Comprehensive Report: Olist E-commerce Sales and Order Analysis

Introduction

This report presents a comprehensive analysis of sales and order data from the Olist E-commerce platform, operating in Brazil. The objective is to identify sales patterns, evaluate operational performance, and uncover actionable insights and anomalies that can inform strategic decision-making and continuous improvement initiatives, **particularly in light of the platform's subsequent insolvency due to high operational debt.** This analysis aims to extract valuable lessons from Olist's operational history.

1. Overall Sales Performance

The initial analysis provides an overview of transaction volume and value over the available data period:
- **Total Product Orders: 6,817**
- **Total Revenue (Product Price): R$ 914,077.08**
- **Total Freight Price: R$ 145,420.97**
- **Average Product Price per Order: R$ 93.46**
- **Total Sales (Product Price + Freight Price): R$ 1,059,498.05**

Insight:

In aggregate, Olist recorded over **1 million** Brazilian Reais in total sales, indicating a significant operational scale during its active period. The relatively stable average product price around **R$ 93.46** suggests a diverse product segmentation or a focus on the mid-price range. These figures provide a baseline for understanding the scale of operations that ultimately became unsustainable.

2. Sales Trend Analysis

2.1. Monthly Sales Trend (Number of Orders & Total Revenue)

Order Period	Number of Orders
2016-10	27
2016-11	2
2017-01	59
2017-02	108
2017-03	176
2017-04	164
2017-05	252
2017-06	203
2017-07	271
2017-08	297
2017-09	302

2017-10	335
2017-11	477
2017-12	434
2018-01	477
2018-02	453
2018-03	458
2018-04	476
2018-05	515
2018-06	456
2018-07	455
2018-08	419
2018-09	1

Order Period	Price
2016-10	4928.66
2016-11	105.90
2017-01	7484.09
2017-02	13226.43
2017-03	26971.02
2017-04	18700.57
2017-05	36381.80
2017-06	28933.87
2017-07	37152.81
2017-08	39209.35
2017-09	46062.20
2017-10	46958.21
2017-11	61840.87
2017-12	58839.61
2018-01	62482.83
2018-02	62789.37
2018-03	54381.99
2018-04	68358.78
2018-05	74076.15
2018-06	56254.43
2018-07	58150.47
2018-08	50757.68
2018-09	29.99

Trend of Unique Orders per Month

Trend of Total Product Price per Month
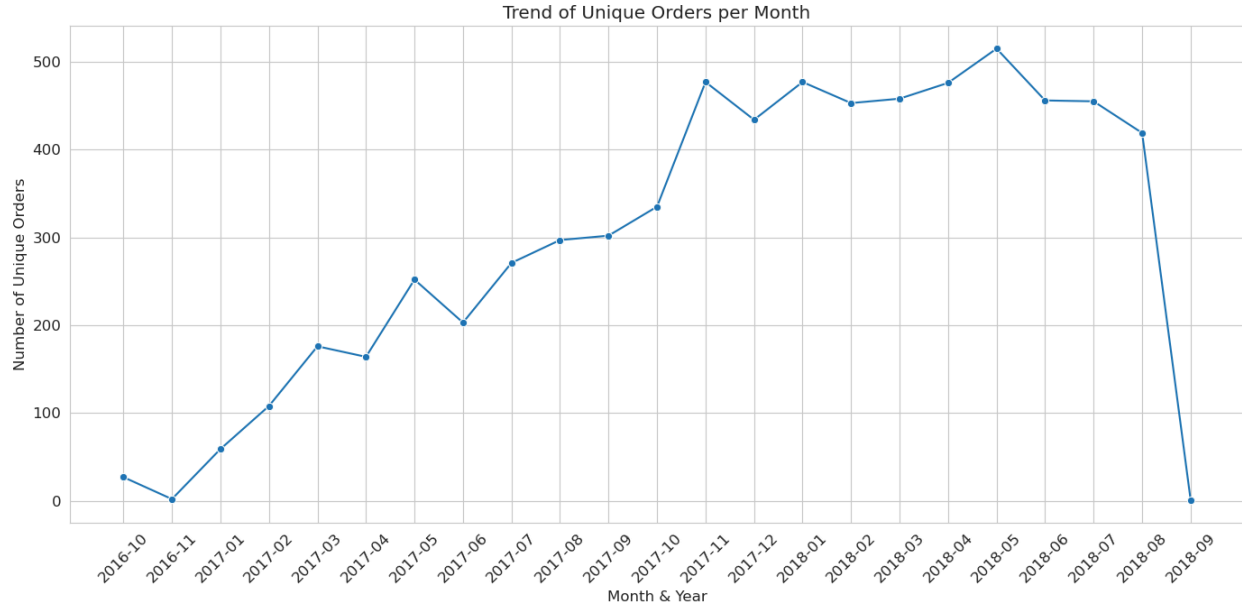
Explanation:

The monthly sales trend shows a consistent growth phase from late **2016** to mid-**2018**, both in terms of number of orders and total revenue. Peak sales in both metrics were observed around May **2018**.

