

# The Retail Pulse

“Decoding Sales Performance & Regional Growth of PT  
Sejahtera Bersama”

Muhammad Rizky

PBI - Business Intelligence Analyst at Bank Muamalat

# About MUHAMMAD RIZKY

## Profile Summary

A Physics Education graduate with a strong interest in data analytics and business intelligence. My academic background trained me to think systematically, break down complex problems, and work with data in a structured and logical way. I use this approach to understand patterns, relationships, and signals within data.

I work with SQL, Python, and Power BI to explore data, build simple analyses, and present findings clearly. I am motivated to grow as a data professional, adapt quickly to new datasets and business contexts, and contribute through careful analysis, clear reporting, and a strong willingness to learn and improve.



## Experience

Course	Learning Path	Issuing Organization	Year
Data Science With Python	Statistical analysis, exploratory data research, data cleaning, and automated data processing.	Habiskerja.com	2025
IBM Data Analyst	Data analysis ecosystem, data wrangling, SQL querying, and professional dashboard reporting	Coursera	2023

# Project Overview & Case Study

## Context: Who is PT Sejahtera Bersama?

PT Sejahtera Bersama is an emerging player in the high-tech retail sector, delivering cutting-edge products such as drones, robotics, and educational kits. With a rapidly expanding market, the company now faces the challenge of managing high-volume transactions across diverse regions.

## The Challenge: Why Does This Analysis Matter?

Currently, PT Sejahtera Bersama's data is scattered across four separate entities: **Orders, Customers, Products, and Categories**. Without a **centralized Master Table**, the business operates with fragmented insights, leading to several critical gaps::

- **Hidden Profit Leaders** : It's difficult to track which product categories are actually driving the most revenue.
- **Regional Performance Gaps** : We lack a clear way to compare sales across different cities in real-time.
- **Reliance on Assumptions** : Without a central Master Table, business decisions often depend on "best guesses" rather than solid data.

## The Solution: Turning Raw Data into Clarity

My objective is to bridge these gaps by:

- Engineering a Master Table : Cleaning and merging fragmented datasets using SQL in **BigQuery** to create a "single source of truth".
- Building Visual Intelligence : Developing a high-impact dashboard in **Looker Studio** that translates complex numbers into clear, actionable business trends for the Bank Muamalat ecosystem.

# Data Architecture Overview

Row	ProdNumber	ProdName	Category	Price
1	BP104	Cat Robot Blueprint	1	4.99
2	BP108	Panda Robot Blueprint	1	7.99
3	BP102	Bsquare Robot Blueprint	1	8.99
4	BP106	Hexacopter Drone Blueprint	1	8.99
5	BP101	All Eyes Drone Blueprint	1	9.99

Table BM-Prod

Row	OrderID	Date	CustomerID	ProdNumber	Quantity
1	1758	2021-01-15	923	BP101	1
2	404	2020-03-26	1256	BP101	2
3	575	2020-05-06	635	BP101	2
4	1098	2020-08-25	1480	BP101	2
5	1320	2020-10-10	534	BP101	2

Table BM-Ord

Row	Custo...	FirstName	LastName	CustomerEmail	CustomerPhone	CustomerAddress	CustomerCity	Customer...	Custo...
1	1368	Buck	Meiklam	bmeiklamiv@myspace.com#m...	205-789-4928	8943 Rusk Drive	Birmingham	Alabama	35205
2	260	Charlena	Lille	clillea8@nasa.gov#mailto:clille...	205-464-9921	13293 Macpherson Pass	Birmingham	Alabama	35215
3	1694	Robinia	Balog	rbalogiw@arstechnica.com#ma...	205-133-6098	565 Fairfield Terrace	Birmingham	Alabama	35220
4	1480	Bryna	Cumberpatch	bcumberpatchjr@auda.org.au #mailto:bcumberpatchjr@aud a.org.au#	205-731-4813	6665 Marcy Street	Birmingham	Alabama	35225
5	244	Jobie	Pinchen	jpinchen15@behance.net#mailt...	205-844-2402	4319 Coleman Lane	Birmingham	Alabama	35231

