Implementation Technology

1. Front-end Implementation

React (or React.js) is a popular javascript front-end used to develop user interfaces for websites. React is an open source library, developed and maintained by Meta (Company that made Facebook). React is used to build UI components, which makes web development easier. One of the features of React is rendering data not only in Server side but also in Client side.

Advantages:

· Easy to use and maintain: React Components can be used with JSX syntax, extended JavaScript syntax, which allow developers to write components with HTML and JavaScript.

· Reusable components: UI is built by components, components can be used many times later, avoiding repeating similar codes.

· Large community with libraries: React is popular among developers, easy to find help from communities as well as a variety of custom libraries suitable for UI development.

2. Back End Implementation

Expressjs is a module from **NodeJs**. Express is used to build server side easier. **Expressjs** supports HTTP methods and middleware creating powerful and easy-to-use APIs

Some of main features:

· Handle HTTP requests.

· Define router for different actions on HTTP method and URL.

· Allow responding HTML pages based on arguments.

3. Database Management System

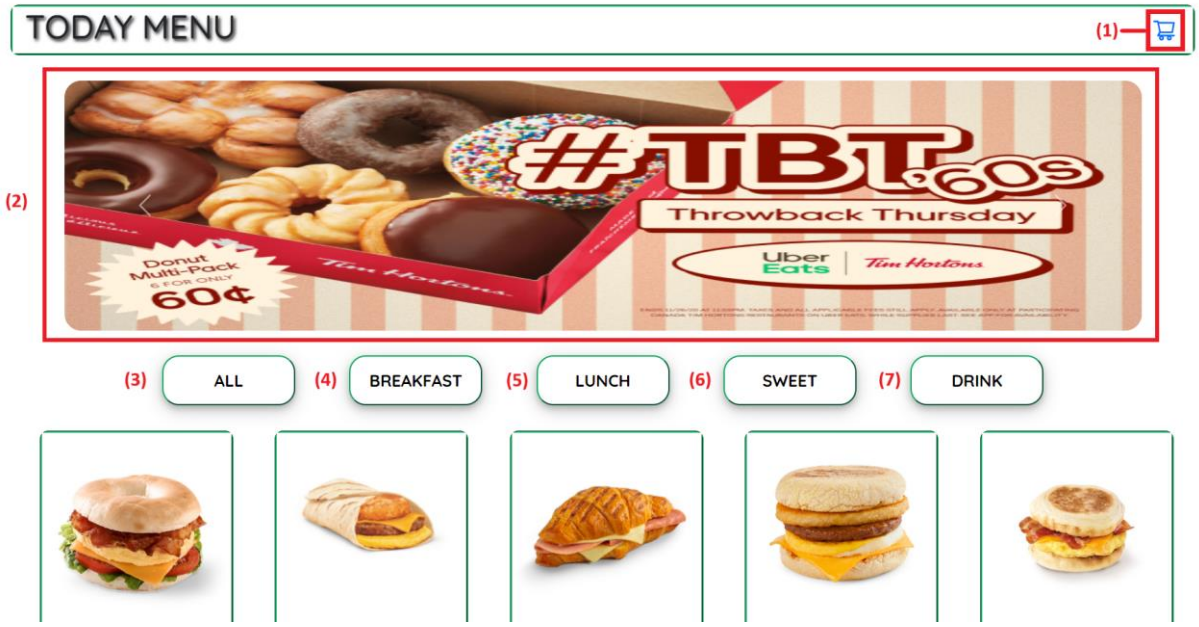
MySQL is an open-source relational database management system (RDBMS), developed, distributed, and supported by Oracle Corporation. MySQL is very fast, reliable, scalable, and easy to use. It is cross-platform which is ideal for both small and large applications.

MySQL is very popular. A very large number of web developers around the world use MySQL and it is also used by huge websites like Facebook, Twitter, Airbnb, Booking.com, Uber, GitHub, YouTube, etc.

Implementation

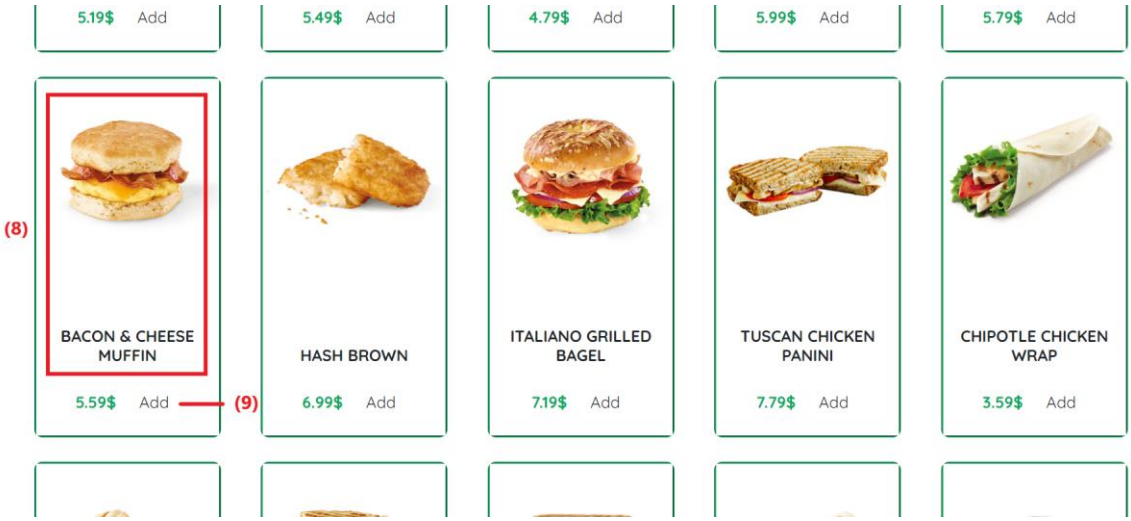
1. Customer View

After scanning the QR code placed on the table, the customer device is presented with the restaurant's Menu Page (UI 1.1) viewing all available food and a banner slide for special deal promotion (2). Below the banner slide is the categories filter bar with multiple for different food types: All (3), Breakfast (4), Lunch (5), Sweet (6), Drink(7), clicking on each category will filter and show only the list of products that belong to that category.



