Module: BMGT7072 - Business Intelligence

Title: "Olist's Data-Driven Transformation: Visualizing Pathways to Operational Agility and Customer Satisfaction"

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Executive Summary

The purpose of this report is to provide actionable insights and recommendations to support the strategic decision-making process of Olist, a leading Brazilian e-commerce company. Utilizing R and Excel, the author explored and visualized data rigorously.

This report explores a number of areas associated with Olist's functioning through a series of visualisations and analysis, such as:

1. Geographical Distribution of Customers and Sellers:

    Olist's customer and seller base is visually represented in several Brazilian states and cities, allowing for focused market expansion and operating initiatives.

2. Order Fulfillment and Delivery Performance:

    Analyses of delivery adherence, average delivery times, and order status distribution, offering insights into possible bottlenecks and chances for streamlining customer service and logistics procedures.

1. Preferences and behaviors related to payments:

    Visualisations of the distribution of payment types and the cumulative distribution of installment payments allow Olist to customise payment choices, enhance cash flow, and even launch special offers or payment plans.

4. Customer Satisfaction and Pricing Harmony:

    A correlation analysis between review scores and payment values, which can be used to spot possible discrepancies between consumer expectations and pricing strategies and make the required adjustments.

The visualizations and insights presented in this report aim to provide Olist with a comprehensive understanding of their operations, customer base, and performance, enabling them to make data-driven decisions and implement strategies to improve their business processes, customer satisfaction, and ultimately, their bottom line.

The report outlines key recommendations and potential benefits for Olist, such as opportunities for market expansion, better customer support and logistics, enhanced delivery performance, customised payment options, pricing strategies that align with customer expectations, and an improved overall customer experience.

Introduction

In the current highly competitive e-commerce landscape, companies have to count on data-driven insights and strategic decision-making to thrive. Utilising their extensive dataset that encompasses many aspects of their business, including product data, customer evaluations, order details, and customer information, this study aims to provide a comprehensive analysis of Olist, a well-known Brazilian e-commerce company.

This report's analysis is based on a thorough data exploration and visualisation process that makes use of potent tools and methodologies. R is a flexible programming language for statistical computation and graphics that is widely used for multiple analysis, data merging, and data cleaning. Furthermore, Excel, a popular spreadsheet tool, has been employed for a variety of data processing tasks, enhancing R's analytical powers.

This report uses these tools to their full potential in an effort to find insightful information that will help Olist make strategic decisions and expand their business. The purpose of the studies and visualisations provided here is to give readers a thorough insight of Olist's consumers, order fulfilment procedures, shipping capabilities, modes of payment, and customer satisfaction ratings.

Company Overview:

Olist is a corporation that links buyers and sellers to the top Brazilian markets via an online shopping portal. By combining numerous features into a single platform, including inventory management, pricing, payments, customer support, and more, it provides traders with extensive operational support. As a result, the company gives the various businesses access to a highly diversified consumer base while streamlining their supply chains (McCarthy, 2022).

Olist is rising to prominence in Brazil and has a solid reputation for providing clients with top-notch services. It is a Brazilian technological company with its headquarters in Parana. Since 2015, it has been in operation as Software as a Service (SaaS), with a focus on offering small and medium-sized enterprises e-commerce solutions (Kaggle, 2021).

With Amazon and Alibaba combined accounting for just 2% of Brazilian e-commerce, Olist seized the chance to establish itself as the country's leader in e-commerce. There are approximately 300 million digital users in Latin America, and by 2025, that number could increase by 20%. Furthermore, by 2025, it is anticipated that online retail sales in that sector will total 160 billion (McCarthy, 2022). These figures demonstrate how Olist must continue to grow and acquire a competitive edge.

Methodology

Business analytics is the process of characterising and examining past data to identify trends, weaknesses, and patterns inside an organisation. This strategy was employed by the author to assist Olist in becoming more effective. Relational data on Olist's (orders, customer reviews, payments, and sellers) from 2017 to 2018 is referenced in this report. Every reader needs to keep in mind that several things might happen in two years. As a result, the solutions put forward in this work correspond with the year 2018. and in the following years, olist can enhance their drawbacks.

Utilising the capabilities of R and Excel, a robust methodology was used to perform an extensive study of Olist's operations and offer actionable insights. Prior to doing exploratory data analysis and visualisation, the analytical process started with data preparation and cleaning.

Among the nine datasets provided by the university, five datasets were utilized for this analysis: 'Olist Orders', 'Olist Order Reviews', 'Olist Customer Information', 'Olist Payments', and 'Olist Sellers'. These datasets were carefully selected to gain insights into various aspects of Olist's operations, including order details, customer information, payment preferences, and seller performance.

During the data cleaning phase, R played a crucial role in handling missing values, removing duplicates, and ensuring consistency across the selected datasets. By leveraging the **'dplyr'** package in R, we could efficiently manipulate and modify data, making it easy to merge relevant datasets. Additionally, Excel's powerful tools like the **'Power Query Editor'** were utilized for seamless data merging and transformation, contributing to maintaining data integrity and consistency throughout the analysis process.

Exploratory data analysis was conducted using R's powerful visualization capabilities, primarily through the 'ggplot2' and 'scales' package. This allowed for the creation of insightful visualizations, including bar charts, scatter plots, and line charts, to uncover patterns and trends within the data. These visualizations provided a comprehensive understanding of Olist's **customer base distribution, order fulfillment processes, delivery performance, payment preferences, and customer satisfaction levels.**

In order to help Olist make data-driven decisions and put plans into place to enhance their business procedures, customer pleasure, and eventually their bottom line, the primary goal of this research was to give them a thorough examination of their operations. Olist can optimise their operations in a number of ways, including market expansion, customised payment alternatives, logistical optimisation, and pricing strategy alignment with customer expectations. These can all be achieved by utilising the insights gathered from the visualisations and analyses.

In the course of the analysis, attention was given to data quality, handling missing or inconsistent data, and ensuring that visualizations accurately represented the underlying data. As a result of this meticulous approach, Olist was able to gain a comprehensive understanding of their operations and enable data-driven decisions.

