Marketing and Retail Analytics

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Agenda

1. Objectives

2. Visualizations

3. Insights

4. Recommendations

5. Appendix –

   - Data Sources

   - Data Methodology

   - Data Assumptions

Objective

- OList, an e-commerce company facing losses, predict product in demand with greater accuracy, minimizing unnecessary inventory storage costs

- Identify top revenue-generating products based on revenue and order item count using Pareto Analysis and analyze

- Analyze products bought together frequently and customer purchase (individual and joint purchases) behavior using market basket analysis.
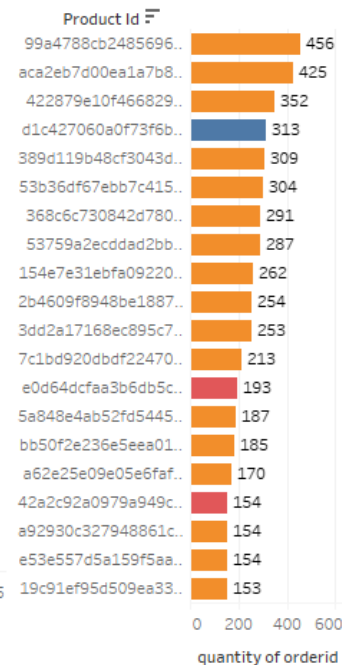
The top 20 quantitatively dominant products

▶ Office furnitures,toys and computer accessories are the most bought products from customer in large quantities
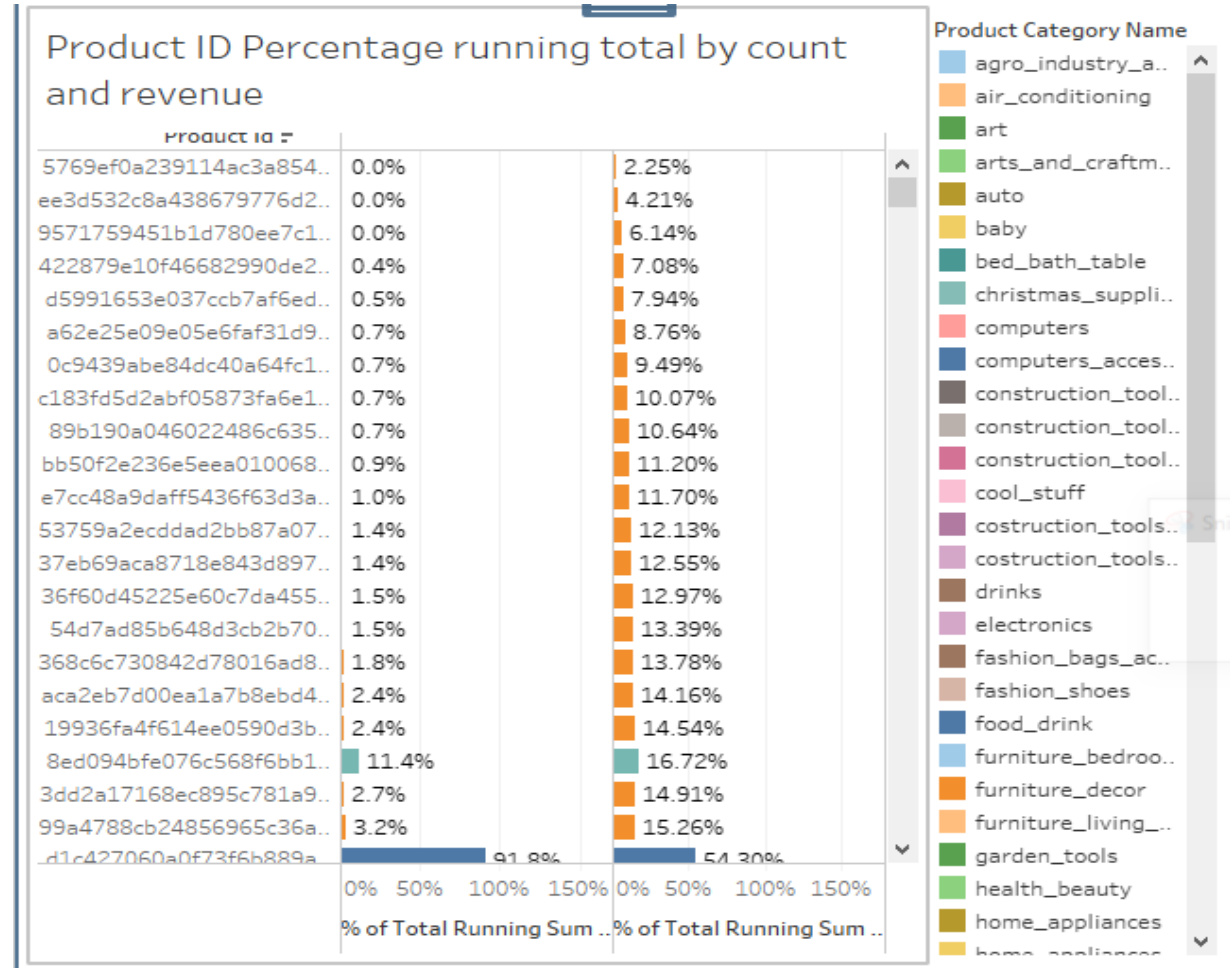
Top 20 Revenue Generator Products

