

# PHARMACEUTICAL COMPANY DATABASE MANAGEMENT AND ANALYSIS

GROUP 04  
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## **Problem Setting :**

Pharmacy is one of the main components of a thriving human civilization and is extremely important to the standard of living and defines the health and sanitation of the country or city. Hence it is extremely important that medicines are in the right hands and is distributed extremely efficiently across a vast range of networks. A database for a Pharmacy is an extremely efficient and an important tool in maintaining its distribution network. In this particular problem, we will see how to create a database and a multidimensional schema for a company called Glenn Pharma responsible for supplying medicines across Massachusetts.

## **Problem Definition :**

This project intends to build the database design of a business model similar to a Pharmaceutical database. Keeping extensibility and scalability in mind, we will build a module that can be converted to a microservice architecture or transferred to a data warehouse to perform data analysis for the prediction of future trends in technologies. The transformed data is loaded in a data warehouse where analysis is done. A few of the analysis topics are mentioned below:

1. What drug generates the maximum revenue
2. Who are the top performing salesmen?
3. Who are the biggest customers?
4. What is the monthly sales analysis.

## **Data :**

The data is collected from the database of a Pharmaceutical company called Glenn Pharma and it is found on [dataworld.org](https://dataworld.org). It contains the details about the meetings held between salesmen and customers, the salesmen, the customers and the products which the company is currently dealing with.

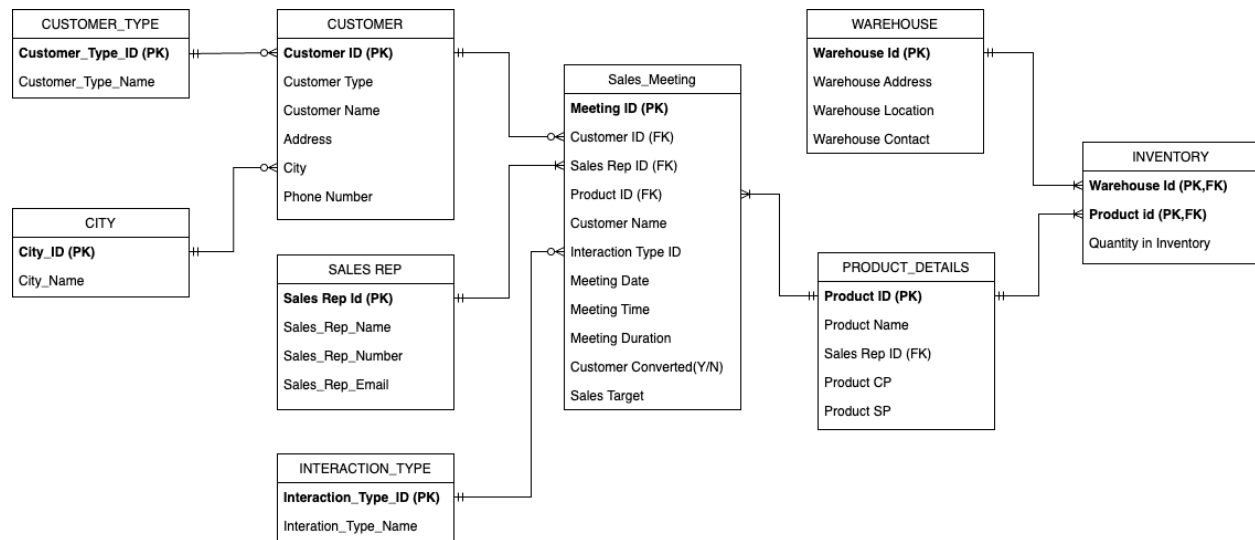
## **Data Description :**

The meeting table contains the record of 2585 meetings held between customers and the sales representatives and also gives information of the amount of sales intended for that meeting and whether the sale was converted or not. The product table contains a list of 30 products with each sales rep responsible for one product respectively. The customer table contains a list of all the customers and their contact information which will be useful to sales reps. We also have the inventory table which gives a list of all the products and their quantities which are stored in the data warehouse.

## **END GOAL :**

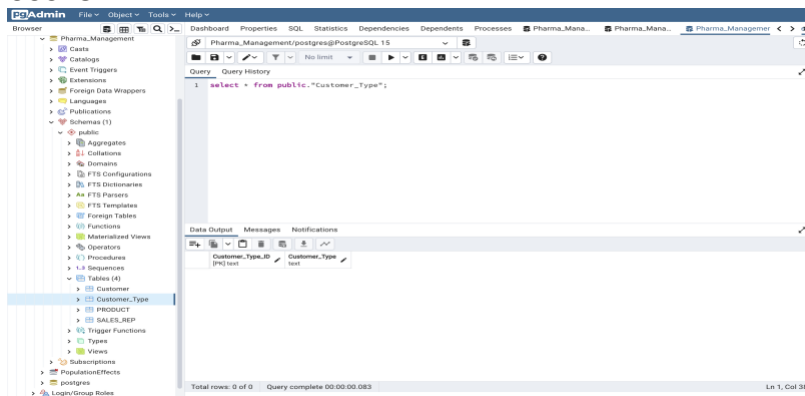
Our end goal in this project is to create a multidimensional model of the pharmaceutical database which will be useful for further analysis.

## ENTITY RELATIONSHIP DIAGRAM :



## ERD SCHEMA AND DATA INSERTION INTO SCHEMA

### CUSTOMER TYPE :



pgAdmin

Browser

Pharma\_Management

- Casts
- Catalogs
- Event Triggers
- Extensions
- Foreign Data Wrappers
- Languages
- Publications
- Schemas (1)
  - public
    - Aggregates
    - Collations
    - Domains
    - FTS Configurations
    - FTS Dictionaries
    - FTS Parameters
    - FTS Templates
    - Foreign Tables
    - Functions
    - Materialized Views
    - Operators
    - Procedures
    - Sequences
    - Tables (6)
      - Customer
        - Customer\_Type
    - Types
    - Subscriptions
    - PopulationEffects
- postgres
  - Login/Group Roles

Pharma\_Management/postgres@PostgreSQL 15

Query

```
select * from public."Customer_Type";
```

Data Output

Customer_Type_ID	Customer_Type_Name
1	Hospital
2	Pharmacy

Total rows: 2 of 2 Query complete 00:00:00.070 Ln 1, Col 58

## CUSTOMER :

pgAdmin

Browser

Pharma\_Management

- Casts
- Catalogs
- Event Triggers
- Extensions
- Foreign Data Wrappers
- Languages
- Publications
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    - FTS Dictionaries
    - FTS Parameters
    - FTS Templates
    - Foreign Tables
    - Functions
    - Materialized Views
    - Operators
    - Procedures
    - Sequences
    - Tables (4)
      - Customer
        - Customer\_Type
        - PRODUCT
        - SALES\_REP
    - Types
    - Views
    - Subscriptions
    - PopulationEffects
- postgres
  - Login/Group Roles

Pharma\_Management/postgres@PostgreSQL 15

Query

```
select * from public."Customer";
```

Data Output

Customer_ID	Customer_Type	Customer_Name	Address	City	Phone_number
1	123001	AdCare Hospital	107 Lincoln Street	CT00001	587794600
2	123002	Amesbury Health Center	24 Aborn Place	CT00002	976885553
3	123003	Anna Jacques Hospital, Part of Beth Israel Lehey Health	25 Highland Avenue	CT00003	9784631059
4	123004	Arden Hospital	49 Robinson Avenue	CT00004	417623400
5	123005	Arden Hospital	2033 Main Street	CT00005	978493011
6	123006	Austin Riggs Center	25 Main Street	CT00006	805174467
7	123007	Baldpate Hospital	83 Baldpate Road	CT00007	9783022131
8	123008	BayRidge Hospital	60 Granite Street	CT00008	781599320
9	123009	Baystate Franklin Medical Center	144 High Street	CT00009	4137330211
10	123010	Baystate Medical Center	759 Chestnut Street	CT00010	413746000

