FACULTY OF COMPUTING
UTM Johor Bahru

SECD2613 - 03

SYSTEM ANALYSIS AND DESIGN

INFORMATION SYSTEM GATHERING AND REQUIREMENT

KACANI ORDERING SYSTEM

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SUBMISSION DATE:

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1.0 Overview of the Project

In this project, our team wants to develop an efficient cafe' operating platform, which is the KACANI ordering system. For this system, it will help increase the efficiency of ordering and make things easier in the local cafes. Our target client is Kacani Cafe, a well-known eatery within UTM.

The current operating model of Kacani cafe uses the basic traditional manual process, so it may face difficulties when they are busy serving food orders for their customers. Some of them include long queues, order mistakes, and less real-time stock visibility. Therefore, to know more information about Kacani cafe's operating processes from current employees, we collect information through questionnaires, interviews, and actual observation processes regarding the use of questionnaires and also direct information with users themselves as our main source of data for identifying possible problems and needs.

The KACANI Ordering System will use a digitalization system, including the order management, tracking of inventory, payment, and customer feedback to alleviate these issues. Besides automating the order processing and providing exact information, it can give benefits like self-service ordering and serving the consumers with several payment options.

2.0 Problem Statement

Kacani Cafe currently uses a traditional manual ordering system, which mainly relies on employees to record orders and manage inventory manually. This manual process exposes many problems during peak hours (e.g breakfast, lunch and dinner), such as:

- Customers need to queue up for long periods of time to order.
- Employees often make mistakes or misunderstand customer requests.
- Customers cannot customize their orders (such as drink sweetness, special notes, etc.).
- Lack of systematic inventory management often results in ingredients being discovered after they are exhausted and unable to be replenished in time.

- The single payment method cannot meet the needs of college students who prefer cashless transactions.
- There is no convenient way to collect customer feedback and suggestions, which affects the improvement of service quality.
- Employees need to undertake multiple tasks (ordering, cashing, preparing meals), with heavy workloads and reduced service efficiency.

These problems lead to poor customer experience, inefficient ordering, chaotic operations, and may have a negative impact on the reputation and revenue of the cafe. Therefore, it is necessary to develop a digital and automated ordering system to optimize processes, reduce errors, improve customer satisfaction and enhance overall management capabilities.

3.0 Proposed Solutions

To improve operational efficiency and enhance customer experience, we proposed implementing a cafe' operating system tailored to manage orders, inventory, and day-to-day transactions. This system will reduce manual errors, optimize stock control, and provide data-driven insights to support business growth. The solution will include the following features :

First of all, the KACANI ordering system will provide an order management system that can accept, modify, and complete orders for customers easily. This feature allows staff to manage orders efficiently, from accepting new ones to modifying and completing them. For example, the system will be receiving the orders and sending them to the cafe so that the cafe employees can monitor the orders. Thus, it can reduce errors by preventing a wrong order, speed up the operation, and ensure a smoother service experience for both staff and customers.

Furthermore, KACANI ordering system has inventory management for the client. They can track their stock in their inventory and they could get low-stock alerts. Inventory tracking helps businesses monitor stock levels in real time and receive a notification when items run low. This prevents stock outs or overstocking, so that they can restock in time to ensure better availability and smoother operations.

Other than that, the KACANI ordering system also has a Payment Gateway Integration. This allows customers to choose their preferred payment option from various payment options, including online transfers via e-wallets and Bank QR, or physical methods like credit cards, debit cards, and cash. This variety makes the checkout process faster, more convenient, and secure, catering to different customer preferences and ensuring a smooth transaction experience.

Last but not least, KACANI's ordering system will be offering a customer feedback & rating system. The customer will be asked to give some feedback when they finish their dining experience. This allows customers to rate their experience by giving ratings from the environment, the food, or the employees' service, or just leaving feedback. This feedback will be valuable insights for the client's cafe and suggest improvements for the cafe. This feature helps businesses identify strengths and areas to improve, leading to better service and stronger trust.

4.0 Current Business Process/Workflow

4.1.1 Customer Workflow: Placing and Picking Up an Order

Scenario: A customer wants to order coffee and a pastry for pickup.

Workflow:

- **Step 1: Accessing the Menu & Browse**
    - **Input:** Customer navigates to the Click&Sip website or mobile app.
    - **Process:** The system loads and displays the cafe's current menu, categorized by food/beverage type, with item descriptions and prices.
    - **Output:** Customer sees the available menu items.
- **Step 2: Selecting Items and Building an Order**
    - **Input:** Customer taps or clicks on desired items (e.g., "Latte," "Croissant") and specifies quantities. The customer might also add customizations (e.g., "extra shot," "almond milk").
    - **Process:** The system adds the selected items to a virtual shopping cart. It calculates the running subtotal and updates the cart display in real-time.
    - **Output:** The customer's shopping cart shows the selected items, quantities, and subtotal.
- **Step 3: Reviewing the Order & Specifying Pickup**
    - **Input:** Customer clicks on the "View Cart" or "Checkout" button. They then review their selections and choose a desired pickup time from available slots.
    - **Process:** The system presents a summary of the cart, applies any relevant taxes/fees, and calculates the final total. It validates the selected pickup time against the cafe's operating hours and current order load.
    - **Output:** A complete order summary with final price and a prompt to confirm the pickup time.
- **Step 4: Payment**
    - **Input:** Customer provides payment details (e.g., credit card information, e-wallet selection).

    - **Process:** The system securely transmits payment details to the integrated payment gateway. The gateway processes the transaction and returns a success or failure response.
    - **Output:** Payment confirmation or an error message if the transaction fails.
- **Step 5: Order Confirmation**
    - **Input:** Successful payment.
    - **Process:** The system generates a unique order ID, records the order in the database, and sends an automated confirmation (via email/app notification) to the customer with the order details and pickup time.
    - **Output:** A "Thank You" screen with the order ID and pickup time displayed to the customer, and a confirmation email/notification received by the customer.
- **Step 6: Picking Up the Order**
    - **Input:** Customer arrives at the cafe at the specified pickup time and provides their order ID or name.
    - **Process:** Cafe staff verifies the order ID against their "ready for pickup" list.
    - **Output:** Customer receives their prepared order.

4.1.2 Cafe Staff Workflow: Managing Orders and Menu

Scenario 1: Processing a New Order

Workflow:

- **Step 1: New Order Notification**
    - **Input:** A customer places a new order through Click&Sip.
    - **Process:** The system immediately pushes a real-time notification (e.g., sound alert, visual highlight) to the staff dashboard.
    - **Output:** Staff dashboard displays the new incoming order prominently.
- **Step 2: Viewing Order Details**
    - **Input:** Staff member clicks on the new order notification.

