



ANALYZING ECOMMERCE BUSINESS PERFORMANCE WITH SQL

by Joni Syofian

About Me

Joni is a fresh graduate student at the Bandung Institute of Technology. He is interested in data science, data analytics, and ocean issues. To improve his skills in the field of data, he took several courses and just completed a data science bootcamp with a good grade.



Outline

- Overview
- Data Preparation
- Annual Customer Activity Growth Analysis
- Annual Product Category Quality Analysis
- Analysis of Annual Payment Type Usage



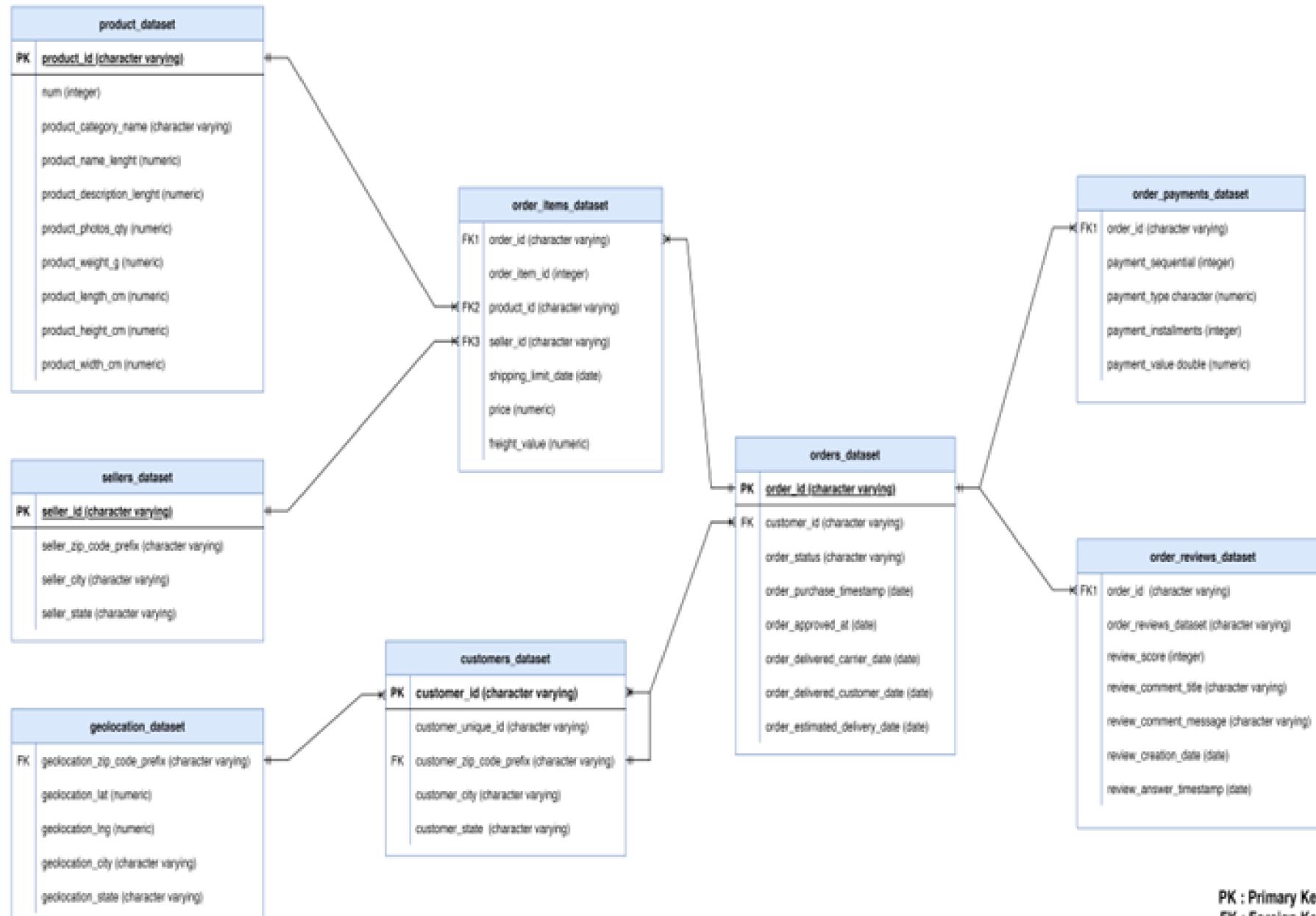


Overview

In a company, measuring business performance is very important to track, monitor, and assess the success or failure of various business processes." Therefore, this time a business performance analysis will be carried out for an eCommerce company, taking into account several business metrics, namely customer growth, product quality, and payment type.

Data Preparation

Entity Relationship Diagram (ERD)



Before starting data processing, the earliest stage is to prepare the raw data into structured and ready-to-process data. As a result, all data sets in.csv format are imported into the database during the data preparation stage using the following procedure:

Create Workspace

Create a database through pgAdmin 4 and create a table with a "create" statement, matching each data type of each column.

Importing Data

Import.csv data into the database using a "copy" statement.

Build Entity Relationship

Define relationships between tables by specifying a primary key and a foreign key using the "alter" statement.