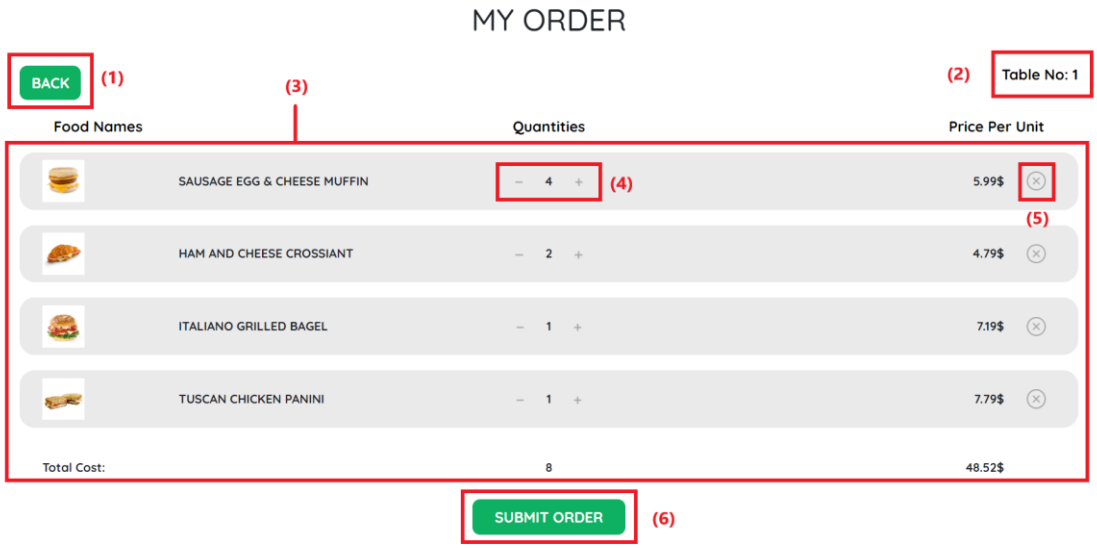
UI 1.1: Customer View start with Menu Page (1)

Below the navigation bar is the menu itself viewing multiple cards for each product (UI 1.2). Each product card contains an image illustrating the food (8), the price and a button to add the product to cart (9). Customers can browse and add the desired food to the local cart store on their device. After being satisfied with their order, customers can click on the cart button placed on the top-right side of the page (1) to route to the View Order page (UI 1.3)



UI 1.2: Customer View start with Menu Page (2)

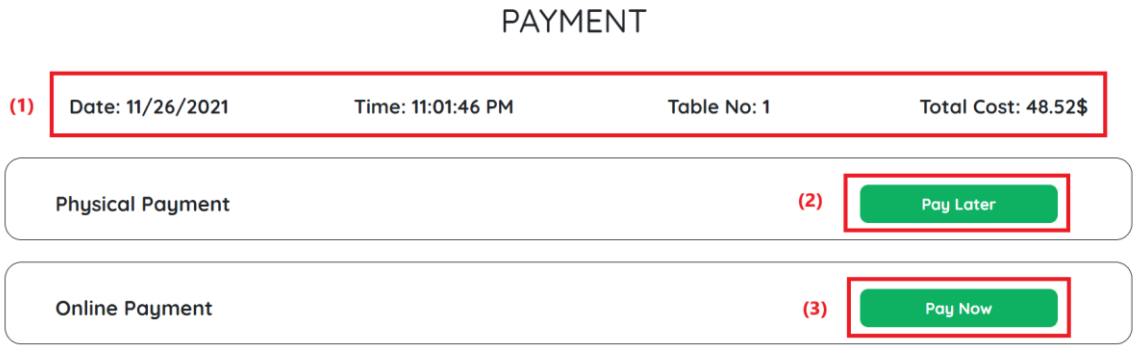
The view order page shows the table number (2) and customer current order state (3). Customers can either modify the quantity of the same product that they want (4) or remove product from the cart (5). Customers can click on the back button (1) to continue browsing the menu. Finally, customers will click on the Submit Order button (6) to finalize the order and routing to payment page (UI 1.4) and start the payment process.



