Project by

Md Rafi Islam

Contact

Email: rakars23@gmail.com

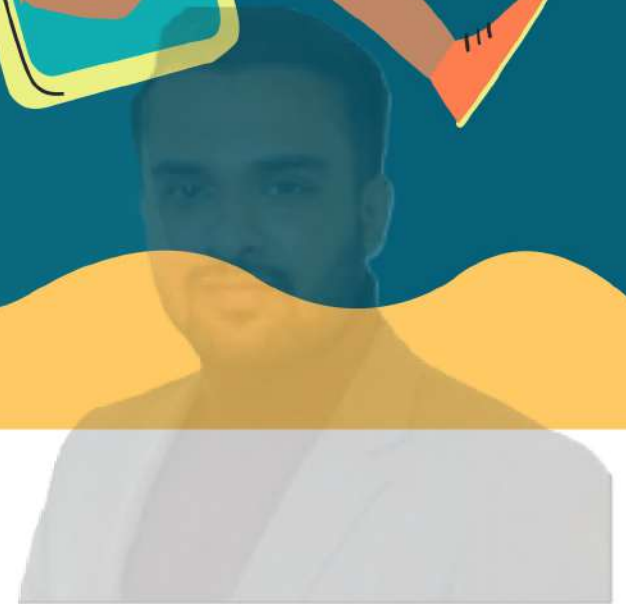Github
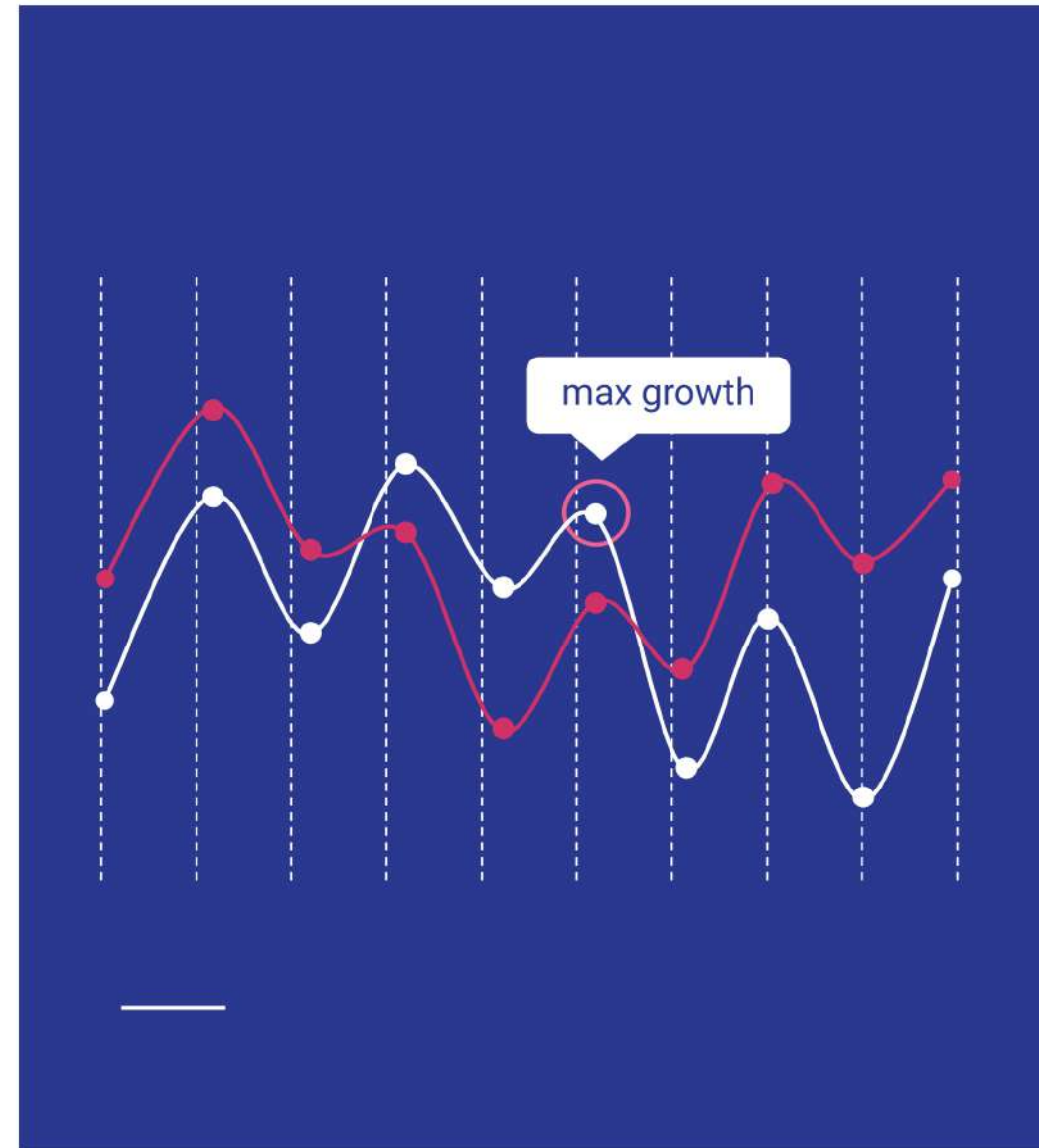
ABOUT MERCADO LIVRE

MercadoLibre, Inc in Spanish, and known as Mercado Livre in Portuguese.