Annual Customer Activity Growth Analysis

One of the metrics used to measure the performance of an eCommerce business is the activity of customers interacting within the eCommerce platform, or customer growth metrics. These metrics used in this project include the following:

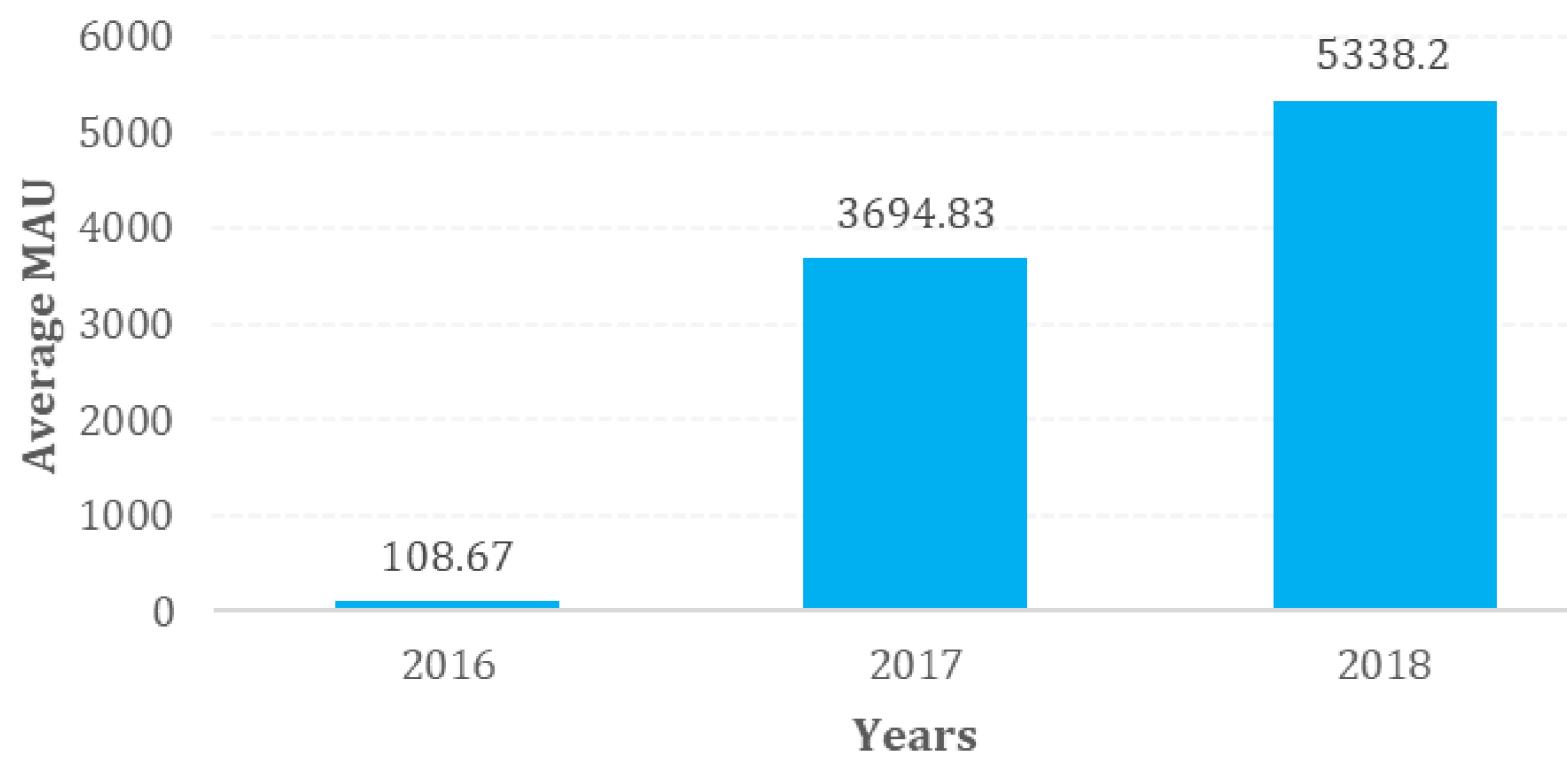
- **Average monthly active user per year**
- **Number of new customers every year**
- **Number of customer repeat orders per year**
- **Average frequency of customer orders per year**

Here's a table of query results for each subscriber growth metric:

