

EASETRANS



Submitted by

Muhammad Shayan Umar (12817)

Salman Khan (13265)

Amir Khan (13286)

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Dr. Ikram Ullah

**Department of Computer Science
City University of Science and Information Technology
Peshawar Pakistan
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by

Muhammad Shayan Umar

Salman Khan

Amir Khan

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Approved by

Supervisor _____
Name _____ Signature _____

Undergraduate Studies Committee

1. Convener _____
Name _____ Signature _____
2. Coordinator FYP _____
3. Head of Department _____

Department of Computer Science
City University of Science and Information Technology
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List of Abbreviations

EaseTrans	Easy Transport
GDP	Gross Domestic Product

1 Introduction

1.1 Overview

In the ever-evolving world of logistics, efficient cargo transportation is critical for businesses to thrive and meet growing demands. However, the trucking industry faces numerous challenges, such as overloading, vehicle maintenance issues, unqualified drivers, and a lack of real-time visibility in cargo movements. EaseTrans is designed to address these challenges by providing a centralized platform that seamlessly connects truck owners, drivers, logistics companies, and service providers. Through advanced features like on-demand truck availability, real-time cargo tracking, and intelligent load matching, EaseTrans optimizes truck capacity utilization and enhances operational transparency. By offering reliable, data-driven solutions, EaseTrans transforms traditional logistics operations, reducing operational costs, improving safety, and fostering better communication across all stakeholders in the transportation chain.

1.2 Background

The logistics and freight industry is a backbone of Pakistan's economy, contributing over 13% to the gross domestic product(GDP) and employing 5.3% of the national workforce [1]. It plays a pivotal role in connecting businesses, industries, and consumers, ensuring the smooth flow of goods across the country. However, despite its significance, the sector faces long-standing inefficiencies that hinder its potential.

Key challenges include truck shortages, reliance on unqualified drivers, and inadequate vehicle maintenance. These issues lead to delayed shipments, increased operational costs, and disruptions in supply chain management. Furthermore, the absence of real-time cargo visibility and the fragmentation of the trucking market exacerbate inefficiencies, making it difficult for logistics companies and truck owners to operate profitably.

The logistics industry in Pakistan is also underutilized in terms of technology adoption. While international markets leverage advanced systems for tracking, load matching, and vehicle health monitoring, local solutions remain limited in scope and functionality. Addressing these challenges is critical for modernizing the industry and meeting the growing demand for reliable freight services in Pakistan [1].

1.3 Motivation

The logistics sector is vital for economic activity but struggles with inefficiencies like truck shortages, unqualified drivers, poor vehicle maintenance, and a fragmented market. These issues result in delays, higher operational costs, and challenges for businesses and consumers. Existing platforms address only limited aspects, such as booking services or niche needs like e-commerce, without providing integrated solutions like real-time tracking, automated freight matching, or vehicle health monitoring.

EaseTrans offers a comprehensive approach to bridge these gaps. By integrating features like real-time cargo tracking, efficient freight matching, and vehicle maintenance alerts, it aims to streamline operations, enhance transparency, and reduce costs. This innovation not only resolves industry inefficiencies but also supports economic growth and modernization in logistics.

1.4 Problem Statement

The cargo transportation industry faces significant inefficiencies due to a fragmented truck transport market, limited cargo tracking, and a lack of centralized management. Truck owners and logistics companies face challenges with overloading, which leads to mechanical issues, unqualified drivers, and truck shortages, leading to delays, increased costs, and underutilized capacity. Additionally, the absence of real-time cargo tracking and limited access to logistics information disrupt decision-making and hinder supply chain efficiency. These challenges highlight the need for a unified platform that connects truck owners, drivers, logistics companies, and service providers to ensure efficient cargo movement, improved transparency, and streamlined vehicle maintenance.

1.5 Aim and Objectives

The aim and objectives of the project are as follows:

1.5.1 Aim

The aim of the project is to streamline and enhance cargo transportation by creating a centralized platform that connects truck owners, drivers, and logistics companies, ensuring efficient load distribution, real-time tracking, and optimized vehicle maintenance.

1.5.2 Objectives

Following are the objectives of the project:

- To connect shippers, drivers and logistics companies through a unified platform.
- To provide on-demand truck availability for efficient cargo transportation.
- To offer cargo tracking and monitoring for better visibility and transparency.
- To increase truck load capacity utilization and reduce under-utilization.
- To ensure access to licensed drivers improving safety and reliability.
- To offer easy access to logistics information and market rates, facilitating informed decision-making.
- To reduce operational costs through efficient cargo matching.

