TurboTrucks: Delivery System Project

SOEN 343 – Software Architecture and Design

Phase 2 Submission: System architecture and sequence diagram

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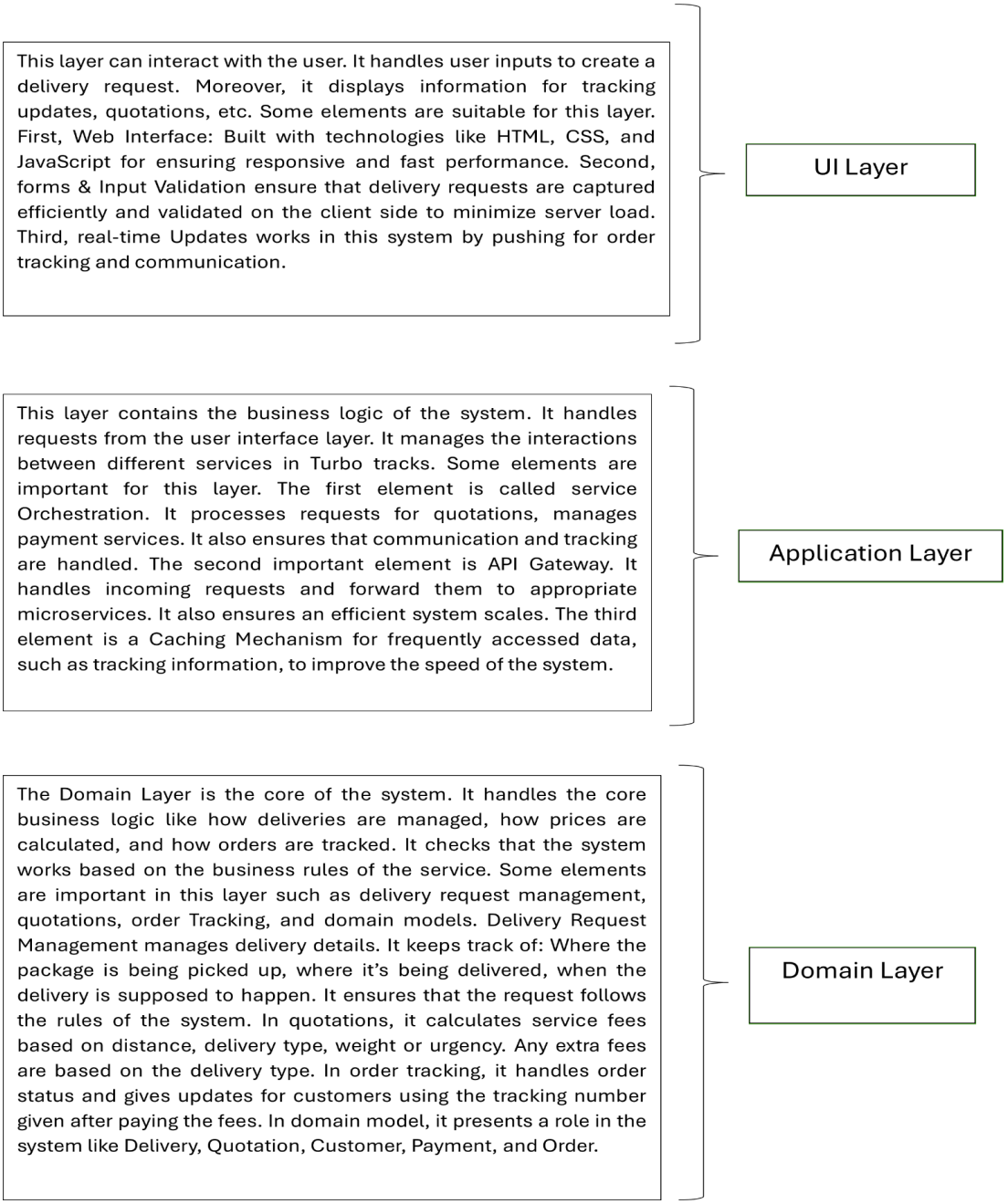
I- Summary of the project

The "Turbo Trucks" service system is an online platform that helps people send and receive packages easily. Customers can request a delivery by giving the pick-up and drop-off details. The system provides a price estimate for the service and allows customers to communicate with the delivery team for updates. It also offers real-time tracking, so users can see where their package is. Payments can be made securely through the platform. Additionally, a chatbot is available to help customers with any questions or issues. The system is built in different layers to keep it organized and efficient.

