the customer, and additional promotions (determined by the business) | Non-registered customers have limited privileges. Personalized orders are not prepared for individuals. |

During the development of the Flavourlab project, our main goal is enabling the restaurant owners to serve their customers easily. The Flavourlab system uses a filter system that all the customers can specify their allergies and preferences about the product that they want to order and according to the result of this filtering process, the system creates a customized menu for the customer which can help the customer to decide what to order in a easier and more satisfying way. Also, the reviews provided by the users will be visible only for the admin. So that, the customers might feel more free and more comfortable while they are describing their experiences within the restaurant. After, we have analyzed our competitors, we have decided that we are on the right path because the systems provided by the competitors are more expensive than ours and they do not provide customization features such as filtering process

as much as our system does. Our system provides an integrated environment with the customers by caring about their allergies and preferences. This is our priority advantage to our competitors. Furthermore, the payment automation system within the project makes our system superior than the competitors. The features of our system is available on other system piecemeal, but the only system which contains it all is our system. That is the reason why we have a huge difference with our competitors.

# 15. USE CASES

## 15.1. Customer Use Cases

<table>
<tr><td colspan="2">Use Case Name: Register</td><td>ID: UC-1</td><td>Priority: High</td></tr>
<tr><td colspan="4">Actor: Customer</td></tr>
<tr><td colspan="4">Description: The customer enters the system for the order.</td></tr>
<tr><td colspan="4">Trigger: Customer needs food or drink.<br>Type: External</td></tr>
<tr><td colspan="4">Pre-conditions: The customer must have an internet connections in order to connect to the system.</td></tr>
<tr><td colspan="4">Normal Course:<br>1. The system will allow the customer to access login page using the QR code.<br>2. The customer will click to sign up page<br>3. The customer will enter his/her information about name, surname, email, allergies and choose a password<br>4. The system will save the customer information to the customer database table.</td></tr>
<tr><td colspan="4">Alternative Course:<br>1a. If the customer does not have access to the QR code, the customer will request a link of the website from waiter.<br>2a. If the customer does not want to sign up to the system, he/she will choose the continue without of sign-up page.</td></tr>
<tr><td colspan="4">Post-conditions: For the customer who has signed up, a message about his/her account created information will appear.</td></tr>
<tr><td colspan="4">Exceptions:<br>E1. The customer cannot sign up to the system with an already existed email.</td></tr>
<tr><td colspan="2">Summary Inputs:<br>Customer’s name and surname<br>Customer’s e-mail<br>Customer’s allergens</td><td colspan="2">Summary Outputs:<br>A new customer account</td></tr>
</table>

| **Use Case Name:** Log in | **ID:** UC-2 | **Priority:** High |
|---|---|---|
| **Actor:** Customer | | |
| **Description:** Customer log in to system with using his/her information. | | |
| **Trigger:** Customer wants to enter the system.<br>**Type:** External | | |
| **Pre-conditions:** Only the customers who has signed up can login. | | |
| **Normal Course:**<br>1. The customer will access to the login page.<br>2. The customer will enter his/her email and password<br>3. The customer will send login request.<br>4. The system will check whether the information of customer is correct. | | |
| **Alternative Course:**<br>4a. If the customer information is incorrect, the system will show a message "Please try again".<br>4b. The customer who has forgotten his/her password can click to the "I forgot my password" button. | | |
| **Post-conditions:** The customer who logged in to the system can be ready to access order page. | | |
| **Exceptions:**<br>E1. If the customer cannot log into system due to a technical problem, the system will send an error message to the user. | | |
| **Summary Inputs:**<br>Customer's information | **Summary Outputs:**<br>Successful log in information<br>Failed log in information | |

| **Use Case Name:** Create an Order | **ID:** UC-3 | **Priority:** High |
|---|---|---|
| **Actor:** Customer | | |
| **Description:** Customer makes and order from the options offered by the system as a result of his/her choices. | | |
| **Trigger:** Customer wants to make an order<br>**Type:** External | | |
| **Pre-conditions:** The system has a database of available categories, materials, products, and their corresponding information. | | |
| **Normal Course:**<br>1. The system will show 3 different categories as "Food, Drink, Dessert".<br>2. The customer will choose one of the categories.<br>3. The system will show the customer which materials does the customer want or not at his/her product.<br>4. The customer will make his/her decision about the materials.<br>5. The customer will click to the create a menu button.<br>6. The system will use a filter algorithm according to the customer decision and allergies.<br>7. The system shows the customer about most suitable products.<br>8. The customer will choose the product or products he/she wants.<br>9. The customer will click the the button "Send my decisions to my basket".<br>10. The system will send the products to the customers basket. | | |
| **Alternative Course:**<br>3a. The customers who did not sign up will enter their allergies here.<br>4a. If the customer does not choose any materials, all the available products will appear for the customer according to his/her allergies (only if he/she signed up).<br>7a. If there is no product after the filtering process, the system will send an error message.<br>10a. If the customer does not want to click "send my decision to my basket" button and create another order from different category, the system will send customer to main page. | | |
| **Post-conditions:** The system will save the customer orders into the database. | | |
| **Exceptions:**<br>E1. Orders can only be placed through the system not with the customer services employee. | | |
| **Summary Inputs:**<br>Customer's requests and demands about order | **Summary Outputs:**<br>The order from customer | |

| **Use Case Name:** Payment | **ID:** UC-4 | **Priority:** High |
|---|---|---|
| **Actor:** Customer | | |
| **Description:** Customer pays for the order he/she received. | | |
| **Trigger:** Invoicing the order<br>**Type:** External | | |
| **Pre-conditions:** The system needs to send payment request to the basket. | | |
| **Normal Course:**<br>1. The customer must click the "go to my basket" button.<br>2. The customer should select his/her table number.<br>3. The system checks the available campaigns for the customer.<br>4. The customer selects one of the campaigns.<br>5. After the campaign selection, the new price for the product will be calculated by the system.<br>6. The customer needs to click the payment button under the products.<br>7. The system will request card information from the customer<br>8. The customer will enter the card information.<br>9. The customer will click the "accept my payment" button.<br>10. The system will control the payment request.<br>11. The system will accept the order request.<br>12. The system saves all the processes including the table number into the orders table. | | |
| **Alternative Course:**<br>3a. If there is no available campaign, the menu price will be appeared for the customer.<br>6a. If the customer does not want to enter his/her card information, then the system will show IBAN number of the restaurant.<br>10a. If the customer bank card has a problem, the system will show an error message. | | |
| **Post-conditions:** The system will show an information about the payment. | | |
| **Exceptions:**<br>E1. Bank card problem | | |
| **Summary Inputs:**<br>Customer's card and other information. | **Summary Outputs:**<br>An invoice | |

| **Use Case Name:** Deliver | **ID:** UC-5 | **Priority:** High |
|---|---|---|
| **Actor:** Customer | | |
| **Description:** The order prepared for the customer, is delivered. | | |
| **Trigger:** Customer placing an order<br>**Type:** External | | |
| **Pre-conditions:** The payment method must be successful. | | |
| **Normal Course:**<br>1. The customer gets the order accepted by the admin. | | |
| **Alternative Course:**<br>1a. If there are deficiencies in the product, the customer has the right not to accept it. | | |
| **Post-conditions:** The customer will receive the product. | | |
| **Exceptions:**<br>E1. Incorrect order received | | |
| **Summary Inputs:**<br>The order request. | **Summary Outputs:**<br>The delivery to customer | |

| **Use Case Name:** Review | **ID:** UC-6 | **Priority:** High |
|---|---|---|
| **Actor:** Customer | | |
| **Description:** Customer reviews the previous orders. | | |
| **Trigger:** Customer's evaluation<br>**Type:** External | | |
| **Pre-conditions:** The products must be delivered. | | |
| **Normal Course:**<br>1. The customer can click to my orders button.<br>2. The system will show past orders.<br>3. The customer will click on the review button of the order he/she wants to review.<br>4. The system will send the customer to the review page.<br>5. The system shows the customer suitable star preferences and a comment line.<br>6. The customer will add a comment.<br>7. The customer clicks to "save my review" button.<br>8. The system saves the customer review to the database. | | |
| **Alternative Course:**<br>7a. The customer can cancel the review he/she sent. | | |
| **Post-conditions:** The reviews made by the customers can be visible for the admin. | | |
| **Exceptions:**<br>E1. Invalid review submission | | |
| **Summary Inputs:**<br>Customer's review about the order | **Summary Outputs:**<br>Score for the business | |

## 15.2. Admin Use Cases

<table>
<tr><td colspan="2">Use Case Name: Log in</td><td>ID: UC-1</td><td>Priority: High</td></tr>
<tr><td colspan="4">Actor: Admin</td></tr>
<tr><td colspan="4">Description: The owner of the business logs into the system.</td></tr>
<tr><td colspan="4">Trigger: Having bought our system.<br>Type: External</td></tr>
<tr><td colspan="4">Pre-conditions:</td></tr>
<tr><td colspan="4">Normal Course:<br>1. The admin will access to the login page.<br>2. The admin will enter his/her email and the password.<br>3. The admin will send login request.<br>4. The system will check whether the information of admin is correct or not.</td></tr>
<tr><td colspan="4">Alternative Course:<br>4a. If the admin's information is incorrect, the system will show a message "Please try again".<br>4b. The admin who has forgotten his/her password can click to the "I forgot my password" button.</td></tr>
<tr><td colspan="4">Post-conditions: The admin who logged in to the system can be ready to access to main page and can add menu of the business.</td></tr>
<tr><td colspan="4">Exceptions:<br>E1.</td></tr>
<tr><td colspan="2">Summary Inputs:<br>Admin's information</td><td colspan="2">Summary Outputs:<br>A new admin account.</td></tr>
</table>

| **Use Case Name:** Control of Menu | **ID:** UC-2 | **Priority:** High |
|---|---|---|
| **Actor:** Admin | | |
| **Description:** Admin controls the menu entered into the system. | | |
| **Trigger:** Data entry into the menu<br>**Type:** External | | |
| **Pre-conditions:** The user must have an admin role. | | |
| **Normal Course:**<br>1. The admin performs CRUD operations on categories.<br>2. The admin performs CRUD operations on menu. | | |
| **Alternative Course:**<br>2a. If the admin cannot do those processes on our system, he/she can do these processes manually using database management system. | | |
| **Post-conditions:** The admin CRUDs the categories and menus according to his/her wish. | | |
| **Exceptions:**<br>E1. The admin did not update the menu | | |

| **Summary Inputs:** | **Summary Outputs:** |
|---|---|
| Data and changes about the menu | Successful CRUD operation<br>Unsuccessful CRUD operation |

| **Use Case Name:** Control Order | **ID:** UC-3 | **Priority:** High |
|---|---|---|
| **Actor:** Admin | | |
| **Description:** Admin checks the orders placed by customers. | | |
| **Trigger:** Admin wants to control the order<br>**Type:** External | | |
| **Pre-conditions:** The system needs to send payment request to the basket. | | |
| **Normal Course:**<br>1. The customer's order reaches to the admin via system.<br>2. The admin can accept the customer's order.<br>3. The admin informs the customer about the order status. | | |
| **Alternative Course:**<br>2a. The admin can reject the customer's order. | | |
| **Post-conditions:** Order table will be updated after all those changes. | | |
| **Exceptions:**<br>E1. The admin was not informed about the payment | | |