1.6 Scope of the Project

Scope of EaseTrans is to revolutionize logistics by providing a centralized platform that connects truck owners, drivers, and logistics companies. The platform integrates real-time tracking, automated freight matching, and vehicle maintenance alerts to enhance transparency, reduce costs, and optimize cargo transportation. By addressing inefficiencies like underutilized vehicles and limited visibility, EaseTrans streamlines operations and fosters sustainable growth in the logistics sector.

2 Related Work

Existing mobile applications addressing logistics and transportation in Pakistan, such as Wahyd Logistics, TruckParking, and Lazada Logistics, fail to fully meet the market's unique challenges. Wahyd focuses on booking services but lacks truck maintenance and capacity optimization features [2]. TruckParking addresses parking but does not offer load matching or driver management [3]. Lazada Logistics is limited to e-commerce deliveries, lacking broader cargo transportation solutions [4]. These gaps underscore the need for EaseTrans, a platform offering real-time tracking, efficient cargo management, and vehicle maintenance tailored to Pakistan's logistics sector. These limitations of the existing systems are shown in the Table 2.1.

Table 2.1: Comparative Analysis of Existing Applications

Name of the Application	Features	Limitations	EaseTrans Features
Wahyd Logistics [2]	Freight management, Basic logistics support	Limited to specific freight types, Minimal in-app communication, No proof of delivery capture	Automated freight matching using AI algorithms, Comprehensive messaging system, Proof of delivery capture features
Laz Logistics [4]	Focused on e-commerce logistics	Limited real-time communication, No dedicated driver mobile app, Lacks dynamic pricing models	Incorporates dynamic pricing models based on demand and distance
Trukkr Adda [5]	Freight transport services in urban areas	Limited rural coverage, Minimal user feedback integration, No predictive analytics	Comprehensive vehicle maintenance solutions, Structured feedback mechanism for service improvement
TruckParking [3]	Parking services for trucks	Focused only on parking, Minimal user engagement, No integration with real-time tracking systems	Detailed performance metrics, Automated customer support with chatbots
Logistics Mobile [6]	Mobile logistics support for global users	Limited integration with providers, Lacks customization, No automated customer support features	Comprehensive reporting on performance metrics, Automated customer support with chatbots

3 Methodology

We adopt the incremental model methodology for our application. This approach divides the project into smaller, manageable increments, with each increment delivering a specific portion of the system's functionality. The development process begins with gathering core requirements and implementing the most critical features in the first increment. Subsequent increments build upon the initial framework, progressively adding new features and enhancing functionality, as illustrated in Figure 3.1 .