Exploration and Progression through Visualizations: Utilizing R and Excel-

1.Distribution of Customers and Sellers by State:
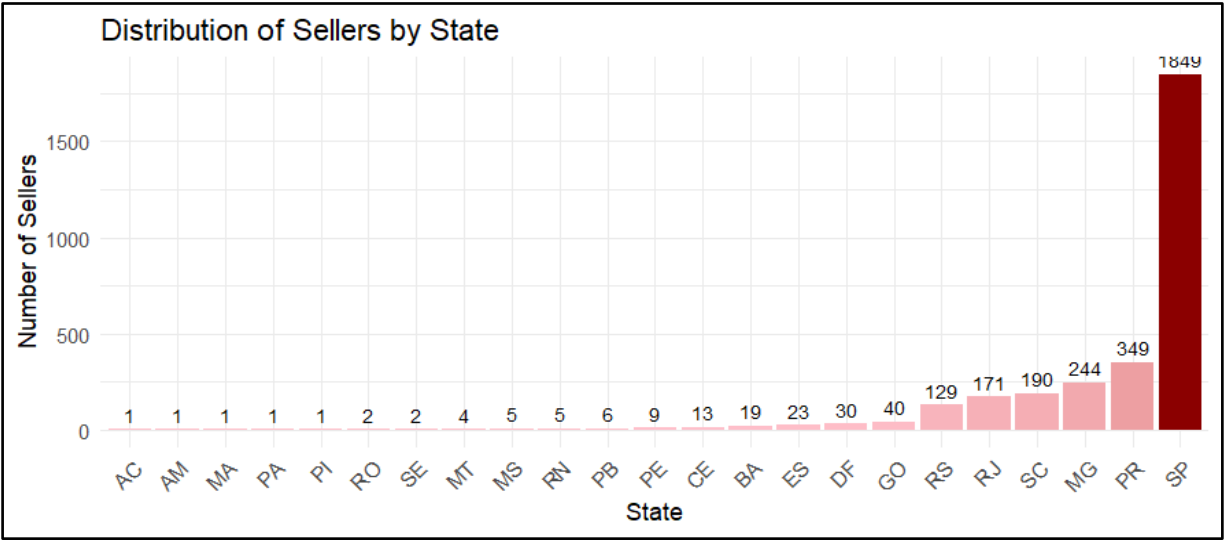
[Fig.1 'Distribution of sellers by state',(Author,2024)]
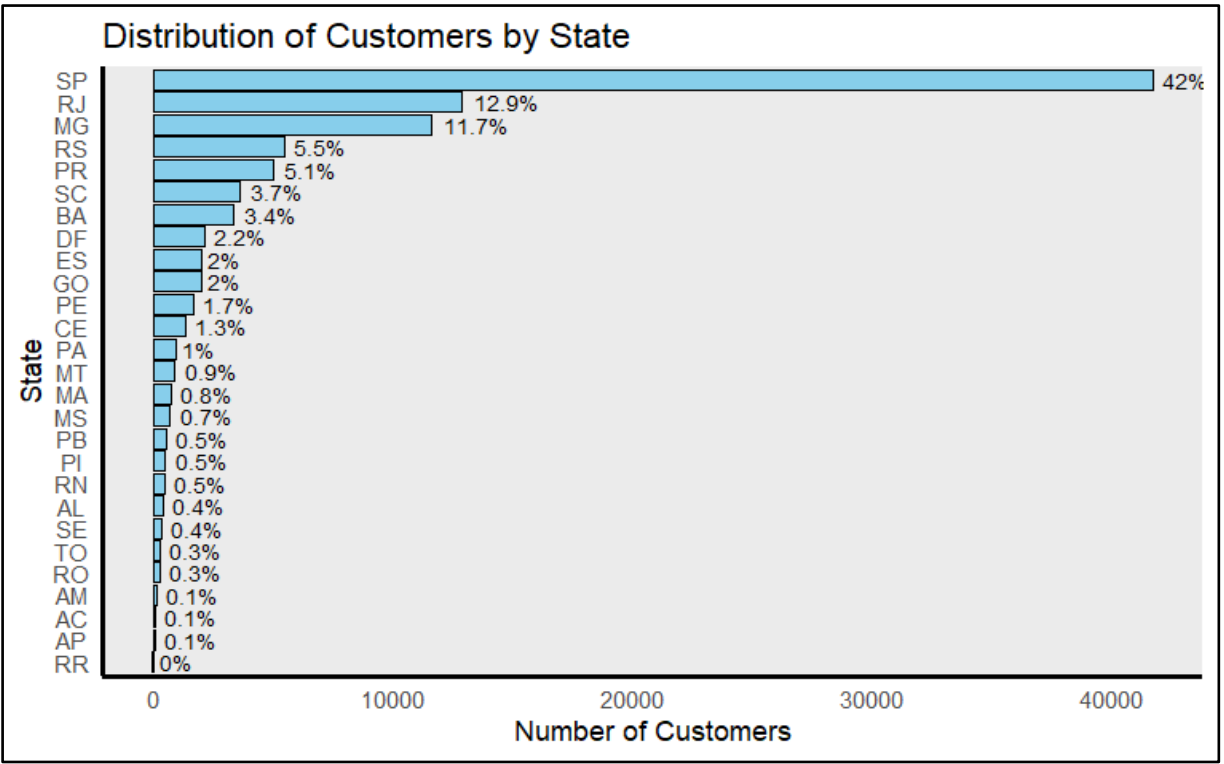
[Fig.2 'Distribution of customers by state',(Author,2024)]

Insights from Figure 1 and 2:

'São Paulo' emerges as the state with the highest number of sellers (1849) and the highest percentage of customers (42%), indicating a strong market presence and potential for growth. Conversely, other states such as 'Paraná', 'Minas Gerais', and 'Rio de Janeiro' demonstrate notable seller and customer concentrations, suggesting robust market demand and business opportunities. States with very small numbers of suppliers and customers include "Acre," "Amazonas," and "Sergipe."

Challenges:

1. Logistical Challenges: There may be operational bottlenecks, increased transportation costs, and longer delivery times as a result of a concentration of buyers and sellers in a certain area. Olist can therefore find it difficult to satisfy client expectations and maintain consistent service levels throughout all locations.

