

Cost and Profit Analysis

Food Delivery Platform: Executive Summary

Project Overview

This project examines the financial and operational aspects of a food delivery platform to assess its cost structure, identify inefficiencies, and recommend actionable strategies to enhance profitability.

Recommendations to Improve Profitability:

- **Address Revenue and Cost Imbalance:** Revenue-to-Cost Ratio is 0.79; average cost per order is ₹161.04, while revenue is ₹126.99, leading to a loss of ₹34,051.85.
 - **Reduce Discounts:** Discounts account for 46.13% of total costs, with a high negative impact on net income (-0.71). Average discount per order is ₹74.29.
 - **Increase Commission Fees:** Commission fees strongly correlate with net income (+0.48) and are the primary revenue source.
 - **Optimize Refund/Chargeback Rates:** Refund rate is 28.5%, with significant cost impact (+0.56) and net income reduction (-0.50).
 - **Drive Larger Order Values with Minimal Discounts:** Larger order values positively influence net income (+0.46) and present revenue growth opportunities.
 - **Optimize Delivery Fees:** Delivery fees impact 81.4% of orders, with slight correlations to cost (+0.16) and net income (-0.14).
 - **Optimize Payment Processing Fees:** These fees add to costs but have a weaker negative correlation with net income (-0.13).
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Analysis

Objectives

- Quantify the cost-revenue balance of the platform.
- Identify key cost drivers and assess their impact on profitability.
- Recommend measures to improve efficiency and reduce losses.

Data Overview

The dataset spans transactional details, covering order values, revenue sources, delivery costs, payment methods, and refund-related metrics for a total of **1000 orders**.

Data Dictionary

- **Order ID:** Unique identifier for each order.
- **Customer ID:** Unique identifier for the customer placing the order.
- **Restaurant ID:** Unique identifier for the restaurant fulfilling the order.
- **Order Date and Time:** Date and time when the order was placed.
- **Delivery Date and Time:** Date and time when the order was delivered.
- **Order Value:** Total value of the food items in the order (before fees and discounts).
- **Delivery Fee:** Fee charged for delivering the order. This is a cost for the platform.
- **Payment Method:** Mode of payment used by the customer.
- **Discounts and Offers:** Discounts or promotional offers applied to the order.
- **Commission Fee:** Fee charged by the platform for facilitating the order. This is revenue for the platform.
- **Payment Processing Fee:** Fee charged by the payment gateway for processing payments. This is a cost for the platform.
- **Refunds/Chargebacks:** Amount refunded or charged back due to disputes or cancellations. This is a cost to the platform if positive (refund) or reduces cost if negative (chargeback). All values in this dataset were positive and represent refunds.

Data Preprocessing

- **Data Type Conversion:** The 'Order Date and Time' and 'Delivery Date and Time' columns were converted to datetime format.
- **Missing Values:** Missing values in the 'Discounts and Offers' column were noted but not imputed as they are acceptable in the analysis.
- **Feature Engineering:** New features were created:
 - **Discount Percentage ('Disc Pct'):** Extracted the discount percentage from 'Discounts and Offers'.
 - **Discount Amount:** Calculated the total discount amount based on the discount percentage and order value.
 - **Cost:** Calculated by summing 'Delivery Fee', 'Discount Amount', 'Payment Processing Fee', and 'Refunds/Chargebacks'.

- **Revenue:** Defined as the 'Commission Fee'.
- **Net Income:** Calculated as 'Revenue' minus 'Cost'.
- **Date:** Extracted date from 'Order Date and Time'.

Key Findings

Financial Performance:

- The platform incurred a total **loss of ₹34,051.85**.
- The Revenue-to-Cost Ratio is 0.79, meaning **for every ₹1 spent on costs, only ₹0.79 is earned** as revenue.
- The average cost per order (₹161.04) exceeds the average revenue per order (₹126.99), indicating an unsustainable cost structure.
- **Net-Income-to-Revenue Ratio is -0.27**, with 27% of revenue being insufficient to cover costs.
- Net-Income-to-Cost Ratio is -0.21, reflecting a **loss of ₹0.21 for every dollar spent**.
- **Revenue constitutes only 12% of the average order value**.
- The **average commission percentage on the total order value is 12.05%**.

Cost Structure:

- Discounts constitute a **large portion of the costs (46.13%)**.
- Average discount per order is ₹74.29, which indicates significant pressure on margins.
- **81.4% of orders have delivery fees paid by the platform**.
- Refunds and chargebacks also contribute to costs.
- The business is operating at a loss, with the **majority of orders showing negative net income**.

Operational Issues

- **A high refund rate of 28.5%** indicates operational or product/service issues.
- Only **18.6% of orders have delivery fees paid by customers**.

Payment Methods

- Cash on Delivery is the most used payment method (35.7%).

Correlation Analysis

- **Costs have a strong negative impact on net income** (-0.90 correlation).
- Discounts have a strong positive correlation with cost (0.78) and a strong negative correlation with net income (-0.71).

- Refunds/Chargebacks are strongly positively correlated with cost (0.56) and strongly negatively correlated with Net Income (-0.50).
- Delivery Fees are slightly positively correlated with Cost (0.16) and slightly negatively correlated with net income (-0.14).
- Revenue has a positive correlation with Net Income (0.48).
- Commission fee has a strong positive correlation with Net Income (0.48).
- Order value has a positive correlation with net income (0.46)

Net Income Analysis

- **61.8% of orders are loss making, 37.9% orders are profit making** and 0.3% orders broke even.
- Profit-making orders are characterized by lower discounts, lower refunds, and higher commission fees, resulting in higher net income.

Scaling Data Based on Ideal Values:

The analysis scaled the original data based on the characteristics of profit making orders, to demonstrate how costs and revenue could be adjusted to improve profitability.