    - **Process:** The system retrieves and displays all details of the specific order, including items, quantities, customizations, customer name, and desired pickup time.
    - **Output:** A detailed view of the customer's order.
- **Step 3: Updating Order Status (Preparation)**
    - **Input:** Staff acknowledges the order and begins preparation. They click "Mark as Preparing."
    - **Process:** The system updates the order's status in the database to "Preparing." This status change is visible on the staff dashboard and, potentially, to the customer via their order tracking.
    - **Output:** Order status updated on the system.
- **Step 4: Updating Order Status (Ready for Pickup)**
    - **Input:** Staff completes the order preparation and places it in the pickup area. They click "Mark as Ready for Pickup."
    - **Process:** The system updates the order's status to "Ready for Pickup" and automatically sends a notification (e.g., in-app push, email) to the customer.
    - **Output:** Order status updated, customer notified their order is ready.

Scenario 2: Managing Menu Items

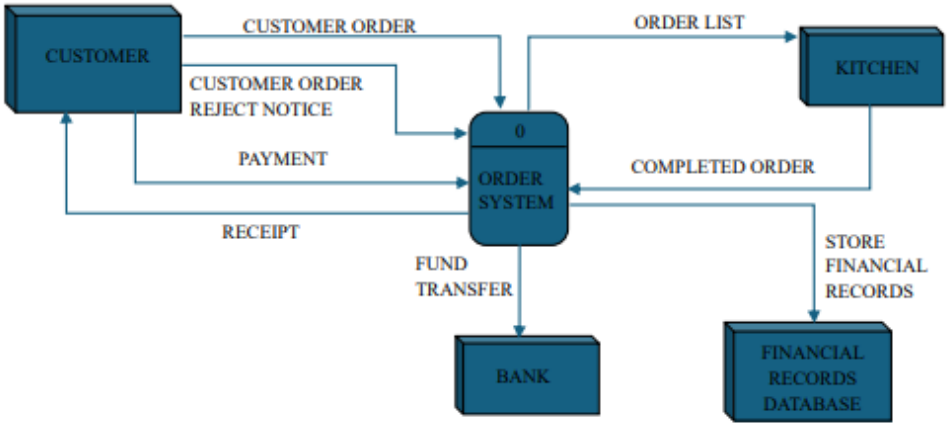
Workflow:

- **Step 1: Accessing Menu Management**
    - **Input:** An authorized staff member logs into the Click&Sip admin panel and navigates to the "Menu Management" section.
    - **Process:** The system loads the current list of menu items with their details.
    - **Output:** Display of existing menu items, categories, prices, and availability.
- **Step 2: Adding a New Item**
    - **Input:** Staff clicks "Add New Item" and inputs item name, description, price, category, and uploads an image (if applicable).
    - **Process:** The system validates the input, creates a new entry in the menu database, and assigns a unique ID.

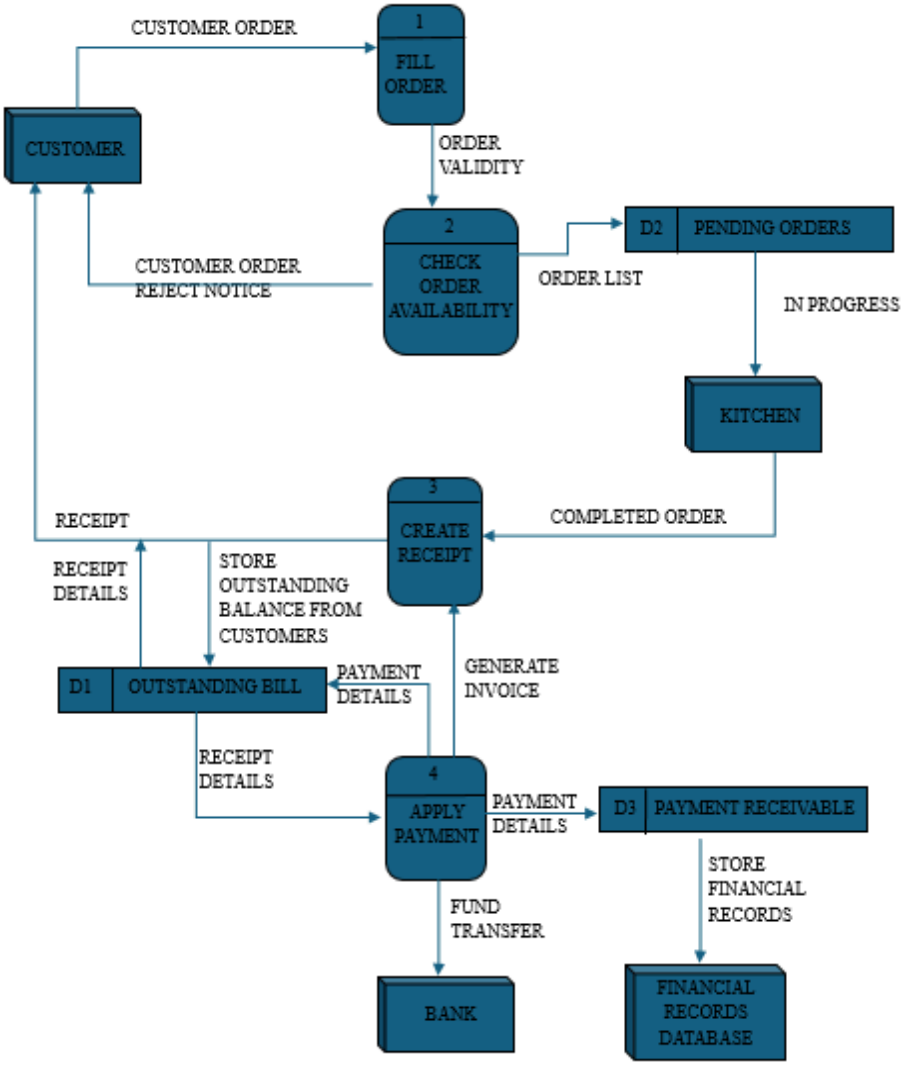
    - **Output:** The new item appears on the menu for customers.
- **Step 3: Updating an Existing Item**
    - **Input:** Staff selects an existing item and modifies its details (e.g., price change, description update, marking as "out of stock").
    - **Process:** The system updates the corresponding record in the menu database. If an item is marked "out of stock," it removes it from active display for customers.
    - **Output:** The menu displayed to customers reflects the updated item details or its unavailability.
- **Step 4: Removing an Item**
    - **Input:** Staff selects an item and confirms "Remove Item."
    - **Process:** The system deletes the item record from the menu database.
    - **Output:** The item is no longer visible on the customer-facing menu.