Total rows: 109 of 109 Query complete 00:00:00.049 Ln 1, Col 33

## PRODUCT :

pgAdmin

Browser

Pharma\_Management

- Casts
- Catalogs
- Event Triggers
- Extensions
- Foreign Data Wrappers
- Languages
- Publications
- Schemas (1)
  - public
    - Aggregates
    - Collations
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    - FTS Configurations
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    - Foreign Tables
    - Functions
    - Materialized Views
    - Operators
    - Procedures
    - Sequences
    - Tables (4)
      - Customer
        - Customer\_Type
        - PRODUCT
        - SALES\_REP
    - Types
    - Views
    - Subscriptions
    - PopulationEffects
- postgres
  - Login/Group Roles

Pharma\_Management/postgres@PostgreSQL 15

Query

```
select * from public."PRODUCT";
```

Data Output

Product_ID	Product_Name	Product_Type	Product_ID	Product_SP
1	223001	T	323001	17
2	223002	P	323002	22
3	223003	N	323003	14
4	223004	I	323004	18
5	223005	M	323005	12
6	223006	C	323006	41
7	223007	L	323007	28
8	223008	S	323008	8
9	223009	P	323009	33
10	223010	H	323010	28
11	223011	S	323011	15

Total rows: 30 of 30 Query complete 00:00:00.048 Ln 1, Col 32

## Sales rep

pgAdmin

Browser

Pharma\_Management

public

Aggregates

Collations

Domains

FTS Configurations

FTS Dictionaries

FTS Parameters

FTS Templates

Foreign Tables

Functions

Materialized Views

Operators

Procedures

Sequences

Tables (4)

Customer

Customer\_Type

PRODUCT

SALES\_REP

Trigger Functions

Types

Views

Subscriptions

PopulationEffects

postgres

Login/Group Roles

Pharma\_Management/postgres@PostgreSQL 15

Query

```
1 select * from public."SALES_REP";
```

Data Output

Sales_Rep_ID	Sales_Rep_Name	Sales_Rep_Number	Sales_Rep_Email
[PK] bigint	text	bigint	text
1	323001 Tina Cobb	5052248336	TinaCobb@glennpharma.com
2	323002 Isabella Holmes	2232420422	IsabellaHolmes@glennpharma.com
3	323003 John Simpson	45827613444	JohnSimpson@glennpharma.com
4	323004 Michael Williams	2082367645	MichaelWilliams@glennpharma.com
5	323005 George Banks	2078634860	GeorgeBanks@glennpharma.com
6	323006 Stephen Davis	5054011426	StephenDavis@glennpharma.com
7	323007 Suzanne Andrews	2097510863	SuzanneAndrews@glennpharma.co..
8	323008 Barbara Carlson	5054448775	BarbaraCarlson@glennpharma.com
9	323009 Candice Wood	5054447563	CandiceWood@glennpharma.com
10	323010 David Murphy	4022176858	DavidMurphy@glennpharma.com
11	323011 Leslie Jones	5055272496	LeslieJones@glennpharma.com

Total rows: 30 of 30 Query complete 00:00:00.066 Ln 1, Col 34

## Warehouse :

pgAdmin

Browser

Pharma\_Management

public

Aggregates

Collations

Domains

FTS Configurations

FTS Dictionaries

FTS Parameters

FTS Templates

Foreign Tables

Functions

Materialized Views

Operators

Procedures

Sequences

Tables (5)

Customer

Customer\_Type

PRODUCT

SALES\_REP

Warehouse

Trigger Functions

Types

Views

Subscriptions

PopulationEffects

postgres

Pharma\_Management/postgres@PostgreSQL 15

Query

```
1 select * from public."Warehouse";
```

Data Output

Warehouse_ID	Warehouse_address	Warehouse_location	Warehouse_contact
[PK] bigint	text	text	bigint

Total rows: 0 of 0 Query complete 00:00:00.093 Ln 1, Col 34

Successfully run. Total query runtime: 93 msec. 0 rows affected.

pgAdmin

Browser

Pharma\_Management

public

Aggregates

Collations

Domains

FTS Configurations

FTS Dictionaries

FTS Parameters

FTS Templates

Foreign Tables

Functions

Materialized Views

Operators

Procedures

Sequences

Tables (5)

Customer

Customer\_Type

PRODUCT

SALES\_REP

Warehouse

Trigger Functions

Types

Views

Subscriptions

PopulationEffects

postgres

Pharma\_Management/postgres@PostgreSQL 15

Query

```
1 select * from public."Warehouse";
```

Data Output

Warehouse_ID	Warehouse_address	Warehouse_location	Warehouse_contact
[PK] bigint	text	text	bigint
1	6601 81 Highland Avenue	Salem	9787411200
2	6602 500 Lynnfield Street	Lynn	7815819200
3	6603 516 Carver Street	Springfield	4179250200
4	6604 51 Blumson Street	Boston	6177232000
5	6605 55 Frogg Road	South Weymouth	7814248000
6	6606 581 Faunce Corner Road	North Dartmouth	5088944887
7	6607 1575 Cambridge Street	Cambridge	6178743344
8	6608 275 Nichols Road	Fitchburg	9783435000
9	6609 187 Cedar Street	Maldenborough	5084815000
10	6610 119 Belmont Street	Worcester	5083341000

Total rows: 10 of 10 Query complete 00:00:00.119 Ln 1, Col 34

## INVENTORY:

PPAdmin File Object Tools Help

Browser

- Pharma\_Management
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
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      - FTS Parameters
      - FTS Templates
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      - Functions
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      - Operators
      - Procedures
      - Sequences
      - Tables (6)
        - Customer
        - Customer\_Type
        - Inventory
        - PRODUCT
        - SALES\_REP
        - Warehouse
      - Trigger Functions
      - Types
      - Views
      - Subscriptions
      - PopulationEffects

Pharma\_Management/postgres@PostgreSQL 15

Query Query History

```
1 select * from public."Inventory";
```

Data Output Messages Notifications

Warehouse_ID [PK] bigint	Product_ID [PK] bigint	Quantity bigint
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Total rows: 0 of 0 Query complete 00:00:00.043 Ln 1, Col 34

PPAdmin File Object Tools Help

Browser

- Pharma\_Management
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
      - FTS Dictionaries
      - FTS Parameters
      - FTS Templates
      - Foreign Tables
      - Functions
      - Materialized Views
      - Operators
      - Procedures
      - Sequences
      - Tables (6)
        - Customer
        - Customer\_Type
        - Inventory
        - PRODUCT
        - SALES\_REP
        - Warehouse
      - Trigger Functions
      - Types
      - Views
      - Subscriptions
      - PopulationEffects

Pharma\_Management/postgres@PostgreSQL 15

Query Query History

```
1 select * from public."Inventory";
```

Data Output Messages Notifications

Warehouse_ID [PK] bigint	Product_ID [PK] bigint	Quantity bigint
1	6610	223007 40000
2	6602	223007 25000
3	6602	223006 40000
4	6606	223030 30000
5	6602	223029 20000
6	6608	223030 40000
7	6603	223006 40000
8	6608	223029 40000
9	6603	223014 30000
10	6606	223016 30000
11	6608	223001 50000

Total rows: 114 of 114 Query complete 00:00:00.042 Ln 1, Col 34

## Sales\_Meeting:

PPAdmin File Object Tools Help

Browser

- Pharma\_Management
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
      - FTS Dictionaries
      - FTS Parameters
      - FTS Templates
      - Foreign Tables
      - Functions
      - Materialized Views
      - Operators
      - Procedures
      - Sequences
      - Tables (7)
        - Customer
        - Customer\_Type
        - Inventory
        - PRODUCT
        - SALES\_REP
        - Sales\_Meeting
        - Warehouse
      - Trigger Functions
      - Types
      - Views
      - Subscriptions

