SYSTEM ANALYSIS AND DESIGN (SECD2613)

PHASE 2 - INFORMATION SYSTEM GATHERING AND REQUIREMENT

DR ROZILAWATI BINTI DOLLAH

NAME	MATRIX NUMBER
RADHA D/O MORGAN	SX220359ECRHS01
LOUIS PAUL S/O KUALIANTAISAMI	SX240262ECRHS01
SRITHAR S/O NARAYANAN	SX221591ECJHF01

Contents

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 analyse 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 INFORMATION GATHERING PROCESS

4.1 METHOD USED

➢ **Questionnaire**

Here is google forms link which used to collect the data by the survey:

https://docs.google.com/forms/d/e/1FAIpQLSebK_Y5QbgID6JtvKTk7TV1LznutLwPDis7TeHMG3N
BYl1bNA/viewform?usp=header

4.2 SUMMARY FROM METHOD USED (INCLUDE EXAMPLE INTERVIEW/QUESTIONNAIRE/OBSERVATION)

Gender *

○ Female

○ Male

Age *

○ 20 - 24

○ 25 - 29

○ 30 - 34

○ 35 - 39

○ 40 - 44

○ 45 - 50

○ Above 50

Occupation *

○ Student

○ Employed

○ Self-employed

○ Unemployed

○ Retired

How often do you use Grab Food per week?

○ 0 times

○ 1 - 2 times

○ 3 - 5 times

○ 6 - 9 times

○ 10 or more times

What time of day do you usually place Grab Food orders?

○ Morning

○ Lunch

○ Dinner

○ Late night

How easy it is to navigate the Grab Food app?

	1	2	3	4	5	
Most Difficult	○	○	○	○	○	Most Easy

How easy is it to access customer support or report a problem in the app?

B *I* <u>U</u> 🔗 ✗

	1	2	3	4	5	
Very Difficult	○	○	○	○	○	Very Easy

How satisfied are you with how Grab resolves complaints or order issues?

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

How clear and helpful are the updates or notifications during your Grab Food delivery?

	1	2	3	4	5	
Not Helpful at All	○	○	○	○	○	Very Helpful

How responsive is the Grab Food during peak hours (e.g., lunch, dinner time)?

○ Very Slow

○ Slow

○ Neutral

○ Fast

○ Very Fast

How would you rate the accuracy of restaurant menu's and item availability on the Grab Food?

1	2	3	4	5
☆	☆	☆	☆	☆

How do you usually choose what to order? (Select all that apply)

○ Promotions/discounts

○ Food cravings

○ Restaurant rating

○ Fast delivery time

○ Previous orders

○ Other: _____

Which types of food do you order most often?

○ Fast food

○ Local cuisine

○ Desserts/beverages

○ Healthy/organic options

○ International cuisine

What features would you like to see added to the Grab Food ordering system? (Select all that apply)

☐ Smart food recommendations

☐ Improved live order tracking

☐ Loyalty rewards/points

☐ Easier order customization

☐ Voice ordering

☐ Other: _____

How likely are you to continue using Grab Food despite the current issues?

1	2	3	4	5
👍	👍	👍	👍	👍

5.0 REQUIREMENT ANALYSIS (BASED ON AS-IS ANALYSIS)

5.1 CURRENT BUSINESS PROCESS (SCENARIOS, 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., GrabPay, 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

Key Business Scenarios

Scenario	Description
Normal Flow	Order accepted, delivered on time, payment successful.
Restaurant Rejection	Restaurant is unavailable or out of ingredients → system suggests alternatives or cancels the order.
Delivery Partner Unavailable	No rider found → order is auto-cancelled or rerouted to other nearby drivers.
Customer Cancels	Allowed within a limited window or before food is prepared.
Late Delivery	Triggers automated customer compensation or discounts.
Multi-Order / Scheduled Orders	Orders scheduled for future delivery or grouped into batch deliveries.

