Karachi Institute Of Economics & Technology (KIET)

Software Requirement Engineering (Lab)

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Lab Assignment 1

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Q1 — Requirements & Challenges (2 marks)

a) Functional requirements (FRs)

1. **User registration & authentication**
   - Customers, Restaurants, Delivery Personnel, and Admin can register/login.
2. **Browse restaurants & menus**
   - Customers can search/filter restaurants, view menus and item details.
3. **Cart & order placement**
   - Add/remove items, select address, choose delivery time, place order.
4. **Payment processing**
   - Integrate with secure payment gateway, support cards, wallets.
5. **Order management for restaurants**
   - Restaurants receive orders, accept/reject, update order status, manage menus.

b) Non-functional requirements (NFRs)

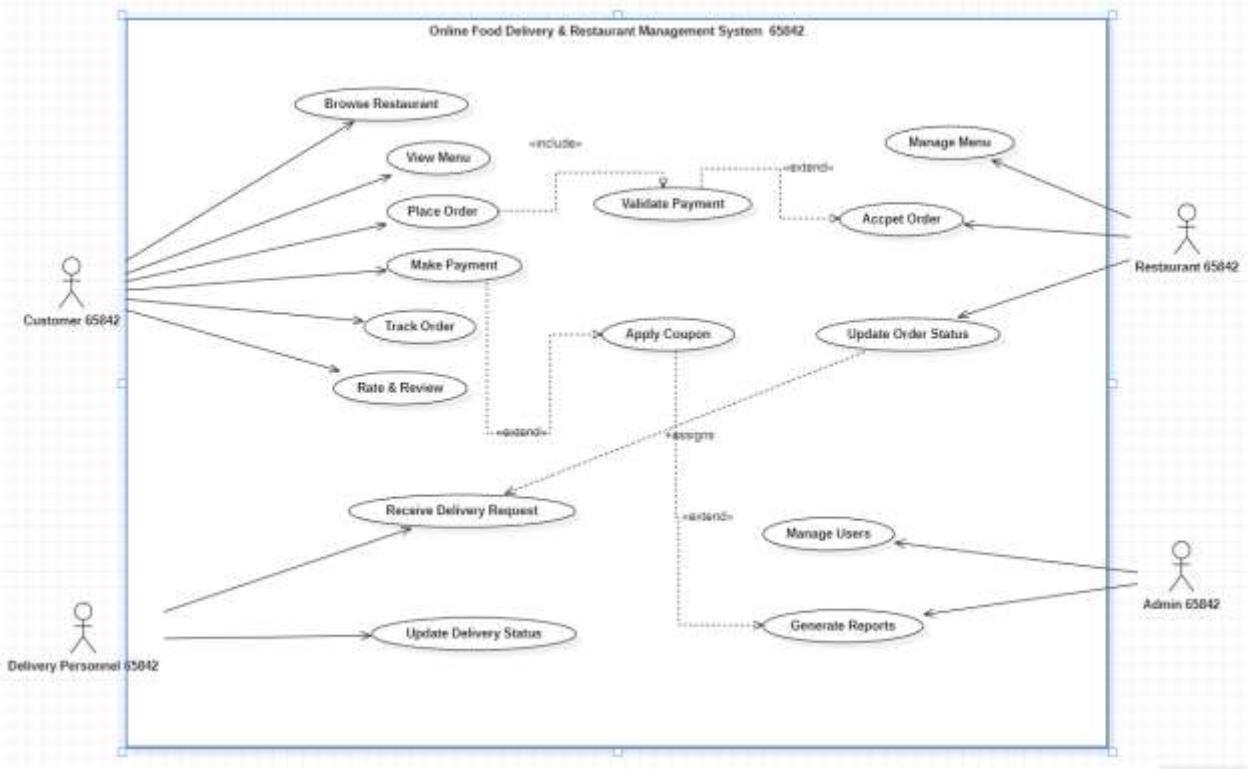
1. **Scalability**
   - System must handle concurrent users and bursts (peak meal times).
2. **Availability**
   - High availability (target 99.9% uptime for core services).
3. **Performance**
   - Search & menu pages load in < 2s; order placement < 3s response.
4. **Security**
   - Secure authentication (hashed passwords), HTTPS/TLS, PCI-DSS compliance for payments.
5. **Reliability**
   - Guaranteed message delivery for critical events (order created/updated).

c) Two challenges in requirement elicitation (explain 2)

1. **Conflicting stakeholder priorities**
   - Customers want fast checkout and many payment options; restaurants care about order accuracy and predictable prep times; delivery personnel want clear routes and fair pay. Balancing these competing priorities requires many stakeholder sessions and prioritization workshops.
2. **Capturing real-world constraints**
   - Delivery logistics depend on traffic patterns, local regulations (e.g., curfews, allowed motorbikes), and variable restaurant prep times. These constraints are often discovered only after prototyping or observing operations, making early elicitation incomplete.