Pharma\_Management/postgres@PostgreSQL 15

Query Query History

```
1 select * from public."Sales_Meeting";
```

Data Output Messages Notifications

Meeting_ID [PK] bigint	Customer_ID [PK] bigint	Sales_Rep_ID [PK] bigint	Product_ID [PK] bigint	Customer_name text	Interaction_Type_ID text	Meeting_Date date	Meeting time wi
1	55112201	323001	223001	AdCare Hospital	IT230001	2021-06-24	20:43:5
2	55112202	323002	223002	Amesbury Health Center	IT230002	2021-05-31	07:22:2
3	55112203	323003	223003	Anna Jacques Hospital, Part of Beth Israel Lahey Health	IT230001	2021-04-06	00:10:5
4	55112304	323004	223004	Arbour Hospital	IT230001	2021-03-19	02:31:4
5	55112305	323005	223005	Arbol Hospital	IT230002	2021-01-05	12:04:1
6	55112306	323006	223006	Austin Riggs Center	IT230002	2021-10-09	03:50:0
7	55112307	323007	223007	Baldgate Hospital	IT230002	2021-08-11	09:20:5
8	55112208	323008	223008	BayRidge Hospital	IT230001	2021-07-07	04:53:3
9	55112209	323009	223009	Baystate Franklin Medical Center	IT230001	2021-07-31	04:55:1
10	55112210	323010	223010	Baystate Medical Center	IT230002	2021-08-07	02:48:4

Total rows: 1000 of 2584 Query complete 00:00:00.057 Ln 1, Col 38

## Interaction Type :

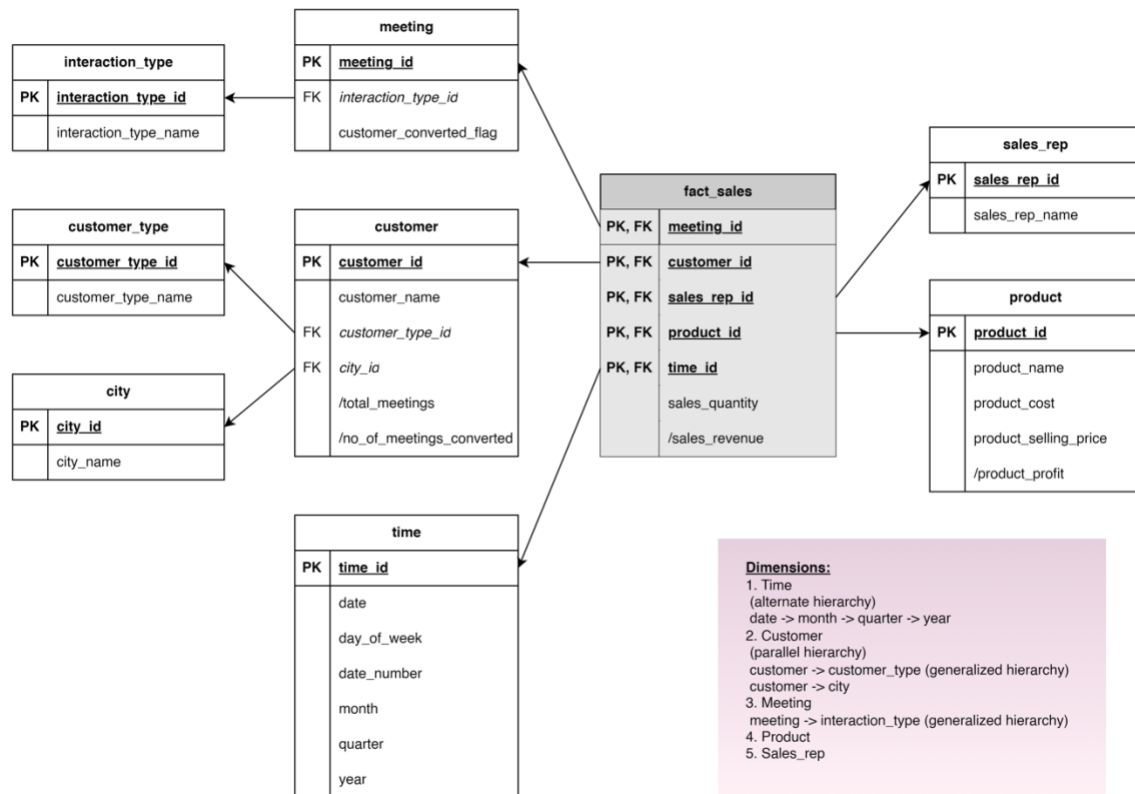
The screenshot shows the pgAdmin interface with a query executed: `select * from public."Interaction_Type";`. The Data Output pane shows the results of the query, which are empty. A status message at the bottom indicates: "Successfully run. Total query runtime: 191 msec. 0 rows affected."

Interaction_Type_ID	Interaction_Type
---------------------	------------------

The screenshot shows the pgAdmin interface with a query executed: `select * from public."Interaction_Type";`. The Data Output pane shows the results of the query, which contain two rows. A status message at the bottom indicates: "Total rows: 2 of 2 Query complete 00:00:00.048".

Interaction_Type_ID	Interaction_Type
IT230001	CALL
IT230002	INPERSON

## MULTIDIMENSIONAL MODEL :



### Dimension Tables :

Interaction\_Type, Customer\_type, city, time, customer, meeting, product, sales\_rep

### Fact Table : fact\_sales

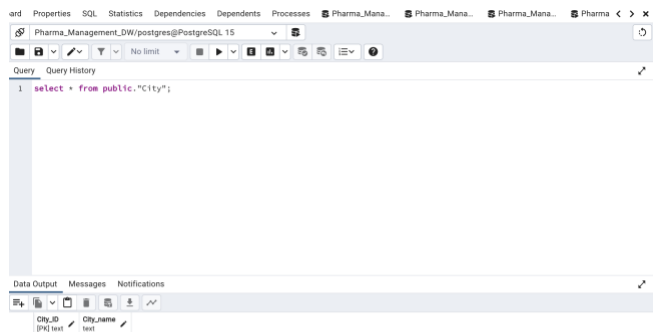
### HIERARCHIES IMPLEMENTED :

- Time (alternate hierarchy)  
Date → month → quarter → year
- Customer (parallel hierarchy)  
Customer → customer\_type (generalized hierarchy)  
Customer → city
- Meeting  
Meeting → interaction\_type (generalized hierarchy)
- Product

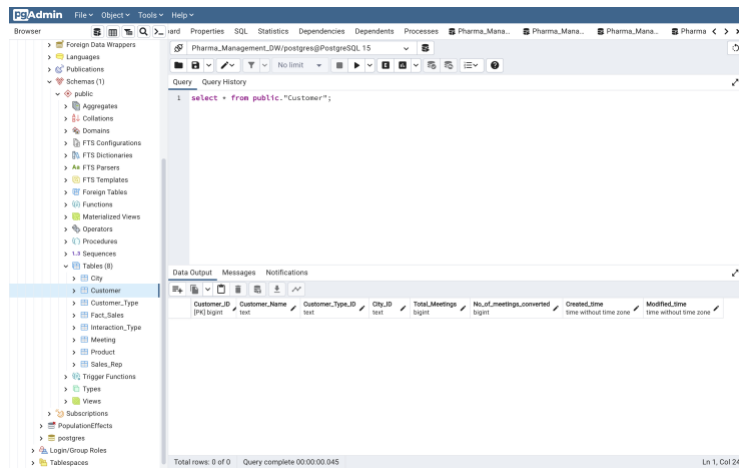
## 5. Sales\_rep

## ROLAP IMPLEMENTATION

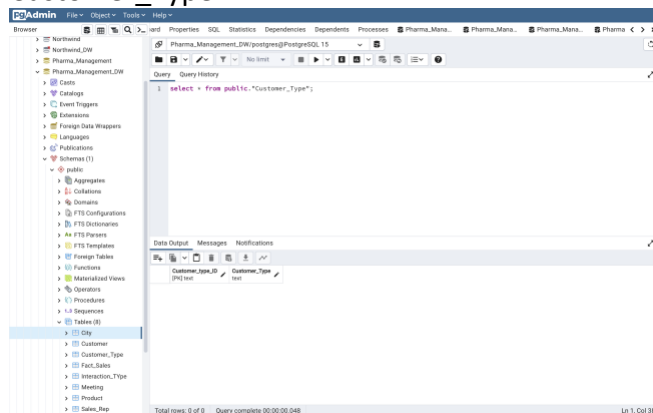
### MULTIDIM SCHEMA :