II- System Architecture

Three layers will be chosen in order for the system to be efficiently and quickly, considering performance and scalability. Each layer has a role in the system architecture. These layers are the following: UI Layer, application layer, and domain layer. They are a good combination for our delivery service system.



UI Layer

Description: This layer can interact with the user. It handles user inputs to create a delivery request. Moreover, it displays information for tracking updates, quotations, etc.

Elements:

- Web Interface: Built with technologies like HTML, CSS, and JavaScript for ensuring responsive and fast performance.
- Forms & Input Validation: it ensures that delivery requests are captured efficiently and validated on the client side to minimize server load.
- Real-time Updates: it works in this system by pushing for order tracking and communication.

Application Layer

Description: This layer contains the business logic of the system. It handles requests from the user interface layer. It manages the interactions between different services in Turbo tracks. **Elements:**

- Service Orchestration: It processes requests for quotations, manages payment services. It also ensures that communication and tracking are handled.
- API Gateway: It handles incoming requests and forward them to appropriate microservices. It also ensures an efficient system scales.
- Caching Mechanism: it for frequently accessed data, such as tracking information, to improve the speed of the system.

Domain Layer

Description: The Domain Layer is the core of the system. It handles the core business logic like how deliveries are managed, how prices are calculated, and how orders are tracked. It checks that the system works based on the business rules of the service

Elements:

- Delivery Request Management: It manages delivery details. It keeps track of Where the package is being picked up, where it's being delivered, when the

delivery is supposed to happen. It ensures that the request follows the rules of the system.

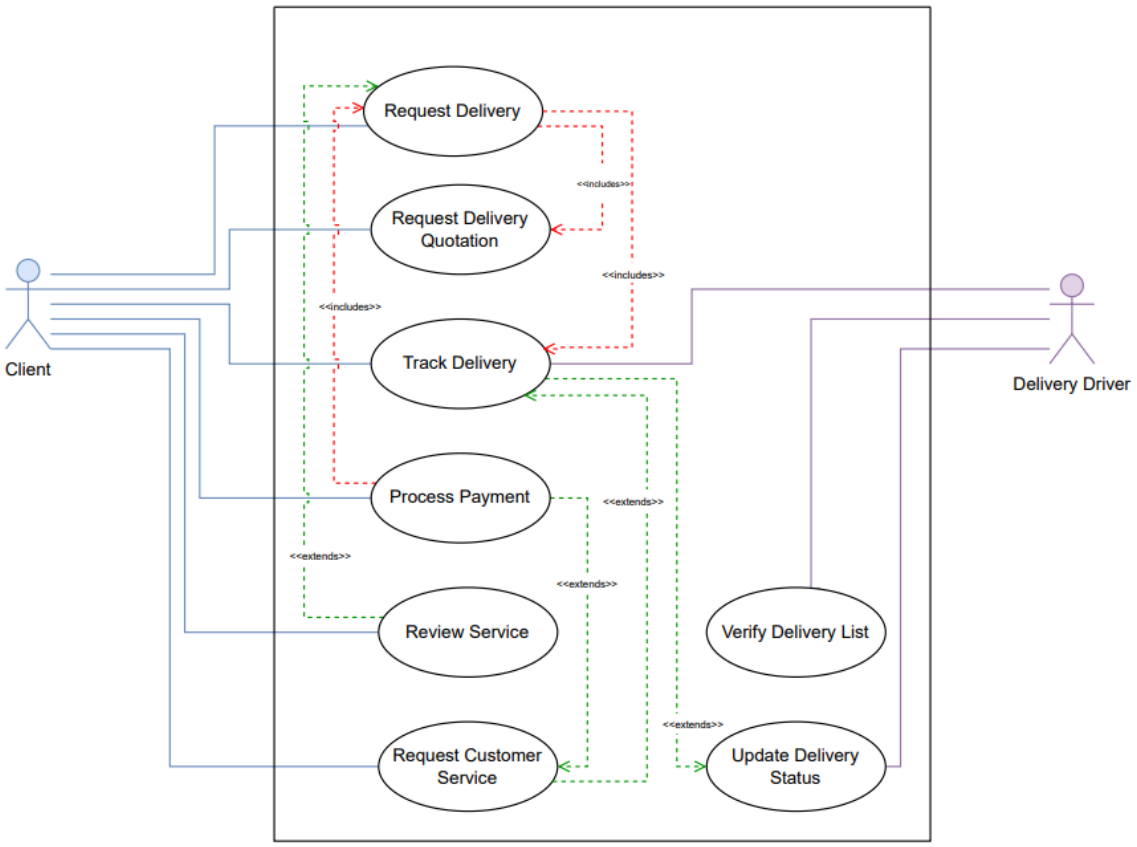
- Quotations: it calculates service fees based on distance, delivery type, weight or urgency. Any extra fees are based on the delivery type.
- Order tracking: it handles order status and gives updates for customers using the tracking number given after paying the fees.
- Domain model: it presents a role in the system like Delivery, Quotation, Customer, Payment, and Order.

