Domestic Travel Services Analysis

MIDTERM SUBMISSION

Submitted by

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Contents

1. Executive Summary

Rajput Travel, a domestic travel agency operating in the B2C (Business-to-Customer) segment, is facing challenges in optimizing profitability and resource allocation. The key issue lies in fluctuating seasonal demand, leading to inconsistent revenue generation and underutilization of available resources. The company operates across various domestic routes, catering to different customer segments, including budget travelers, mid-spenders, and high-spenders.

A major challenge in sustaining profitability is the variation in demand based on seasonality, travel destinations, and customer spending behavior. High-demand seasons often result in higher bookings but increased operational costs, whereas off-peak seasons lead to underutilized vehicles and reduced revenue. Furthermore, destination popularity and seasonal travel trends significantly impact pricing strategies, requiring a more data-driven approach to maximize revenue while ensuring competitive pricing.

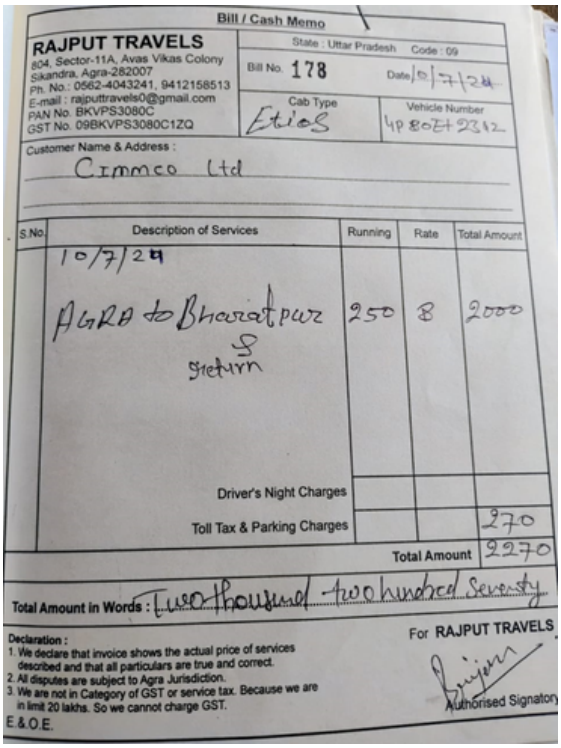
To address these challenges, this study adopts a data-driven approach utilizing Python's pandas library for statistical and trend analysis. The focus will be on:

- Understanding Seasonal Demand: Analyzing how demand fluctuates across different months and seasons.
- Destination Popularity Trends: Identifying high-traffic and low-traffic routes to optimize marketing and operational strategies.
- Customer Segmentation Analysis: Categorizing customers based on their spending behavior to tailor services accordingly.
- Profitability & Cost Analysis: Evaluating total revenue, costs, and profit margins to enhance pricing strategies.

2. Proof Of Originality

Link to the Document Proof - Proof of Originality

I. Some Photos of Organization and Owner


Bill / Cash Memo

RAJPUT TRAVELS
804, Sector-11A, Avas Vikas Colony
Sikandra, Agra-282007
Ph. No.: 0562-4043241, 9412158513
E-mail : rajputtravels0@gmail.com
PAN No. BKVPS3080C
GST No. 09BKVPS3080C1ZQ

State : Uttar Pradesh Code : 09
Bill No. 178 Date 10/7/24
Cab Type Etios
Vehicle Number UP 80 ET 2312