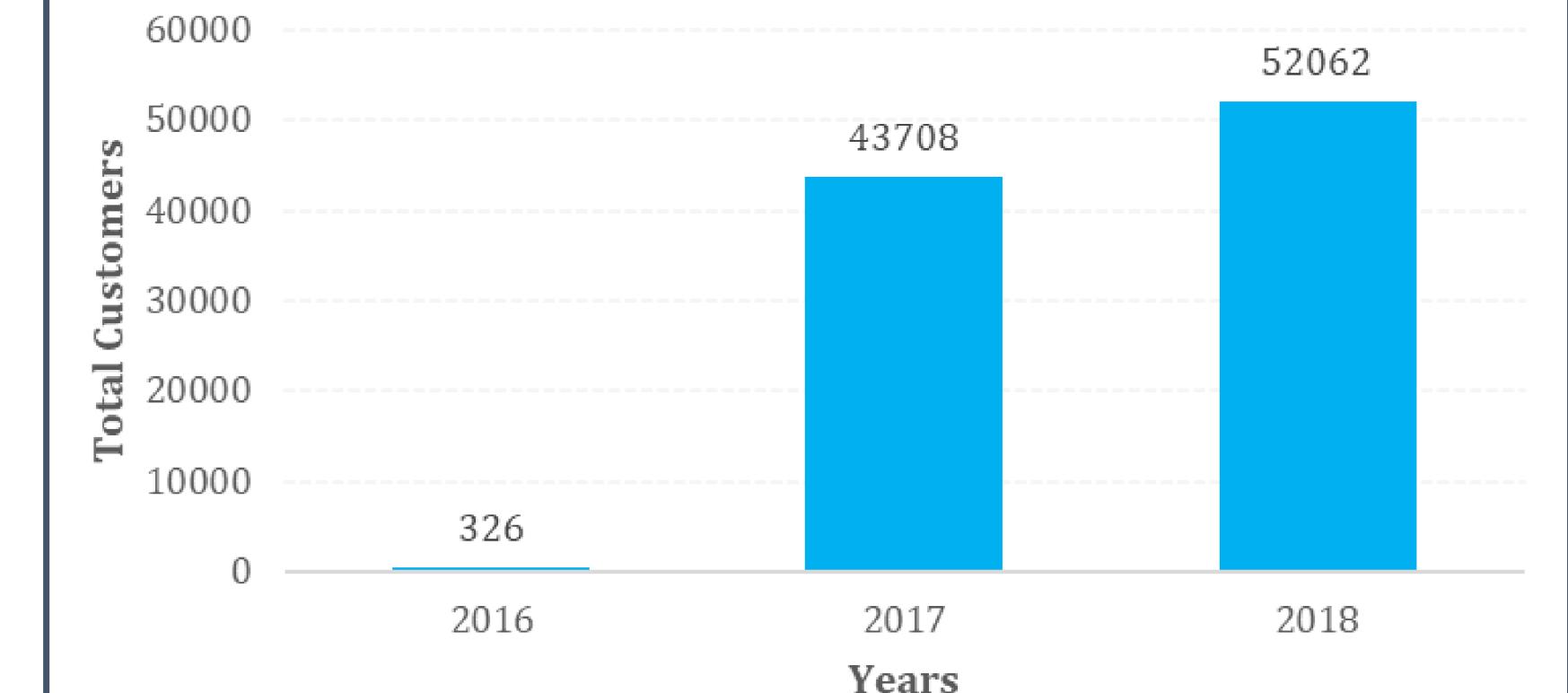
	year double precision	average_mau numeric	new_customers bigint	repeating_customers bigint	avg_orders_per_customers numeric
1	2016	108.67	326	3	1.009
2	2017	3694.83	43708	1256	1.032
3	2018	5338.20	52062	1167	1.024

