

Process Model Analysis



TRANSPORT SERVICE MATCH PLATFORM

Version	Description of Change	Author	Date
1.0	First Draft	Ahmed Berdai / Ophelia Karpetyan/ Maria / Moustapha Abu zeir / Aadel Bouzambou	28/02/2025

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1. Introduction

This document provides a clear and structured breakdown of the workflow and sequence diagrams for the Transport Service Match System. The application streamlines interactions between Logistic Providers (LP) and Logistic Requesters (LR), enabling efficient handling of logistics requests, real-time communication, and payment processing.

Organized step-by-step, the document walks through each stage of the process, starting with participant registration and role selection, followed by the creation and acceptance of logistics requests, pickup and delivery coordination, and concluding with payment processing and feedback.

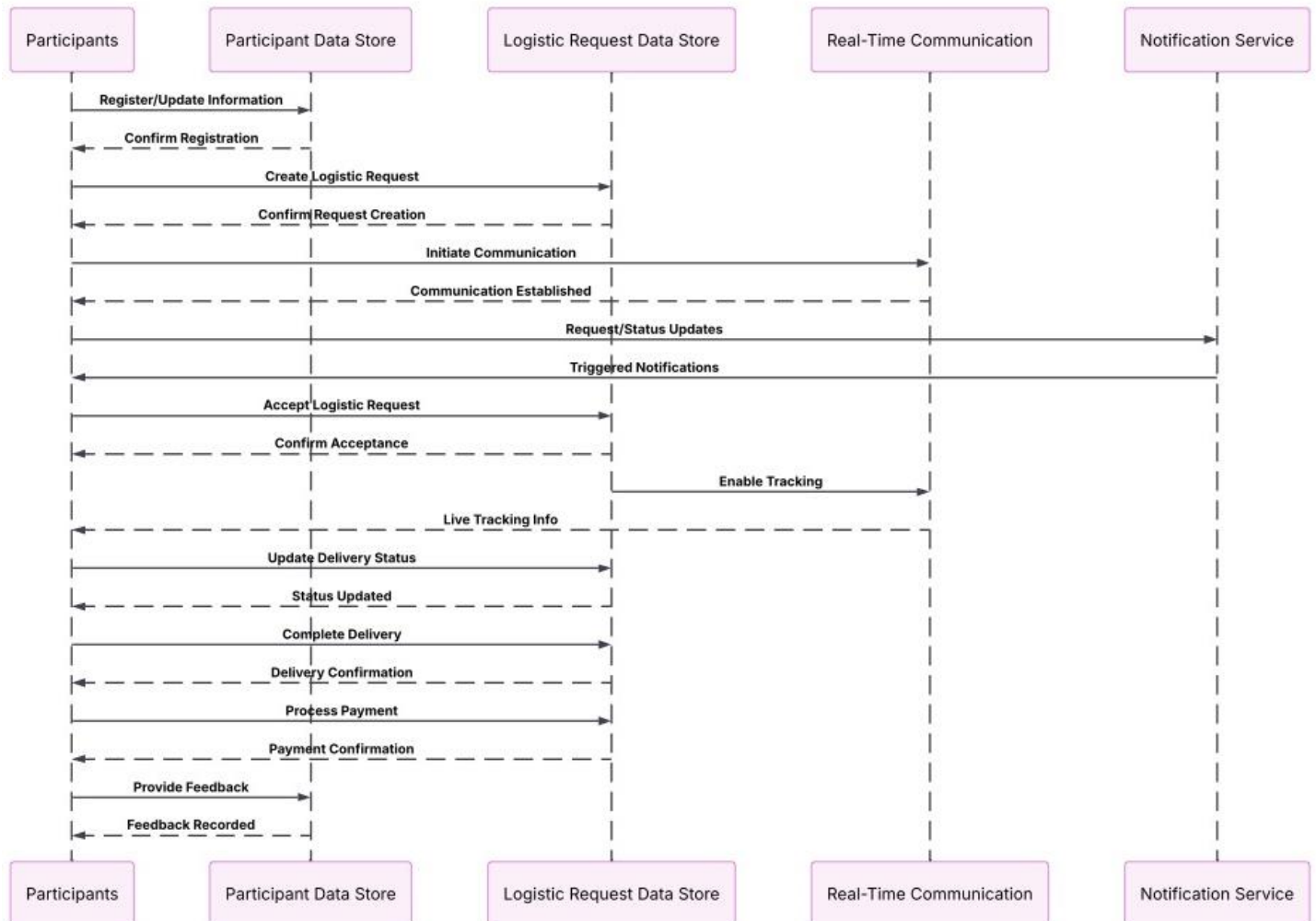
Each step is supported by sequence diagrams that visually map the interactions between participants, the system, and data stores.

This Process Model Analysis serves as a practical guide for understanding the application's processes.

It ensures a transparent and detailed view of how actions and data flow within the system.

2. General Overview (Full App)

2.1 Sequence Diagram



Graphique 1: General Workflow Diagram representing the core processes of the Transport Service Match System, including interactions between participants, data stores, and services. Realized using lucid.app.