Insight:

- The significant increase in **2017** and early **2018** indicates successful growth strategies and market expansion for Olist during its operational period.
- **Critical Event - Insolvency:** The drastic and abnormal drop in sales in **September 2018**, with only **1** order and **R$ 29.99** in revenue, is directly attributable to the company's **insolvency**

(bankruptcy) caused by high operational debt. This event marks the effective cessation of their e-commerce operations.

Next Actions (Lessons Learned from Insolvency):

- **In-depth Financial Post-Mortem:** Future analysis, perhaps for investors or business students, should focus on identifying the specific financial metrics and operational costs that led to the high debt. This would involve examining:
  - **Unit Economics:** Were individual transactions profitable after accounting for all costs (product, marketing, fulfillment, customer service)?
  - **Burn Rate & Cash Flow:** How quickly was Olist depleting its cash reserves, and were there early warning signs in its financial statements?
  - **Cost Structure Analysis:** A detailed breakdown of operational expenses (e.g., marketing spend, technology infrastructure, logistics, staffing) relative to revenue generation.
- **Sustainable Growth Models:** For new e-commerce ventures, Olist's case highlights the critical importance of balancing rapid growth with financial sustainability and robust cost management from the outset.

2.2. Sales Trend by Day of the Week

Order Day	Number of Orders
Monday	1344
Tuesday	1218
Wednesday	1141
Thursday	180
Friday	135
Saturday	1393
Sunday	1406