III- Use cases

This use case diagram shows the interactions between a Client (main actor) and a Delivery Driver (secondary actor) within a delivery service system. The Client, on the left side of the diagram, initiates various actions like requesting deliveries, obtaining quotations, tracking deliveries, processing payments, reviewing services, and requesting customer support. On the right side, the Delivery Driver interacts with the system to verify assigned deliveries and update delivery statuses.

The <<includes>> relationships represent required steps, such as how requesting a quotation is inherently part of the delivery request process. The <<extends>> relationships highlight optional or conditional actions, like how the tracking feature may expand to include updates from the delivery driver. This setup ensures that the system can handle core functionalities while providing flexibility for additional actions as needed.

Use Case Diagram



Use case scenarios

ID:	UC-DS-01
Title:	Request Delivery
Description:	This use case allows the client to request a delivery of a package by entering details such as the origin, destination, package measurements, and sender/recipient information. The system will then generate a unique delivery identification.
Primary Actor:	Client (user requesting the delivery)
Preconditions:	- The client is logged into the system. - The request delivery option is available. - The origin and destination are valid locations. - The package measurements are valid.
Postconditions:	- A unique delivery identification is generated. - The package information is stored in the system's database.
Inputs:	- Origin and destination locations. - Package measurements. - Sender and recipient information.
Outputs:	- Confirmation of delivery request. - Unique delivery identification.
Main Success Scenario:	1. The client logs into the delivery system and selects the request delivery option. 2. The system prompts the client to enter the sender & recipient information, origin & destination locations, and package measurements. 3. The client enters all the required information. 4. The system validates the inputs. 5. The system confirms the delivery request and generates a unique delivery identification. 6. The system stores the package information in the database.

ID:	UC-DS-02
Title:	Request Delivery Quotation
Description:	This use case allows the client to receive a quotation for the delivery service by entering the package details and delivery information. The system then calculates and displays the estimated cost.
Primary Actor:	Client (user requesting a quotation).
Preconditions:	- The client is logged into the system. - The request a quotation option is available. - The client inputs the valid delivery details. - There exists a delivery route between the origin and destination.
Postconditions:	- The system provides a quotation for the delivery service based on the package information.
Inputs:	- Package measurements. - Origin and destination locations. - Delivery option (standard, express, etc.)
Outputs:	- Delivery service quotation. - Estimated delivery time.
Main Success Scenario:	1. The client logs into the delivery system and selects the request delivery quotation option. 2. The system prompts the user to enter the package measurements, origin & destination locations, and the type of delivery option. 3. The client enters the required information. 4. The system validates the inputs. 5. The system calculates the estimated cost based on the information entered by the client. 6. The system displays the quotation (estimated cost and time).

ID:	UC-DS-03
Title:	Track Delivery
Description:	This use case allows the client to track the status of a delivery by entering a unique delivery identification. The system then provides the estimated arrival time, current location of the package and the contact information of the sender or recipient.
Primary Actor:	Client (user tracking a delivery)
Preconditions:	- Client is logged into the system. - The track a delivery option is available. - Client enters a valid delivery identification. - The package is registered in the system.
Postconditions:	- Client receives the tracking information of the package being delivered.
Inputs:	- Delivery identification.
Outputs:	- Tracking information (current location, estimated arrival). - Contact information of the sender or recipient.
Main Success Scenario:	1. The client logs into the system and selects the track a delivery option. 2. The system prompts the client to enter the unique delivery identification. 3. The client enters the ID. 4. The system validates the input and retrieves the corresponding delivery details. 5. The system displays the tracking information and the contact information of the sender/recipient.