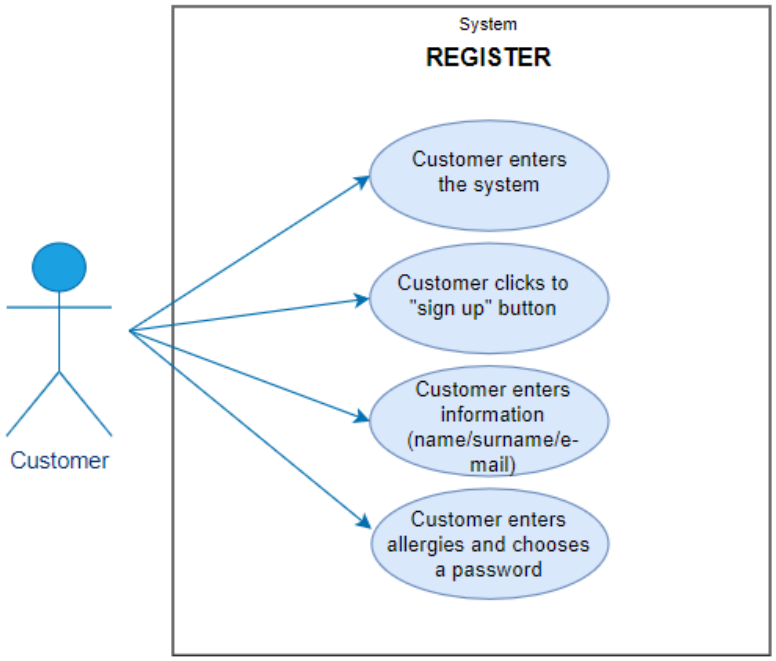
| **Summary Inputs:** | **Summary Outputs:** |
|---|---|
| Customer's order | Feedback to the customer |

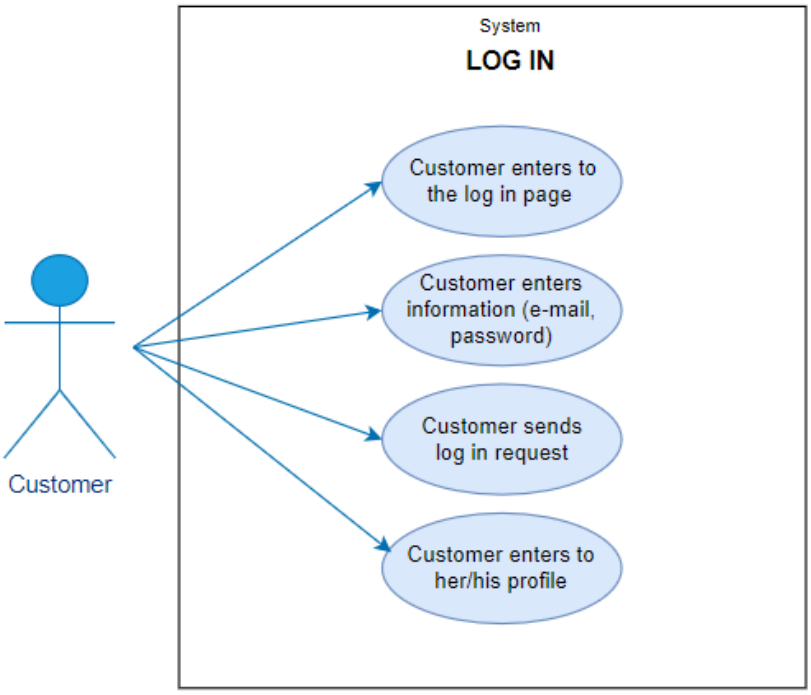
| **Use Case Name:** Deliver | **ID:** UC-4 | **Priority:** High |
|---|---|---|
| **Actor:** Admin | | |
| **Description:** Once the admin accepts the order, the order is confirmed, and the delivery phase begins. | | |
| **Trigger:** Customer pays for his/her order<br>**Type:** External | | |
| **Pre-conditions:** The payment method must be successful. | | |
| **Normal Course:**<br>1. The order information will be sent to admin by the system.<br>2. After the order has been prepared, the admin will send information about prepared order to customer.<br>3. The admin will send the order information to the waiter according to table no. | | |
| **Alternative Course:**<br>1a. | | |
| **Post-conditions:** The admin informs the waiter about the order. | | |
| **Exceptions:**<br>E1. If the delivered order is delivered in full within the specified time, the customer cannot have the right to refuse or object to the delivery. | | |
| **Summary Inputs:**<br>Customer's information about the order | **Summary Outputs:**<br>Delivery to the customer | |

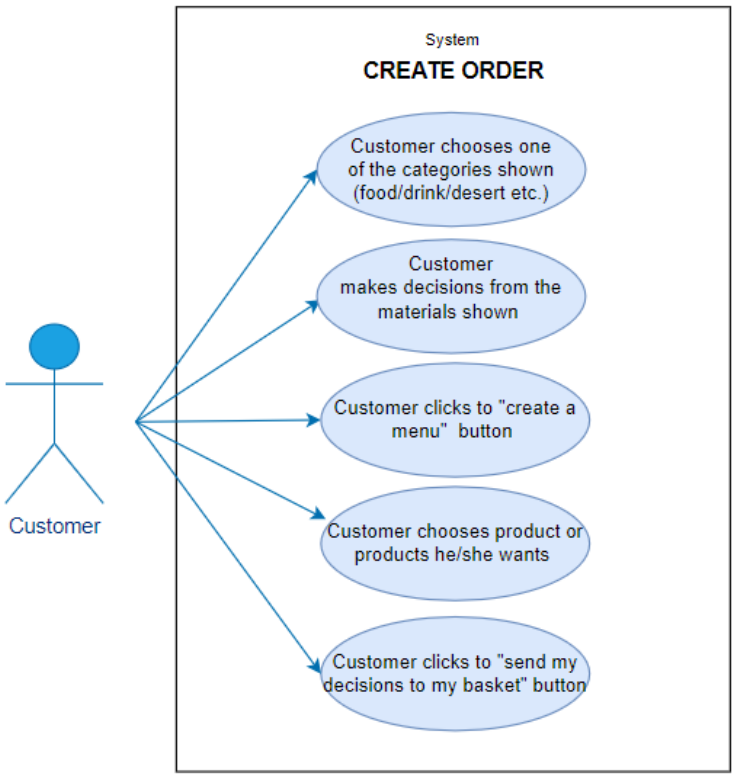
| **Use Case Name:** Review | **ID:** UC-5 | **Priority:** High |
|---|---|---|
| **Actor:** Admin | | |
| **Description:** Admin reviews the customer's review. | | |
| **Trigger:** A customer make a review<br>**Type:** External | | |
| **Pre-conditions:** The customer must do some reviews | | |
| **Normal Course:**<br>1. The admin receives the customer reviews.<br>2. The admin can read the customer feedback. | | |
| **Alternative Course:** | | |
| **Post-conditions:** The system updates the review database. | | |
| **Exceptions:**<br>E1. The admin cannot reach to the content of the review | | |
| **Summary Inputs:**<br>Customer review | **Summary Outputs:**<br>Admin's feedback | |

