

# Data-Driven Insights to Boost OTA Sales & Profitability

**Problem Statement:** Our objective is to analyze **6 months of booking data** from an **Online Travel Agency (OTA)** to identify key trends and potential areas of improvement in sales and profitability. The dataset includes various fields like **buyer\_id** (unique customers), **supplier\_id** (flight suppliers), **selling price**, **refund status**, and more.

## Data Overview:

- **Buyer Information:** Unique customer identification through `buyer_id`
- **Supplier Information:** Unique identification of suppliers through `supplier_id`
- **Booking Dates:** Data spread across six months, allowing monthly and weekly trend analysis.
- **Payment Methods:** Different payment channels used by customers.
- **Refund Status:** Insights into refund behavior and the financial impact.
- **Sales Channels:** Platforms such as Android, iOS, and Web.

**Analysis Approach:** Using **Python** and libraries like **Pandas**, and **Matplotlib**, we've processed, cleaned, and analyzed the data to extract meaningful insights. Python has allowed us to efficiently:

- **Aggregate data** to observe trends in payment methods, refund behavior, and sales channels.
- **Generate visualizations** to highlight trends and areas of concern.
- **Quantify metrics** like revenue, refund amounts, customer loyalty, and performance across channels.

## Goal:

- **Identify actionable insights** to increase sales and profitability.
- **Provide strategic recommendations** to improve customer experience and channel efficiency.



# Data Insights and Analysis

## Revenue, Profit and Refunds

### Observation: Negative Profit Despite Positive Sales

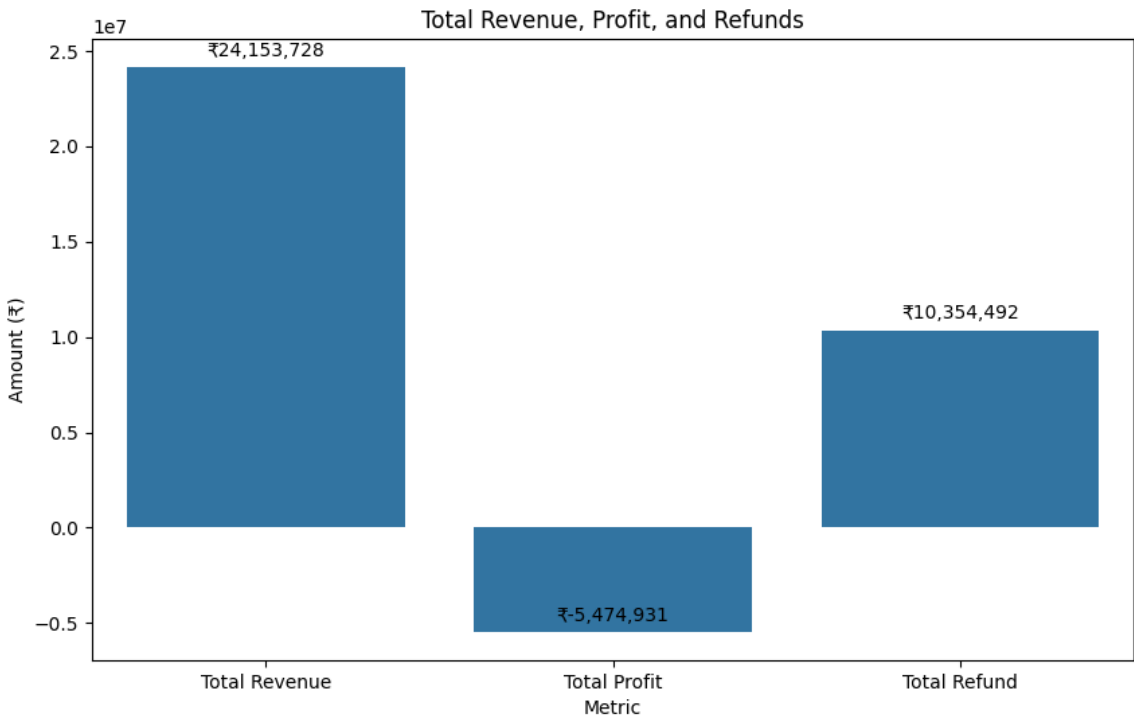
- **Total Revenue:** ₹24,153,728
- **Profit:** ₹-5,474,931
- While the selling price exceeds the cost price, refunds totaling ₹10,354,492 have turned the business **loss-making**.

