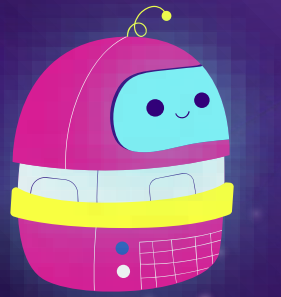
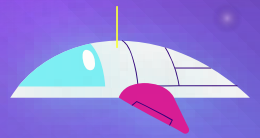
BOKHO

# Business Intelligence technology & Automation Processes to make more accurate decisions for sales operations





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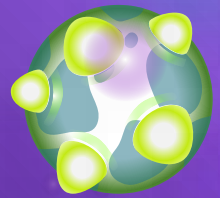
# OUTLINE

# I. INTRODUCTION

## Scope

- Helps to analyze data and enhance the decision-making process.
- Identify the customer segments of the business.
- How is the sales performance of the business?
- What is the tendency of customers' purchasing behaviors?

# I. INTRODUCTION



## Value & Desired outcome

- An effective Business Intelligence solution that includes data collection, storage, processing, analysis, and presentation of results
- Automation in BI saves time, reduces errors, and boosts productivity from data source to end-user.

# I. INTRODUCTION

## Sales Business Process

# I. INTRODUCTION


*Cre: SuperOffice. (2023, February 21). Sales Process: A Structured Approach to Closing Sales Faster! https://www.superoffice.com/blog/sales-process/*

# II. BUSINESS REQUIREMENTS ANALYSIS

How is the sales performance of the business?

Identify the customer segments of the business?

What is the tendency of customers' purchasing behaviors?

# II. BUSINESS REQUIREMENTS ANALYSIS

**How is the sales performance of the business?**

**1. Discover sales performance by regions**

Acknowledge the regions that are performing well or not.

Adapt their marketing and sales strategies better.

Providing useful insights into customer behaviors and preferences in different places.

# II. BUSINESS REQUIREMENTS ANALYSIS

**How is the sales performance of the business?**

**2. Acknowledge sales performance across online and offline channels**

Identify which channels generate the most revenue, which channels are performing poorly.

Identify most effective channels for promoting specific product items.

# II. BUSINESS REQUIREMENTS ANALYSIS

**How is the sales performance of the business?**

**3. Evaluate sales performance by analyzing delivery performance in different regions**

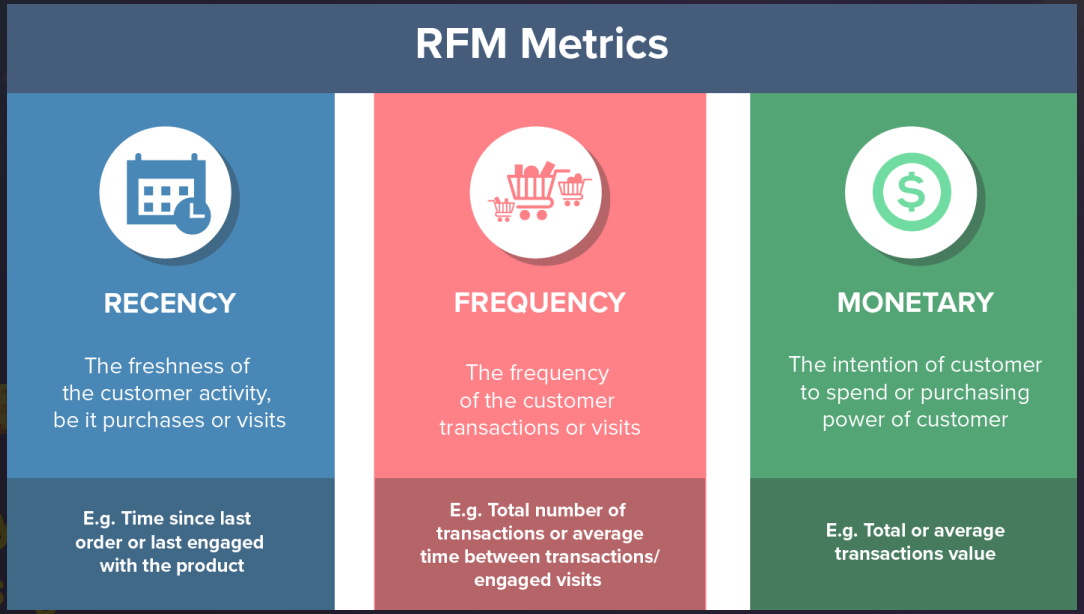
Is one of the determining factors of customer satisfaction.

The decision-maker can easily track status, optimize transportation costs, and make decisions that improve customer satisfaction.

# II. BUSINESS REQUIREMENTS ANALYSIS

Identify the customer segments of the business?

1. Identify customer segments using RFM model




*Cre: Digalyst. (2022, March 5). Mô hình RFM - Phân tích RFM: Làm Marketing phải biết! - Digalyst. Digalyst. https://digalyst.com/digital-marketing/mo-hinh-rfm-phan-tich-rfm-lam-marketing-phai-biet/*

- Customize their marketing efforts for each group.
- Creation of more personalized experiences for individual customers, which can result in increased customer loyalty and satisfaction.

# II. BUSINESS REQUIREMENTS ANALYSIS

**What is the tendency of customers' purchasing behaviors?**

**1. Analyze customer trends in purchasing behavior for specific products using cross-selling**

Analyze customer trends in purchasing behavior for specific products using cross-selling.


What is the t
of custom
purchasing behaviors?

asing behavior for

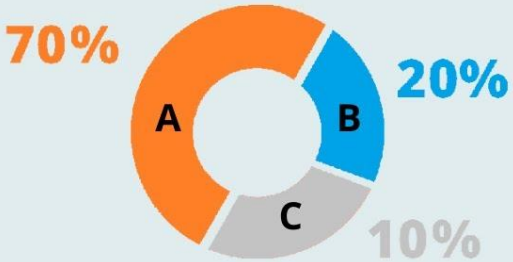
- Cross-selling data helps businesses identify the products that customers tend to purchase together, which can provide valuable insight into what customers are looking for.

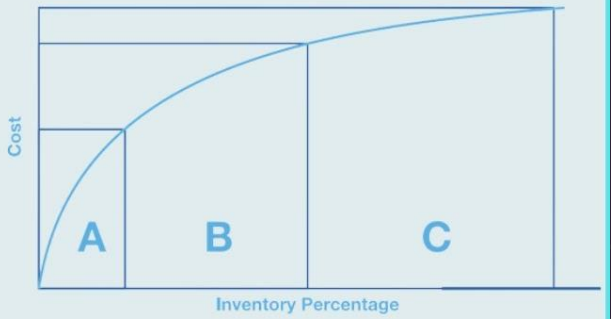
# II. BUSINESS REQUIREMENTS ANALYSIS

What is the tendency of customers' purchasing behaviors?