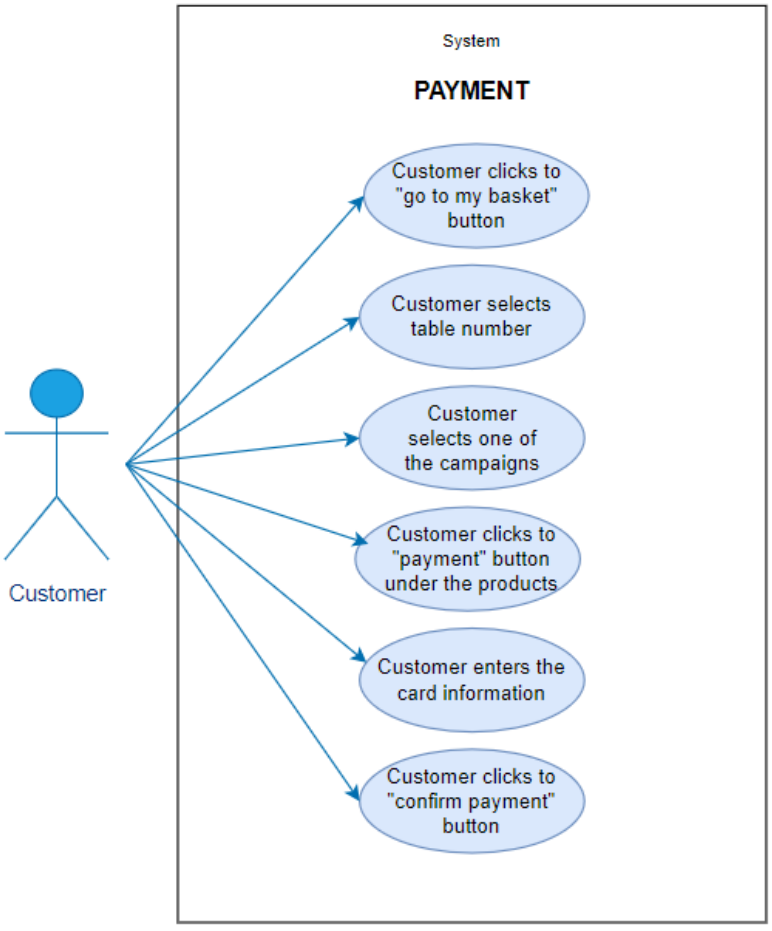
# 16. USE CASE DIAGRAMS

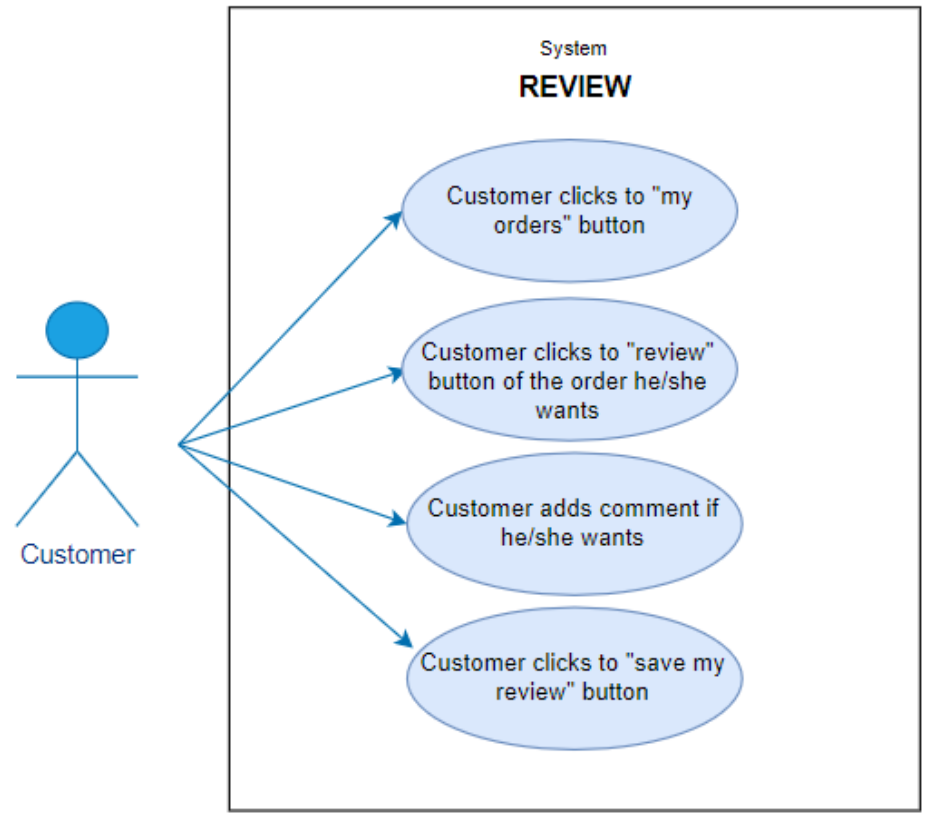
## 16.1. Customer Use Case Diagrams

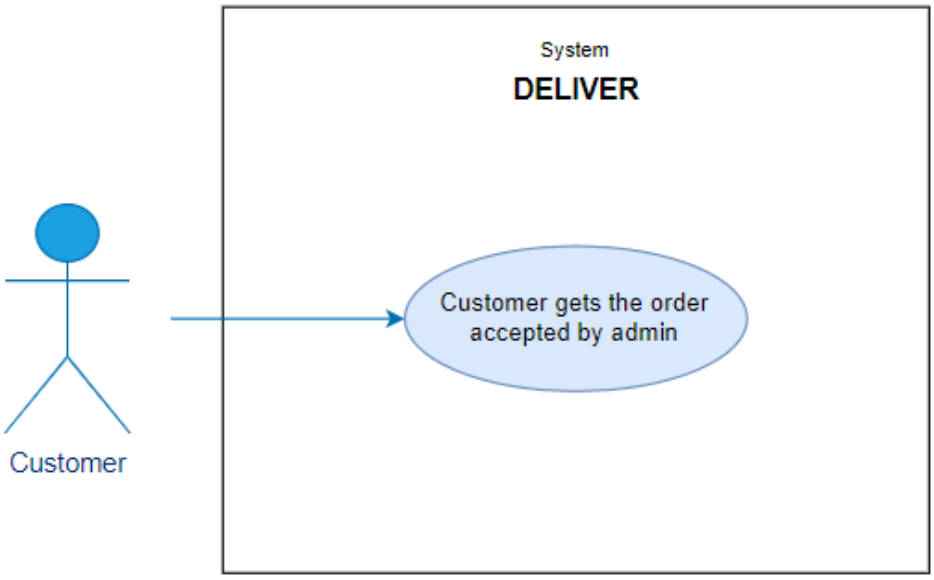


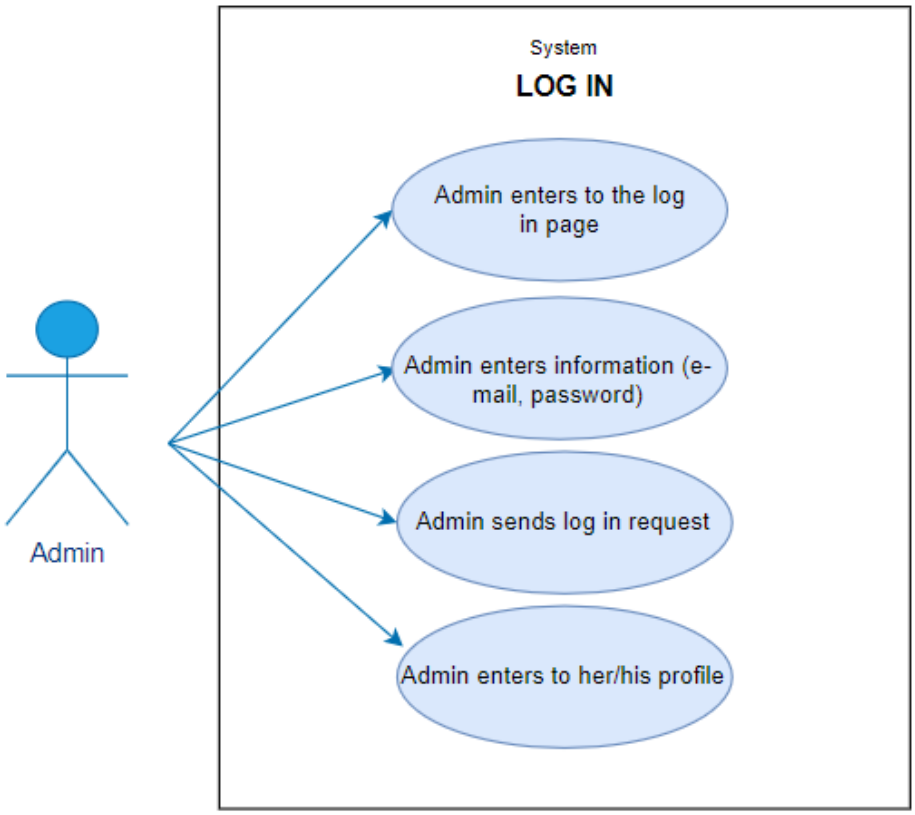

System
CREATE ORDER
Customer chooses one of the categories shown (food/drink/desert etc.)
Customer makes decisions from the materials shown
Customer clicks to "create a menu" button
Customer chooses product or products he/she wants
Customer clicks to "send my decisions to my basket" button
Customer

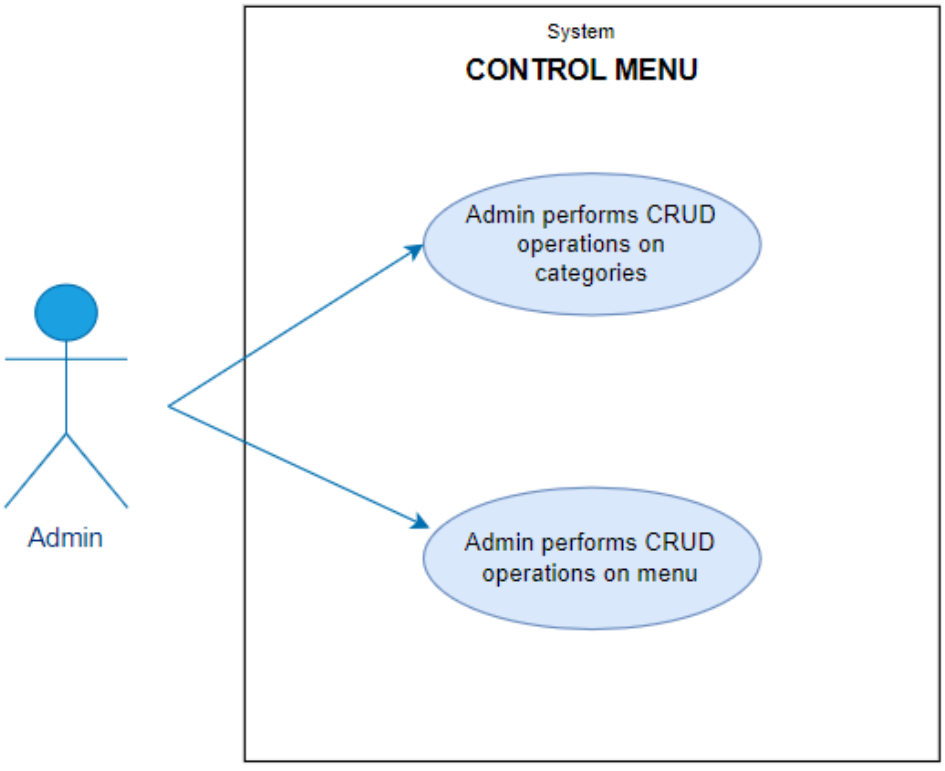

System
PAYMENT
Customer clicks to "go to my basket" button
Customer selects table number
Customer selects one of the campaigns
Customer clicks to "payment" button under the products
Customer enters the card information
Customer clicks to "confirm payment" button
Customer

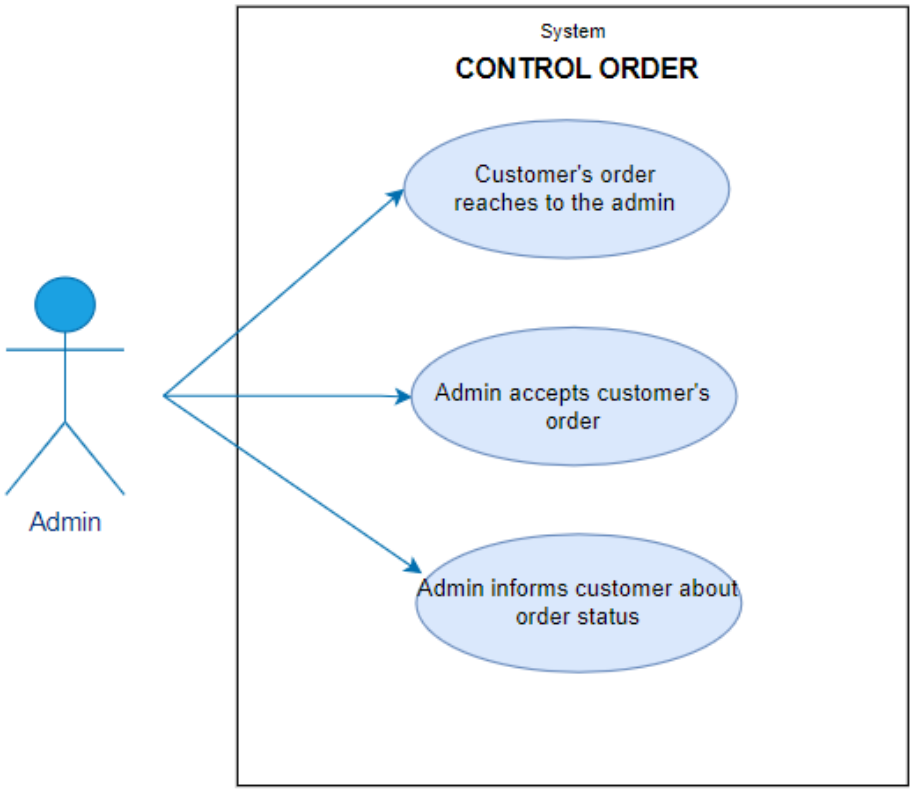

System
REVIEW
Customer clicks to "my orders" button
Customer clicks to "review" button of the order he/she wants
Customer adds comment if he/she wants
Customer clicks to "save my review" button
Customer