2.2 Key Process Steps

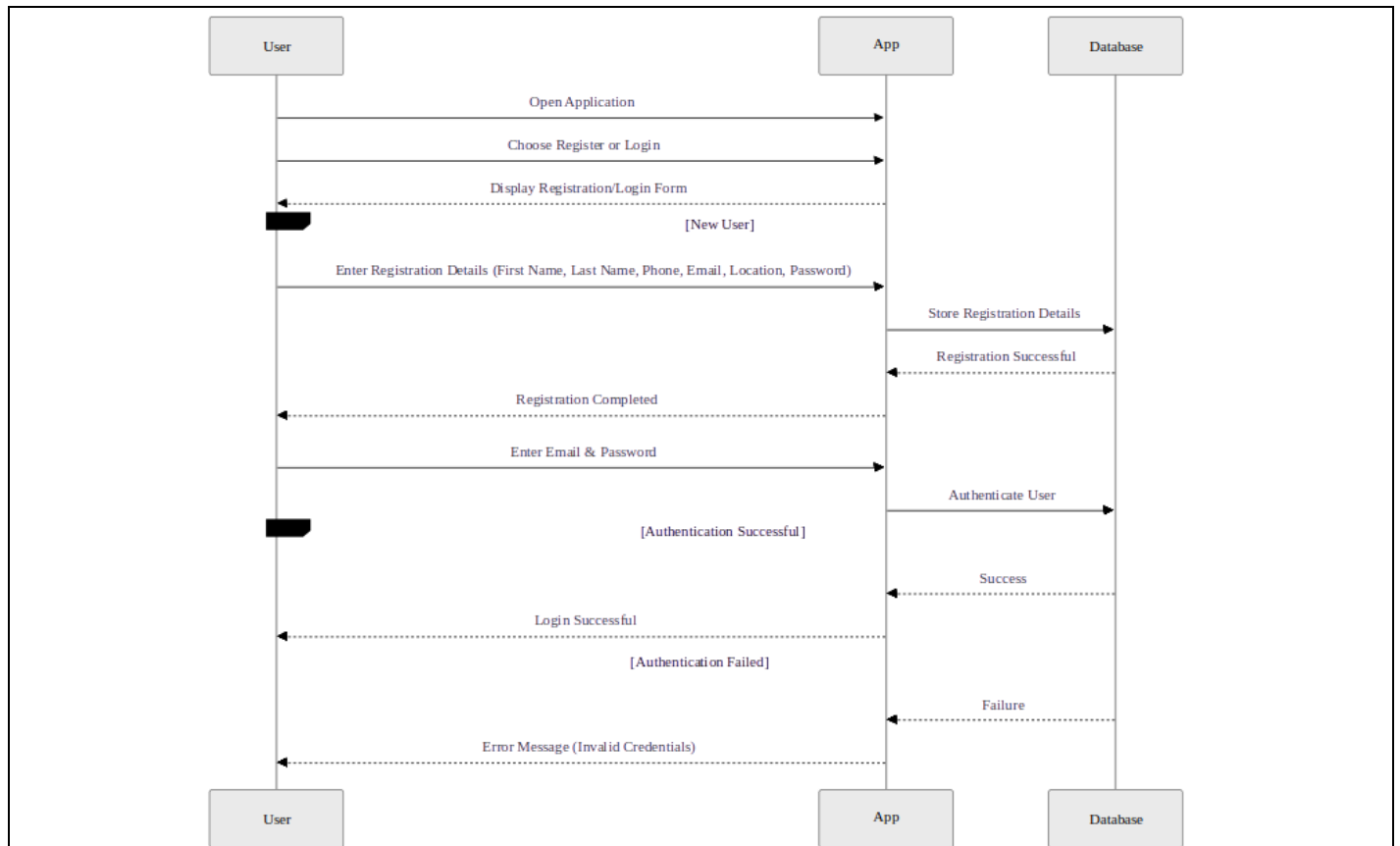
- ◆ Participant Interaction:
 - Participants (Logistic Providers (LP) and Logistic Requesters (LR)) interact with the system.
 - Actions include registration, login, role selection, and dashboard navigation.
- ◆ Data Storage:
 - Participant data (e.g., registration details, role selection, feedback, and ratings) is stored in the Participant Data Store.
 - Logistic request details (e.g., pickup/dropoff locations, package details, status updates, and payment information) are stored in the Logistic Request Data Store.
- ◆ Real-Time Communication:
 - Coordination between LP and LR during pickup and delivery is facilitated through real-time communication.
- ◆ Notification Service:
 - Notifications are sent to participants regarding request status, confirmations, and updates.
- ◆ Alternatives:
 - The system differentiates between actions for Logistic Providers (LP) and Logistic Requesters (LR) using "alt" blocks in the diagram.

2.3 Data Flow Overview

- ◆ Participant Data Store:
 - Participant information (e.g., FirstName, LastName, PhoneNumber, Email, Location, Password).
 - Role selection (Logistic Provider or Logistic Requester).
 - Feedback and ratings provided by participants.
- ◆ Logistic Request Data Store:
 - Logistic request details (e.g., PickupCity, PickupStreet, DropoffCity, DropoffStreet, PackageSize, PackageWeight, MinDeliveryDate, MaxDeliveryDate).
 - Status updates (e.g., "Pending," "Confirmed," "Completed").
 - Payment information (e.g., payment method, timestamp, status).
- ◆ Real-Time Communication facilitates:
 - Real-time location sharing and messaging between LP and LR during pickup and delivery.
 - Coordination updates (e.g., pickup readiness, delivery status).
- ◆ Notification Service sends:
 - Notifications about request status (e.g., request created, accepted, confirmed, completed).
 - Payment confirmations and feedback submission confirmations.

3. Participant registration / Log In

3.1 Sequence Diagram



Graphique 2: Sequence Diagram for Participant Registration and Login, illustrating the flow of user authentication and data storage. Realized using lucid.app.