5.0 Logical DFD (AS-IS)

5.1 Context Diagram

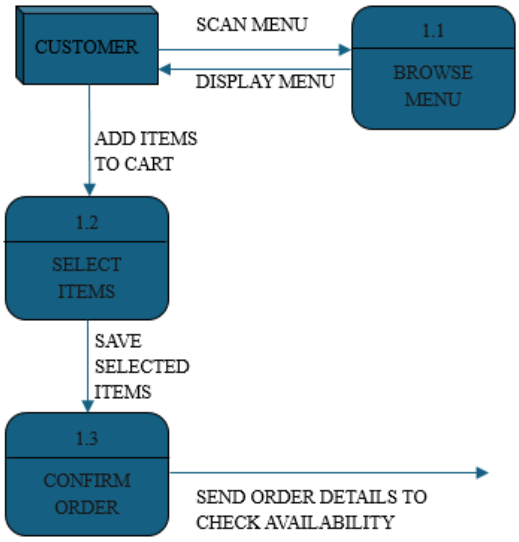


5.2 Diagram 0

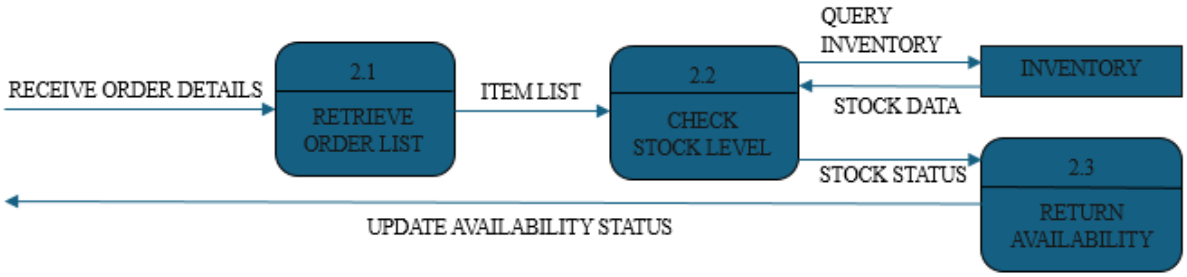


5.3 Child Diagram

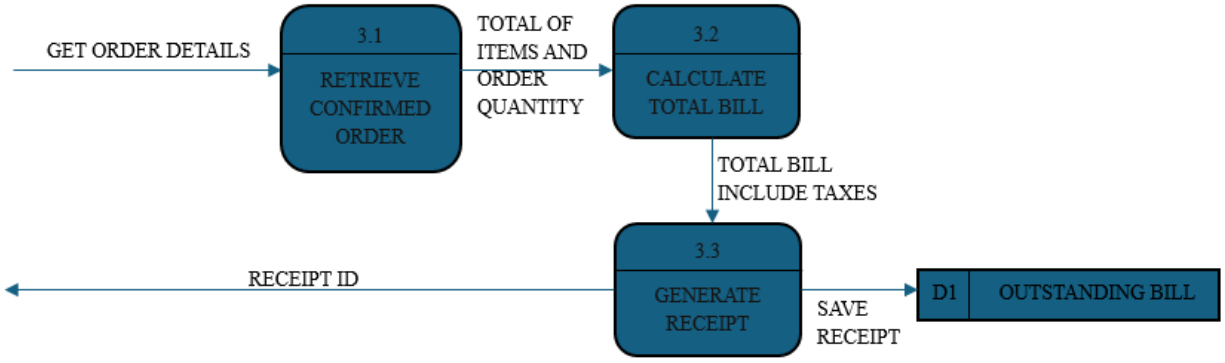
5.3.1 Process 1 - Fill Order



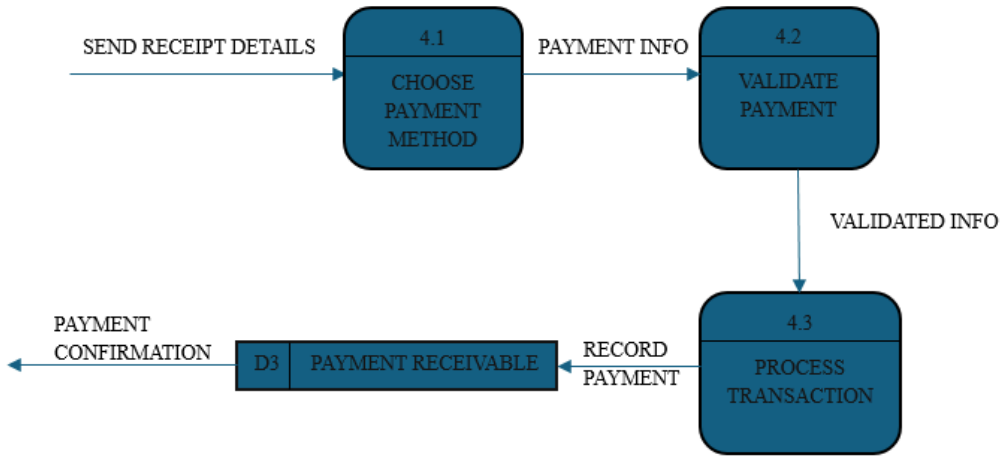
5.3.2 Process 2 - Check Order Availability