Mercado Livre is an Argentine company headquartered in Montevideo, Uruguay and incorporated in Delaware in the United States that operates online marketplaces dedicated to e-commerce and online auctions.

Mercado Libre also runs a real estate and motors division under the name "*Mercado Libre Classificados*". Realtors pay a monthly fee to list properties and automobiles on the Mercado Libre platform.

PROBLEM STATEMENT

Mercado Livre, a leading Brazilian e-commerce platform, aims to optimize its marketplace operations by gaining deeper insights into customer behavior, seller performance, product trends, and fulfillment efficiency. The goal is to uncover growth opportunities, improve customer experience, and forecast future sales trends to support data-driven decision-making.

STEPS INVOLVED:

PART 1: SQL ANALYSIS

PART 2: DASHBOARD CREATION - POWER BI

PART 3: PYTHON – EDA & TREND ANALYSIS

DASHBOARD CREATION
POWER BI

Objective:

Build an interactive, multi-page dashboard with navigational buttons. Each page focuses on a theme with clearly defined KPIs, matrices, and visual insights.

Md Rafi Islam www.linkedin.com/in/rafi-islam-md

Power BI

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Total Revenue
$16.01M

Total Orders
99K

Average Order Value
$160.99

MOM Growth
360.50K...

Year

2016   2018

2017

Monthly Revenue Trend

$1.0M

$0.5M

Revenue

$0.0M $0.00M $0.00M

$0.45M $0.59M $0.51M $0.88M $0.99M $1.19M $1.12M $1.16M $1.02M $1.07M $0.00M

$0.42M

Jan 2017   Jul 2017   Jan 2018   Jul 2018

Month – Year

Number of Active Customers

8K

6K

Active Customers

4K

2.7K   4.3K   7.5K   5.7K   7.2K   6.2K   6.5K

2K

0K   0.0K   0.0K   0.0K

Jan 2017   Jul 2017   Jan 2018   Jul 2018

Month

Top 10 Product Categories by Revenue

Product Category	Sales
beleza_saude	1.26M
relogios_presentes	1.21M
cama_mesa_banho	1.04M
esporte_lazer	0.99M
informatica_acessorios	0.91M
moveis_decoracao	0.73M
cool_stuff	0.64M
utilidades_domesticas	0.63M
automotivo	0.59M
ferramentas_jardim	0.49M

0.0M   0.5M   1.0M
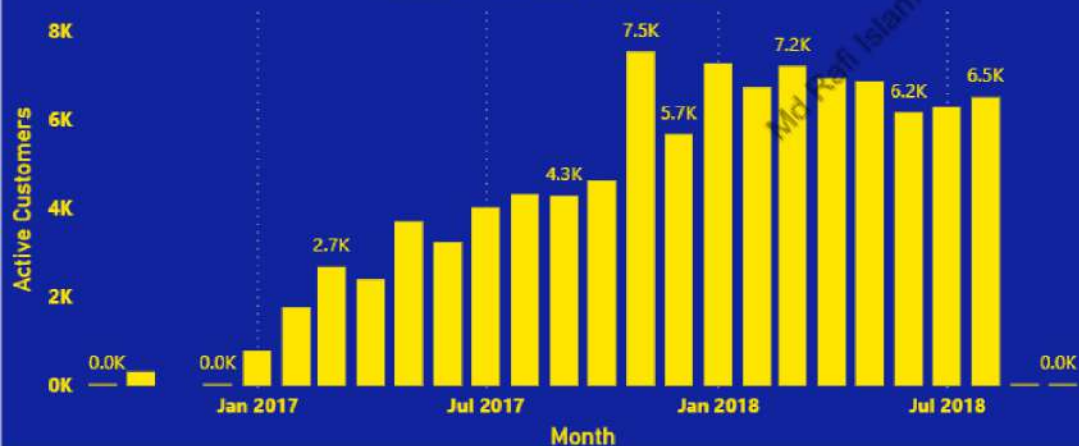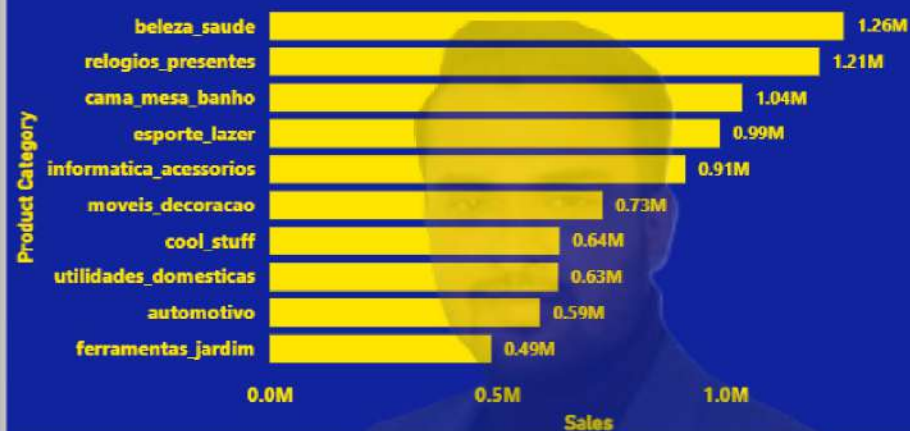
INSIGHTS:

Executive Sales Overview:

Mercado Livre experienced strong business growth across 2017 and 2018, supported by increasing revenue, rising customer activity, and consistent order value.

