Apple's Sales Data Mart

BI System Specifications Document

Date: 11/02/2024

Version: 5.00

Written by: Adi Aljadeff

Content

1. General

1.1. Project Objective

This project's objective is the creation of a full BI solution for Apple's sales department, to support Apple's growth in devices sales. The project was designed according to Apple's sales department KPIs and is aimed at increasing the company's overall (and the devices sales department in particular) ROI.

Apple Inc. is a multinational technology company headquartered in Cupertino, California. It designs, develops, and sells consumer electronics, computer software, and online services. The company's best-known devices include the iPhone, iPad, Mac, Apple Watch, and Apple TV. Apple's devices are sold all over the world, through Apple's physical stores, Apple online store, and authorized resellers (via physical and online stores). This project will focus only on sales performed by Apple stores (physical and online).

The Data Mart creation will be done using information derived from the PriorityERP database (Apple's operational database). The solution will include summarized data tables, focusing on devices sales data, as well as data regarding Apple's customers, salespersons, products, and stores. In addition, the BI solution will include costumed reports containing sales analysis, customer analysis, and executive dashboard. These reports will be tailored for the sales departments' needs and will contribute to Apple's devices sales growth.

1.2. Project Contents

The project includes the building of a Data Mart which contains sales data. The data will be transferred through an ETL process from the PriorityERP operational database to the Data Mart – ApplesSalesDM.

ERD model of the AppleSalesDM database: ERD Link

1.2.1. The Data Mart will include 1 fact table and 4 dimension tables, and 1 history table:

- FactSales – Data regarding all sales, including the id of the order, products bought, quantities, and prices. Data loading process for this table will be incremental.
- DimCustomers – Data regarding the company's customers.
- DimStores – Data regarding the company's stores.
- DimEmployees – Data regarding the company's employees.
- DimProducts - Data regarding the company's products.
- DimProductsHistory – Historic data regarding the company's products.

Source To Target Link

The tables will be updated daily at 04:00:00 using an automated process configured in the SQL Server Management Studio.

1.2.2. The reports will include data visualizations that will support the project's objective in the following ways:

- Sales Analysis:

  The sales report will include data about sales (revenue, number of orders, and number of units) by date, country, product, store (online vs. physical), and salespersons which will help the department to assess the performance of all the parts needed for sales growth. The reports will help to identify sale trends like seasonality and trending product categories, analyze products orders and revenue, spot top performing salespersons, and analyze the differences in behavior between the online store and physical stores. All of these will support data driven strategic decision making which can lead to growth in sales and revenue.

- Customer Analysis:

  The customers analysis report will include data regarding Apple's customers by date, country, store, product, and category. This report is aimed to help Apple's customer department to better understand their customers' behavior, like what (products), where (countries and stores), and when do they shop. This is vital to retain current customers and reach new ones.

- Executive Dashboard:

  The dashboard will include key visuals from the two reports. The dashboard will allow a wider perspective on the data and will integrate measures both from sales and customer analysis.

2. Gnatt

Gnatt Link

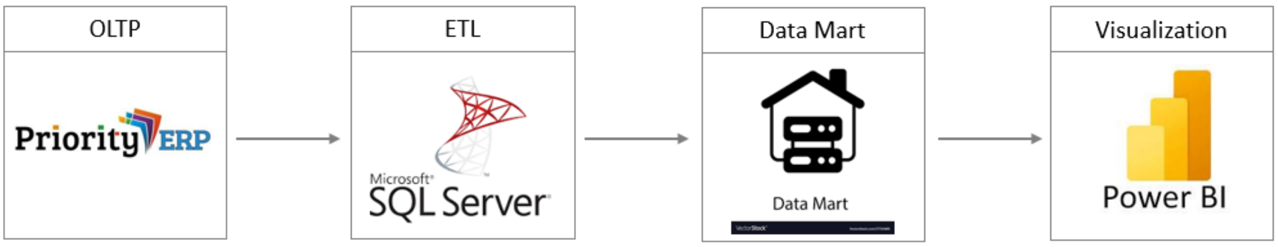
3. Technical Specification

3.1. Prerequisites

SQL Server	ERP system in the operational DB (PriorityERP) - tables, data (SQL files)
SSIS	ETL processes using SSIS in Visual Studio
Data refresh processes	Definition of JOBS in SSMS
Power BI	Creating reports and dashboards using Power BI

3.2. Solution Architecture

3.2.1. High Level Design:



The ETL process, which includes arranging the data into a Data Mart will be performed in SQL Server using SSIS. After the Data Mart creation, reports will be created using Power BI.

3.2.2. Power BI Reports:

3.2.2.1. The report for the sales department will consist of:

- Total sales
- YTD sales
- Total orders

- Average price per order
- Total units
- Average revenue per customer
- Total sales and year over year growth (this graph can change to orders, units)
- Total sales by month and day - online vs physical stores (this graph can change to orders, units)
- Top stores by sales (this graph can change to orders, units)
- Sales by country (this graph can change to orders, units)
- Sales by category and subcategory (this graph can change to orders, units)

3.2.2.2. The report for the customer department will consist of:

- Total number of customers
- Number of new customers
- Percentage of new customers from total
- YTD customers
- Average revenue per customer
- Average orders number per customer
- Total customers and new customers by month and day
- Customers by country
- Customers by number of orders per customer
- Top products by customers
- Average revenue per customer compared to previous year by month and day

3.2.2.3. The executive dashboard will consist of:

- Total sales
- Average monthly revenue
- Total orders
- Total customers
- Percentage of new customers from total
- YTD sales
- MTD sales
- Total sales and month over month growth by quarter and month
- Revenue by online vs physical stores
- Top selling products by revenue
- Total customers by quarter and month
- Revenue by country

4. Functional Specification

4.1. Creation of final Source to Target and ERD models.

4.1.1. Source to Target

- Source To Target link

A total of 11 tables will be used from the operational database.