Customer Name & Address : Cimmco Ltd

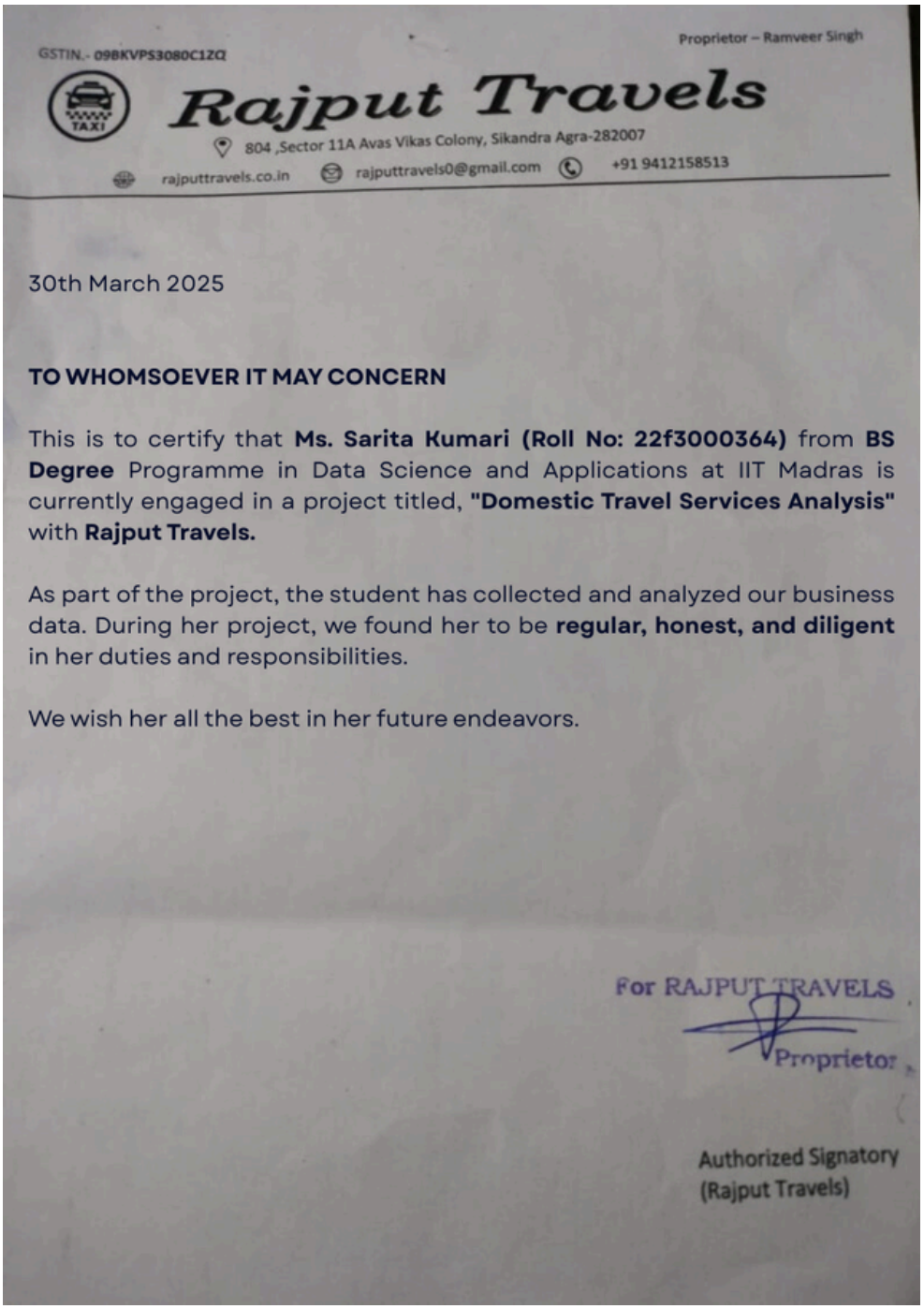
S.No.	Description of Services	Running	Rate	Total Amount
	10/7/24 AGRA to Bharatpur & return	250	8	2000
	Driver's Night Charges			
	Toll Tax & Parking Charges			270
	Total Amount			2270

Total Amount in Words : Two thousand two hundred Seventy

Declaration :
1. We declare that invoice shows the actual price of services described and that all particulars are true and correct.
2. All disputes are subject to Agra Jurisdiction.
3. We are not in Category of GST or service tax. Because we are in limit 20 lakhs. So we cannot charge GST.
E & O.E.