Key Metrics:
- Total Revenue: $16.01M
- Total Orders: 99K
- Avg. Order Value: $160.99
- MoM Growth: 360.5K

Top Categories by Revenue:
- Beleza & Saúde – $1.26M
- Relógios & Presentes – $1.21M
- Cama, Mesa & Banho – $1.04M

Revenue Trend:

Revenue surged from early 2017, peaking at $1.19M, and remained stable above $1M/month through 2018. A final drop to zero likely indicates data cut-off, not performance decline.

Customer Activity:

Active customers climbed steadily to 7.5K by early 2018, maintaining a strong base around 6K–7K. This shows solid customer retention and engagement.
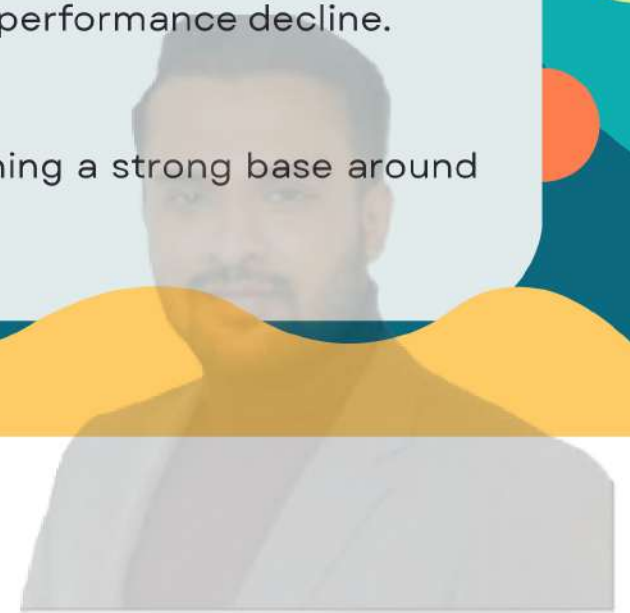
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Total Customers	Avg Orders per Customer	Customer Retention Rate	First Purchases
99.44K	**1.00**	**3.01%**	**634**

State

AC	CE	MG	PE	RO
AL	DF	MS	PI	RR
AM	ES	MT	PR	RS
AP	GO	PA	RJ	SC
BA	MA	PB	RN	SE

Top States by Number of Customers

Count of Customer vs Customer State

- SP: 42K
- RJ: 13K
- MG: 12K
- RS: 5K
- PR: 5K
- SC: 4K
- BA: 3K
- DF: 2K
- ES: 2K
- GO: 2K
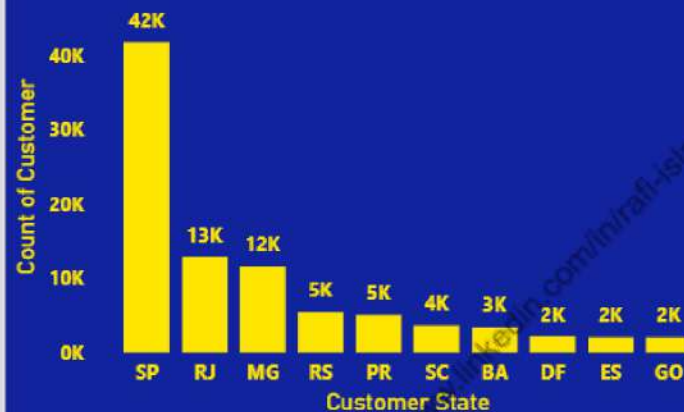
Average Review Score by State

Customer State	Review Score
AP	4.2
AM	4.2
PR	4.2
SP	4.2
MG	4.1
RS	4.1
MS	4.1
RN	4.1
MT	4.1
TO	4.1
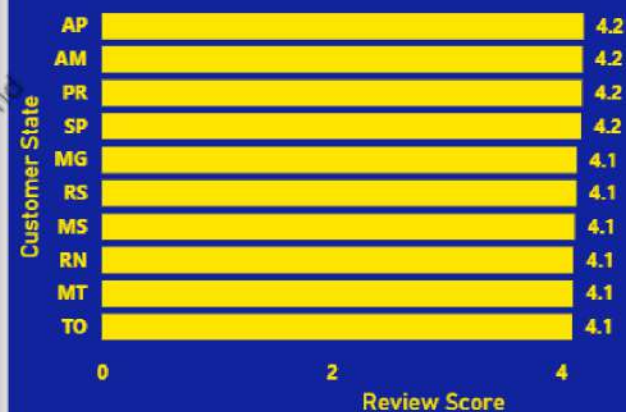
Ratings

1	4
2	5
3	

High Value Orders

$3.94M (24.63%)