5.3.3 Process 3 - Create Receipt



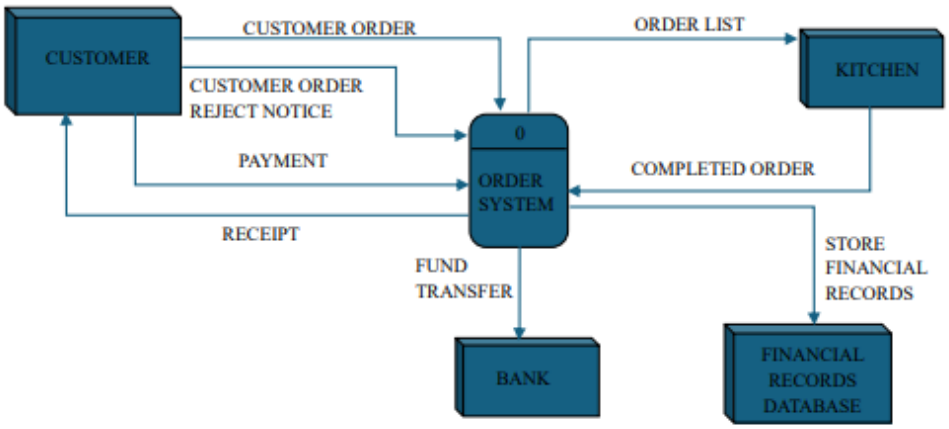
5.3.4 Process 4 - Apply Payment



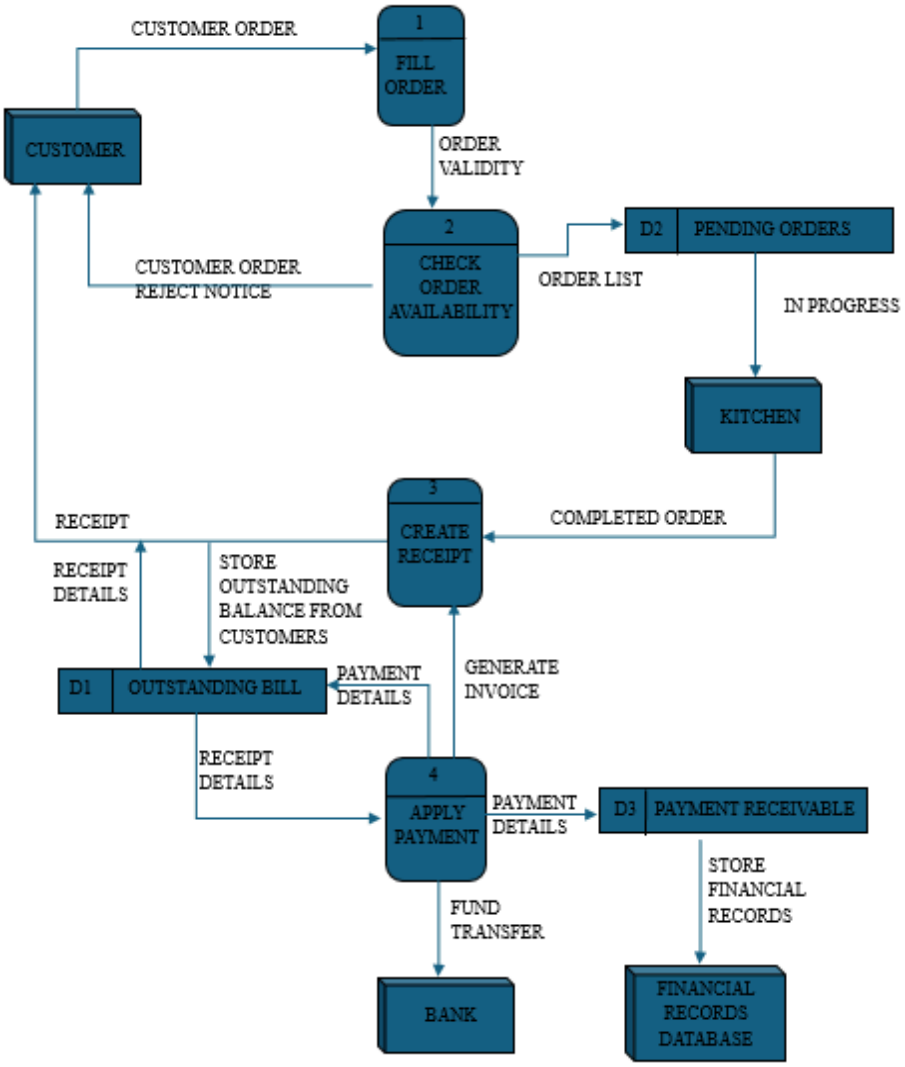
6.0 System Analysis and Specification

6.1 Logical DFD TO-BE system

6.1.1 Context Diagram

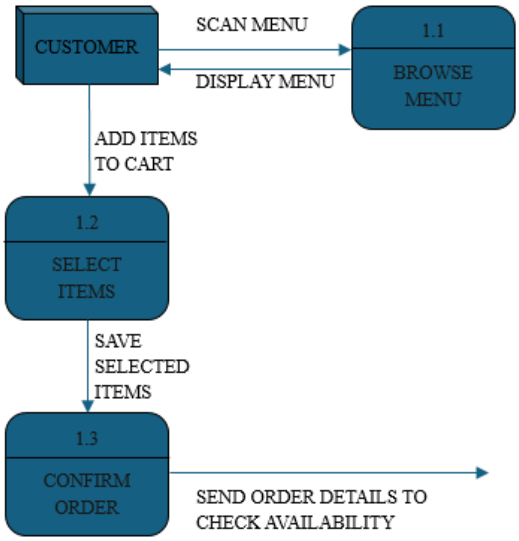


6.1.2 Diagram 0

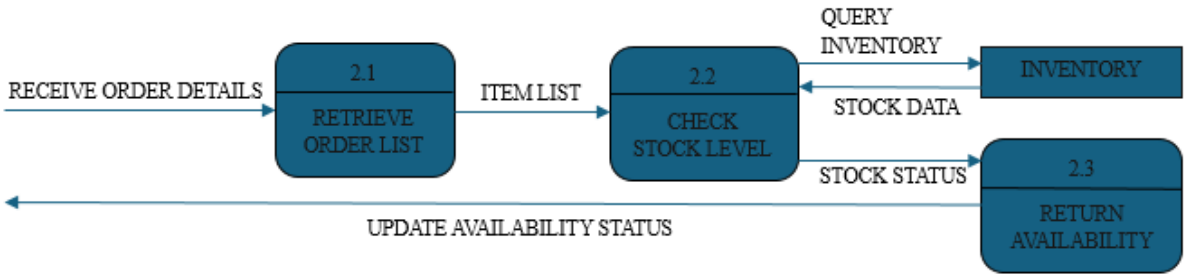


6.1.3 Child Diagram

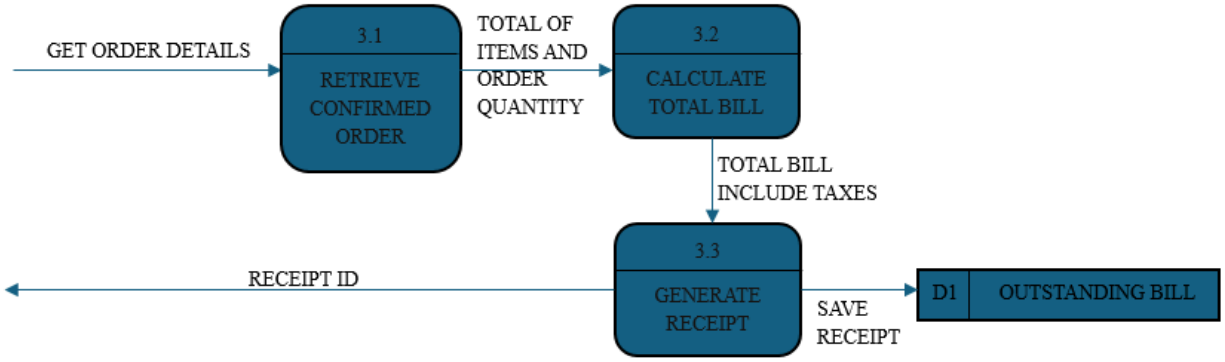
6.1.3.1 Process 1 - Fill Order



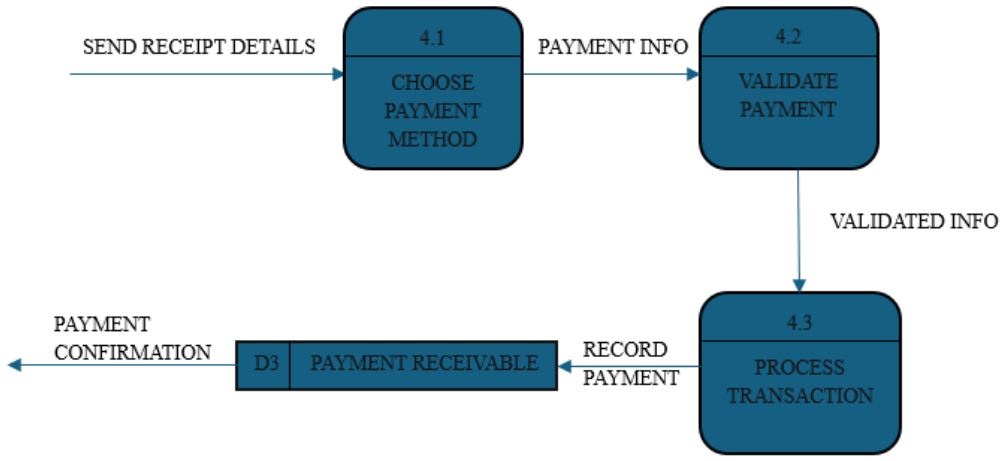
6.1.3.2 Process 2 - Check Order Availability



6.1.3.3 Process 3 - Create Receipt



6.1.3.4 Process 4 - Apply Payment



6.2 Process Specification (based on Logical DFD TO-BE)

6.2.1 Process 1 – Fill Order

Input:

- Menu selection by customer through mobile/web interface
- Quantity of items
- Optional special instructions (e.g., less sugar, add ice)

Process:

- System retrieves menu from the database and displays it to the customer.
- Customer selects items and customizations and adds them to a virtual cart.
- Upon confirmation, the system captures the order details and stores them in the order database.
- The order is temporarily held for availability verification in the next process.

Output:

- Preliminary order data saved in cart
- Order ID generated
- Sent to availability check process

6.2.2 Process 2 – Check Order Availability

Input:

- Preliminary order details from Process 1
- Requested quantity of each menu item

Process:

- The system cross-references each ordered item with the current stock level in the Inventory DB.