Annual Customer Activity Growth Analysis

Average Monthly Active Users (MAU)
per Year

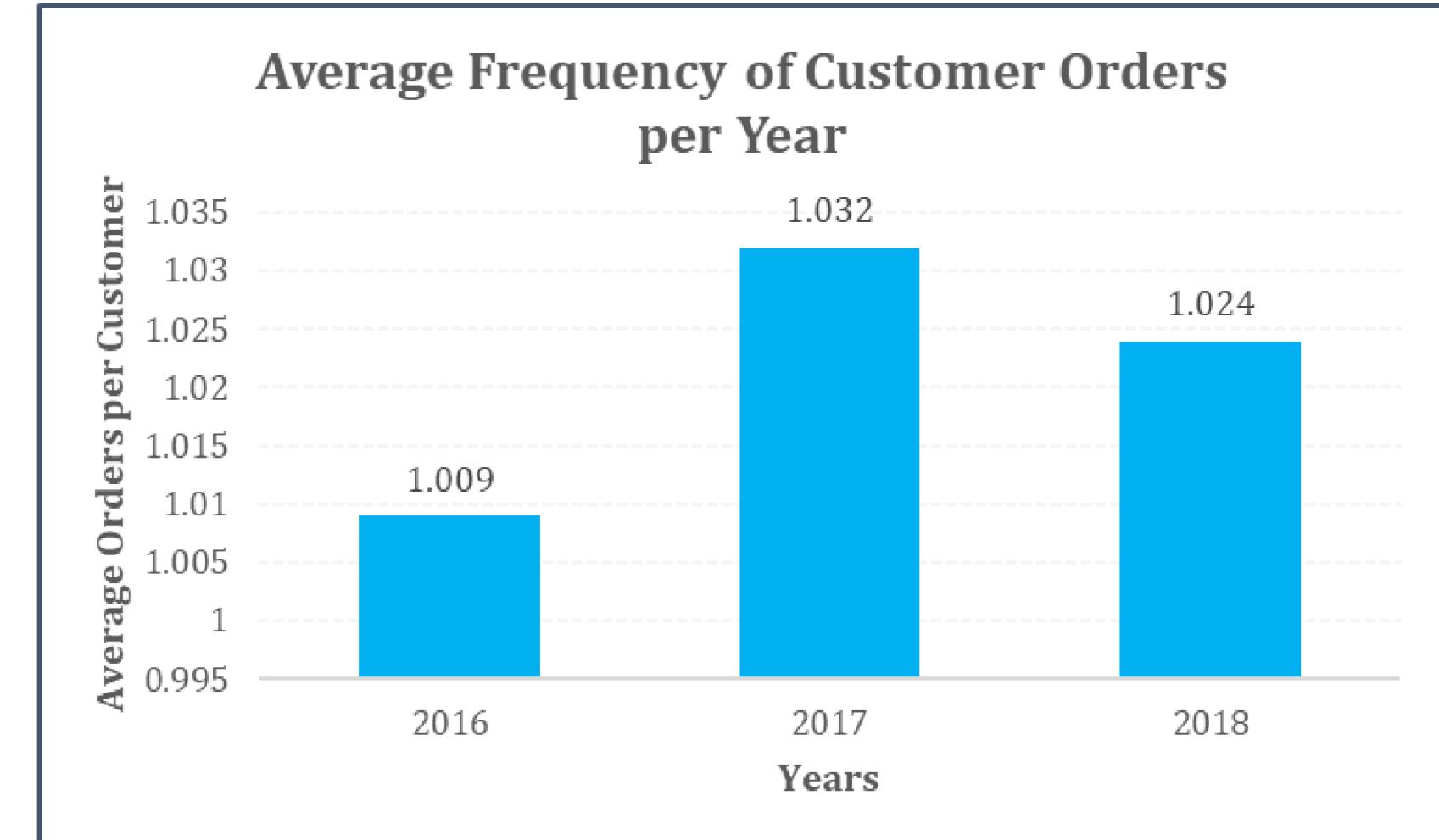
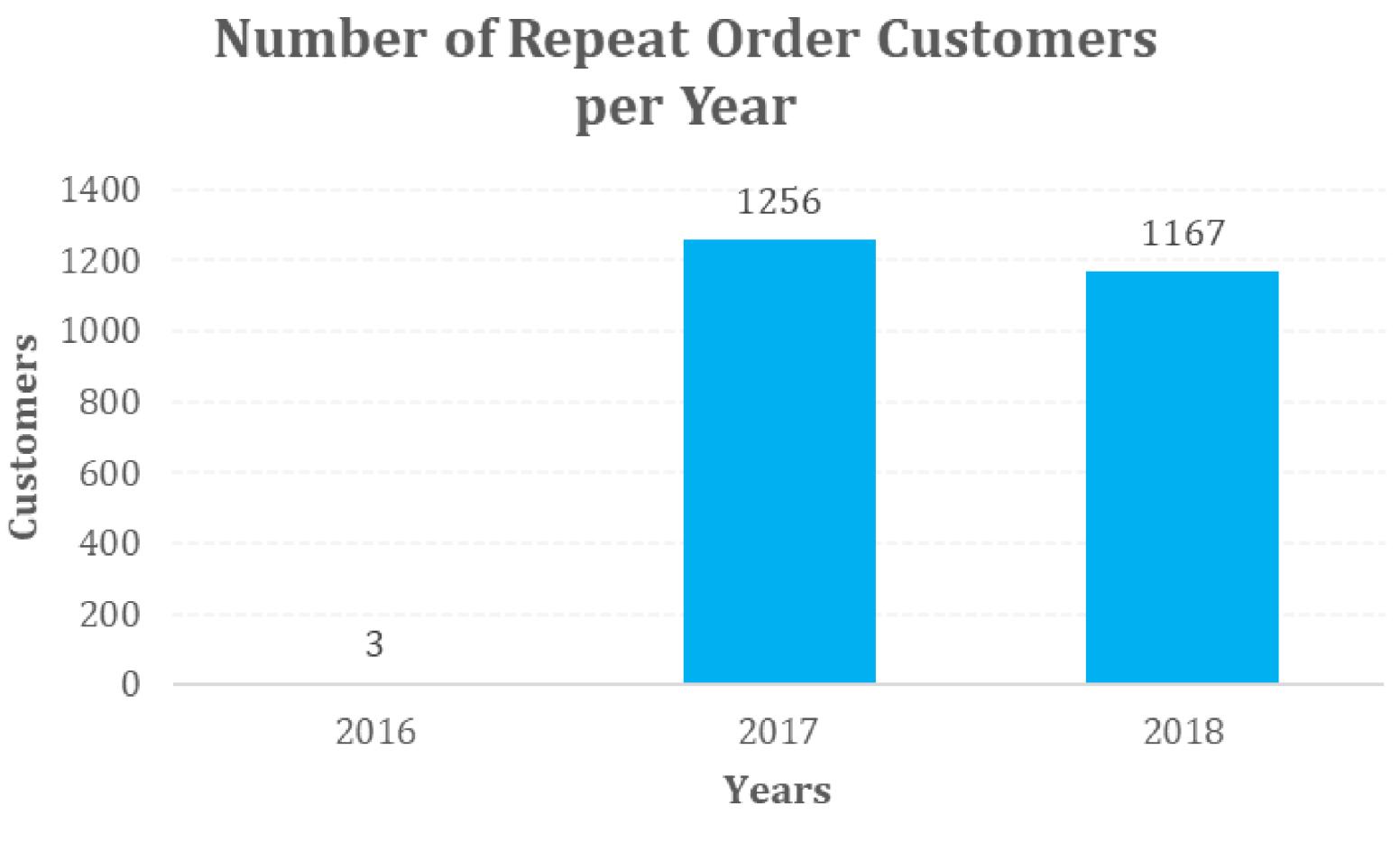