$12.07M (75.37%)

Order Value: ● Low value ● High value
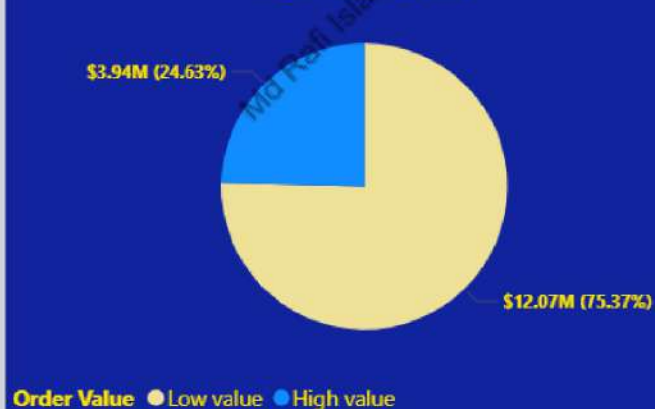
Heatmap of Customers Location

INSIGHTS:

Customer Insights:

Mercado Livre has a broad and loyal customer base, with over 99.44K total customers. However, the customer retention rate is low at 3.01%, indicating a need to improve post-purchase engagement and loyalty programs.

- High-value orders dominate, contributing $12.07M (75.37%) of total revenue.
- Indicates customer willingness to spend, which is a strong sign of trust and perceived value.
- Avg. orders per customer: 1.00
- First-time purchases: 634
- São Paulo (SP) leads with 42K customers, followed by Rio de Janeiro (RJ) with 13K and Minas Gerais (MG) with 12K.
- Strong customer concentration is visible across Brazil, especially the Southeast region, as shown in the heatmap.
- Most states maintain a 4.1–4.2 average review score, reflecting overall customer satisfaction.
- Majority of customers gave ratings between 3–5, signaling a positive brand experience.
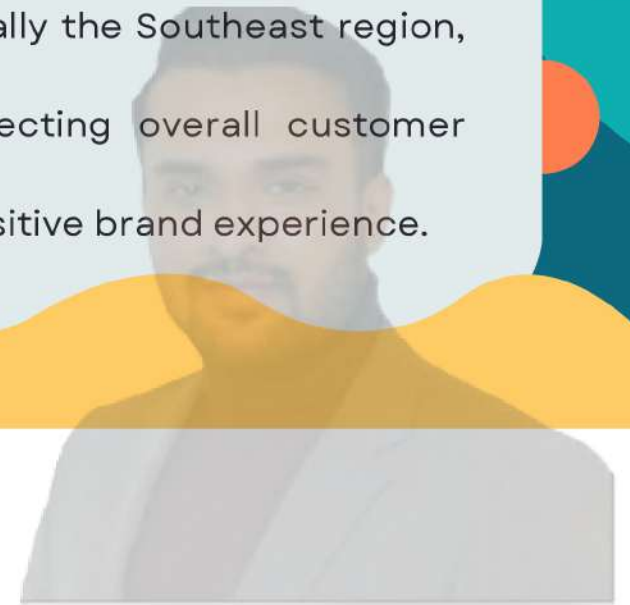
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Review Score
| 1 | 2 | 3 | 4 | 5 |

Product Categories
71

Total Products Available
32.95K

High-Value Orders
4239

Top 10 Product Categories by Revenue
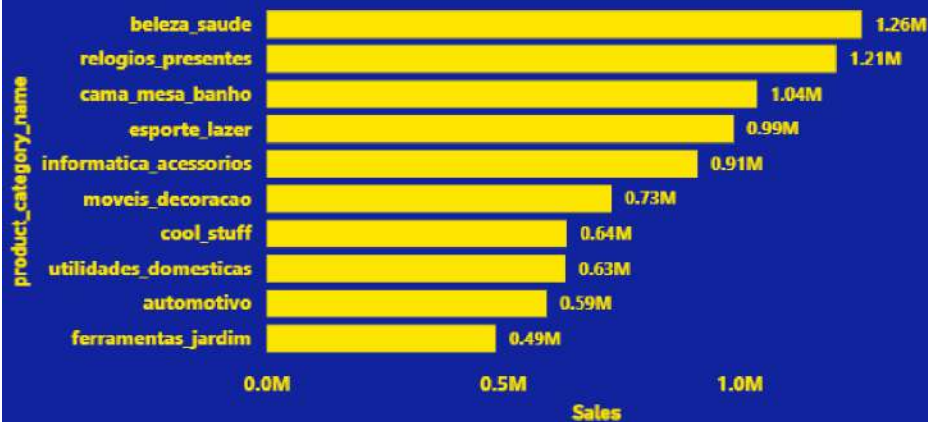
Product Category	Sales
beleza_saude	1.26M
relogios_presentes	1.21M
cama_mesa_banho	1.04M
esporte_lazer	0.99M
informatica_acessorios	0.91M
moveis_decoracao	0.73M
cool_stuff	0.64M
utilidades_domesticas	0.63M
automotivo	0.59M
ferramentas_jardim	0.49M