2. Categorize products items based on their importance by ABC classification.

# ABC Analysis

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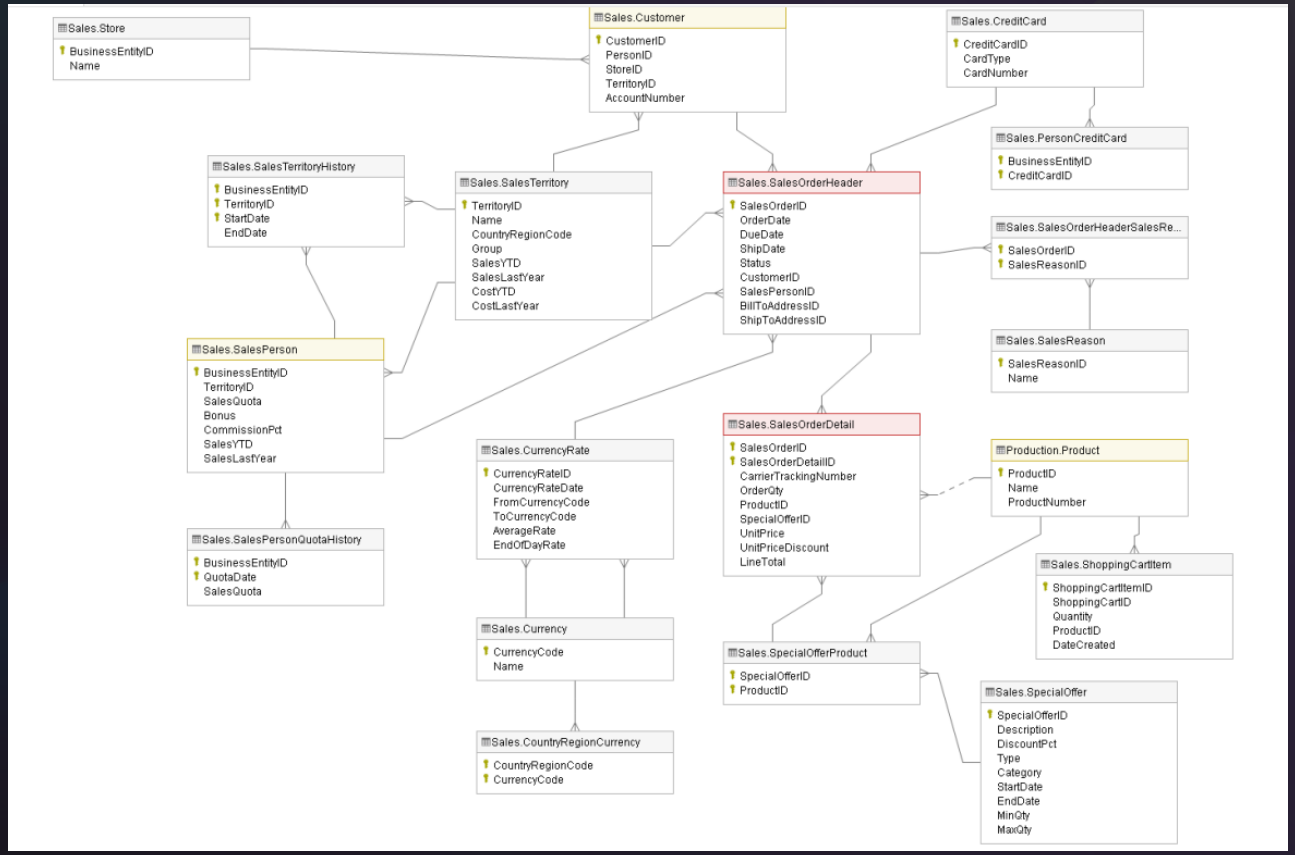
- Gain insights into customer demand and behavior
- Reduce the cost, optimize their supply chain and minimize inventory management costs.

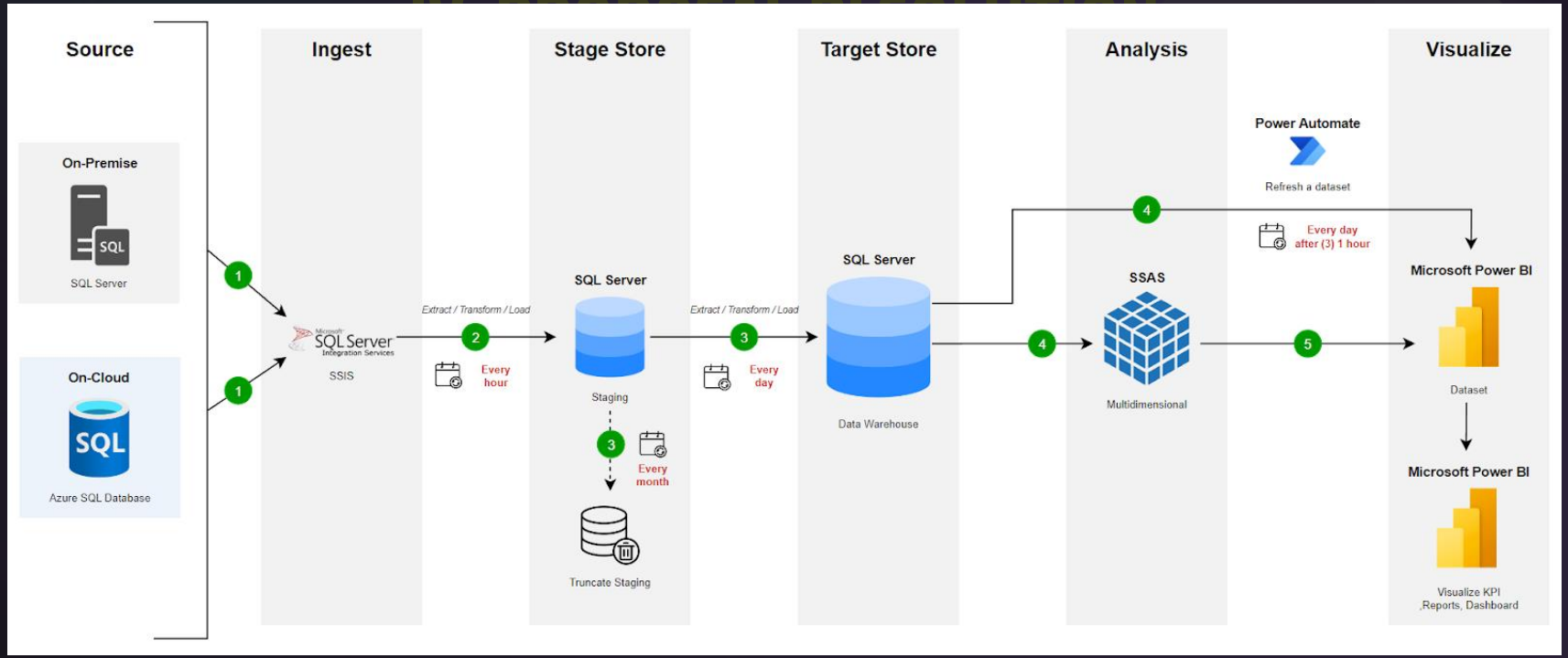
# III. DATA SOURCE ADVENTUREWORKS DATABASE