▶ Office furniture's is one of the most profit generated product in Olist basket
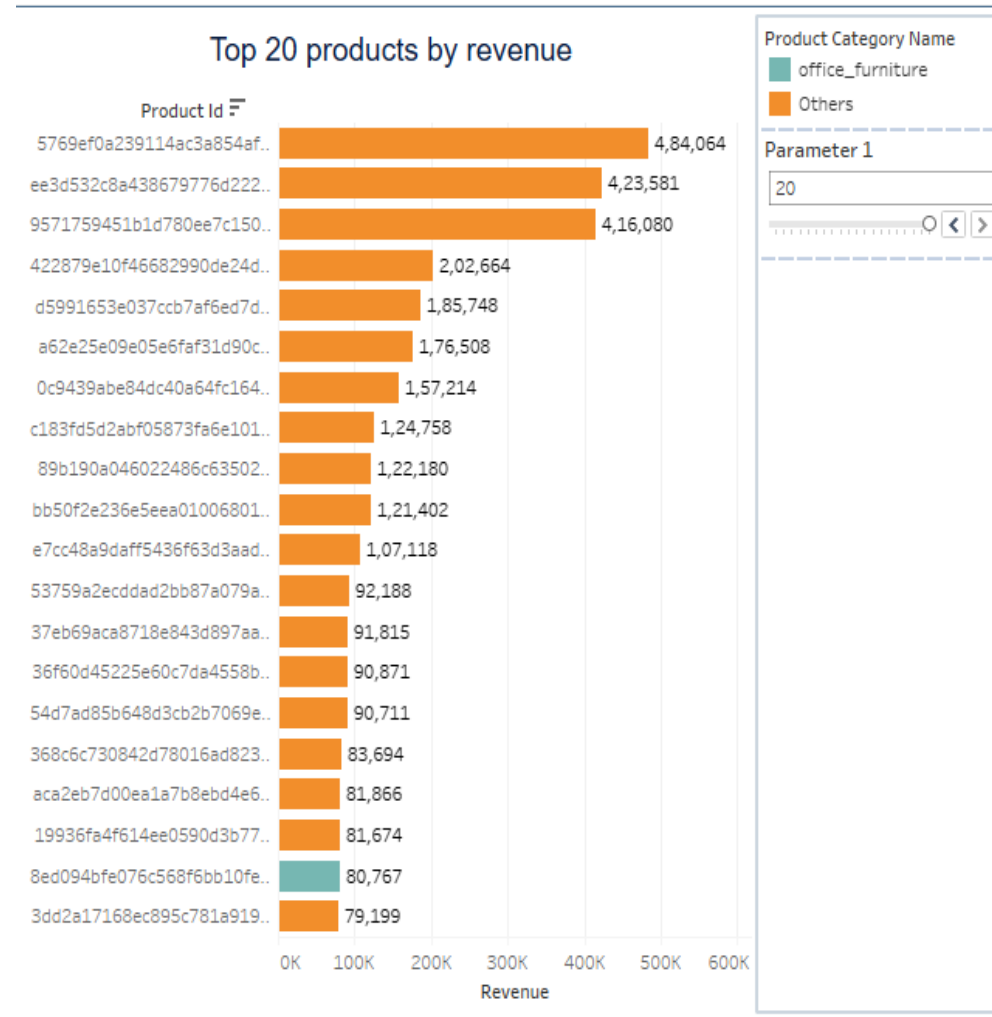
% Running totals by revenue and number of orders by products