Category-wise Average Order Value

Average Order Value axis: $0, $500, $1,000

Product Category: pcs, portatei..., eletrodo..., agro_ind..., instrum..., eletropo..., portatei..., telefoni..., construc..., moveis..., moveis..., climatiz..., moveis..., relogios..., construc..., construc..., pc_gamer, moveis..., casa_con..., industri..., cool_stuff, sinalizac..., la_cuisine, casa_con..., construc..., musica, automot..., bebes
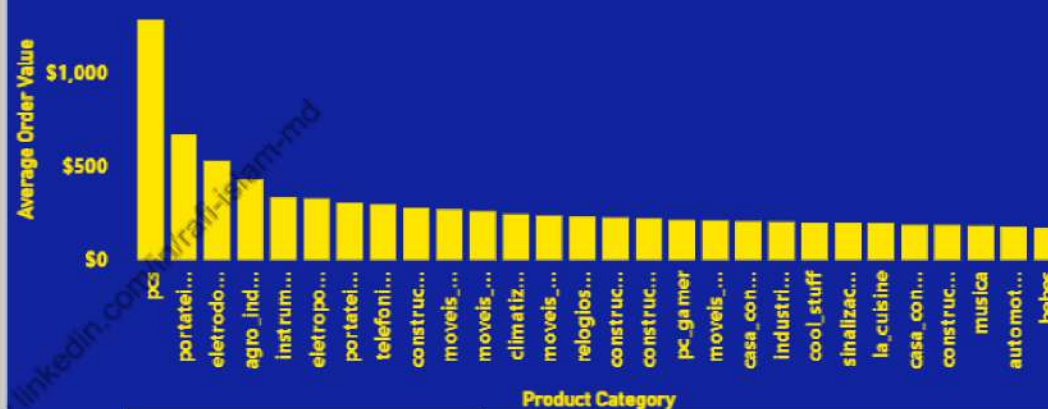
Order Volume by Product Category

product_category_name	Order_Volume
cama_m...	11.1K
beleza_s...	9.7K
esporte_...	8.6K
moveis_...	7.8K
informat...	7.0K
utilidade...	6.0K
relogios...	4.5K
telefonia	4.2K
ferrame...	3.8K
automot...	3.1K
brinque...	2.5K
cool_stuff	1.9K
perfuma...	1.6K
bebes	1.1K
eletronic...	0.8K
papelaria	
fashion_...	
pet_shop	
moveis_...	
consoles...	
malas_ac...	
construc...	
eletrodo...	
instrum...	

% Share of Each Category

Product Category	Category Share
cama_mesa_banho	9.87%
beleza_saude	8.58%
esporte_lazer	7.67%
moveis_decoracao	7.40%
informatica_acessorios	6.95%
utilidades_domesticas	6.18%
relogios_presentes	5.32%
telefonia	4.03%
ferramentas_jardim	3.86%
automotivo	3.76%

Top 10 SKUs by Sales Volume

Quantity Sold by Product Category

Product Category	Quantity Sold
bed_bath_table	13.7K
furniture_decor	11.5K
health_beauty	11.1K
sports_leisure	9.9K
computers_access...	9.9K
housewares	9.1K
watches_gifts	6.6K
garden_tools	5.9K
telephony	5.2K
auto	4.9K

Review Score Distribution by Category

Review Score: 1, 2, 3, 4, 5

Categories: cama_me.., beleza_se.., esporte_l.., informati.., moveis_d.., utilidades.., relogios_.., telefonia, automotivo, brinquedos, cool_stuff, ferramen.., perfumaria, bebes, eletronicos, papelaria, fashion_b.., pet_shop, moveis_e.., consoles_.., malas_ac.., eletrodo.., construca.., eletropor.., instrume.., livros_int.., casa_cons.., alimentos

Avg Review Score per Category

AvgReviewScore by product_category_name_english

Category	Avg
cds_dvds_...	4.7
fashion_chi...	4.5
books_gen...	4.5
costruction...	4.4
books_tech...	4.4
flowers	4.4
food_drink	4.4
luggage_ac...	4.3
books_imp...	4.3
small_appli...	4.3
fashion_sp...	4.3
food	4.3
la_cuisine	4.3
stationery	4.2
cine_photo	4.2
pet_shop	4.2
fashion_sh...	4.2
music	4.2
costruction	4.2
perfumery	4.2
industry_c...	4.2
fashion_ba...	4.2
toys	4.2
musical_ins...	4.2
health_bea...	4.2
computers	4.2

Monthly Product Returns

Returned Orders by Order Month (Jan 2017 – Jul 2018)

INSIGHTS:

Product Performance:

Key KPIs:
- 71 Product Categories
- 32.95K Products Available
- 4,239 High-Value Orders