Total Costumers per Year



The available data is from September 2016. This is what caused the average MAU and total customers to be lower in 2016 compared to 2017 and 2018. Overall, the average MAU and the number of new customers have increased from year to year.

Annual Customer Activity Growth Analysis



However, the frequency of customer orders and repeat orders has decreased. It can be seen from the two visualizations above that both the average frequency of customer orders per year and the number of order repeat customers per year from 2017 to 2018 have decreased.

Annual Product Category Quality Analysis

The performance of the eCommerce business is certainly closely related to the products available in it. Analyzing product quality in eCommerce can provide you with the information you need to make better business decisions. Metrics for analyzing product quality for each year of this project include the following:

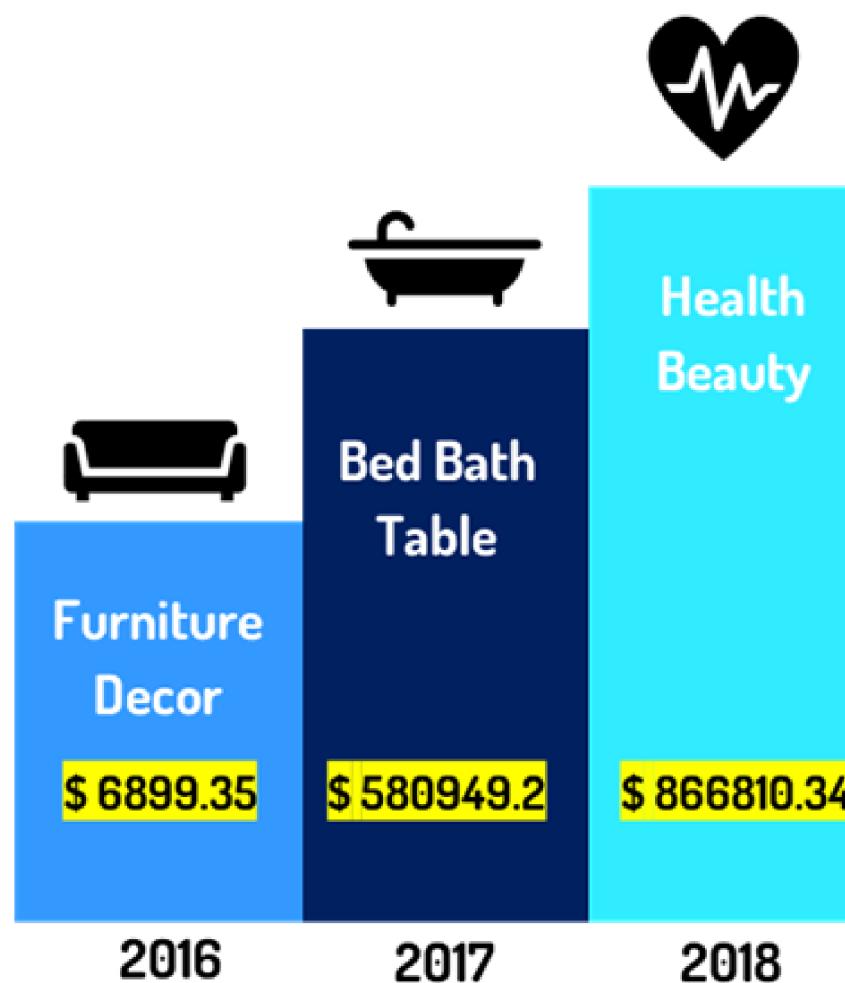
- **Total Revenue per Year**
- **Number of cancelled orders per year**
- **Product Categories with the Highest Annual Revenue**
- **Product Categories with the Most Orders Cancelled Per Year**

Here's a table of query results for each of the metrics above:

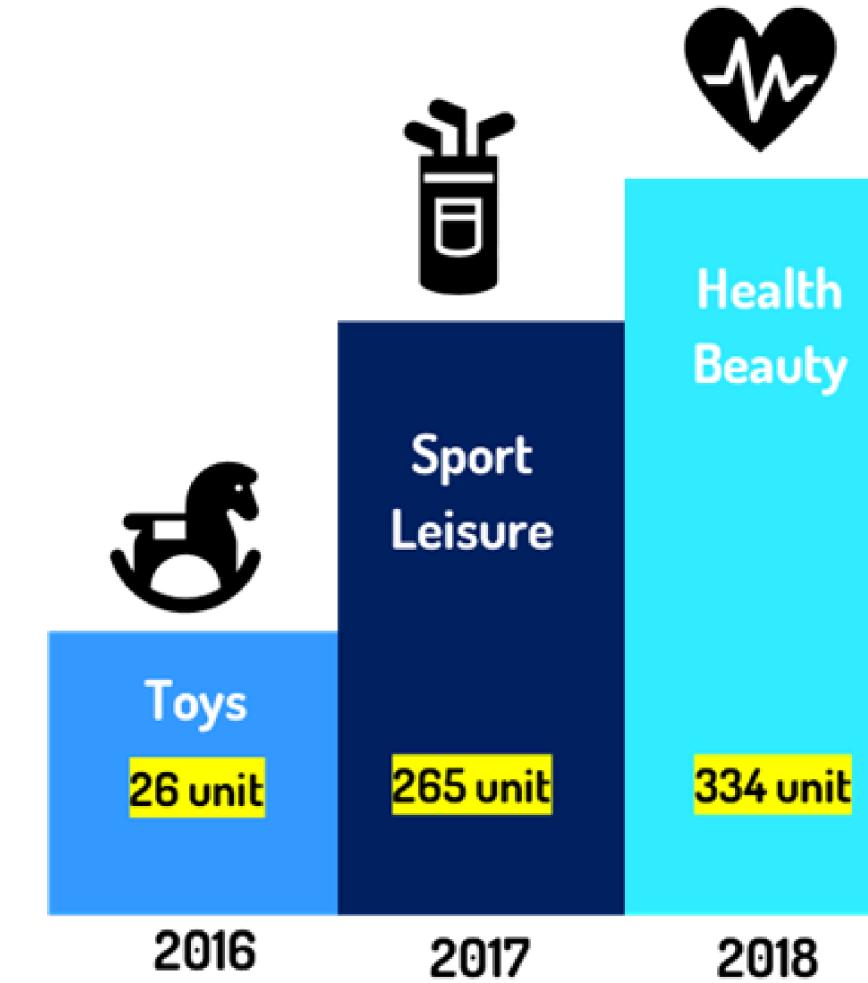
	year double precision	top_product_category_by_revenue character varying (250)	category_revenue double precision	year_total_revenue double precision	most_canceled_product_category character varying (250)	category_num_canceled bigint	year_total_num_canceled bigint
1	2018	health_beauty	866810.3399999982	8451584.76999985	health_beauty	27	334
2	2017	bed_bath_table	580949.2000000012	6921535.239999665	sports_leisure	25	265
3	2016	furniture_decor	6899.35	46653.740000000005	toys	3	26

Annual Product Category Quality Analysis

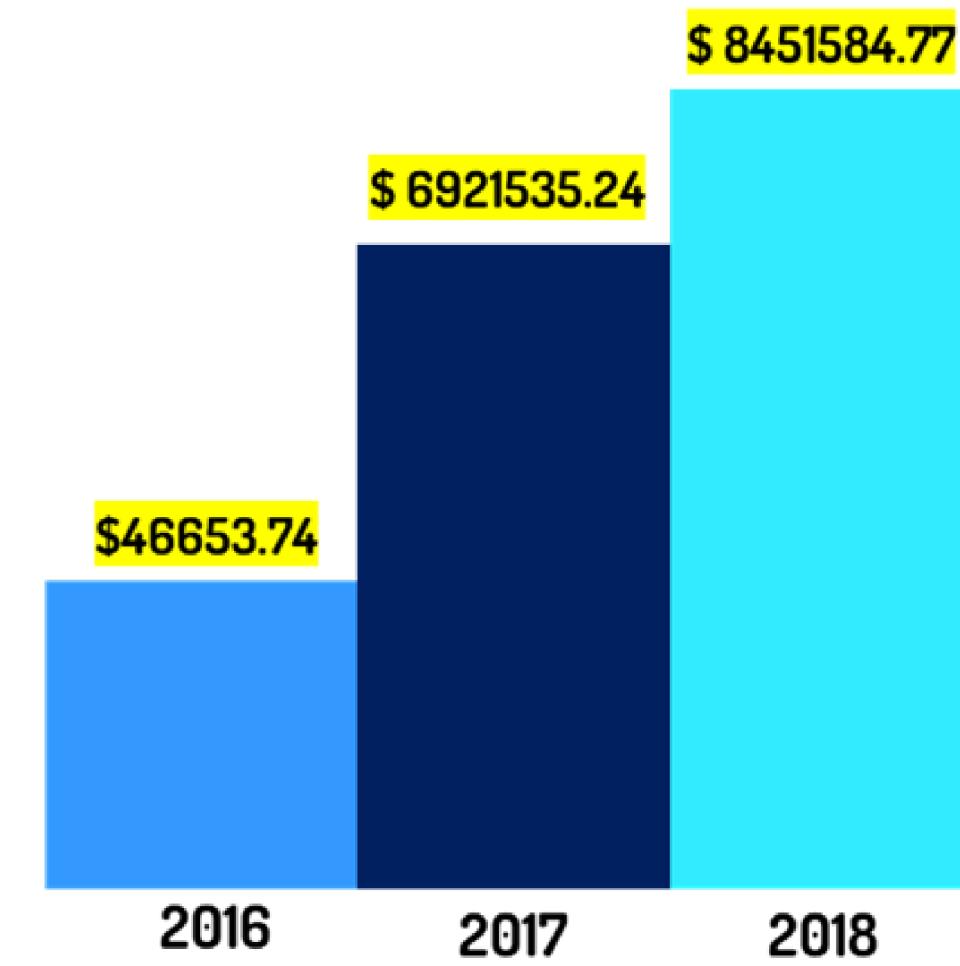
Product categories with the most revenue