4.1.2. ERD model of the AppleSalesDM database

- ERD link

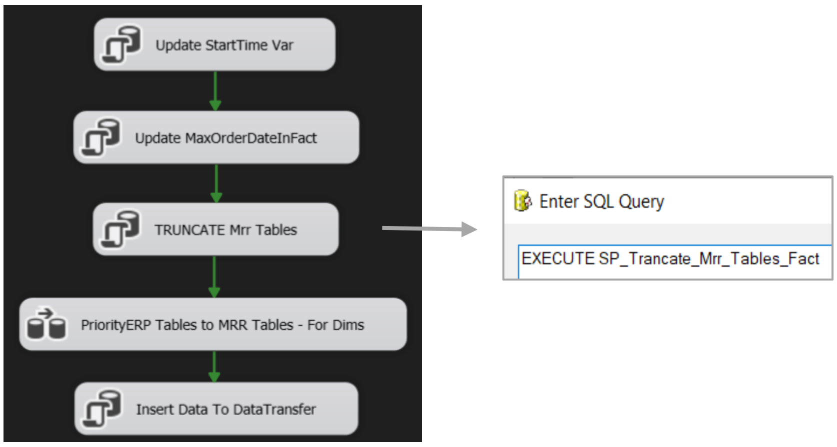
4.2. ETL processes

The ETL process was done in SSIS using 13 packages.

All the packages include 2 reoccurring Execute SQL tasks (Update StartTime Var and Insert Data to DataTransfer), and Row Count transformations which oversee updating the DataTransfer table. These will be explained later in the DataTransfer table section.

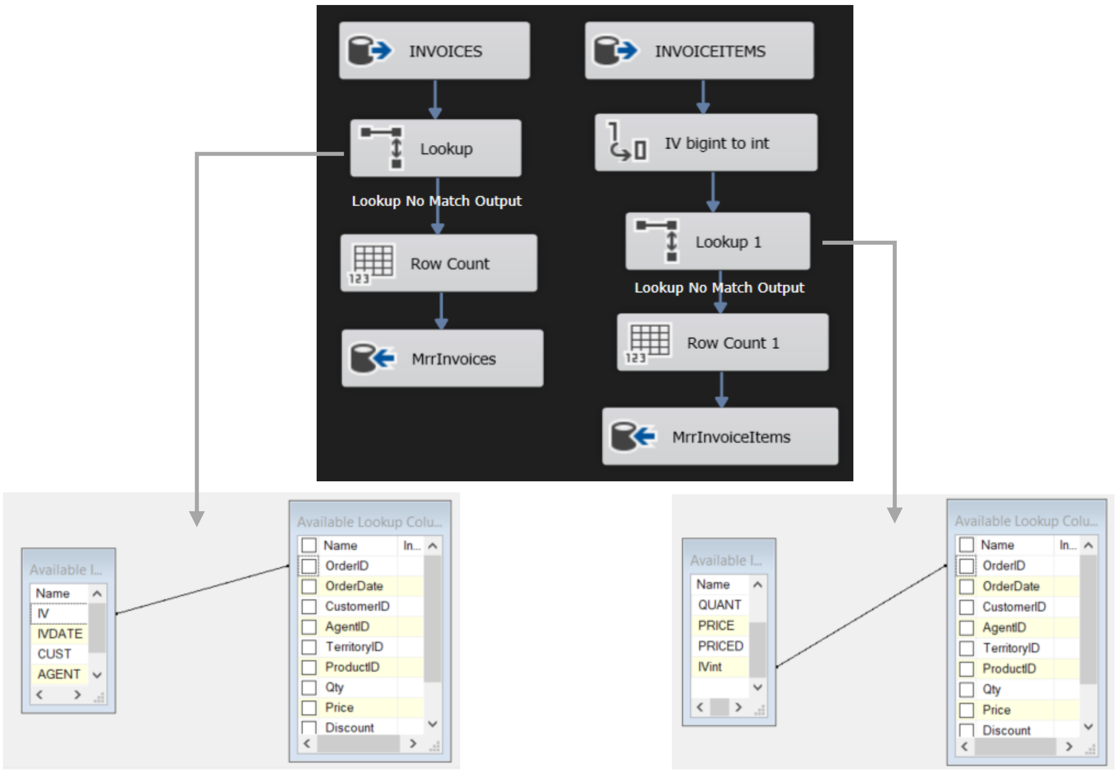
- **FactSales Table:**
  - MRR_Sales package:

    Mirror tables are truncated (using a stored procedure) and data is loaded from PriorityERP database (INVOICES and INVOICEITMES) to AppleSalesDM mirror tables.