▶ Products like Toys,computer accessories, home appliance, house wares, computes are the most revenue generators across the product categories.

▶ The Percentage of Total Running Revenue and Quantity Ordered has been broken down by Product Id.

▶ The contribution of each product towards the total revenue can be identified.

Product ID Percentage running total by count and revenue

Product Id	% of Total Running Sum	% of Total Running Sum
5769ef0a239114ac3a854..	0.0%	2.25%
ee3d532c8a438679776d2..	0.0%	4.21%
9571759451b1d780ee7c1..	0.0%	6.14%
422879e10f46682990de2..	0.4%	7.08%
d5991653e037ccb7af6ed..	0.5%	7.94%
a62e25e09e05e6faf31d9..	0.7%	8.76%
0c9439abe84dc40a64fc1..	0.7%	9.49%
c183fd5d2abf05873fa6e1..	0.7%	10.07%
89b190a046022486c635..	0.7%	10.64%
bb50f2e236e5eea010068..	0.9%	11.20%
e7cc48a9daff5436f63d3a..	1.0%	11.70%
53759a2ecddad2bb87a07..	1.4%	12.13%
37eb69aca8718e843d897..	1.4%	12.55%
36f60d45225e60c7da455..	1.5%	12.97%
54d7ad85b648d3cb2b70..	1.5%	13.39%
368c6c730842d78016ad8..	1.8%	13.78%
aca2eb7d00ea1a7b8ebd4..	2.4%	14.16%
19936fa4f614ee0590d3b..	2.4%	14.54%
8ed094bfe076c568f6bb1..	11.4%	16.72%
3dd2a17168ec895c781a9..	2.7%	14.91%
99a4788cb24856965c36a..	3.2%	15.26%
d1c427060a0f73f6b889a..	91.8%	54.30%

% of Total Running Sum ..   % of Total Running Sum ..

Product Category Name
- agro_industry_a..
- air_conditioning
- art
- arts_and_craftm..
- auto
- baby
- bed_bath_table
- christmas_suppli..
- computers
- computers_acces..
- construction_tool..
- construction_tool..
- construction_tool..
- cool_stuff
- costruction_tools..
- costruction_tools..
- drinks
- electronics
- fashion_bags_ac..
- fashion_shoes
- food_drink
- furniture_bedroo..
- furniture_decor
- furniture_living_..
- garden_tools
- health_beauty
- home_appliances
- home_appliances

