



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SYSTEM ANALYSIS AND DESIGN (SECD2613)

PHASE 3 – ANALYSIS AND DESIGN

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1.0 OVERVIEW OF THE PROJECT

Grab is a popular mobile app used in Southeast Asia that offers many everyday services. It started as a ride-hailing app (like Uber), but now it's a super app meaning it combines many services in one app. Grab is a leading Southeast Asian super app that offers services like ride-hailing, food delivery, and digital payments. This proposal focuses on enhancing and analyze the existing Grab system of food delivery and grocery and package delivery to address performance inefficiencies and improve the overall user experience. Through a systematic approach in system analysis and design, the project will identify critical issues and propose viable solutions for optimization. Grab has emerged as a dominant force in the on-demand economy of Southeast Asia. Initially launched as a ride-hailing platform, Grab has expanded its services to include transportation, food delivery, financial services, and more.

2.0 PROBLEM STATEMENT

The current Grab application, while functional, suffers from several issues. These include inconsistent response times during peak usage, a complex user interface that confuses new users, and irregular fare pricing that leads to dissatisfaction. The system's feedback and support features are not easily accessible, which hinders timely problem resolution. These problems are interrelated as performance and usability directly influence user retention and service efficiency.

3.0 PROPOSED SOLUTIONS

- Redesign the user interface for clarity and ease-of-use for the customer feedback issues.
- Implement AI-driven features: Personalized suggestions based on time of day, weather, mood (user-set), or dietary preferences. Users discover meals they're more likely to enjoy and order.
- Real-time queue & prep time feature: Display how many orders are ahead and estimated prep time. Sets better expectations and reduces cancellations.

4.0 CURRENT BUSINESS PROCESS/WORKFLOW

1. A customer browses and search for restaurants and food items on the Grab app.

Step	Activity	System/Actor
1.1	User opens Grab app and selects "Food" icon.	Customer
1.2	User searches for a restaurant/dish to be select.	Grab App UI
1.3	User adds items to cart and reviews order.	Customer
1.4	User confirms delivery address and places order.	Customer
1.5	User chooses payment method (e.g., Grab Pay, card, cash).	Customer
1.6	Order confirmation sent to backend.	Grab System

2. Order Processing

Step	Activity	System/Actor
2.1	Order is routed to selected restaurant.	Grab System
2.2	Restaurant accepts or rejects the order.	Restaurant
2.3	If accepted, food preparation begins.	Restaurant
2.4	Estimated preparation time and delivery ETA are updated.	Grab System
2.5	Order details sent to nearby delivery partners.	Grab Driver App

3. Delivery Partner Assignment & Pickup (Rider)

Step	Activity	System/Actor
3.1	Delivery-partner is assigned (based on proximity, rating, etc.).	Grab Matching Algorithm
3.2	Partner accepts task and navigates to restaurant.	Delivery-Partner
3.3	Order is picked up after confirming details.	Delivery-Partner & Restaurant
3.4	Status updated to "Order Picked Up".	Grab System
3.5	Delivery ETA adjusted and shown to customer.	Grab App

4. Delivery to Customer

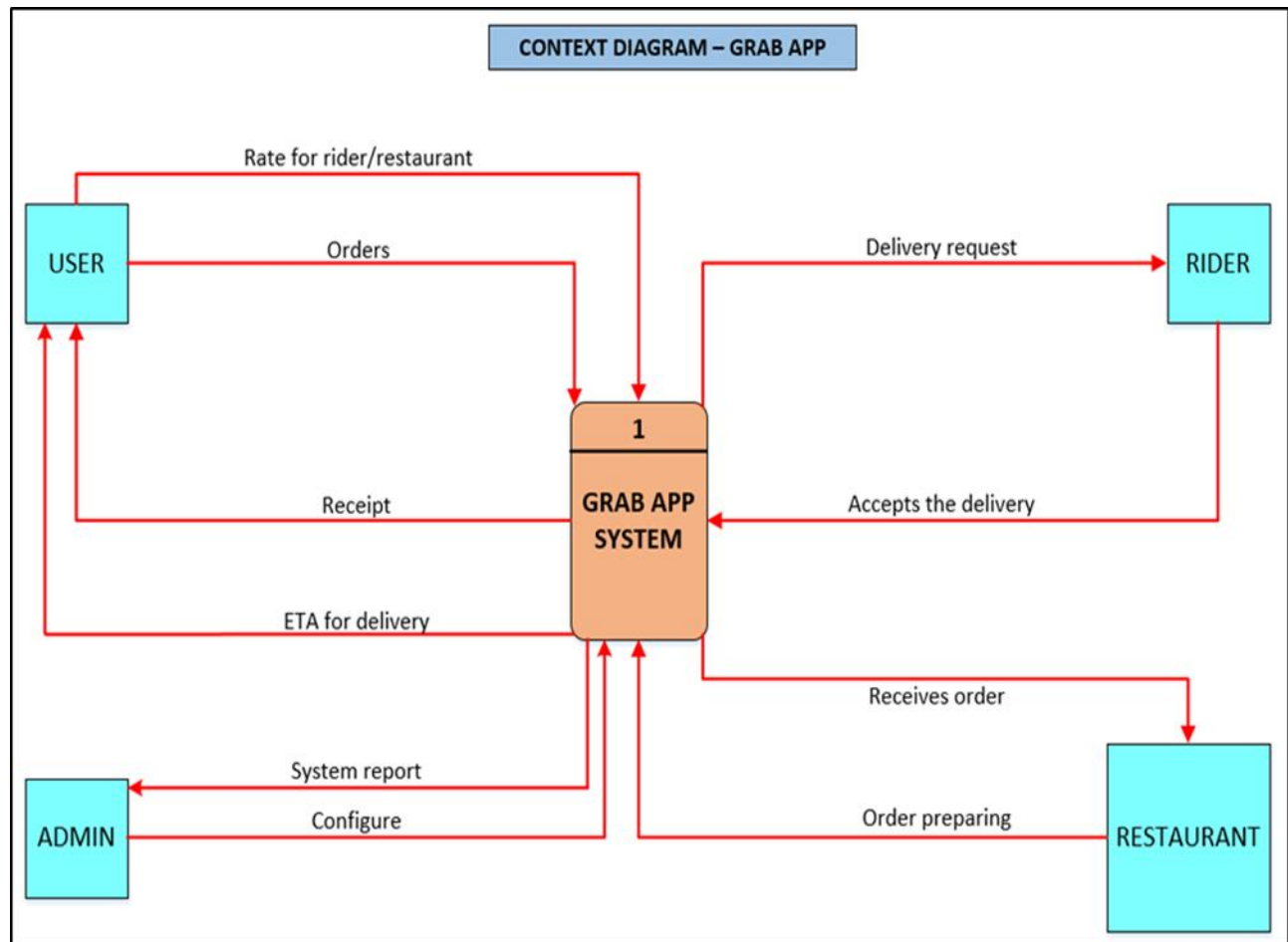
Step	Activity	System/Actor
4.1	Driver navigates to customer's location.	Delivery-Partner
4.2	Driver hands over order and confirms delivery.	Delivery-Partner
4.3	System updates order as "Delivered".	Grab System
4.4	Payment processed if postpaid.	Grab System
4.5	Customer prompted to rate food and delivery.	Customer

5.0 LOGICAL DFD (AS-IS)

5.1 CONTEXT DIAGRAM

➤ **Entities:**

- ✓ User
- ✓ Rider
- ✓ Restaurant
- ✓ Admin



5.2 DIAGRAM 0

➤ Entities:

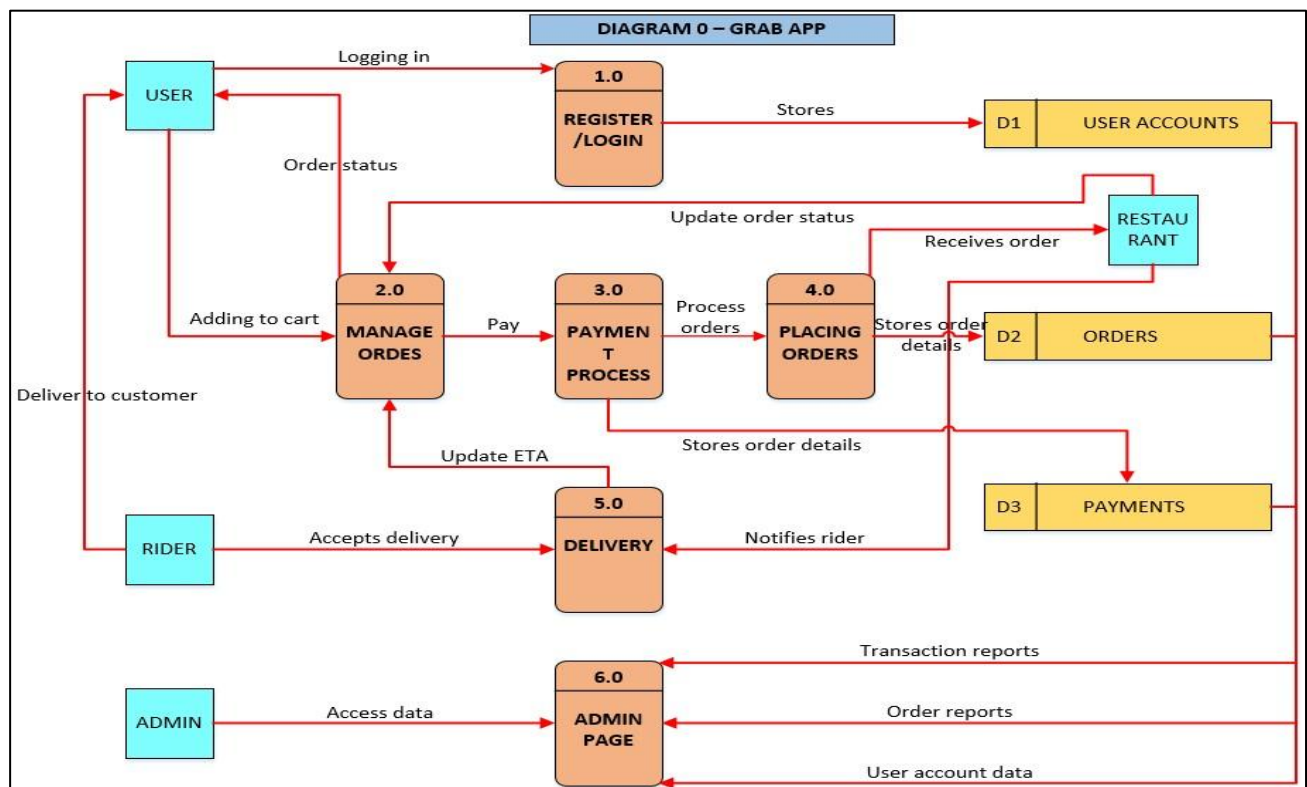
- User
- Rider
- Restaurant
- Admin

➤ Processes:

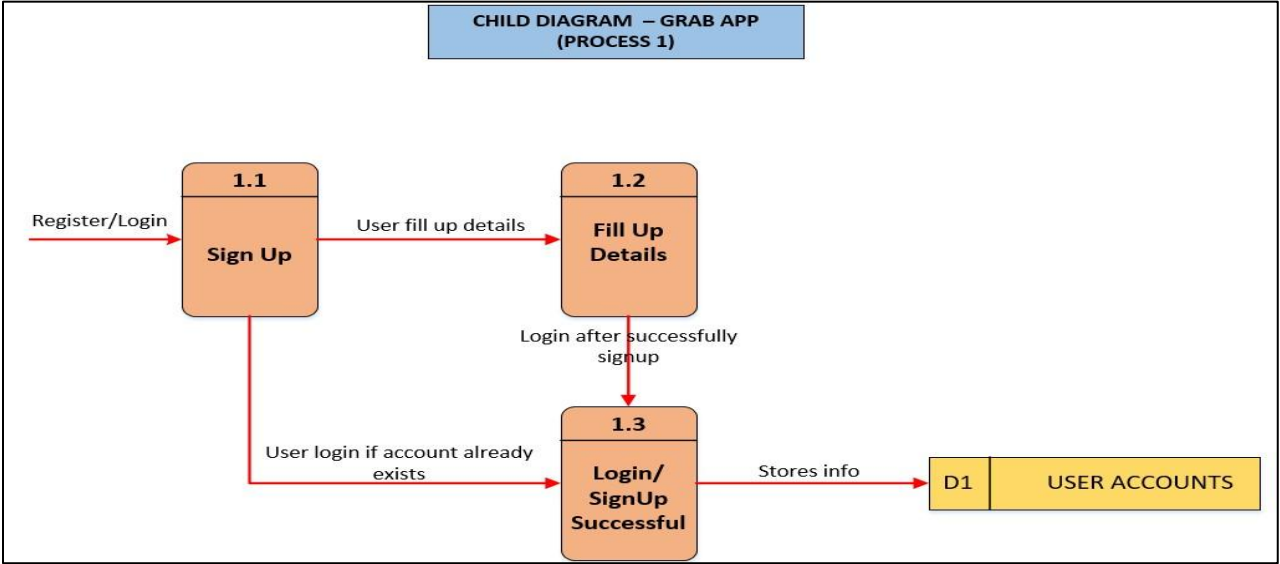
- Register/Login
- Manage Orders
- Placing Orders
- Delivery
- Admin Page

➤ Data Store:

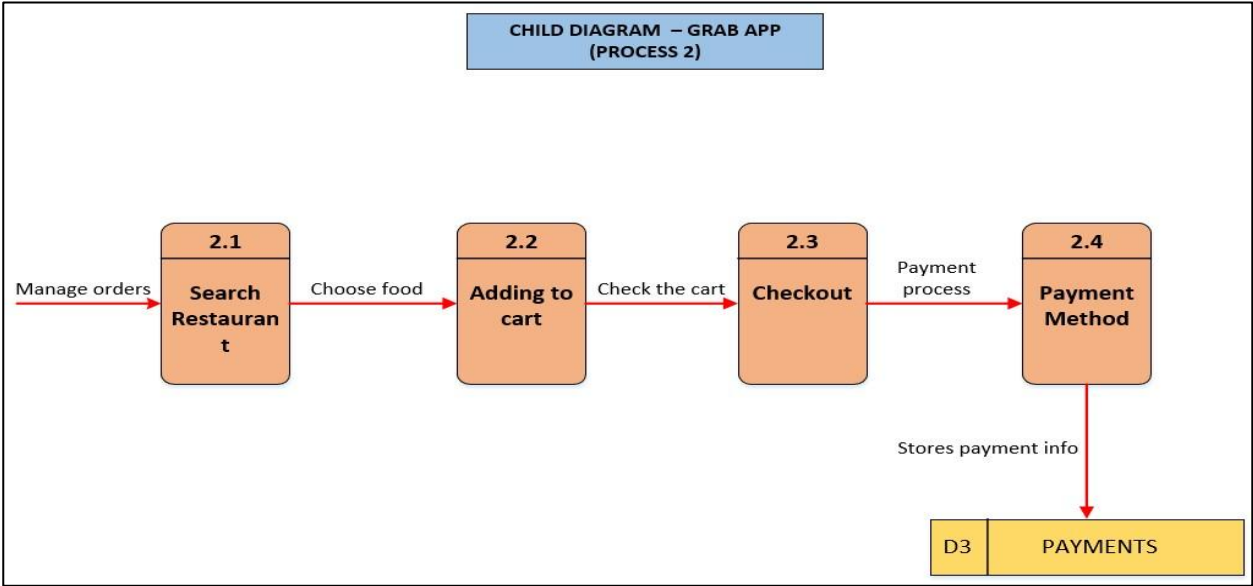
- D1: User Accounts
- D2: Orders
- D3: Payments



5.3 CHILD DIAGRAM EXAMPLE (1.0 REGISTER/LOGIN) PROCESS 1



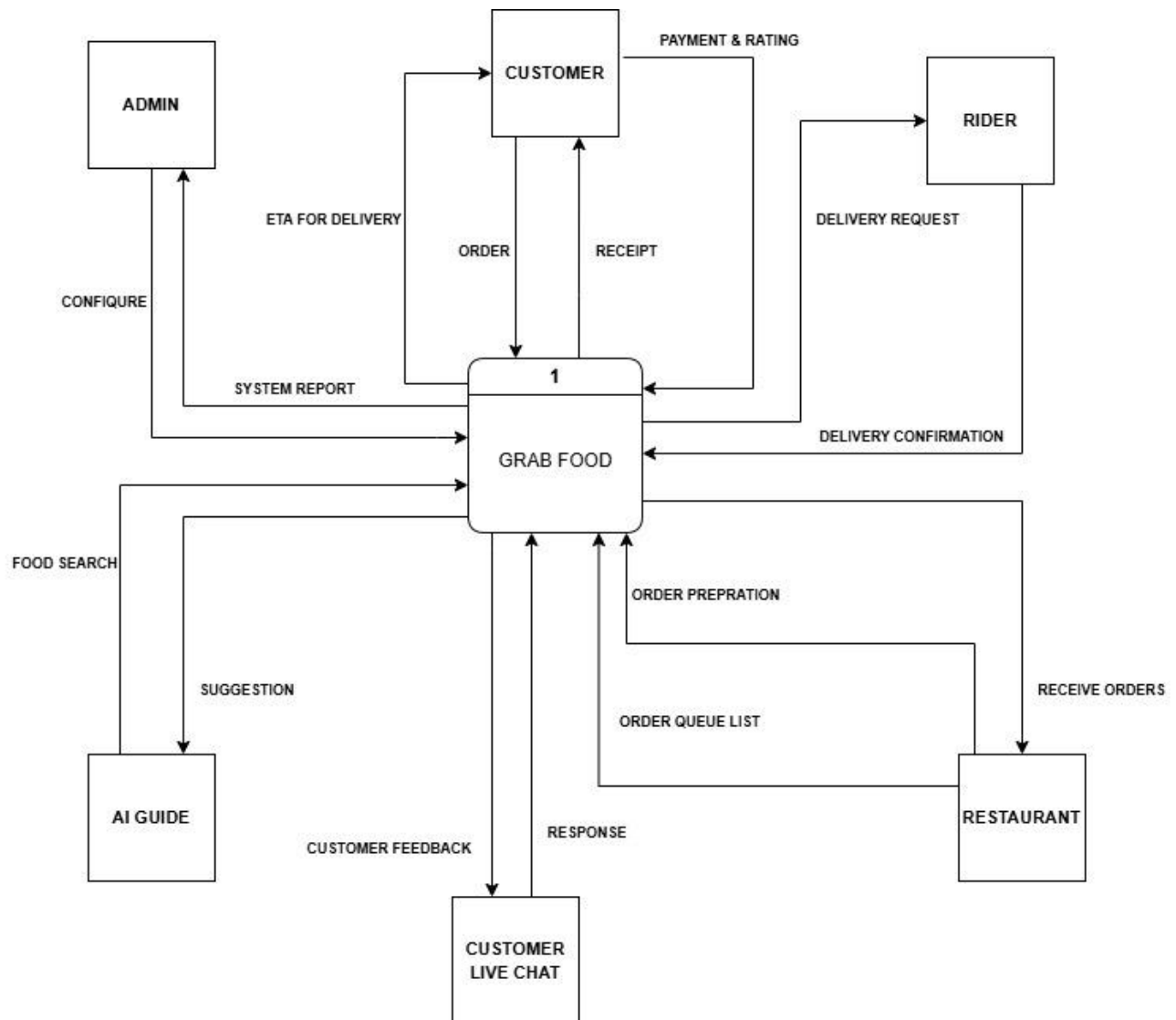
5.4 CHILD DIAGRAM EXAMPLE (2.0 MANAGE ORDERS) PROCESS 2