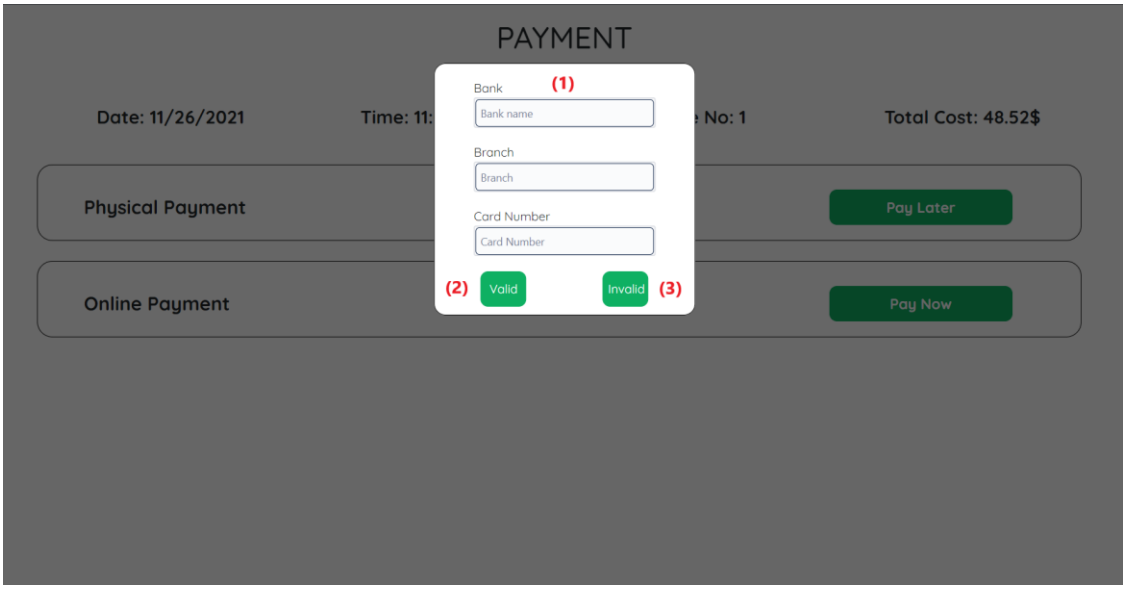
UI 1.3: Customer View of Their Order

In the Payment page (UI 1.4), there are some fields that show information about customer's detail (1): Date which is the date of the customer's order, Time which is the time

that a customer makes his/her order, Table No to show the table number that the customer is using and the total cost which shows the amount of money that the customer must pay.



UI 1.4: Customer View with Making Payment Feature

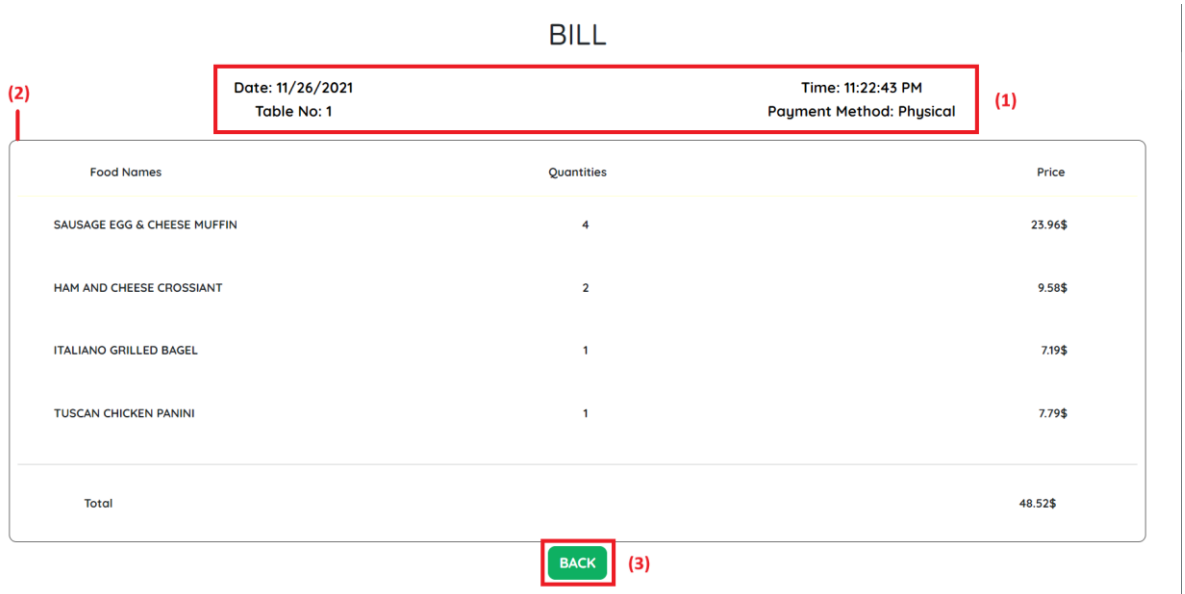


UI 1.5: Online Payment simulation with Valid and Invalid Option

The customer can choose two options: Physical method or Online payment. If the customer chooses Physical payment, he/she can press the confirm button (2) in the physical payment box, and the customer will send their payment request to the Clerk. If the customer

chooses Online payment, they press the confirm button (3) in the online payment box, and the customer will receive a window that shows in the screen (UI 1.5).

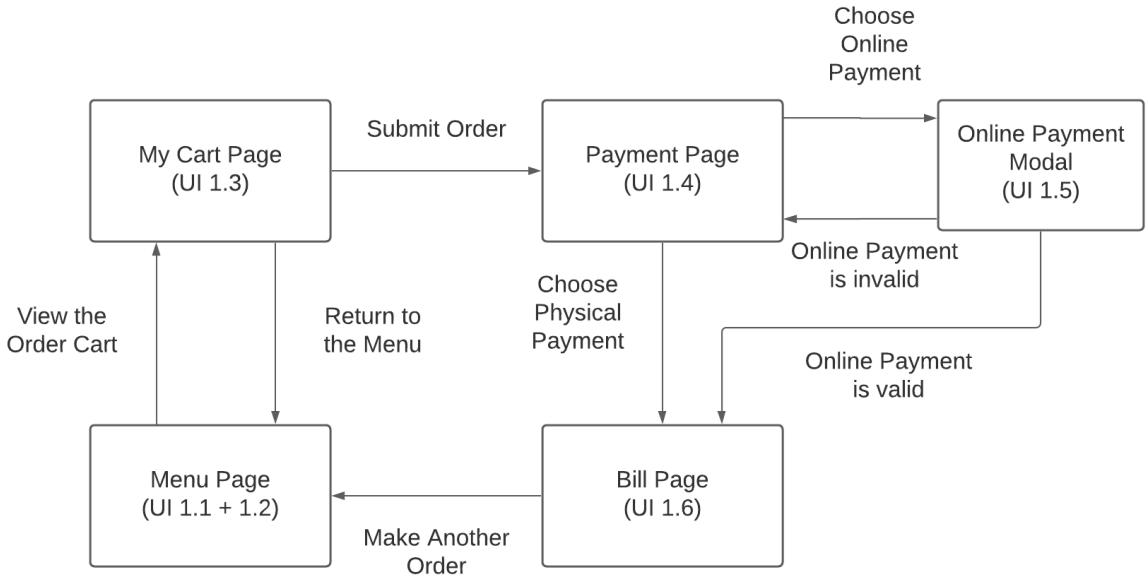
After filling 3 fields Bank, Branch and Card number (1) to connect to his/her bank account, the Valid and Invalid Option is a simulation of the Online Payment Service, when the customer clicks on Valid, System registers the Payment as Valid and move to the Bill, while clicking on Invalid, System registers the Payment as Invalid and return customers back to the Payment Page, where Customer should choose a different payment method.