2. Market Reach: The uneven distribution of sellers and customers limits Olist's market penetration and makes it more difficult for it to enter growing markets and specialised sectors. Olist's growth potential is impeded by this limitation, which also makes it harder for the company to take advantage of changing consumer tastes and industry trends.

3. Revenue Disparities: Revenue inequalities may arise from the unequal distribution of sellers and customers, with locations with higher concentrations of sellers or customers contributing disproportionately to Olist's overall revenue. Long-term financial planning and resource allocation are made more difficult by this imbalance, which jeopardises financial predictability and revenue stability.

Strategic Initiatives to be taken by olist company:

1. Targeted Expansion Strategies: Olist can implement targeted expansion strategies to penetrate underserved regions and cultivate a more balanced seller and customer base. By identifying regions with untapped market potential and deploying resources strategically, Olist can broaden its market reach and establish a more geographically diversified presence.

2. Data-Driven Insights: Olist may obtain deeper insights into regional market dynamics, consumer behaviour patterns, and competitive landscapes by utilising

modern data analytics and market intelligence. Equipped with this data, Olist can customise its product offers, marketing plans, and operational endeavours to conform to regional tastes and market requirements.

3. Collaborative Partnerships: In underserved regions, Olist can foster partnerships with sellers, customers, and local stakeholders to drive community engagement, foster brand loyalty, and stimulate organic growth. By engaging with local businesses, influencers, and community organizations, Olist can amplify its presence, build trust, and establish itself as a valued partner within diverse communities.

2.Top 10 Cities with Highest Seller Concentration:
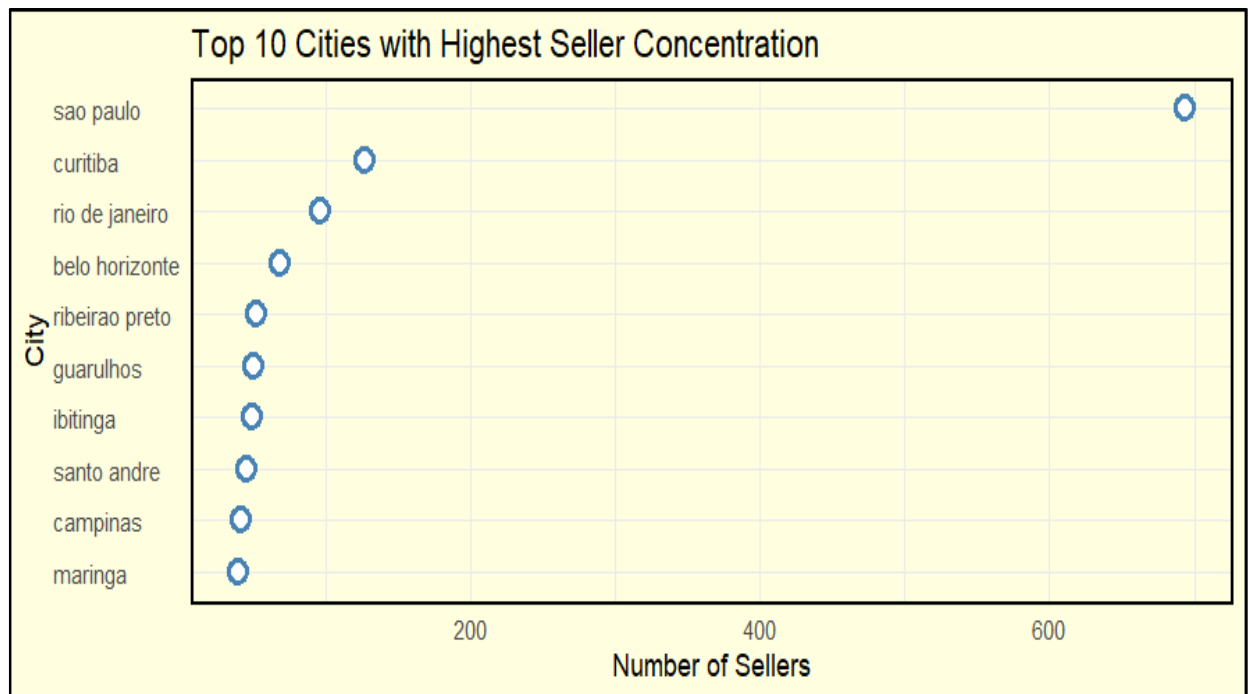
[Fig.3 'Top 10 Cities with highest sellers',(Author,2024)]

Insights from figure 3:

The issue stems from the uneven dispersion of sellers among different cities, which causes differences in the market presence and client reach. While 'São Paulo' leads with a high concentration of sellers, other cities with much lower seller presence include 'Curitiba', 'Rio de Janeiro', 'Belo Horizonte', and 'Ribeirão Preto'. Customers in areas where there are fewer sellers may have limited access to products as a result of this imbalance, which could negatively affect Olist's capacity to generate income as well as consumer happiness.

Challenges:

1. <u>Market Imbalance</u>: The disproportionate concentration of sellers in São Paulo compared to other cities creates an uneven playing field, limiting market access for both sellers and customers in underrepresented areas.

2. <u>Customer reach:</u> Longer delivery times and a smaller selection of products may be experienced by cities with fewer merchants, which could lower customer happiness and loyalty.

3. <u>Competitive Advantage:</u> If Olist's sellers are primarily concentrated in a single region, it may find it difficult to maintain a competitive edge and risk losing market share to rivals with more diverse networks of sellers.

Strategic Initiatives to be taken by olist company:

1. <u>Seller Outreach Programs</u>: To encourage sellers from underrepresented cities to participate, launch focused campaigns and provide incentives like lowered commission rates or marketing assistance.

2. <u>Regional Partnerships:</u> Forge partnerships with local businesses and organizations in cities with low seller concentration to facilitate seller onboarding and provide logistical support for product delivery.

3. <u>Marketing Campaigns:</u> Deploy region-specific marketing campaigns to raise awareness among sellers about the benefits of joining Olist and expand the platform's reach to untapped markets.