Update StartTime Var
Update MaxOrderDateInFact
TRUNCATE Mrr Tables
PriorityERP Tables to MRR Tables - For Dims
Insert Data To DataTransfer
Enter SQL Query

```
EXECUTE SP_Trancate_Mrr_Tables_Fact
```

In the data flow, data is incrementally loaded using lookup transformations, meaning only new transactions that cannot be found in the FactSales table are loaded:

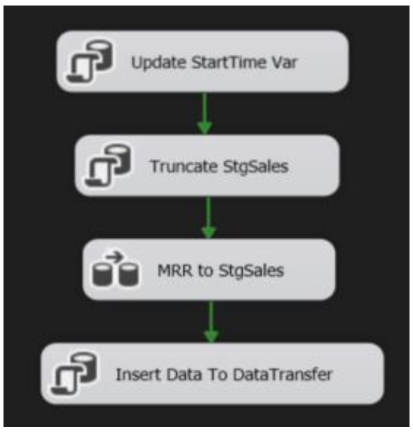


Data Conversion transformation is used to convert the IV column from bigint to int (DT_I4), this is necessary for the lookup transformation:

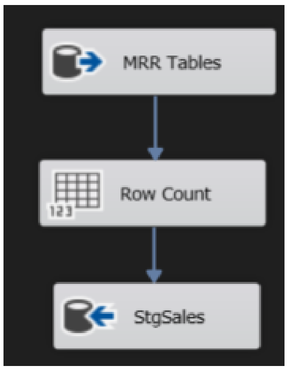
Input Column	Output Alias	Data Type
IV	IVint	four-byte signed integer [DT_I4]

- <u>STG_Sales package</u>:

  StgSales table is truncated, and the mirror tables are joined and loaded using a data flow task.



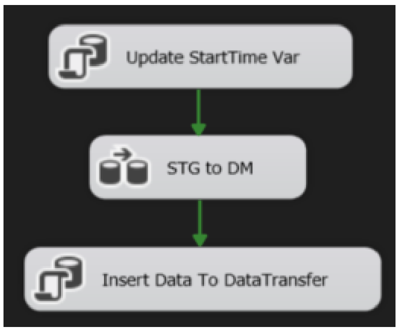
In the data flow, the mirror tables (MrrInvoices and MrrInvoiceItems) are joined, and the data is loaded to StgSales table.



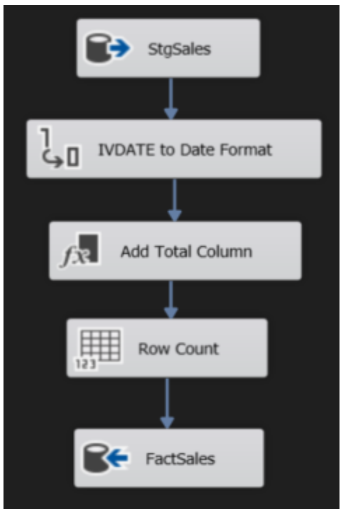
```
SELECT i.IV, i.IVDATE, CUST, i.AGENT, i.ZONE, ii.PART, QUANT, PRICE, PRICED
FROM MrrInvoices i
JOIN MrrInvoiceItems ii ON i.IV = ii.IV
```

- DM_Sales package:

  Data is loaded from StgSales to FactSales, and a Total column is added.



In the data flow, IVDATE column is converted from string to date format (DT_DBDATE) in a data conversion transformation. A Total column, which specifies the total price for the product in a sale, is calculated and added using a derived column transformation.

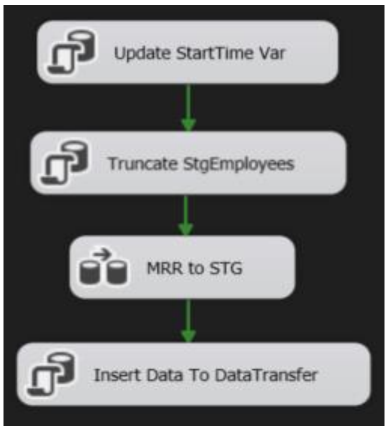


Input Column	Output Alias	Data Type
IVDATE	IVDATE_DateFormat	database date [DT_DBDATE]

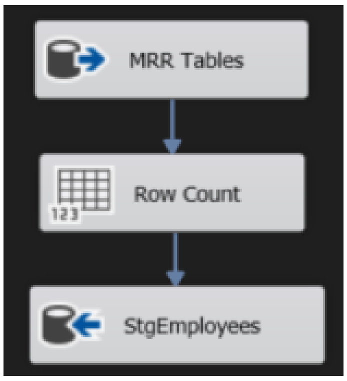
Derived Column Name	Derived Column	Expression
Total	<add as new column>	QUANT * PRICE * (1 - PRICED) * 1.17

- **DimEmployees Table**:
  - STG_Employees package:

StgEmployees table is truncated, and the mirror tables are joined and loaded using a data flow task.



In the data flow, the mirror tables (MrrEmployees and MrrInvoicesDim) are joined, and the data is loaded to StgEmployees table.

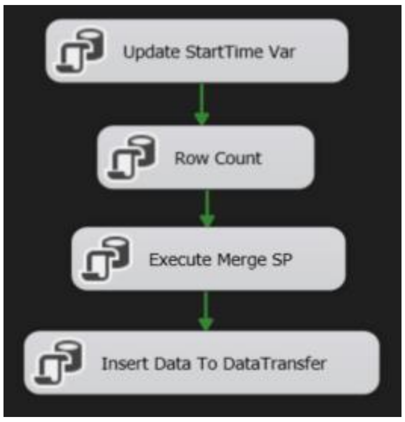


```
SELECT DISTINCT EMPCODE, FNAME, SNAME, SKILL,
HDATE, e.PHONE, ADDRESS2, e.ZONE
FROM MrrEmployees e
JOIN MrrInvoicesDim i ON e.EMPCODE = i.AGENT
```

This Join's objective is to exclude irrelevant employees from the sales data mart, i.e. include only employees which made a sale (thus are included in the INVOICES table).