UI 1.6: System displays the bill for the Payment/ Order

In Bill page (UI 1.6), there are four information (1) provided below the Bill header that are similar to Payment page, Payment Method is the method that customer chooses in Payment page. Below the information field is the summary table (2). The table provides several information about the order, these are Product Name, Quantities of each type Product, Price of each type Product and Total Payment. At the bottom of the page is Back button (3), which will return to the Menu page and reset all information in the cart when a customer presses it, used for making new orders.

Screen flow of Customer View (From View Menu, Make Order to Make Payment, Bill Page)



Since this feature is an important feature, a screen flow diagram is needed.

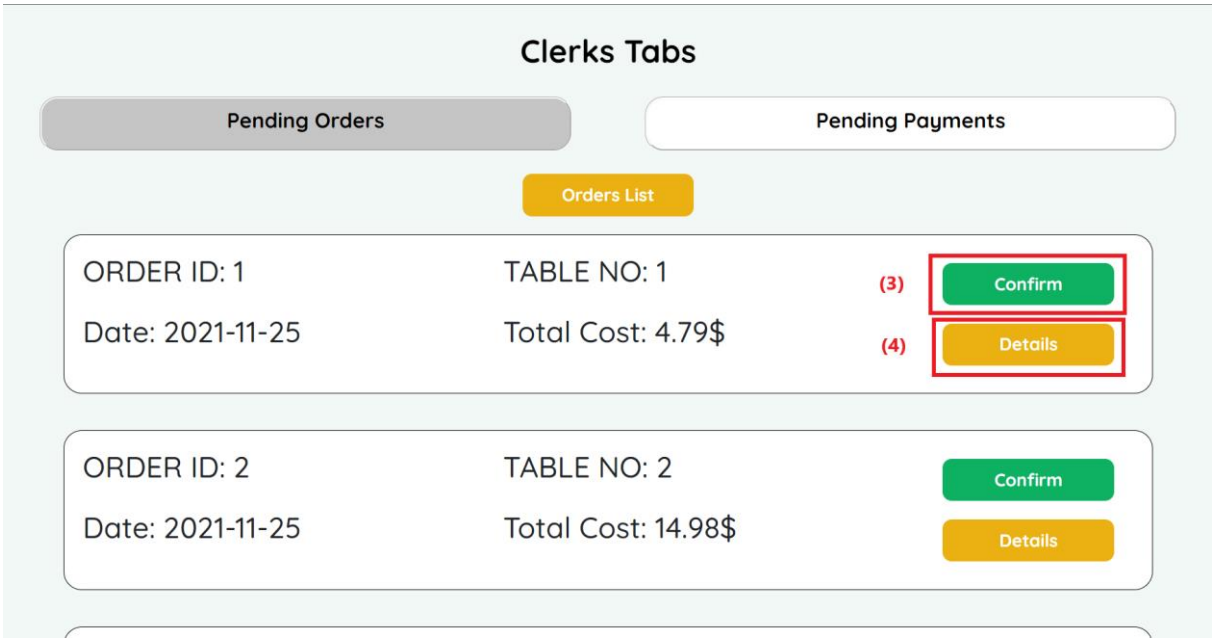
- Customers start as Menu Page (UI 1.1), can add Product to their Order and moves to My Cart Page by the Cart Button
- In My Cart Page, customer can go back to Menu Page through the Back Button, can change Quantity of current in-cart Product or clicks Submit Order for Clerk to Confirm, after their Order has been confirmed, customers go to Payment Page
- In Payment Page, customers choose between Physical Payment and Online Payment, if they choose Online Payment, a pop up will appear, require input information, click the Valid Option simulated the Online Payment Service validates the Payment and customer moves to Bill Page, otherwise, they remain in Payment Page to choose a different payment option
- In the Bill Page, customers can go back to the Menu Page to make a new Order

2. Clerk View

When starting up the view on the browser, the clerk is presented only with the navigation bar (UI 2.1) with two options, click on Pending Orders navigation link (1) views list of pending orders waiting to be confirmed (UI 2.2), the same with Pending Payments navigation link (2) views list of pending payments (UI 2.3).