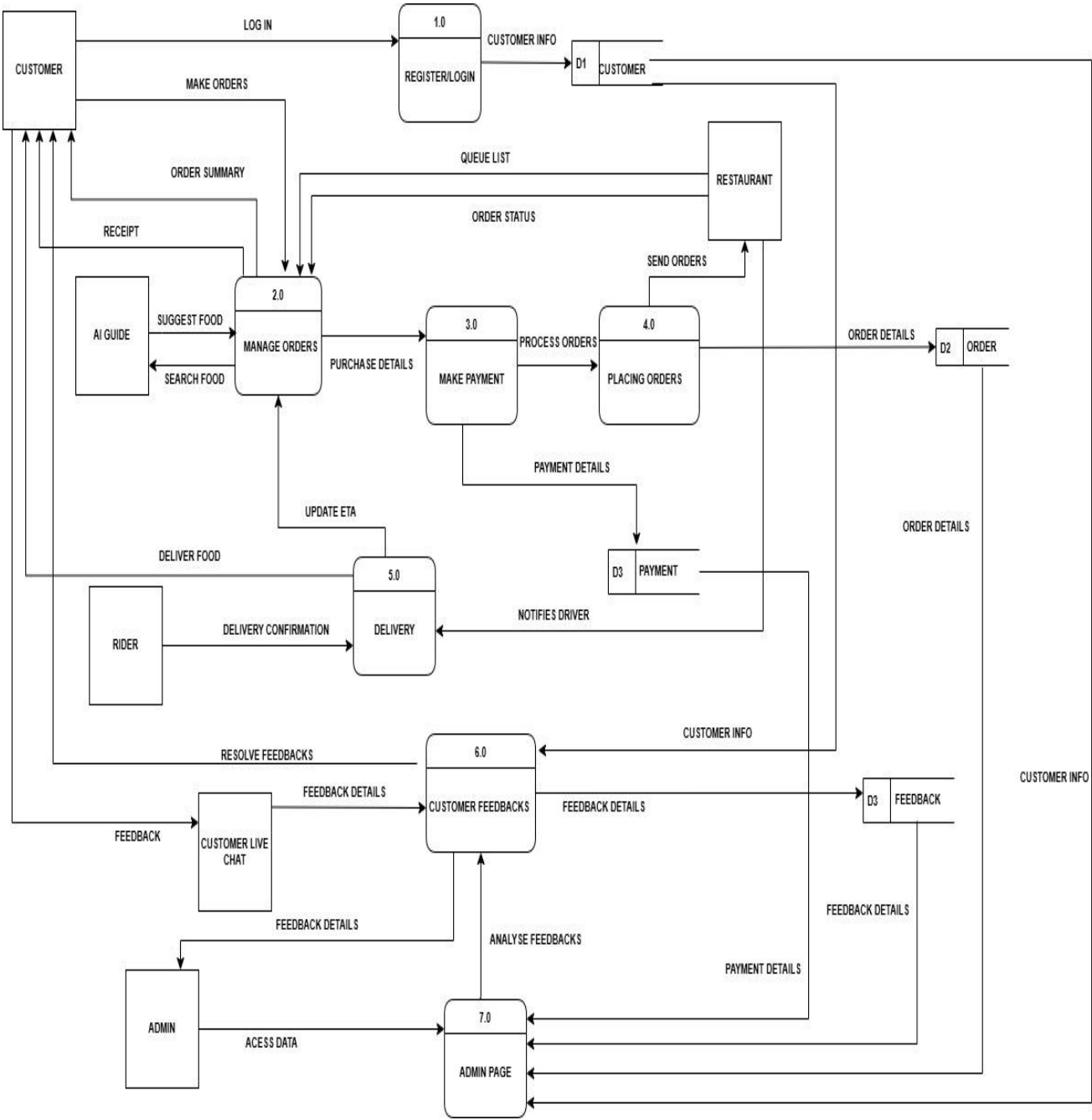
6.0 SYSTEM ANALYSIS AND SPECIFICATION

6.1 LOGICAL DFD TO-BE SYSTEM (CONTEXT DIAGRAM, DIAGRAM 0, CHILD)

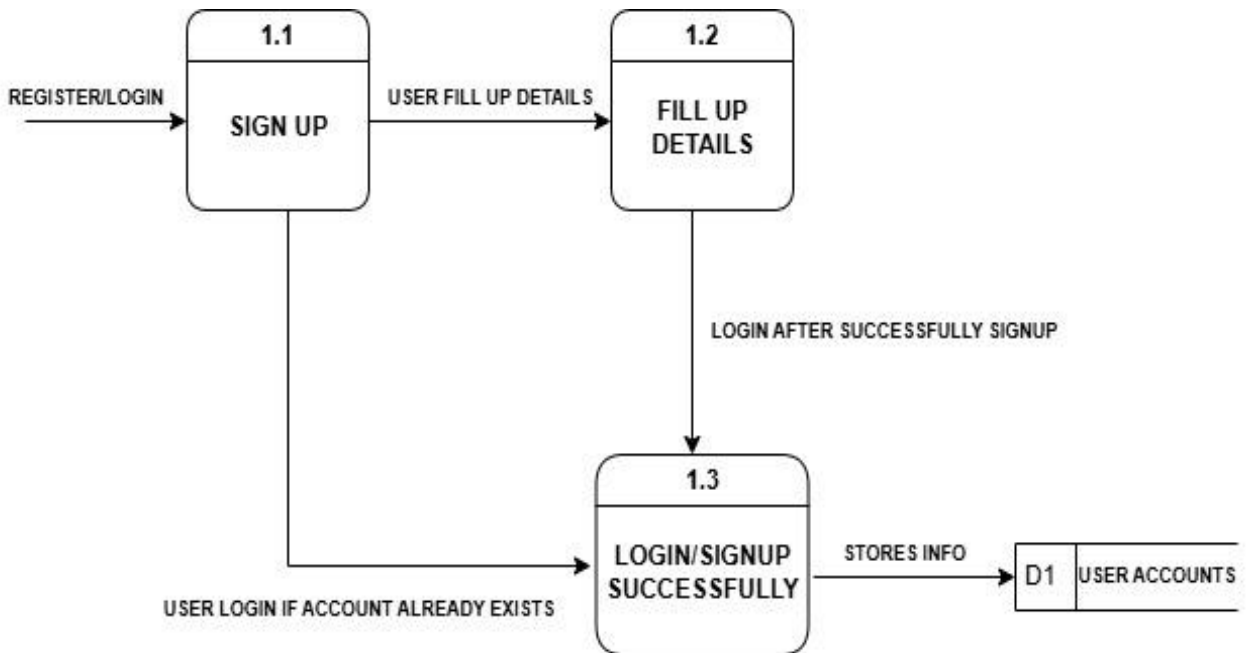
6.1.1 CONTEX DIAGRAM



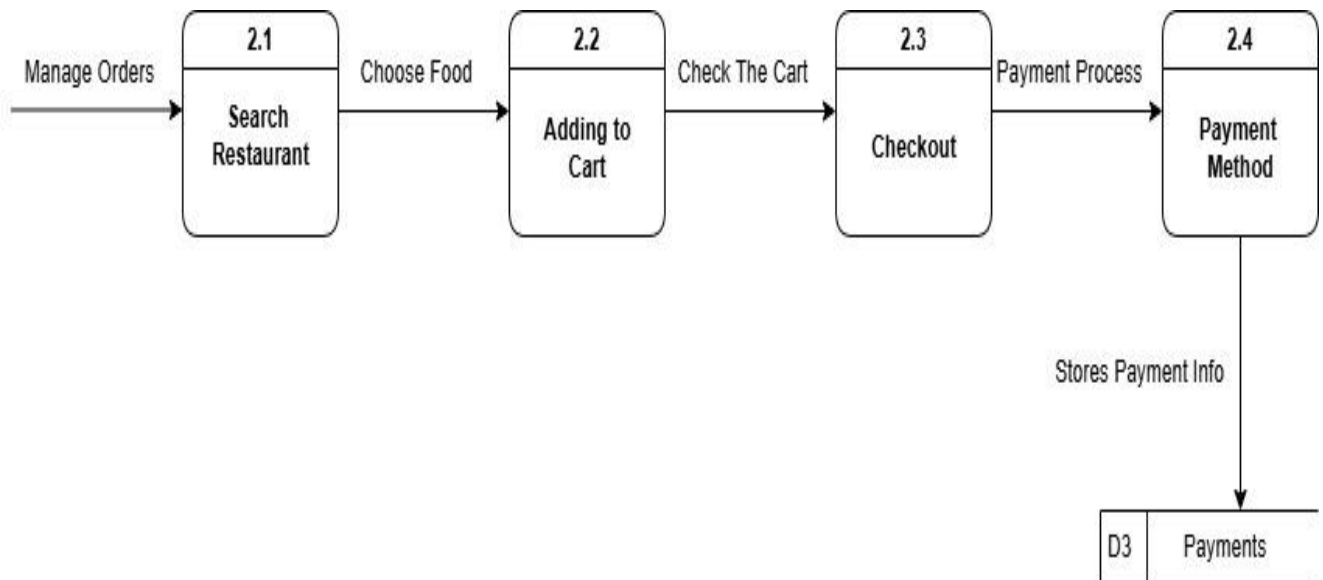
6.1.2 DIAGRAM 0



6.1.3 CHILD DIAGRAM (1.0 REGISTER/LOGIN) PROCESS 1



6.1.4 CHILD DIAGRAM (2.0 MANAGE ORDERS) PROCESS 2



6.2 PROCESS SPECIFICATION (BASED ON LOGICAL DFD TO-BE)

Process:

➤ **Process 1.0 Register/Login**

Input: Logged-in Customer

Output: Customer Info

Description: Customers register or log in to access the food ordering system.

➤ **Process 2.0 Manage Orders**

Input: Customer order request

Output: Order Summary, Receipt, Purchase Details

Description: Allows customers to browse food, get suggestions from AI, and manage their cart/orders.

➤ **Process 3.0 Make Payment**

Input: Purchase Details

Output: Payment Details

Description: Facilitates the payment process for customer orders.

➤ **Process 4.0 – Placing Orders**

Input: Payment Details

Output: Order Details, Send Orders to Restaurant

Description: Finalizes and sends the order to the respective restaurant after successful payment.

➤ **Process 5.0 – Delivery**

Input: Order Details

Output: Delivery Confirmation

Description: Coordinates with the rider to deliver the order and confirm delivery status.

➤ **Process 6.0 – Customer Feedbacks**

Input: Customer Info, Feedback

Output: Feedback Details, Feedback Resolution

Description: Manages customer feedback via direct input or live chat and resolves complaints or suggestions.

➤ **Process 7.0 – Admin Page**

Input: Feedback Details, Payment Details

Output: Analysis of Feedback

Description: Admin accesses system data for monitoring and analysis to improve service.

Data Stores:

- D1 – Customer: Stores registered customer information.
- D2 – Order: Stores order-related details.
- D3 – Payment: Stores payment transaction records.
- D4 – Feedback: Stores customer feedback and complaint records.

