

Resolve Issues with Consignment Measurements During Pickup

*A Project Report submitted in partial fulfilment of the requirements
for the award of the degree of*

Bachelor of Technology
in
Computer Science and Engineering

Under the Guidance of
Mohit Malani Sir and Mudit Garg Sir

Department of Computer Engineering & Applications
Institute of Engineering & Technology



GLA University
Mathura- 281406, INDIA
July,2024



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Declaration

I hereby declare that the work which is being presented in the B.Tech. Mini Project “**Resolve Issues with Consignment Measurements During Pickup**”, in partial fulfillment of the requirements for the award of the **Bachelor of Technology** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of my own work carried under the supervision of **Mr. Mohit Malani Sir (Co founder of skillcred)** under the guidance of **Dr. Rahul Pradhan** and **Assistant Professor Mrs. Priyanka Gupta [GLA UNIVERSITY MATHURA]**.

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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Certificate

DATA ANALYST MICRO EXPERIENCE

THIS SKILL CREDENTIAL IS PRESENTED TO

Vijay Kumar



for completing Micro Experience Program for Data Analytics titled **Resolve Issues with Consignment Measurements During Pickup**

Problem: Devise a Logic to Identify the Incorrectly Entered Weight-Volume for Consignment While Doing the Pickup.

Domain & Skills: **E-Commerce**

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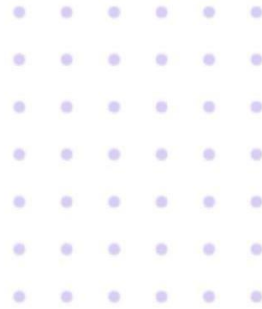
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Problem: Devise a Logic to Identify the Incorrectly Entered Weight-Volume for Consignment While Doing the Pickup.

Domain & Skills: **E-Commerce**

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ACKNOWLEDGEMENT

I am deeply grateful to everyone who contributed to the successful completion of the project, “**Resolve Issues with Consignment Measurements During Pickup.**” This project was an invaluable opportunity to explore the intricacies of e-commerce logistics and address critical challenges associated with consignment measurements. First and foremost, I would like to thank my organization for entrusting me with this meaningful and impactful project. I extend my heartfelt gratitude to **Mr. Mohit Malani** for his exceptional guidance, insightful feedback, and unwavering support throughout this endeavor. His expertise was instrumental in navigating complex scenarios and identifying innovative solutions. I am also profoundly thankful to my team members for their collaborative spirit and dedication. Their constructive feedback, problem-solving approach, and innovative ideas were key to addressing challenges related to consignment measurement accuracy during the first-mile logistics process. A special thanks to the **logistics and operations teams**, whose cooperation and willingness to share practical insights significantly enhanced the project’s outcomes. Their real-world perspectives were invaluable in designing solutions that align with operational realities.

Lastly, I express my gratitude to all stakeholders for their trust, support, and encouragement during this journey. This project has been a transformative learning experience, offering deep insights into the e-commerce ecosystem, and I am truly thankful to everyone who contributed to its success.

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ABSTRACT

The project, “**Resolve Issues with Consignment Measurements During Pickup,**” focuses on addressing discrepancies in consignment measurements during the first mile of logistics operations. E-commerce companies, which deliver packages nationwide across India’s 25,000+ pin codes, rely heavily on accurate weight and dimension data to streamline their processes. Any mismatch between declared and actual measurements can lead to billing disputes, delays, and inefficiencies in downstream operations like package consolidation and transit planning.

This project aimed to develop a robust system that ensures accurate measurements at the point of pickup, reducing manual errors and improving data reliability. The system integrates digital measuring devices, automated barcode scanning, and a real-time validation process to compare supplier-declared measurements with actual readings. Any discrepancies are flagged immediately, enabling prompt resolution.

Key features include a user-friendly interface for logistics personnel, automated error reporting, and a workflow for dispute management. The project also addresses the handling of special cases like fragile and heavy packages by using clear labeling to ensure safe transit.

The outcome of this project is an efficient, accurate, and transparent measurement system that enhances the overall logistics workflow. It helps minimize delays, improves customer satisfaction, and reduces operational overheads. The successful implementation of this project reinforces the importance of precision in e-commerce logistics and provides a scalable solution for managing consignments effectively.

This project serves as a stepping stone toward building smarter logistics systems that adapt to the growing demands of the e-commerce industry.

