

ANALYZING ECOMMERCE BUSINESS PERFORMANCE WITH SQL

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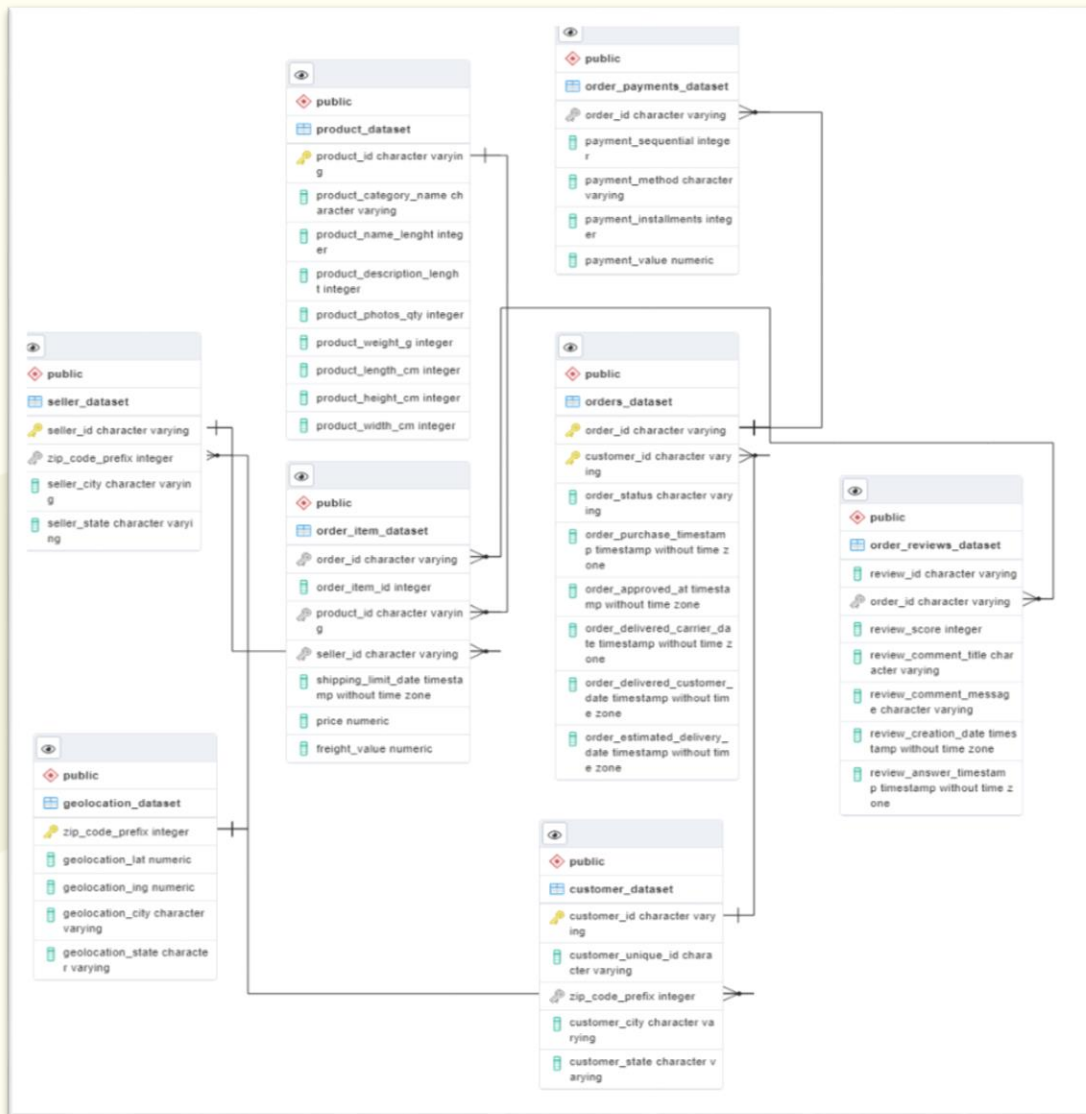
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An aspiring Data Analyst/Scientist who loves finding pattern and connecting the dots from any perspective. Having a background in physics has given me good analyzing skill. I have a passion for learning new things and am able to think critically and objectively in finding solutions to solve a problem. To deepen my knowledge and technical skills in data science, I have also completed Data Science Intensive Bootcamp : Machine Learning Specialization from Rakamin Academy so I have a solid foundation in SQL and Python for Data Science. I'm excited to start a career in data science and expand my field of expertise.