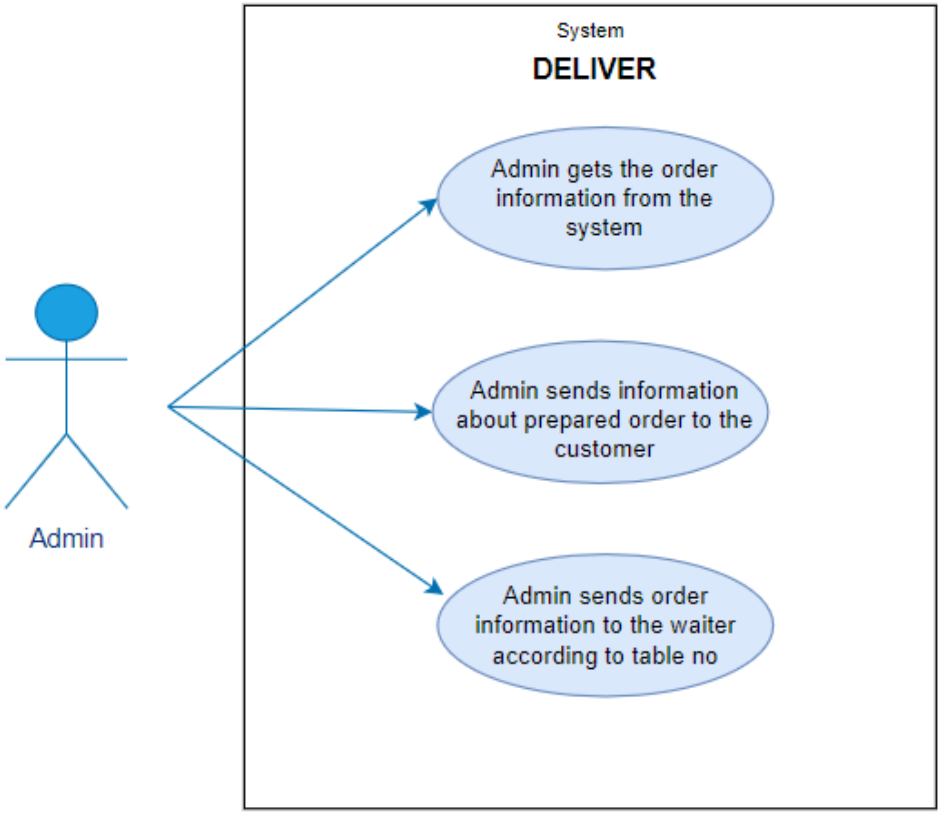

System
DELIVER
Customer gets the order accepted by admin
Customer

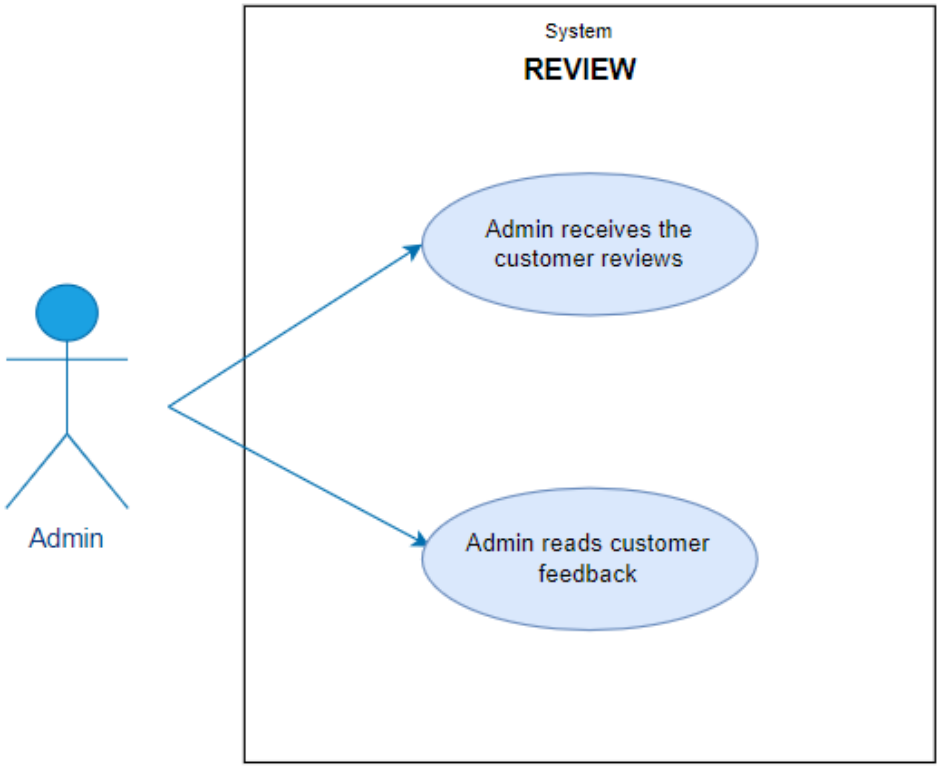
## 16.2. Admin Use Case Diagrams



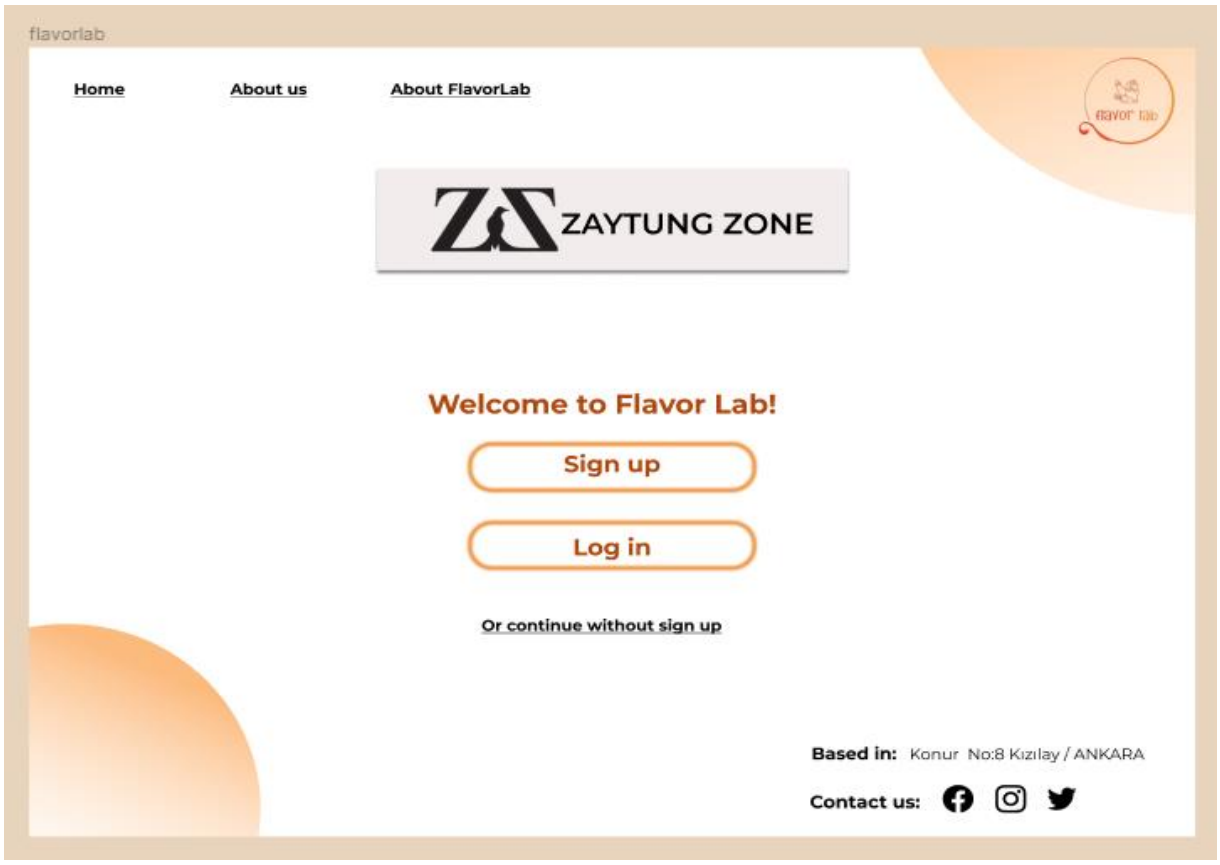



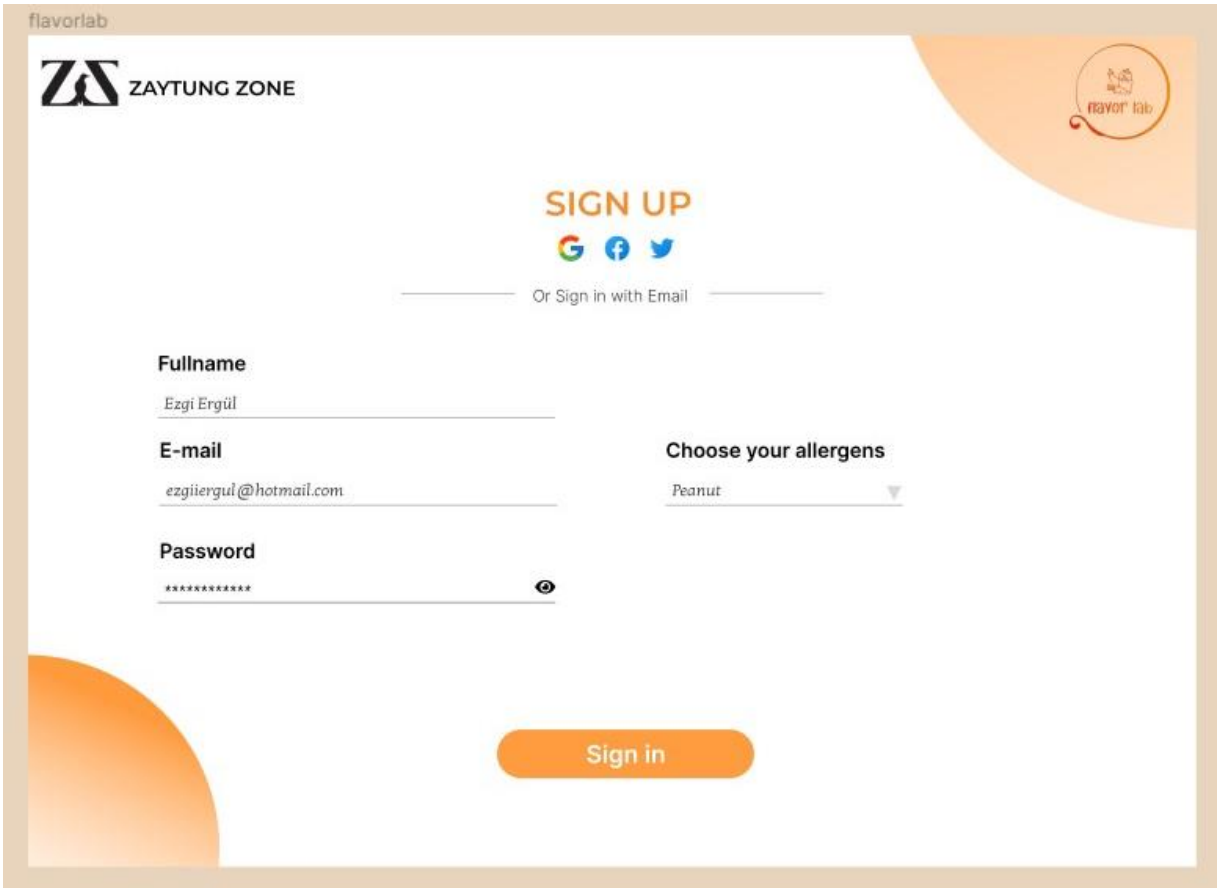

System
CONTROL ORDER
Customer's order reaches to the admin
Admin accepts customer's order
Admin informs customer about order status
Admin


System
DELIVER
Admin gets the order information from the system
Admin sends information about prepared order to the customer
Admin sends order information to the waiter according to table no
Admin


System
REVIEW
Admin receives the customer reviews
Admin reads customer feedback
Admin

# 17. USER INTERFACES



flavorlab

ZAYTUNG ZONE

flavor lab

E-mail

ezgiiergul@hotmail.com

Password

**********

Keep me logged in

Forgot password?