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About the Project

This project focuses on the operational processes within e-commerce logistics, examining how companies deliver packages across India, covering more than 25,000 pin codes. It highlights the intricate steps involved in consignment management, from the moment the order is placed to the final delivery at the customer's doorstep. This includes processes such as tracking, packaging, and managing the transit of consignments, all of which are critical for timely and accurate deliveries. The project provides a detailed exploration of how logistics systems are designed to handle large volumes of orders efficiently and seamlessly, ensuring that customers receive their packages without delays.

Through this project, we gain insights into the real-world challenges faced by e-commerce platforms and how they employ advanced technologies and optimized processes to meet customer expectations in the fast-paced world of online shopping.

Primary Reason to Choose This Project

The decision to choose this project stems from a desire to understand the complexities of logistics within e-commerce platforms. E-commerce logistics is a multifaceted field involving the movement of products, handling of consignments, managing delivery timelines, and ensuring optimal routes for transportation. This project provides an opportunity to delve into how supply chains are managed, how operational hurdles are overcome, and how technology and data are leveraged to ensure smooth, cost-effective, and timely deliveries. The study also offers valuable learning on improving delivery accuracy, reducing lead times, and enhancing customer satisfaction.

By exploring how e-commerce companies like Amazon and Flipkart manage their consignments, the project aims to enhance our understanding of the logistics system's operational dynamics, and how modern systems are changing the way goods are moved across vast geographies.

The Main Objective of the Project

The primary objective of this project is to explore the logistics and consignment management process in e-commerce, focusing on the entire lifecycle of consignments. This includes stages such as order processing, documentation, tracking, and packaging. The project also looks at critical operational phases like first-mile, middle-mile, and last-mile delivery. These stages encompass processes from the initial order to the final delivery at the customer's door, all of which need to be efficient to ensure timely and accurate delivery.

The key aim is to understand how logistics networks are optimized for speed, reliability, and cost efficiency. This includes examining the systems and processes that allow e-commerce companies to handle large-scale shipments, maintain real-time tracking, and ensure that customers receive their packages promptly and without issues.

Scope Of the Project

This project covers the entire logistics and supply chain process in e-commerce. It examines the movement of consignments from the supplier or manufacturer to the final customer, covering various stages such as consignment creation, tracking, packaging, and documentation. The study also investigates the different operational phases of logistics, namely first-mile, middle-mile, and last-mile delivery.

Additionally, the project delves into the role of technology in the logistics process, such as real-time tracking systems, automated warehouse management, and the use of advanced analytics to optimize delivery routes. A significant focus is placed on understanding how technology integrates with the supply chain to increase delivery speed and reduce errors.

The project also addresses challenges such as regional disparities, supply chain disruptions, and issues with managing logistics over vast geographical regions. The findings will provide insights into the best practices that e-commerce companies can use to streamline their operations, reduce costs, and improve customer satisfaction.

Working Methodology of the Project

This project follows a systematic methodology to study and analyze the logistics framework of e-commerce. The key steps include:

- 1. Research and Data Collection**

The first step involves collecting secondary data from case studies, reports, and articles related to logistics in e-commerce. This data is sourced from leading e-commerce companies like Amazon, Flipkart, and others to gain insights into their logistics operations, challenges, and strategies.

- 2. Analysis of Consignment Process**

This phase focuses on mapping the consignment process from order placement to delivery. It identifies the critical stages in the lifecycle of a consignment, such as consignment creation, tracking, documentation (e.g., Consignment Note, Proof of Delivery), and status updates.

- 3. Study of Operational Phases**

The project investigates the logistics network structure, analyzing how consignments are handled during the first-mile, middle-mile, and last-mile stages. This analysis helps understand how goods are moved from suppliers to hubs, how packages are sorted and routed, and how final deliveries are made to customers.

- 4. Packaging and Handling Review**

The packaging of consignments is crucial to ensuring safe and timely delivery. This phase of the project looks at packaging protocols, tracking systems, and handling fragile or heavy goods to ensure that consignments reach their destinations without damage.

- 5. Technology and Systems Integration**

Technology plays a significant role in modern logistics. This section of the project explores how e-commerce companies use technologies like real-time tracking systems, warehouse management systems (WMS), and automated delivery routing systems to streamline operations and reduce human error.

- 6. Challenges and Solutions**

The logistics industry faces several challenges, including regional disparities

in infrastructure, supply chain disruptions, and handling an increasing number of orders. The project identifies these challenges and explores potential solutions, including technological innovations and process improvements.