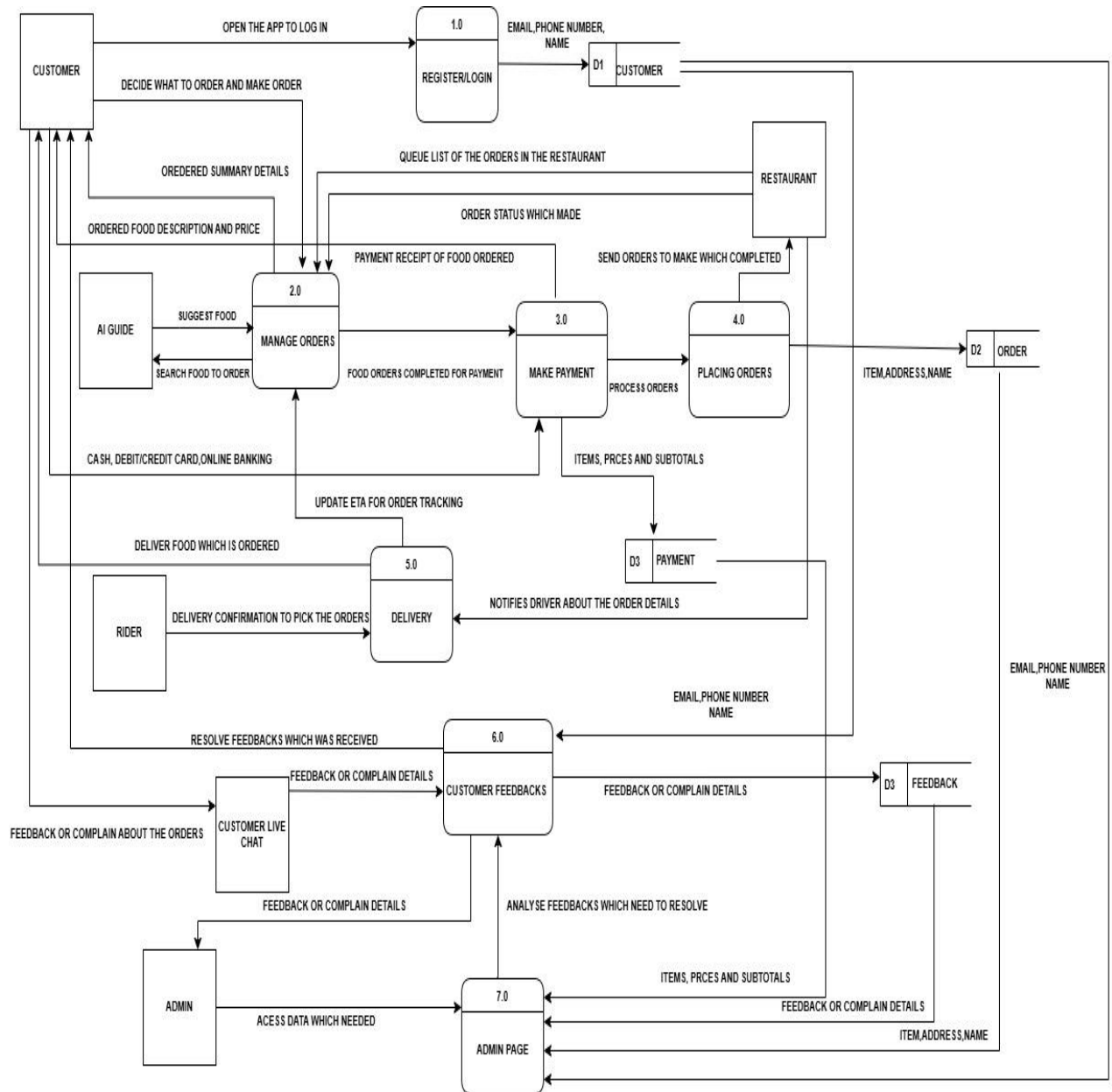
Entities:

- Customer: Interacts with login, order placement, payments, and feedback.
- Restaurant: Receives orders and updates status.
- Rider: Delivers food based on orders assigned.
- Admin: Manages the backend, resolves issues, and analyzes system performance.
- AI guide: Interact with customer for food suggestion
- Customer Live Chat: Receive customer feedbacks and resolve the feedback issues

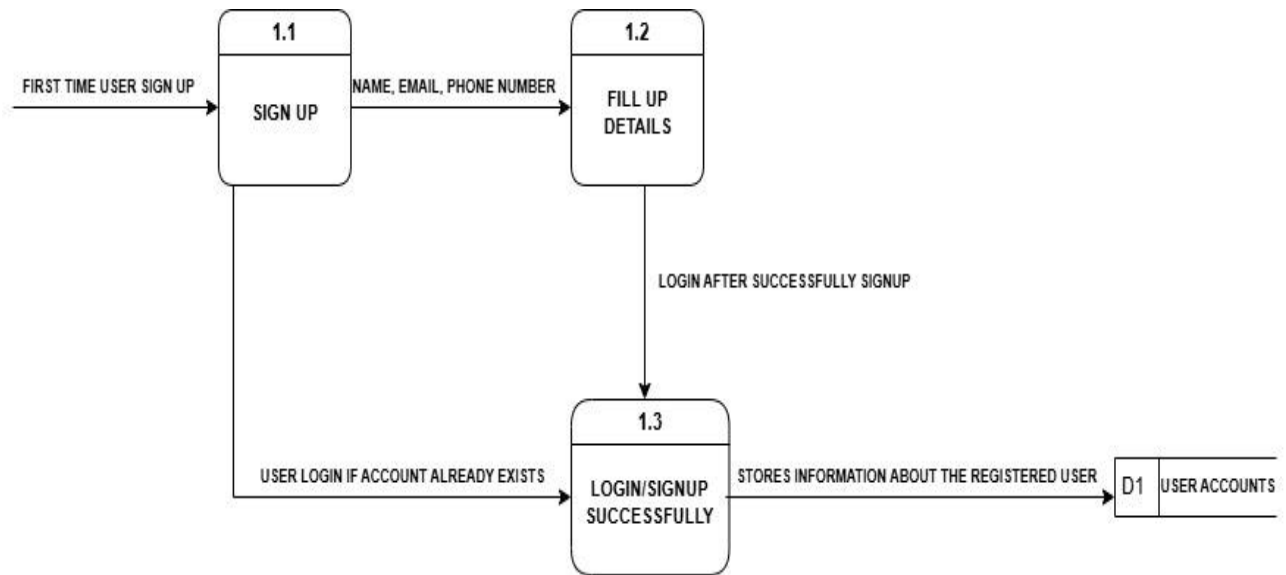
7.0 PHYSICAL SYSTEM DESIGN

7.1 PHYSICAL DFD TO-BE SYSTEM (DIAGRAM 0, CHILD, PARTITIONING, CRUD MATRIX, EVENT RESPONSE TABLE, STRUCTURE CHART, SYSTEM ARCHITECTURE)

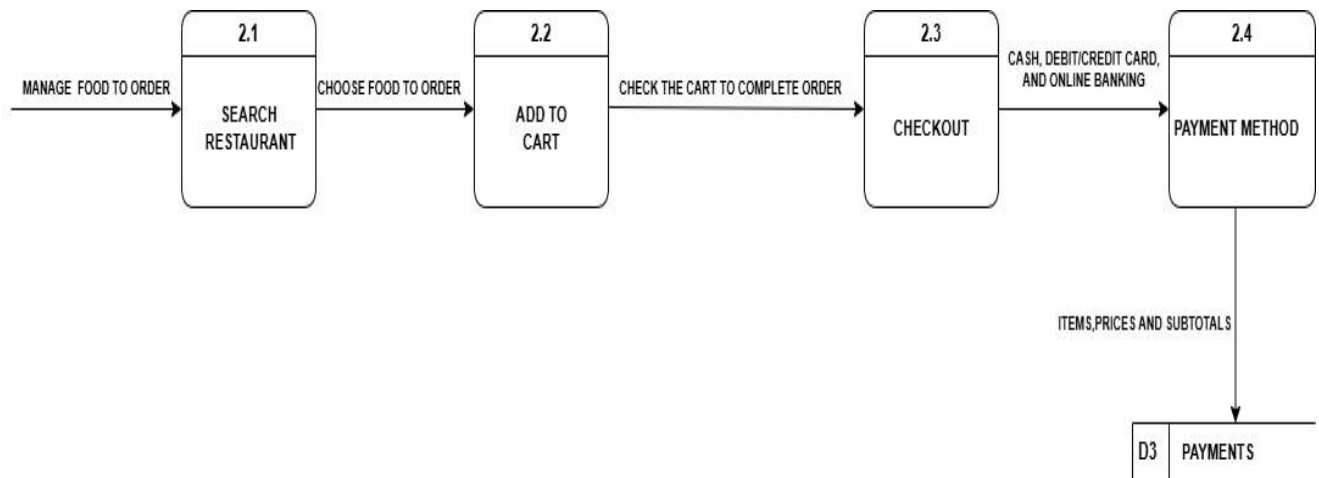
7.1.1 PHYSICAL DFD TO BE SYSTEM DIAGRAM 0



7.1.2 PHYSICAL DFD TO BE SYSTEM CHILD DIAGRAM (1.0 REGISTER/LOGIN) PROCESS 1



7.1.3 PHYSICAL DFD TO BE SYSTEM CHILD DIAGRAM (2.0 MANAGE ORDERS) PROCESS 2



7.1.4 PARTITIONING

Process	Done by System (Automated)	Done by Human (Manual)
User Registration/Login	✓	
Food Search & Menu Browsing	✓	
Order Placement	✓	
Restaurant Order Processing	✓	Preparation (Restaurant Staff)
Delivery Partner Assignment	✓	
Pickup & Delivery		Rider
Payment Processing	✓	
Rating & Review	✓	User submits
Admin Management (Monitoring, Updates)	✓	Admin

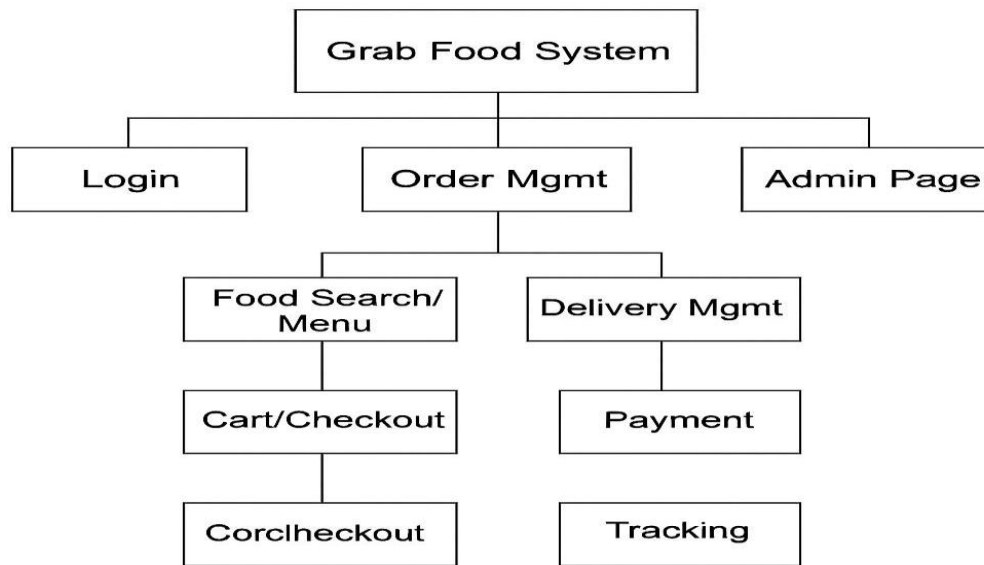
7.1.5 CRUD MATRIX (CREATE, READ, UPDATE, DELETE MATRIX)