Overview

"In a company, measuring business performance is very important to track, monitor, and assess the success or failure of various business processes. Therefore, this project will analyze business performance for an eCommerce company (in Brazil) by taking several business metrics such as customer growth, product quality, and payment types into account."

Data Preparation



The steps I did in Data Preparation stages are as follows:

- **Create Workspace.** Creating databases and tables according to the amount of data needed (SQL keyword: CREATE). The usage of the right data types in each columns should be regarded carefully.
- **Import Data.** Importing data from a csv file. (SQL keyword: COPY)
- **Build Entity Relationship.** Adding a primary key and foreign key to each table (SQL keyword: ALTER). Then generate ERD and save it as an image.

What needs to be considered in making an ERD is determining the Primary Key and Foreign Key which will determine the relationship between tables.

Clearer ERD flowchart [here](#)
Complete SQL queries [here](#)

Annual Customer Activity Growth Analysis

	tahun double precision 🔒	m_a_u numeric 🔒	new_cust bigint 🔒	repeat_order_customer bigint 🔒
1	2016	109	326	3
2	2017	3695	43713	1256
3	2018	5338	52749	1167

The following table is the result of the analysis of e-commerce customer growth from 2016 to 2018. **m_a_u** defines the monthly active user/number of active customers each month, **new_cust** defines the amount of new customers, and **repeat_order_customer** defines the amount of customers who have made purchases more than once.

Annual Customer Activity Growth Analysis



Data from 2016 are not included in this analysis and diagram, because the total amount of data did not include the entirety of year 2016 which would cause a significant difference with other years.

It can be observed that from 2017 to 2018, the average monthly active customer and the number of new customers has increased, while the number of repeat customers has decreased from 2017 to 2018. This shows that the eCommerce's growth is good in terms of the number of customers awareness of the eCommerce. But on the other hand, total customer orders doesn't look good and need further evaluation.




Annual Product Category Quality Analysis

	tahun double precision	revenue_pertahun numeric	revenue_tertinggi character varying	jumlah_revenue numeric	cancel_pertahun bigint	cancel_tertinggi character varying	jumlah_cancel numeric
1	2016	60313.42	furniture_decor	8677.99	15	toys	3
2	2017	7907521.98	bed_bath_table	675173.64	247	sports_leisure	25
3	2018	9556470.12	health_beauty	945870.05	280	health_beauty	27

The table shown above is the result of product category quality analysis in year 2016 – 2018. As seen on the table, the annual revenue continues to increase, as well as the number of order cancellations.

Annual Product Category Quality Analysis




Top Product Revenue

	2016	2017	2018
Total Revenue	\$60,313.42	\$7,907,521.98	\$9,556,470.12
Top Product	 Furniture Decor	 Bed Bath Table	 Health & Beauty
Revenue from Top Product	\$8,677.99 (14.4%)	\$675,173.64 (8.5%)	\$945,870.05 (9.9%)

The product categories that provide the largest revenue differs each year. In 2016, the largest revenue was provided by products from Furniture Decor category, which was around 14.4% of total revenue. In 2017, the largest revenue was provided by Bed Bath Table category with around 8.5% of total revenue, while in 2018, the largest revenue was provided by Health & Beauty category with around 9.9% of total revenue

Annual Product Category Quality Analysis

Cancelled Products

2016	2017	2018
		
Toys	Sport & Leisure	Health & Beauty
3/15	25/247	27/280

The product categories that experience the most order cancellations each year vary. In 2016, the most order cancellations were in the Toys category, which amounted to 20% of the total canceled orders. In 2017, the most order cancellations were in the Sports & Leisure category, which was around 10.1% of total canceled orders. Lastly, in 2018, the most order cancellations were in the Health & Beauty category, which was around 9.6%.