Number of Orders per Day of the Week
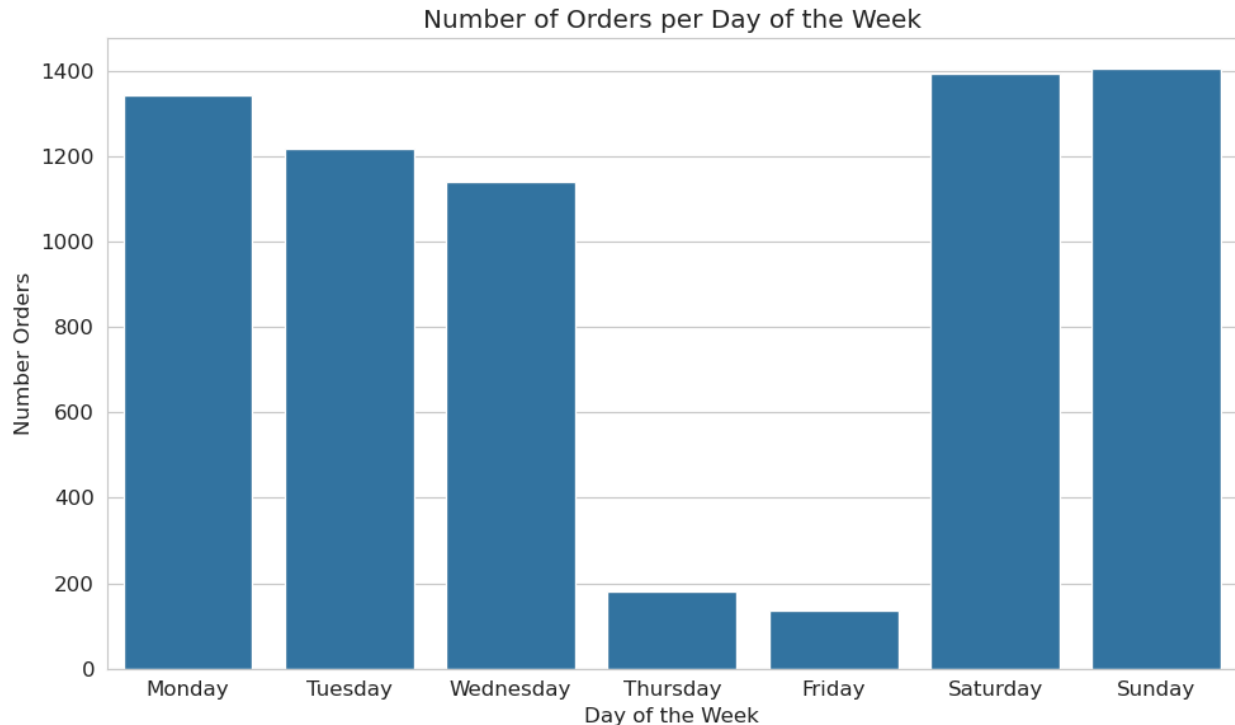
Explanation:
The sales pattern indicates high activity at the beginning of the week (Monday, Tuesday) and on weekends (Saturday, Sunday), with Sunday being the peak for orders. However, a sharp decline is observed on Thursdays and Fridays.
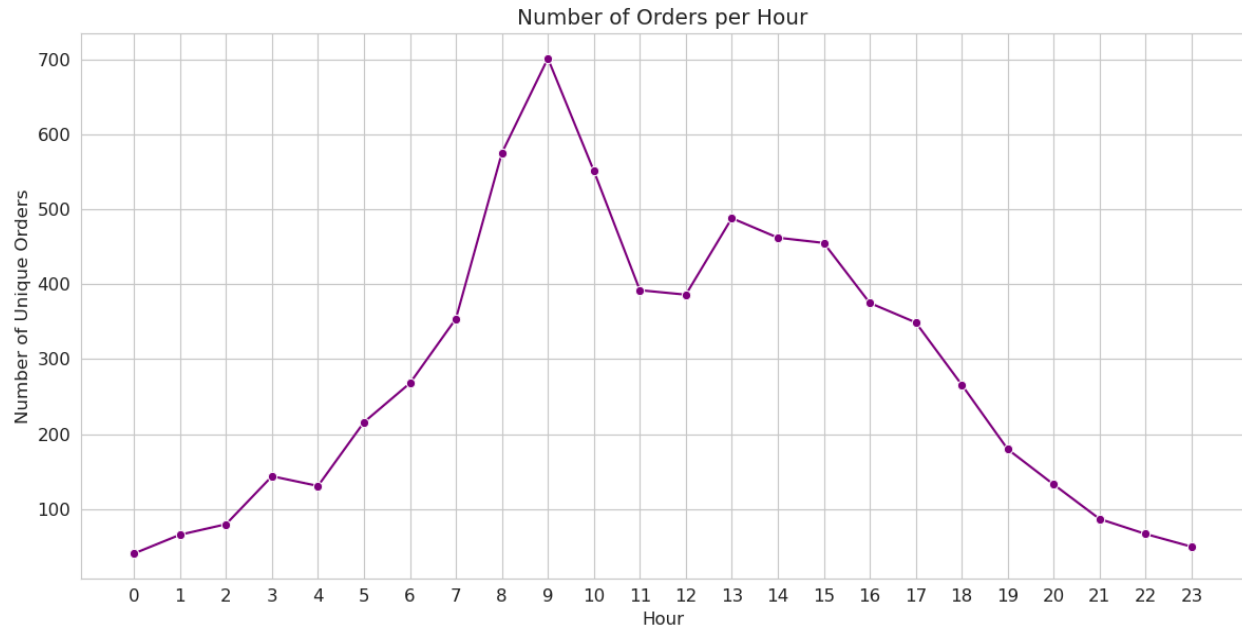
Insight:

- Olist customers tended to shop at the beginning of the week or during weekends, possibly reflecting consumer buying habits for weekly preparations or leisure time.
- The unusually low order volume on **Thursdays and Fridays** represents a significant missed opportunity in revenue generation during Olist's active operational period. If not addressed, such inefficiencies could contribute to overall operational debt.

Next Actions (Lessons Learned & Contributory Factors):

- **Revenue Leakage Analysis:** For similar e-commerce businesses, it is crucial to analyze why certain days perform poorly. This could involve examining:
  - **Marketing Spend Allocation:** Was marketing budget effectively distributed across days, or were Thursdays/Fridays neglected?
  - **Competitive Landscape:** Were competitors more aggressive with promotions on these specific weekdays?
  - **User Behavior & Demographics:** Understanding why target customers were less engaged on these days.
- **Impact on Profitability:** A consistent pattern of low sales on specific days, without corresponding cost reductions, would lead to lower overall profitability and potentially contribute to escalating operational debt.

2.3. Sales Trend by Hour of Purchase

Order Hour	Number of Orders
0	41
1	66
2	80
3	144
4	131
5	216
6	268
7	354
8	575
9	701
10	551
11	392
12	386
13	488
14	462
15	455
16	375
17	349
18	266
19	180
20	133
21	87
22	67
23	50

Number of Orders per Hour

Explanation:

Purchase volumes tended to be high during typical business hours (morning around **8-10 AM** and afternoon around **1-3 PM**). Early morning (**0-4 AM**) and late evening (**8-11 PM**) hours show relatively lower order volumes.