Total annual revenue



Product categories with the highest number of cancellations



The interesting thing here is that, in addition to having the highest revenue in 2018, health and beauty products have also had the highest number of cancellations. This may happen because in 2018, the product category that dominated the overall transaction was health and beauty. Further analysis can be carried out to confirm this.

Analysis of Annual Payment Type Usage

eCommerce businesses typically offer open-payment-based payment systems that allow customers to select from a variety of payment options. Analyzing the performance of existing payment types can provide insights to help create better strategic partnerships with payment service providers. There are several metrics that will be analyzed related to the use of payment types in this project, namely as follows:

- **Overall number of payment type users**
- **Annual number of payment type users**

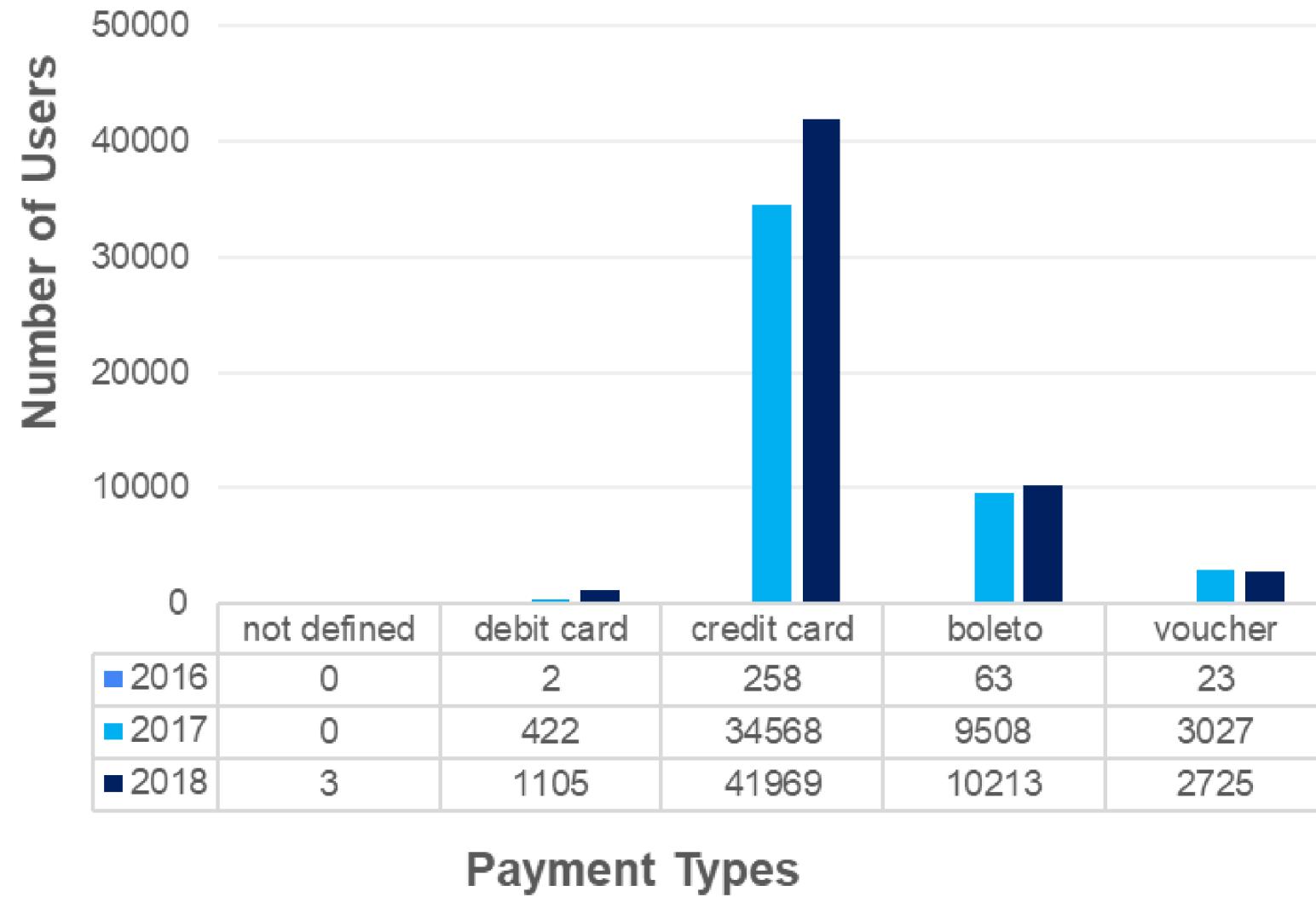
Here's a table of query results for each of the metrics above:

	payment_type character varying (250) 	num_used bigint 
1	credit_card	76795
2	boleto	19784
3	voucher	5775
4	debit_card	1529
5	not_defined	3

