FPT ACADEMY INTERNATIONAL

FPT - APTECH COMPUTER EDUCATION

Logistics Management System

Supervisor: Trần Phước Sinh

Class: T1.2109.M1

Group: 1

Serial No.	**Student Name**	**Student ID**	
1	Trần Trọng Nhân	Student1531946	Leader
2	Tăng Trấn Vĩ	Student1531948	
3	Lưu Thuận Phát	Student1531935	
4	Đặng Văn Anh	Student1531945	

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ACKNOWLEDGEMENT

In logistics companies, managing driver assignments, delivery scheduling, and vehicle usage manually often leads to inefficiency, high fuel costs, and poor coordination. Dispatchers typically assign drivers through phone calls or spreadsheets, which causes delays, overworked drivers, and resource imbalance. Without a centralized system, companies struggle to monitor driver rest times, track vehicle locations, or optimize routes for multiple deliveries.

Compliance with transportation laws, such as mandatory driver rest hours, is difficult to ensure manually. Drivers may be assigned beyond their safe working hours, leading to fatigue-related risks. Companies also lack historical analytics on performance, trip duration, and driver workload distribution.

To address these challenges, a centralized digital platform is needed to automate driver-vehicle-trip assignments, monitor fleet activity, and support real-time decision-making through data insights and AI-assisted routing.

INTRODUCTION

The purpose of this Software Requirements Specification (SRS) document is to describe the functional and non-functional requirements of the Logistics Management System (LMS). This document defines the system's objectives, scope, features, constraints, and overall behavior. It serves as a reference for developers, testers, managers, and stakeholders throughout the system's development lifecycle.

The SRS ensures a shared understanding of how the system should support logistics operations such as order creation, shipment management, vehicle scheduling, driver assignment, tracking, and delivery confirmation.

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REVIEW 1

1.1 PROBLEM DEFINITION

The logistics industry faces increasing challenges as customer expectations for fast, reliable, and transparent delivery continue to rise. Traditional delivery workflows—often managed through spreadsheets, phone calls, and manual coordination—are no longer sufficient to handle large volumes of orders or support efficient decision-making.

Many logistics companies still rely on fragmented systems that make it difficult to coordinate drivers, vehicles, delivery schedules, and real-time location data. This leads to multiple operational issues, including:

From the Customer's Viewpoint

Difficulty tracking delivery progress in real time
Limited visibility into shipping fees, delivery status, and estimated arrival times
Slow or inconsistent communication between customer, driver, and company
Lack of a centralized platform to report issues or request support

From the Dispatcher's Viewpoint

Manual assignment of drivers and vehicles leads to delays and inefficiencies
Difficulty checking driver availability, rest times, and vehicle conditions
No automated route optimization, causing increased fuel costs and longer delivery times
Limited tools for monitoring delivery progress and resolving incidents promptly

From the Driver's Viewpoint

Unclear trip information or last-minute changes delivered through phone calls
No centralized system for receiving tasks, updating delivery status, or navigating optimized routes
Difficulty proving delivery completion due to lack of digital confirmation (signature/photo/OTP)

From the Manager/Admin Viewpoint

Lack of consolidated dashboards to monitor fleet performance, workload, and compliance
No analytics to evaluate operational efficiency, such as trip duration, vehicle usage, or driver workload
Difficulty preventing mistakes such as over-assigning tired drivers or using vehicles that require maintenance
High dependency on manual reports, which are often inaccurate or delayed

1.1.1 THE REQUIREMENTS OF THE PROJECT

- **User Registration & Authentication:**
    - Support account creation for Customers, Drivers, Dispatchers, Managers, and Admins.
    - Provide secure login with role-based access control.
    - Allow users to update personal information and change passwords.
- **Order Management:**
    - Allow customers to create delivery orders with package details, pickup and destination addresses.
    - Enable dispatchers to manage, view, and modify orders.
    - Automatically calculate delivery fees based on distance, weight, and value.
- **Driver & Vehicle Management:**
    - Store and manage driver profiles, availability status, rest time, and performance logs.
    - Register and maintain company-owned vehicles (motorcycles, vans, trucks).
    - Monitor vehicle condition, maintenance schedules, and usage history.
- **Intelligent Assignment System:**
    - Assign drivers and vehicles automatically or manually based on:
    - Availability
    - Vehicle type
    - Route efficiency
    - Driver rest compliance
    - Delivery priority
    - Support reassignments in case of delays or emergencies.
- **Route Planning & GPS Tracking:**
    - Integrate with map APIs (OpenStreetMap, OSRM, or Google Maps).
    - Provide optimized routing for drivers.
    - Offer real-time GPS tracking with updated ETA.
    - Allow dispatchers to monitor delivery progress on a live map.
- **Driver Mobile Application:**
    - Drivers receive assigned trips instantly.
    - Allow drivers to update delivery status:
    - Pickup completed
    - On the way
    - Arrived
    - Delivered (with proof: photo, signature, or OTP)
    - Provide navigation support and automated work/rest time logging.
- **Notifications & Communication**
    - Send push notifications for order updates, assignments, delays, or cancellations.
    - Support in-app chat between drivers and dispatchers.
    - Provide alerts for system events (vehicle issues, overdue tasks, etc.)