7. Conclusion and Recommendations

The final step of the project involves summarizing key findings and offering recommendations for improving the e-commerce logistics system. The recommendations focus on optimizing consignment handling, reducing lead times, and improving the accuracy and reliability of deliveries.

Details About the Hardware and the Software

Hardware Requirements:

1. Personal Computer/Laptop:

- Processor: Intel Core i5 or equivalent
- RAM: 8 GB
- Storage: 256 GB SSD for fast data processing
- Display: Minimum 15.6-inch screen for comfortable analysis
- Internet Connectivity: Stable internet connection for accessing cloud services and online databases

Software Requirements:

1. Microsoft Office Suite:

- Microsoft Word: Used for writing reports and documentation
- Microsoft Excel: Utilized for analyzing data, generating reports, and visualizing consignment processes
- Microsoft PowerPoint: For creating presentations to showcase project findings

2. Database Software:

- DBeaver and PostgreSQL: These tools are used for managing large datasets related to consignment tracking, shipment data, and other logistical information.

System Requirements

- **Supported Operating System:** Windows
- **Software Required:** DBeaver with PostgreSQL

Frontend and Backend

● **Frontend:**

- DBeaver (for managing PostgreSQL data)
- Excel (for processing and visualizing data)

● **Backend:**

- Data sources: CSV files, Python for scripting
- E-commerce platforms: Systems integrated with backend logistics.

Complete Code SCREENSHOT with Output

```

-- Check for records with dimensions in inches
SELECT * FROM consignment_volume WHERE unit = 'inches';

-- Convert dimensions from inches to centimeters
UPDATE consignment_volume
SET length = length * 2.54,
    breadth = breadth * 2.54,
    height = height * 2.54
WHERE unit = 'inches';

-- Add a new column for volume in cubic feet if it doesn't exist
DO $$
BEGIN
    IF NOT EXISTS (SELECT 1 FROM information_schema.columns
                    WHERE table_name='consignment_volume' AND
column_name='volume_cft') THEN
        ALTER TABLE consignment_volume ADD COLUMN volume_cft DECIMAL(10, 2);
    END IF;
END $$;

-- Calculate volume in cubic feet (1 cubic foot = 30.48 cm)
UPDATE consignment_volume
SET volume_cft = (length / 30.48) * (breadth / 30.48) * (height / 30.48);

--task-3: Join Tables to Add Volume to consignment_data
-- Verify column names in consignment_volume for clarity
-- Verify column names in consignment_volume for clarity
SELECT column_name
FROM information_schema.columns
WHERE table_name = 'consignment_volume';

-- Retrieve relevant data by joining tables
SELECT cd.id,
    cd.client_id,
    cd.weight,
    cd.total_boxes,
    cv.volume_cft,
    cd.industry_type
FROM consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id;

--task-4: Calculate Density (kg/CFT):
-- Add a new column for density if it doesn't exist
-- Add a new column for density if it doesn't exist
ALTER TABLE consignment_data
ADD COLUMN IF NOT EXISTS density DECIMAL(10, 2);

-- Calculate density as weight (kg) per cubic feet (CFT)
UPDATE consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id
SET cd.density = cd.weight / cv.volume_cft
WHERE cv.volume_cft > 0; -- Ensure no division by zero

--STEP-2: Exploring Data & CFT Analysis

```

```
--Industry-Level Statistics:
-- Calculate average, maximum, median CFT and average density by industry
SELECT cd.industry_type,
       AVG(cv.volume_cft) AS avg_cft,
       MAX(cv.volume_cft) AS max_cft,
       PERCENTILE_CONT(0.50) WITHIN GROUP (ORDER BY cv.volume_cft) AS median_cft,
       AVG(cd.density) AS avg_density
FROM consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id
GROUP BY cd.industry_type;
```

```
--Client-Level CFT Analysis:
-- Calculate average and maximum CFT by client
SELECT cd.client_id,
       AVG(cv.volume_cft) AS avg_cft,
       MAX(cv.volume_cft) AS max_cft
FROM consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id
GROUP BY cd.client_id;
```