### Analysis:

- High refund amounts are eroding profitability.
- The business is generating sales but losing revenue through excessive refunds.

### Recommendations:

- **Reduce refund rates** by enhancing customer experience.
- Implement stricter **refund policies** for non-critical issues.
- Analyze **refund trends** to identify and mitigate root causes.



# Payment Method Sales Distribution

**Data:** Average sales volume across payment methods is approximately ₹604,000. However, PayPal dominates the total sales volume.

**Observation:**

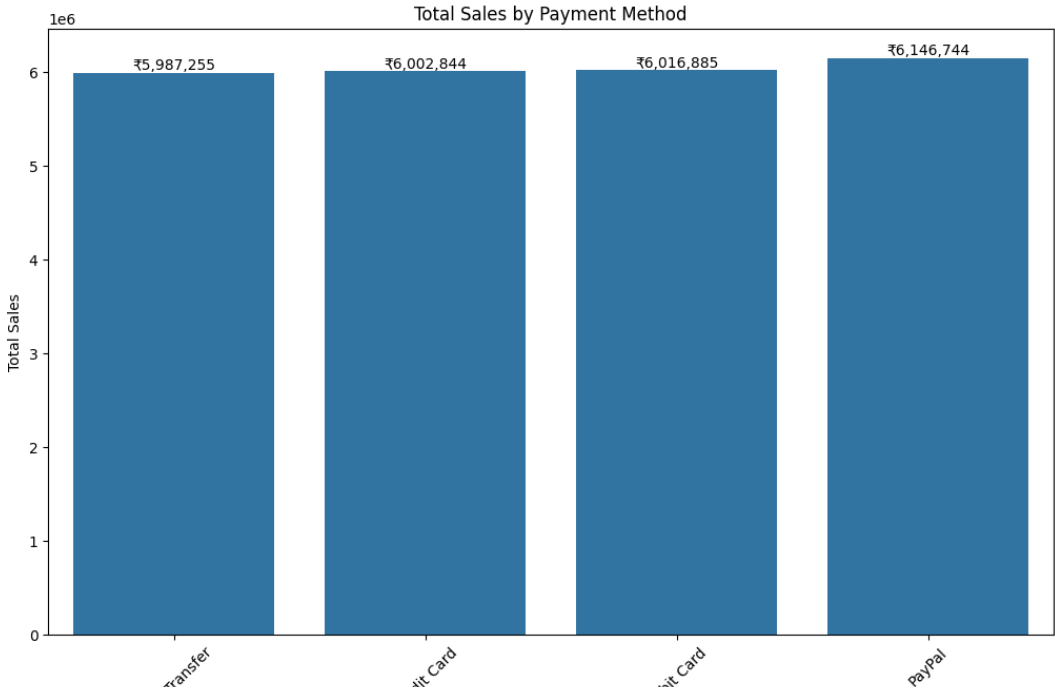
- No significant variation in sales across different payment methods, but PayPal shows higher sales volume.

**Analysis:**

- This indicates customer preferences may lean towards PayPal, potentially influenced by promotions or ease of use.

**Recommendation:**

- **Short-Term:** Focus marketing campaigns around PayPal to leverage its dominant position.
- **Long-Term:** Offer incentives (e.g., cashback or discounts) to promote lesser-used payment methods, helping diversify sales channels and reduce dependency on PayPal.