Insight:

- This pattern is consistent with general online shopping habits. For Olist, it implies that most of its revenue-generating activities occurred during these peak hours.

Next Actions (Operational Planning & Efficiency):

- **Resource Alignment:** For any future e-commerce venture, this historical data provides valuable insight into optimal resource allocation (e.g., customer service staffing, server capacity) to match peak demand hours, thereby potentially reducing unnecessary operational costs during off-peak times.
- **Targeted Engagement:** Understanding peak hours can inform strategy for scheduling automated marketing campaigns or live chat support to maximize engagement and conversion.

3. Order Fulfillment & Delivery Performance

3.1. Order Status Distribution

Order Status	Percentage
Delivered	**98.22**
Shipped	**0.84**
Canceled	**0.42**
Processing	**0.26**
Invoiced	**0.24**

Distribution of Order Status
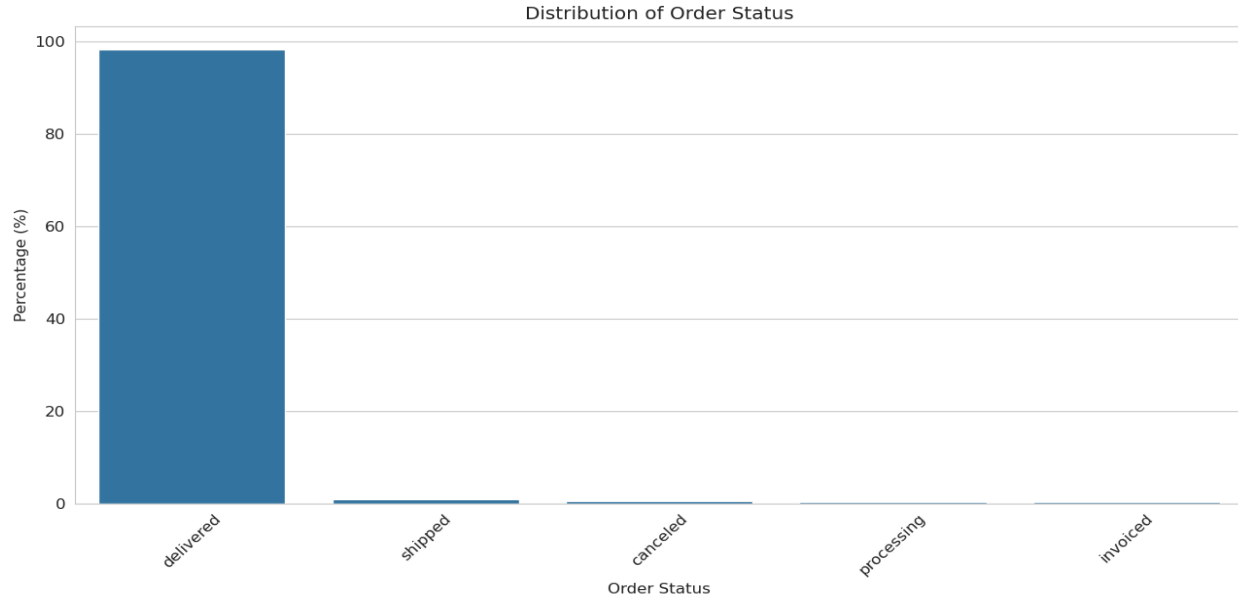
Explanation:

The vast majority of orders (**98.22%**) were successfully delivered to customers. The proportion of orders that were canceled, processing, or invoiced was very small.

Insight:

- A very high delivery success rate is a strong indicator of efficient operational execution and good customer satisfaction for Olist during its active period. This was a significant operational strength.

Next Actions (Lessons on Operational Strength):

- **Best Practice Identification:** This high delivery rate can be studied as a best practice for fulfillment processes within the e-commerce industry, demonstrating that Olist had robust mechanisms for getting products to customers.
- **Contrasting Strengths with Failure:** It highlights that operational efficiency alone (e.g., successful deliveries) is not always sufficient to ensure financial viability if core unit economics or overall cost management are not sustainable.