--STEP-3: Outlier Detection Using IQR

```
--Calculate IQR for CFT by Industry:
-- Calculate Q1, Q3, and IQR for CFT by industry
WITH cft_percentiles AS (
    SELECT cd.industry_type,
           PERCENTILE_CONT(0.25) WITHIN GROUP (ORDER BY cv.volume_cft) AS Q1,
           PERCENTILE_CONT(0.75) WITHIN GROUP (ORDER BY cv.volume_cft) AS Q3
    FROM consignment_data cd
    JOIN consignment_volume cv ON cd.id = cv.consignment_id
    GROUP BY cd.industry_type
)
SELECT industry_type,
       Q1,
       Q3,
       (Q3 - Q1) AS IQR,
       Q1 - 1.5 * (Q3 - Q1) AS Lower_bound,
       Q3 + 1.5 * (Q3 - Q1) AS upper_bound
FROM cft_percentiles;
```

```
--Flag Outliers Based on IQR:
-- Flag outliers based on IQR calculations
WITH outlier_limits AS (
    SELECT industry_type,
           Q1 - 1.5 * (Q3 - Q1) AS Lower_bound,
           Q3 + 1.5 * (Q3 - Q1) AS upper_bound
    FROM (
        SELECT industry_type,
               PERCENTILE_CONT(0.25) WITHIN GROUP (ORDER BY cv.volume_cft) AS Q1,
               PERCENTILE_CONT(0.75) WITHIN GROUP (ORDER BY cv.volume_cft) AS Q3
        FROM consignment_data cd
        JOIN consignment_volume cv ON cd.id = cv.consignment_id
        GROUP BY cd.industry_type
    ) cft_percentiles
)
```

```

)
SELECT cd.id,
       cd.client_id,
       cv.volume_cft,
       CASE
         WHEN cv.volume_cft < o.lower_bound OR cv.volume_cft > o.upper_bound
       THEN 1
         ELSE 0
       END AS flag_outlier
FROM consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id
JOIN outlier_limits o ON cd.industry_type = o.industry_type;

```

--STEP-4: Logic Building for Anomalies

--Logic 1: Weight vs Volume Mismatch:

-- Logic to detect weight vs volume mismatches

```

SELECT cd.id,
       cd.client_id,
       cd.weight,
       cv.volume_cft,
       CASE
         WHEN ABS(cd.weight - (cv.volume_cft * 7)) > threshold THEN 1 -- Adjust
the threshold based on your data analysis
         ELSE 0
       END AS flag_weight_volume_mismatch
FROM consignment_data cd
JOIN consignment_volume cv ON cd.id = cv.consignment_id;

```

--Logic 2: Density Outliers:

-- Logic to detect density outliers

```

SELECT cd.id,
       cd.client_id,
       cd.density,
       CASE
         WHEN cd.density < lower_density_limit OR cd.density >
upper_density_limit THEN 1
         ELSE 0
       END AS flag_density_outlier
FROM consignment_data cd;

```

--Performance Evaluation:

-- Count total flagged outliers based on both logics

```

SELECT COUNT(*) AS total_outliers
FROM consignment_data
WHERE flag_weight_volume_mismatch = 1 OR flag_density_outlier = 1;