Activity	Customer	Item	Order	Order Detail
Register/Login	C/R/U			
Manage Orders (Search/Suggest)	R	R		
Placing Orders	R	R	C	C
Make Payment	R		U	
Delivery	R		U	U
Customer Feedbacks	R			C
Admin Actions	R/U	R/U	R/U	R/U

7.1.6 EVENT RESPONSE TABLE

Event	Trigger	Response
User clicks "Register"	Registration form submitted	Create user record, send OTP, redirect to home
User places an order	"Place Order" clicked	Validate input, store order, notify restaurant
Restaurant updates order status	Restaurant accepts/prepares	Update order progress, notify delivery system
System assigns rider	Order marked ready	Assign rider via algorithm, notify rider
Rider confirms pickup	In-app pickup confirmation	Update order status, start tracking
Rider marks order delivered	In-app delivery confirmation	Complete order, trigger rating & payment process
User rates order	Rating submitted	Store feedback, update partner/restaurant score
Admin updates menu/items	Admin dashboard action	Reflect in real-time on customer side
Payment fails	Transaction declined	Show error, request new payment method

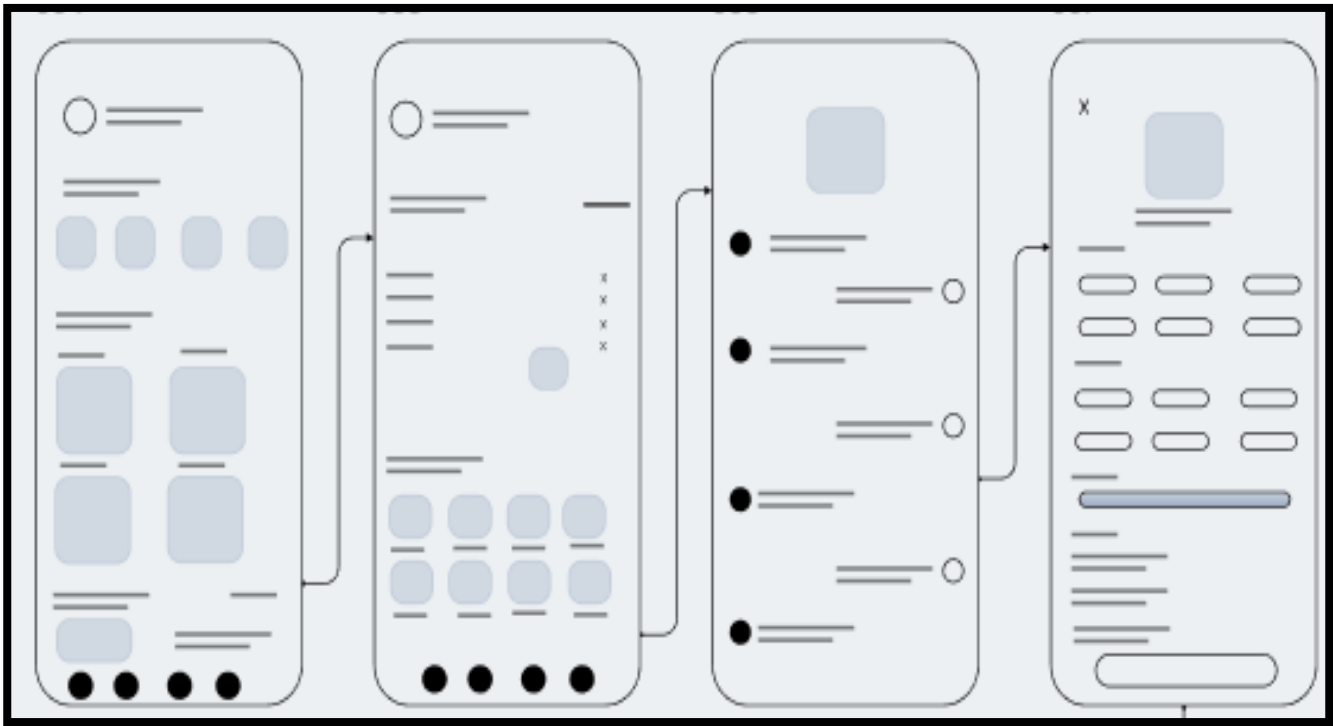
7.1.7 STRUCTURE CHART

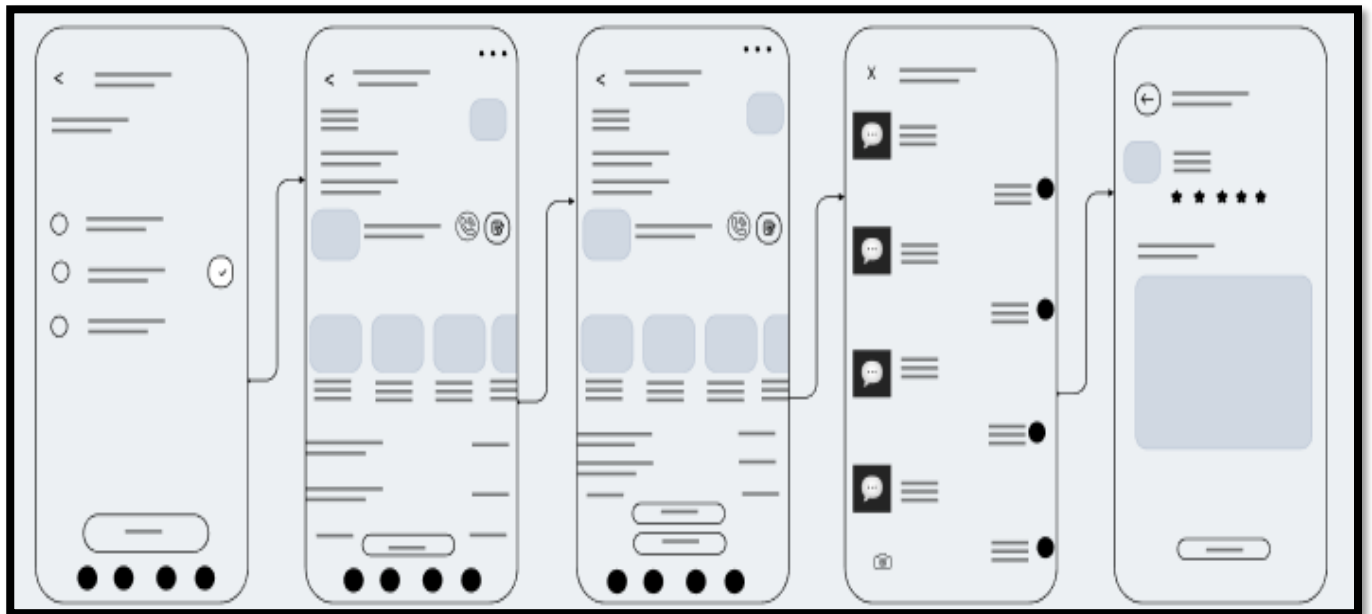
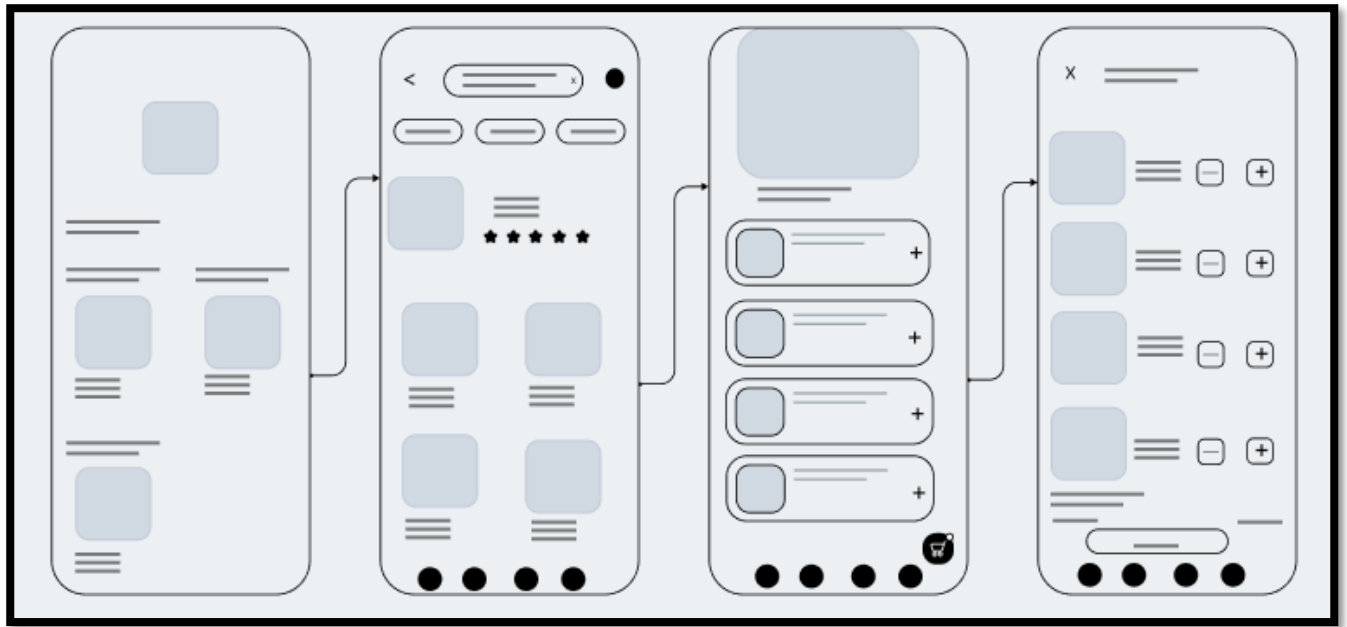