flavorlab

ZAYTUNG ZONE

Drink Food Desert

- Chocolate
- Milk
- Sherbet
- Strawberry
- Banana
- Raspberry
- Biscuit
- Hazelnut
- Oreo

flavor lab

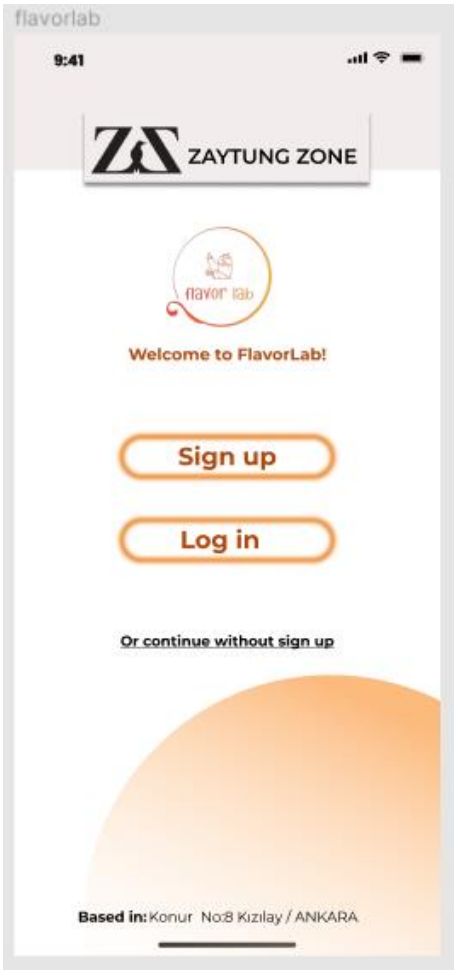
Our suggestion to you:

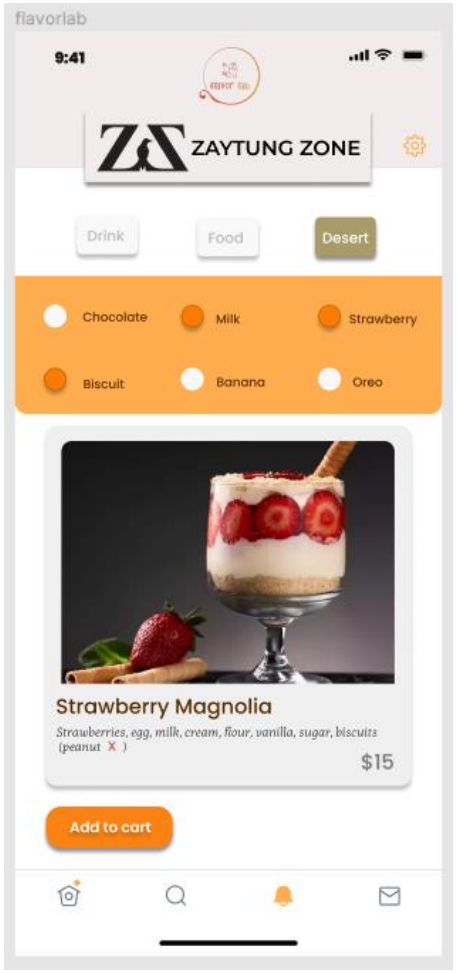
Strawberry Magnolia

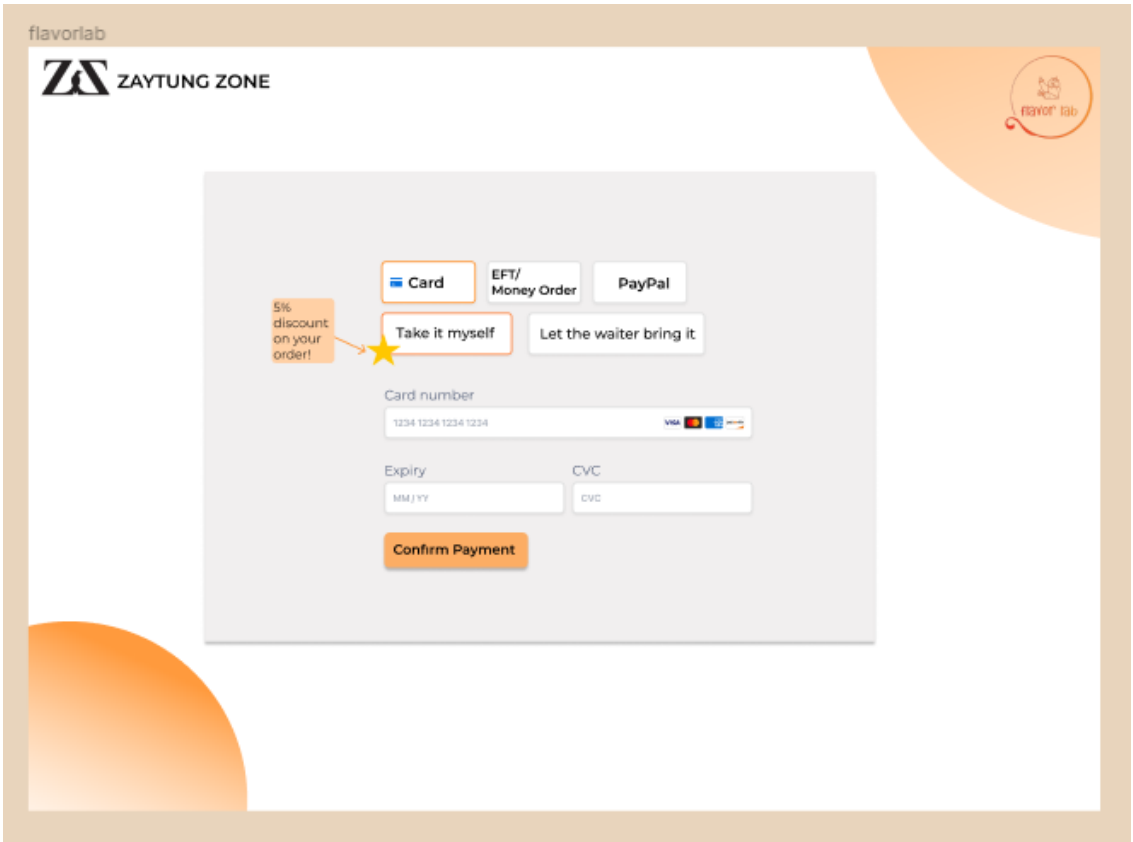
*Strawberries, egg, milk, cream, flour, vanilla, sugar, biscuits (peanut ✕)*

$15

Add to cart


flavorlab
9:41
ZAYTUNG ZONE
flavor lab
Welcome to FlavorLab!
Sign up
Log in
Or continue without sign up
Based in: Konur No:8 Kızılay / ANKARA


flavorlab
9:41
ZAYTUNG ZONE
Drink
Food
Desert
Chocolate
Milk
Strawberry
Biscuit
Banana
Oreo
Strawberry Magnolia
Strawberries, egg, milk, cream, flour, vanilla, sugar, biscuits
(peanut X )
$15
Add to cart


flavorlab
ZAYTUNG ZONE
flavor lab
Card
EFT/
Money Order
PayPal
5% discount on your order!
Take it myself
Let the waiter bring it
Card number
1234 1234 1234 1234
Expiry
MM / YY
CVC
CVC
Confirm Payment

# 18. SOFTWARE AND HARDWARE SPECIFICATIONS

## 18.1. Customer Software Requirements

**Web Page:**

Browser Support: Google Chrome, Mozilla Firefox, Safari, Microsoft Edge.

- **Backend:**
    - The backend part that ensures the logic and processing of data on the web page is built on a robust and reliable .NET or Wordpress infrastructure.
- **Frontend:**
    - The user interface is developed using Angular or Wordpress technology to provide an interactive and user-friendly experience. This enables users to interact comfortably and enjoyably with a modern and dynamic frontend.

**Order Management:**

- User-friendly interface with registration, login, and guest order screens.
- Quickly create orders using category and request filters.
- Campaign and order delivery selection screen in cart management.
- Payment screen.
- Special order evaluation page for registered users.
- View order history.

## 18.2. Admin Software Requirements

**POS Terminal Computer (Admin Side):**

- **User Interface:**
    - Touchscreen-friendly user-friendly interface.
- **Login and Session Management:**
    - Secure user session and account management.
- **Staff Management:**
    - Approval or rejection of orders with completed payments.
    - Access to daily sales reports.
    - Menu addition, deletion, or update.
    - Campaign definition feature.
    - Reading user evaluations.

## 18.3. Hardware Requirements

**POS Terminal Computer:**

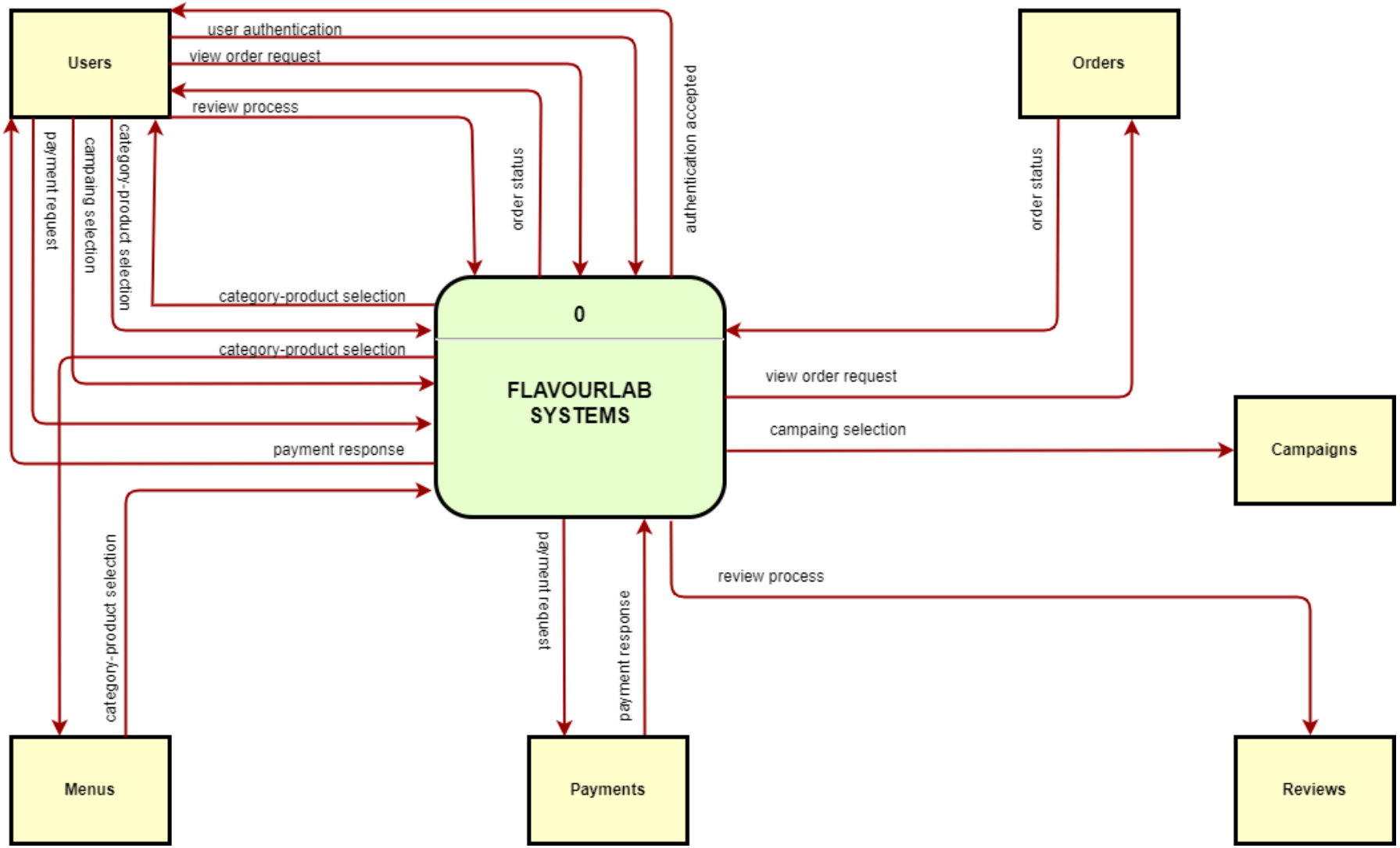
- **Processor:**
  - Intel Core i3 or equivalent, minimum 4 cores.
- **Memory:**
  - Minimum 8 GB DDR4 RAM.
- **Storage:**
  - Minimum 120 GB NVMe SSD.
- **Display:**
  - At least a 15-inch touchscreen.
- **Connection:**
  - Ethernet and Wi-Fi support.
- **Power Supply:**
  - Redundant power supply or a long-lasting battery.