Table BM-Cust

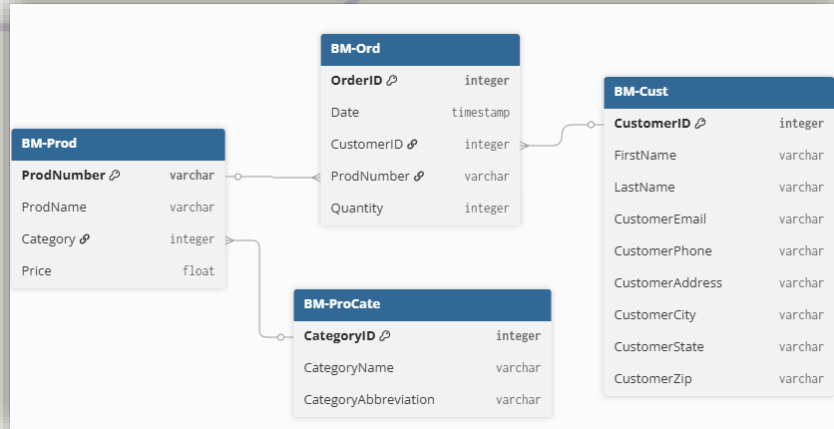
Row	Cate...	CategoryName	Categ...
1	1	Blueprints	BP
2	2	Drone Kits	DK
3	3	Drones	DS
4	4	eBooks	EB
5	5	Robot Kits	RK

Table BM-ProCate

To ensure data integrity, I mapped out the following four entities, identifying their specific attributes and **Primary Keys (PK)** to build a solid relational foundation:

- **BM-Ord Table:** Acts as the central transaction log. It tracks every sale through OrderID (**PK**), Date, CustomerID, ProdNumber, and Quantity.
- **BM-Cust Table:** A detailed database of 9 key attributes: CustomerID (**PK**), FirstName, LastName, CustomerEmail, CustomerPhone, CustomerAddress, CustomerCity, CustomerState, and CustomerZip.
- **BM-Prod Table:** The product catalog containing item-specific details: ProdNumber (**PK**), ProdName, Category (FK), and Price.
- **BM-ProdCate Table:** A reference table to standardize grouping: CategoryID (**PK**), CategoryName, and CategoryAbbreviation.

# Data Preparation & Relational Schema (ERD)



## Primary Key (PK) & Data Types Identification

Establishing a **Single Source of Truth** requires precise key identification and optimized data types:

- **BM-Ord** : **OrderID** as the Primary Key (PK). This table acts as the main transaction table and links orders to customers and products through many-to-one relationships.
- **BM-Cust** : **CustomerID** as the Primary Key (PK). It connects to the orders table in a one-to-many relationship and stores customer identity and location data.
- **BM-Prod** : **ProdNumber** as the Primary Key (PK). It relates to the orders table with a one-to-many relationship so each order references the correct product and price.
- **BM-ProCate** : **CategoryID** as the Primary Key (PK). It has a one-to-many relationship with the products table to organize products into defined technology categories.

# Data Cleaning

```

2 -- Cleaning Customer data: removing 'mailto:' tags, trimming whitespace,
3 -- handling missing states, and removing duplicates/nulls.
4
5 CREATE TABLE `pbi-bank-muamalat.BankMuamalat.BM-Cust_clean` AS
6 SELECT
7   DISTINCT CustomerID,
8   REGEXP_REPLACE(CustomerEmail, r'#mailto:.*?#', '') CustomerEmail_Clean,
9   TRIM(CustomerCity) CustomerCity,
10  COALESCE(TRIM(CustomerState), 'Unknown') CustomerState,
11  FirstName,
12  LastName,
13  CustomerPhone,
14  CustomerAddress,
15  CustomerZip
16 FROM `pbi-bank-muamalat.BankMuamalat.BM-Cust`
17 WHERE CustomerID IS NOT NULL;

```

CustomerEmail

bmeiklamiv@myspace.com#mailto:bmeiklamiv@myspace.com#
clillea8@nasa.gov#mailto:clillea8@nasa.gov#
rbalogiw@arstechnica.com#mailto:rbalogiw@arstechnica.com#
bcumberpatchjr@auda.org.au#mailto:bcumberpatchjr@auda.org.au#
jpinchen15@behance.net#mailto:jpinchen15@behance.net#



CustomerEmail\_Clean

bmeiklamiv@myspace.com
clillea8@nasa.gov
rbalogiw@arstechnica.com
bcumberpatchjr@auda.org.au
jpinchen15@behance.net