3.2. Descriptive Statistics for Processing & Delivery Times

	Time to Approve	Time to Carrier	Shipping Time	Total Delivery Time	Delivery vs. Estimate
Count	7475.00	7409.00	7405.00	7405.00	6966.00
Mean	-0.59	2.87	9.21	11.49	-11.50
Std	3.26	3.32	8.55	8.60	10.24
Min	-62.36	-9.34	-11.98	-11.02	-74.16
25%	-1.08	0.96	4.26	6.49	-16.41
50%	0.04	2.04	7.10	9.31	-12.11
75%	1.23	3.42	11.58	13.94	-7.00
Max	11.55	64.57	194.21	196.43	166.58

Explanation:

The average total_delivery_time (from purchase to customer receipt) was approximately **11.49** days. The negative mean value for delivery_vs_estimate (**-11.50** days) indicates that, on average, deliveries by Olist were significantly faster than the estimated time provided to customers.
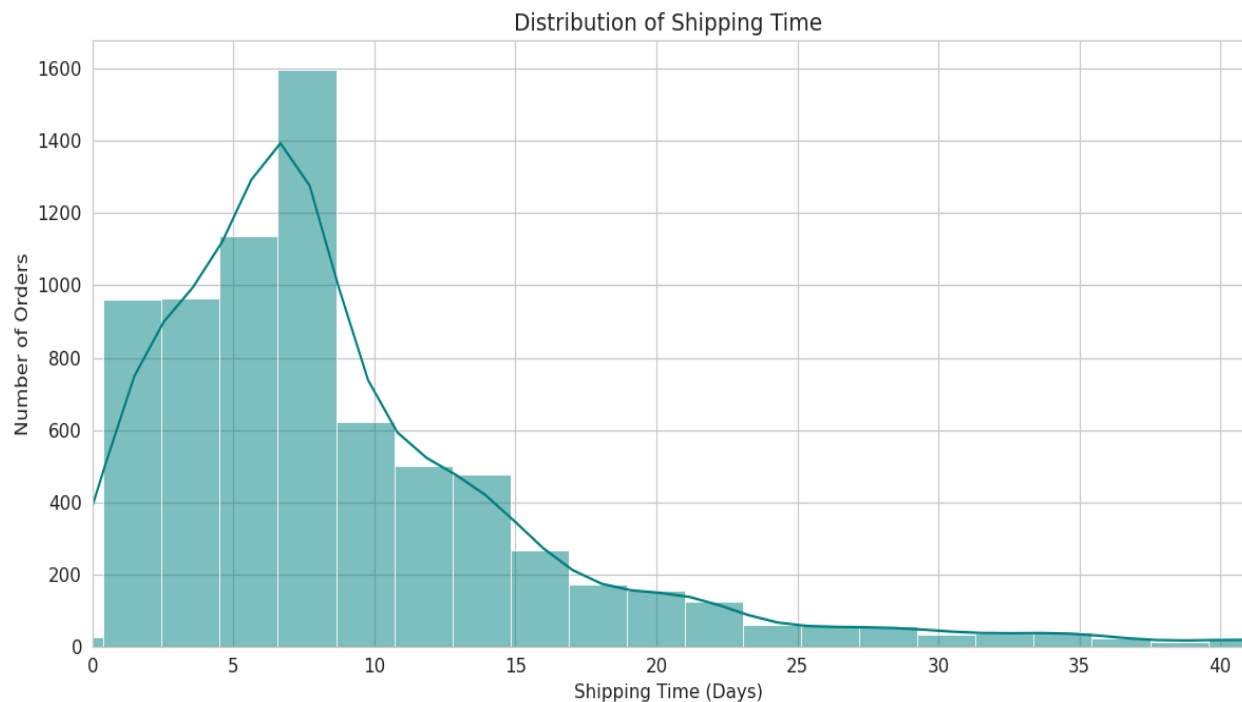
Insight:

- **Critical Data Quality Issue:** The presence of negative minimum values for time_to_approve (**-62.36** days) indicates a **severe data quality issue with timestamps**. An order cannot logically be approved before it is purchased. This type of data inaccuracy can lead to misinformed decisions and potentially mask underlying operational inefficiencies if not addressed.
- Olist's overall delivery speed was commendable, consistently outperforming the estimated delivery times.

Next Actions (Lessons on Data Integrity & Operational Performance):

- **Importance of Data Validation:** This case study underscores the critical importance of stringent data validation protocols for any business, especially for time-series data related to operations. Unreliable data can lead to skewed metrics and flawed strategic decisions.
- **Unleveraged Strength:** While Olist excelled in delivery speed, this operational strength seemingly could not overcome the financial challenges. This highlights the need for a holistic view of business health, where operational excellence must be paired with financial sustainability.