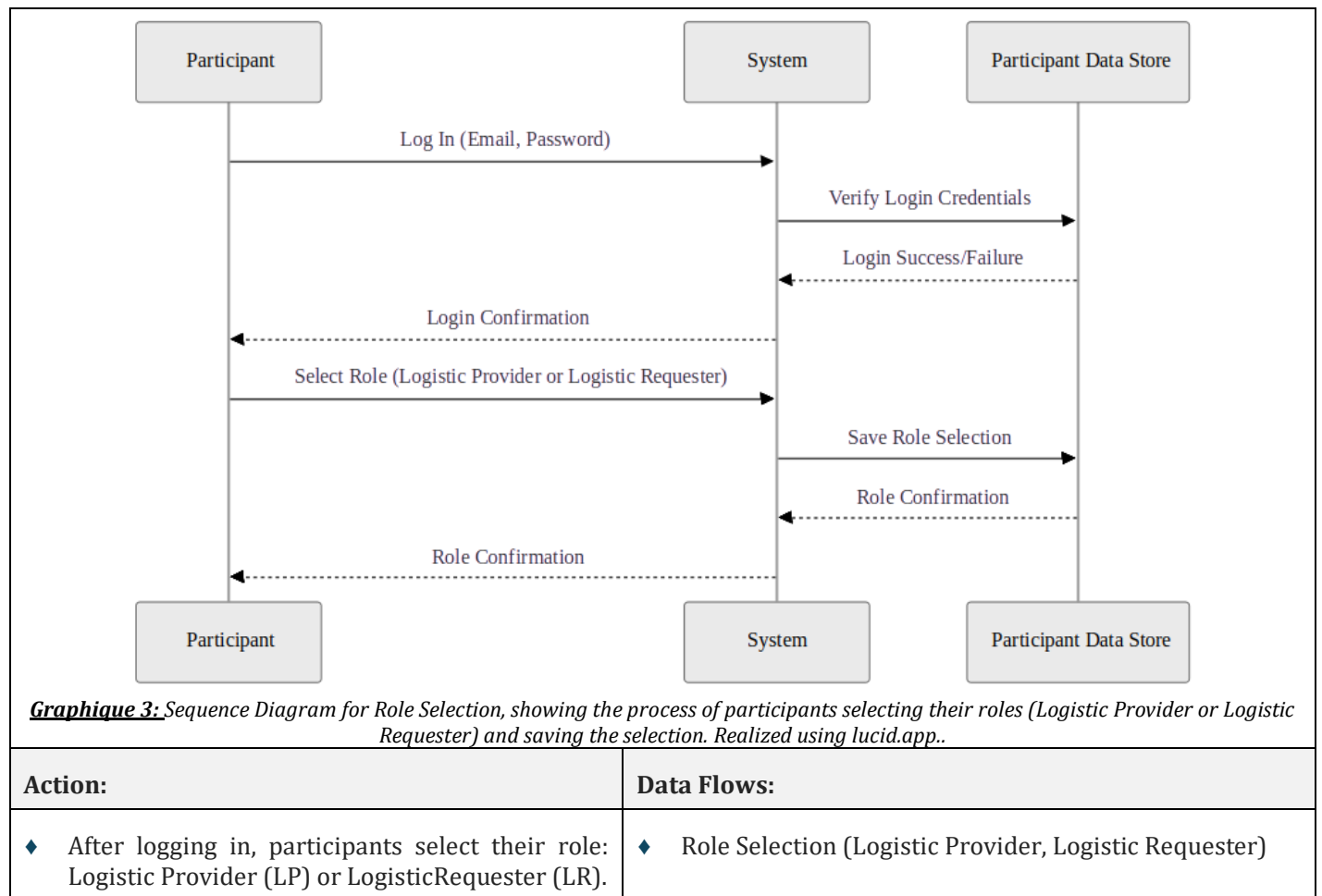
Action:	Data Flows:
♦ Register or Log In to the Application	♦ Registration Details (FirstName, LastName, PhoneNumber, Email, Location, Password)

3.2 Comment

- ♦ Registration Flow:
 - The user opens the application and chooses to register.
 - The app displays the registration form, and the user enters their details.
 - The app sends the registration details to the Database for storage.
 - Upon successful storage, the app confirms the registration to the user.
- ♦ Login Flow:
 - The user chooses to log in and enters their email and password.
 - The app sends the credentials to the Database for authentication.
 - If the credentials match, the app confirms the login and grants access.
 - If the credentials are invalid, the app displays an error message

4. Role Selection

4.1 Sequence Diagram

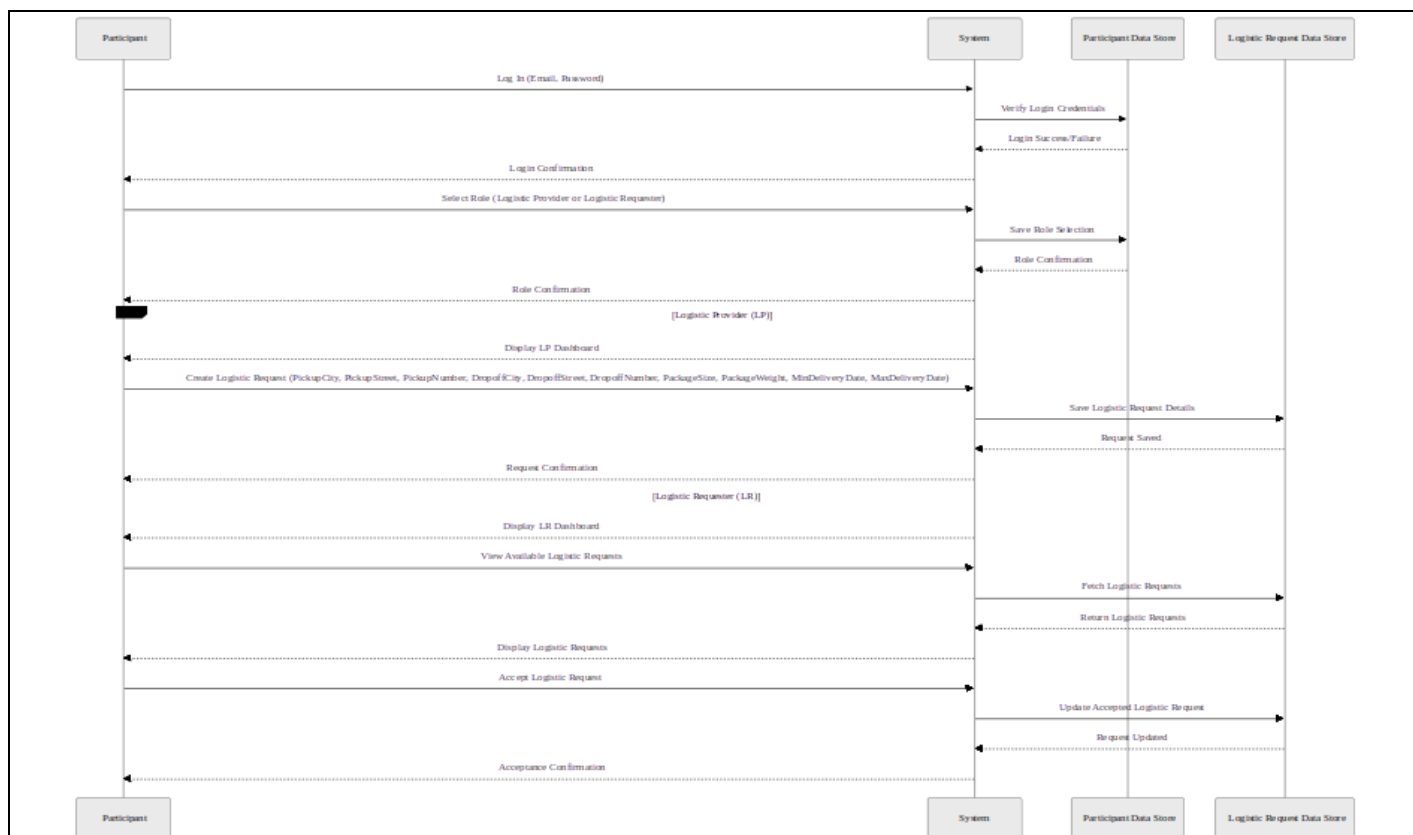


4.2 Comment

- ◆ Key Points:
 - After successful login, the participant selects their role (LP or LR).
 - The system saves the selected role in the Participant Data Store and confirms the selection to the participant.
 - This role selection dictates the dashboard and actions available to the user (e.g., creating requests for LPs or accepting requests for LR).
- ◆ Data Flow:
 - The participant's role selection is sent to the Participant Data Store for storage.
 - The system confirms the role selection to the participant, ensuring transparency.
- ◆ System Actions:
 - The system validates and saves the role selection, ensuring it is accurately recorded for future use.
 - It provides immediate feedback to the participant, confirming the role has been successfully set.