- If an item is out of stock, the system will mark it as unavailable or suggest alternatives.
- For low-stock items, a real-time update may be sent to the staff dashboard for action.
- If all items are available, the system proceeds with the order and updates the inventory levels accordingly.

Output:

- Availability confirmation
- Updated inventory status in Inventory DB

- Notification to the order process to proceed with receipt generation

6.2.3 Process 3 – Create Receipt

Input:
- Confirmed order details with validated availability
- Item prices and applicable taxes

Process:
- The system calculates the subtotal based on quantity and item price.
- Taxes and additional charges (if any) are applied.
- A receipt is generated, including order ID, items ordered, total amount, and timestamp.
- The receipt is stored in the Outstanding Bill DB and sent forward for payment processing.

Output:
- Receipt stored in Outstanding Bill DB
- Receipt summary (items, total price, order ID)
- Data sent to the payment gateway interface

6.2.4 Process 4 – Apply Payment

Input:
- Receipt details
- Payment method selected by customer (e-wallet, QR code, credit/debit card, or cash)

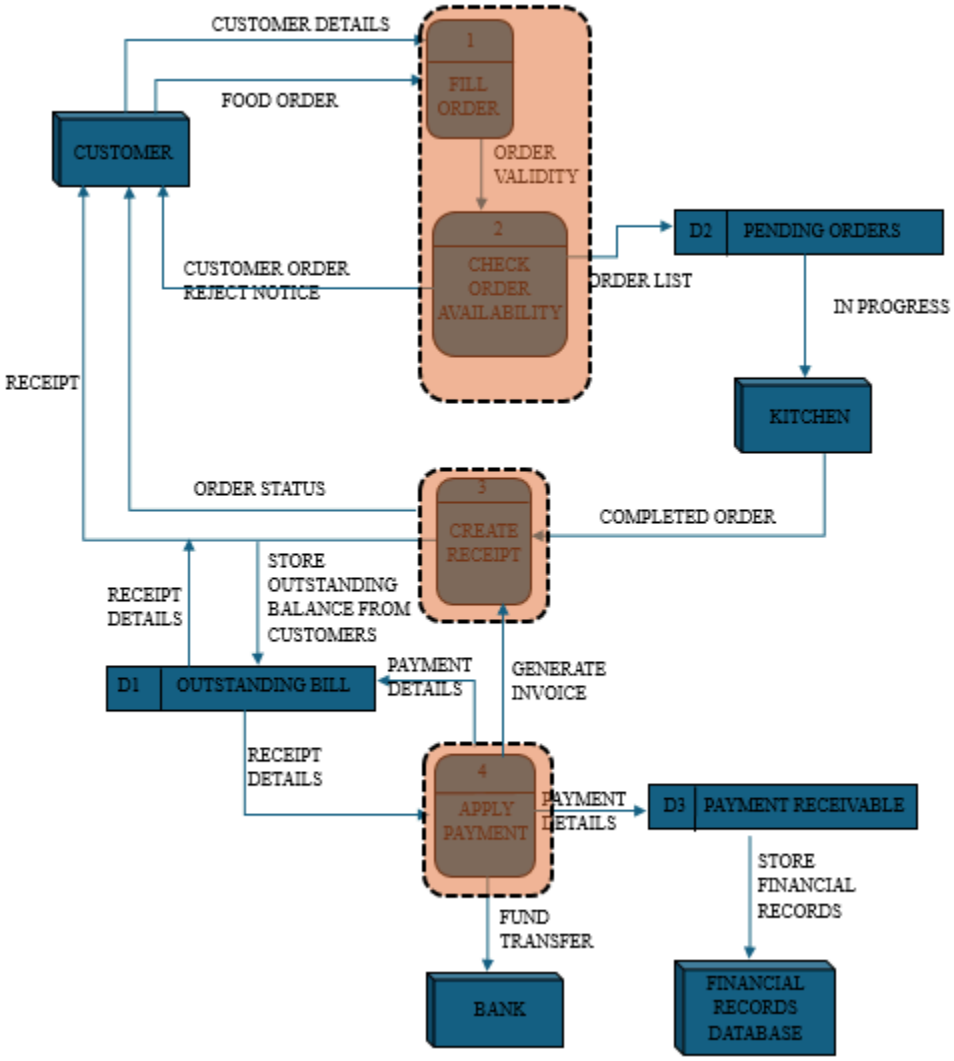
Process:
- System prompts the customer to select a payment method.
- For online methods, the system integrates with the payment gateway to securely process transactions.
- Upon transaction success, payment confirmation is generated.
- If the transaction fails, the system prompts the customer to retry or select another method.