# SCHEMA SALES






Cre: https://learn.microsoft.com/en-us/sql/samples/adventureworks-install-configure?view=sql-server-ver16&tabs=ssms




BI Solution (Source: Author's proposal)

# V. BUILDING DATA WAREHOUSE

# 1. BUS MATRIX

| | Employee | Product | Customer | Store | Channel | Geography | ShipMethod | Date |
|---|---|---|---|---|---|---|---|---|
| Customer segmentation | | | x | | | | | x |
| Delivery performance tracking | | | | | x | x | x | x |
| Sales performance by channel | x | | x | x | x | | | x |
| Sales performance by region | | | | | | x | | x |
| Purchasing behavior | | x | x | | x | x | | x |
| ABC Classification | | x | x | | x | x | | x |

# V. BUILDING DATA WAREHOUSE

## 2. MASTER DATA

| Object | Description |
|---|---|
| Customer | Information about Customers (Name,YearlyIncome, Gender..) |
| Employee | Information about Employee(Name, Birth Date, Gender..) |
| Product | Information about Products (SubCategory, Category, Name..) |
| Store | Information about Stores (Name, Year Opened..) |
| Geography | Information about Postal Code, Region.. |
| Ship Method | Information about Ship Methods |

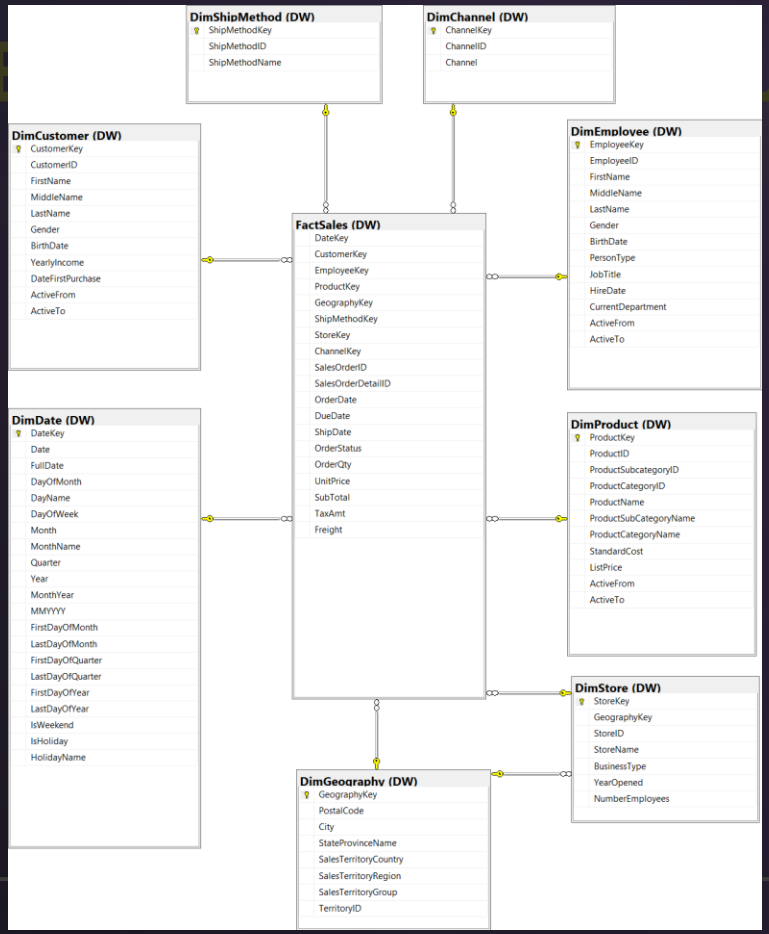
## 3. TRANSACTION DATA

| Object | Description |
|---|---|
| Order Header Transaction Data | Information about SubTotal, TaxAmt, Freight, TotalDue.. |
| Order Detail Transaction Data | Information about ProductID, Order Quantity, Unit Price. |

# 4. ETL MAPPING

| DataWarehouse | | | DataSource | | | | |
|---|---|---|---|---|---|---|---|
| **FactSales** | | | | | | | |
| CustomerKey | int | | DimCustomer | CustomerKey | int | | Look up from [DimCustomer].[CustomerKey] |
| EmployeeKey | int | | DimEmployee | EmployeeKey | int | | Look up from [DimEmployee].[EmployeeKey] |
| ProductKey | int | | DimProduct | ProductKey | int | | Look up from [DimProduct].[ProductKey] |
| ShipMethodKey | int | | DimShipMethod | ShipMethodKey | int | | Look up from [DimShipMethod].[ShipMethodKey] |
| GeographyKey | int | | DimGeography | GeographyKey | int | | Look up from [DimGeography].[GeographyKey] |
| DateKey | int | | DimDate | DateKey | int | | Look up from [DimDate].[DateKey] |
| StoreKey | int | | DimStore | StoreKey | int | | Look up from [DimStore].[StoreKey] |
| ChannelKey | int | | DimChannel | ChannelKey | int | | Look up from [DimChannel].[ChannelKey] |
| OrderDate | datetime | | Sales.SalesOrderHeader | OrderDate | datetime | | From source |
| DueDate | datetime | | Sales.SalesOrderHeader | DueDate | datetime | | From source |
| ShipDate | datetime | yes | Sales.SalesOrderHeader | ShipDate | datetime | yes | From source |
| OrderStatus | tinyint | | Sales.SalesOrderHeader | Status | tinyint | | From source |
| OrderQty | smallint | | Sales.SalesOrderDetail | OrderQty | smallint | | From source |
| UnitPrice | money | | Sales. SalesOrderDetail | UnitPrice | money | | From source |
| SubTotal | money | | Sales.SalesOrderHeader | SubTotal | money | | From source |
| TaxAmt | money | yes | Sales.SalesOrderHeader | TaxAmt | money | | From source |
| Freight | money | | Sales.SalesOrderHeader | Freight | money | | From source |