4. <u>Seller Training and Support</u>: Provide sellers in marginalised cities with resources and training programmes so they may acquire the skills and know-how necessary to thrive on the platform.

5. <u>Incentivized Expansion</u>: Incentivize sellers to expand their operations to new cities by offering financial incentives or logistical support for establishing presence in target markets.

3.Distribution of olist orders statuses:
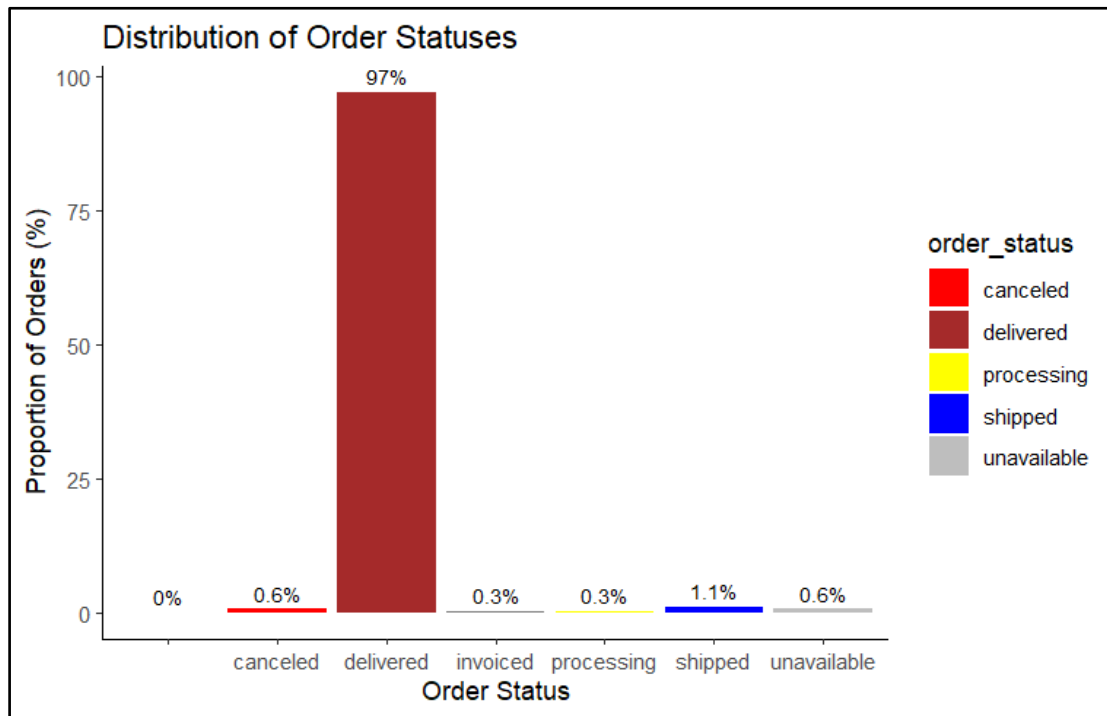
[Fig.4 'Distribution of order statuses',(Author,2024)]

Insights from figure 4:

Order status distribution provides information about how well Olist, a Brazilian e-commerce company, processes orders and fulfils orders. Olist can spot any issues and chances for enhancement in its order management system by examining the percentages of various order statuses, including "cancelled," "delivered," "processing," "shipped," and "unavailable." In order to guide strategic actions to improve operational efficiency and customer happiness, this research seeks to identify patterns, trends, and areas of concern within the order processing workflow.

Challenges:

1. Comparative Analysis of Cancelled and Unavailable Orders: The slightly higher percentage of cancelled orders compared to unavailable orders may indicate challenges in managing order cancellations effectively or issues with product availability.

2. Unavailable Orders (0.3%): Another challenge is the presence of unavailable orders, representing 0.3% of total orders. These orders may result from inventory issues, product unavailability, or technical glitches.

3. Low Percentage of Other Order Statuses: The low percentages of orders labelled as "cancelled," "processing," "shipped," and "unavailable" raise questions about the effectiveness of order processing, possible shipment delays, and problems with inventory management.

Strategic Initiatives to be taken by olist company:

1. Order Tracking and Confirmation Systems: To ensure precise and prompt updates on order status, enhance order tracking and confirmation systems. This will increase customer satisfaction and transparency.

2. Streamlined Order Processing: Order processing, shipping, and inventory management should all be done with streamlined procedures to cut down on mistakes and delays and lower the chance of orders being reported as "cancelled" or "unavailable".

3. Customer Communication: Enhance communication channels with customers to provide timely updates on order status changes, address any concerns or issues promptly, and maintain customer trust and satisfaction.

Olist can boost customer experience, optimise order processing efficiency, and improve order status management by putting these solutions into practice. This would therefore help the e-commerce platform's overall operational performance, order completion rates, and customer satisfaction levels.

4.Delivery Adherence :
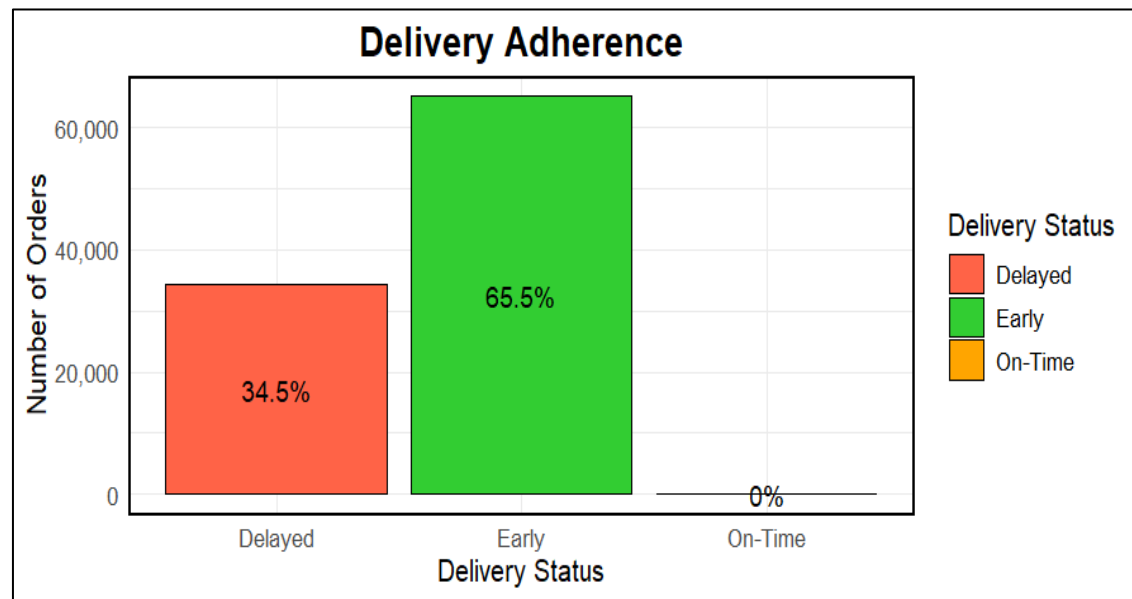
[Fig.5 'Delivery Adherence of Olist', (Author,2024)]