For RAJPUT TRAVELS
Authorised Signatory

II. The signed and stamped letter from the organisation (GSTIN: 09BKVPS3080C1ZQ)



GSTIN.- 09BKVPS3080C1ZQ

Proprietor – Ramveer Singh

Rajput Travels

TAXI

804 ,Sector 11A Avas Vikas Colony, Sikandra Agra-282007

rajputtravels.co.in rajputtravels0@gmail.com +91 9412158513

30th March 2025

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Sarita Kumari (Roll No: 22f3000364)** from **BS Degree** Programme in Data Science and Applications at IIT Madras is currently engaged in a project titled, **"Domestic Travel Services Analysis"** with **Rajput Travels.**

As part of the project, the student has collected and analyzed our business data. During her project, we found her to be **regular, honest, and diligent** in her duties and responsibilities.

We wish her all the best in her future endeavors.

For RAJPUT TRAVELS

Proprietor

Authorized Signatory
(Rajput Travels)

3. Meta Data and Descriptive Statistics

The dataset contains travel booking records from Rajput Travel, a travel agency based in Agra, Uttar Pradesh, India. The data includes details of customer bookings, including distance traveled, total fare, cost, and profit margins.

3.1. Meta Data

The link to Dataset: Click here to view the Dataset

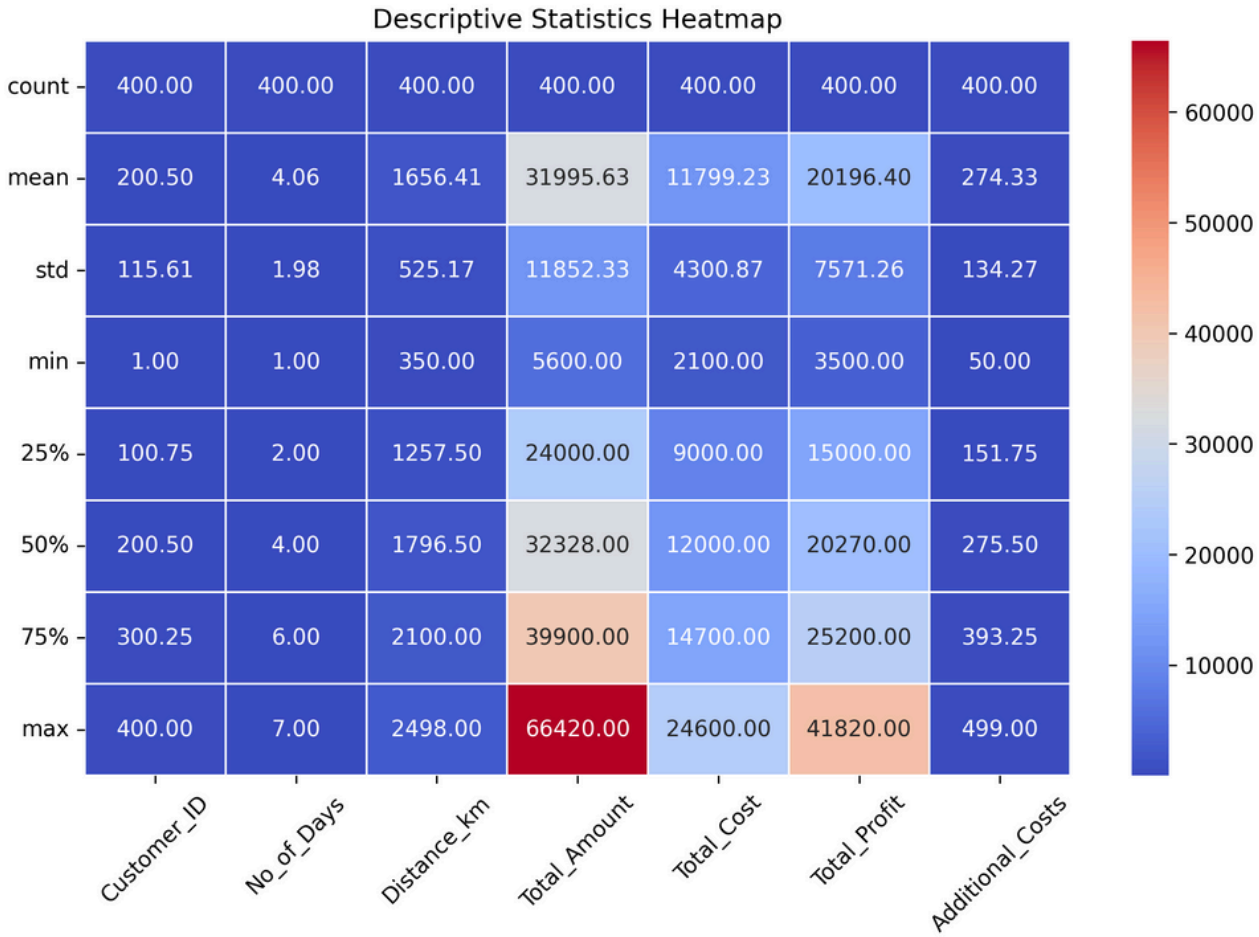
The dataset consists of 401 rows and 17 columns, with relevant fields covering customer details, trip details, and financial metrics.