# 5. DATA WAREHOUSE MODEL

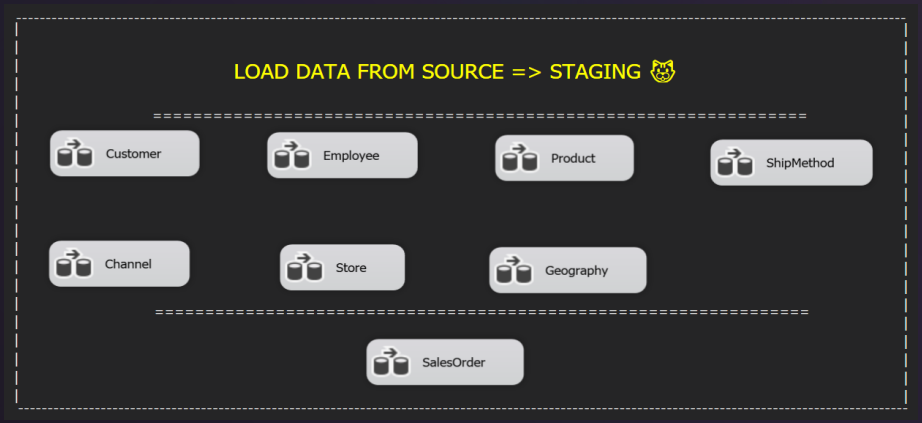



Data Warehouse
Star Schema

# 6. ETL PROCESSES

V. BUILDING DATA WAREHOUSE

## 6.1 Load Source to Staging



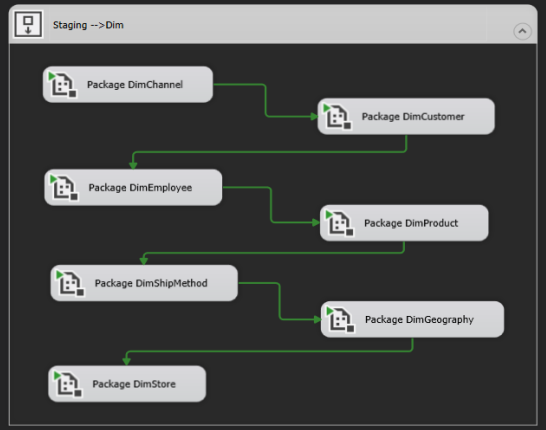

To break down the amount of data being loaded from the source into staging, we have set up an automated system to run every hour.

# 6. ETL PROCESSES

## V. BUILDING DATA WAREHOUSE

### 6.2 Load Staging to Data warehouse

LOAD DATA FROM STAGING --> DIM




LOAD DATA FROM STAGING --> FACT


To enable observers to track the fluctuation of the business, data used for reporting in the data warehouse will be updated on a daily basis.

# 6. ETL PROCESSES

V. BUILDING DATA WAREHOUSE

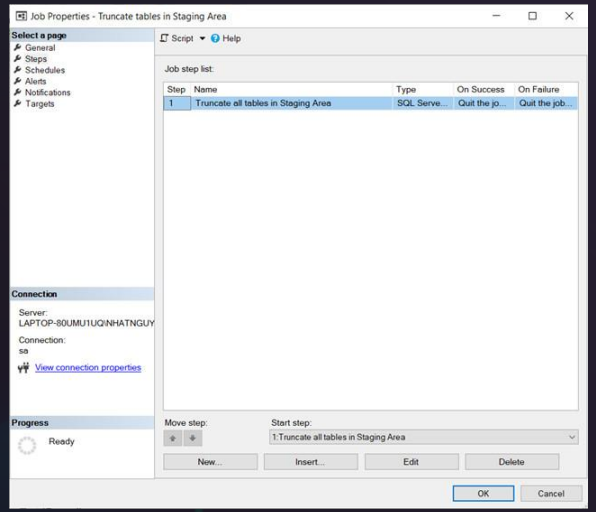
## 6.3 Truncate Staging


To save storage space, data in staging will be deleted every month upon confirmation that there are no issues in the data warehouse.