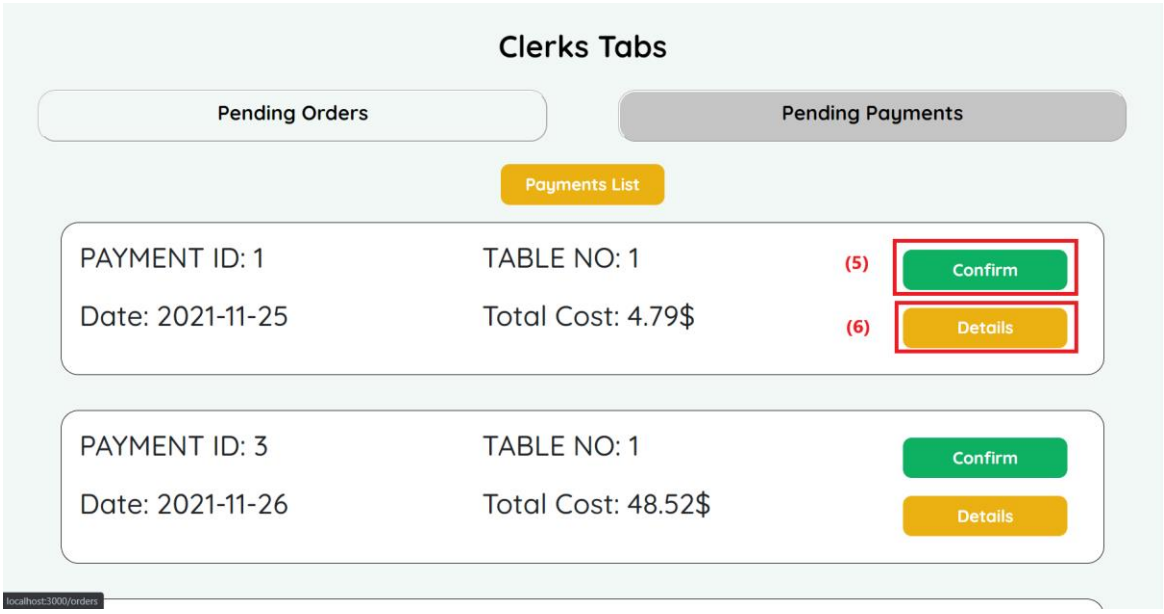
UI 2.1: Clerk View Load Page

On the Orders List page (UI 2.2), there are rows of items presented for each pending order, clicking on the confirm button (3) will send the accept update to backend and the item will disappear from the screen and clicking on detail button (4) will route to the Order Detail Page (UI 2.4).



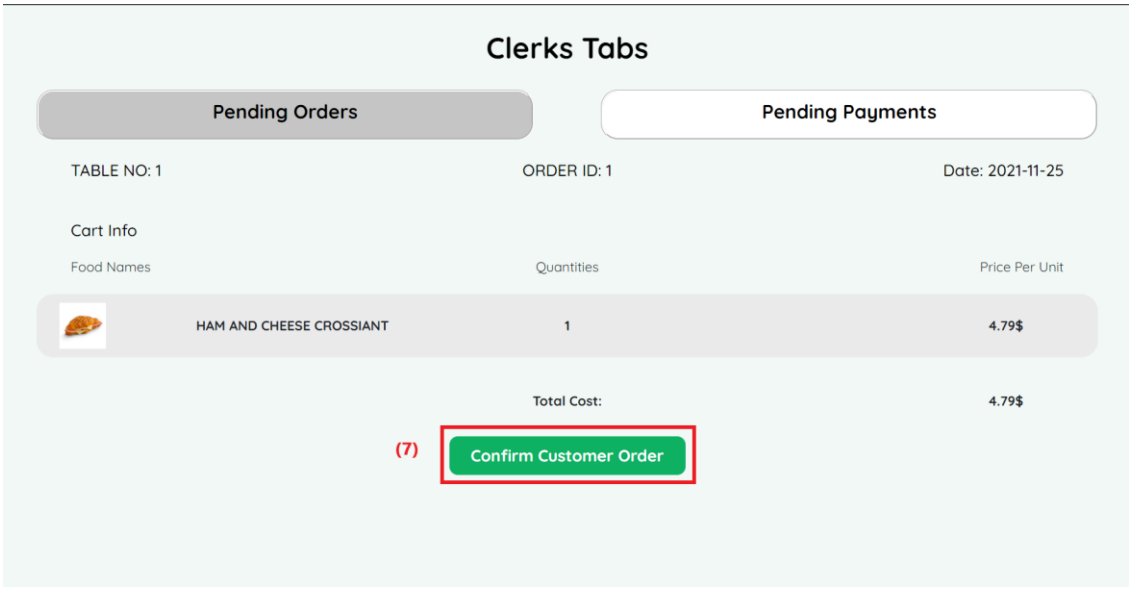
UI 2.2: Clerk View Orders List

The same with Payments List Page (UI 2.3), clicking confirm button (5) to accept the payment and clicking detail button (6) to view Payment Detail (UI 2.5).