- <u>DM_Employees package</u>:

  Data is incrementally loaded and updated in the DimEmployees.

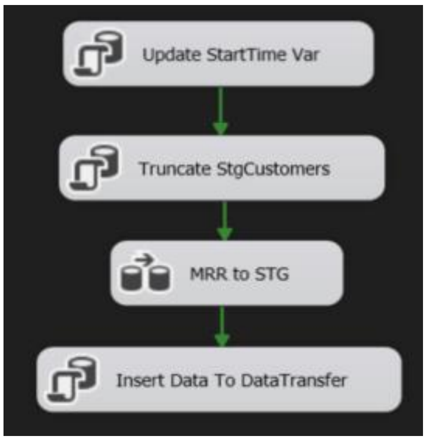


A merge stored procedure is executed in the Execute SQL Task, the merge statement works according to the following rational:

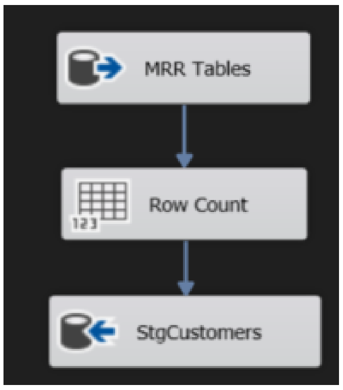
1. For **new** employees (EmployeeID exists in StgEmployees but not in DimEmployees): Insert new records to DimEmployees.
2. For **updated** employees (EmployeeID exists in StgEmployees and in DimEmployees but one or more of the other columns does not match): Update the record in DimEmployees.
3. For **deleted** employees (EmployeeID exists in DimEmployees but not in StgEmployees): Update the IsActive column in DimEmployees to 'N'.

- **DimCustomers Table**:
  - STG_Customers package:

    StgCustomers table is truncated, and the mirror tables are joined and loaded using a data flow task.



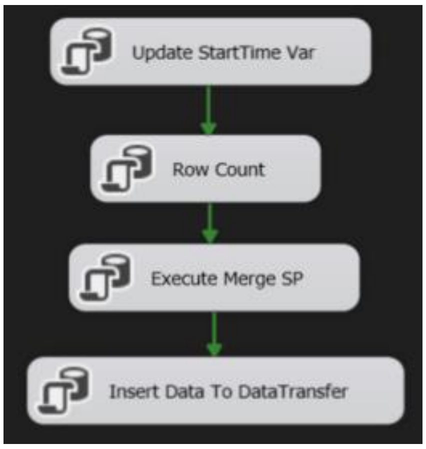
In the data flow, the 5 mirror tables (MrrCustomers , MrrInvoicesDim, MrrDestcodes, MrrStates, MrrCountries) are joined, and the data is loaded to StgCustomers table.



```
SELECT DISTINCT c.CUST, c.CUSTNAME, d.ADDRESS, d.CITY,
s.STATENAME, co.COUNTRY, c.BRANCH
FROM MrrCustomers c
JOIN MrrInvoicesDim i ON c.CUST = i.CUST
LEFT JOIN MrrDestcodes d ON i.DESTCODE = d.DESTCODE
LEFT JOIN MrrStates s ON d.STATE = s.STATEID
LEFT JOIN MrrCountries co ON s.COUNTRY = co.COUNTRYCODE
```

  - DM_Customers package:

Data is incrementally loaded and updated in DimCustomers.

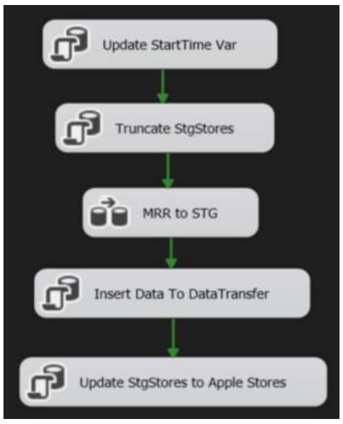


A merge stored procedure is executed in the Execute SQL Task, the merge statement works according to the following rational:

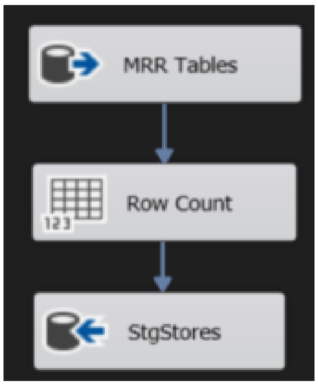
1. For **new** customers (CustomerID exists in stgCustomers but not in DimCustomers): Insert new records to DimCustomers.
2. For **updated** customers (CustomerID exists in stgCustomers and in DimCustomers but one or more of the other columns does not match): Update the record in DimCustomers.
3. For **deleted** customers (CustomerID exisst in DimCustomers but not in StgCustomers): Updates the IsActive column in DimCustomers to 'N'.

- **DimStores Table**:
  - STG_Stores package:

  StgStores table is truncated, and the mirror tables are joined and loaded using a data flow task. Store names are updated using a stored procedure, executed in an Execute SQL task.