**Database Server Requirements:**

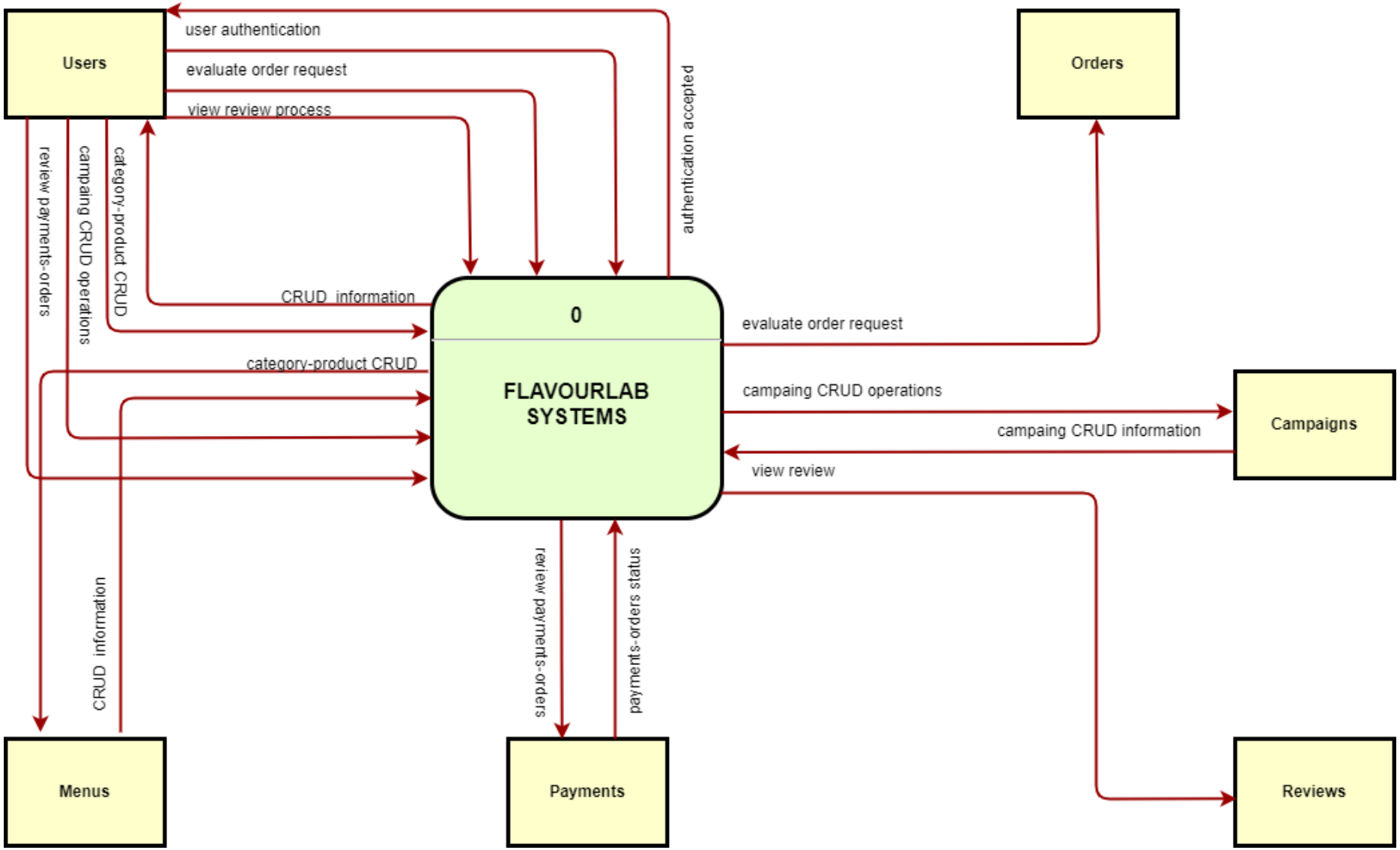
- **Operating System:**
  - Ubuntu Server 20.04 LTS or later.
- **Database Type:**
  - MsSQL 13.x.
- **Security:**
  - Use of SSL/TLS, advanced authorization, and audit mechanisms.
- **Backup:**
  - Automatic regular backup processes and backup storage space.
- **Performance and Scalability:**
  - Database query optimization and indexing, scalability for high-traffic environments.