5. Dashboard

5.1 Sequence Diagram



Graphique 4: Sequence Diagram for Dashboard Display, depicting the actions of Logistic Providers (LP) and Logistic Requesters (LR) based on their selected roles. Realized using lucid.app.

Depending on the selected role, participants land on the corresponding dashboard.

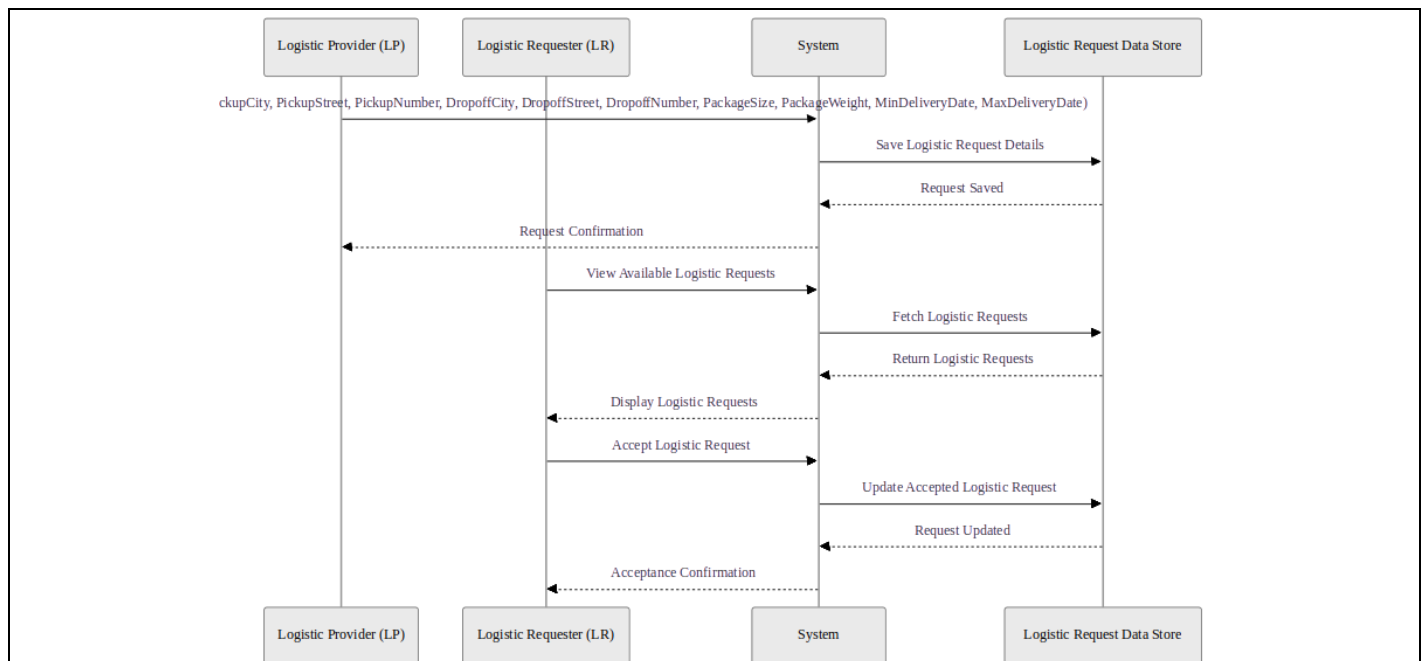
Actions:	Data Flows:
◆ LP Dashboard: Create a Logistic Request	◆ LP Dashboard: Logistic Request Details (PickupCity, PickupStreet, PickupNumber, DropoffCity, DropoffStreet, DropoffNumber, PackageSize, PackageWeight, MinDeliveryDate, MaxDeliveryDate)
◆ LR Dashboard: Accept a Logistic Request	◆ LR Dashboard: Accepted Logistic Request

5.2 Comment

- ◆ Login and Role Selection:
 - The participant logs in, and the system verifies their credentials.
 - The participant selects their role (Logistic Provider or Logistic Requester), and the system saves the role selection.
- ◆ Dashboard Display:
 - If the participant is a Logistic Provider (LP):
 - The system displays the LP Dashboard.
 - The LP creates a logistic request by providing details (e.g., pickup/dropoff locations, package details, etc.).
 - The system saves the logistic request in the Logistic Request Data Store and confirms the request to the LP.
 - If the participant is a Logistic Requester (LR):
 - The system displays the LR Dashboard.
 - The LR views available logistic requests fetched from the Logistic Request Data Store.
 - The LR accepts a logistic request, and the system updates the request status in the Logistic Request Data Store and confirms the acceptance to the LR.

6. Create / Accept Logistic Request

6.1 Sequence Diagram



Graphique 5: Sequence Diagram for Creating and Accepting Logistic Requests, illustrating the flow of request creation by LPs and acceptance by LRs. Realized using lucid.app.