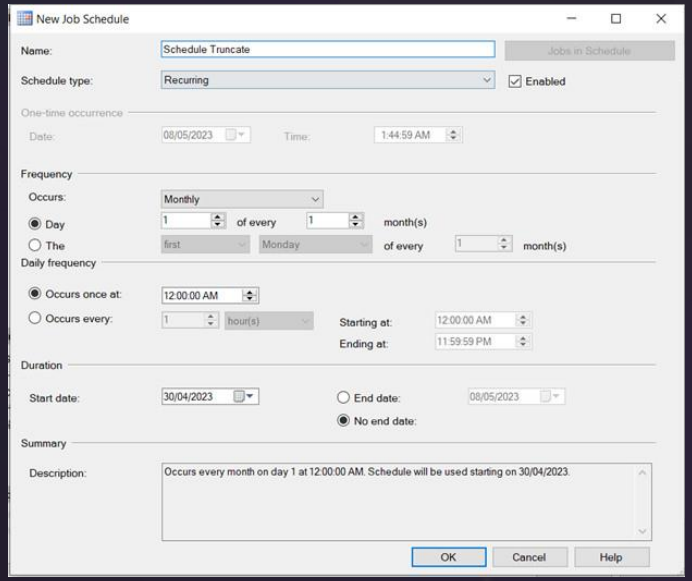
# 6. ETL PROCESSES

## 6.4 Schedule job (local implement)





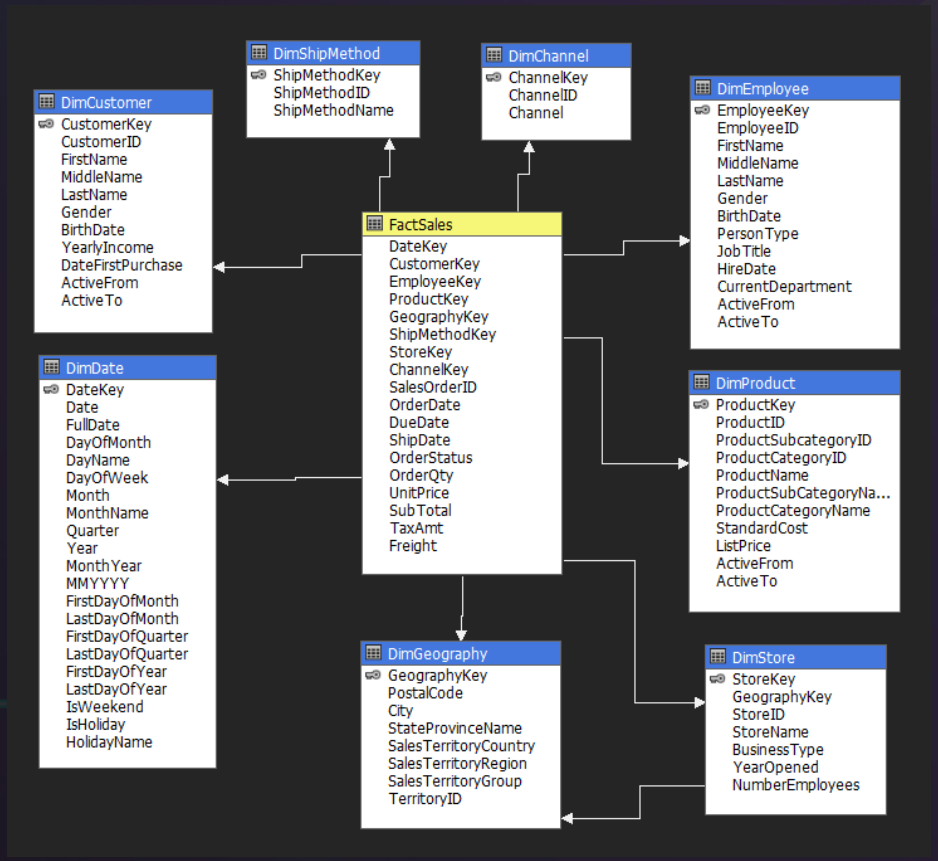

Configure the ETL steps




Determine the suitable time for this iteration based on our business needs

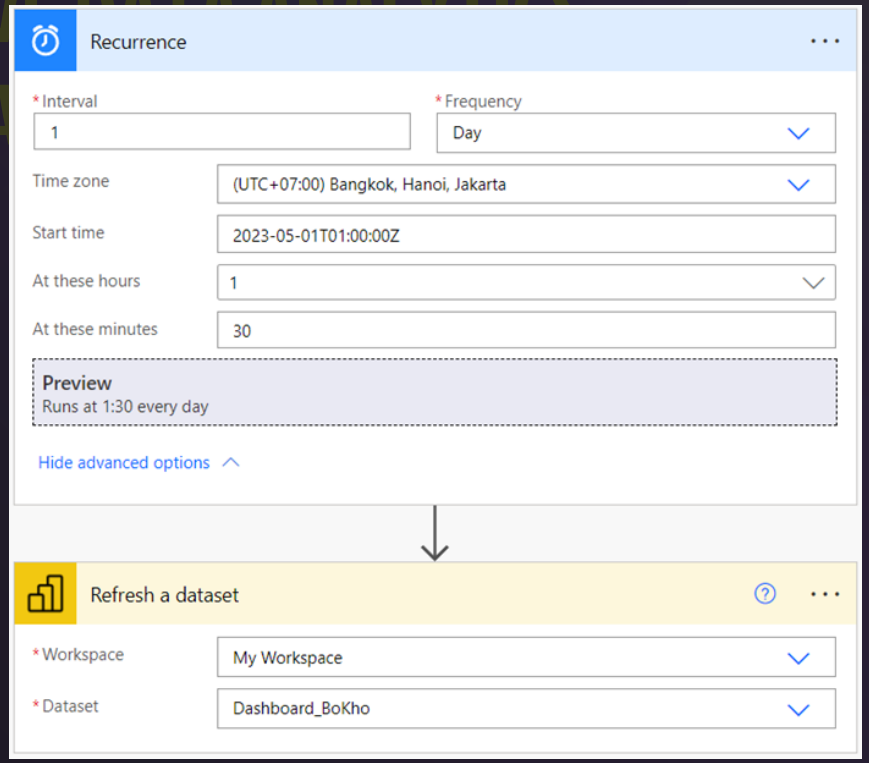
# VI. DATA ANALYTICS AND VISUALIZATION

# 1. SASS TECHNOLOGY

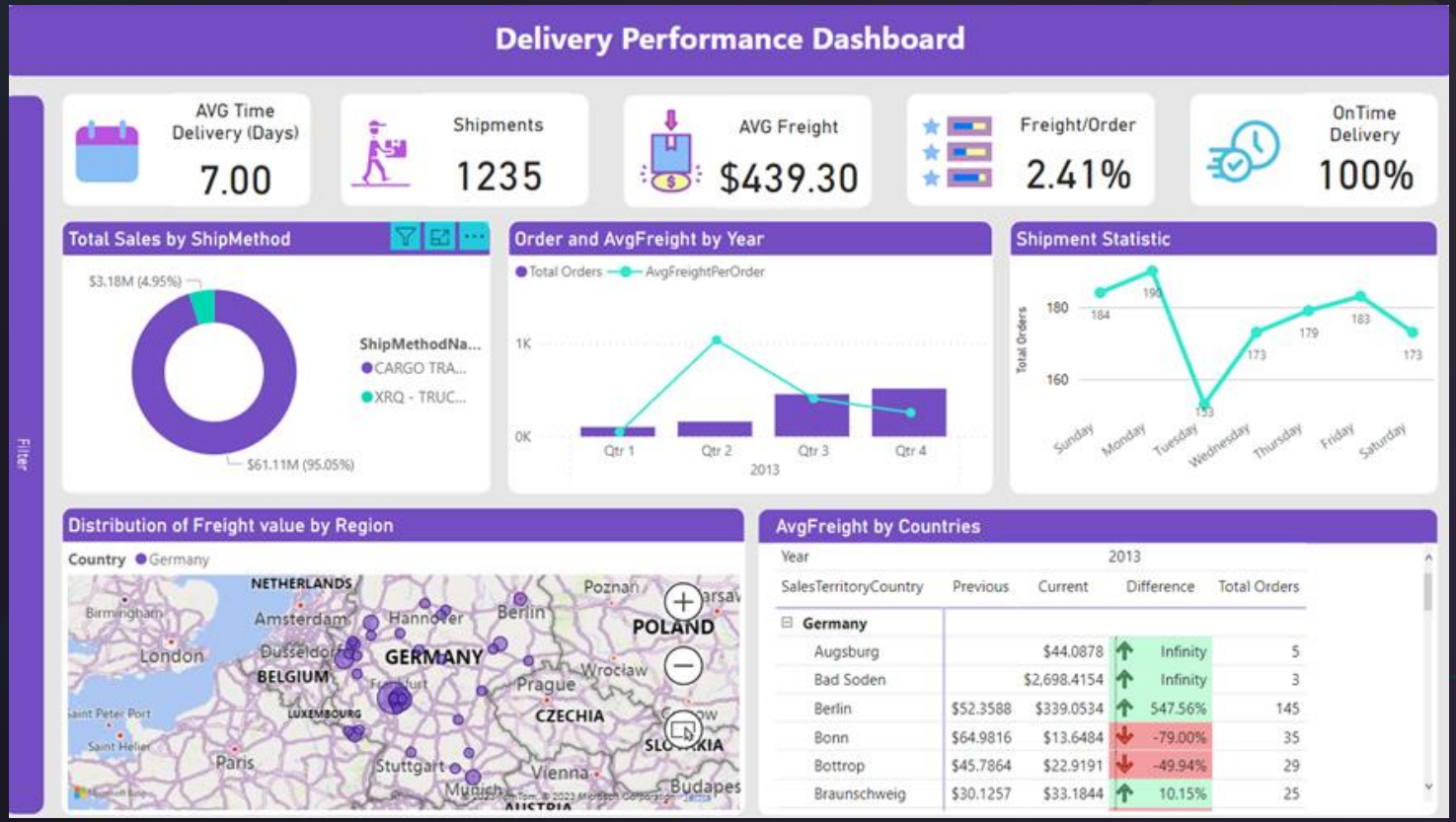


# 2. INCREMENTAL REFRESH USING POWER AUTOMATE

Power Automate



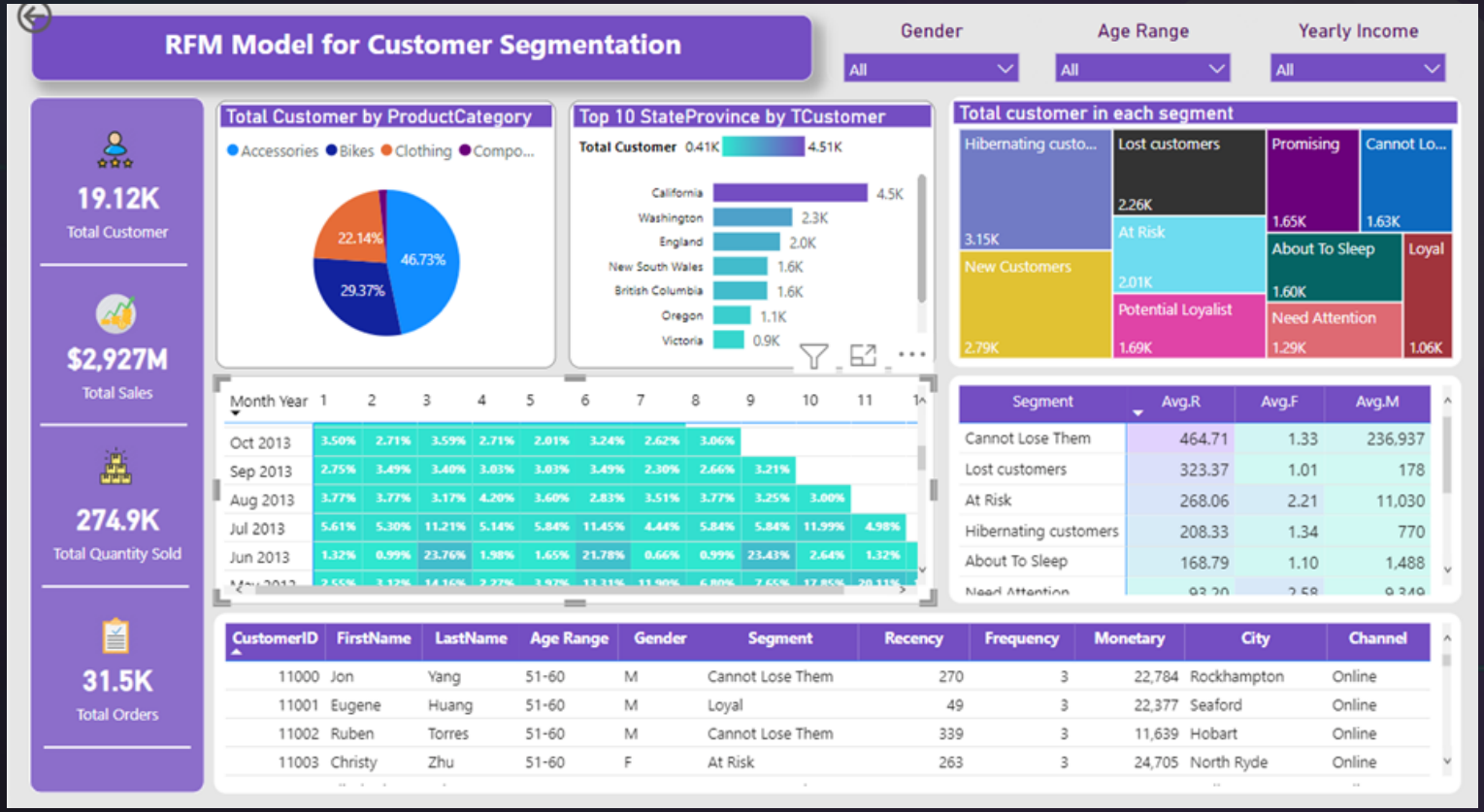
# 3. POWER BI






3.1 Delivery Performance

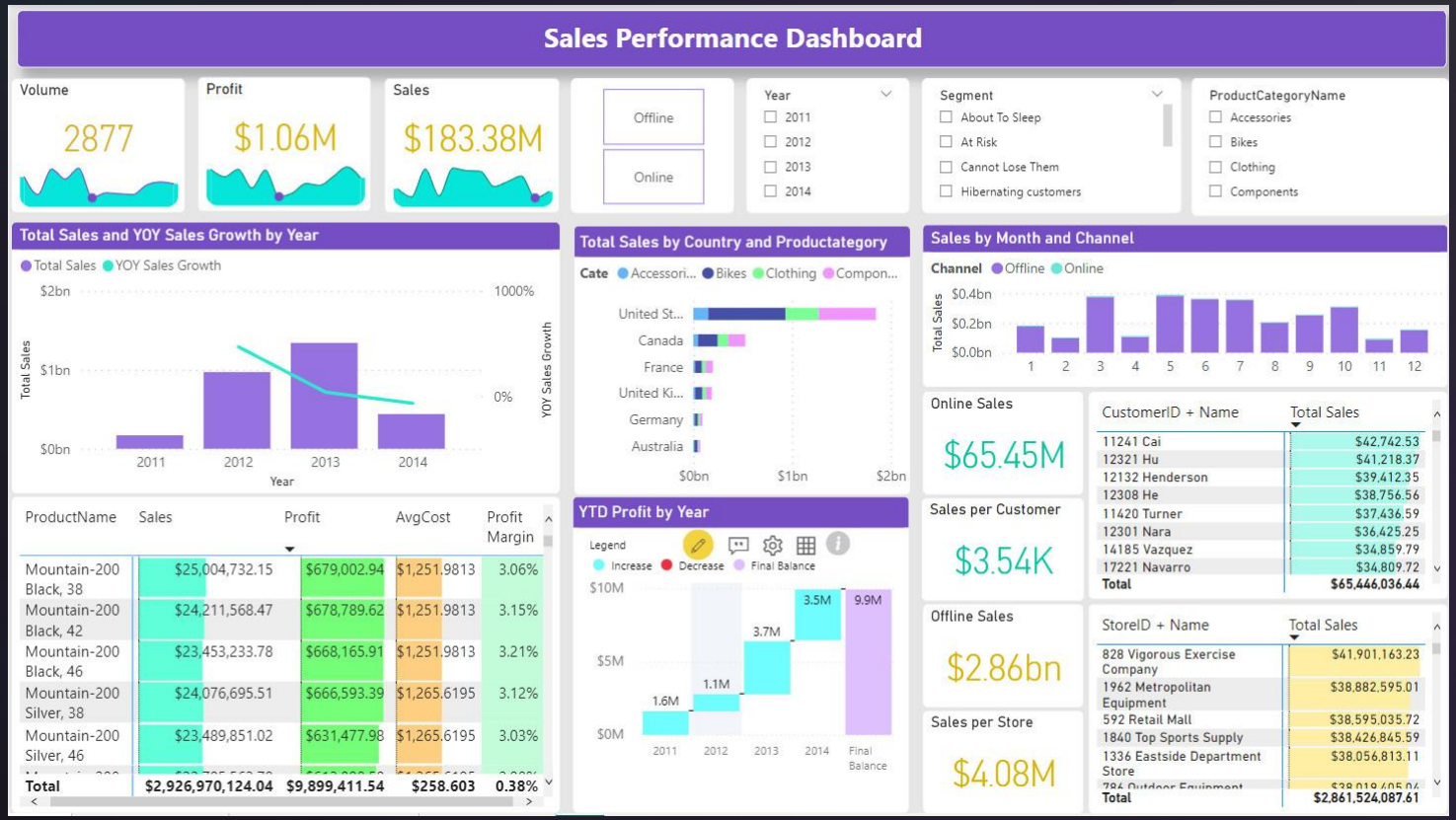
# 3. POWER BI






3.2 RFM

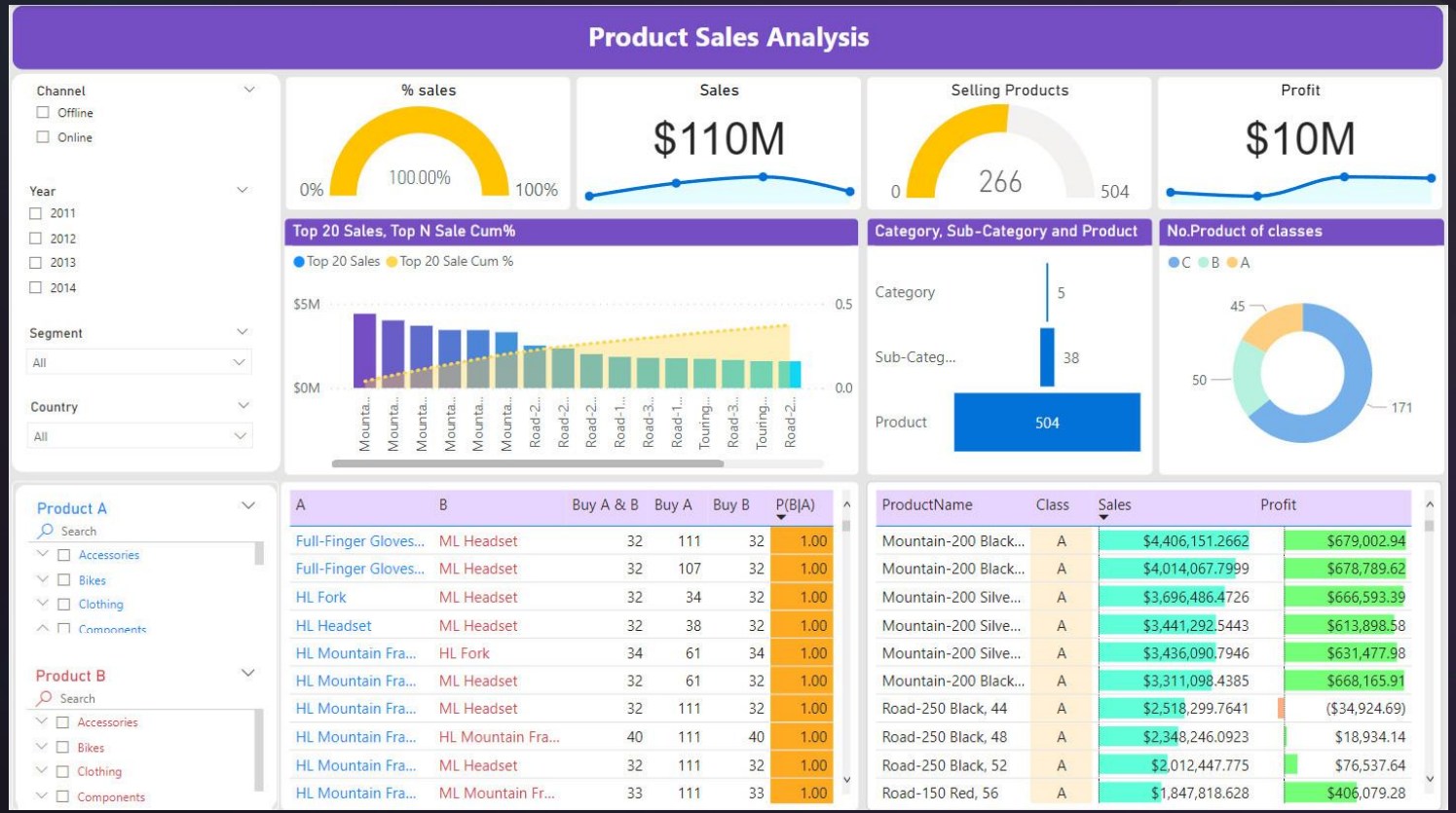
# 3. POWER BI






3.3 Sales Performance

# 3. POWER BI




| A | B | Buy A & B | Buy A | Buy B | P(B\|A) |
|---|---|---|---|---|---|