3.3. Distribution of Shipping Time (Carrier to Customer)

Distribution of Shipping Time

Explanation:

The histogram shows that the majority of shipments were completed within a relatively short period, but there was a "long tail" indicating a small number of shipments requiring a significantly longer time.
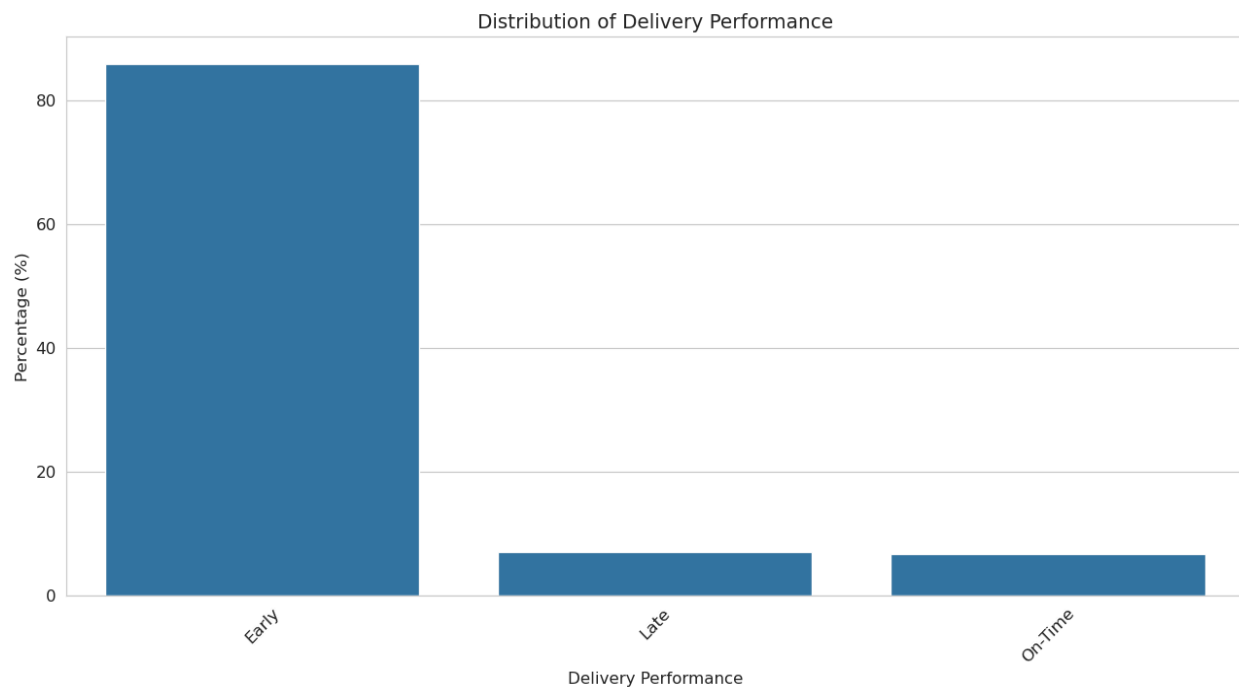
Insight:
- Most of the carrier-to-customer shipping processes were efficient, but outliers existed. In an ongoing business, these outliers would be areas for investigation to reduce average delivery times and associated costs.

Next Actions (Historical Operational Analysis):
- **Root Cause Analysis for Extreme Cases:** For a historical perspective, one could still analyze the factors contributing to these exceptionally long shipping times (e.g., specific remote locations, carrier issues, unique product types) to understand common logistical hurdles in the Brazilian e-commerce landscape. This data could be valuable for new entrants.

3.4. Delivery Performance vs. Estimate

Delivery Performance	Percentage
Early	86.02
Late	7.17
On-Time	6.80

Distribution of Delivery Performance

Explanation:

A remarkable **86.02%** of orders were delivered earlier than estimated, while only **7.17%** were late, and **6.80%** were on time.
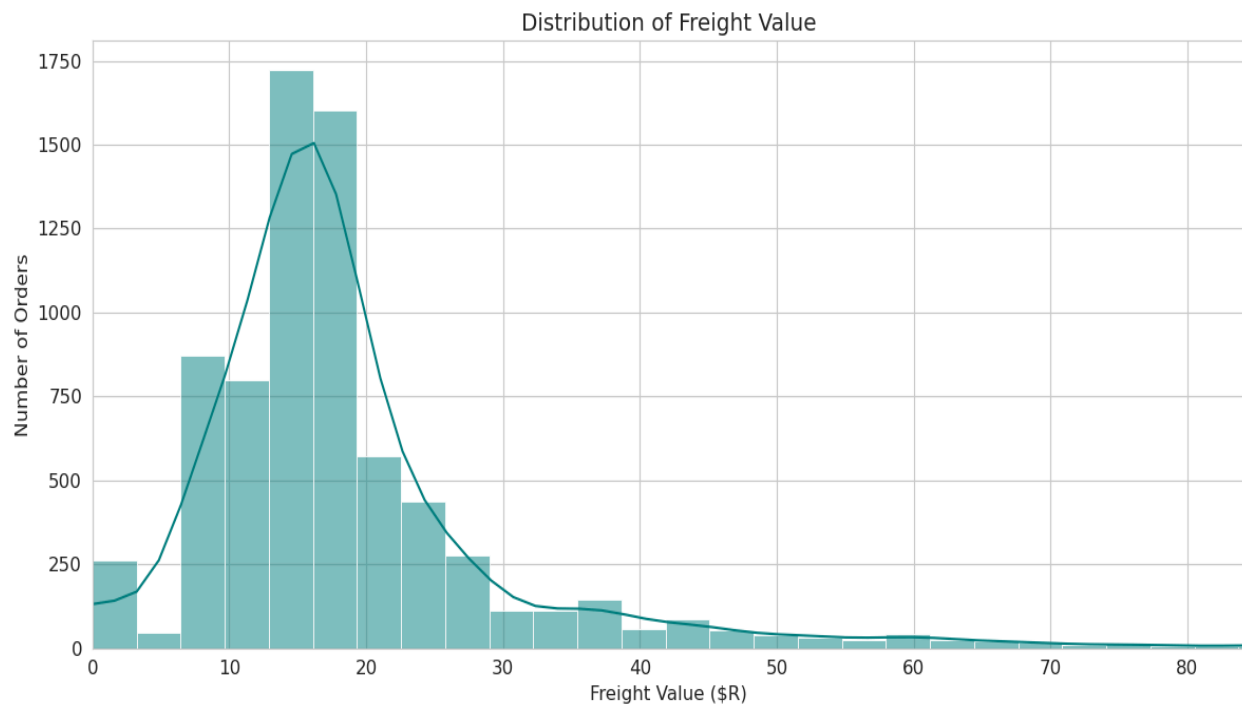
Insight:
- Olist possessed a strong competitive advantage in delivery speed, consistently delivering orders much faster than promised.
- The estimated delivery times provided to customers were likely overly conservative, which could have been adjusted to manage customer expectations or used more aggressively in marketing.

Next Actions (Strategic Implications):
- **Leveraging Operational Excellence:** For businesses operating in a competitive landscape, Olist's example demonstrates that exceeding delivery expectations can be a powerful customer satisfaction driver.
- **Financial Disconnect:** The fact that strong operational performance in delivery did not prevent bankruptcy underscores that other factors, likely financial management and overall cost control, were more decisive in the company's fate.