Note: Depending on the selected role, participants can either Create or Accept Logistic Request

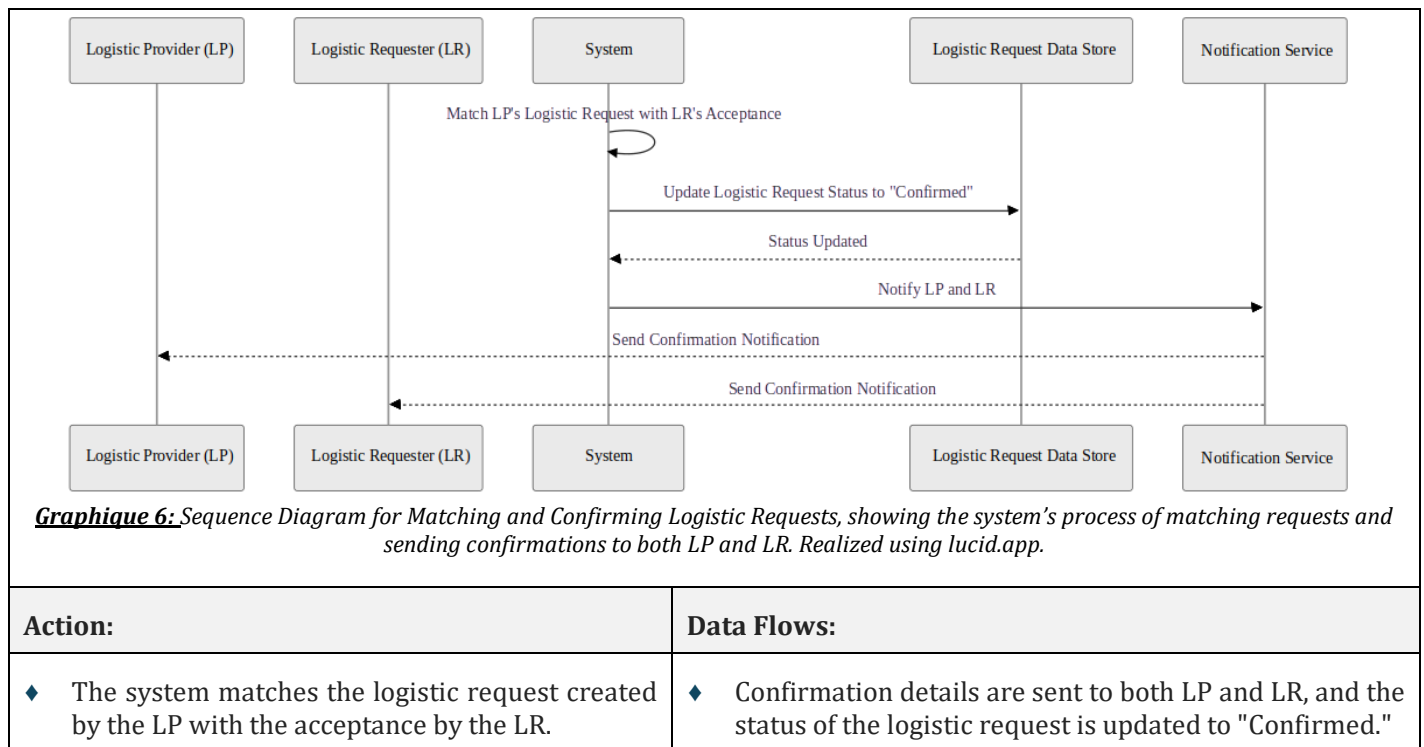
Actions:	Data Flows:
♦ LP creates a logistic request by providing necessary details.	♦ Logistic Request Details are sent to the Logistic Request Data Store.
♦ LR views available logistic requests and accepts one that matches their requirements.	♦ Accepted Logistic Request details are updated in the Logistic Request Data Store.

6.2 Comment

- ♦ Logistic Provider (LP) - Create Logistic Request:
 - The LP creates a logistic request by providing details such as pickup/dropoff locations, package size, weight, and delivery dates.
 - The system saves the logistic request details in the Logistic Request Data Store (LRDS).
 - The system confirms the request creation to the LP.
- ♦ Logistic Requester (LR) - Accept Logistic Request:
 - The LR requests to view available logistic requests.
 - The system fetches the available logistic requests from the Logistic Request Data Store (LRDS).
 - The system displays the logistic requests to the LR.
 - The LR accepts a logistic request that matches their requirements.
 - The system updates the accepted logistic request in the Logistic Request Data Store (LRDS).
 - The system confirms the acceptance to the LR.