Insights from figure 5:

The delivery adherence of orders is shown by the bar graph according to their status: delayed, early, and on-time. The number of orders is shown on the y-axis, while the delivery status categories are indicated on the x-axis. The examination provides information on how quickly orders are delivered.

Challenges:

1. High Rate of Early Deliveries (65.5%): The predominant challenge identified is the disproportionately high percentage of orders delivered early, accounting for 65.5% of total orders. While early deliveries may seem favorable, an excessively high rate could indicate issues such as inaccurate delivery estimates or inefficient logistics management.

2. Significant Delayed Orders (34.5%): An further obstacle is the significant percentage of orders that are delayed, which accounts for 34.5% of all orders. Customers' displeasure can negatively affect a brand's reputation and loyalty when deliveries are delayed. Addressing this issue will require determining the underlying reasons of delays.

3. <u>Lack of On-Time Deliveries:</u> The lack of deliveries on schedule is a significant issue, as evidenced by the fact that 0% of orders arrive by the scheduled time. This raises the possibility of differences between projected and actual delivery times, underscoring the need for better planning and execution of deliveries.

Strategic Initiatives to be taken by olist company:

<u>Optimize Delivery Scheduling:</u> Delivery scheduling algorithms can be improved with Olist to give more precise forecasts and reduce the likelihood of early and delayed deliveries. To more accurately predict delivery timeframes, this may entail utilising predictive analytics and historical data.

<u>Strengthen Logistics Infrastructure</u>: Investing in transportation networks and logistics infrastructure can help optimise delivery procedures, lowering the possibility of delays and raising overall delivery effectiveness. Better shipment management and monitoring are made possible by the implementation of real-time tracking technologies.

<u>Enhance Communication and Transparency:</u> Enhancing channels of communication with clients about updates on delivery status and any delays promotes openness and confidence. Customers are empowered to make plans ahead of time and reduce frustration due to delays when they receive proactive communications regarding order progress and projected delivery times.

5. Payment Type Distribution and Cumulative Distribution of Payment Installments:
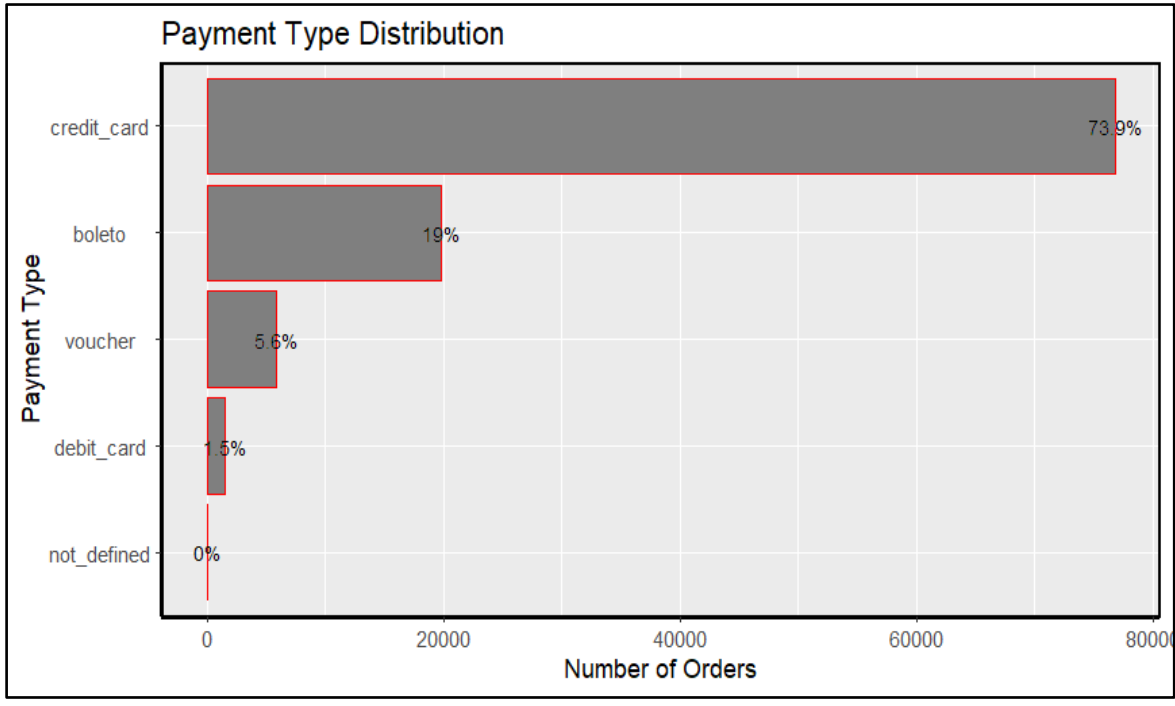
[Fig.6 'Payment type distribution of Olist', (Author,2024)]
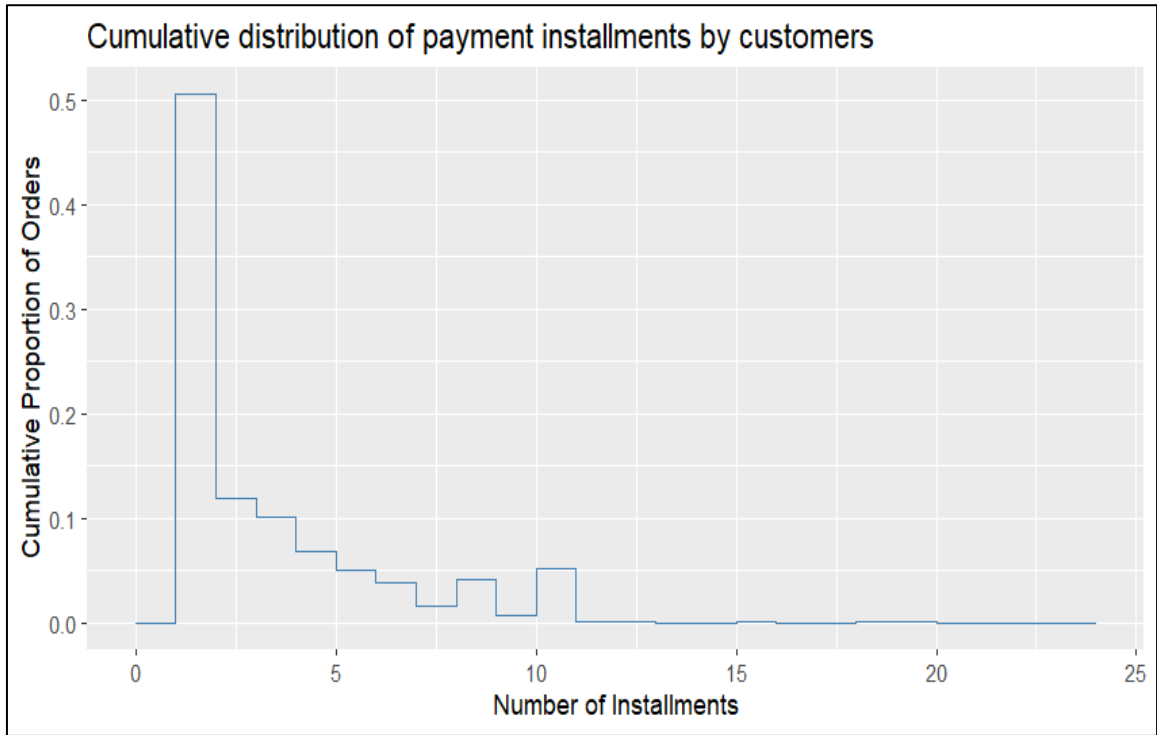
[Fig.7 'distribution of Payment installments', (Author,2024)]