1. **Customer_ID**: Unique ID assigned to each customer.
2. **Booking_Date**: Date when the booking was made.
3. **Pickup_Location**: The starting location of the journey.
4. **Destination**: The final destination of the trip.
5. **No_of_Days**: Number of days the trip lasted.
6. **Distance_km**: The total distance covered in kilometers.
7. **Season**: The season during which the trip took place (Winter, Summer, etc.).
8. **Car_Name**: The type of car booked (e.g., Innova, Artica, Aura, etc.).
9. **Total_Amount**: The total charge for the trip.
10. **Total_Cost**: The cost incurred by the company for the trip.
11. **Total_Profit**: Profit earned from the booking.
12. **Mode_of_Payment**: The payment method used (Online, Card, Cash).
13. **Additional_Costs**: Any extra costs incurred (e.g., fuel, tolls).
14. **Day_of_Week**: The weekday on which the booking was made.
15. **Customer_Segment**: Classification of customers based on spending (Budget-Spender, Mid-Spender, High-Spender).
16. **Seasonal_Demand**: Whether the trip falls into high or low seasonal demand.
17. **Destination_Popularity**: The popularity of the destination (High, Low).

3.2.Descriptive Statistics

The dataset provides insights into the distribution of travel bookings:

Total Customers: 400 (valid entries)
Total Trip Duration: Ranges from 1 to 7 days.
Average Distance Traveled: ~1656 km
Average Trip Fare: ₹31,995
Profit Margin: Roughly ₹20,196 per trip
Additional Costs: Range from ₹50 to ₹499



4. Explanation of Analysis Process/Methods

The objective of this project is to assess the performance and operational efficiency of Rajput Travels, a domestic travel service provider. By leveraging a data-driven approach, we aim to uncover key trends, optimize services, and enhance decision-making. The methodology consists of the following stages:

4.1. Data Acquisition & Understanding

The dataset comprises details related to travel bookings, revenue, customer demographics, trip details, and service utilization. A metadata summary will be created to define each attribute's purpose and significance. Descriptive statistics will be generated to understand data distribution, including measures such as mean, median, standard deviation, and range.