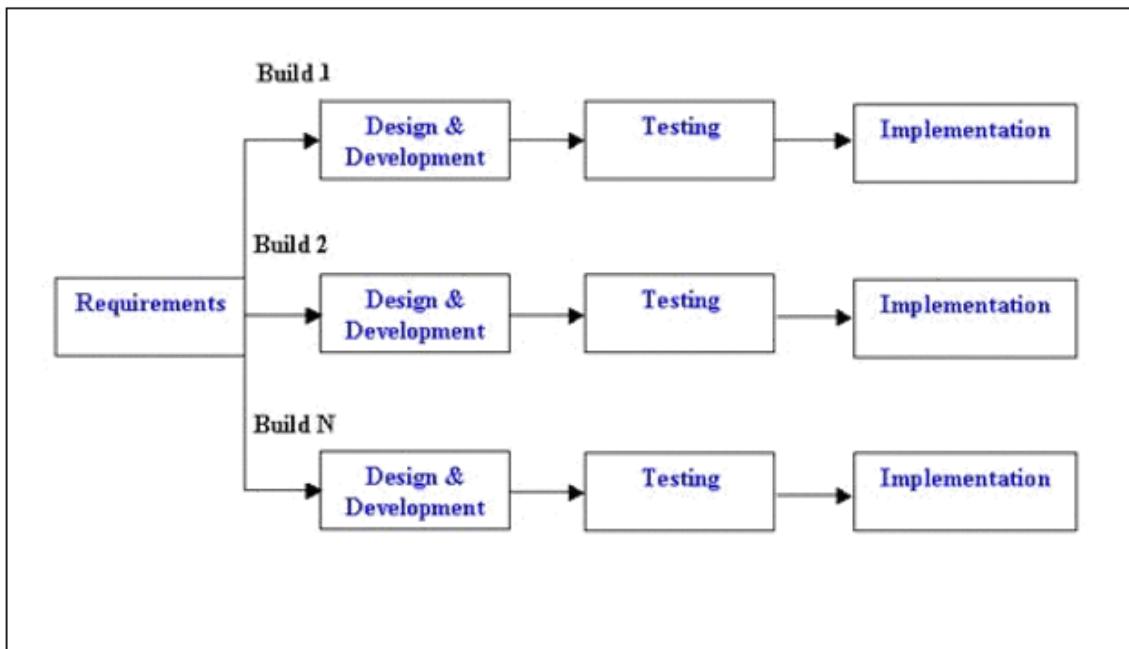


Figure 3.1: Incremental Model [7]

3.1 Proposed Solution

The proposed solution is to develop EaseTrans, a comprehensive logistics platform that integrates real-time tracking, automated freight matching, and vehicle management. This platform will connect shippers with reliable, qualified drivers and carriers, ensuring efficient cargo distribution based on cargo type and truck availability. Additionally, the platform will send maintenance reminders to truck owners to maintain vehicle health and safety.

3.2 Tools and Techniques

- **Android Studio:** Serves as the integrated development environment for the development of the application.
- **Flutter:** It will be used to Create a cross-platform application to save development time and cost.
- **Firebase:** Manages real-time data (cargo tracking, load matching) and user authentication.
- **Google Maps:** Enables real-time cargo tracking. It helps users (shippers, drivers, and logistics companies) visualize cargo movement.
- **Web Browsers:** For users who might prefer desktop access or for managing admin-level features (like reporting and analytics), web browsers are used to access the web-based components of the platform.

3.3 Work Plan

Increment 1 begins on 20th November 2024. The Requirement phase starts on this date and concludes on 20th December 2024, focusing on identifying and documenting the core needs of the project to establish a strong foundation. Following this, the Design phase begins on 20th December 2024 and continues until 20th January 2025, during which the technical framework and initial system plans are finalized. The Development phase commences on 20th January 2025 and extends until 20th February 2025, emphasizing the creation of the primary functionalities of the system. Concurrently, the Testing phase starts on 20th February 2025, ensuring quality control and addressing potential issues in the developed components. Finally, the Implementation phase begins on 20th March 2025, deploying the tested and validated features to end users as shown in Figure 3.2.

Increment 2 begins on 20th February 2025. The Design phase resumes on this date and concludes on 20th March 2025, refining the existing framework and incorporating additional functionalities into the system. The Development phase starts on 20th March 2025 and continues until 20th April 2025, focusing on building the next set of system features. Simultaneously, the Testing phase begins on 20th April 2025, ensuring the accuracy and stability of the newly added components. The Implementation phase kicks off on 20th May 2025, deploying the additional features and improving the overall performance of the system as shown in Figure 3.3.

Increment 3 begins on 20th April 2025. The Design phase starts on this date and concludes on 20th May 2025, addressing final adjustments and updates to the system's design. The Development phase begins on 20th May 2025 and extends until 20th June 2025, focusing on the completion of the remaining modules. Concurrently, the Testing phase runs from 20th May 2025, ensuring the system's final quality and stability. The Implementation phase begins on 20th June 2025, deploying the fully integrated system. Finally, the Documentation phase starts on 20th June 2025, completing the project with well-prepared technical and user documentation as shown in Figure 3.4.