Q2 — Use Case Modeling

a) Use Case Diagram (Actors Name with Student ID)



b) Brief interaction description (Customer, Restaurant, Delivery Personnel)

Customer ↔ Restaurant

- Customer browses restaurants and menus; selects items and places an order. The restaurant receives an order notification, confirms availability, accepts the order, and starts preparing.

Restaurant ↔ Delivery Personnel

- After restaurant marks order ready, the system (or restaurant via dashboard) requests assignment of a delivery person. Delivery Personnel receive assignment requests, accept one, and update status (Picked Up). Restaurant is notified when pickup occurs.

Customer ↔ Delivery Personnel (via System)

- The customer tracks the delivery in real time through the system (map + ETA). Delivery Personnel update status as they progress; system forwards live location. After delivery, customer confirms receipt and may rate the order.

Q3 — Use Case Narration & Activity Diagram

a) Use case narration — Place Order

Use Case Name: Place Order
Primary Actor: Customer
Supporting Actors: Restaurant, Payment Gateway, Delivery Personnel (indirect later in process)

Pre-conditions:

- Customer is logged in.
- Customer has items in the cart.
- Restaurant is actively accepting online orders.

Main Flow (Happy Path):

1. Customer selects menu items and clicks **Place Order**.
2. System shows order summary and requests payment method.
3. Customer confirms payment.
4. System sends payment details to **Payment Gateway**.
5. Payment Gateway authorizes the payment and sends confirmation.
6. System forwards the confirmed order to the **Restaurant**.
7. Restaurant **accepts** the order and starts preparing food.
8. Once food is ready, the system **assigns Delivery Personnel**.
9. Delivery Personnel picks up the order and delivers it to the customer.
10. System marks the order as **Delivered**.

Alternate Flows:

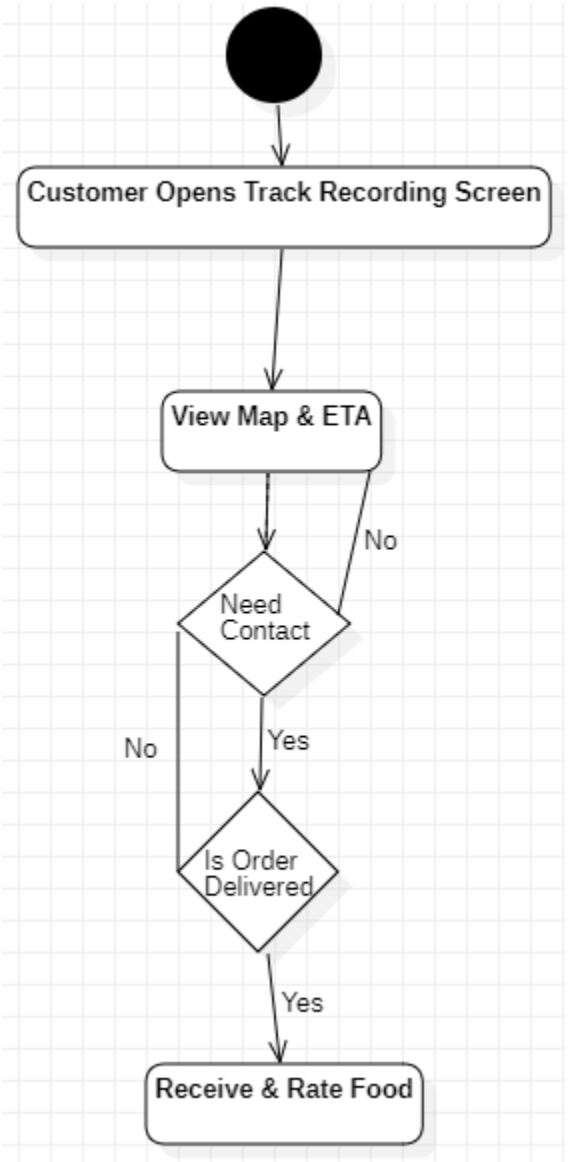
- **A1: Payment Failed**
  - At Step 5, Payment Gateway declines the transaction.
  - System notifies Customer and asks for another payment method.
- **A2: Restaurant Rejects Order**
  - At Step 7, Restaurant rejects due to item unavailability.
  - System informs Customer and allows choosing another restaurant or cancelling.
- **A3: No Delivery Personnel Available**

- In Step 8, system fails to find a delivery person.
- System notifies Customer and offers choice to wait or cancel.

Post-conditions:

- Successful: Order stored with status **Delivered**, payment completed.
- Failure: Order cancelled and payment (if any) refunded.

b) Activity Diagram — Track Order



Q4 — Collaboration Diagram

Process: Assign Delivery Personnel