5.2 FUNCTIONAL REQUIREMENT (INPUT, PROCESS AND OUTPUT)

Component	Input	Process	Output
1. User Registration & Login.	Username, phone number/email, password, OTP.	User verification, account creation, login session management.	User account access, login confirmation, user profile created.
2. Food Search & Menu Browsing.	Keywords (e.g., "pizza"), location, filters (e.g., rating, price).	Search query processed, matching restaurants and items fetched.	List of available restaurants, dishes, estimated delivery times.
3. Order Placement.	Selected food items, quantity, delivery address, payment method.	Cart created, address validated, payment method confirmed.	Order summary page, confirmation message, estimated delivery time.
4. Order Confirmation & Restaurant Processing.	Order details sent to restaurant.	Restaurant accepts or rejects, prepares the order.	Confirmation notification to user, prep time displayed.
5. Delivery Partner Assignment.	Order ready time, location, delivery radius.	Matching algorithm assigns driver, notifies driver.	Assigned delivery partner, ETA displayed to user & restaurant.
6. Order Tracking & Delivery.	GPS data, order status updates.	Real-time tracking, location updates, status changes.	Live map tracking, order status (e.g., picked up, en route, delivered).
7. Payment & Checkout.	Payment method (e-wallet, card, cash).	Process transaction, verify payment success.	Payment confirmation, receipt generated, order marked as paid.
8. Review & Rating System.	Customer rating and review text.	Feedback collected, stored, analysed.	Updated restaurant and driver ratings, review visible to other users.
9. Promotions & Vouchers.	Promo code or voucher selection.	Validate voucher, apply discount rules.	Discount applied to total bill, promo confirmation shown.

5.3 NON-FUNCTIONAL REQUIREMENT (PERFORMANCE AND CONTROL)

➢ **Performance**:

- <1.5 seconds average response time, even under load.
- AI-load balancer ensures no degradation during peak periods (lunch& dinner time).
- Able to support high concurrency from multiple users, drivers, and restaurants without performance degradation.

➢ **Usability**:

- Redesigned UI follows mobile UX best practices (e.g., minimal taps, intuitive navigation and user friendly).
- New user onboarding walkthrough with easier navigation.

➢ **Reliability**:

- 99.99% uptime with fallback and retry mechanisms without failures.

➢ **Scalability**:

- System auto scaling on cloud infrastructure based on real-time traffic to maintain the good feedback.

➢ **Security**:

- Two-factor authentication.
- AES-256 encrypted storage of personal/payment data.

➢ **Support Accessibility**:

- Real-time and 24hrs chat supports visible within all app sections for any issues facing.
- Ticket system with status notifications for alert.

➢ **Throughput**

- Capable of processing thousands of food orders per second across regions without bad record.