Output:
- Payment record stored in Payment Receivables DB
- Success or error status is shown to the customer
- Order status updated to "Paid" upon successful transaction
- Digital receipt/confirmation displayed and optionally emailed or pushed via app

7.0 Physical System Design

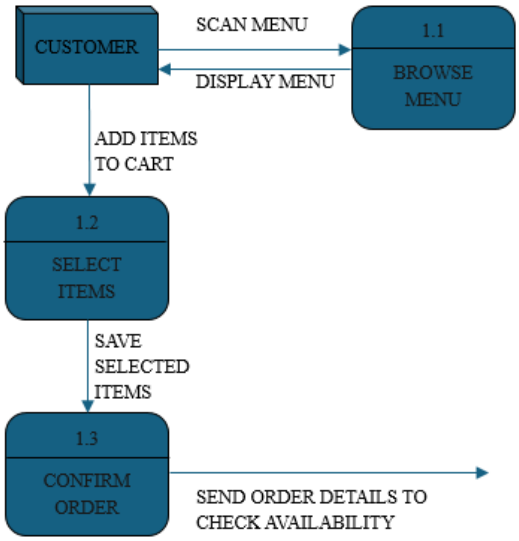
7.1 Physical DFD TO-BE system

7.1.1 Diagram 0

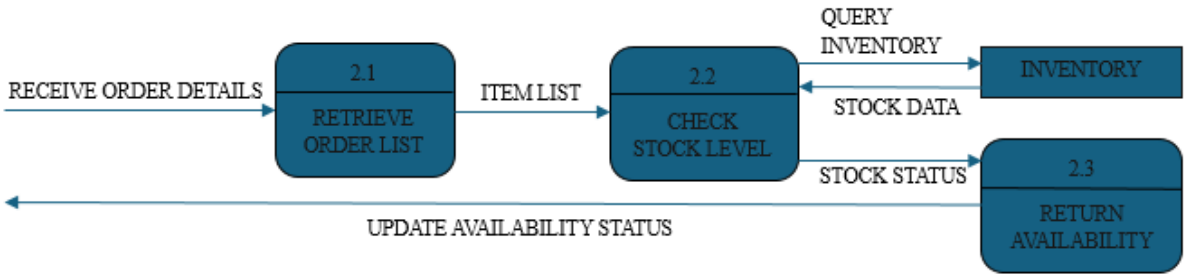


7.1.2 Child Diagram

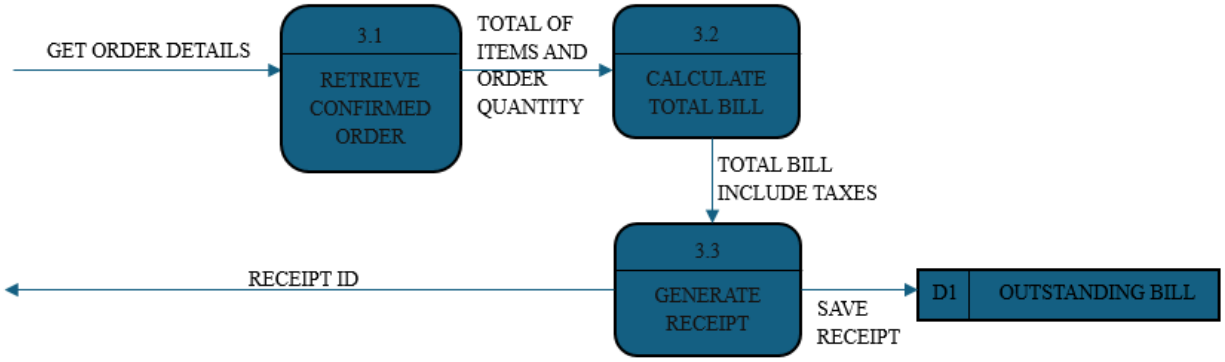
7.1.2.1 Process 1 - Fill Order



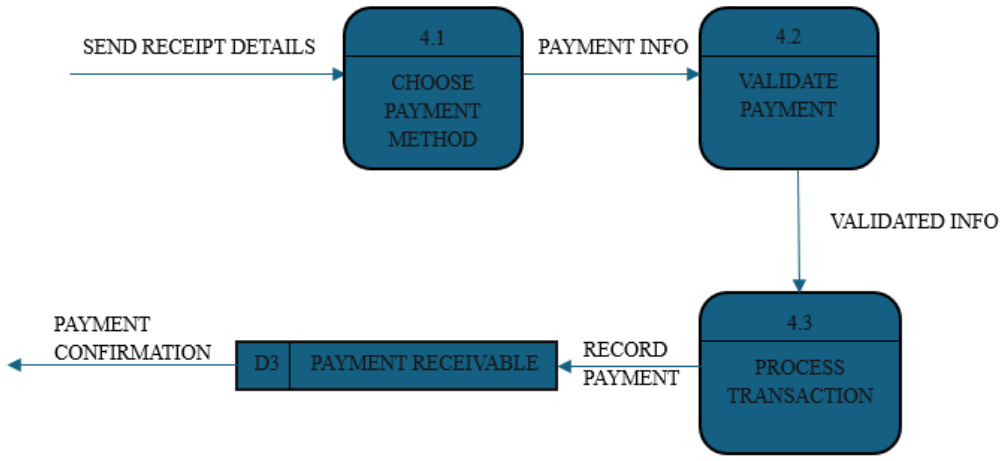
7.1.2.2 Process 2 - Check Order Availability