# 19. CONTEXT DIAGRAMS

## 19.1. Customer Context Diagram

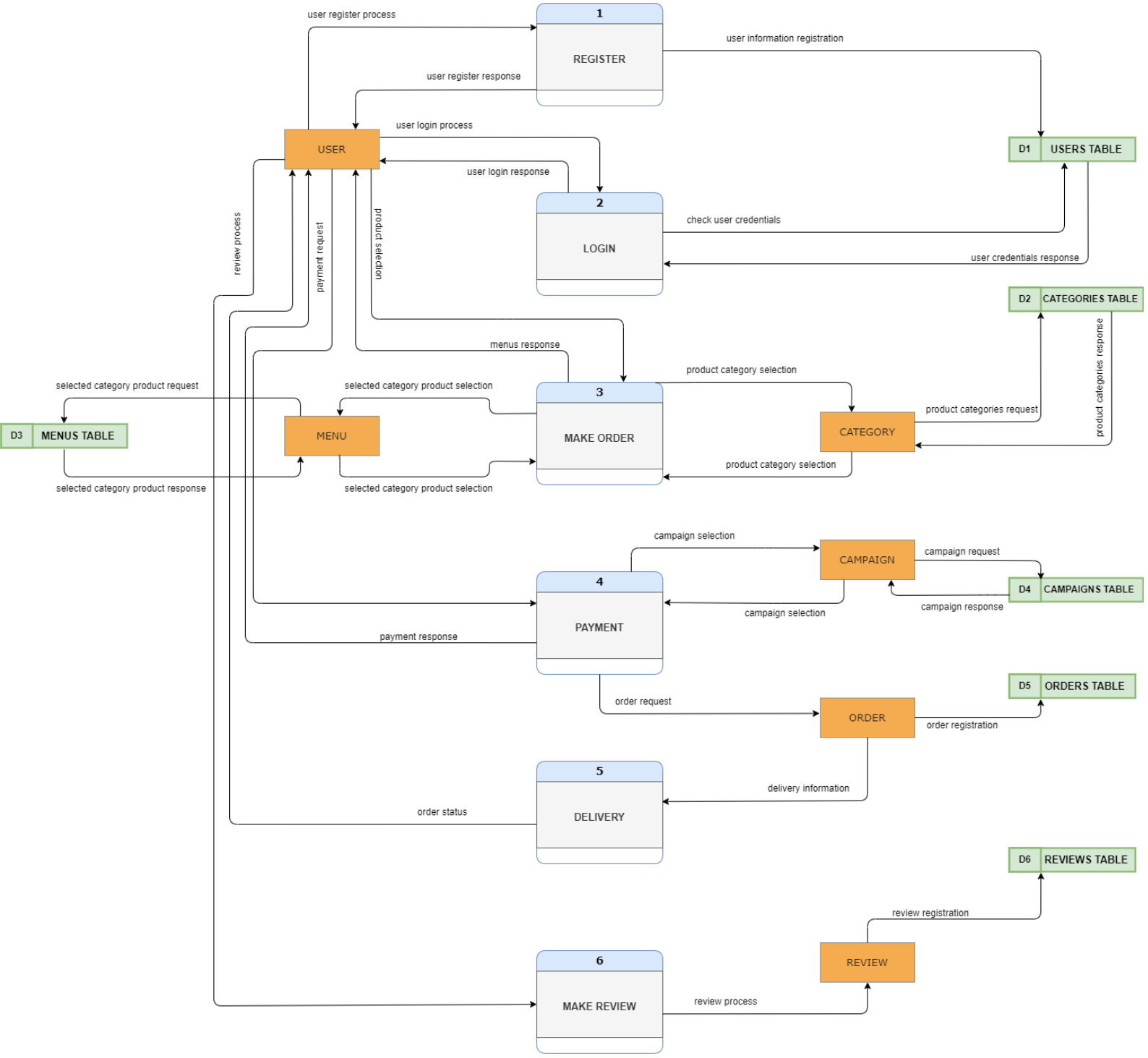


## 19.2. Admin Context Diagram

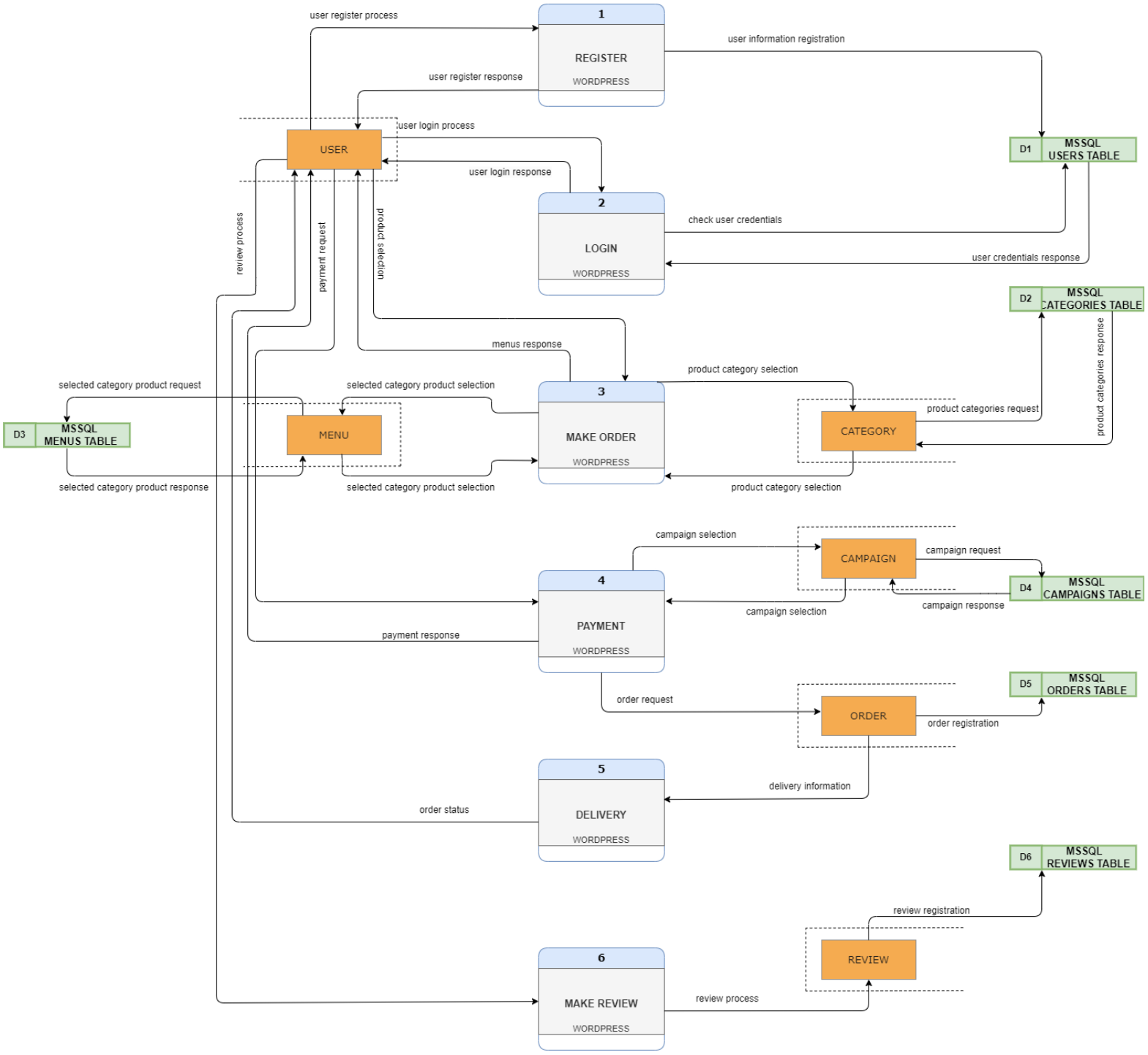


# 20. DATA FLOW DIAGRAMS

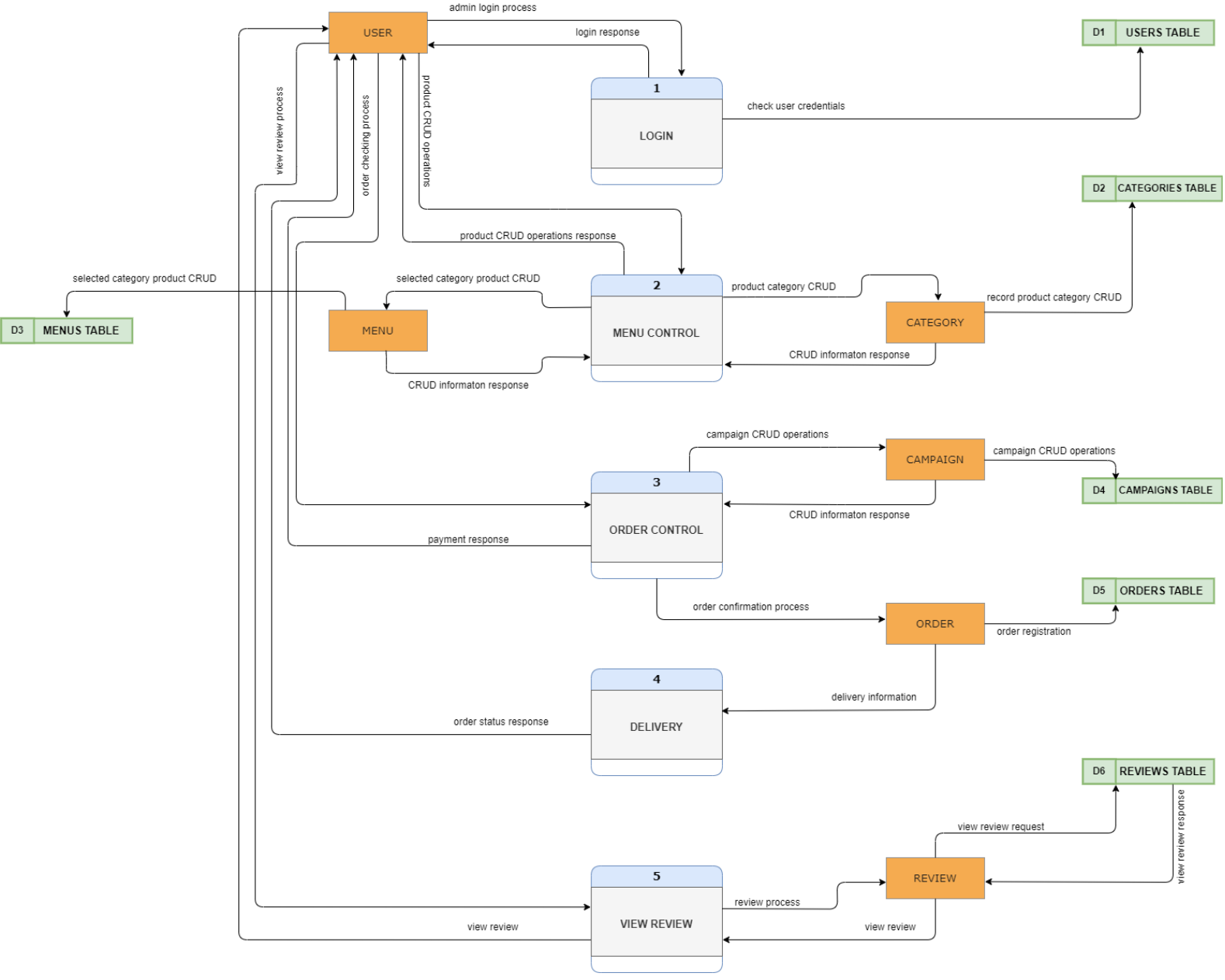
## 20.1. Customer Logical DFD



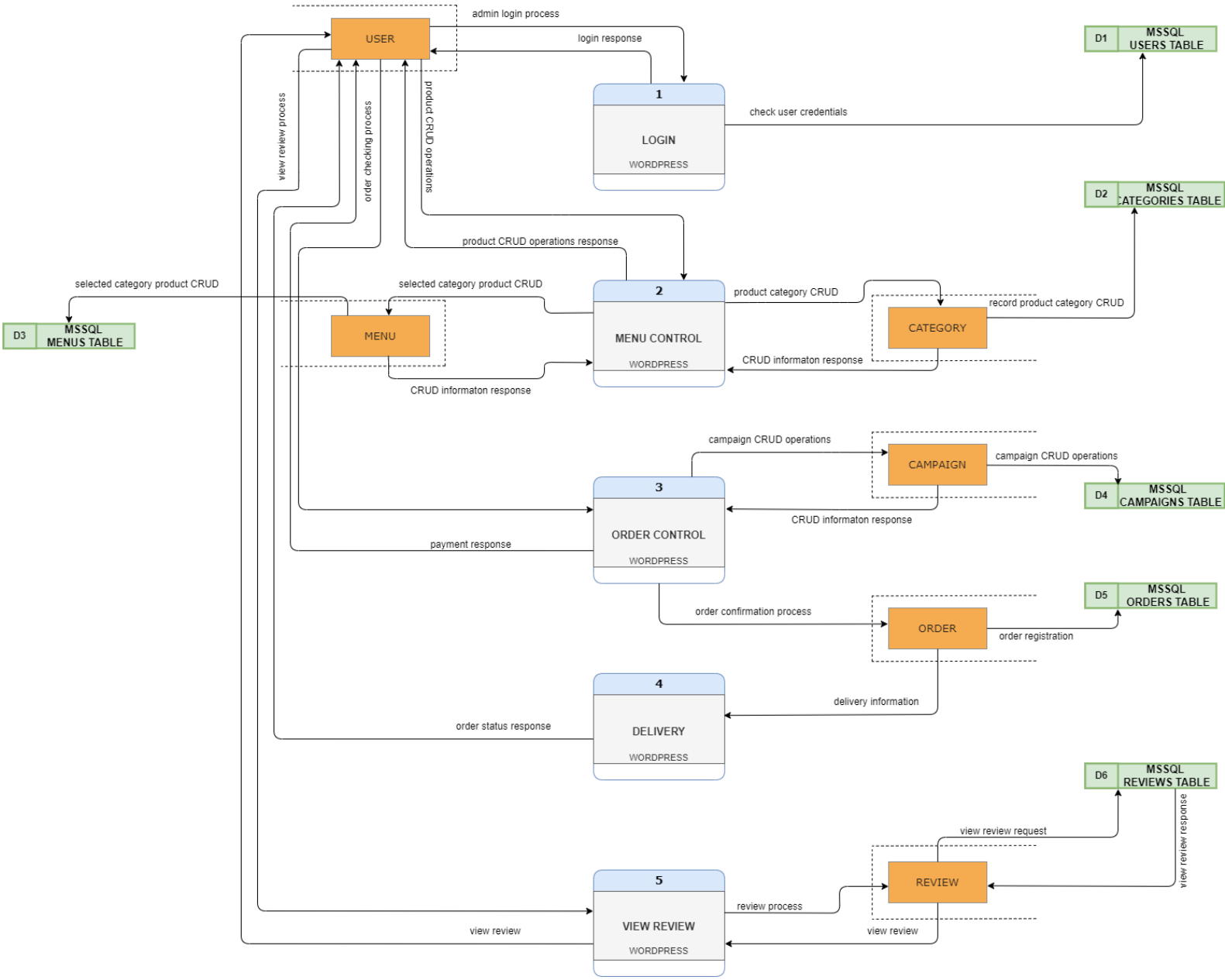
## 20.2. Customer Physical DFD



## 20.3. Admin Logical DFD

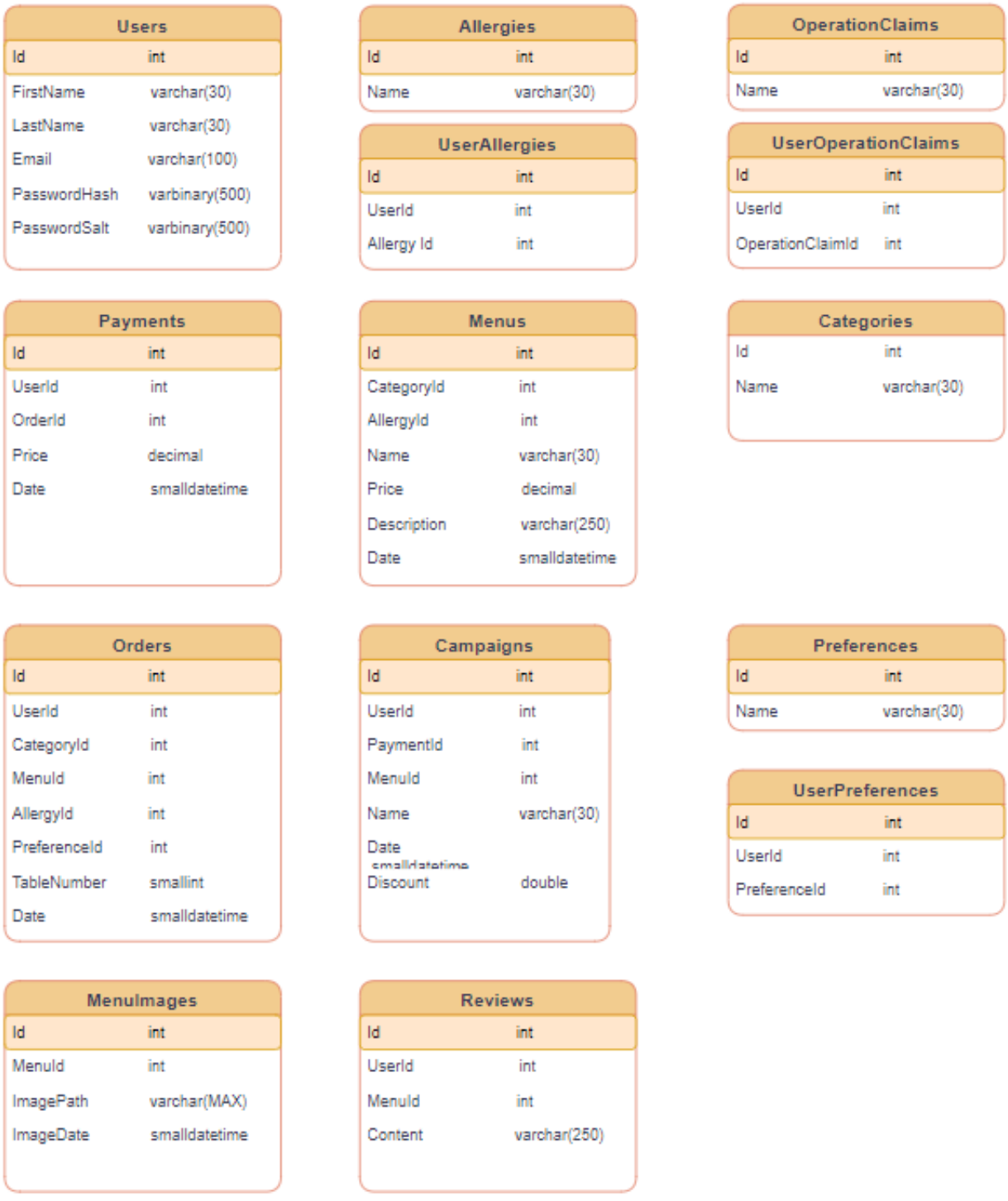


## 20.4. Admin Physical DFD

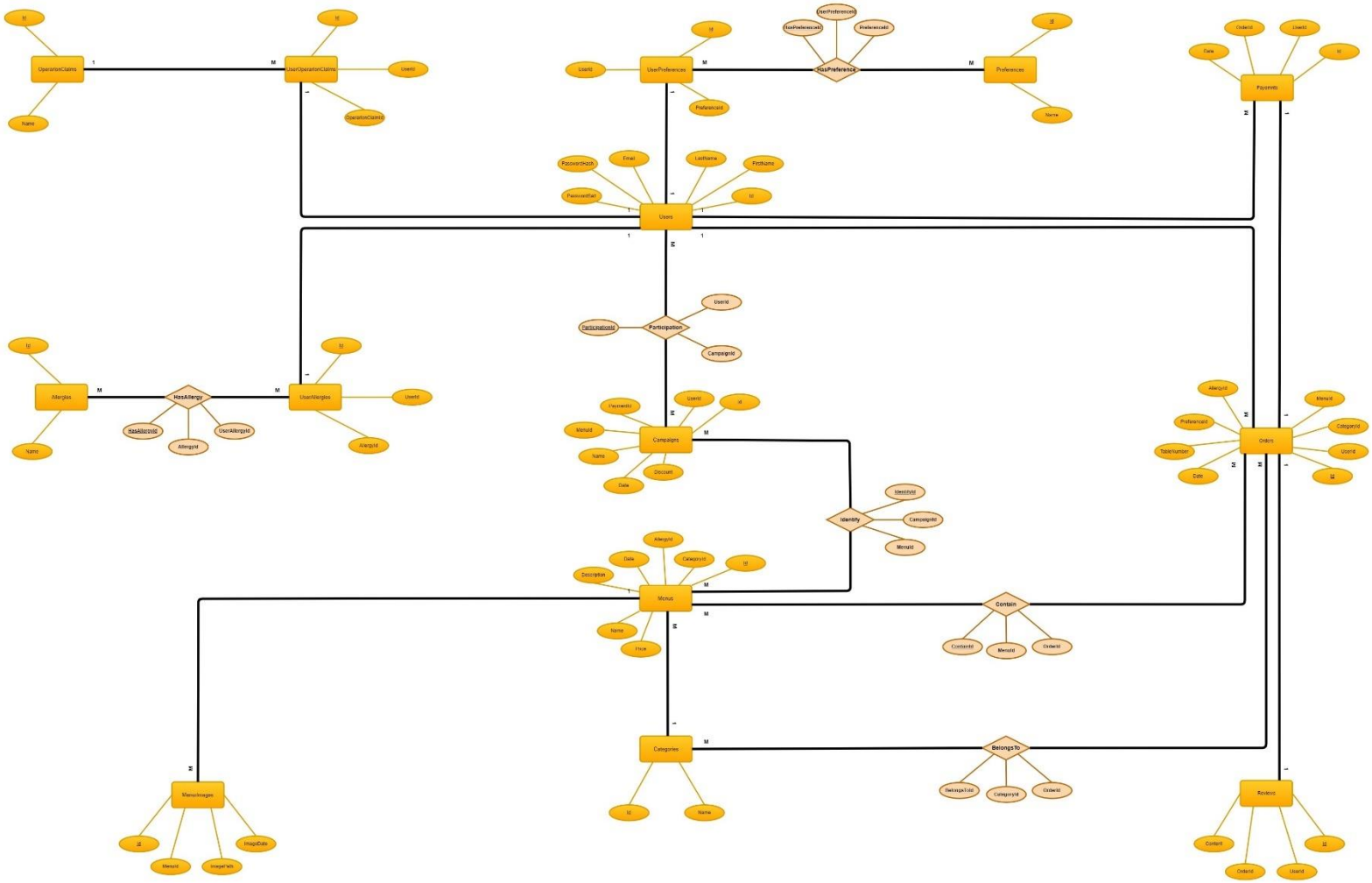


# 21. ENTITY RELATIONSHIP DIAGRAM

# 22. ENTITY & ATTRIBUTES

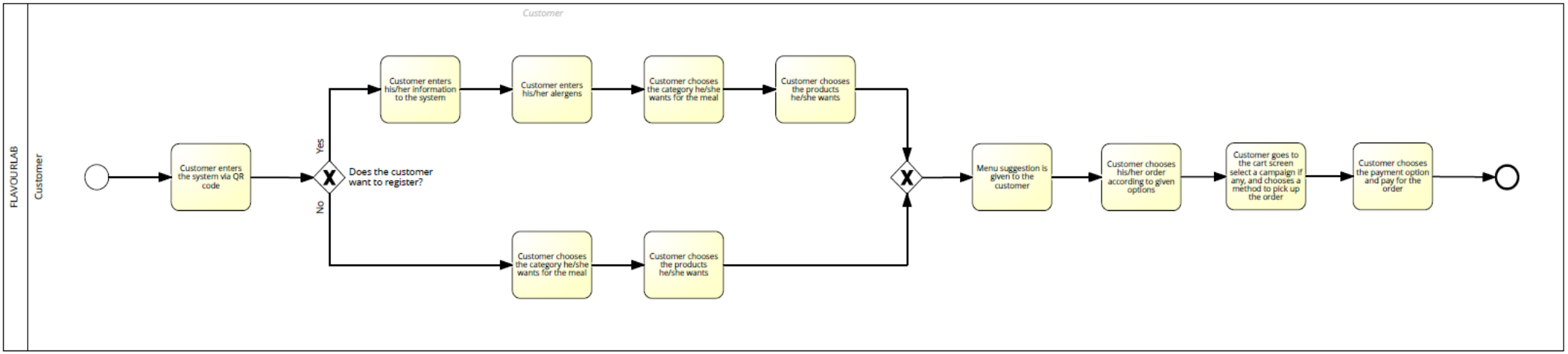


# 23. TRADITIONAL ENTITY RELATIONSHIP DIAGRAM

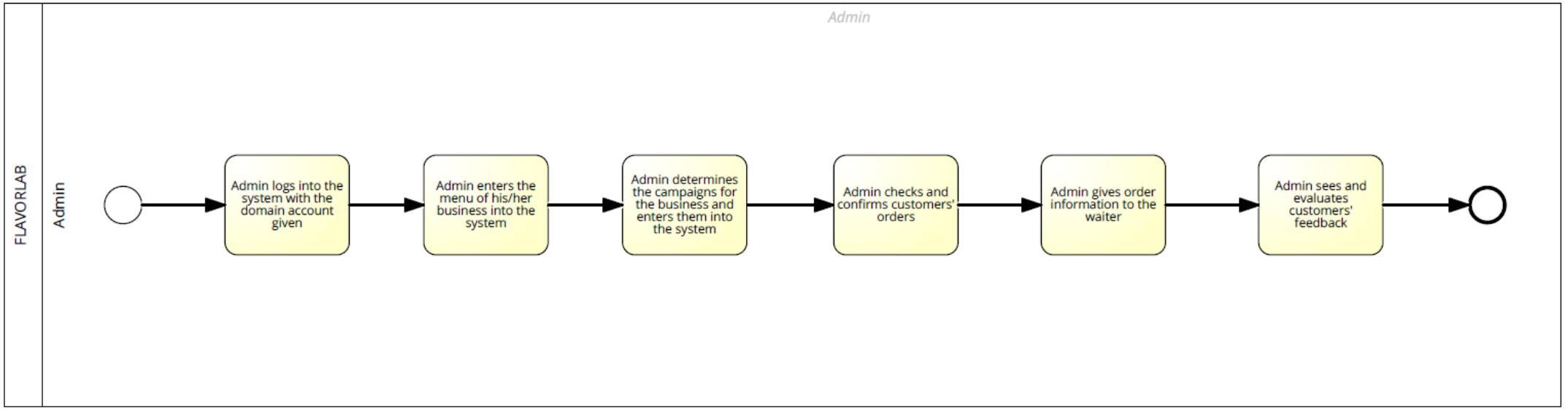


# 24. PROCESS FLOW DIAGRAMS

## 24.1. Customer PFL




## 24.2. Admin PFL



## 25. REVENUE MODEL

The main revenue model of our project is trying to sell our project to the restaurants. In order to market our system we will have the following options:

- 1. Option: The restaurant can use the system with monthly payment option by paying the installation cost ($250) and monthly cost ($15). Since the restaurant does not have all the rights of Flavourlab, in case of any intervention in the system, we have the right to initiate the necessary legal proceedings. In case of any problems within the system, we have a maintenance service. The maintenance service prices will be like the following:

- a) The restaurant can pay 5$ more to its monthly payment in order to have the maintenance. This maintenance service will be only 1 time in a month.
- b) If 2 or more maintenance will be needed, the price of each maintenance will be 25$

- 2. Option: If the restaurant wants to purchase the annual plan of the Flavourlab, the should pay the installation cost (250$) and the annual cost (150$). The maintenance service prices will be like the following:

- a) 1year guarantee packet costs 200$ and it contains at maximum 12 maintenance services in one year. Every maintenance request which exceeds 12 times will cost $25.