```

SCREENSHOT WORKING

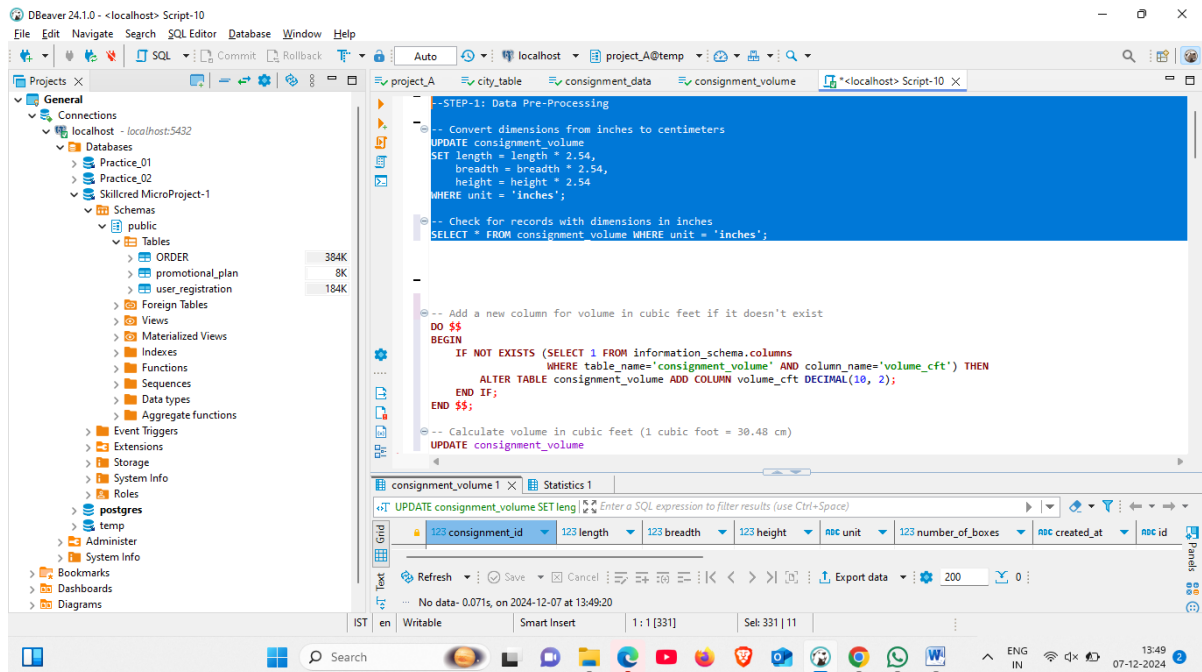


Fig. 1

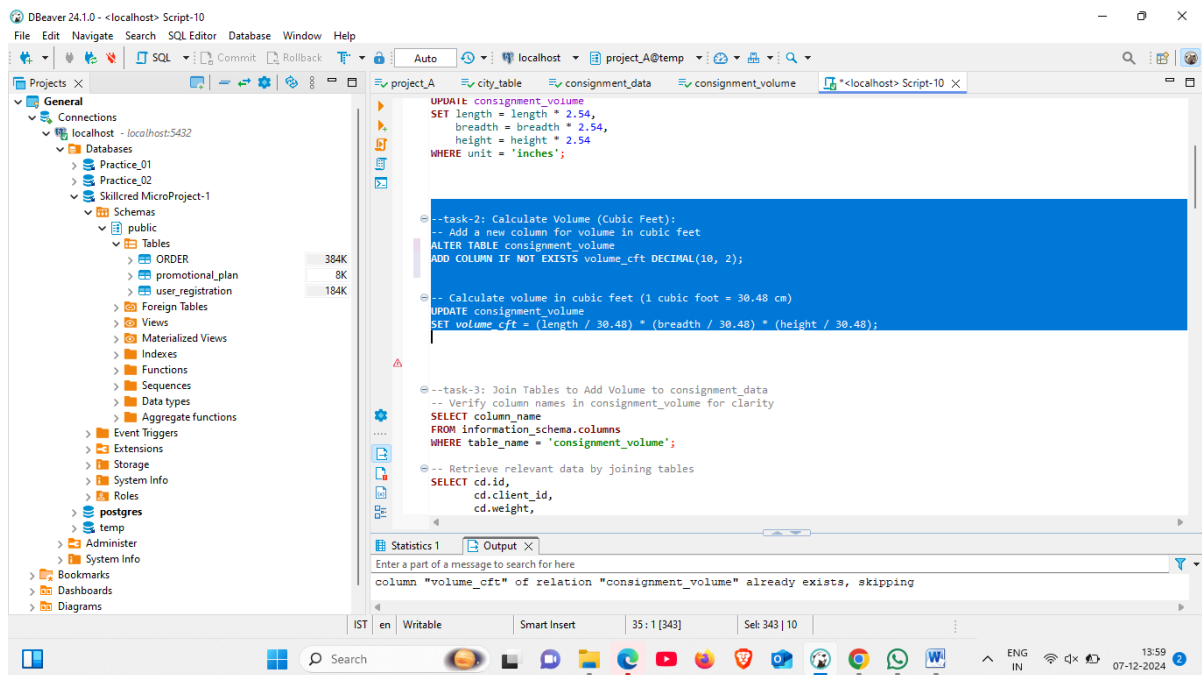


Fig. 2

Data Flow Diagrams

0 Level DFD:

This diagram represents the entire system as a single process interacting with external entities. The system interfaces with customers, sellers, delivery partners, and admins.

Entities:

- **Customer:** Places orders and tracks consignments
- **Seller/Supplier:** Provides product
- **Delivery Partner:** Handles transportation and delivery
- **Admin:** Manages system configuration and tracking

1 Level DFD:

This diagram breaks down the system into major sub-processes, such as order processing, consignment management, tracking updates, and delivery management.

2 Level DFD:

At this level, the processes are drilled down to specific details. It shows how orders are validated, consignments are scheduled, real-time tracking is updated, and delivery statuses are recorded.

References

[Include the references you have used for your research here, including articles, case studies, reports, and e-commerce logistics-related resources.]

Thank you