# High Refund Count

**Data:** Refunds - Yes: 22,429; No: 9,811

**Observation:**

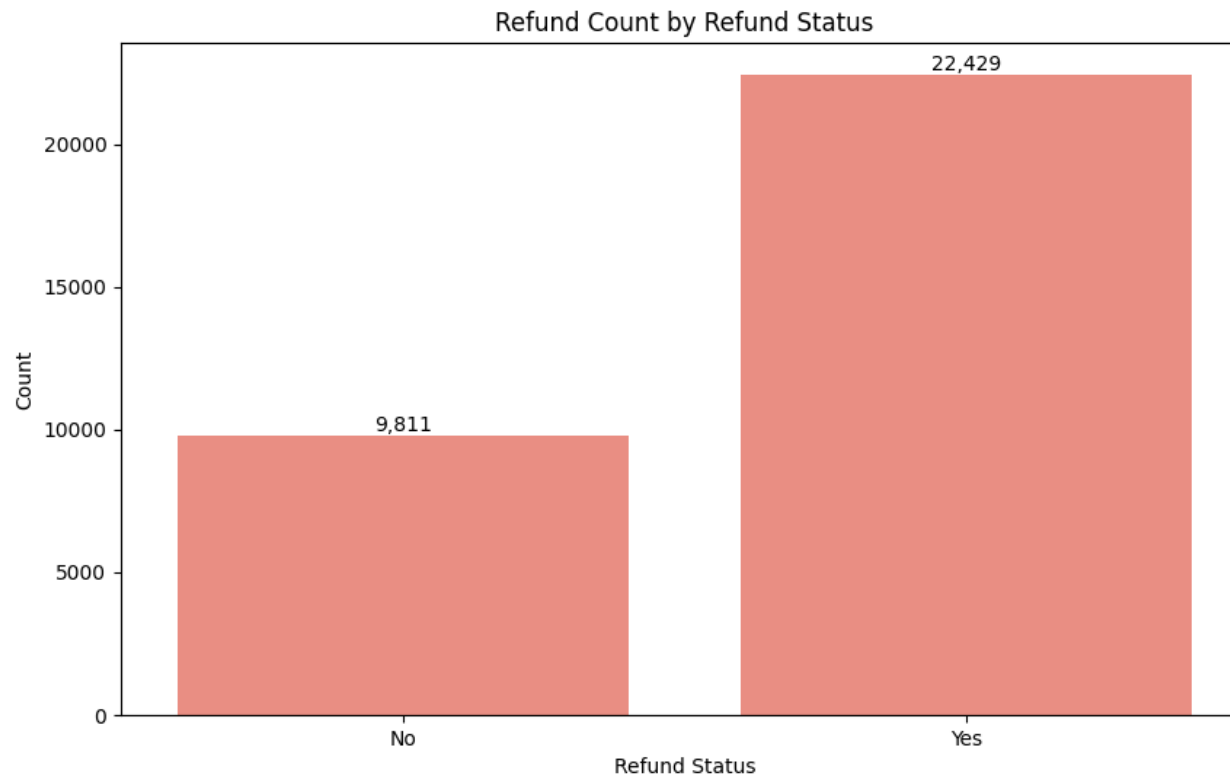
- Refunds are **70% higher** in 'Yes' status than 'No', potentially affecting immediate profitability.

**Analysis:**

- Likely due to customer dissatisfaction or operational issues during fulfillment.
- Average refund amount is ~ ₹461

**Recommendation:**

- Conduct a **root cause analysis** of refund triggers and develop a **refund prevention plan** (e.g., clearer refund policies, better customer support).



# Web Channel Dominance

**Data:** Web contributes **49.91%** of total sales (₹12.05M out of ₹24.15M).

## Observation:

- Web is the dominant sales channel, contributing **nearly half** of total revenue.

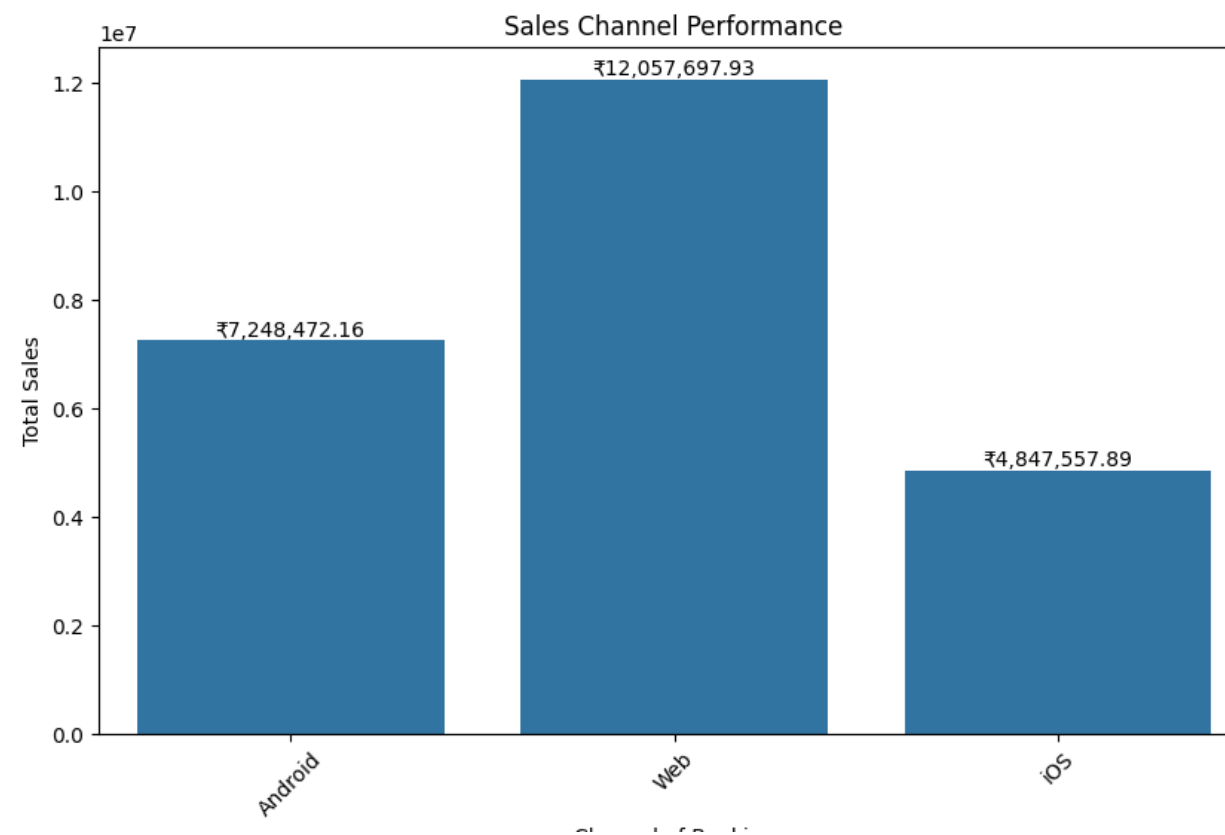
## Analysis:

- Shows the Web platform as a strong customer acquisition tool, with Android and iOS trailing behind.

## Recommendation:

- Invest in optimizing and expanding Web marketing efforts to retain its top status. Prioritize **cross-channel promotion** to reduce over-reliance on a single channel.

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# Monthly Revenue Stability

## Observation:

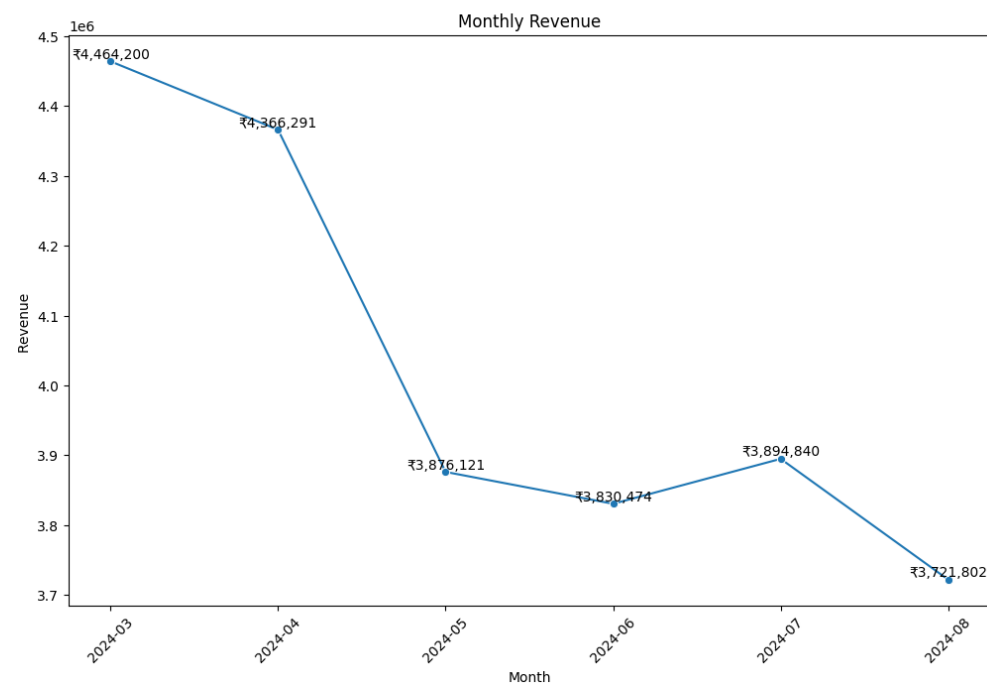
- The monthly revenue has seen a gradual decline from ₹4,464,200 in March to ₹3,721,802 in August.
- Although there was a dip in May and June, the revenue shows slight recovery in July, but still remains below March's peak.