4.2. Data Cleaning & Preprocessing

To ensure accuracy and consistency, the following steps will be undertaken:

- Handling Missing Data: Identify and manage missing values using appropriate techniques such as imputation (mean/median for numerical values, mode for categorical values) or removal of irrelevant records.
- Date Standardization: Ensure booking and travel dates follow a uniform format for time-based analysis.
- Duplicate Detection & Removal: Identify and eliminate redundant entries that could distort results.
- Outlier Detection: Utilize statistical methods such as the interquartile range (IQR) and Z-score to detect and manage extreme values.
- Data Transformation: Convert categorical variables (e.g., travel destinations, booking types) into numerical representations for analysis.

4.3. Trend Identification & Forecasting

1. Time-Series Analysis:
- Examine booking trends across different periods to identify seasonal demand shifts.
- Develop predictive models to forecast future demand.

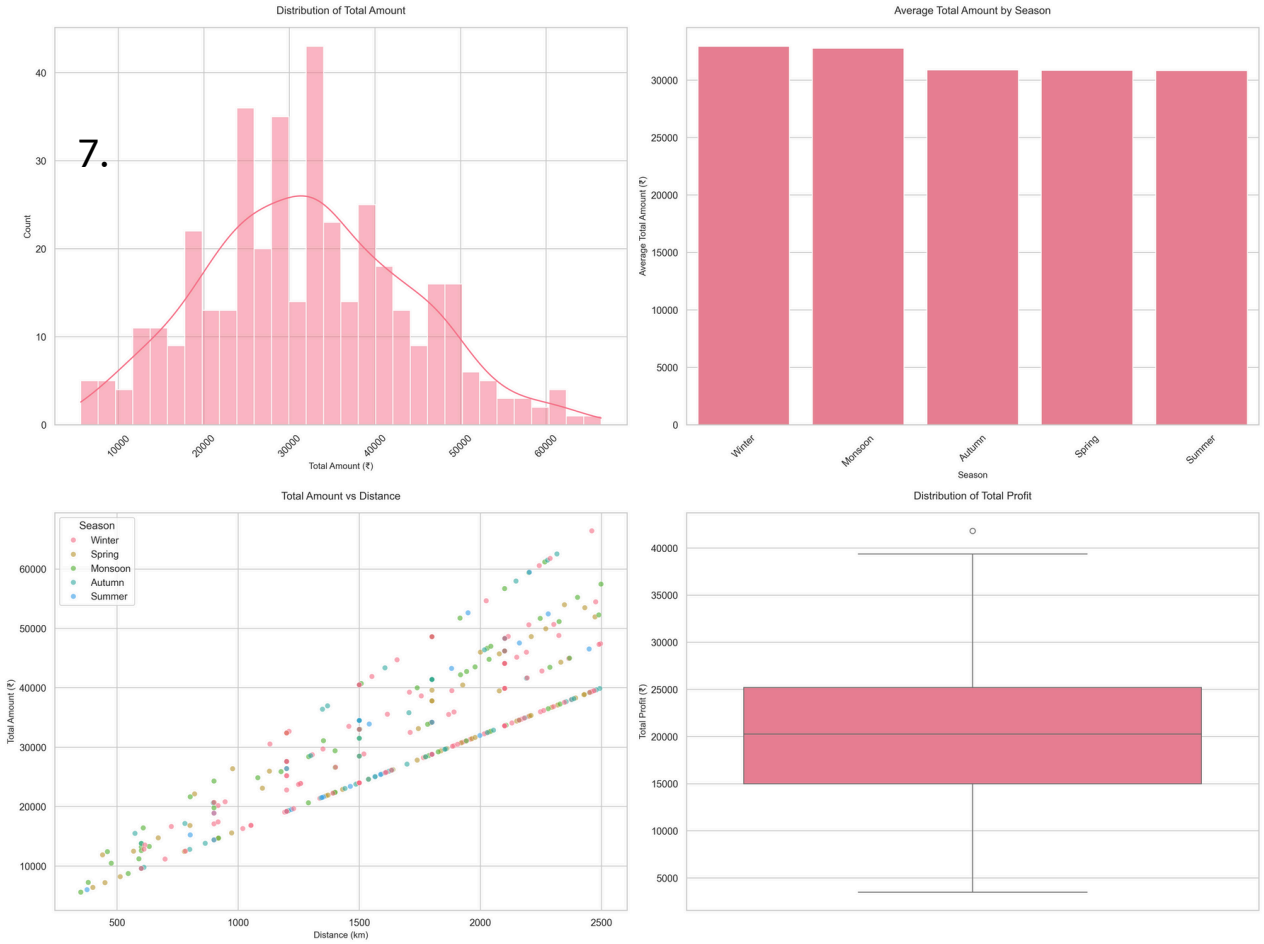
2. Correlation Analysis:
- Investigate relationships between key variables, such as the impact of discounts on revenue or the influence of holidays on travel demand.
- Identify external factors affecting customer preferences and travel choices.