➢ **Real-time Tracking**

- GPS tracking must update every 5-10 seconds for customers and drivers to see live location for avoid the major delay.
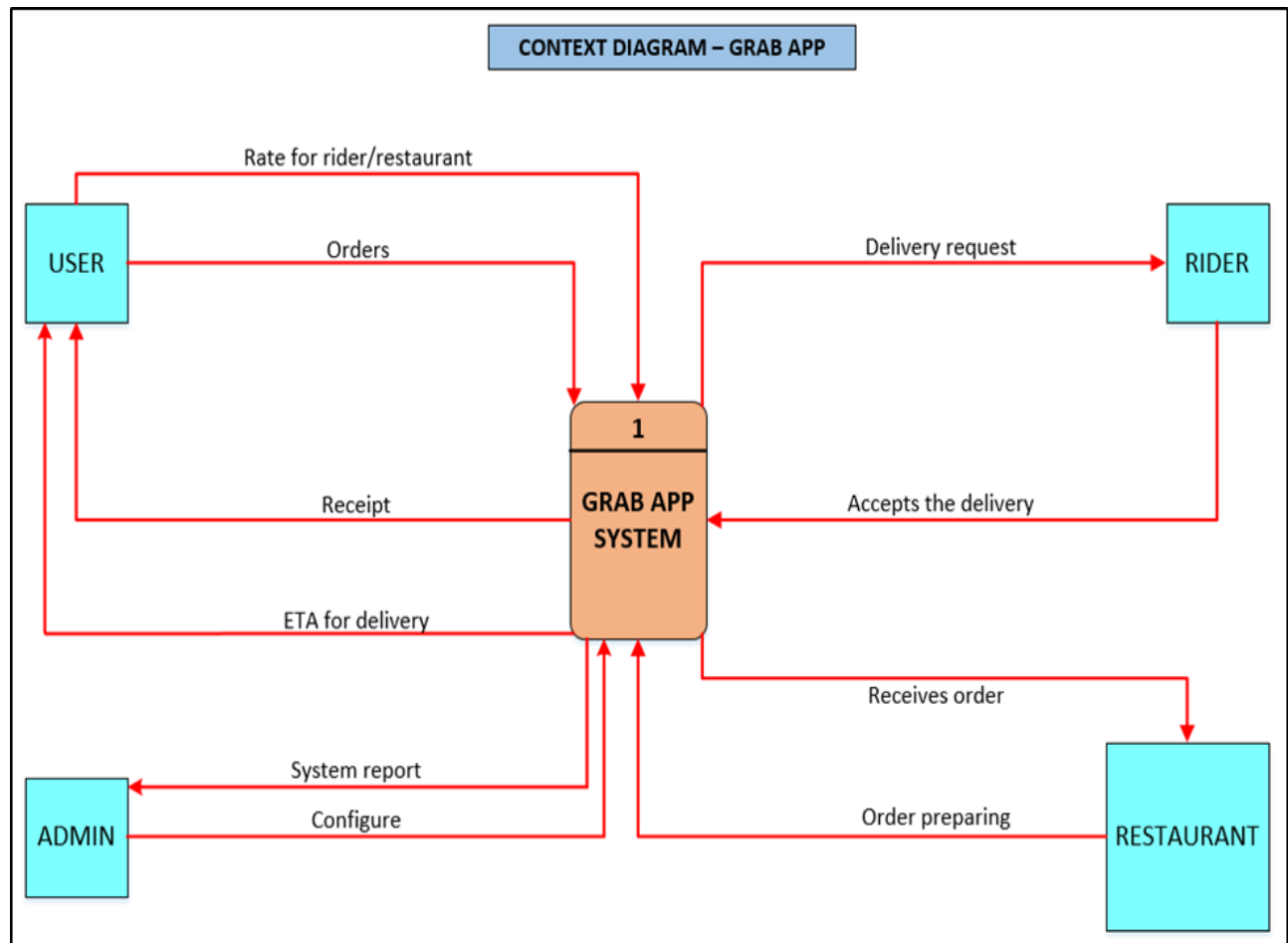
➢ **Data Synchronization**

- Menu and item availability should be updated in real-time to avoid ordering out-of-stock items and avoid major cancelation.