Contd

Full Data
10,000 rows 5 fields

Product Id	Product Category Name	Order Id	order id (Sheet11)	Revenue
32bcebd1122da0e45ac11739dd7a1cad	toys	53be479f3b3486d26abed234b365a3...	53be479f3b3486d26abed234b365a3...	17,568
e72e59338050d312832e22ea7aedc0fd	toys	897d215bbe78c235bc0008784a15ac78	897d215bbe78c235bc0008784a15ac78	16,084
1e5428c428e0f783acd6e3d94ba4ee2a	computers	a23f4025d60af6199b5eb5631b070e7f	a23f4025d60af6199b5eb5631b070e7f	10,878
152397b614be35e54106663bd5671f7d	Others	01a0013ddc7cd129e350e8671b56a263	01a0013ddc7cd129e350e8671b56a263	10,494
d9894482fba41f536a273ba2276d951f	Others	ad1aeeb1a99c9f021e38a49865bb812c	ad1aeeb1a99c9f021e38a49865bb812c	9,984
810cfa5dd36b001cfc186499381f72ab	Others	3e6f06c624c7f67d6a0710e39ca97f2b	3e6f06c624c7f67d6a0710e39ca97f2b	9,688
a5215a7a9f46c4185b12f38e9ddf2abc	Others	694e3d121f16bcbb9b4595b6c6ab3baf	694e3d121f16bcbb9b4595b6c6ab3baf	8,092
27535386be7362e36d9e78c2afb8c0e5	Others	d3e20e12dd625bc8aa36a78636912b0f	d3e20e12dd625bc8aa36a78636912b0f	7,288
f3720bc68555b1bff49b9ffd41b017ac	Others	31b855608ca69e4146b737745506f2d5	31b855608ca69e4146b737745506f2d5	7,104
a5647c44af977b148e0a3a4751a09e2e	office_furniture	a2a53e824841856d25e9fe22467e42...	a2a53e824841856d25e9fe22467e42...	6,948
42bf9ee410b1247f0223626107834b87	Others	ca0400dec2c292340c373e63b1c2c5...	ca0400dec2c292340c373e63b1c2c5...	6,876
1bb0f142789375f5709d08b2f2355c2b	Others	61a4e749e6975384980e883fc5653d...	61a4e749e6975384980e883fc5653d...	6,846
1bb0f142789375f5709d08b2f2355c2b	Others	61a4e749e6975384980e883fc5653d...	61a4e749e6975384980e883fc5653d...	6,846
56d45b2c27871322801134f57d1b9dfb	Others	448795135b904d057254f5fd0d5a6a...	448795135b904d057254f5fd0d5a6a...	6,628

Quantity Pareto Analysis

Pareto Analysis on Contribution of Distinct Products Categories by Number of Distinct Orders in olist
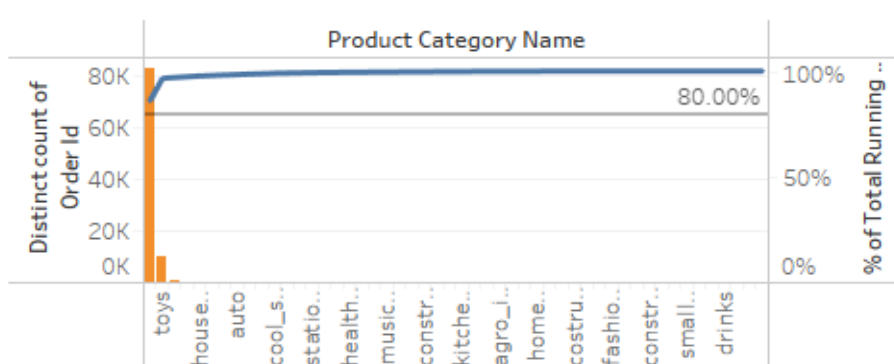
Pareto Analysis on Contribution of Distinct Products Id by Number of Distinct Orders in olist

Measure Names
- % of Total Running S..
- Distinct count of Ord..
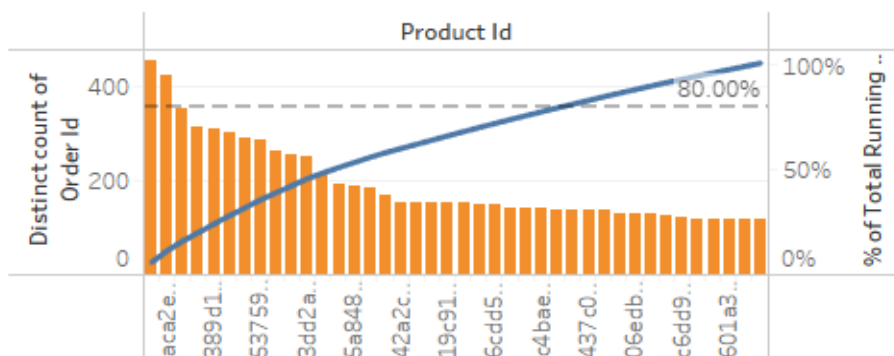
- ▶ Toys, houseware auto cool stuff stationeries health & beauty are frequently ordered product categories at order id level quantitvely