7. Match and Confirm Logistic Request

7.1 Sequence Diagram

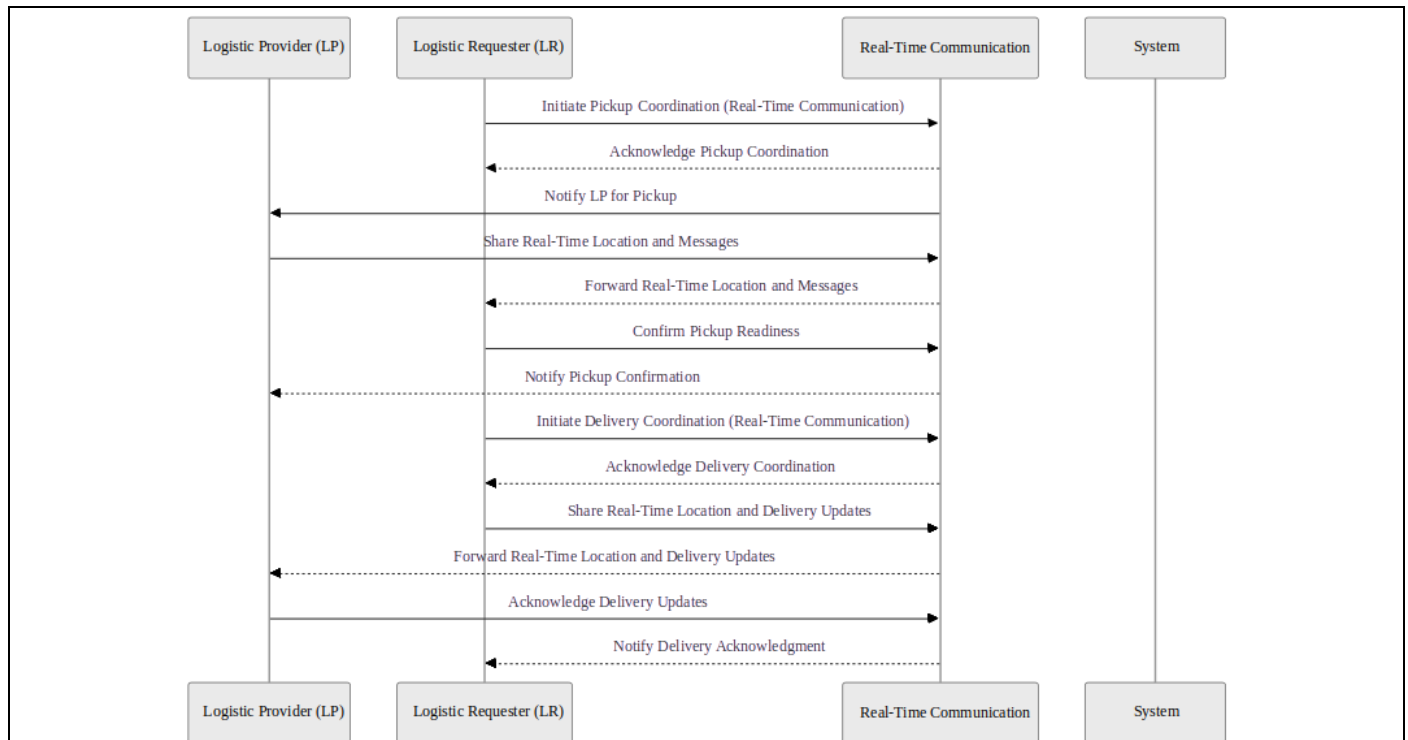


7.2 Comment

- ◆ System Matches Request and Acceptance: The system matches the logistic request created by the LP with the acceptance by the LR.
- ◆ Update Request Status: The system updates the status of the logistic request to "Confirmed" in the Logistic Request Data Store (LRDS).
- ◆ Send Confirmation Notifications: The system uses the Notification Service (NS) to send confirmation notifications to both the LP and LR.

8. Pick Up / Delivery Coordination

8.1 Sequence Diagram



Graphique 7: Sequence Diagram for Pickup and Delivery Coordination, detailing real-time communication and updates between LP and LR during pickup and delivery. Realized using lucid.app.

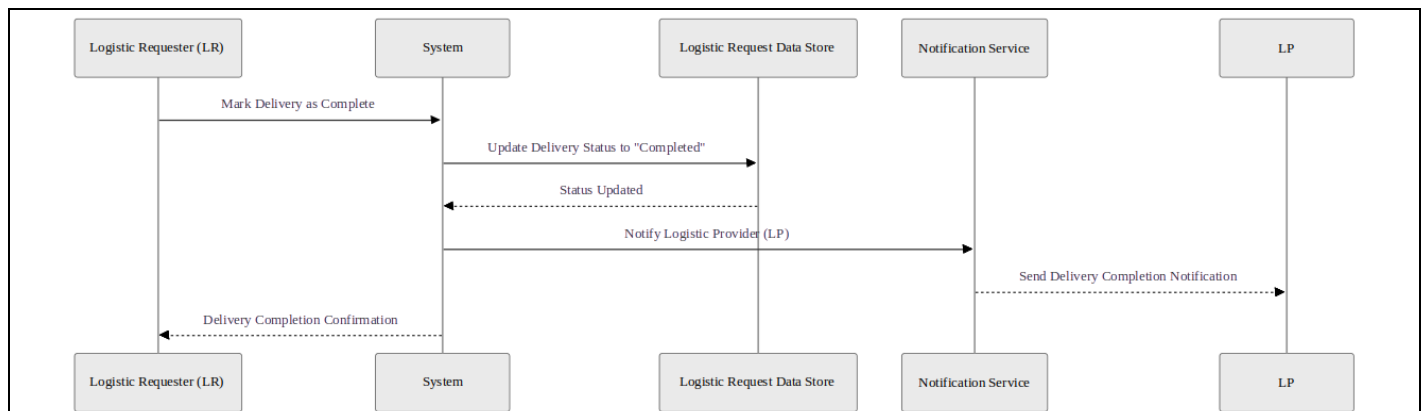
Actions:	Data Flows:
<ul style="list-style-type: none"> ◆ Pickup Coordination: The LR coordinates with the LP for the pickup of the package. Real-time communication and tracking are enabled. 	<ul style="list-style-type: none"> ◆ Real-time location data and messages are exchanged between LP and LR.
<ul style="list-style-type: none"> ◆ Delivery Coordination: The LP delivers the package to the specified drop-off location. Real-time updates are provided to the LR. 	<ul style="list-style-type: none"> ◆ Delivery status updates and real-time location data are sent to the LR.

8.2 Comment

- ◆ Pickup Coordination:
 - The Logistic Requester (LR) initiates pickup coordination using Real-Time Communication (RTC).
 - The RTC notifies the Logistic Provider (LP) about the pickup.
 - The LP shares real-time location and messages with the LR via RTC.
 - The LR confirms pickup readiness, and the RTC notifies the LP of the confirmation.
- ◆ Delivery Coordination:
 - The LR initiates delivery coordination using Real-Time Communication (RTC).
 - The LR shares real-time location and delivery updates with the LP via RTC.
 - The LP acknowledges the delivery updates, and the RTC notifies the LR of the acknowledgment.

9. Delivery Completion

9.1 Sequence Diagram



Graphique 8: Sequence Diagram for Delivery Completion, illustrating the process of marking delivery as complete and updating the request status. Realized using lucid.app.

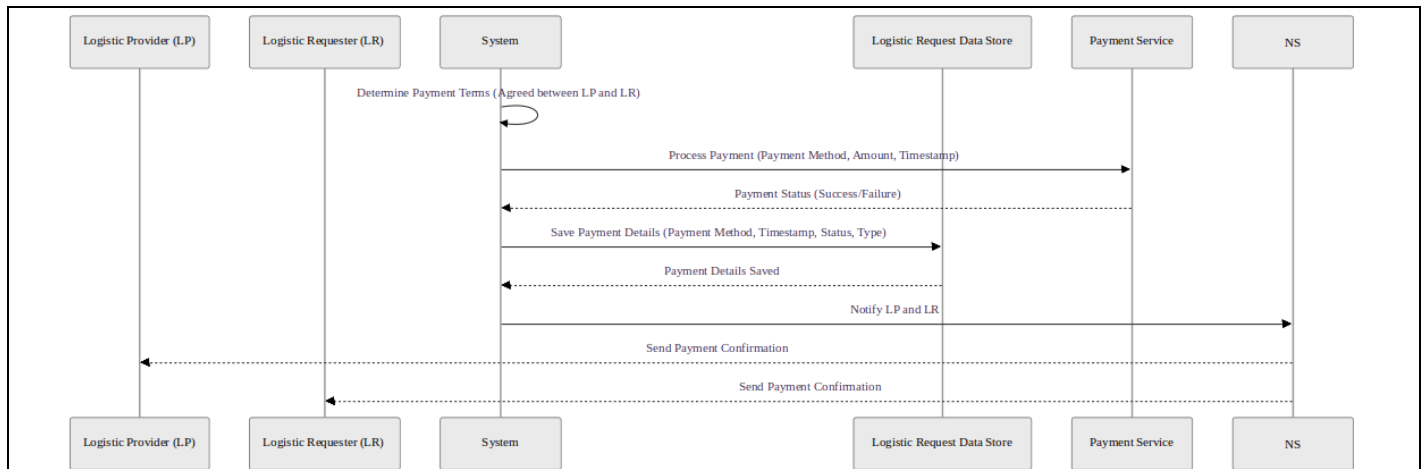
Action:	Data Flows:
<ul style="list-style-type: none"> ♦ The LR marks the delivery as complete once the package is delivered to the drop-off location. 	<ul style="list-style-type: none"> ♦ Delivery status is updated to "Completed" in the Logistic Request Data Store