## Analysis:

- This decline could be attributed to seasonal trends, changes in customer demand, or external factors affecting bookings (e.g., fewer travel deals or promotions).
- Another potential cause might be competition or economic factors impacting customer spending during the later months.

## Recommendation:

- **Short-Term:** Launch targeted promotions or discounts in the months with lower revenue (May to August) to re-engage customers and boost bookings. A loyalty program or referral discounts might help bring back customers.
- **Long-Term:** Analyze seasonal trends and customer booking patterns to anticipate revenue dips and proactively introduce campaigns (e.g., early-bird discounts or bundle offers) during these periods to maintain revenue stability.



# Weekly Revenue Stability

## Observation: Decline in Weekly Revenue

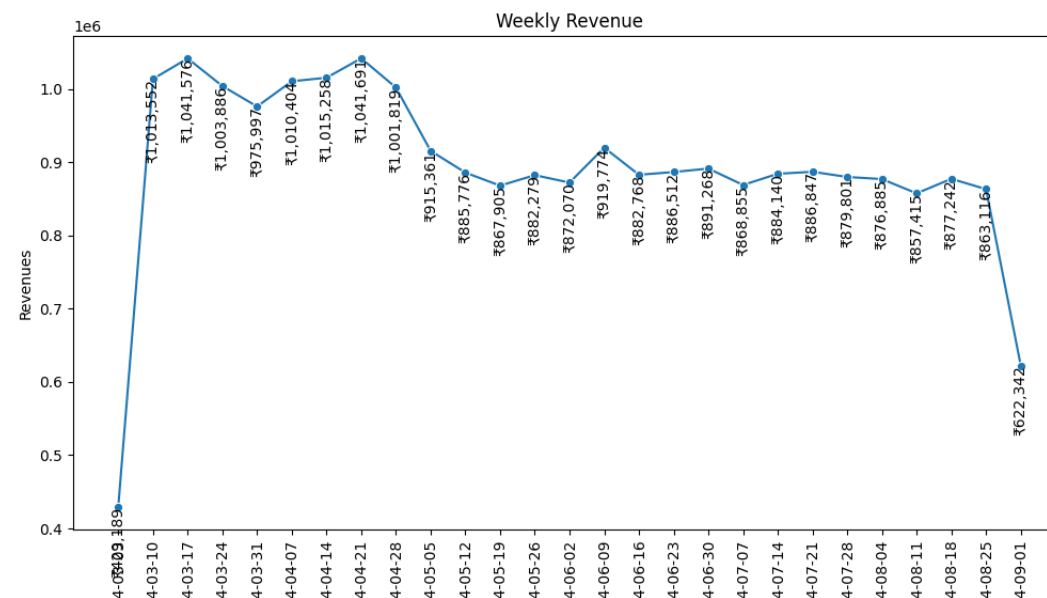
- **13% decline** observed from **Week 9 (₹1,001,819)** to **Week 12 (₹867,905)**.
- Revenue in Week 15 showed improvement but did not recover fully.
- Continuous drops in later weeks could become **irrecoverable** without intervention.

## Analysis:

- **Seasonal fluctuations** and end of holiday periods.
- **Increased competition** with better offers.
- **High refund rates** contributing to revenue drops.

## Recommendation:

- **Targeted promotions** for underperforming weeks.
- **Dynamic pricing** to stay competitive.
- **Loyalty programs** to drive repeat business.



# Analysis of Customer Loyalty vs. Selling Price

## Box Plot Overview:

- **Median Selling Price:** ~₹750
- **Interquartile Range (IQR):**
  - **Lower Quartile (25th percentile):** ~₹400
  - **Upper Quartile (75th percentile):** ~₹1100
- **Outliers:** A few values significantly outside the IQR

## Analysis:

- **Median Price:** The typical selling price for loyal customers is around ₹750, indicating a central tendency in spending.
- **Price Range:** 50% of loyal customers' transactions fall between ₹400 and ₹1100, showing diverse spending behavior.
- **Outliers:** High and low outliers suggest variability in transaction values, potentially due to special offers or premium products.
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## Recommendations

1. **Optimize Pricing Strategies:** Tailor pricing and promotions to different spending segments to maximize profitability.
2. **Enhance Loyalty Programs:** Design rewards and incentives that cater to various spending levels among loyal customers.
3. **Monitor Trends:** Regularly track purchasing patterns to adjust strategies and improve customer engagement.



Caption