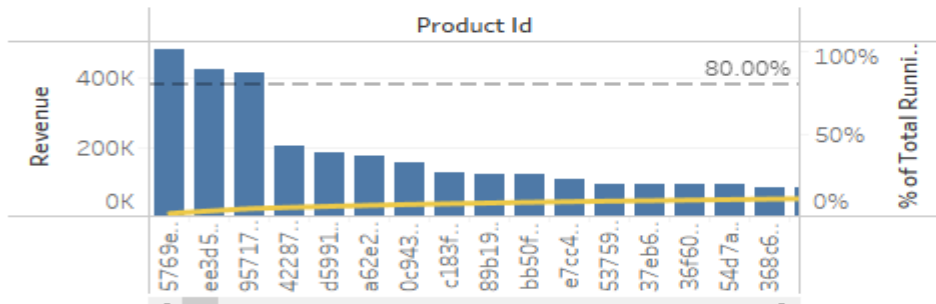- ▶ Olist should stock these products based on pattern seen over last 2 years

Revenue Pareto Analysis

Pareto Analysis on Contribution of Distinct Products Categories by revenue

Measure Names
- % of Total Running S..
- Revenue
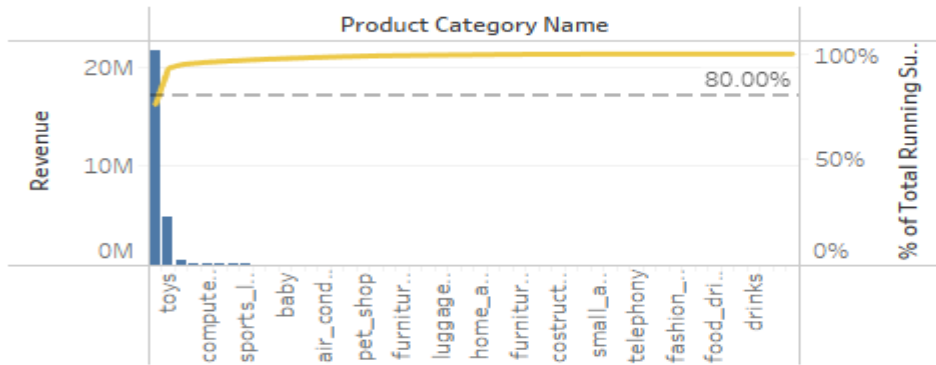
Pareto Analysis on Contribution of Distinct count of Products Id by Number of Distinct Orders in olist
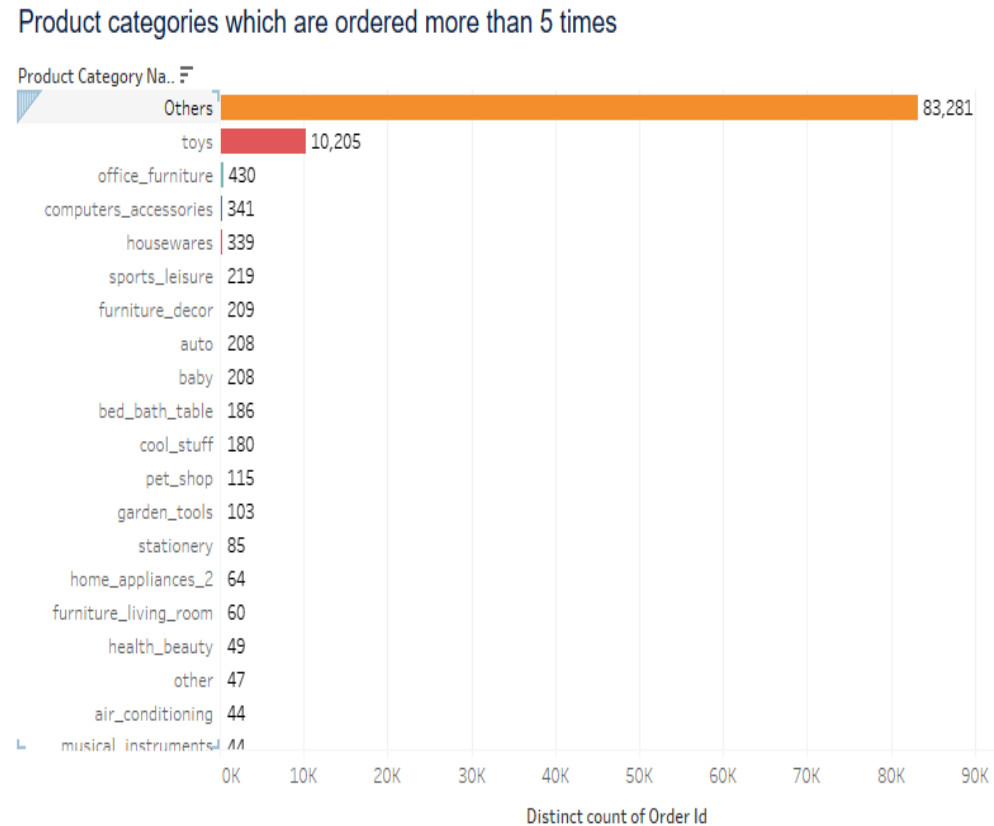