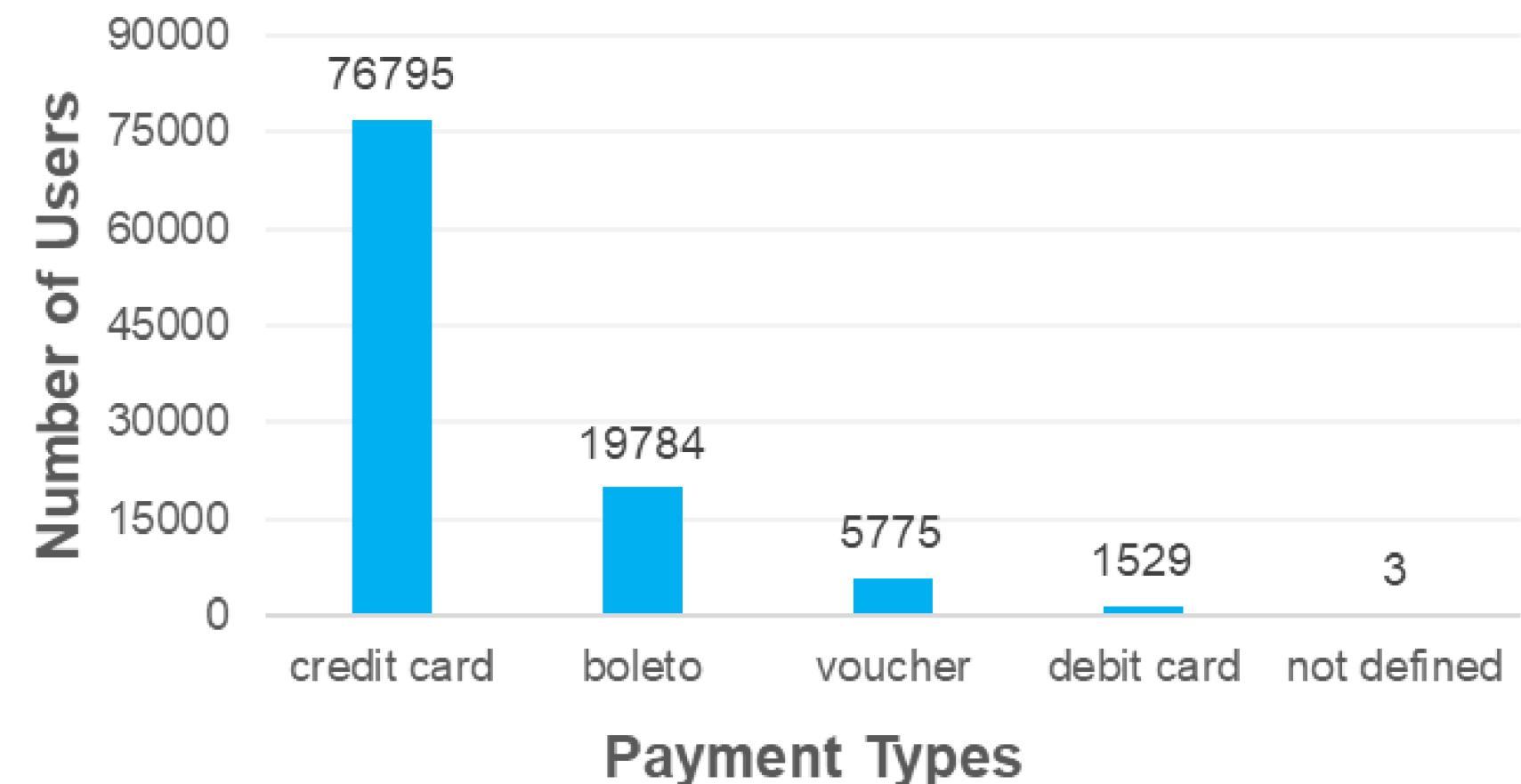
	payment_type character varying (250) 	year_2016 numeric 	year_2017 numeric 	year_2018 numeric 	pct_change_2017_2018 numeric 
1	not_defined	0	0	3	[null]
2	debit_card	2	422	1105	1.62
3	credit_card	258	34568	41969	0.21
4	boleto	63	9508	10213	0.07
5	voucher	23	3027	2725	-0.10

Analysis of Annual Payment Type Usage

Annual Number of Payment Type Users



Number of Users for Each Payment Type



- Overall, the credit card payment method is the largest, so further analysis can be carried out on customer habits in using credit cards, for example, the length of the tenor chosen, what product categories are usually purchased with credit cards, etc.
- All types of payment methods have increased from year to year. However, the use of vouchers has actually decreased. This may occur due to promotions or cooperation with certain debit cards and a reduction in promotion methods using vouchers. Further analysis can be done by confirming with other departments, for example, marketing or business development, regarding this matter.

THANK YOU



Email Address

jonisyofian14@gmail.com

LinkedIn

<https://www.linkedin.com/in/jonisyofian/>