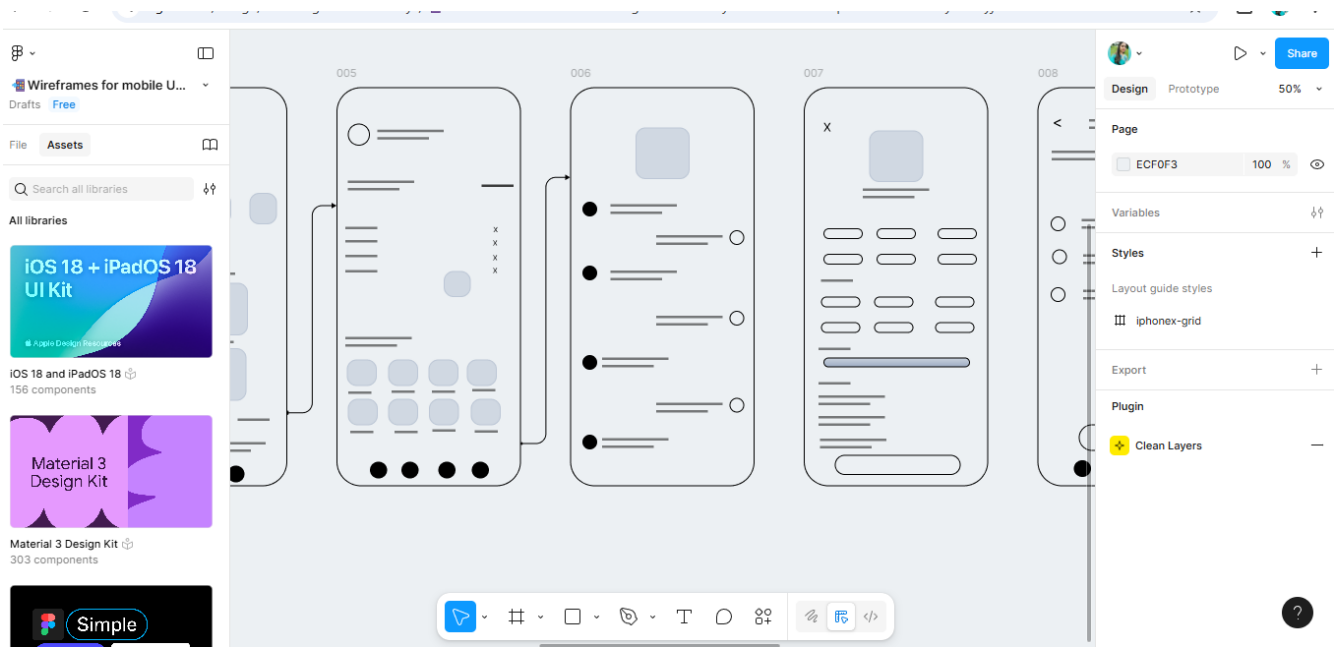
7.1.8 SYSTEM ARCHITECTURE

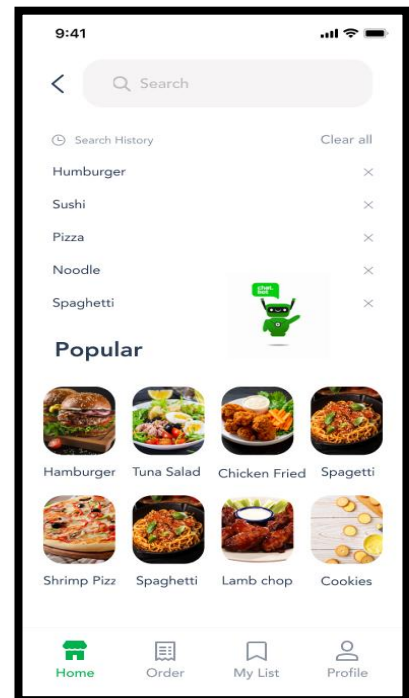
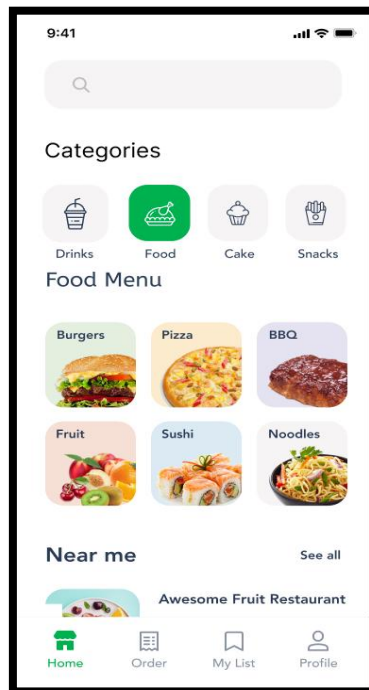
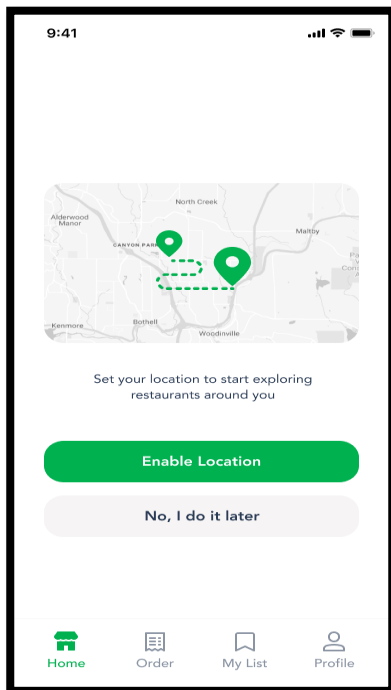
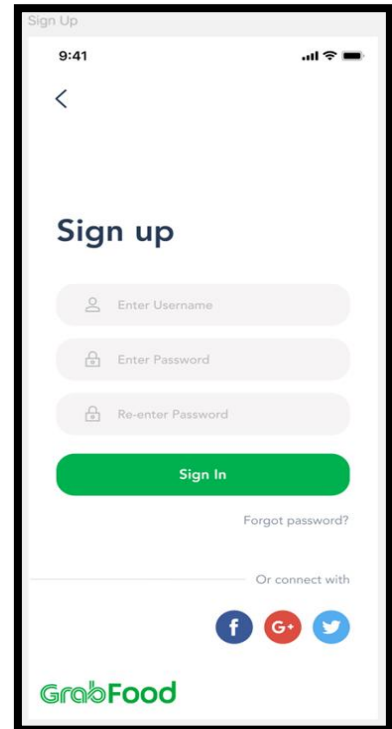
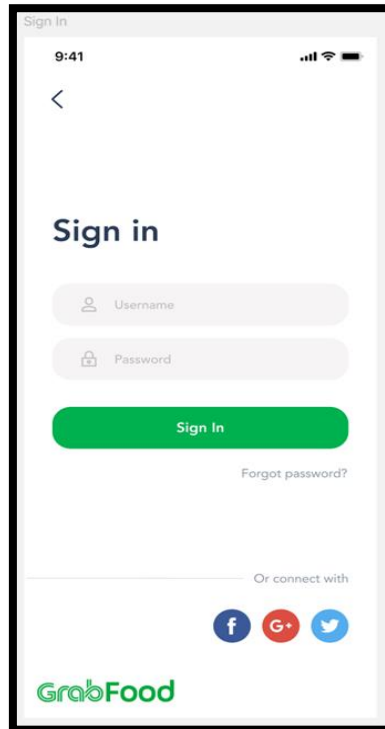
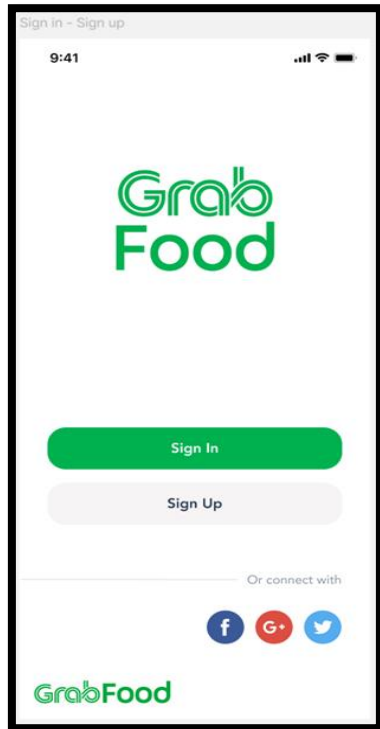
Layer	Technology / Role
Presentation Layer	Mobile App (iOS/Android) – User & Rider Interfaces
Application Layer	Backend API – Handles login, orders, delivery, rating, notifications
Database Layer	MySQL / Firebase – Stores user data, orders, payments, reviews, restaurants
Third-Party Services	GPS/Maps API, Payment Gateway (Grab Pay, Stripe), SMS/Email (OTP, alerts)
Admin Interface	Web-based portal – Admin tools for managing menu, users, reports
Security	AES-256 encryption, OAuth2, Two-Factor Authentication
Hosting	Cloud (AWS / Google Cloud) with load balancer, auto-scaling for peak hours