UI 2.3: Clerk View Payments List

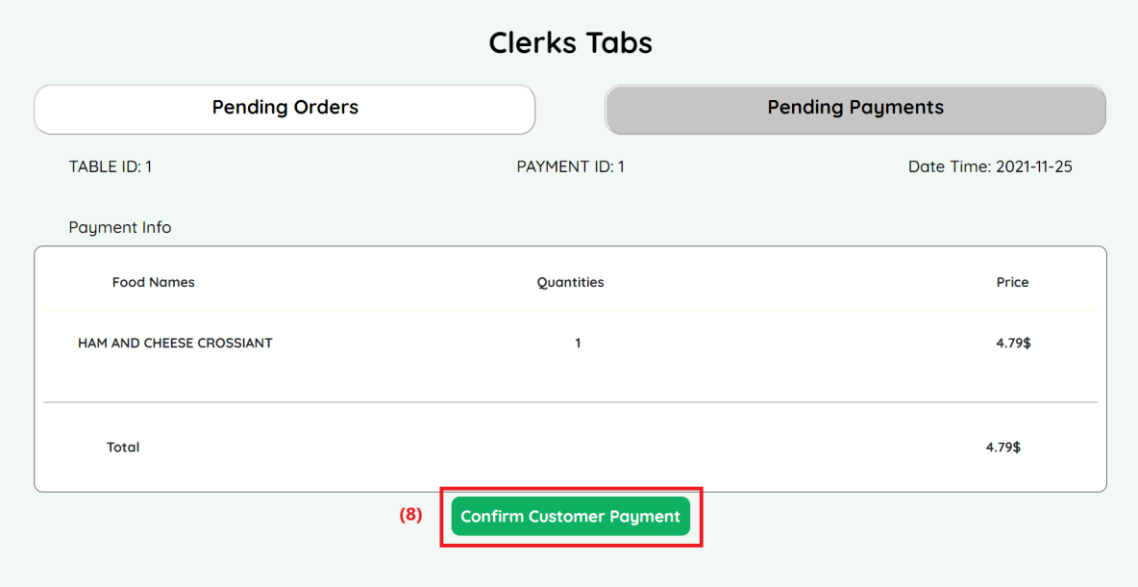
On the Order Detail page (UI 2.4) the details about the list of products ordered by the customer are presented with the prices and the total cost of the order, clicking the 'Confirm Customer Order' (7) will send an update request to backend. Clerk now will be return back to the Orders List page (UI 2.2) and the confirm order is removed from the list appeared UI



UI 2.4: Clerk View Order Detail

On the Payment Detail page (UI 2.5) the bill of the direct payment is presented. After the customer paid the bill, the clerk will click the 'Confirm Customer Payment' to confirm

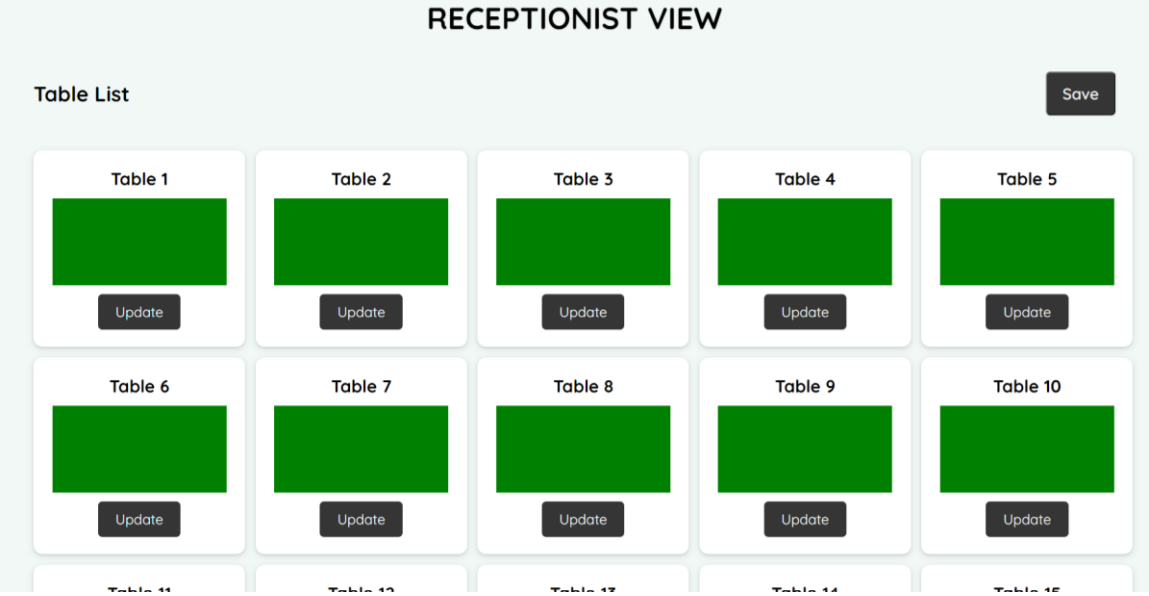
payment and will be routed back to the Payments List page (UI 2.3) and the confirmed payment will disappear.



UI 2.5: Clerk View Payment Detail

3. Receptionist View

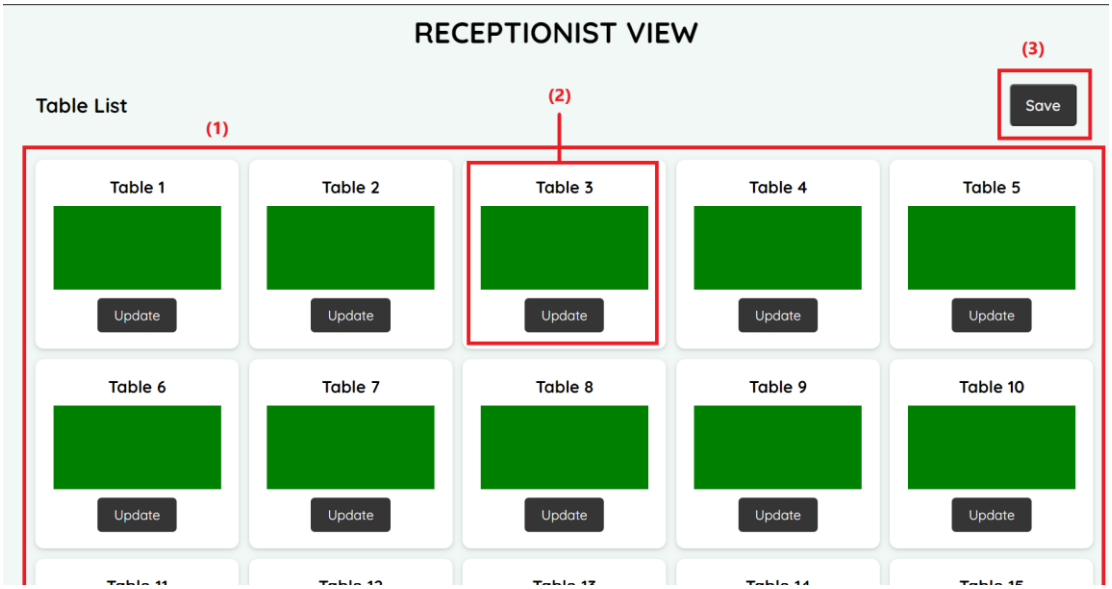
When start up the page, the System will execute the procedure to get 25 table's status from the Restaurant Database and display them to the Receptionist