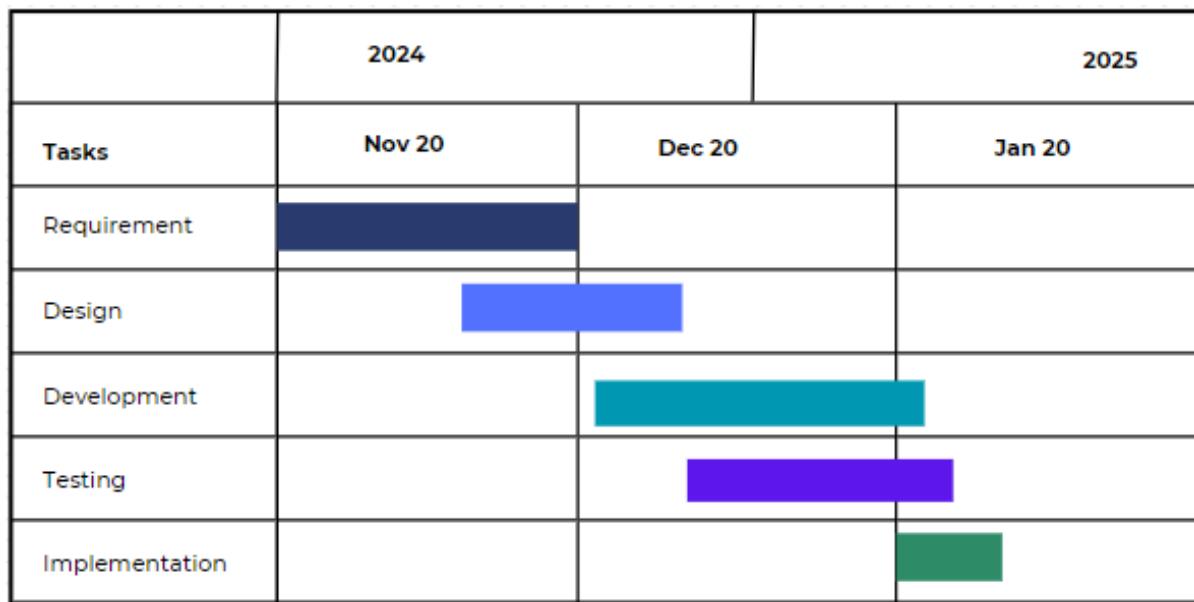


Figure 3.2: Build 1 Gantt Chart

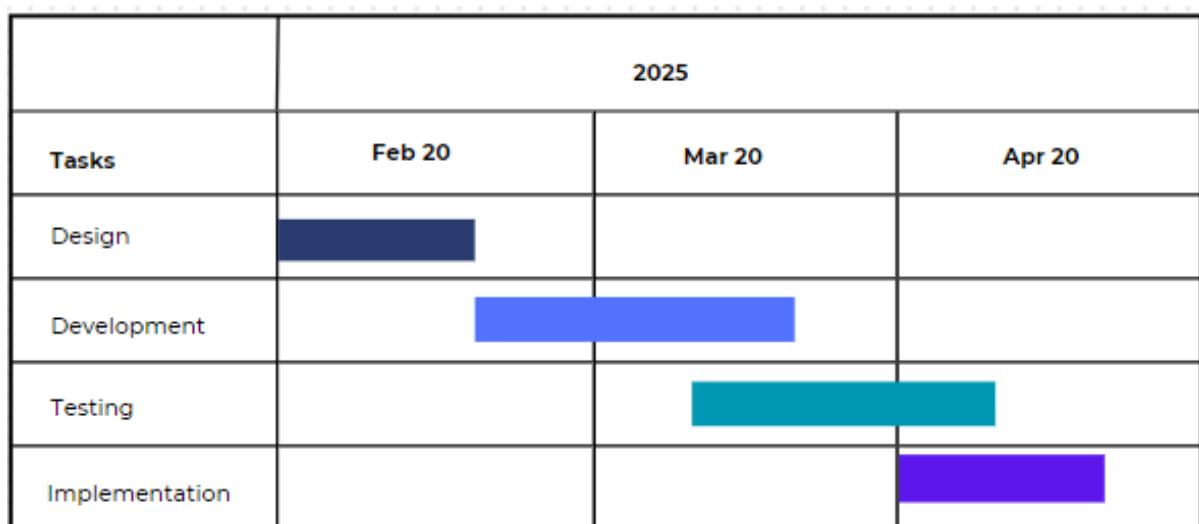


Figure 3.3: Build 2 Gantt Chart



Figure 3.4: Build 3 Gantt Chart

Conclusion

The EaseTrans platform addresses the critical challenges faced by the trucking industry in Pakistan, including poor vehicle maintenance, lack of qualified drivers, and limited visibility of cargo movements. By offering a centralized system that improves transparency, communication, and logistics management, EaseTrans will enhance the efficiency and profitability of the cargo transportation sector. The platform's real-time tracking, automated cargo matching and features are designed to ensure a seamless and efficient experience for all stakeholders involved in logistics operations.

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