5.4 LOGICAL DFD AS-IS SYSTEM (CONTEXT DIAGRAM, DIAGRAM 0, CHILD)

5.4.1 CONTEXT DIAGRAM

➢ **Entities:**

- User
- Rider
- Restaurant
- Admin

CONTEXT DIAGRAM – GRAB APP

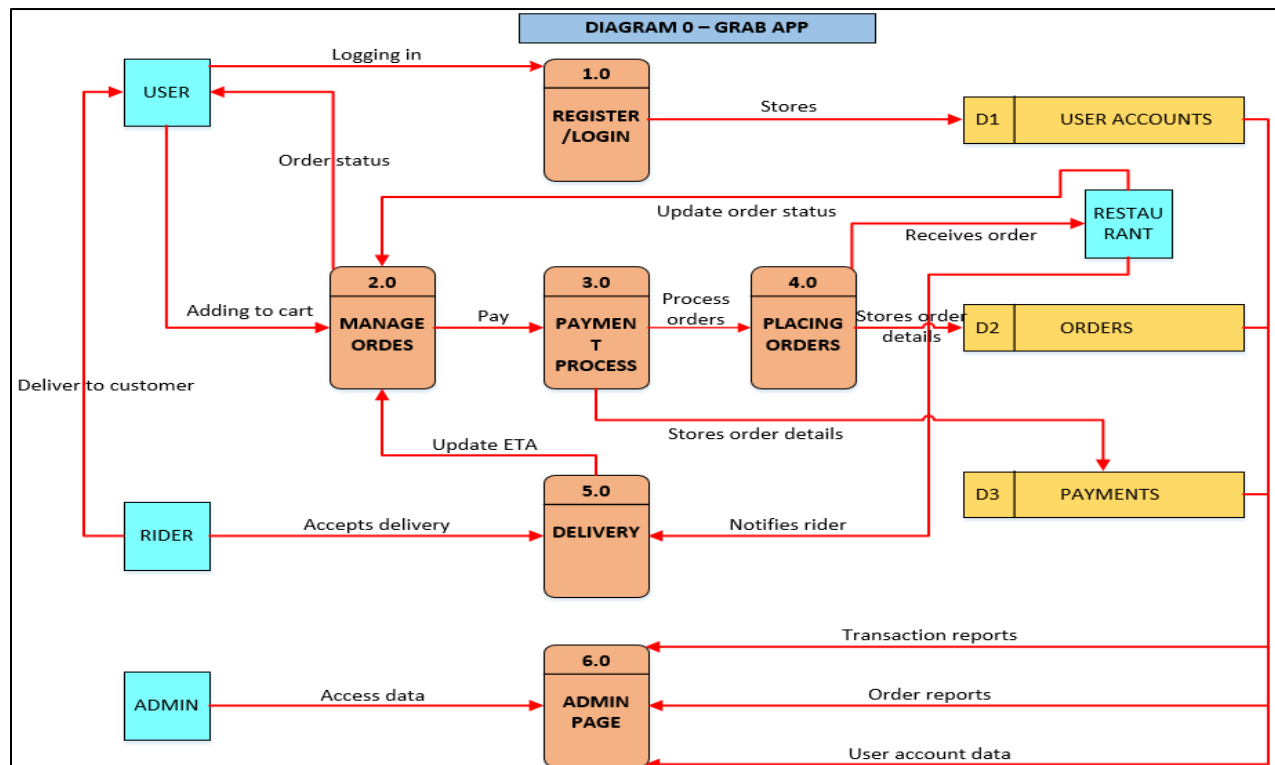## 5.4.2 DIAGRAM 0 – MAIN SYSTEM PROCESS DECOMPOSITION

➢ **Entities:**
- User
- Rider
- Restaurant
- Admin

➢ **Processes:**
- Register/Login
- Manage Orders
- Placing Orders
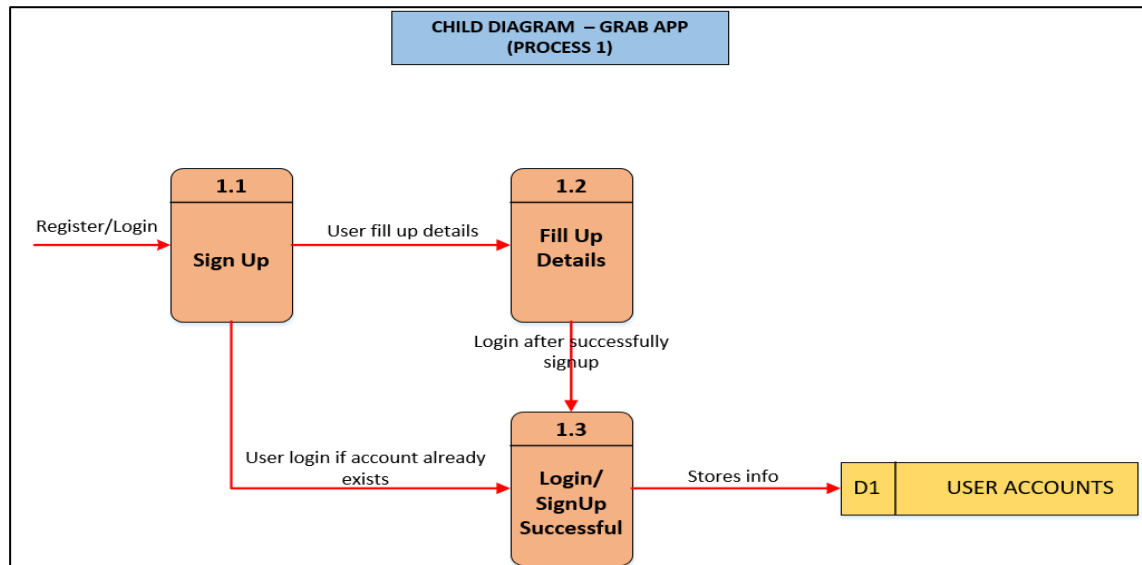- Delivery
- Admin Page