▶ Toys , computers_accessories , wares ,sports leisure are the major product categories where Olist will have the biggest payoff.

Market Basket Analysis -1
Product Categories Repurchased Over 5 Times

▶ Focus on these product categories to manage inventory, as they generate large revenue and continue to be in high demand among customers

▶ An example, these are the product categories which are frequently ordered together with 'toys'.

Product categories which are ordered more than 5 times

Product Category Na...	Distinct count of Order Id
Others	83,281
toys	10,205
office_furniture	430
computers_accessories	341
housewares	339
sports_leisure	219
furniture_decor	209
auto	208
baby	208
bed_bath_table	186
cool_stuff	180
pet_shop	115
garden_tools	103
stationery	85
home_appliances_2	64
furniture_living_room	60
health_beauty	49
other	47
air_conditioning	44
musical_instruments	44

Market Basket Analysis -2
Shopping Synergies

▶ Customers who purchase toys also purchase other items. Toys should be offered in conjunction with new offers

Combinations of product categories bought together

		toys	Others	furnitur..	auto	sports_l..	baby	bed_bat..	cool_
toys			256	11	24	1	1	5	
Others		256		11	3	3	6	6	
sports_leis..		1	3			219			
furniture_d..		11	11	209					
auto		24	3		208				
baby		1	6				208		
bed_bath_t..		5	6					186	
cool_stuff		2							
pet_shop		4	5						
garden_too..		1	3						
stationery		2	5						
home_appli..									
furniture_li..		2							
health_bea..		1	2						
other		2	3						
air_conditi..									
musical_ins..			2						
industry_c..		1							
luggage_ac..		2	1						
constructio..		3	2						
computers									
small_appli..			1						
kitchen_din..									
home_appli..									

Product Category Name

Insights

- Olist even with a 0.63% cancellation rate, 99.37% of orders proceed through to delivery, signifying customer trust and commitment to purchase

- Over a two-year period, the maximum number of orders per month occurs between the months of March and August.

- Olist's journey has been remarkable! From 285 orders in 2016, they scaled to over 9610 orders by 2018. (Showcases the platform's growth trajectory)

- October and September may be quieter months for Olist compared to the peak seasons of May, July, and August, offering potential opportunities for targeted marketing campaigns. ,monday tuesday olist website will be busy because maximum num of orders are seen on these day over past 2 years compared to weekend

- 75.24% Customers prefer credit_card as prefferred payment method followed by wallet (19.46%customer) compared to other available methodsGood news for fashionistas! Olist's lower shipping charges on watches and shoes make online shopping even more enticing.

- Olist's hefty shipping charges for health and beauty, computers, and construction tools can be a hurdle for some shoppers.

- More than 75% of products sold are toys and rest products categories constitutes 25% of olist business.

- More than 50% , 12 % of customers has made their payments by opting for 1 month and 2 month installment respectively using their credit card.

- OList customers predominantly hail from Sao Paulo state (41.93%), while Rio de Janeiro (12.88%) and Minas Gerais (11.71%) make up significant portions of the customer base

Recommendations

- The company should focus on the categories that generate more than 80% of the revenue by always keeping them in stock.