- **Reporting & Analytics**
  - Generate reports on:
  - Delivery performance
  - Driver workload
  - Vehicle utilization
  - Fuel and route efficiency
  - Delay analysis
  - Provide dashboards for Admins and Managers.
- **System Administration:**
  - Admin can manage all user roles and permissions.
  - Configure system settings (prices, routing rules, rest policies).
  - View system logs, audit trails, and security alerts.
  - Manage data backup and restoration.

1.1.2 CURRENT STATE OF THE PROBLEM, AND SOLUTION

Current State of the Problem:

The current logistics workflow used by many delivery companies is fragmented, heavily manual, and lacks real-time visibility. These limitations result in slow operations, increased costs, and inconsistent customer experiences. Key issues include:

1. Manual Order Processing

Most logistics operations rely on phone calls, spreadsheets, or basic systems to record orders. This leads to:

- Frequent errors in order details
- Slow processing times
- Difficulty verifying and updating order statuses

2. Inefficient Driver & Vehicle Assignment

Dispatchers often assign drivers based on memory or manual checking. This causes:

- Unbalanced workload between drivers
- Overlooking driver rest-time regulations
- Assigning unsuitable vehicles for certain deliveries
- Delays due to poor coordination

3. Lack of Real-time Tracking

Traditional logistics workflows lack integrated GPS tracking, resulting in:

No real-time visibility into vehicle location

Inaccurate ETA predictions

Difficulty detecting delays or route deviations

4. Poor Communication Between Stakeholders

Communication usually happens through phone calls or messaging apps, creating:

Delays in relaying instructions

Misunderstandings between drivers and dispatchers

No centralized message history for dispute resolution

5. Limited Analytics and Reporting

Without digital data consolidation, managers cannot obtain:

Delivery performance insights

Driver productivity analysis

Route efficiency reports

Operational cost breakdowns

This results in decisions based on experience rather than real-time data.

6. Customer Dissatisfaction

Customers face:

Unclear delivery timelines

No real-time tracking

Limited communication and transparency

Manual proof of delivery that is slow to verify

Overall, these issues reduce competitiveness and lead to increased operational costs.

1.2. CUSTOMER'S REQUIREMENTS SPECIFICATIONS (CRS)

The Customer Requirements Specifications (CRS) outline the expectations and needs of all user groups interacting with the Logistics Management System. These requirements serve as the foundation for defining the system's functionalities, ensuring that the platform supports efficient, accurate, and transparent logistics operations.

1.2.1 REQUIRE FUNCTION

A. Customer Requirements

Customers using the LMS expect the following capabilities:

Create Delivery Orders
Enter pickup and drop-off addresses
Provide package details (weight, value, size, notes)
Choose service type (standard, express, same-day)

Real-Time Tracking
View current driver location
Receive updated ETA
Track order status from creation to final delivery

Order History & Management
View previous deliveries
Download receipts or invoices
Report issues or request support

Notifications
Receive SMS/push/app notifications for status updates
Get alerts on delays, pickup confirmation, and delivery completion

B. Dispatcher Requirements

Dispatchers are responsible for coordinating and managing deliveries. They require:

1.**Order Management Tools**

View all incoming orders

Edit order details

Cancel or prioritize orders

2.**Driver & Vehicle Assignment**

Assign drivers manually or automatically

Check availability, rest time, and vehicle status

Reassign drivers in case of emergencies or delays

3.Real-Time Monitoring

Track all active deliveries on a live map

Monitor driver progress and detect unusual behavior

Update customers proactively in case of delays

4.**Communication Tools**

Send instructions to drivers

Receive driver notes or incident reports

Use in-app messaging to centralize communication

C. Driver Requirements

Drivers require a mobile app with features supporting their daily workflow:

Receive Delivery Assignments
View assigned orders with full details
Accept or reject assignments (based on company policy)

Navigation & Routing
Use integrated map navigation
Get optimized route suggestions
Receive auto-updated routes due to traffic conditions

Status Updates
Update order stages: picked up, in transit, delivered
Upload digital proof of delivery (photo, signature, OTP)

Driver Work Logs
Automatic recording of work hours
Break and rest-time notifications
View shift history and performance metrics

D. Manager & Admin Requirement

Management-level users expect advanced monitoring and configuration abilities:

Dashboard & Reports
Delivery performance statistics
Driver prductivity and workload
Vehicle utilization and maintenance overview
Compliance alerts and service quality analytics

User & System Administration
Manage user accounts and roles
Configure pricing rules, routing policies, and shift guidelines
Oversee system logs and audit trails

Operational Oversight
Review incidents and driver reports
Detect delayed or high-risk deliveries
Ensure compliance with transportation safety regulations

1.2.2 Non-Functional Requirements:

Performance
Real-time tracking updates with minimal latency
Page and API response times under 2 seconds

Security
Encrypted data storage and transmission
Role-based access control (RBAC)
Protection against unauthorized access and data breaches

Usability
Intuitive web and mobile interfaces
Clear navigation and consistent layouts
Multilingual support (if required)

Scalability
Handle large numbers of concurrent drivers and customers
Process peak order volumes without performance degradation

Availability
System uptime target of 99% or higher
Robust failover and backup mechanisms

Compatibility
Support major browsers (Chrome, Edge, Safari)
Mobile app compatibility with Android & iOS

1.2.3 Data Processing Requirements

The system must support efficient and secure data handling:

Process customer order information

Store and update driver and vehicle data

Handle GPS data streams for real-time tracking

Maintain status logs for all deliveries

Generate analytical data for reporting

Protect sensitive information with encryption

1.2.4 Algorithms & Decision Logic Requirements

The LMS may employ algorithms for:

Route optimization (shortest path, traffic-aware routing)

Driver assignment based on load, location, and availability

Cost estimation by distance, weight, and risk factors

ETA prediction using historical trip data

Risk analysis to detect delays, detours, or abnormal behavior

1.2.5 HARDWARE/ SOFTWARE REQUIREMENTS

HARDWARE

Web Server

Processor	Intel Core I7 or higher.
Memory	32 GB RAM or greater.

Modem/ADSL	Internet access is required.

Client

Processor	Intel Core I5 or higher.
Memory	8 GB RAM or greater.
Monitor	Super VGA (1024x768) or higher resolution.
Modem/ADSL	Internet access is required.

SOFTWARE

Web Server

Operation System	Window 7 or later.
Browser	Google Chrome version 35.
Database	SQL SERVER
Software	Internet Information Service
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TECHNOLOGY

Language	**Framework**
• Javascript. • Typescript	Reactjs+Vite

• Jsx • HTML • CSS/SASS	
• Dax	Power BI Desktop & Services
• Dart	Flutter
• C#	ASP.NET Core Web API / DevExpress
• Java	Java Spring Boot Rest API
• Python	Flask
• javascript in Node JS (NodeJs is a runtime environment only)	Express JS