| Full-Finger Gloves... | ML Headset | 32 | 111 | 32 | 1.00 |
| Full-Finger Gloves... | ML Headset | 32 | 107 | 32 | 1.00 |
| HL Fork | ML Headset | 32 | 34 | 32 | 1.00 |
| HL Headset | ML Headset | 32 | 38 | 32 | 1.00 |
| HL Mountain Fra... | HL Fork | 34 | 61 | 34 | 1.00 |
| HL Mountain Fra... | ML Headset | 32 | 61 | 32 | 1.00 |
| HL Mountain Fra... | ML Headset | 32 | 111 | 32 | 1.00 |
| HL Mountain Fra... | HL Mountain Fra... | 40 | 111 | 40 | 1.00 |
| HL Mountain Fra... | ML Headset | 32 | 111 | 32 | 1.00 |
| HL Mountain Fra... | ML Mountain Fr... | 33 | 111 | 33 | 1.00 |

| ProductName | Class | Sales | Profit |
|---|---|---|---|
| Mountain-200 Black... | A | $4,406,151.2662 | $679,002.94 |
| Mountain-200 Black... | A | $4,014,067.7999 | $678,789.62 |
| Mountain-200 Silve... | A | $3,696,486.4726 | $666,593.39 |
| Mountain-200 Silve... | A | $3,441,292.5443 | $613,898.58 |
| Mountain-200 Silve... | A | $3,436,090.7946 | $631,477.98 |
| Mountain-200 Black... | A | $3,311,098.4385 | $668,165.91 |
| Road-250 Black, 44 | A | $2,518,299.7641 | ($34,924.69) |
| Road-250 Black, 48 | A | $2,348,246.0923 | $18,934.14 |
| Road-250 Black, 52 | A | $2,012,447.775 | $76,537.64 |
| Road-150 Red, 56 | A | $1,847,818.628 | $406,079.28 |



3.4 Product Sales Analysis

# VI. DATA ANALYTICS AND VISUALIZATION

## What can we solve requirements with dashboards ?

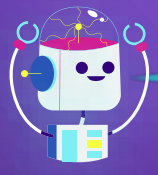
- Marketing strategies for 3 main segments.

- Optimize delivery performance.

- Enhance sales performance.

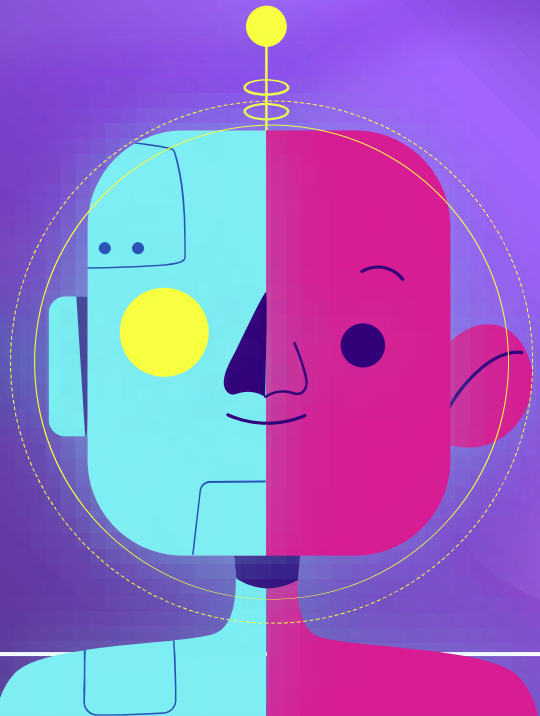
- Product-based strategy.