### Customer :



### Customer\_Type :





## Sales fact Table :

The screenshot shows the pgAdmin interface with the 'Fact\_Sales' table selected in the left-hand browser pane. The table is located under the 'public' schema. The main pane displays the table's structure with the following columns:

Column Name	Data Type	Constraints
Meeting_ID	bigint	PK
Customer_ID	bigint	
Sales_Rep_ID	bigint	
Product_ID	bigint	
Time_ID	bigint	
Sales_Quantity	bigint	
Sales_Revenue	bigint	
Created_time	time without time zone	
Modified_time	time without time zone	

The query window shows the following SQL query:

```
select * from public."Fact_Sales";
```

The status bar at the bottom indicates 'Total rows: 0 of 0' and 'Query complete 00:00:00.048'.

## Interaction\_Type :

The screenshot shows the pgAdmin interface with the 'Interaction\_Type' table selected in the left-hand browser pane. The table is located under the 'public' schema. The main pane displays the table's structure with the following columns:

Column Name	Data Type	Constraints
Interaction_Type_ID	PK	text
Interaction_Type	text	

The query window shows the following SQL query:

```
select * from public."Interaction_Type";
```

The status bar at the bottom indicates 'Total rows: 0 of 0' and 'Query complete 00:00:00.042'.

## Meeting :

The screenshot shows the pgAdmin interface with the 'Meeting' table selected in the left-hand browser pane. The table is located under the 'public' schema. The main pane displays the table's structure with the following columns:

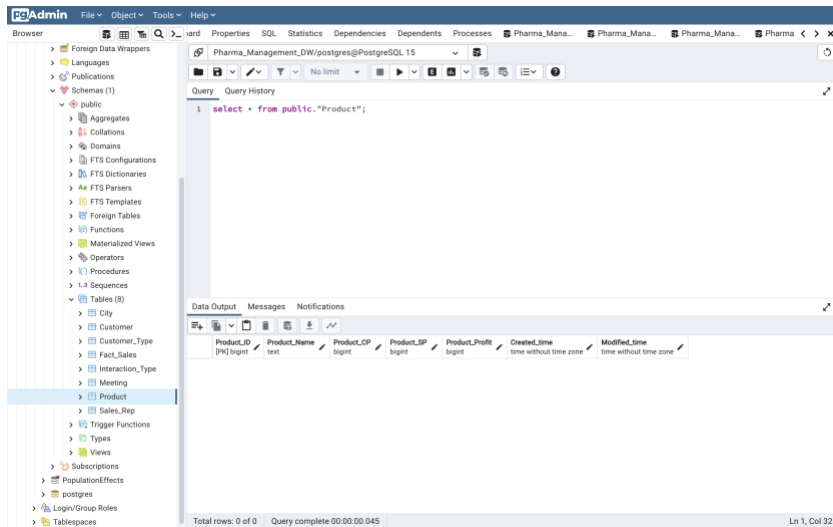
Column Name	Data Type	Constraints
Meeting_ID	PK	bigint
Interaction_Type_ID	text	
Customer_Converted_Flag	text	

The query window shows the following SQL query:

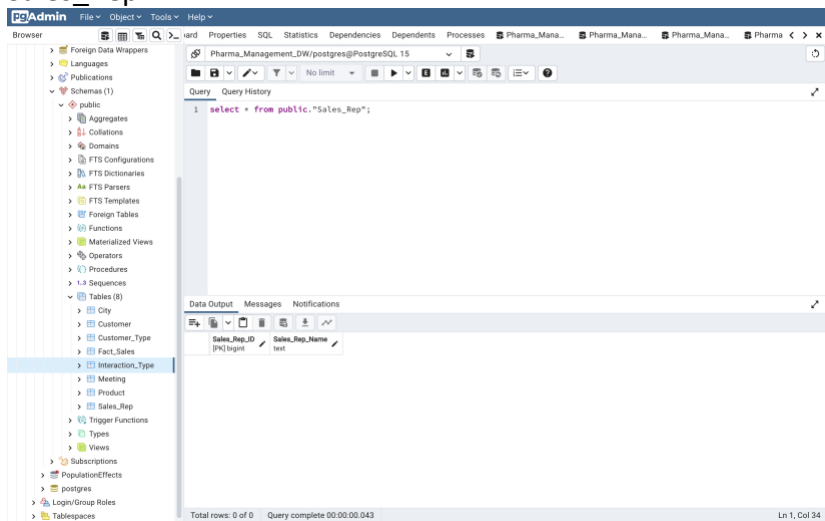
```
select * from public."Meeting";
```

The status bar at the bottom indicates 'Total rows: 0 of 0' and 'Query complete 00:00:00.048'.

## PRODUCT :



## Sales\_Rep :



## OLAP Operations

1. What is the total sales target for all sales reps?

`SELECT SUM(Sales_target) AS Total_Sales_Target FROM Meetings;`

**OLAP Operation:** Roll-up: Total\_Sales\_Target by sales\_rep\_id, customer\_id, and product\_id

2. What is the total sales target for each sales rep?

`SELECT sales_rep_id, SUM(Sales_target) AS Sales_Target FROM Meetings GROUP BY sales_rep_id;`

**OLAP Operation:** Roll-up: Sales\_Target by sales\_rep\_id and customer\_id

3. What is the average meeting duration by product?

```
SELECT product_name, AVG(meeting_duration) AS Avg_Meeting_Duration FROM Meetings  
JOIN Products ON Meetings.product_id = Products.product_id GROUP BY product_name;
```

**OLAP Operation:** Slice: Avg\_Meeting\_Duration by product\_name

4. What is the total number of meetings for each customer who has converted?

```
SELECT customer_id, COUNT(Meeting) AS Total_Meetings FROM Meetings WHERE  
Customer_converted_Y_N = 'Y' GROUP BY customer_id;
```

**OLAP Operation:** Slice: Total\_Meetings by customer\_id, where Customer\_converted\_Y\_N = 'Y'

5. What is the total revenue generated by each sales rep, including the cost of products?

```
SELECT sales_rep_id, SUM(product_sellingprice - product_costprice) AS Total_Revenue  
FROM Meetings JOIN Products ON Meetings.product_id = Products.product_id GROUP BY  
sales_rep_id;
```

**OLAP Operation:** Drill-down: Total\_Revenue by sales\_rep\_id and product\_id, including product\_costprice and product\_sellingprice

6. How many meetings have occurred for each product?

```
SELECT product_name, COUNT(Meeting) AS Total_Meetings FROM Meetings JOIN Products ON  
Meetings.product_id = Products.product_id GROUP BY product_name;
```

**OLAP Operation:** Drill-down: Total\_Meetings by product\_name

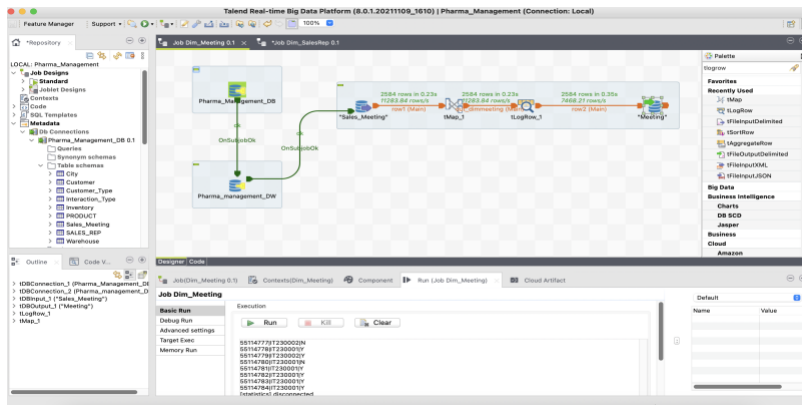
6. What is the total revenue generated by each product?

```
SELECT product_name, SUM(product_sellingprice - product_costprice) AS Total_Revenue FROM  
Meetings JOIN Products ON Meetings.product_id = Products.product_id GROUP BY  
product_name;
```