1.2.6 LIMITS OF THE PROJECT

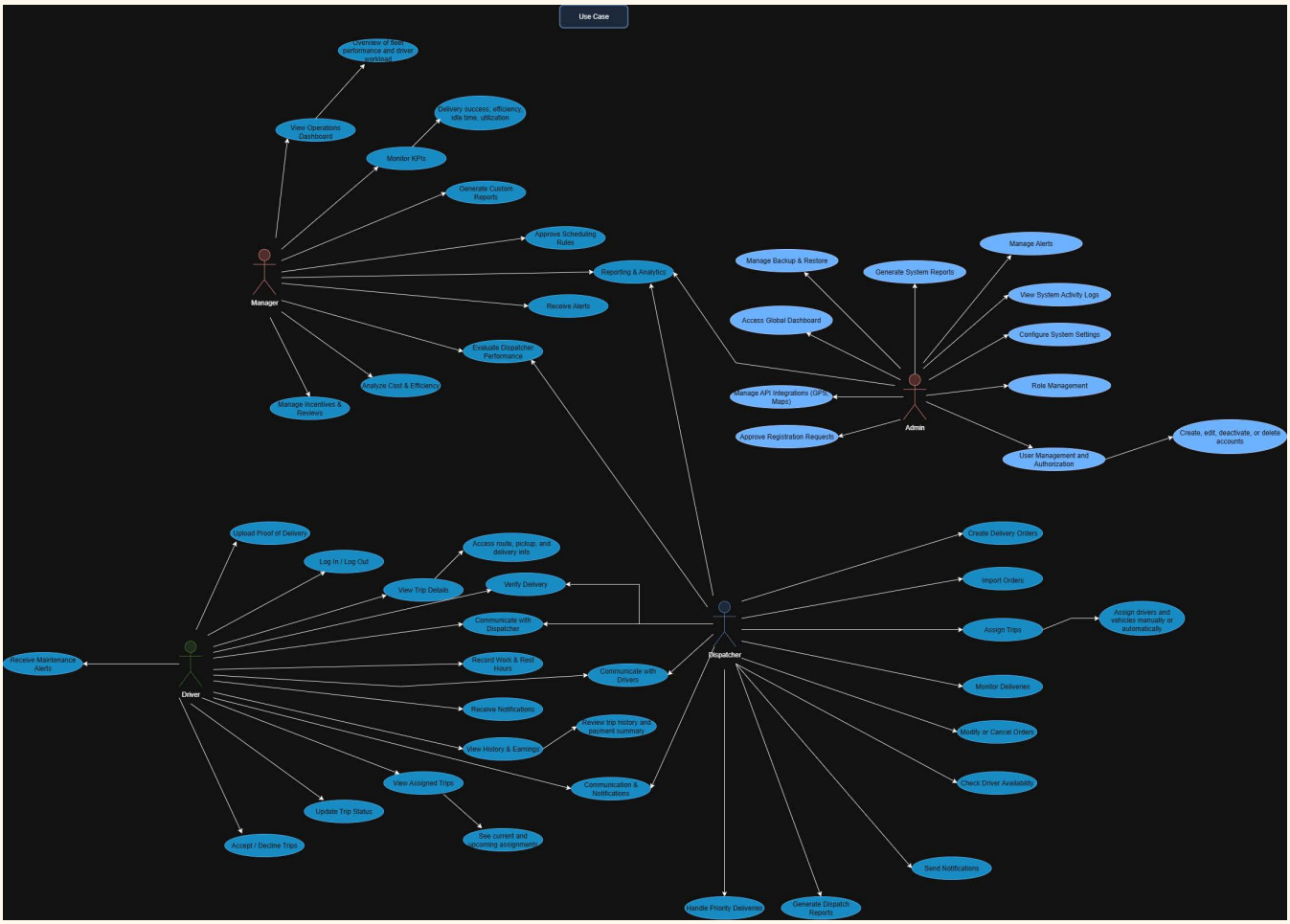
Real-time GPS tracking depends on mobile data signal quality

Accuracy of ETA may vary with traffic or weather conditions

System performance may degrade during large-scale peaks without proper scaling

Integration with external APIs may introduce dependencies or rate limits

1.3 FUNCTION DIAGRAM



1.4 TASK SHEET REVIEW 1

Project Ref.No		Project Title	Activity plan prepared by	Date of preparation of Activity plan				
#	Task			Start date	End date	Actual days	Member's name	Status
1	Acknowledgement	Logistic Management System	Trần Trọng Nhân	2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
2	Introduction			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
3	Problem definition			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
4	The requirements of the project			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
5	Current state of the problem, and solution			2025-11-26	2025-12-22	2	Đặng Văn Anh	Done
6	Customer requirement specification (CSR)			2025-11-26	2025-12-22	2	Lưu Thuận Phát	Done
7	Required function for Customer			2025-11-26	2025-12-22	2	Lưu thuận phát	Done
8	Required function for Dispatcher			2025-11-26	2025-12-22	2	Tăng trấn Vĩ	Done
9	Required function for Driver, Admin,Manager			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
10	Non-functional requirement			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
11	Data processing processes			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
12	Algorithms			2025-11-26	2025-12-22	2	Tăng trấn Vĩ	Done
13	Hardware/software requirement			2025-11-26	2025-12-22	2	Trần Trọng Nhân	Done
14	Limits of the project			2025-11-26	2025-12-22	2	Đặng Văn Anh	Done
15	Function diagram			2025-11-26	2025-12-22	2	Đặng Văn Anh	Done
16	Task Sheet review 1			2025-11-26	2025-12-22	2	Tăng trấn Vĩ	Done

Signature of instructor	Signature of Team Leader
Mr. Trần Phước Sinh	**Mr. Trần Trọng Nhân**