<u>Insights from figure 6 and 7:</u>

Figures 1 and 2 depict key insights into payment trends and installment preferences among customers of Olist, a Brazilian e-commerce company.

<u>Figure 1: Distribution of Payment Types by Number of Orders:</u>

With the number of orders on the x-axis and payment kinds such credit card, debit card, voucher,boleto and not defined on the y-axis, the bar graph shows the distribution of payment methods used by Olist customers. Among the noteworthy discoveries are:

1. <u>Credit Card Dominance:</u> 73.9% of orders are paid with credit cards, making them the most often used payment option. This demonstrates how common credit cards are among Olist users and how popular they are for making online purchases.

2. <u>Boleto Bancário Preference:</u> Boleto bancário, a widely used substitute mode of payment in Brazil, represents 19% of orders. This suggests that clients who prefer offline payment methods or do not have access to credit cards have a preference for boleto bancário.

3. <u>Vouchers and Debit Cards Usage</u>: Vouchers represent 5.6% of orders, indicating a moderate usage of promotional vouchers or discount codes. Debit cards, accounting for only 1.5% of orders, suggest a relatively lower preference for direct debit transactions compared to credit cards.

<u>Figure 2: Cumulative Distribution of Payment Installments by Customers:</u>

The x-axis shows the number of installments, while the y-axis shows the cumulative proportion of orders. The line graph depicts the cumulative distribution of payment installments selected by Olist customers. Important findings consist of:

1. <u>Prevalence of Upfront Payments (0 Installments):</u> About 60% of items are paid for in full up front; no payment plan is chosen. Customers clearly prefer rapid payment, and this may be due to discounts or other promotions that encourage upfront payments.

<u>Relationship Between 'Payment Types' and 'Installment Preferences':</u>

The distribution of payment types in Figure 1 may influence the installment preferences observed in Figure 2. For instance, customers opting for credit card payments may be more inclined to choose upfront payments or shorter installment plans due to the convenience and flexibility offered by credit cards. Conversely, customers using boleto bancário, which typically requires immediate full payment, may be less likely to opt for installment plans.

Understanding the interplay between payment types and installment preferences is crucial for Olist to tailor its payment offerings, optimize customer experiences, and drive sales growth. Strategies such as offering diverse payment options, incentivizing specific payment methods, and providing flexible installment plans can enhance customer satisfaction and increase transaction volume on the platform.

Challenges:

1. <u>Limited Payment Options</u>: Olist may face a challenge in catering to diverse customer preferences due to a limited range of payment options. While credit cards are widely accepted, customers who prefer alternative payment methods such as direct debit or digital wallets may feel underserved.

2. <u>Low Adoption of Installment Plans</u>: Even with possibilities for installment payments, a sizable percentage of clients still favour upfront payment. This suggests that there may be a mismatch between what customers expect from the available payment alternatives and the actual usage of installment plans.

3. <u>Potential Revenue Loss</u>: The dominance of upfront payments and the relatively low usage of installment plans may result in missed revenue opportunities for Olist. Customers who prefer installment payments may choose alternative platforms that offer more flexible payment terms, leading to potential revenue leakage.

Strategic Initiatives to be taken by olist company:

1. <u>Diversify Payment Options:</u> To accommodate a wider range of client preferences, Olist ought to consider broadening the scope of its payment options. Consumer convenience and accessibility can be improved by offering more payment options such digital wallets, bank transfers, or installment payment gateways.

2. <u>Promote Installment Benefits:</u> To encourage adoption of installment plans, Olist should educate customers about the benefits of spreading payments over time. Highlighting features such as zero-interest installment options, flexible repayment terms, and budget-friendly payment schedules can incentivize customers to choose installment plans.