**OLAP Operation:** Drill-down: Total\_Revenue by product\_name, including product\_costprice and product\_sellingprice

# TALEND IMPLEMENTATION

## Meeting Dimension Table :

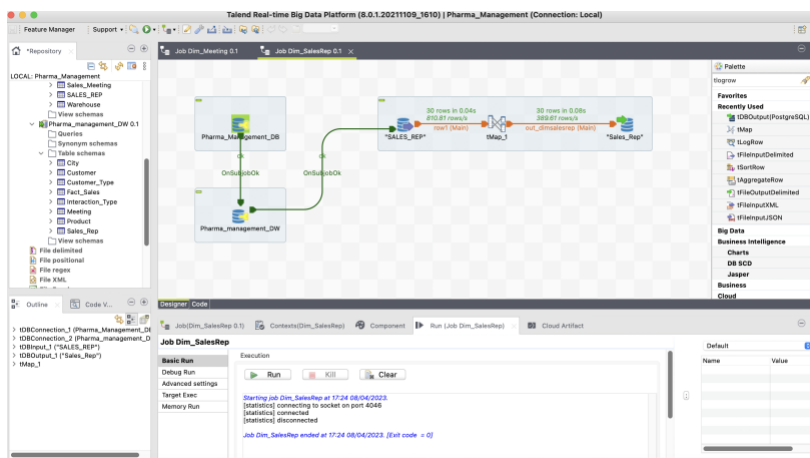


The screenshot shows the DBeaver database tool interface. The 'Query History' tab displays a query that was executed: 'select \* from public."Meeting";'. The 'Data Output' tab shows the results of the query, which are the Meeting Dimension Table data.

Meeting_ID	Interaction_Type_ID	Customer_Converted_Y_N
55112201	IT230001	Y
55112202	IT230002	N
55112203	IT230001	N
55112204	IT230001	N
55112205	IT230002	Y
55112206	IT230002	Y
55112207	IT230002	Y
55112208	IT230001	N
55112209	IT230001	Y
55112210	IT230002	N
55112211	IT230001	N

Total rows: 1000 of 2584. Query complete: 00:00:00.054. Ln 1, Col 32.

## Sales\_Rep Dimension Table :



pgAdmin

Browser

- Foreign Data Wrappers
- Languages
- Publications
- Schemas (1)
  - public
    - Aggregates
    - Collations
    - Domains
    - FTS Configurations
    - FTS Dictionaries
    - FTS Parsers
    - FTS Templates
    - Foreign Tables
    - Functions
    - Materialized Views
    - Operators
    - Procedures
    - Sequences
    - Tables (8)
      - City
      - Customer
      - Customer\_Type
      - Fact\_Sales
      - Interaction\_Type
      - Meeting
      - Product
      - Sales\_Rep
    - Columns (2)
      - Sales\_Rep\_ID
      - Sales\_Rep\_Name
    - Constraints
    - Indexes
    - RLS Policies
    - Rules

Query

```
select * from public."Sales_Rep";
```

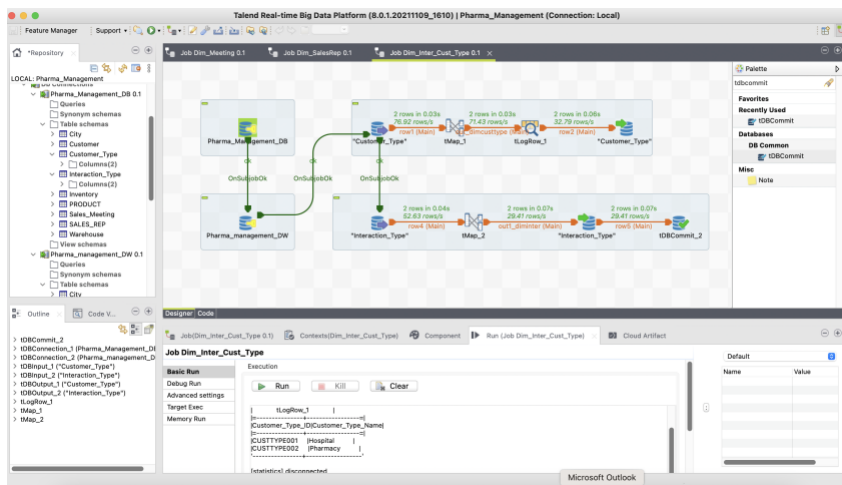
Query History

Data Output

Sales_Rep_ID [PK] text	Sales_Rep_Name text
1	323001 Tina Cobb
2	323002 Isabella Holmes
3	323003 John Simpson
4	323004 Michael Williams
5	323005 George Banks
6	323006 Stephen Davis
7	323007 Suzanne Andrews
8	323008 Barbara Carlson
9	323009 Candace Wood
10	323010 David Murphy
11	323011 Leslie Flores

Total rows: 30 of 30 Query complete 00:00:00.044 Ln 1, Col 34

## Customer\_Type and Interaction\_Type Dimension Tables :



pgAdmin

Browser

- Procedures
- Sequences
- Tables (8)
  - City
  - Customer
  - Customer\_Type
    - Columns (2)
      - Customer\_Type\_ID
      - Customer\_Type\_Name
    - Constraints
    - Indexes
    - RLS Policies
    - Rules
    - Triggers
  - Fact\_Sales
  - Interaction\_Type
    - Columns (2)
      - Interaction\_Type\_ID
      - Interaction\_Type
    - Constraints
    - Indexes
    - RLS Policies
    - Rules
    - Triggers
    - Meeting
    - Product
    - Sales\_Rep
    - Trigger Functions
    - Types
    - Views
    - Subscriptions
    - PopulationEffects
    - postgres
    - Login/Group Roles
    - Tablespaces

Query

```
select * from public."Interaction_Type";
```

Query History

Data Output

Interaction_Type_ID [PK] text	Interaction_Type text
1	t230001 CALL
2	t230002 INPERSON

Total rows: 2 of 2 Query complete 00:00:00.042 Ln 1, Col 41

PCAdmin File Object Tools Help

Browser

- Procedures
- Sequences
- Tables (8)
  - City
  - Customer
    - Customer\_Type
      - Columns (2)
        - Customer\_Type\_ID
        - Customer\_Type\_Name
  - Constraints
  - Indexes
  - RLS Policies
  - Rules
  - Triggers
  - Fact\_Sales
  - Interaction\_Type
    - Columns (2)
      - Interaction\_Type\_ID
      - Interaction\_Type
  - Constraints
  - Indexes
  - RLS Policies
  - Rules
  - Triggers
  - Meeting
  - Product
  - Sales\_Rep
  - Trigger Functions
  - Types
  - Views
  - Subscriptions
  - PopulationEffects
  - postgres
  - Login/Group Roles
  - Tablespaces

Pharma\_Management\_DW/postgres@PostgreSQL 15

Query Query History

```
1 select * from public."Customer_Type";
```

Data Output Messages Notifications

Customer_Type_ID	Customer_Type_Name
CUSTTYPE001	Hospital
CUSTTYPE002	Pharmacy

Total rows: 2 of 2 Query complete 00:00:00.059 Ln 1, Col 38

## City Dimension table :



PCAdmin File Object Tools Help

Browser

- Warehouse
- Trigger Functions
- Types
- Views
- Subscriptions
- Pharma\_Management\_DW
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
      - FTS Dictionaries
      - FTS Parsers
      - FTS Templates
      - Foreign Tables
      - Functions
      - Materialized Views
      - Operators
      - Procedures
      - Sequences
      - Tables (8)
        - City
          - Columns (2)
            - City\_ID
            - City\_Name
          - Constraints
          - Indexes