- b) 2 years guarantee packet costs 350$ and it contains at maximum 26 maintenance services in one year. Every maintenance request which exceeds 26 times will cost $25.
- c) 3 years guarantee packet costs 500$ and it contains at maximum 40 maintenance services in one year. Every maintenance request which exceeds 40 times will cost $25.

- 3.Option: If a company wants to purchase all the rights of Flavourlab system, they can pay 100.000$ in order to have all the license rights of the Flavourlab.

Those are revenue models of Flavourlab.

## 26. SUPPORT PLAN

Our system can only be used by customers with the QR code system within the business. It is simple enough for the user to use easily. In addition, system owners constantly try to keep the system up to date and continue to improve the system by solving user problems. Additionally, when business encounter a problem, they can directly contact the business employees or us from the help section.

As system owners:

· We help the system work better.

· We support the solution of user problems.

. We support business employees in learning and using the system.

· We provide support for possible problems in accessing the system.

· We provide support for possible software or hardware deficiencies in the system.

. We make continuous improvements by regularly evaluating user feedback and the performance of the system.

. We will provide training to customer personnel or managers on managing and updating the site.

. We will provide fast response times and solution-oriented support in emergency situations.

. We work by taking into account user demands to add new features and update existing features.

# 27. REFERENCES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. *Restaurant QR menu: Tablet menu: Digital menu: E menu. My Menu. (n.d.). https://www.mydigimenu.com/*

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