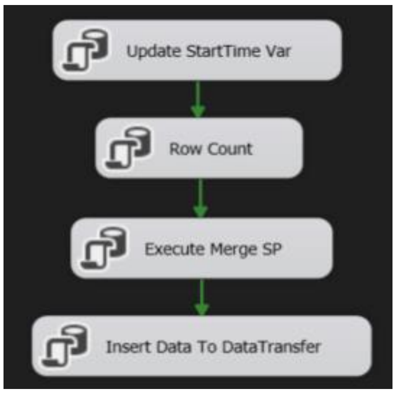
In the data flow, the 3 mirror tables (MrrBranches, MrrCustomers, MrrInvoicesDim) are joined, and the data is loaded to StgStores table.



```
SELECT DISTINCT b.BRANCH, b.BRANCHNAME, IIF(b.BRANCH = 1995,
'Online', s.STATENAME) AS STATENAME
FROM MrrBranches b
LEFT JOIN MrrCustomers c ON c.BRANCH = b.BRANCH
JOIN MrrInvoicesDim i ON c.CUST = i.CUST
LEFT JOIN MrrDestcodes d ON i.DESTCODE = d.DESTCODE
LEFT JOIN MrrStates s ON d.STATE = s.STATEID
```

- <u>DM_Stores package</u>:

  Data is incrementally loaded and updated in DimCustomers.

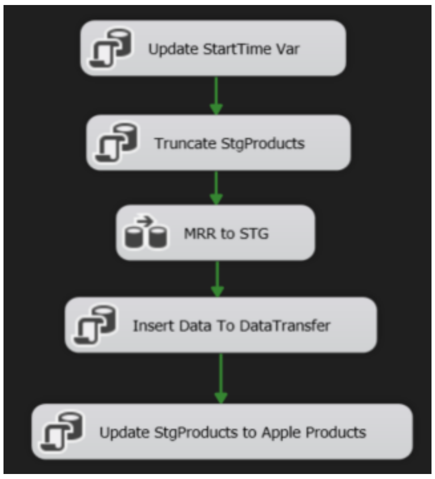


A merge stored procedure is executed in the Execute SQL Task, the merge statement works according to the following rational:

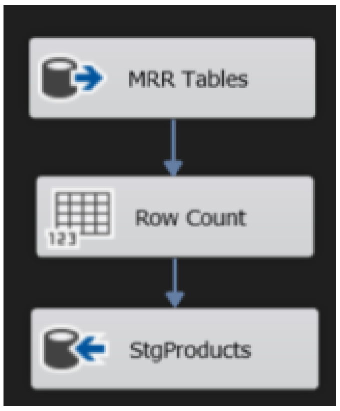
1. For **new** stores (storeID exists in StgStores but not in DimStores): Insert new records to DimStores.
2. For **updated** stores (storeID exists in StgStores and in DimStores but one or more of the other columns does not match): Update the record in DimStores.
3. For **deleted** stores (storeID exists in DimStores but not in StgStore): Update the IsActive column in DimStores to ‘N’.

- **DimProducts Table**:
  - <u>STG_Products package</u>:

StgProducts table is truncated, and the mirror tables are joined and loaded using a data flow task. Product names, categories, and subcategories are updated using a stored procedure, executed in an Execute SQL task.

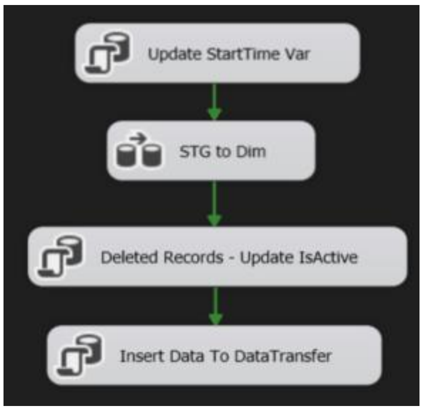

Update StartTime Var
Truncate StgProducts
MRR to STG
Insert Data To DataTransfer
Update StgProducts to Apple Products

In the data flow, the 3 mirror tables (MrrPart, MrrFamily, MrrFamilyTypes) are joined, and the data is loaded to StgProducts table.



```
SELECT p.PART, PARTNAME, FTNAME, FAMILYNAME
FROM MrrPart p
LEFT JOIN MrrFamily f ON p.FAMILY = f.FAMILY
LEFT JOIN MrrFamilyTypes ft ON f.FAMILYTYPE =
ft.FAMILYTYPE
```

- <u>DM_Products package:</u>
  Data is incrementally loaded and updated in DimProducts. Deleted records are updated in DimProducts using an Execute SQL task.

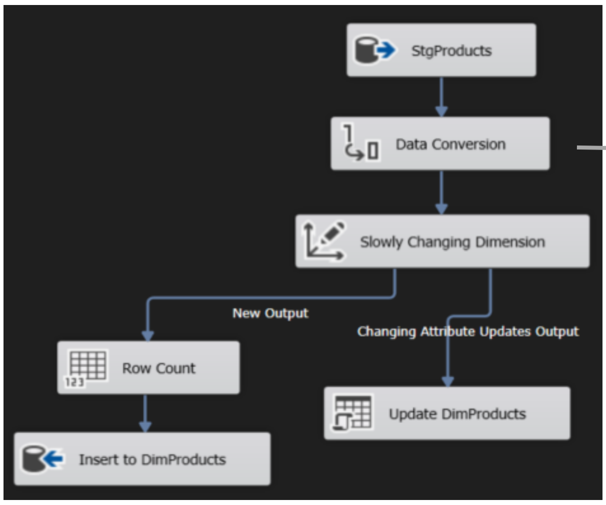

Update StartTime Var
STG to Dim
Deleted Records - Update IsActive
Insert Data To DataTransfer

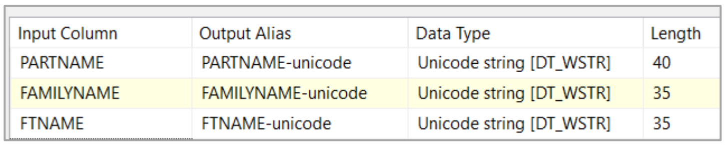
```
UPDATE DimProducts
SET IsActive = 'N', UpdateDate = GETDATE()
FROM DimProducts d
LEFT JOIN StgProducts s ON d.ProductID = s.PART
WHERE s.PART IS NULL AND IsActive = 'Y'
```

Deleted records are located using Left Join between DimProducts and StgProducts using ProductID as the key, while filtering records to products where ProductID in StgProducts is

NULL (i.e. products which cannot be found in StgProducts), and products where IsActive in DimProducts is 'Y' (i.e. they were not updated as deleted yet).