UI 3.1: Receptionist view with Feature Table Management

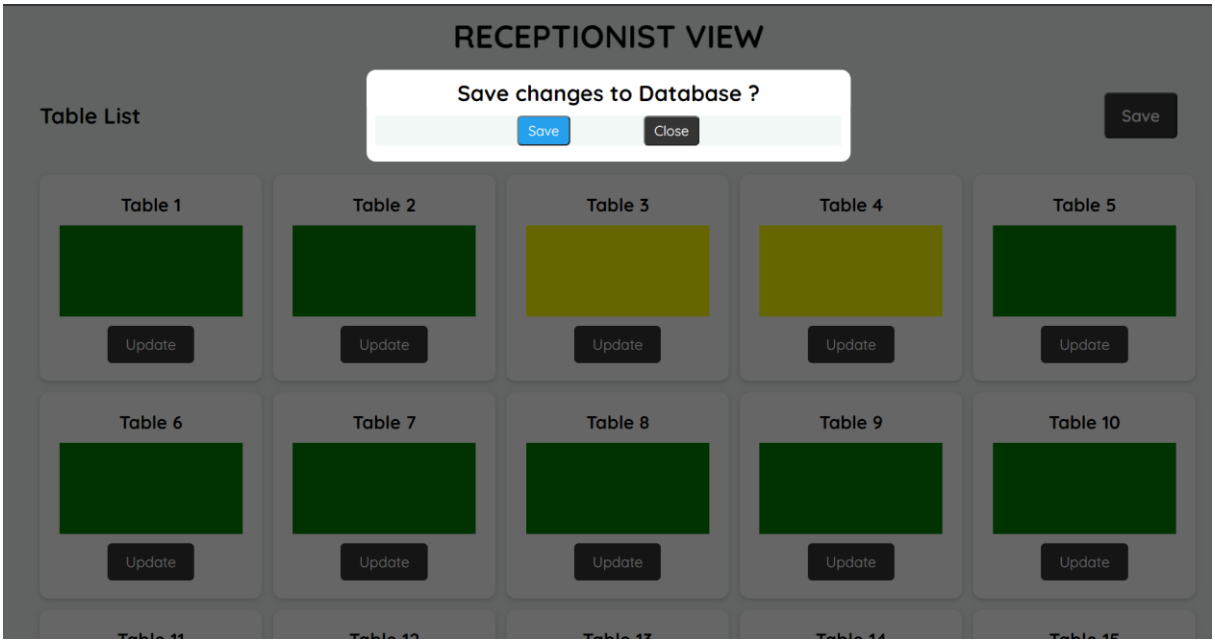
Each table is displayed as each card (Object 1) in a grid, inside each card contains table number, table status represented by a colored box (green as available and yellow as occupied) and a "Update" button to change its status.

When receptionist presses "Update" button in a selected table, the colored box toggles its (from yellow to green and vice versa) and the system saves that change to its local storage



UI 3.2: Table Management annotation

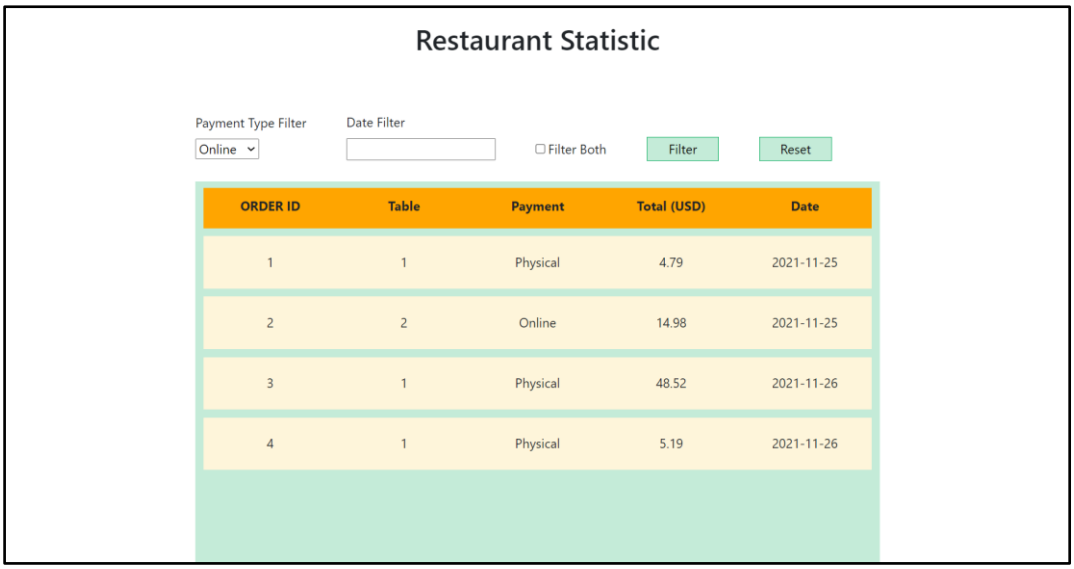
When receptionist has finished their update, the receptionist clicks the Save Button (2), which pops up a modal asking to confirm the choice and if receptionist chooses to save, the changes will be updated to the Restaurant Database