3. <u>Optimize Checkout Experience:</u> Improving customer happiness and promoting conversion can be achieved by optimising the checkout procedure and incorporating smooth payment choices. Adding tools like autofill payment information, one-click checkout, and support for mobile payments helps streamline and expedite the payment process.

4. <u>Personalized Payment Recommendations</u>: Olist can provide customised payment recommendations based on user preferences by utilising client data and past purchases. Olist may provide the best payment options and installment plans for each customer based on their past payment history, demographics, and product preferences, improving user satisfaction and encouraging recurring business.

6.Correlation between Review Score and Payment Value:
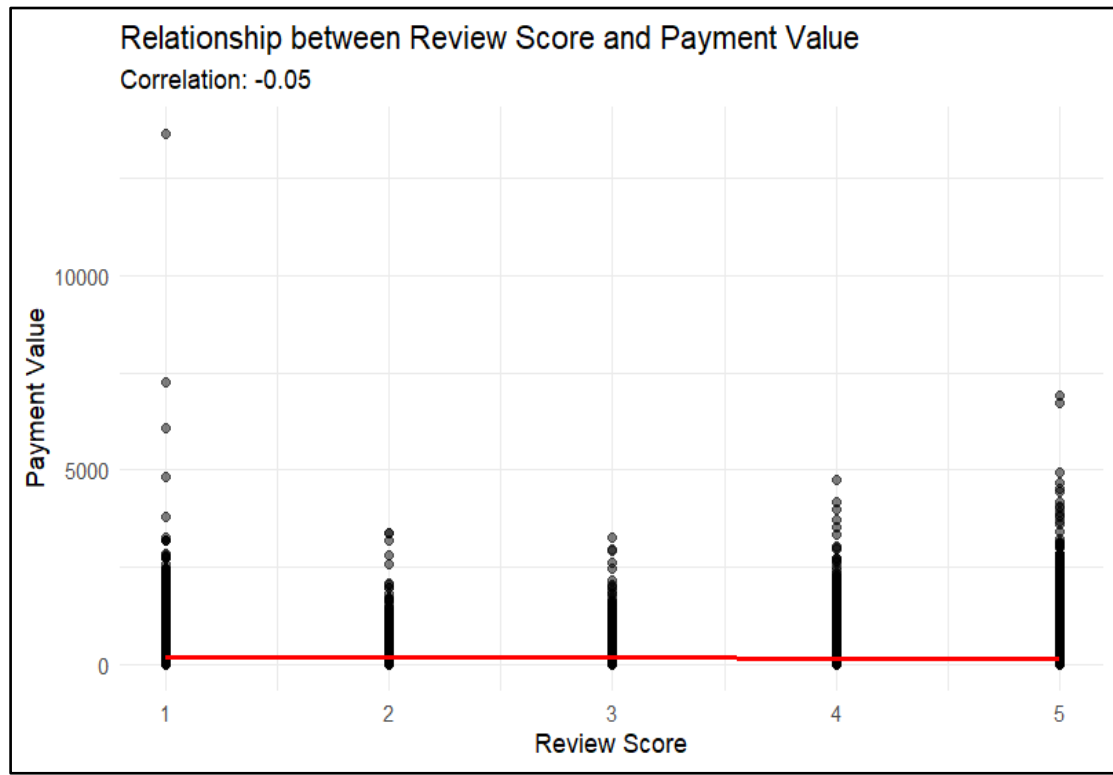
[Fig.8 'Relationship between review score and payment value', (Author,2024)]

Insights from Figure 8:

The review score and payment value have a very weak negative link, as seen by their correlation value of '-0.05'.

 Drawing on this visualisation, Olist could benefit from the following observations and suggestions:

1. Order value and customer satisfaction are not highly correlated: The near-zero correlation suggests that the amount customers paid for their orders has little bearing on how highly they rate reviews. This could imply that elements other than cost—like product calibre, delivery time, or customer support—have a bigger impact on consumer happiness. Assessment of pricing strategy: Olist should look into if their pricing tactics across various product categories or client segments are suitably linked with the perceived value and customer expectations, even though a weak correlation doesn't always indicate causality.

2. Customer segmentation: The weak correlation suggests that customers may have different priorities and value perceptions. Olist could consider segmenting their customer base based on factors like purchase behavior, demographics, or preferences, and tailor their strategies accordingly.

3. Continuous monitoring: While the current correlation is weak, Olist should continue monitoring this relationship over time, as customer preferences and market dynamics may change, potentially affecting the correlation between review scores and payment values.

Conclusion:

In conclusion, this report offers comprehensive insights into Olist's operations and performance through extensive data analysis and visualization techniques. By harnessing data from diverse sources and employing advanced analytical methods with R and Excel, we've gained a holistic view of Olist's customer demographics, order fulfillment processes, payment preferences, and customer satisfaction levels.

The visualizations presented here have uncovered crucial trends, challenges, and improvement opportunities within Olist's business framework. From mapping the geographical distribution of customers and sellers to analyzing payment type distributions and order statuses, each visualization provides actionable insights to guide strategic decision-making and enhance operational efficiency.

By leveraging these insights, Olist can refine its market strategies, optimize logistics operations, and tailor its offerings to better meet customer needs. Moreover, the data-driven approach outlined in this report empowers Olist to adapt to changing market dynamics, anticipate customer demands, and maintain a competitive edge in the e-commerce landscape.

In essence, the visualizations presented in this report serve as a roadmap for Olist's future growth and success, enabling the company to navigate challenges effectively and capitalize on emerging opportunities in the ever-evolving e-commerce ecosystem. Through continuous analysis and refinement of its operations, Olist can drive sustainable growth, foster customer loyalty, and solidify its position as a leader in the Brazilian e-commerce industry.

Recommendations:

Several suggestions can be offered to Olist to improve its operations and customer satisfaction based on the insights gained from the visualisations:

1. <u>Market Expansion Strategies</u>: Olist should consider targeted expansion strategies to penetrate underserved regions and cultivate a more balanced seller and customer base. This can be achieved through partnerships with local businesses, targeted marketing campaigns, and investment in logistics infrastructure.