## Data Sanitization.

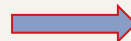
- Create a new cleaned table BM-Cust\_clean from the original customer table to keep raw data unchanged.
- Clean and standardize fields by removing #mailto tags from emails, trimming whitespace in city names, and replacing missing state values with Unknown.
- Remove invalid and duplicate records by filtering out NULL CustomerID values and applying DISTINCT to ensure one row per customer.

```

27 -- Standardizing Product data: Converting Price to FLOAT64 to ensure numerical
28 -- consistency and enable precise aggregation in the visualization layer.
29 CREATE TABLE `pbi-bank-muamalat.BankMuamalat.BM-Prod_clean` AS
30 SELECT
31   ProdNumber,
32   ProdName,
33   Category,
34   -- Using SAFE_CAST to FLOAT64 for calculation efficiency and dashboard compatibility
35   SAFE_CAST(Price AS FLOAT64) AS Price
36 FROM `pbi-bank-muamalat.BankMuamalat.BM-Prod`
37 WHERE ProdNumber IS NOT NULL;

```

Field name	Type
ProdNumber	STRING
ProdName	STRING
Category	INTEGER
Price	INTEGER



column_name	data_type
ProdNumber	STRING
ProdName	STRING
Category	INT64
Price	FLOAT64

## Data Standardization.

- Create a new cleaned product table BM-Prod\_clean to preserve the original dataset.
- Convert the Price column from INT to FLOAT64 using SAFE\_CAST to support accurate calculations and aggregation.
- Filter out records with NULL ProdNumber to keep only valid product entries.

# Data Integration (Building the Master Table)

```
-- Consolidating all entities into a master table with 10 columns
-- Additional columns are placed at the end to maintain task requirements
CREATE OR REPLACE TABLE `pbi-bank-muamalat.BankMuamalat.Master_Sales_Table` AS
SELECT
  o.Date AS order_date,
  pc.CategoryName AS category_name,
  p.ProdName AS product_name,
  p.Price AS product_price,
  o.Quantity AS order_qty,
  -- Business Metric: Revenue
  (p.Price * o.Quantity) AS total_sales,
  c.CustomerEmail_Clean AS cust_email,
  c.CustomerCity AS cust_city,
  -- Additional columns at the end
  c.CustomerState AS cust_state,
  c.CustomerPhone AS cust_phone
FROM `pbi-bank-muamalat.BankMuamalat.BM-Ord` o
LEFT JOIN `pbi-bank-muamalat.BankMuamalat.BM-Cust_clean` c ON o.CustomerID = c.CustomerID
LEFT JOIN `pbi-bank-muamalat.BankMuamalat.BM-Prod_clean` p ON o.ProdNumber = p.ProdNumber
LEFT JOIN `pbi-bank-muamalat.BankMuamalat.BM-ProCate` pc ON p.Category = pc.CategoryID
-- Ensuring data is sorted from the earliest date
ORDER BY order_date ASC;
```

## Structural and time alignment

I merged all required fields into a single table with a fixed 10-column structure, aligned with the project definition from order\_date to cust\_phone. The data is sorted by order\_date in ascending order to support clear time-based analysis and reporting.

## Feature engineering for business analysis

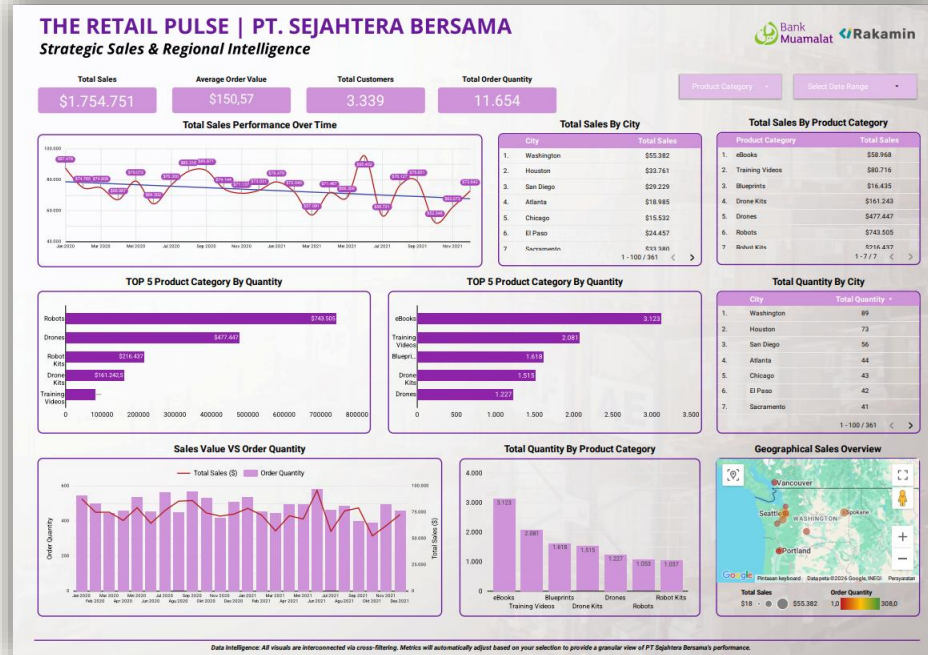
The table includes a derived total\_sales field calculated as Price multiplied by Quantity. This metric is generated at the database level so revenue figures are consistent, reusable, and ready for dashboard consumption without extra transformation.