UI 3.3: Save Changes to Database popup

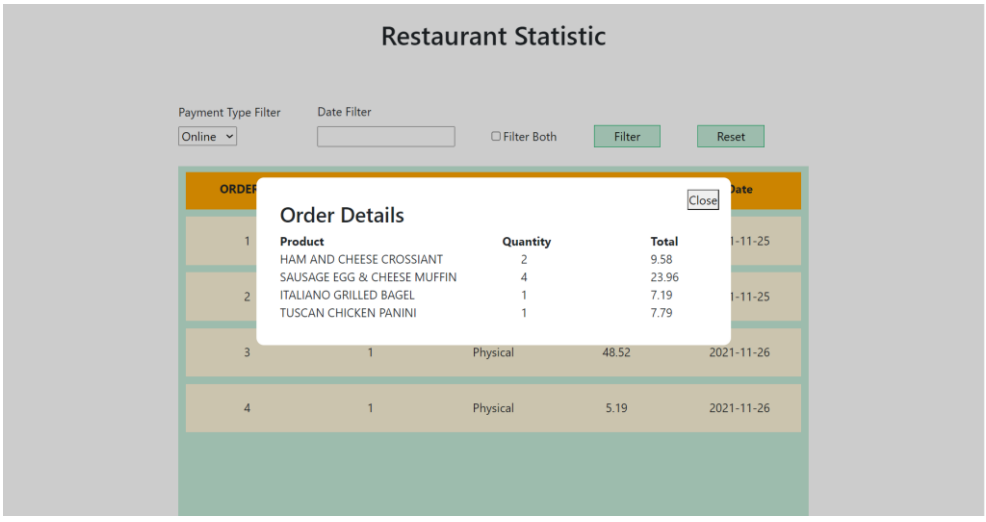
4. Manager View

When starting up the page, the System will execute the procedure to get all orders and payments recorded from the Restaurant Database and display them to the Manager in pages. Each Record is displayed as each row in the Data Table (6), inside row contains Order ID, Table of the Order, Payment Type, Total Bill and Date



UI 4.1: Manager view screen

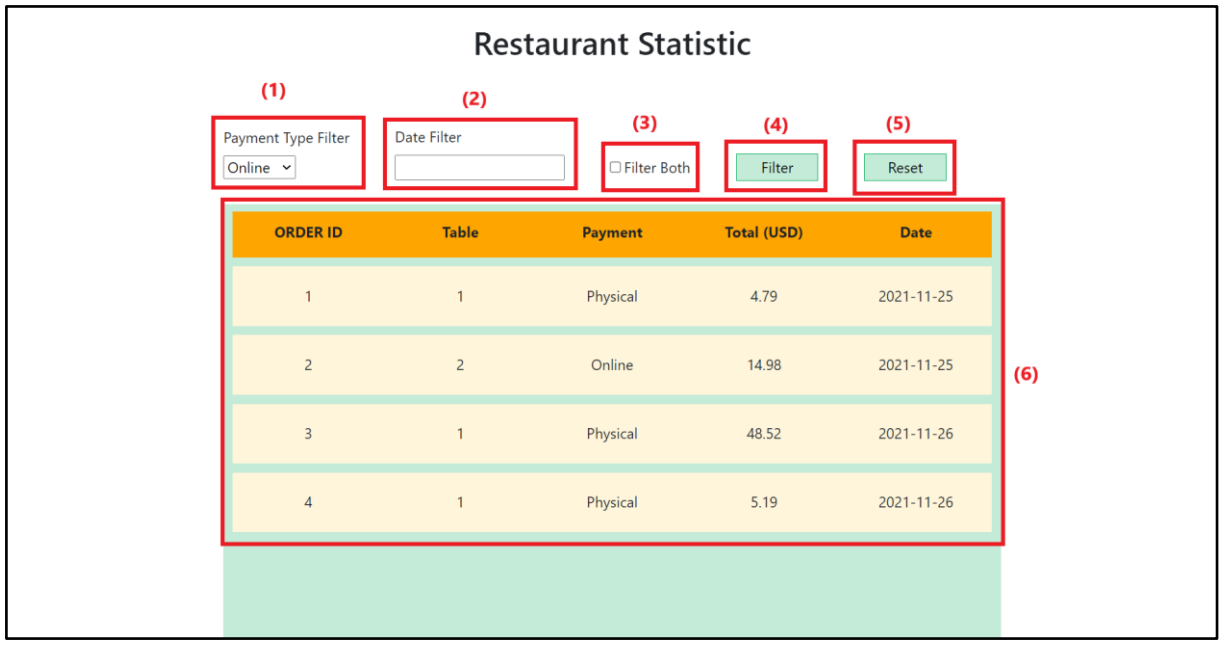
When Manager clicks a row in the data table, system displays a modal showing the order detail about that order/ payment



UI 4.2: Pop-up screen

Manager can filter records by date when choosing a day in the Date Picker (2) and presses the filter button (4), payment method by using Payment Type Filter (1) and presses the filter button (4) or both by choosing input for (1) and (2), check the filter both box (3) and then presses the filter button (4) .

After filtering data, the manager can press the Reset button (5) to view all records.



UI 4.3: Manager view annotation

GitHub repository

For further detail, please visit the work at our GitHub repository

https://github.com/remsokawaii1/CNPM

The final product is in branch /main.

The development branch is branch /customer

The document branch is branch /document