In the Data Flow, Incremental load to the DimProducts table is done using the Slowly Changing Dimension transformation (change type: Changing Attribute). 3 column data types are converted to Unicode (DT_WSTR) using data conversion transformation to match destination data types.

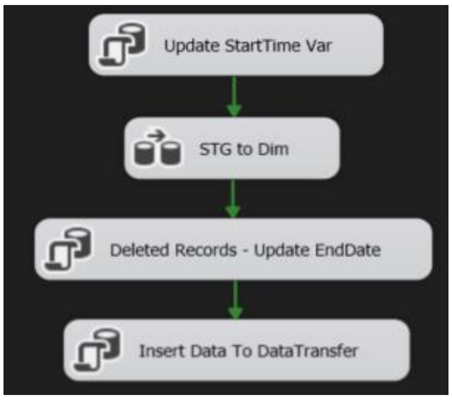




Input Column	Output Alias	Data Type	Length
PARTNAME	PARTNAME-unicode	Unicode string [DT_WSTR]	40
FAMILYNAME	FAMILYNAME-unicode	Unicode string [DT_WSTR]	35
FTNAME	FTNAME-unicode	Unicode string [DT_WSTR]	35

- **DimProductsHistory Table**:
  - DM_ProductsHistory package:

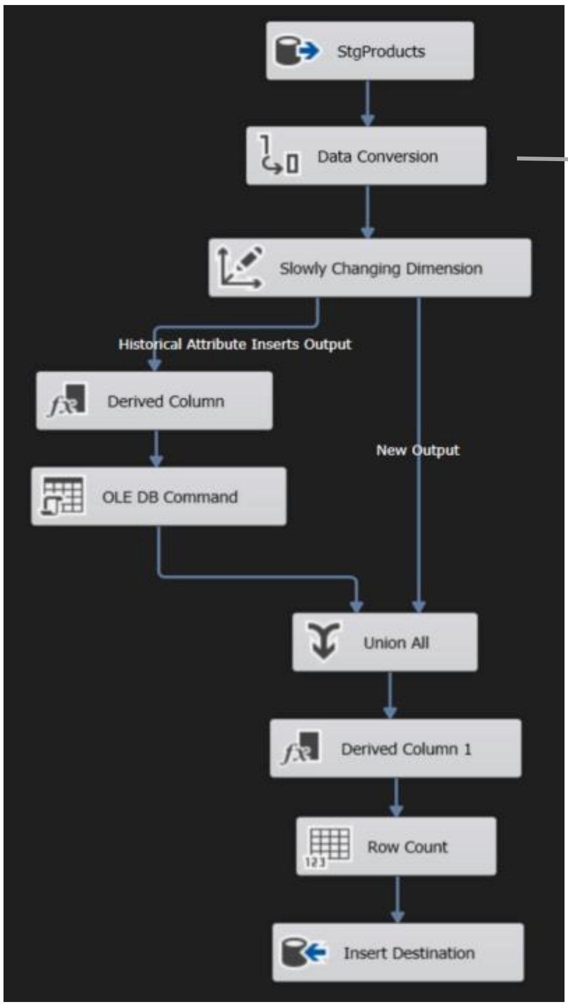
    Data is incrementally loaded and updated in DimProductsHistory. Deleted records are updated in DimProductsHistory using an Execute SQL task.

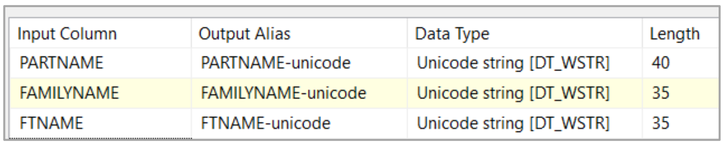


```
UPDATE DimProductsHistory
SET EndDate = GETDATE()
FROM DimProductsHistory d
LEFT JOIN StgProducts s ON d.ProductID = s.PART
WHERE s.PART IS NULL AND d.EndDate IS NULL
```

Deleted records are located in the same manner as in the DM_Products package but while using EndDate column instead of IsActive.

In the Data Flow, Incremental load to the DimProductsHistory table is done using the Slowly Changing Dimension transformation (change type: Historical Attribute). 3 column data types are converted to Unicode (DT_WSTR) using data conversion transformation to match destination data types.