ID:	UC-DS-04
Title:	Process Payment
Description:	This use case allows the client to identify the delivery service and proceed with the payment. The system then allows the transaction to be processed.
Primary Actor:	Client (user making the payment for the delivery service)
Preconditions:	- The client is logged into the system. - The payment option is available.
Postconditions:	- The payment is successfully processed, and the delivery is confirmed. - The system updates the status to paid and provides a receipt.
Inputs:	- Delivery identification - Payment method
Outputs:	- Payment confirmation - Receipt of payment
Main Success Scenario:	1. The client logs into the system and selects the make a payment option. 2. The system prompts the client to enter the delivery ID to identify the service that needs a payment. 3. The client enters the delivery ID. 4. The system retrieves the amount that needs to be paid and displays a window for the payment. 5. The client selects the payment method and enters the payment details. 6. The system processes the payment and confirms its success. 7. The system stets the payment status to “paid” and provides a receipt.

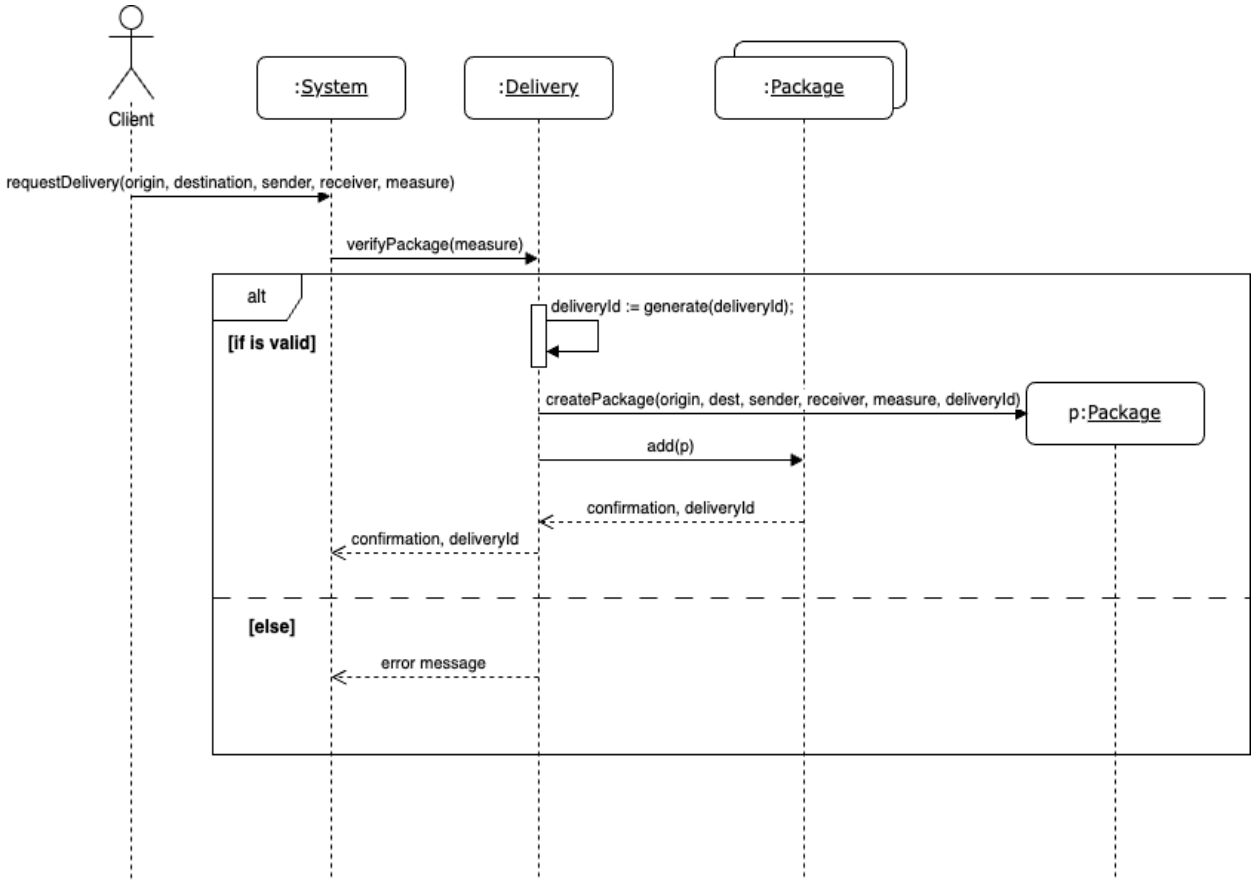
ID:	UC-DS-05
Title:	Review Service
Description:	This use case allows the client to review the delivery service after its completion. The client can provide feedback on the delivery service, comment on the delivery person and other details related to the offered service.
Primary Actor:	Client (user reviewing the delivery service)
Preconditions:	- The client is logged into the system. - Reviewing the service is available to the client. - The delivery service is completed.
Postconditions:	- The client has received the delivery and submits a review. - The feedback is available to review by the service provider.
Inputs:	- Rating (ex: 1 to 5 stars) - Comments (feedback on delivery person and delivery experience).
Outputs:	- Confirmation of the submitted review. - Review is stored in the system.
Main Success Scenario:	1. The client logs into the system after the delivery has been completed. 2. The system prompts the user to enter the delivery ID to identify the service. 3. The client enters the appropriate ID and is prompted to rate the service and leave comments about the delivery person and service. 4. The client rates and provides feedback about the service. 5. The system confirms the submission of the review and stores this feedback in the system for the service provider to view.