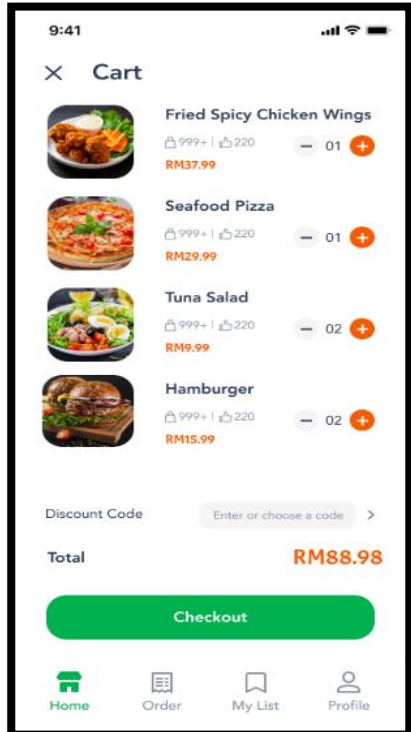
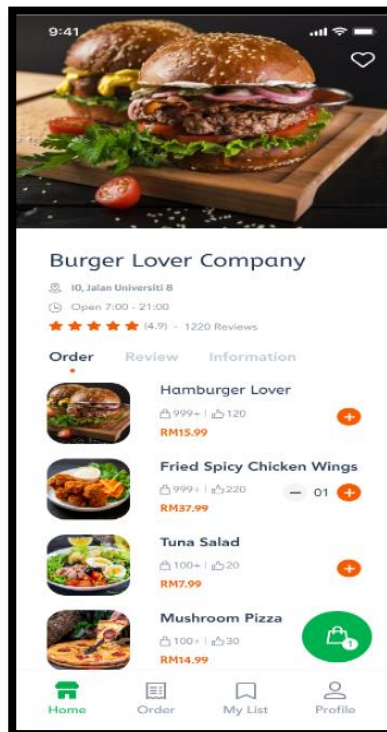
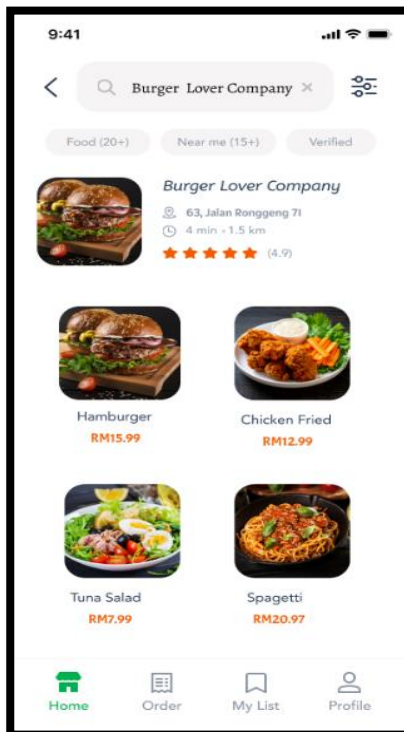
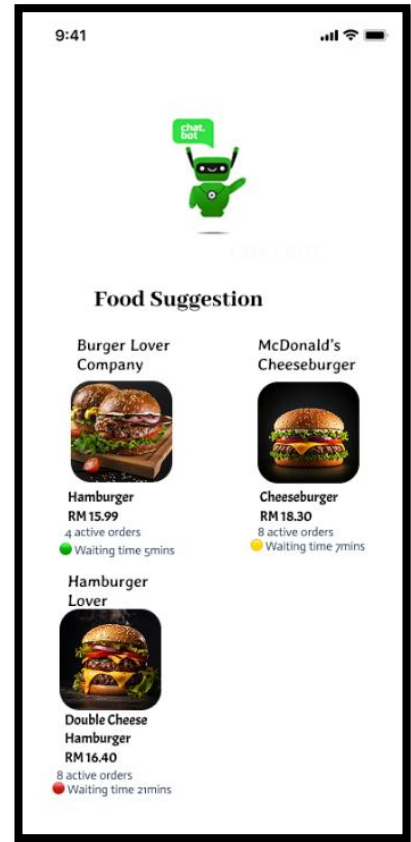
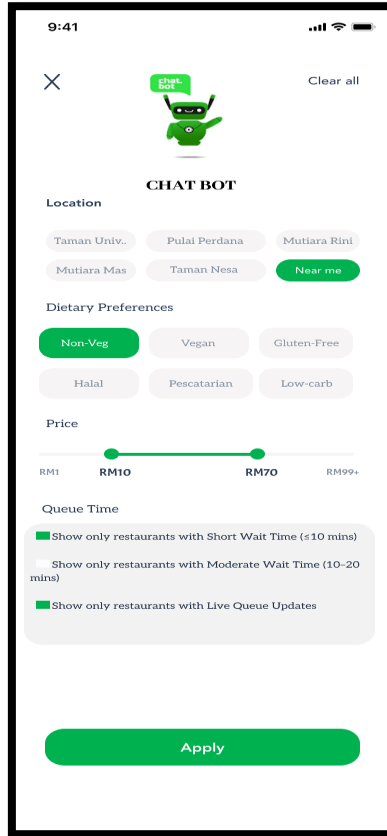
8.0 SYSTEM WIREFRAME (INPUT DESIGN, OUTPUT DESIGN)

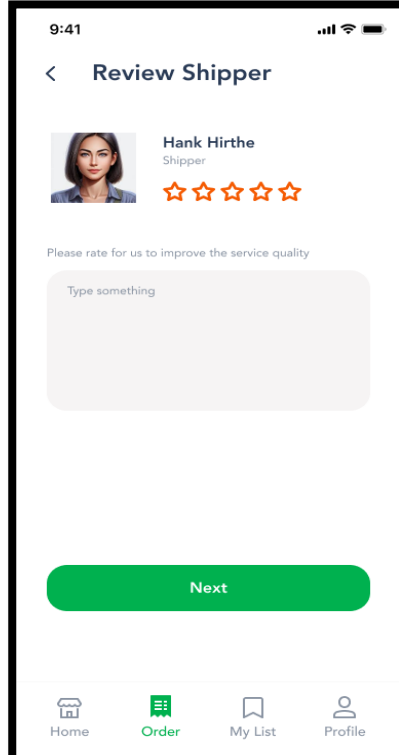
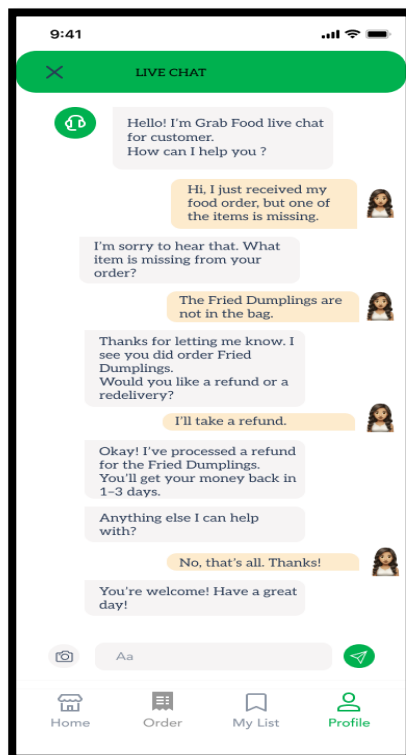
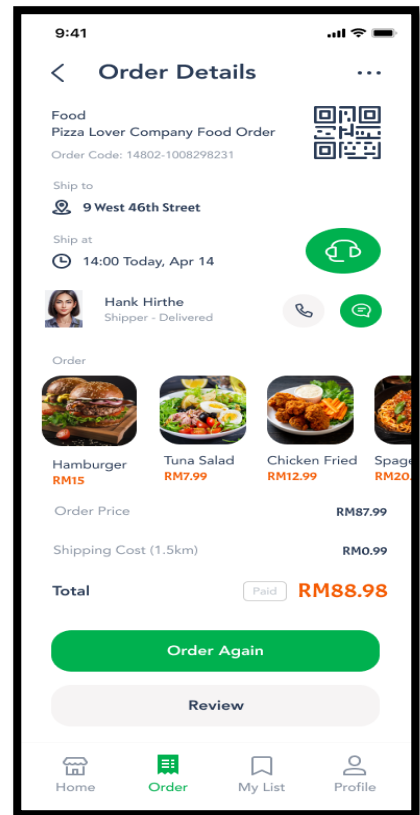
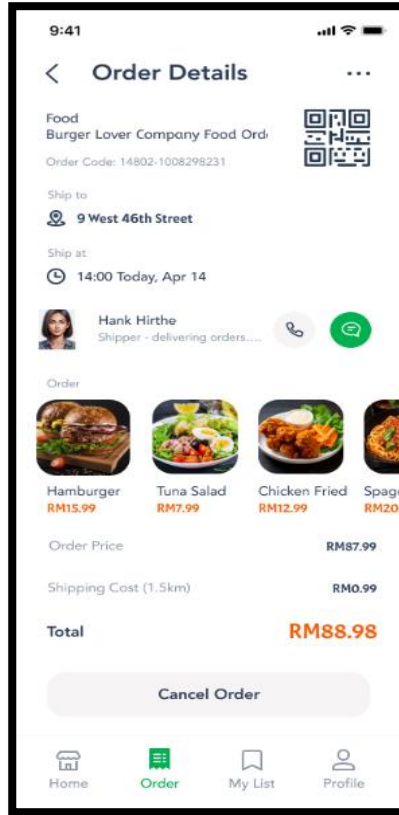
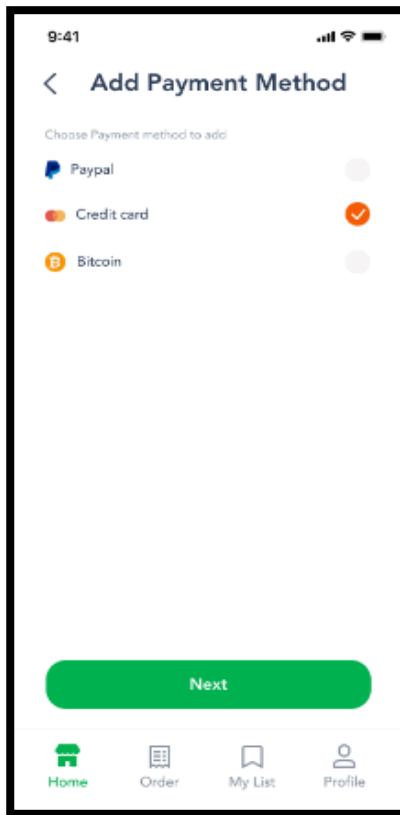