4.4. Business Insights & Recommendations

Based on the findings, the following insights will be provided:

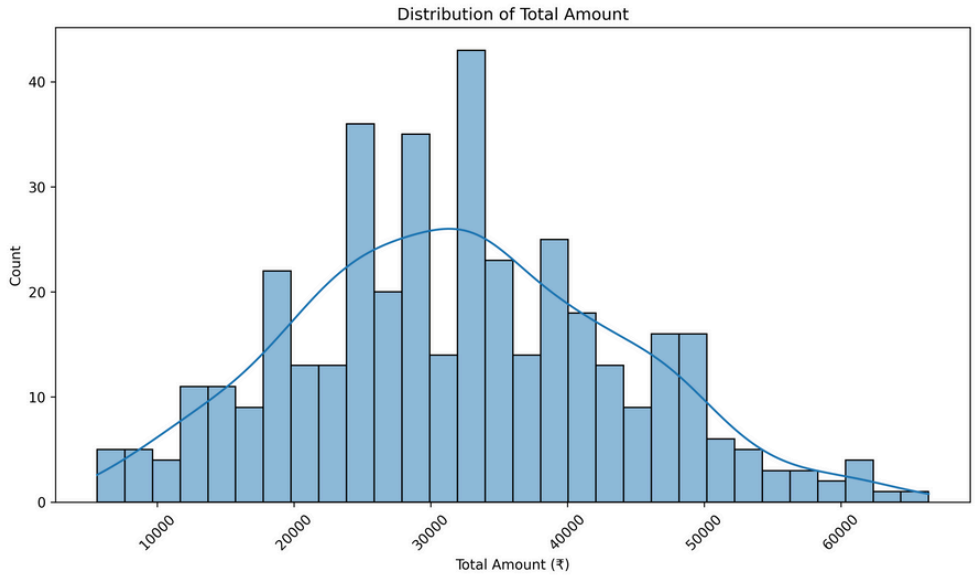
- Service Optimization: Determine which travel services should be prioritized or improved.
- Dynamic Pricing Strategy: Suggest pricing adjustments based on demand trends.
- Targeted Marketing: Identify customer segments and popular destinations for focused advertising efforts.
- Operational Enhancements: Offer recommendations to streamline services and improve overall efficiency.

Results and Findings



The histogram above illustrates the distribution of total earnings, showing that most transactions range between ₹10,000 and ₹40,000, with a peak around ₹30,000. The right-skewed pattern indicates fewer high-value transactions. This visualization helps identify common revenue brackets and supports strategic pricing and service optimization.
4o

Customer Segments: High spenders contribute the most revenue, while budget spenders generate the least. Day-wise Spending: Wednesday sees the highest spending, with other days showing a balanced trend. Payment Modes: Cash (36.5%) is the most preferred, followed by online (33.2%) and card (30.2%). Top Cars: Crista leads in revenue, followed by Innova and Carence.



Distribution: Positively skewed, with most amounts between ₹20,000 - ₹40,000.
Peak: Highest frequency around ₹30,000.
Spread: Ranges from ₹5,000 to ₹60,000+.
Trend: Gradual decline after ₹40,000.