4. Freight Value Analysis

4.1. Distribution of Freight Value

Distribution of Freight Value

Explanation:
The distribution of freight value tended to concentrate at lower values, but with the presence of outliers indicating very high shipping costs for some orders.
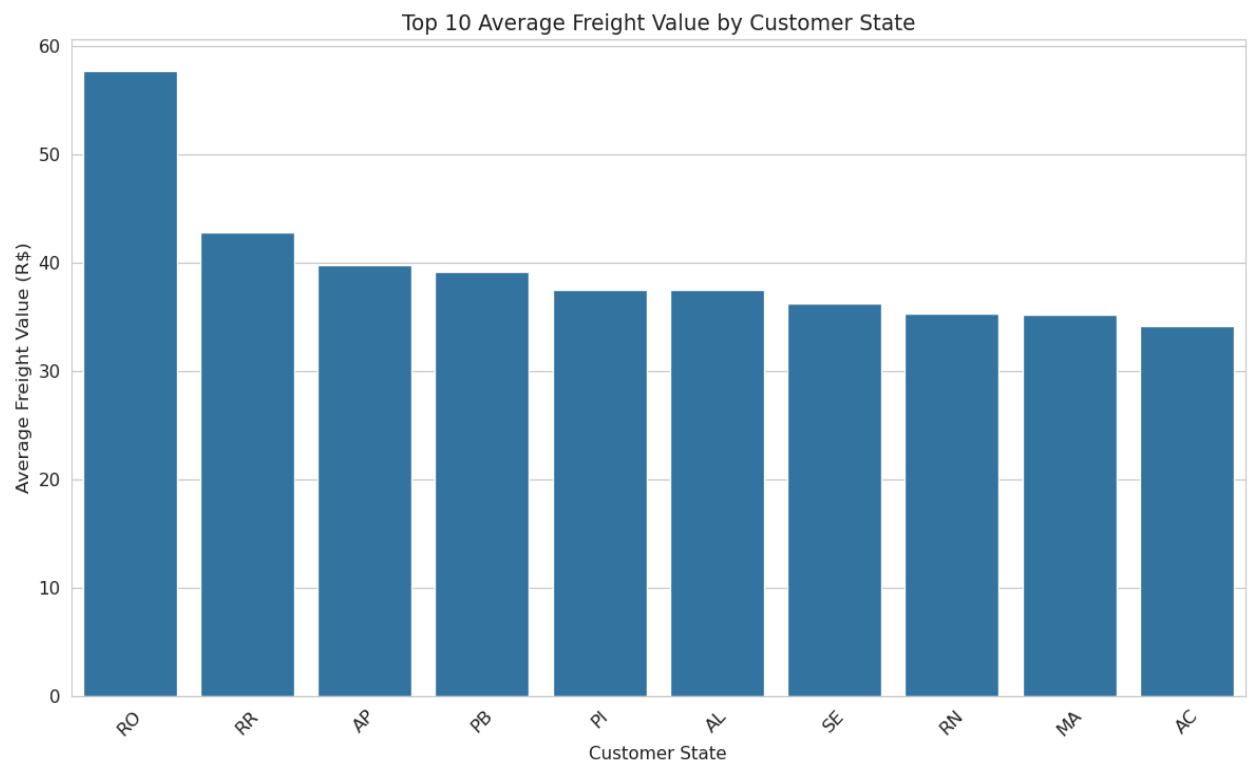
Insight:
- Most orders incurred standard shipping costs, but there were specific cases where freight charges were notably high. This pattern suggests that managing these high-cost outliers could have been crucial for overall profitability.

Next Actions (Cost Contribution to Debt):
- **High-Cost Delivery Analysis:** For a retrospective view, analyzing the characteristics of these high-cost deliveries (e.g., product type, destination, carrier) can illuminate specific areas where operational costs may have escalated, potentially contributing to the high operational debt. This is valuable for understanding cost drivers in e-commerce logistics.

4.2. Average Freight Value per Customer State (Top 10)

Customer State	Freight Value
RO	57.73
RR	42.84
AP	39.79
PB	39.22
PI	37.56
AL	37.54
SE	36.30
RN	35.37
MA	35.18
AC	34.20

Explanation:

States such as Rondônia (RO), Roraima (RR), Amapá (AP), and Paraíba (PB) showed the highest average freight costs.

Insight:

- The higher shipping costs in these states were likely due to more remote geographical locations or less efficient logistics infrastructure compared to major economic centers in Brazil. Such sustained high costs, if not effectively passed on to customers or optimized, would directly contribute to rising operational debt.

Next Actions (Financial and Logistical Lessons):
- **Regional Cost Management:** This highlights a critical lesson for any e-commerce business operating in a geographically diverse country: understanding and proactively managing regional logistics costs is vital for financial health. Strategies like localized inventory, different pricing tiers, or optimizing carrier networks for specific regions are crucial.
- **Impact on Unit Economics:** High freight costs in certain regions could have severely impacted the unit economics of orders originating from those areas, making them unprofitable and thus accelerating the accumulation of operational debt.

Summary and Key Takeaways

The analysis of Olist's sales and order data, understood in the context of its insolvency due to high operational debt, provides crucial lessons for the e-commerce industry:
- **Growth Alone Is Insufficient:** Olist achieved impressive sales growth and operational efficiency (e.g., high delivery success rate, fast delivery times). However, these strengths were ultimately insufficient to overcome deep-seated financial challenges, specifically high operational debt.
- **Financial Sustainability is Paramount:** This case underscores that robust financial management, including meticulous cost control, sustainable unit economics, and sufficient cash flow, is paramount for long-term survival, even for businesses demonstrating strong market traction and operational excellence.
- **Identified Contributors to Operational Burden:**
  - **Revenue Leakage:** Consistent low sales days (Thursdays/Fridays) represent missed revenue opportunities that, if not offset, add to operational burden.
  - **High Logistics Costs:** Elevated freight values to remote regions, if not effectively managed or priced, likely drained profitability.
- **Importance of Data Integrity:** The data quality issues (e.g., negative timestamps) serve as a reminder that accurate data is fundamental for reliable performance measurement and informed decision-making, which is crucial for preventing financial distress.

Olist's trajectory serves as a potent case study on the complex interplay between market growth, operational efficiency, and financial discipline in the highly competitive e-commerce sector.