# VII. CONCLUSION

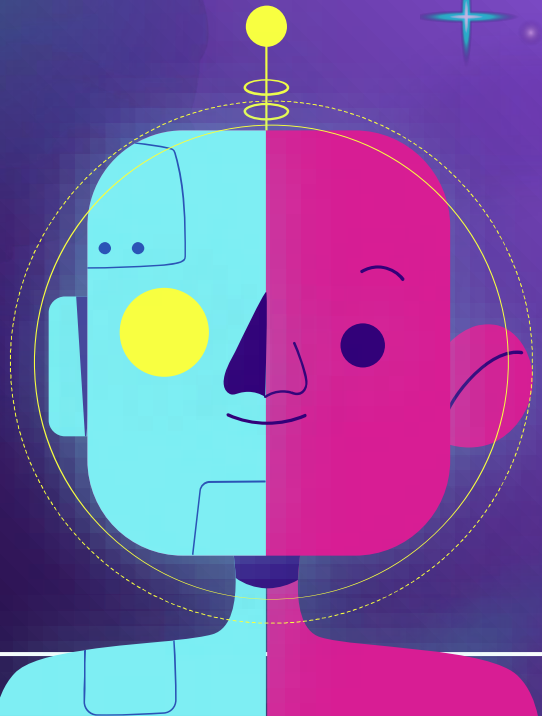


## Results

- Able to acknowledge the process of implementing a BI solution
- The data warehouse was built to meet the sales team's requirements
- Make ETL process automatically from sources to data warehouse and from data warehouse to visualization tools.



# VII. CONCLUSION



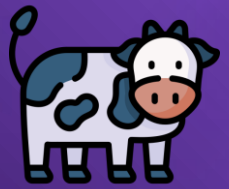
## Limitations

- The ETL process time-consuming and inefficient.
- We have not been able to store the data warehouse in the cloud yet.

# VII. CONCLUSION

## Future works

- Integrating with Python to produce more models about forecasting and propose useful insights for business.
- Utilizing various visualization tools such as Tableau, Qlik to have diverse forms of dashboards.



# Thanks!