- The company should target customers who are more likely to buy 'other' and 'toys' to boost sales as the category toys is the most ordered category.

- Offer promo codes or discounts on the frequently ordered category associations to encourage cross-selling among the products.

- The company can reduce some of the subcategories which have very low sales.

Appendix – Data Sources

- OList Retail dataset containing order-related information for the year 2016 to 2018.
- Here is a snapshot of our data dictionary:

Dataset name	Column Name	Description
orders	order_status	Indicates the status of an order, for example: delivered, cancelled, processing etc.
orders	order_purchase_timestamp	Timestamp when the order was made from the customer
orders	order_approved_at	Timestamp when the order was approved from the sellers' side
orders	order_delivered_timestamp	Timestamp when the order was delivered at customer's location
orders	order_estimated_delivery_d	Estimated date of delivery shared with the customer while placing the order
order_items	order_id	Unique identifier for an order
order_items	order_item_id	Item number in each order. Order_id along with this column acts as the primary key of this table
order_items	product_id	Unique identifier for a product
order_items	seller_id	Unique identifier for the seller
order_items	price	selling price of the product
order_items	shipping_charges	charges associated with the shipping of the product
customers	customer_id	Unique identifier for a customer, acts as the primary key of this table
customers	customer_zip_code_prefix	Customer's Zip code
customers	customer_city	Customer's Zip city
customers	customer_state	Customer's Zip state
payments	order_id	Unique identifier for an order, this table can have duplicates in this column
payments	payment_sequential	Povides the info of the sequence of payments for the given order
payments	payment_type	Type of payment like credit_card, debit_card etc.
payments	payment_installments	Payment installement number in case of credit cards
payments	payment_value	Trasaction value
products	product_id	Unique identifier for each product, acts as the primary key of this table
products	product_category_name	Name of the category the product belongs to
products	product_weight_g	Product weight in grams
products	product_length_cm	Product length in centimeters
products	product_height_cm	Product height in centimeters
products	product_width_cm	Product width in centimeters
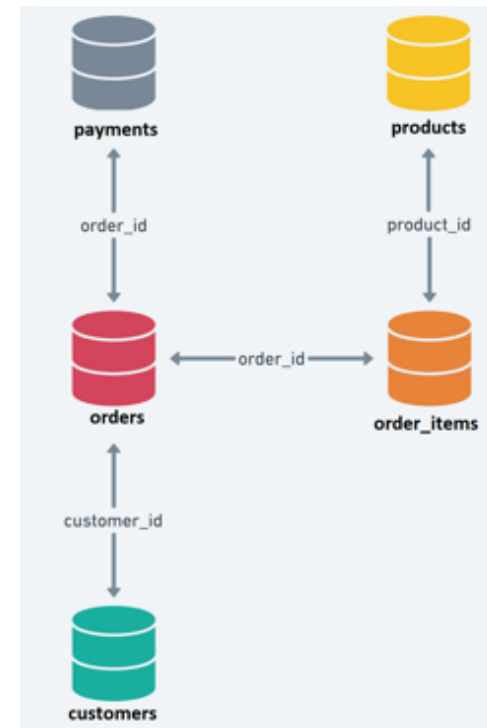
Appendix – Data Methodology

▶ Retail Data set "Retail_dataset" is provided in the form of excel with orders ,order_items,customer,product,payment worksheet .

▶ Jupiter Python is used for Data Understanding, Pre-processing ,Merging of tables,Exploratory data analysis .

▶ Cleaned data frame is saved in the form of excel "Cleaned_Retail_dataset"

▶ Further Analysis done in Tableau desktop using "Cleaned_Retail_dataset"

Appendix – Data Assumptions

▶ Only the cases having order status as 'delivered' are considered.

▶ Instead of building bigger, OList is building smarter: their innovative inventory strategy to save on warehouse costs.

▶ The company's strategies are built around sustained sales growth.

▶ Revenue column was created using price and order_item_id.

▶ Missing value in product category is categorized as "other"

Thank You