➢ **Data Store:**
- D1: User Accounts
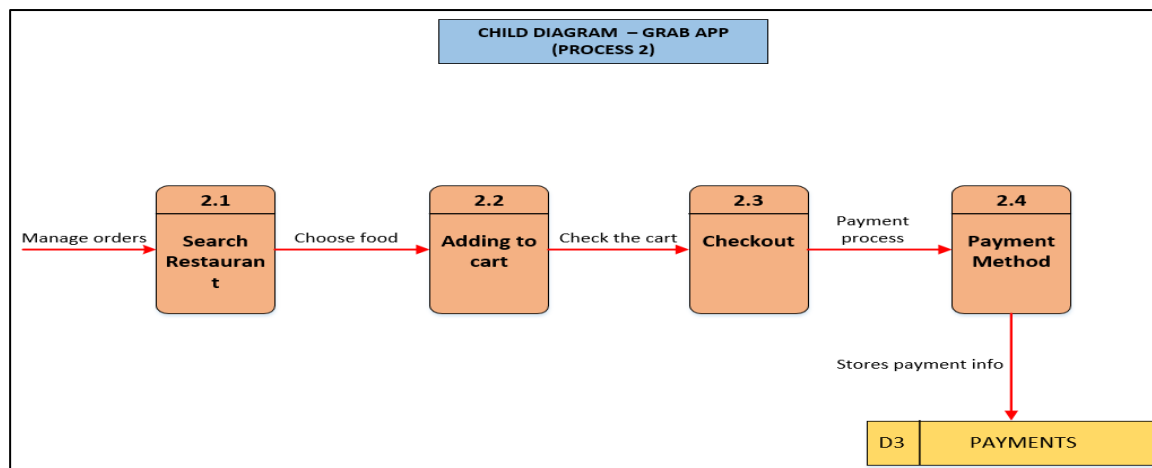- D2: Orders
- D3: Payments

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

- 1.1 Sign Up
- 1.2 Fill Up Details
- 1.3 Login/Sign Up Successful

5.4.4 CHILD DIAGRAM EXAMPLE (2.0 MANAGE ORDERS) PROCESS 2

- 2.1 Search Restaurant

- 2.2 Adding to cart

- 2.3 Checkout

- 2.4 Payment Method

6.0 SUMMARY OF REQUIREMENT ANALYSIS PROCESS

This requirement analysis process identifies clear issues within Grab's food ordering of current delivery ecosystem and offers strategic, technology-driven solutions. By focusing on user interface, AI personalization, real-time tracking, and system performance of customer feedbacks, Grab can significantly enhance its service quality, improve user satisfaction, and maintain its leadership in the Southeast Asian on-demand services market. The function of the enhanced Grab Food system is to provide a faster, smarter, and more personalized food ordering experience, while ensuring real-time to increase the population of customer usage to enhance in future. As from the requirement analysis process, we gathered the required information that needed for further completion of the project and satisfy our project goals. Completing this project is crucial to fix existing issues, meet user expectations, remain competitive, and build a more reliable, scalable, and intelligent food delivery system for all users. The requirement analysis process is essential because it forms the foundation of a successful project. It ensures the final system solves the right problems, meets user expectations, and is built efficiently and correctly.