ID:	UC-DS-06
Title:	Request Customer Support
Description:	This use case allows the client to contact customer support for assistance (for general inquiries or for specific requests). The client can ask a question or describe a problem, and the system routes the request to a support agent.
Primary Actor:	Client (user requesting customer support)
Preconditions:	- The client is logged into the system. - A customer support option is available. - The client can have a delivery ID for specific questions or no ID for general inquiries.
Postconditions:	- The support request is logged in the system. - A customer support agent is assigned to handle the client's request. - The client receives an answer to the problem.
Inputs:	- Client details - Delivery ID (if the issue is specific to a delivery) - Description of the issue or request
Outputs:	- Response from the customer support agent. - Ticket number for the support request.
Main Success Scenario:	1. The client logs into the system and selects the customer support option. 2. The system prompts the client to choose between submitting a general request or a delivery-specific inquiry. 3. If the client chooses the delivery specific option, they are prompted to enter the corresponding delivery ID. 4. The client enters the description of their issue. 5. The system logs the request and generates a ticket number. 6. The system routes the request to a customer support agent. 7. The customer support agent reviews the case and contacts the client with a solution to their problem.

IV- Sequence diagram

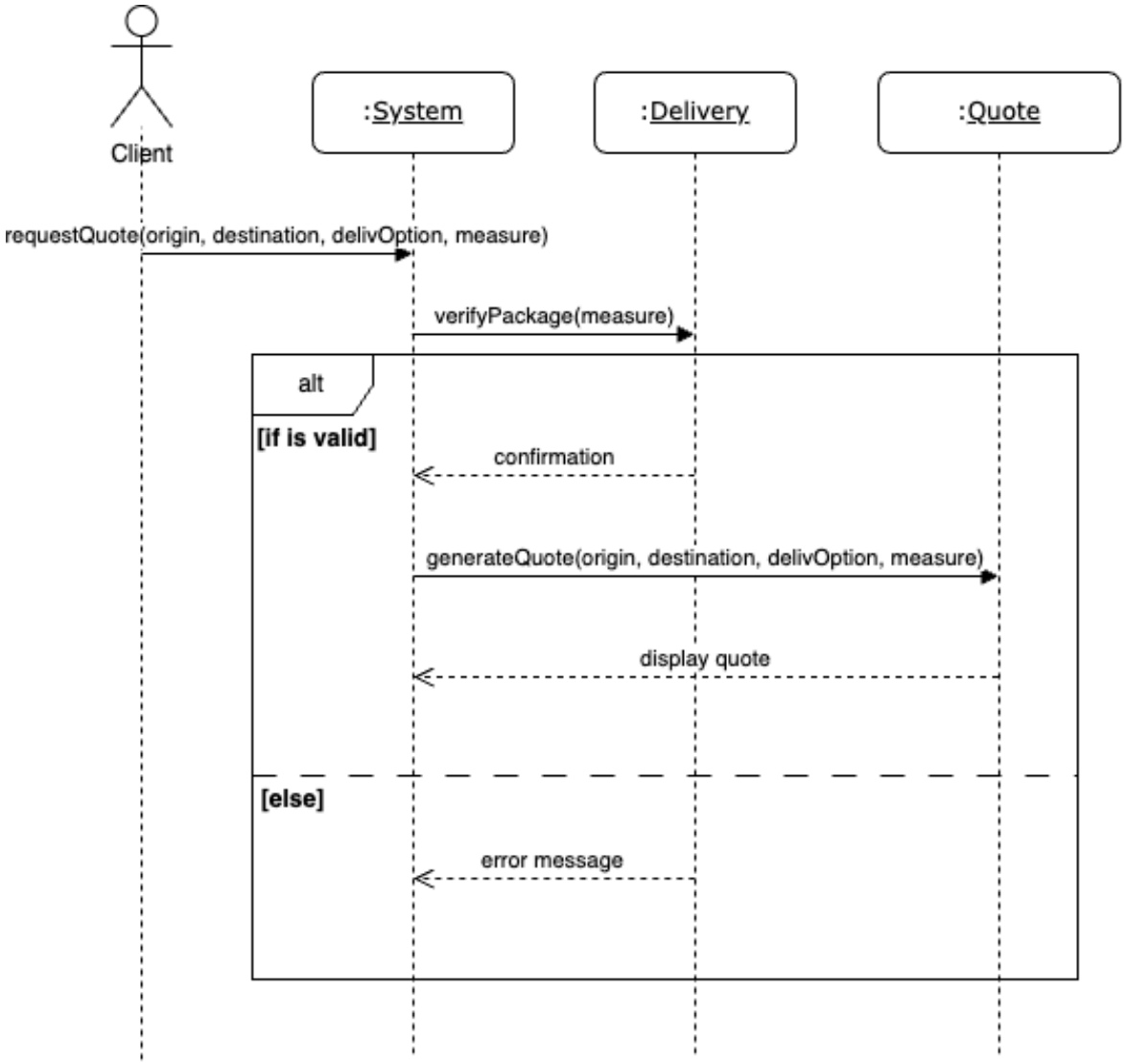
UC-DS-01 - Request Delivery

The request is initiated in real life by the client (user) after providing pickup and dropoff locations, sender and receiver contact information, and package measurements.