- Cama, Mesa e Banho leads in sales (13.7K units), orders (11.1K), and market share (9.87%).
- Beleza e Saúde and Relógios e Presentes are also top revenue drivers.
- Cool Stuff and Informática Acessórios show high revenue per order with moderate volume.
- Telephony has high volume but lower revenue—likely due to lower-priced items.
- Most categories enjoy strong review scores (avg. 4.2–4.7 stars).
- Returns peaked in early 2018, highlighting areas for post-sale improvement.
- Portáteis Casa and Electronics have the highest average order values, ideal for upselling strategies.
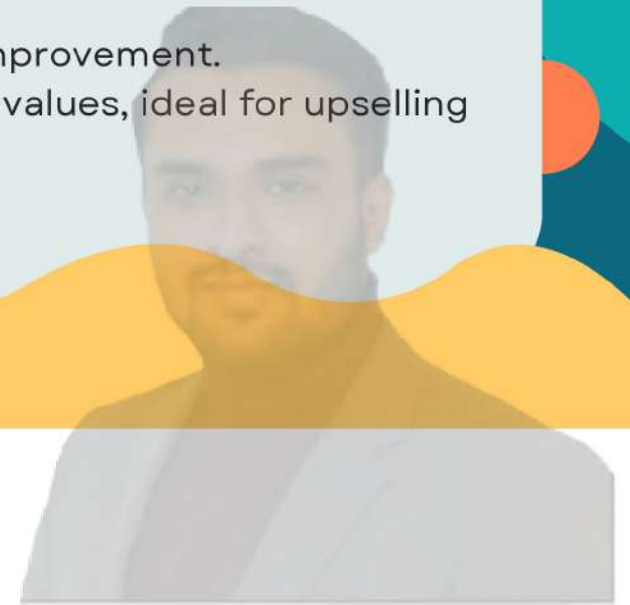
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Avg Delivery Days	Seller Return Rate	Total Sellers	Total Orders
12.50	14.12%	3095	99K

Product Category

- [ ] agro_industry_and_commerc
- [ ] air_conditioning
- [ ] art
- [ ] arts_and_craftmanship
- [ ] audio
- [ ] auto
- [ ] baby
- [ ] bed_bath_table
- [ ] books_general_interest
- [ ] books_imported
- [ ] books_technical
- [ ] cds_dvds_musicals
- [ ] christmas_supplies
- [ ] cine_photo
- [ ] computers
- [ ] computers_accessories
- [ ] consoles_games
- [ ] construction_tools_construc...
- [ ] construction_tools_lights
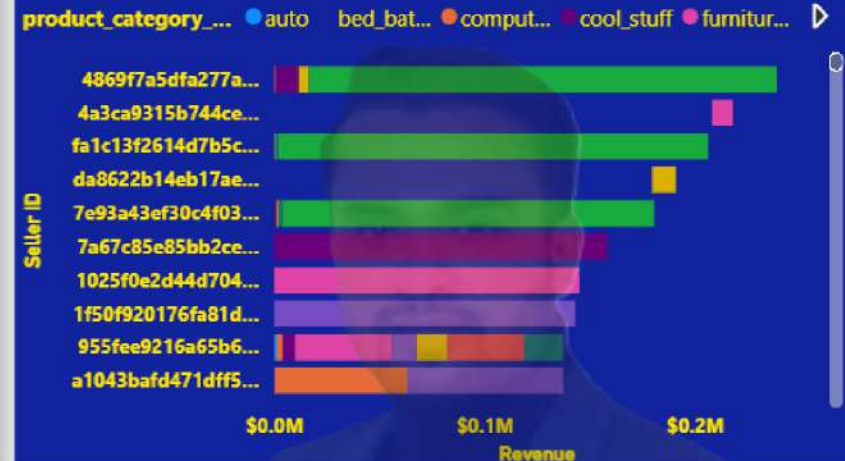- [ ] construction_tools_safety

Top 10 Sellers by Revenue

Sales (Y-axis): 0.0M, 0.1M, 0.2M

Bar values: 0.22M, 0.19M, 0.17M, 0.16M, 0.14M, 0.11M, 0.10M, 0.10M, 0.08M, 0.07M, 0.06M

Sellers (X-axis): 4869f7a..., fa1c13f..., 7e93a4..., 4a3ca9..., da8622..., 7a67c8..., 955fee9..., 1025f0e..., 1f50f92..., 656021..., a1043b..., 7d13fca..., edb1ef..., ccc4bb..., f7ba60f..., 856105..., cc41e0..., cca3071...

Geographical Spread of Sellers

Order Count per Seller

Order Count (Y-axis): 0, 500, 1000, 1500, 2000

Bar values: 1854, 1706, 1404, 1287, 1160, 1132, 982, 943, 915, 740, 718, 712, 667, 657

Sellers (X-axis): 6560211a..., 4a3ca931..., cc41e06..., 1f50f920..., da8622b1..., 955fee92..., 7a67c85e..., ea848 2cd..., 4869f7a5..., 3d871de0..., 7c67e144..., 8b321bb..., 1025f0e2..., 620c87c1..., a1043baf..., cca3071e..., f8db351d..., e9779976...

Revenue per Seller by Product Category

product_category_... ● auto ● bed_bat... ● comput... ● cool_stuff ● furnitur... ▶

Seller ID:
- 4869f7a5dfa277a...
- 4a3ca9315b744ce...
- fa1c13f2614d7b5c...
- da8622b14eb17ae...
- 7e93a43ef30c4f03...
- 7a67c85e85bb2ce...
- 1025f0e2d44d704...
- 1f50f920176fa81d...
- 955fee9216a65b6...
- a1043bafd471dff5...