9.2 Comment

- ♦ **Mark Delivery as Complete:** The Logistic Requester (LR) marks the delivery as complete once the package is delivered to the drop-off location.
- ♦ **Update Delivery Status:** The system updates the delivery status to "Completed" in the Logistic Request Data Store (LRDS).
- ♦ **Notify Logistic Provider (LP):** The system uses the Notification Service (NS) to notify the Logistic Provider (LP) about the delivery completion.
- ♦ **Confirmation to LR:** The system confirms the delivery completion to the LR.

10. Payment Processing

10.1 Sequence Diagram



Graphique 9: Sequence Diagram for Payment Processing, showing the flow of payment determination, processing, and confirmation. Realized using lucid.app.

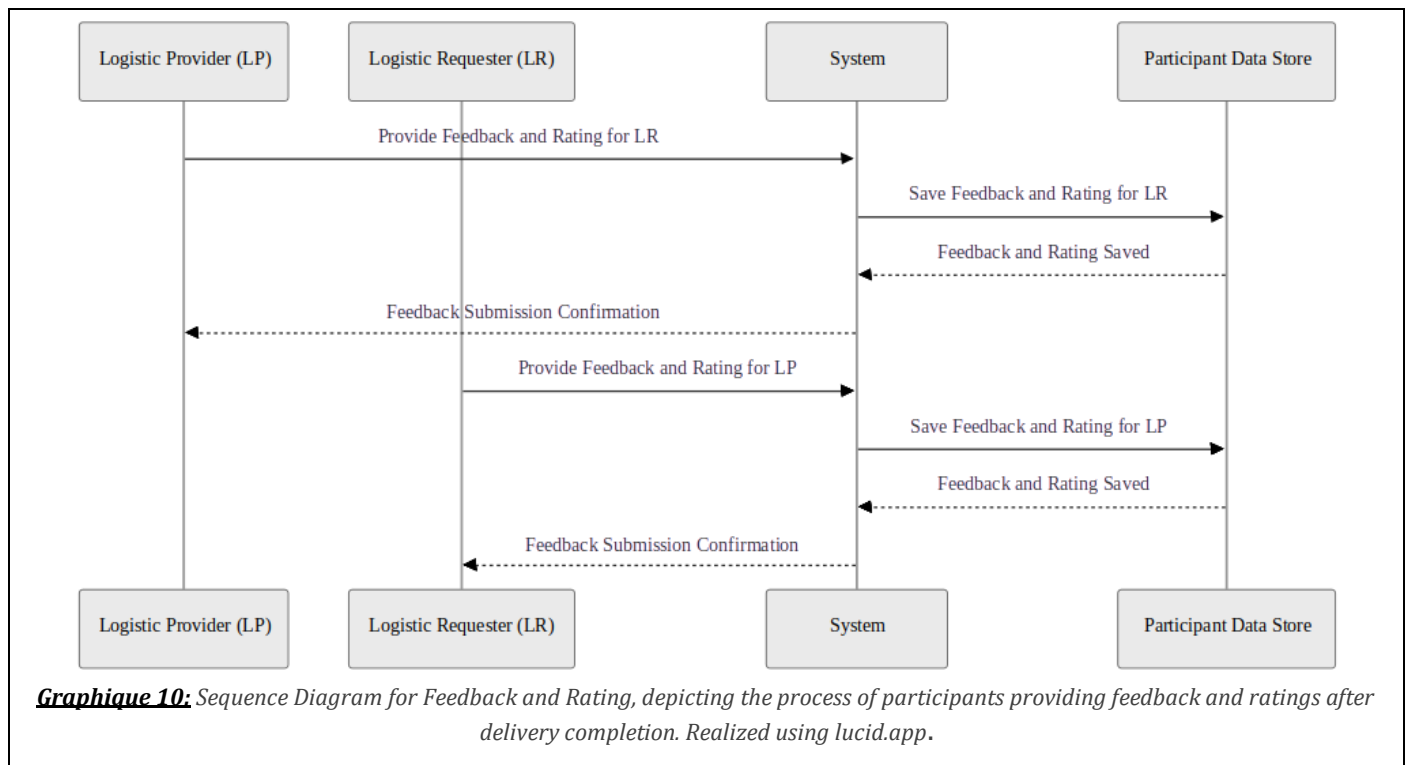
Action:	Data Flows:
<ul style="list-style-type: none"> Payment details are processed based on the agreed terms between LP and LR. 	<ul style="list-style-type: none"> Payment method, timestamp, status, and type are recorded in the Logistic Request Data Store.

10.2 Comment

- ◆ Determine Payment Terms: The system determines the payment terms agreed upon between the LP and LR.
- ◆ Process Payment: The system uses the Payment Service (PS) to process the payment based on the payment method, amount, and timestamp.
- ◆ Save Payment Details: The system saves the payment details (payment method, timestamp, status, and type) in the Logistic Request Data Store (LRDS).
- ◆ Notify Participants: The system uses the Notification Service (NS) to notify both the LP and LR about the payment confirmation.