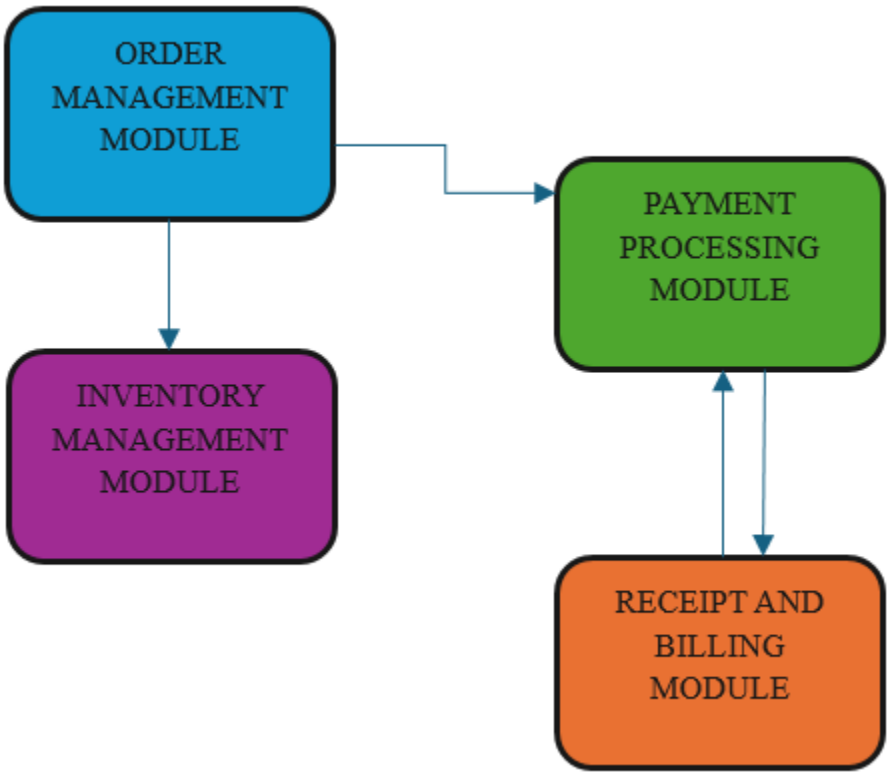
7.1.2.3 Process 3 - Create Receipt



7.1.2.4 Process 4 - Apply Payment



7.1.3 Partitioning



1. **Order Management Module**

   This is the core of the system's operations. It handles the end-to-end lifecycle of a customer order, from:

   - Filling and capturing order details (item, quantity, custom notes)
   - Checking item availability through real-time inventory access
   - Generating receipts
   - Processing order tracking and status updates (e.g., "preparing," "ready for pickup").

This module interacts closely with both the Inventory and Payment modules to ensure smooth coordination.

2. **Inventory Management Module**

   The inventory module tracks real-time stock levels of menu items and ingredients. Key responsibilities include:

- Updating stock upon order confirmation
- Alerting staff when ingredients are low or out of stock
- Managing inventory data (e.g., item name, quantity, status: in-stock/out-of-stock).

This module ensures accurate menu availability and prevents the risk of overselling items no longer in stock.

3. **Payment Processing Module**

   This module manages customer payments via different channels such as:

   - E-wallet
   - QR code
   - Credit/debit cards
   - Cash (manual confirmation).

It validates and processes the transaction through the integrated payment gateway, returns success/failure messages, and updates the order status upon successful payment. It also records financial transactions for future reconciliation.

4. **Receipt and Billing Module**

   After verifying order availability, this module is responsible for:

   - Calculating the total price including applicable taxes
   - Generating a digital receipt
   - Storing it in the Outstanding Bill Database,
   - Passing it on to the payment module.

This module ensures transparency in pricing and provides a permanent record for both customers and staff.

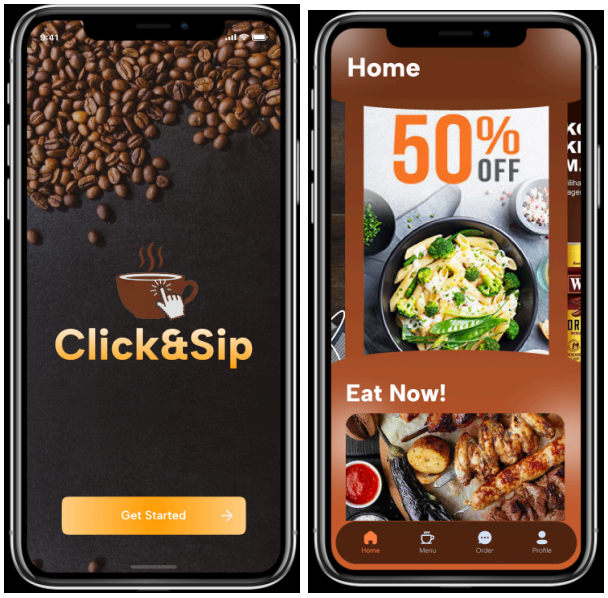
7.1.4 CRUD Matrix

Activity	Outstanding Bill	Pending Orders	Financial Records Database	Order List	Customer Details
Food Order		C		C	R
Check Order Validity		RU		RU	R

Create Receipt	C	D	C	R
Apply Payment	UR		U	U
Generate Invoice	R		C	R
Store Financial Records			CU	

8.0 System Wireframe (Input Design, Output Design)

Main Menu



Input Design:

- The user can:
    - click on menu categories (e.g., Drinks, Snacks) to filter items.
    - select an item to view more details or start ordering.
    - Select Profile Page

These inputs allow the user to start ordering their items .

Output Design:

- The system display:
    - Home screen that displays advertisements and their menu image

This output allows the cafe owner to show his cafe advertisements or food image in the screen to attract customers.

Profile Page

Input Design:

- The user can:
    - input personal information such as:
        - username
        - Password

This input allows users to input their information to login to their account.

Output Design:

The system display:

- Displays the current user profile data retrieved from the user database.

This output shows the current user profile data in this account and the user could be updating it anytime.

Ordering Page

Input Design:

- User can:
    - selects item(s) from the menu.
    - Input quantity.
      Adds special instructions (optional).
    - Proceeds to check out the order.