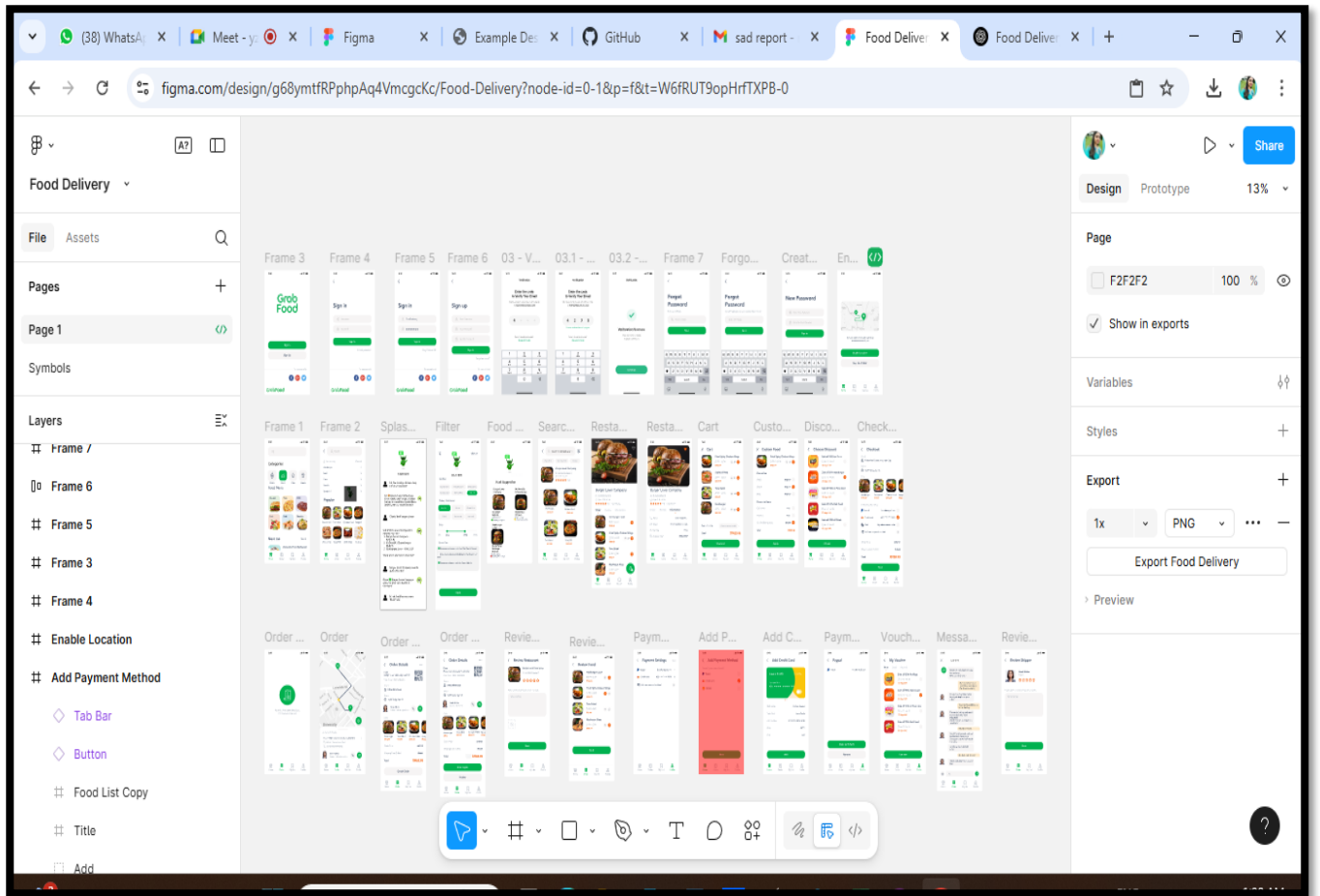












9.0 SUMMARY OF THE PROPOSED SYSTEM.

This analysis and design phase of our project describes more about the system analysis of the Logical DFD (TO-BE) System which we designed based on the problem statement. In this section we will focus on the add-on of the new function for the system to solve the problem statement as we proposed in the phase 1 project. In this phase, we can see more details about process specification of the system which will explain more about each process, entities and data store. Moreover, the next requirement which is the physical system design which explain the particular of the system in details. Lastly, we created the wireframe with the input and output design that required to complete the prototype. The analysis and design phase is essential because it give the complete requirement for the completion of the new designed system which was proposed for successful project of our group. We hope it ensures the final system prototype solves the right problems, meets user expectations, and is built efficiently and correctly.

MEETING LOG FOR SADM PROJECT: PHASE 1- PROJECT PROPOSAL AND PLANNING

DATE: 28 JUNE 2025

LOG NO: 1

TEAM NAME: GROUP 10

TEAM MOTTO: WORK SMART RATHER THAN WORK HARD

TEAM GROUND RULE: COMPLETE PROJECT ON TIME

Attendance:

Group Member Name	Signatures
1. RADHA D/O MORGAN	
2. SRITHAR S/O NARAYANAN	
LOUIS PAUL S/O KUALIANTASAMI	

Discussion Results/Findings:

we are group of 3 conducted a discussion about the project proposal and planning at UTM after the class section based on our case study related to E-Commerce theme. We decided to choose a system that high demand in current and easy to solve the problem. As from the discussion we choose Grab food as the project to analysis and design. First of all, we divided the task among us to complete within the time given 3 MAY 2025. We discussed about problem background of the system and the high effective solution to solve the problem. Furthermore, we discussed more about objectives, scope of the project, propose feasibility study, Project Plan and Project Management.

Members Contributions/Ideas:

Group member name	Contributions/ideas
1. RADHA D/O MORGAN	1.0 INTRODUCTION 2.0 BACKGROUND STUDY 3.0 PROBLEM STATEMENT 4.0 PROPOSED SOLUTIONS (ECONOMICAL - CBA) 7.3 PERT CHART (BASED ON WBS) -DO MEETING LOGS -FINALISE THE PROJECT REPORT AND SUBMIT. 8.0 BENEFIT AND OVERALL SUMMARY OF PROPOSED SYSTEM
2. SRITHAR S/O NARAYANAN	1.0 INTRODUCTION 2.0 BACKGROUND STUDY 3.0 PROBLEM STATEMENT 4.0 PROPOSED SOLUTIONS (INCLUDE FEASIBILITY STUDY – TECHNICAL, OPERATIONAL) 5.0 OBJECTIVES 6.0 SCOPE OF THE PROJECT 7.0 PROJECT PLANNING 7.1 HUMAN RESOURCE 7.2 WORK BREAKDOWN STRUCTURE (WBS) 7.4 GANTT CHART
3. LOUIS PAUL S/O KUALIANTAISAMI	-

MEETING LOG FOR SADM PROJECT: PHASE 2 - INFORMATION SYSTEM GATHERING AND REQUIREMENT

DATE: 28 JUNE 2025

LOG NO: 2

TEAM NAME: GROUP 10

TEAM MOTTO: WORK SMART RATHER THAN WORK HARD

TEAM GROUND RULE: COMPLETE PROJECT ON TIME

Attendance:

Group Member Name	Signatures
1. RADHA D/O MORGAN	
2. SRITHAR S/O NARAYANAN	
3. LOUIS PAUL S/O KUALIANTAISAMI	

Discussion Results/Findings:

After the completion of phase 1 project proposal and planning, we continue with the next phase 2 - information system gathering and requirement. We conducted this discussion of the project by whatSapp chat and communicated via phone calls. In this phase we discussed about the method for gathering information about the grab food and we chose questionnaire to gather the information. We used google form for the survey and we used closed questions and bipolar questions in the survey. We also discussed about requirement analysis based on survey/interview conducted and gathers information about what the users want in the new systems (to-be) based on the current system (as-is).

Members Contributions/Ideas:

Group Member Name	Contributions/Ideas
1. RADHA D/O MORGAN	<p>4.1 METHOD USED (QUESTIONNAIRE) CREATED GOOGLE FORM AND ADDED QUESTIONS.</p> <p>4.2 SUMMARY FROM METHOD USED QUESTIONNAIRE</p> <p>5.0 REQUIREMENT ANALYSIS (BASED ON AS-IS ANALYSIS)-CHECKED AND EDITED</p> <p>5.1 CURRENT BUSINESS PROCESS (SCENARIOS, WORKFLOW) - CHECKED AND EDITED</p> <p>5.2 FUNCTIONAL REQUIREMENT (INPUT, PROCESS AND OUTPUT) - CHECKED AND EDITED</p> <p>5.3 NON-FUNCTIONAL REQUIREMENT (PERFORMANCE AND CONTROL) - CHECKED AND EDITED</p> <p>5.4 LOGICAL DFD AS-IS SYSTEM (CONTEXT DIAGRAM, DIAGRAM 0, CHILD)-GUIDED LOUIS TO DO THE DFD.</p> <p>6.0 SUMMARY OF REQUIREMENT ANALYSIS PROCESS</p> <p>DO MEETING LOGS AND FINALISE THE PROJECT REPORT AND SUBMIT.</p>
2. SRITHAR S/O NARAYANAN	-ADDED QUESTIONS IN QUESTIONNAIRE
3. LOUIS PAUL S/O KUALIANTAISAMI	<p>5.1 CURRENT BUSINESS PROCESS (SCENARIOS, WORKFLOW)</p> <p>5.2 FUNCTIONAL REQUIREMENT (INPUT, PROCESS AND OUTPUT)</p> <p>5.4 LOGICAL DFD AS-IS SYSTEM (CONTEXT DIAGRAM, DIAGRAM 0, CHILD)</p> <p>5.3 NON-FUNCTIONAL REQUIREMENT (PERFORMANCE AND CONTROL)</p>

MEETING LOG FOR SADM PROJECT: PHASE 3 – ANALYSIS AND DESIGN

DATE: 28 JUNE 2025

LOG NO: 3

TEAM NAME: GROUP 10

TEAM MOTTO: WORK SMART RATHER THAN WORK HARD

TEAM GROUND RULE: COMPLETE PROJECT ON TIME

Attendance:

Group Member Name	Signatures
1. RADHA D/O MORGAN	
2. SRITHAR S/O NARAYANAN	
3. LOUIS PAUL S/O KUALIANTAISAMI	

Discussion Results/Findings:

After the completion of phase 2 project, we continue to phase 3 which is the last part due 30 June 2025. In this phase, we discussed more about the (TO-BE) System that we wanted to analysis and design. As usual we divided the task among us to complete within the time. We discussed the project in the whatsapp chat to share ideas and information. We discussed more about the Systems Analysis that required which is the Logical DFD (TO-BE) System and Identification of Process Specification (From Logical DFD (TO-BE) System). Moreover, we also discussed about Systems Specifications, Systems Design and System Wireframe of the Physical DFD (TO-BE) System. We created a Non-working prototype which is the final step of our project phase 3 and completed the report phase 3.

Members Contributions/Ideas:

Group Member Name	Contributions/Ideas
1. RADHA D/O MORGAN	6.1 LOGICAL DFD TO-BE SYSTEM (CONTEXT DIAGRAM, DIAGRAM 0, CHILD) 6.2 PROCESS SPECIFICATION (BASED ON LOGICAL DFD TO-BE) 7.1 PHYSICAL DFD TO-BE SYSTEM (DIAGRAM 0, CHILD) 8.0 SYSTEM WIREFRAME (INPUT DESIGN, OUTPUT DESIGN) -PROTOTYPE (FIGMA) 9.0 SUMMARY OF THE PROPOSED SYSTEM. DO THE MEETING LOG CHECKED, COMPILED AND FINALISE THE PROJECT REPORT.
2. SRITHAR S/O NARAYANAN	7.1 PARTITIONING, CRUD MATRIX, EVENT RESPONSE TABLE, STRUCTURE CHART, SYSTEM ARCHITECTURE)
3. LOUIS PAUL S/O KUALIANTAISAMI	-PROTOTYPE (FIGMA)