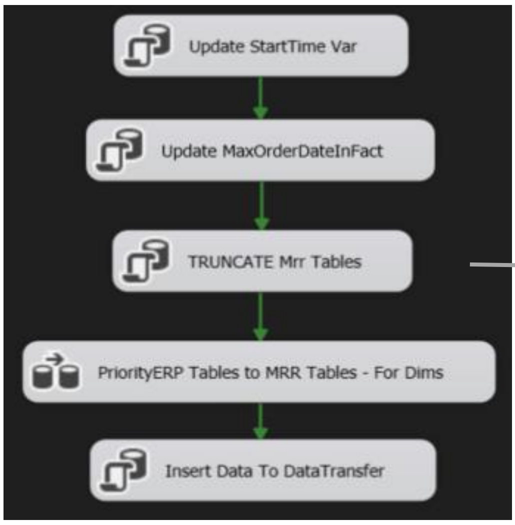


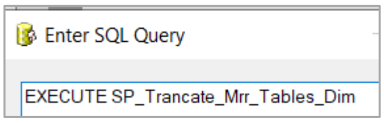


Input Column	Output Alias	Data Type	Length
PARTNAME	PARTNAME-unicode	Unicode string [DT_WSTR]	40
FAMILYNAME	FAMILYNAME-unicode	Unicode string [DT_WSTR]	35
FTNAME	FTNAME-unicode	Unicode string [DT_WSTR]	35

- **All Dim Tables – Mirror step**
  - MRR_Dim package:

    This package is responsible for loading data from PriorityERP tables to all mirror tables relevant for the dim tables (10 tables in total). All mirror tables (except MrrInvoicesDim) are truncated using a stored procedure.

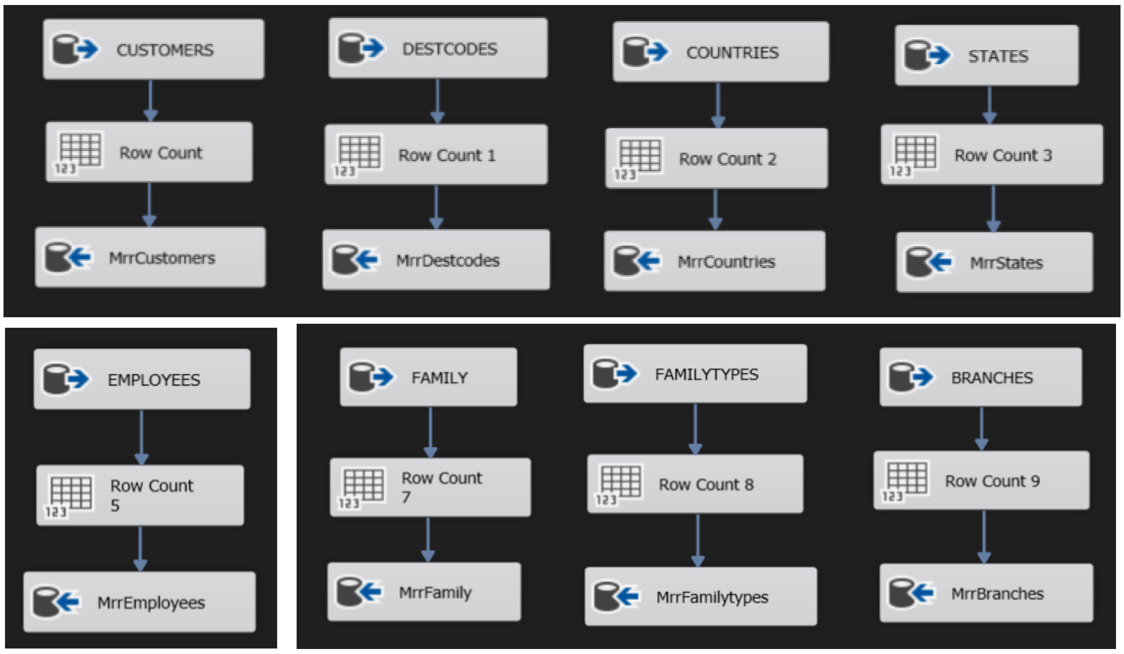

Update StartTime Var
Update MaxOrderDateInFact
TRUNCATE Mrr Tables
PriorityERP Tables to MRR Tables - For Dims
Insert Data To DataTransfer



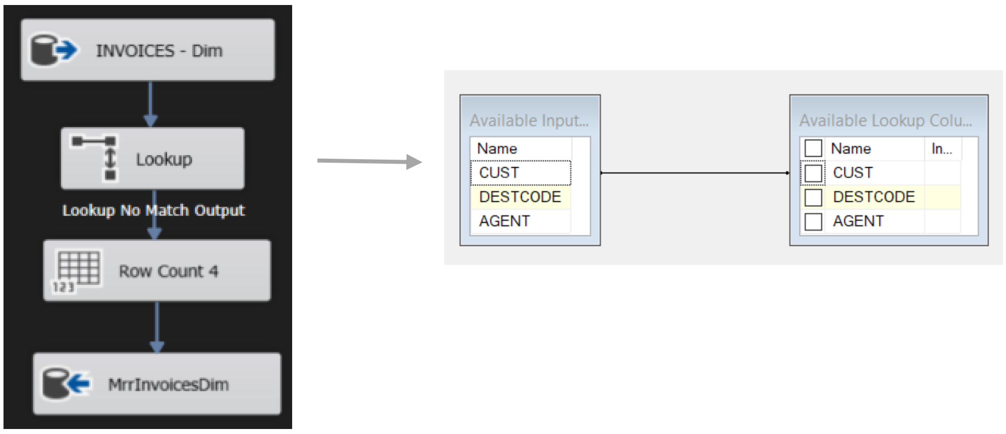
Enter SQL Query

```
EXECUTE SP_Trancate_Mrr_Tables_Dim
```