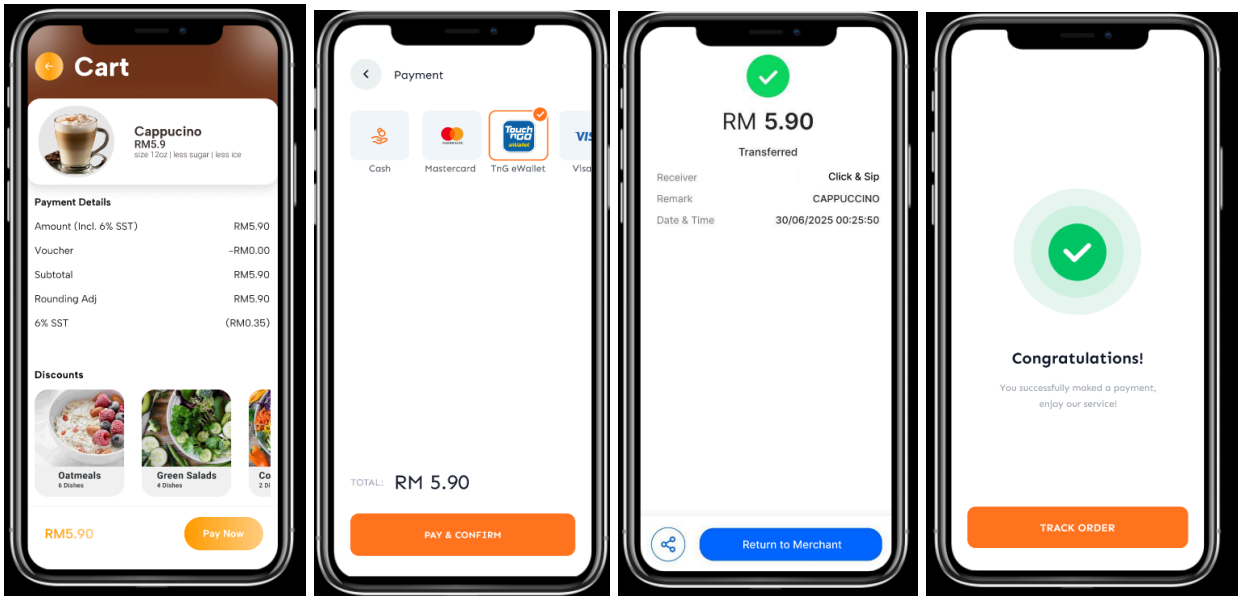
These inputs allow customers to select their item and they can customize their item so that the employees can make sure they won't make a wrong order which will affect customers dining experience.

Output Design:

- The system will:
    - Display ongoing orders and orders history

These outputs will allow customers to know their foods serving estimated time and recheck their ordered items.

Payment Page



Input Design:

- Customer can :
    - selects preferred payment method (e-wallet, QR, credit/debit card, cash).
    - May input card details or scan QR code.
    - Clicks Pay & Confirm.

These inputs allow customers to pay for their food via various payment methods .These payment methods could give convenience to the customers and improve the customers dining experience.

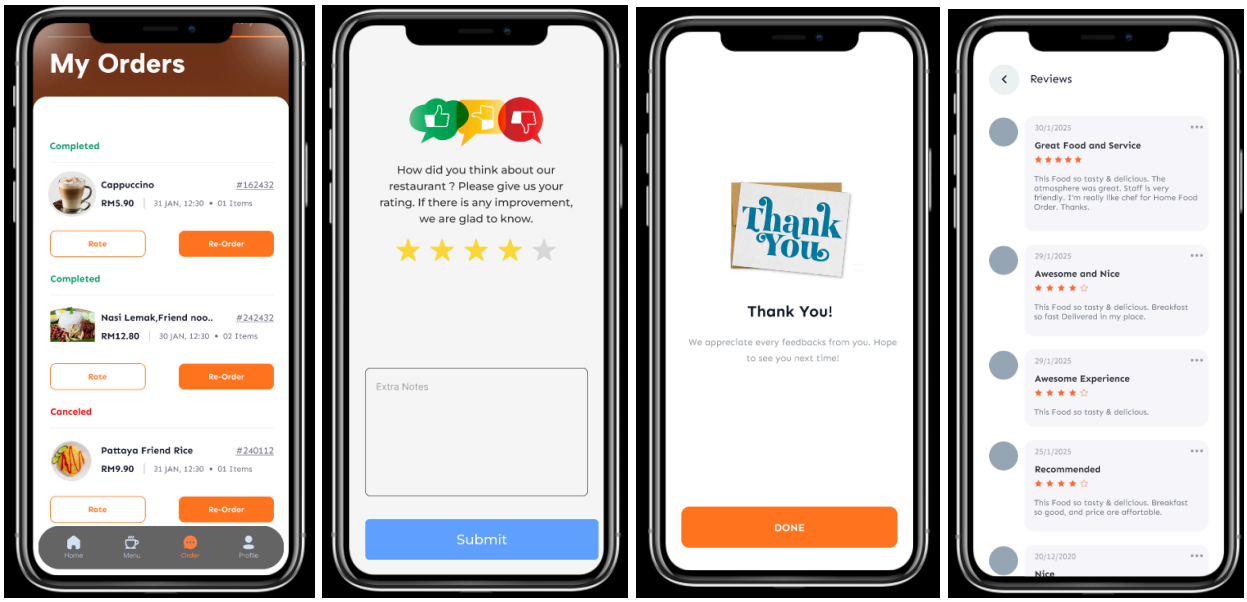
Output Design:

The system display:

- payment status (success or error).
- Shows receipt or payment confirmation with total amount and order ID
- Total payment amount including taxes.

This output allows customers to know their total payment amount ,payment status and keeping their receipt online.

Feedback And Rating Page



Input Design:

- Customer can:
    - User selects a star rating (1 to 5 stars).
    - Optionally types a review or comment.
    - Clicks submit to send feedback.

These inputs allow customers to give feedback and rating to the cafe for the suggestion or adjustment to improve their operation.

Output Design:

- The system display:
    - thank-you or confirmation message after submitting feedback.
    - Shows the user's submitted rating (optional, depending on app flow).

This output allows the cafe owner to monitor the feedback and review to his cafe, so that he can adjust or enhance the cafe operating service and the quality.

Stock Tracking Page

Input Design:

- Staff members can:
    - Enter or update stock quantity for each inventory
    - Mark items as **“Out of Stock”** , **“Low Stock” or ”In Stock”**
    - Add new inventory items (name, category, stock amount)
    - Remove items that are no longer offered

These inputs allow employees to keep the inventory database up to date and accurately.

Output Design:

The system displays:

- A list of inventories with their current stock levels
- Alerts or notifications for items that have Low Stock or Out Of Stock.

This output allows employees to monitor inventory status in real time, make informed stocking decisions, and ensure the customer-facing menu stays accurate.

9.0 Summary of the proposed system

As a conclusion, our group has completed the analysis and design phase for the KACANI ordering system, including the Logical and Physical DFD TO-BE, process specification, and the system wireframe. The TO-BE system automates the ordering process—from order validation and kitchen processing to receipt generation and payment—improving efficiency over the manual AS-IS system. It tracks outstanding bills, applies payments through the bank, and stores financial records. Users can filter past orders by period and view profit data easily, with all information uniquely identified and stored in the database.

In the system wireframe,we write out the input design and output from our prototype system pages such as main menu,ordering,rating and feedback,payment,profile and inventory tracking. These pages would be fulfilling the user requirements for the system to complete their online ordering operation and enhance their user experience.for the specific pages such as inventory tracking and rating review that can only accessed by authorized users such as admin ,employees or the cafe owner to smooth their cafe operation.

In summary, this prototype reflects a significant improvement over the current system by automating key processes, supporting better decision-making through data analysis, and enhancing the overall experience for both end users and clients.