11. Feedback and Rating

11.1 Sequence Diagram



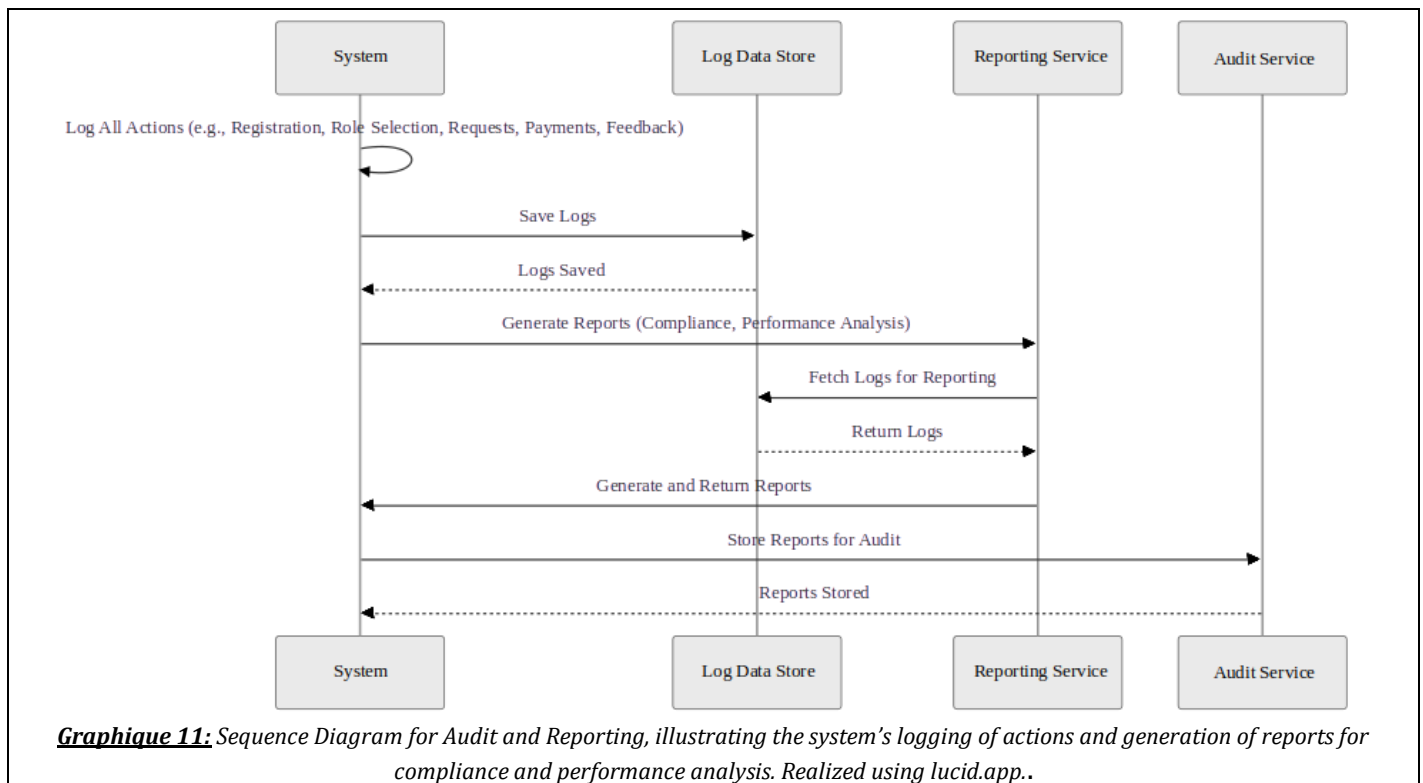
Action:	Data Flows:
<ul style="list-style-type: none"> Both LP and LR provide feedback and rate each other based on the delivery experience. 	<ul style="list-style-type: none"> Feedback and ratings are stored in the Participant Data Store.

11.2 Comment

- ◆ LP Provides Feedback and Rating:
 - The Logistic Provider (LP) provides feedback and rates the Logistic Requester (LR) based on the delivery experience.
 - The system saves the feedback and rating in the Participant Data Store (PD).
 - The system confirms the feedback submission to the LP.
- ◆ LR Provides Feedback and Rating:
 - The Logistic Requester (LR) provides feedback and rates the Logistic Provider (LP) based on the delivery experience.
 - The system saves the feedback and rating in the Participant Data Store (PD).
 - The system confirms the feedback submission to the LR.

12. Audit and Reporting

12.1 Sequence Diagram



Action:	Data Flows:
<ul style="list-style-type: none"> The system maintains logs of all actions and generates reports for audit purposes. 	<ul style="list-style-type: none"> Logs and reports are stored and managed for compliance and performance analysis.

12.2 Comment

- ◆ Log All Actions: The system logs all actions (e.g., registration, role selection, requests, payments, feedback) and saves them in the Log Data Store (LDS).
- ◆ Generate Reports:
 - The system uses the Reporting Service (RS) to generate reports for compliance and performance analysis.
 - The Reporting Service fetches the necessary logs from the Log Data Store (LDS).
 - The reports are generated and returned to the system.
- ◆ Store Reports for Audit: The system stores the generated reports in the Audit Service (AS) for future audit purposes.¹

¹ **Methodology Note:**
Process Model Analysis

The Process Model Analysis was developed through a detailed examination of the workflow chart, Entity-Relationship Diagram (ERD), and specifications requirements. Each step of the system was broken down into individual processes to ensure clarity and alignment with the system's design.

1. Workflow Chart: It provided the foundation, outlining the high-level processes and interactions between participants (Logistic Providers and Logistic Requesters), the system, and data stores. It guided the identification of key processes such as registration, role selection, request creation, pickup and delivery coordination, payment processing, and feedback.
2. ERD Analysis: The ERD was analyzed to understand the data structure and relationships between entities like participants, logistics requests, payments, and feedback. This ensured accurate representation of data flows and storage in the process model.
3. Specifications Requirements: The requirements document detailed system functionalities, including participant interactions, data storage, real-time communication, and notifications. These specifications validated each step in the workflow, ensuring the process model reflected the intended system behavior.
4. Process Breakdown: Each workflow step was broken into smaller processes, such as:
 - ◆ Registration/Login: User authentication and data storage.
 - ◆ Role Selection: Role assignment and confirmation.
 - ◆ Dashboard: Role-specific interfaces and actions.
 - ◆ Logistic Requests: Creation, acceptance, and status updates.
 - ◆ Pickup/Delivery: Real-time coordination and tracking.
 - ◆ Payment Processing: Payment determination, processing, and confirmation.
 - ◆ Feedback/Rating: Post-delivery feedback submission.
 - ◆ Audit/Reporting: Logging actions and generating reports.
5. Sequence Diagrams: They were created for each process to visually map interactions between participants, the system, and data stores. These diagrams ensured accurate representation of actions and data flows, aligning with the workflow and ERD.