Revenue (X-axis): $0.0M, $0.1M, $0.2M

INSIGHTS:

Seller Analytics:

- Avg Delivery Time is 12.5 days – acceptable but can be optimized for a better customer experience.
- Return Rate is relatively high at 14.12%, hinting at potential product quality or buyer mismatch issues.
- With 3,095 active sellers and 99K total orders, the platform is highly active and competitive.
- The top revenue-generating seller crosses $220K, while the top order count is 1,854 – showing a clear split between high-volume vs high-value seller strategies.
- Categories like auto, computers, and bed_bath_table are leading revenue generators.
- Revenue is well-distributed, with several sellers tapping into multiple high-performing categories.
- The geographical map shows a dense seller concentration in Southeast Brazil, especially around São Paulo, Rio de Janeiro, and Minas Gerais – strong regions for focused delivery networks and marketing.
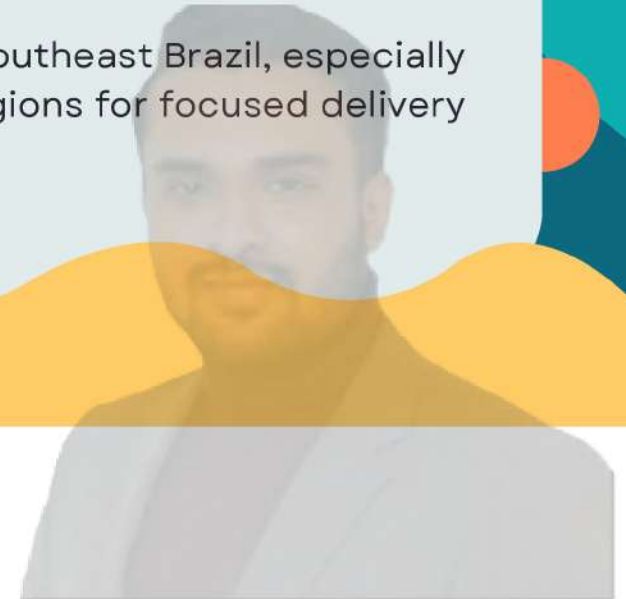
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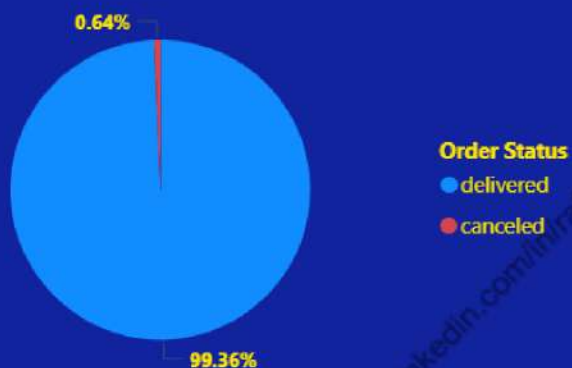| Freight Cost per Order	Avg Delivery Days	Avg Order Value	Average Review
$19.99	**12.50**	**$160.99**	**4.09**

Month Selector

January	July
February	August
March	September
April	October
May	November
June	December

Cancelled vs Completed Orders

- 0.64%
- 99.36%

Order Status
- delivered
- canceled

Average Freight Cost per Category

Product Category	Freight Cost
signaling_and_sec...	$46.48
small_appliances_h...	$36.64
small_appliances	$25.43
sports_leisure	$21.84
security_and_servi...	$20.61
stationery	$20.25
toys	$19.92
watches_gifts	$17.88
telephony	$16.96

Average Delivery Time

Order Month	Avg Delivery Time
	55
	5
	13
	11
	15
	11
	12
	15
	14
	17
	8
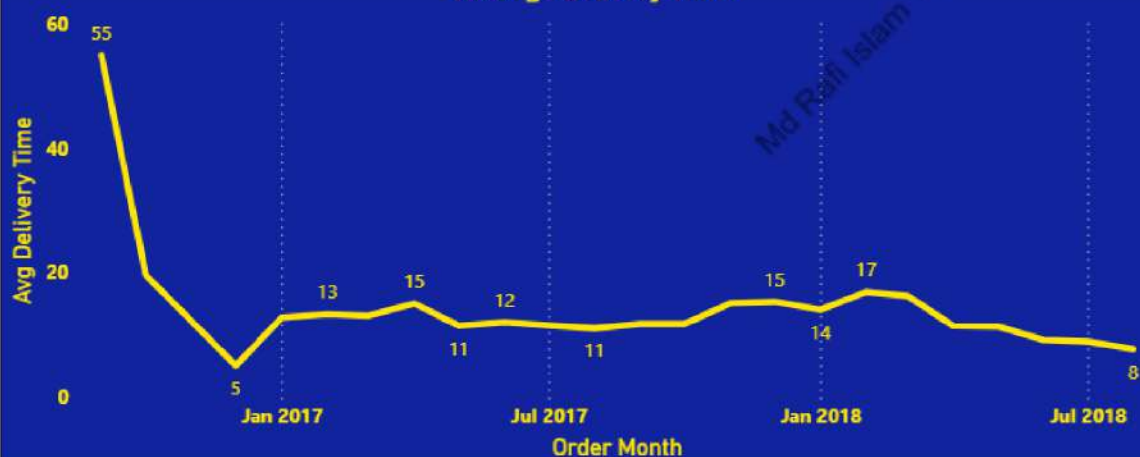
State-wise Avg. Shipping Duration