Pharma\_Management\_DW/postgres@PostgreSQL 15

Query Query History

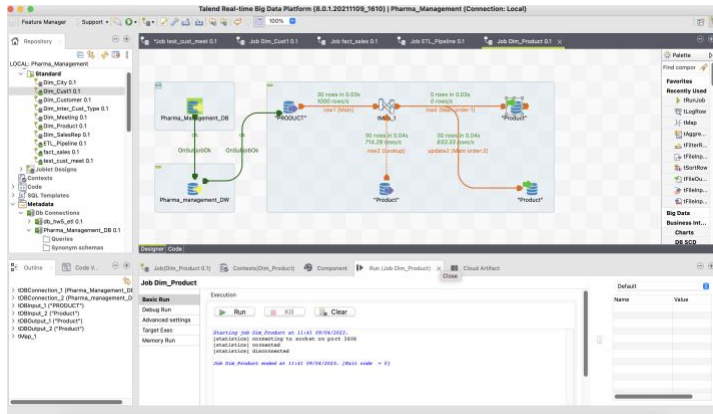
```
1 select * from public."City";
```

Data Output Messages Notifications

City_ID	City_Name
CT00001	Worcester
CT00002	Amesbury
CT00003	Newburyport
CT00004	Jamaica Plain
CT00005	Attail
CT00006	Stockbridge
CT00007	Georgetown
CT00008	Lynn
CT00009	Greenfield
CT00010	Springfield

Total rows: 74 of 74 Query complete 00:00:00.052 Ln 1, Col 29

## PRODUCT DIMENSION TABLE :



Pharma\_Management\_DW@postgres@PostgreSQL 15

Query History

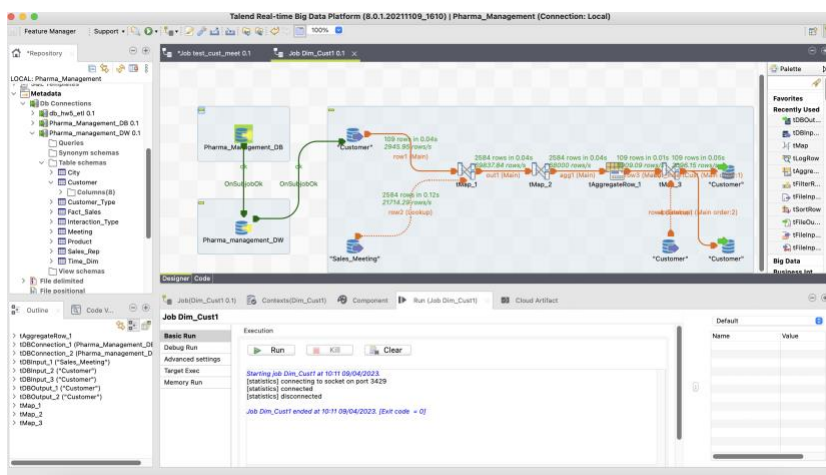
```
1 SELECT "Product_ID", "Product_Name", "Product_CP", "Product_SP", "Product_Profit", "Created_time", "Modified_time"
2 FROM public."Product";
```

Data Output

Product_ID	Product_Name	Product_CP	Product_SP	Product_Profit	Created_time	Modified_time
223001	T	9	17	8	1958.28.529	2016.13.431
223002	P	16	22	4	1958.28.529	2016.13.431
223003	H	16	17	3	1958.28.529	2016.13.431
223004	I	16	21	3	1958.28.529	2016.13.431
223005	M	12	19	7	1958.28.529	2016.13.431
223006	C	41	47	6	1958.28.529	2016.13.431
223007	L	26	31	3	1958.28.529	2016.13.431
223008	S	6	15	7	1958.28.529	2016.13.431
223009	P	33	38	5	1958.28.529	2016.13.431
223010	H	36	42	4	1958.28.529	2016.13.431

Total rows: 30 of 30 Query complete 00:00:00.238 Ln 1, Col 1

## Customer Dimension table :



The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays the database structure, including the 'public' schema and various tables. The main window shows the 'Query History' tab with a single query executed. Below the query, the 'Data Output' tab displays a table with 12 columns: 'id', 'Customer\_Id', 'Customer\_Type\_Id', 'City\_Id', 'Total\_Meetings', 'No\_of\_meetings\_converted', 'Created\_time', and 'Modified\_time'. The table contains 12 rows of data. The status bar at the bottom indicates 'Total rows: 100 of 100' and 'Query complete 00:00:00.097'.

id	Customer_Id	Customer_Type_Id	City_Id	Total_Meetings	No_of_meetings_converted	Created_time	Modified_time
1	123001	AdCare H...	CT00001	1	1	10:26:59.452	10:31:00.798
2	123002	Amenduc...	CT00002	1	0	10:26:59.452	10:31:00.807
3	123003	Anna Jag...	CT00003	3	0	10:26:59.452	10:31:00.764
4	123004	Arloar H...	CT00004	1	0	10:26:59.452	10:31:01.188
5	123005	Athol Hos...	CT00005	1	1	10:26:59.452	10:31:00.81
6	123006	Austen R...	CT00006	1	1	10:26:59.452	10:31:00.814
7	123007	Baldpate ...	CT00007	2	2	10:26:59.452	10:31:01.199
8	123008	BayRidge ...	CT00008	1	0	10:26:59.452	10:31:00.82
9	123009	Baystate ...	CT00009	1	1	10:26:59.452	10:31:00.798
10	123010	Baystate ...	CT00010	1	0	10:26:59.452	10:31:01.197

[illegible]



PCAdmin File Object Tools Help

Dashboard Properties SQL Statistics Dependencies Dependents Processes public.Fact\_Sales/Pharma\_Management\_DW/postgr...

Query Query History

```
1 SELECT * FROM public."Fact_Sales"
2 LIMIT 100
3
```

Data Output Messages Notifications

	Meeting_ID bigint	Customer_ID bigint	Sales_Rep_ID bigint	Product_ID bigint	Time_ID integer	Sales_Quantity integer	Sales_Revenue integer	Created_time time without time zone	Modified_time time without time
1	55112201	123001	323001	223001	175	200	1600	23.36.16.463	[null]
2	55112205	123005	323005	223005	5	250	1750	23.36.16.467	[null]
3	55112206	123006	323006	223006	282	200	1200	23.36.16.467	[null]
4	55112207	123007	323007	223007	223	150	450	23.36.16.467	[null]
5	55112209	123009	323009	223009	212	50	250	23.36.16.467	[null]
6	55112215	123015	323015	223015	267	50	550	23.36.16.467	[null]
7	55112220	123020	323020	223020	154	250	1750	23.36.16.467	[null]
8	55112221	123021	323021	223021	238	150	750	23.36.16.467	[null]
9	55112222	123022	323022	223022	72	100	600	23.36.16.467	[null]
10	55112225	123025	323025	223025	314	300	3600	23.36.16.467	[null]

Total rows: 100 of 100 Query complete 00:00:00.144 Ln 1, Col 1

PCAdmin File Object Tools Help

Dashboard Properties SQL Statistics Dependencies Dependents Processes public.Sales\_M... Pharma.Mana... public < > x