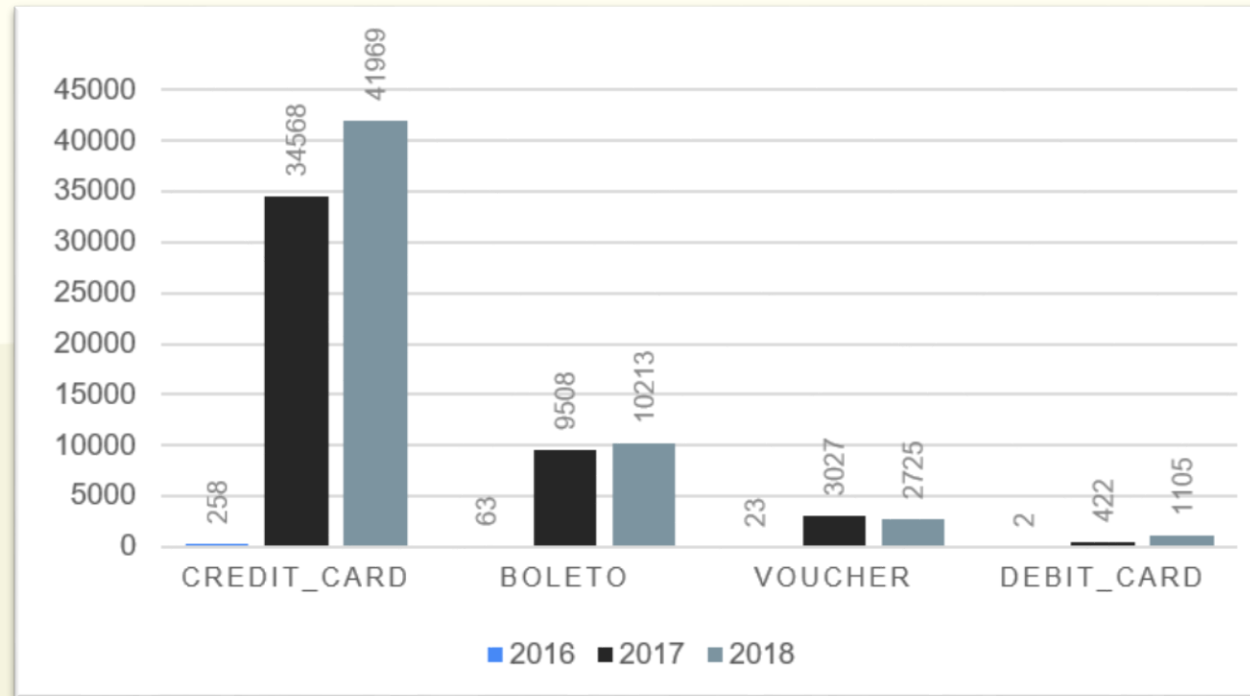
In addition, Health & Beauty products are the category that provides the largest revenue as well as the most canceled products. This might happen because in 2018 there was a trend of using health & beauty products. Further analysis can be carried out to confirm this statement.

Annual Payment Method Analysis

tahun double precision	credit_card bigint	boleto bigint	voucher bigint	debit_card bigint	not_defined bigint
2016	258	63	23	2	0
2017	34568	9508	3027	422	0
2018	41969	10213	2725	1105	3

The table above is the result of an analysis of payment methods used by customers. There are 4 types of payment methods that are commonly used : credit cards, boleto, vouchers and debit cards. Boleto is a popular payment method in Brazil. It is a printed or virtual voucher with a barcode contained customers' information and of payment details. Boleto can be paid in so many locations in Brazil so many customers used it. However, from the data it was also found that there were 3 payment transactions using payment methods that were not identified/not commonly used methods.

Annual Payment Method Analysis



From the diagram it can be observed that the most used payment method is a credit card. Further analysis can be carried out regarding customer habits using a credit card, for example like length of tenor selected, what product category usually purchased with a credit card, etc.

It can also be seen that the number of transactions made increases every year for each payment method, except for the voucher category. This might happen because of the promotions provided through the use of other payment methods so that the use of vouchers from eCommerce tends to decrease.