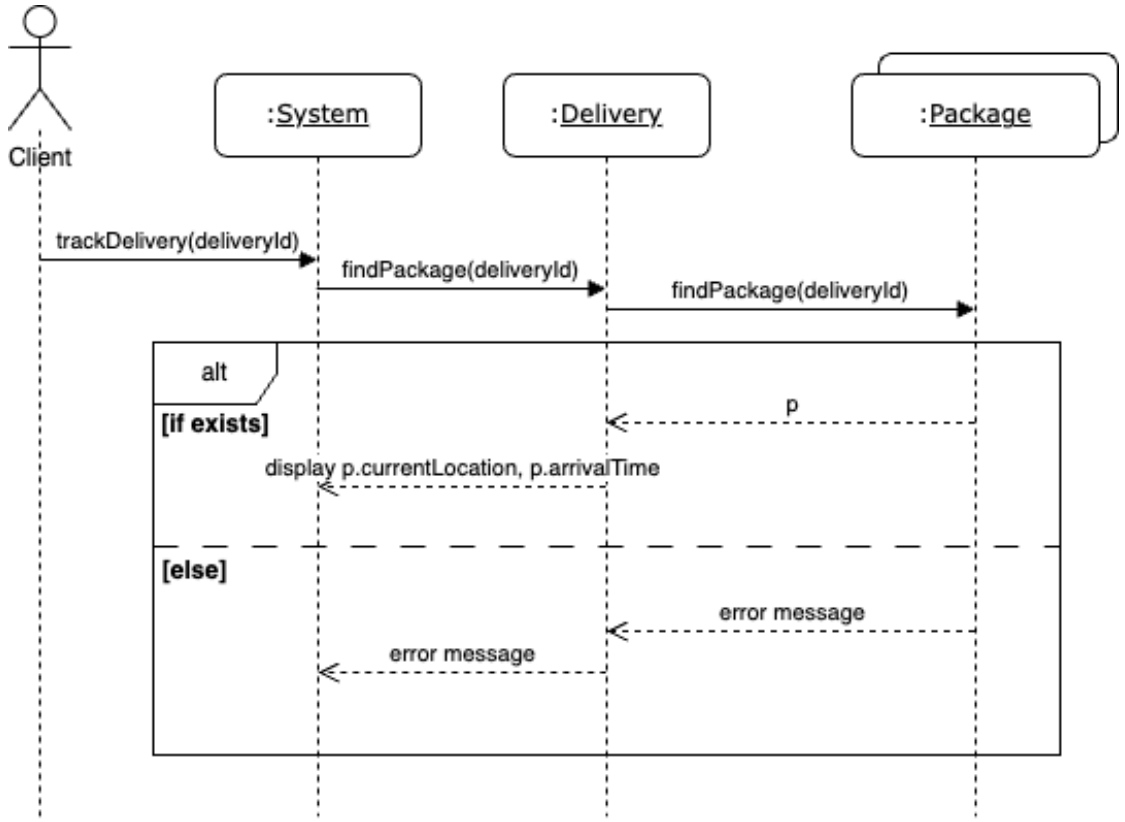
UC-DS-02 - Request Delivery Quotation

The delivery quotation is initiated similarly to that of the delivery - the client (user) enters pickup and dropoff locations, package measurements, and the delivery type option.