Query Query History

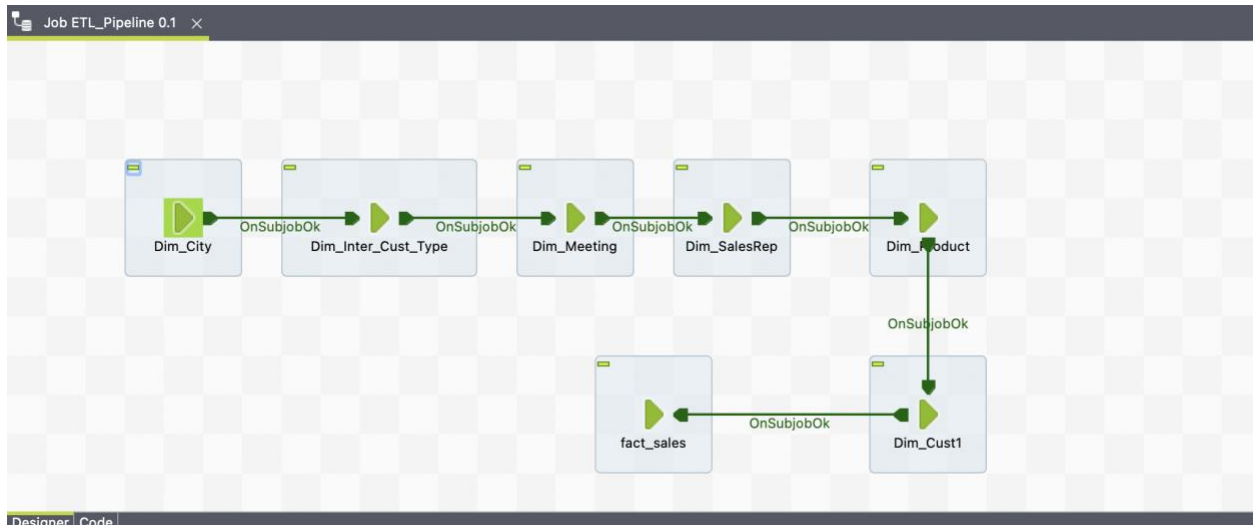
```
1 SELECT * FROM public."Fact_Sales"
2 ORDER BY "Meeting_ID" ASC, "Customer_ID" ASC, "Sales_Rep_ID" ASC, "Product_ID" ASC, "Time_ID" ASC LIMIT 100
3
```

Data Output Messages Notifications

	Meeting_ID [PK] bigint	Customer_ID [PK] bigint	Sales_Rep_ID [PK] bigint	Product_ID [PK] integer	Time_ID [PK] integer	Sales_Quantity integer	Sales_Revenue integer	Created_time time without time zone	Modified_time time without time z
1	55112201	123001	323001	223001	175	200	1600	02.29.16.09	11.13.24.966
2	55112205	123005	323005	223005	5	250	1750	02.29.16.094	11.13.24.97
3	55112206	123006	323006	223006	282	200	1200	02.29.16.094	11.13.24.97
4	55112207	123007	323007	223007	223	150	450	02.29.16.094	11.13.24.97
5	55112209	123009	323009	223009	212	50	250	02.29.16.094	11.13.24.97
6	55112215	123015	323015	223015	267	50	550	02.29.16.095	11.13.24.97
7	55112220	123020	323020	223020	154	250	1750	02.29.16.097	11.13.24.971
8	55112221	123021	323021	223021	238	150	750	02.29.16.097	11.13.24.971
9	55112222	123022	323022	223022	72	100	600	02.29.16.097	11.13.24.971
10	55112225	123025	323025	223025	314	300	3600	02.29.16.097	11.13.24.971

Total rows: 100 of 100 Query complete 00:00:00.369 Ln 1, Col 1

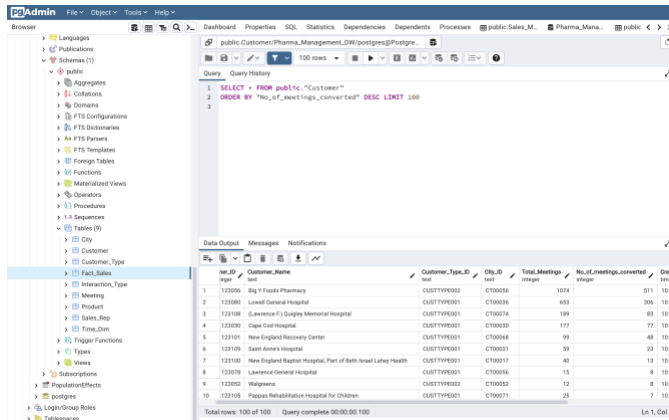
## FINAL TALEND ETL PIPELINE :



## SOME QUERY RESULTS :

### Customers who have converted most number of meetings by count

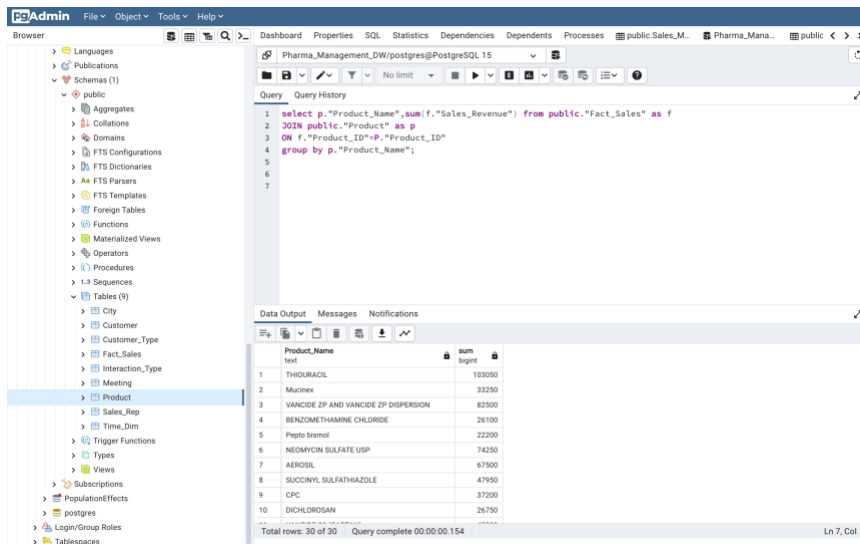
Ans. It can be observed that Big Y Foods Pharmacy is responsible for the highest converted calls with 511 calls



id	Customer Name	Customer_Type_ID	City_ID	Total_Meetings	No_of_meetings_converted	City
1	123056 Big Y Foods Pharmacy	CUSTTYPE002	CT00056	1074	511	100
2	123060 Lowest General Hospital	CUSTTYPE001	CT00056	653	309	100
3	123108 Lawrence F. Douglas Memorial Hospital	CUSTTYPE001	CT00056	199	89	100
4	123050 Open Coal Hospital	CUSTTYPE001	CT00050	177	77	100
5	123101 New England Recovery Center	CUSTTYPE001	CT00068	99	48	100
6	123109 Saint Anne's Hospital	CUSTTYPE001	CT00051	99	23	100
7	123100 New England Baptist Hospital, Part of Beth Israel Lahey Health	CUSTTYPE001	CT00017	40	13	100
8	123079 Lawrence General Hospital	CUSTTYPE001	CT00056	15	8	100
9	123052 Walgreens	CUSTTYPE002	CT00052	12	8	100
10	123105 Peppes Rehabilitation Hospital for Children	CUSTTYPE001	CT00071	25	7	100

Total rows: 100 of 100 Query complete 00:00:00.100 Ln 1, Col 1

### Product generating most revenue : THIOURACIL



Product_Name	sum
1 THIOURACIL	103050
2 Mucinex	33250
3 VANCIDE ZP AND VANCIDE ZP DISPERSION	82500
4 BENZOMETHAMINE CHLORIDE	26100
5 Pefro bromol	22200
6 NEOMYCIN SULFATE USP	74250
7 AEDOSIL	47500
8 SUCONYL SULFATHIAZOLE	47950
9 CPC	37200
10 DICHLOROSAN	26750

Total rows: 30 of 30 Query complete 00:00:00.154 Ln 7, Col 1

### List of sales reps who have generated most revenue

Admin

FileObjectToolsHelp

Browser

Pharma\_Management\_DW/postgres@PostgreSQL 15

Query

```
1 select f."Sales_Rep_ID",s."Sales_Rep_Name",SUM(f."Sales_Revenue") AS "Total_Revenue_Generated" from public."Fact_Sa
2 JOIN public."Sales_Rep" as s
3 ON f."Sales_Rep_ID"=s."Sales_Rep_ID"
4 group by f."Sales_Rep_ID",s."Sales_Rep_Name"
5 ORDER BY "Total_Revenue_Generated" DESC
6
7
8
9
10
11
12
```