## Data integrity and analytical coverage

The master table is built entirely from validated *\_clean* tables, ensuring consistent keys, formats, and values. This approach creates a reliable single source of truth and enables multi-dimensional analysis, such as evaluating product category performance by state and customer segment.

Row	order_date	category_name	product_name	produ...	ord...	total...	cust_email	cust_city	cust_state	cust_phone
1	2020-01-01	Drone Kits	BYOD-220	69.0	1	69.0	edew@nba.com	Honolulu	Hawaii	808-945-4067
2	2020-01-01	eBooks	Polar Robots	23.99	2	47.98	fvaslerqt@comsenz.com	Jackson	Mississippi	601-786-0195
3	2020-01-01	eBooks	SCARA Robots	19.5	5	97.5	llespercx@com.com	Des Moines	Iowa	515-193-2721
4	2020-01-01	eBooks	Spherical Robots	16.75	5	83.75	lfromonte9@de.vu	Birmingham	Alabama	205-279-7028
5	2020-01-01	Robots	RWW-75 Robot	883.0	3	2649.0	tmckernot@tinyurl.com	Katy	Texas	832-987-8363

# DASHBOARDING



## The Retail Pulse: Interface Features

### Unified Interactive Design

All visuals run on a single data structure. One user action updates more than 10 visuals at the same time.

### Flexible Filtering Controls

Users can filter by product category. Users can set a custom date range. Time based analysis becomes more precise.

### Full Cross Filtering Experience

Every chart responds to interaction. Maps, bar charts, and tables update instantly. Data exploration feels continuous.

### Geographical Sales Insights

Sales data appears on an interactive map. You can track regional performance. You can spot growth and market reach in real time.



# BUSINESS & INSIGHT

*# Which product category is the most popular in terms of volume, and does it generate the highest revenue?*

Product Category		Total Sales
1.	eBooks	\$58.968
2.	Training Videos	\$80.716
3.	Blueprints	\$16.435
4.	Drone Kits	\$161.243
5.	Drones	\$477.447
6.	Robots	\$743.505
7.	Robot Kits	\$216.437

## Strategic Revenue Drivers

- Market Reach and Revenue Impact
  - eBooks sell the most with 3,123 units**, but **revenue stays low at \$58,968**. This shows wide reach but weak monetization.
  - Robots sell fewer units, yet **bring in \$743,505**. This points to strong margins and high customer willingness to pay.
- Product Mix Strategy
  - Digital products like eBooks and Videos** sit far below hardware in revenue. This clearly splits customers into value seekers and premium buyers.
  - Use eBooks to attract users at scale. Guide them toward higher value products such as Robot Kits.
- Expansion Potential
  - Training **Videos reach 2,081 units**, proving solid interest in learning-based content.
  - Bundle digital training with physical products to increase perceived value. This helps **keep the average order value stable at \$150.57** across categories.

*# Which city is our primary market stronghold, and how much has it contributed to our total sales?*

### Total Sales By City

	City	Total Sales
1.	Washington	\$55.382
2.	Houston	\$33.761
3.	San Diego	\$29.229
4.	Atlanta	\$18.985
5.	Chicago	\$15.532
6.	El Paso	\$24.457
7.	Sacramento	\$33.380

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### Regional Market Intelligence

#### 1. Main Revenue Center

- Washington stands out as the strongest market, **generating \$55,382 in total sales.**
- The city also records the most-high value transactions, which explains the largest bubble on the map.