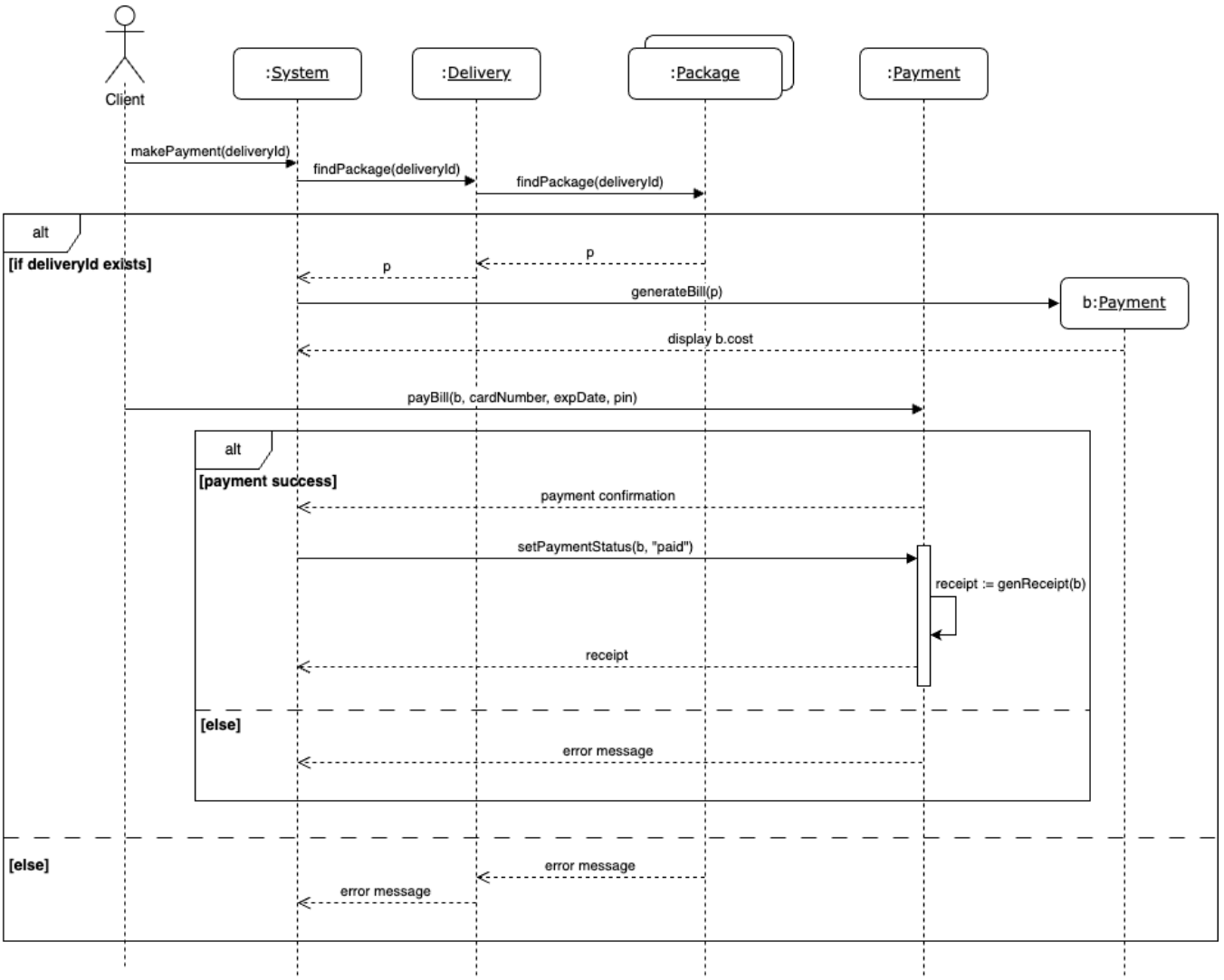
UC-DS-03 - Track Delivery

Delivery tracking is initiated by the client entering the unique delivery id associated with the package.



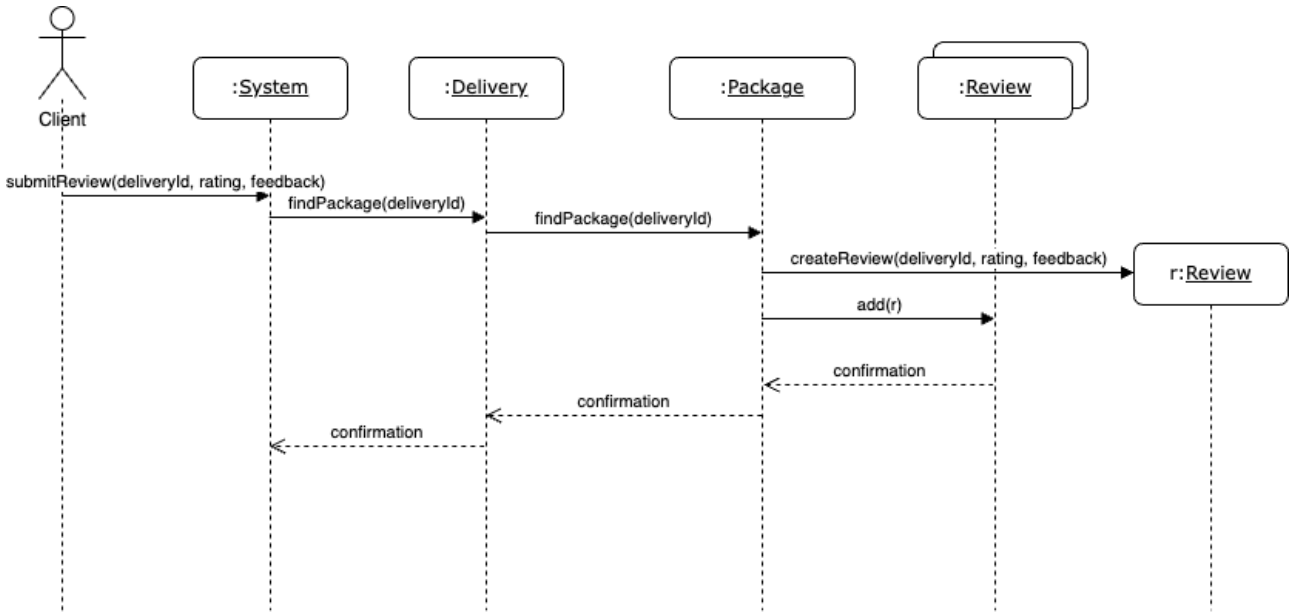
UC-DS-04 - Process Payment

The payment process is available and initiated by the client after the package has been delivered. The system keeps track of the deliveryId associated with the package, and the client provides payment information such as card number, expiry date, and pin.



UC-DS-05 - Review Service

The review service is initiated when the client submits a review about a delivered package. The system keeps track of the delivery id associated with the package, and the client provides a star rating (1-5) as well as additional comments.



UC-DS-06 - Request Customer Support

Support contact is initiated in real life when a client selects the customer support option. The client enters the subject of a support ticket, their name, and a description of the problem. Additionally, clients may provide a delivery id to associate the ticket with a delivery.