Data Output

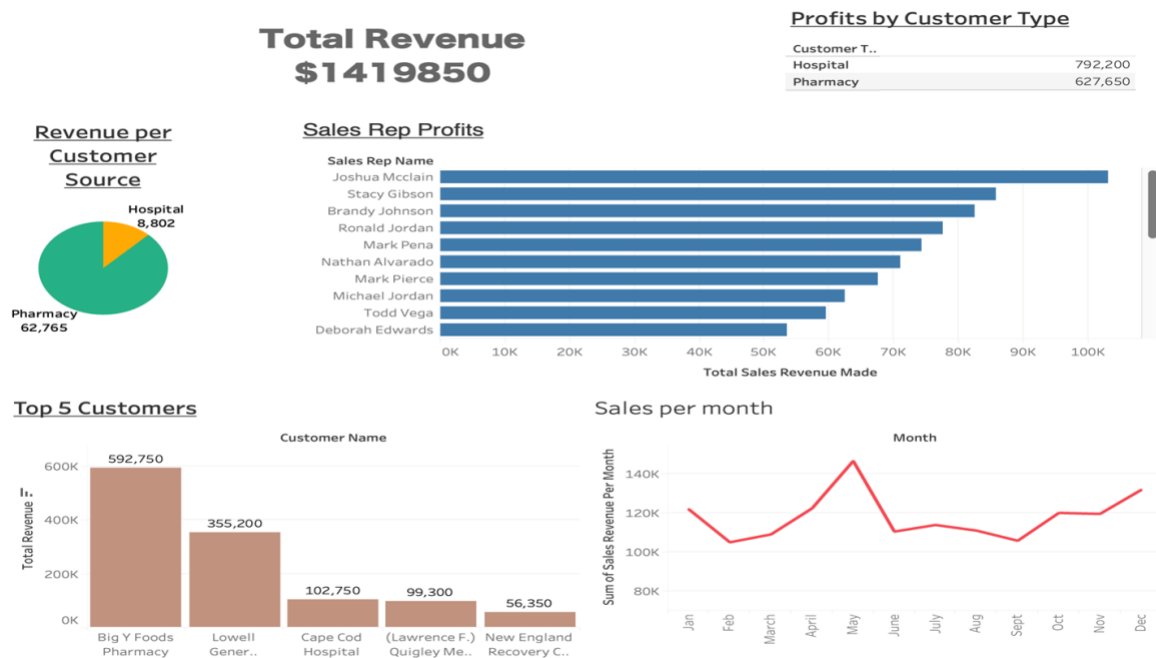
Sales_Rep_ID	Sales_Rep_Name	Total_Revenue_Generated
bigint	text	bigint
1	323013 Joshua McClain	103050
2	323025 Stacy Gibson	85800
3	323023 Brandy Johnson	82500
4	323015 Ronald Jordan	77550
5	323017 Mark Pena	74250
6	323012 Nathan Alvarado	71000
7	323018 Mark Pierce	67500
8	323030 Michael Jordan	62500
9	323020 Todd Vega	59500
10	323027 Deborah Edwards	53550

Total rows: 30 of 30Query complete 00:00:00.040Ln 5, Col 40

# MILESTONE 7

## DATA VISUALIZATION ON TABLEAU

### DASHBOARD 1 : SALES REVENUE SUMMARY



### CONCLUSION FROM ABOVE DASHBOARD:

The following KPI Metrics were defined and certain conclusions were drawn from them

1. **Total Revenue** - \$1419850

2. **Profits per Customer Type:**

We can observe that the revenue generated by Hospitals and Pharmacies were \$792200 and \$627650 respectively

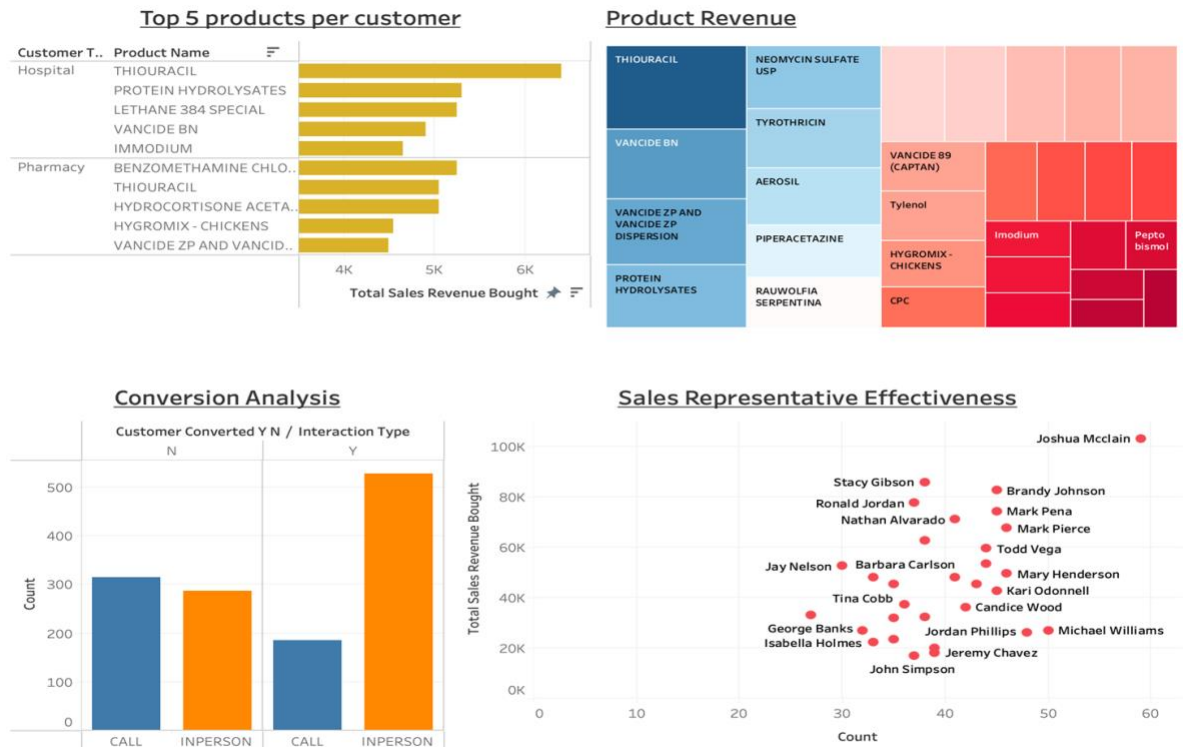
3. **Revenue per Customer Source :**

We have about 99 hospitals and 11 pharmacies in the dataset. Though the overall revenue generated by hospitals is more than pharmacies, but who is more effective? Upon calculating the revenue per customer source, we can observe that each Pharmacy generates about \$62,765 and each hospital generates about \$8,800 of revenue. Thus we can observe that Pharmacies generate a lot more revenue and the focus of the business should be to consider Pharmacies as the primary clients.

#### 4. Sales per Month

The month of May generates the maximum revenue.

## DASHBOARD 2 – PERFORMANCE ANALYSIS



### CONCLUSIONS DRAWN FROM ABOVE DASHOARD:

#### 1. Top 5 products per Customer

Thouracil and Benzamethamine Chloride generate the maximum Sales revenue for Hospital and Pharmacies respectively.

#### 2. Product revenue:

Thouracil generates the maximum revenue.

#### 3. Conversion Analytics :

We can clearly see that InPerson meetings are much more effective and hence the business should plan more Inperson meetings to have a better conversion rate.

#### 4. Sales Represenatative Effectiveness :

One of the most important metrics, it helps us to understand that Joshua McClain was the most hardworking and most profit generating while George banks held the least meetings and generated least revenue. Thus business can improve by training employees who are less effective and reward the higher performing employees.