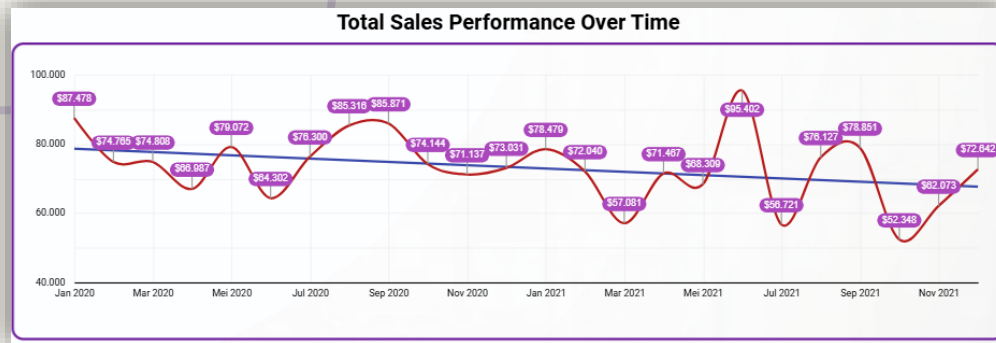
#### 2. Secondary Sales Hubs

- Houston and San Diego come next with **\$33,761 and \$29,229 in revenue.**
- Sales clustering in these three cities shows that the strategy works best in major urban areas.

#### 3. Room for Expansion

- Cities like Sacramento and Chicago still **lag behind with fewer orders.**
- Compare customer behavior, pricing, and channels in Washington and Sacramento. **Apply the same winning approach to boost performance in weaker markets.**

*# How stable is our revenue performance over time, and do we have a consistent quality of transactions despite monthly fluctuations?*



**Average Order Value**

**\$150,57**

## Sales Momentum & Transactional Health

### 1. Trend Volatility & Stability

- The revenue performance **shows significant fluctuations** throughout 2021, with major peaks reaching \$85K in March and September.
- Despite these swings, **the Average Order Value (AOV) remains remarkably stable at \$150.57**, proving consistent transaction quality regardless of monthly volume.

### 2. Strategic Growth Focus

- With a total of 11,654 orders processed**, the business exhibits **strong** operational scale and a healthy customer-to-order ratio.
- To ensure predictable cash flow, the focus should shift **to frequency-based promotions during identified "low" months** like **April** and **July** to flatten the revenue volatility.

# Strategic Recommendation (Summary)

Based on **The Retail Pulse** dashboard analysis, our business shows strong fundamentals with a healthy **Average Order Value of \$150.57**. However, to move from just tracking data to driving real growth, we need to address the gap between our high-volume digital products and our high-value hardware revenue. Moving forward, our strategic roadmap will focus on these key areas:

- 1. Smart Bundling:** We must leverage the massive reach of **eBooks (3,123 units)** to "pull" sales for premium products like **Robots (\$743,505 in sales)**. Creating a "Starter-to-Pro" bundle will help convert low-spending digital users into high-value hardware customers.
- 2. Stabilizing the Trend:** Since our revenue hits noticeable dips in **April and July**, we need to implement "Mid-Quarter" loyalty campaigns during these periods. This will help flatten the volatility in our sales curve and ensure a more predictable monthly cash flow.
- 3. The Washington Blueprint:** We will treat **Washington (\$55,382)** as our gold standard for regional success. By analyzing the customer behavior there, we can replicate the same marketing playbook in underperforming cities like **Sacramento** to boost their contribution.
- 4. Quality Over Quantity:** While we want more orders, we must protect our **\$150.57 AOV**. Any future discount or promotional strategy must be designed to maintain this transaction quality, ensuring we keep attracting high-value customers.

# THANK YOU

I walked through the key insights from The Retail Pulse dashboard, focusing on product performance, regional strengths, and overall sales patterns. Based on these findings, the next steps are clear. Bundle the right products and apply the Washington playbook to other markets. This approach gives us a strong path toward more stable and sustained growth.

**Muhammad Rizky**

PS. This video captures the core of the presentation. You can see the key insights and the main analysis flow. [Click Logo Below]