Customer State	Avg Shipping Duration
RR	29.34
AP	27.18
AM	26.36
AL	24.50
PA	23.73
MA	21.51
SE	21.46
CE	21.20
AC	21.00
PB	20.39
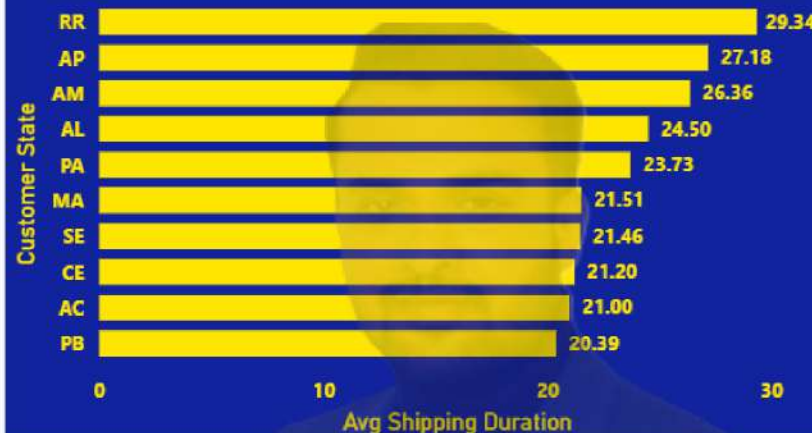
INSIGHTS:

Operational & Fulfillment Metrics:

- Avg Delivery Time holds steady at 12.5 days, which is consistent and reliable.
- Freight Cost per Order averages $19.99, with notable variation across categories.
- Signaling & security incurs the highest freight at $46.48, while telephony is the lowest at $16.96.
- State-wise Delivery Time shows RR (Roraima) and AP (Amapá) have the longest shipping durations (29.34 & 27.18 days), indicating regional logistical challenges.
- Avg Order Value is strong at $160.99, showing customers are spending well.
- Cancellation Rate is only 0.64%, with 99.36% orders successfully delivered, reflecting excellent operational efficiency.
- Customer Satisfaction is solid with an average review score of 4.09 out of 5.
- Delivery times dropped significantly from 55 days to around 11–13 days, stabilizing over the period—a sign of improved supply chain and fulfillment processes.

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State

AC	CE	MG	PE	RO	SP
AL	DF	MS	PI	RR	TO
AM	ES	MT	PR	RS	
AP	GO	PA	RJ	SC	
BA	MA	PB	RN	SE	

Month-on-Month Change in Transaction Volume

- January: 26.94%
- February: -10.99%
- March: 16.85%
- April: 0.10%
- May: -0.59%
- June: -11.27%
- July: 4.17%
- August: -4.14%
- September: -99.57%
- October: -86.72%

(Y-axis: Revenue; X-axis: Month)

Payment Methods Distribution

- credit_card: 74.93%
- boleto: 18.23%
- voucher: 4.87%
- debit_card

Payment Type
- credit_card
- boleto
- voucher
- debit_card
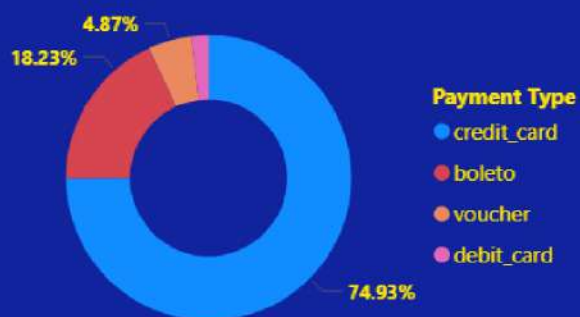
Avg. Payment Value per Method

- credit_card: $163.36
- debit_card: $157.85
- boleto: $143.31
- voucher: $75.44

(Y-axis: Avg Payment Value; X-axis: Payment Type)

Revenue by Payment Method

- $6.86M (78.81%)
- $1.46M (16.82%)
- $0.17M (2%)

Payment Type
- credit_card
- boleto
- voucher
- debit_card

INSIGHTS:

Payment & Financial Insights:

- Credit cards dominate with 74.93% of transactions and contribute 78.81% of total revenue ($6.86M) – clearly the most preferred and high-value method.
- Boletos are the second most used (18.23%) with $1.46M revenue, while vouchers and debit cards contribute minimally.
- Avg Payment Value is highest via credit card ($163.36), followed by debit card ($157.85) and boleto ($143.31). Vouchers trail behind at $75.44.
- Strong growth was seen in January (26.94%) and March (16.85%).
- However, September (-99.57%) and October (-86.72%) saw massive drops in transaction volume–possibly due to external market or operational disruptions.
- Credit cards are critical to Mercado Livre's payment ecosystem–both in volume and value.
- Boletos maintain relevance, especially in regions with lower card penetration.
- A steep decline in later months demands investigation into potential causes like system outages, policy changes, or seasonality.