2. <u>Pricing Strategy Alignment</u>: Olist should evaluate its pricing strategy to ensure it aligns with customer expectations and market trends. By conducting pricing analysis and customer segmentation, Olist can tailor its pricing strategies to different customer segments and product categories.

3. <u>Diversification of Payment Options:</u> Beyond credit cards and boleto bancário, Olist could expand its payment choices to better accommodate a wider range of client preferences. Providing bank transfers, installment payment plans, and digital wallets can boost transaction volume and enhance consumer satisfaction.

4. <u>Optimization of Order Fulfillment Processes:</u> In order to minimise delays and enhance delivery compliance, Olist ought to optimise its processes for order processing, shipping, and inventory management. This could entail investing in logistics technology, improving consumer communication channels, and putting in place better tracking and confirmation systems.

5. <u>Utilization of Business Intelligence Tools:</u> Utilizing advanced Business Intelligence (BI) tools such as Tableau, Power BI, Google Analytics, and Salesforce Analytics Cloud, Olist can gain actionable insights and make data-driven decisions. These tools offer robust analytics capabilities, enabling Olist to visualize data, track key performance indicators, and optimize operations. With features like interactive dashboards and real-time reporting, Olist can enhance customer engagement, improve marketing effectiveness, and drive revenue growth. By harnessing the power of BI tools, Olist can stay ahead of the competition, streamline processes, and achieve sustainable success in the dynamic e-commerce market.

Reference list

1. Com mais R$ 1 bilhão na conta, Olist é novo unicórnio brasileiro | Exame (no date) exame.com. Available at: https://exame.com/pme/olist-novo-unicornio-brasileiro-investimento-1-bilhao/ (Accessed: 8 May 2024).

2. Kaggle (2021) Brazilian E-Commerce Public Dataset by Olist, www.kaggle.com. Available at: https://www.kaggle.com/datasets/olistbr/brazilian-ecommerce.

3. McCarthy, M. (2021) Olist Becomes Brazil's Newest Unicorn, Raises $186M, Bloomberg Línea. Available at: https://www.bloomberglinea.com/english/olist-becomes-brazils-newest-unicorn-raises-186m/.

4. Niwate, T. (2021) ScholarWorks Theses, Projects Office of Graduate Studies 8-2021 IMPACT ON REVENUE GENERATION OF OLIST ECOMMERCE IMPACT ON REVENUE GENERATION OF OLIST ECOMMERCE COMPANY ON THE BASIS OF VARIOUS PRODUCT PARAMETERS COMPANY ON THE BASIS OF VARIOUS PRODUCT PARAMETERS. Available at: https://scholarworks.lib.csusb.edu/cgi/viewcontent.cgi?article=2464&context=etd.

Appendices:

ABBREVIATION

ABBREVIATION	STATE NAME
SP	SAO PAULO
AC	ACRE
AL	ALAGOAS
AM	AMAZONAS
AP	AMAPÁ
BA	BAHIA
CE	CEARÁ
DF	DISTRITO FEDERAL
ES	ESPÍRITO SANTO
GO	GOIÁS
MA	MARANHÃO
MT	MATOGROSSO
MS	MATOGROSSO DO SUL
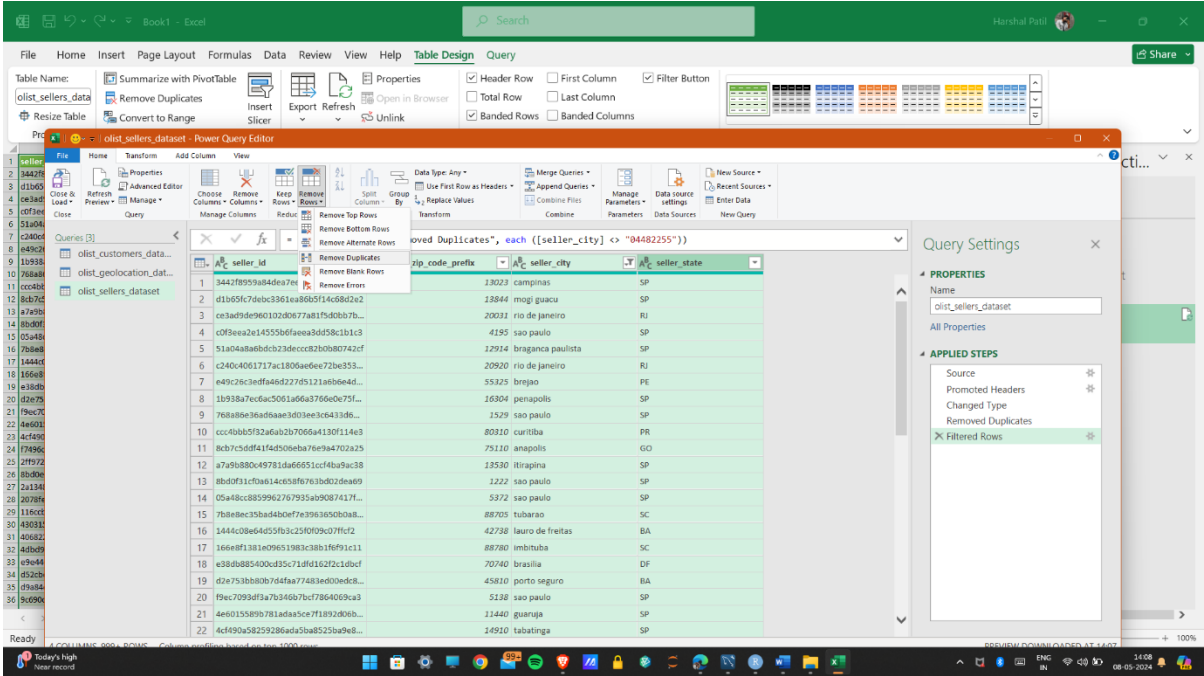
[Data cleaning using Power Query Editor]

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STUDENT DECLARATION FORM - Use of AI tools in Assessment

Your response has been recorded.

Submit another response

This form was created inside Google@Brookes. Report Abuse

Google Forms

[Declaration of AI form]