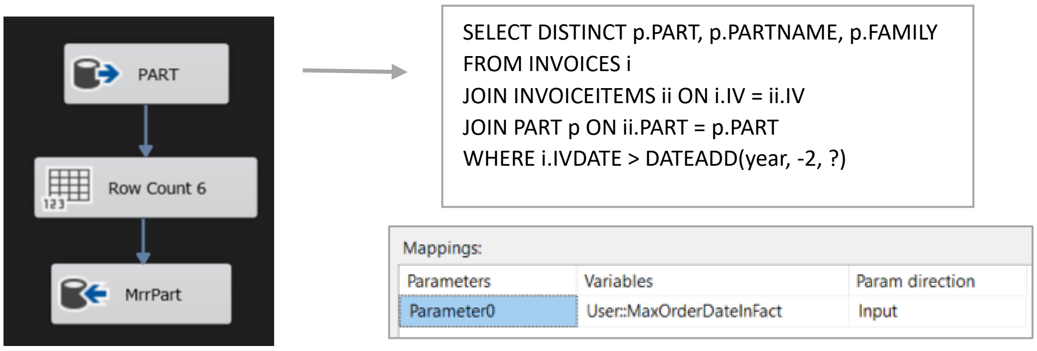
In the data flow:



Loading to MrrInvoicesDim is incremental and is performed using Lookup transformation (comparing records to MrrInvoicesDim), the MrrInvoicesDim is not truncated (compared to other mirror tables):



In order to filter out irrelevant product while loading to MrrPart, only products sold in the last 2 years are loaded to the table. This is done using a variable containing the max order date in the FactSales table:



```
SELECT DISTINCT p.PART, p.PARTNAME, p.FAMILY
FROM INVOICES i
JOIN INVOICEITEMS ii ON i.IV = ii.IV
JOIN PART p ON ii.PART = p.PART
WHERE i.IVDATE > DATEADD(year, -2, ?)
```

Mappings:

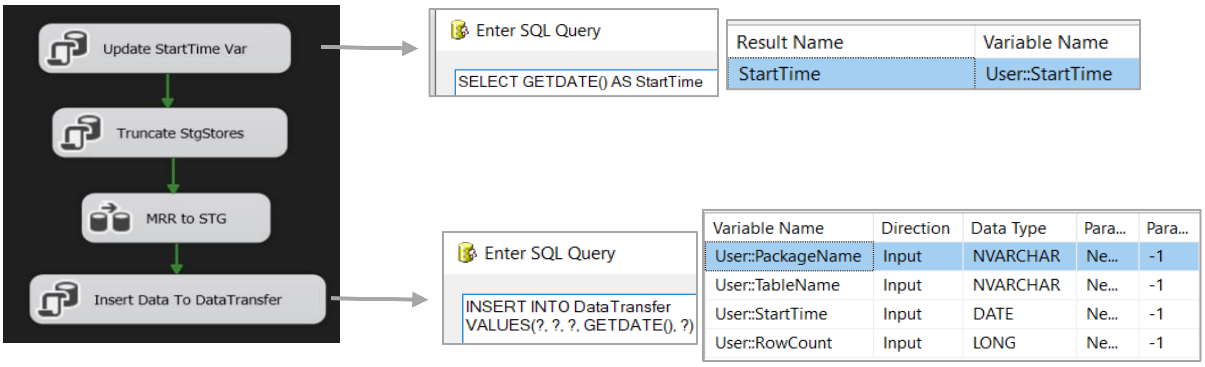
Parameters	Variables	Param direction
Parameter0	User::MaxOrderDateInFact	Input

- **DataTransfer Table**

  To monitor the ETL process, a dataTransfer table was created documenting each data insert: which table was updated and in which package, how many rows were inserted, and start and end times. The tasks and transformation in charge of the updates are included in all of the packages.

  Example from STG_Stores package:

  In the control flow user variable StartTime is updated in the first task, and an insert statement is executed in the last task, inserting the values of the user variables: PackageName, TableName, StartTime, RowCount (which is updated in the data flow), with GETDATE() as EndTime.



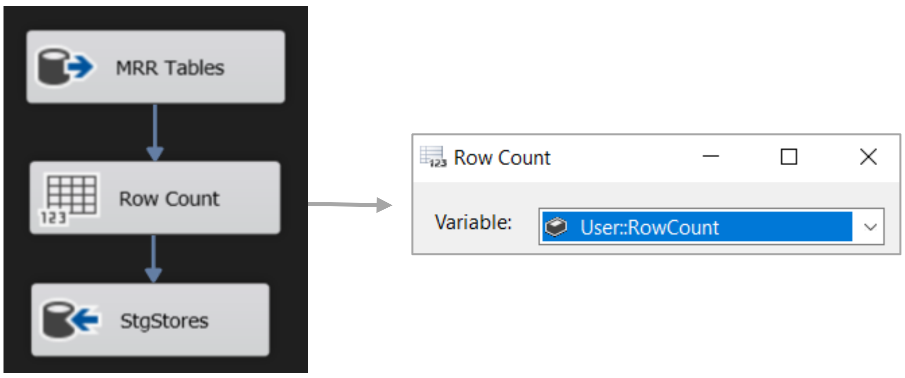
```
SELECT GETDATE() AS StartTime
```

Result Name	Variable Name
StartTime	User::StartTime

```
INSERT INTO DataTransfer
VALUES(?, ?, ?, GETDATE(), ?)
```

Variable Name	Direction	Data Type	Para...	Para...
User::PackageName	Input	NVARCHAR	Ne...	-1
User::TableName	Input	NVARCHAR	Ne...	-1
User::StartTime	Input	DATE	Ne...	-1
User::RowCount	Input	LONG	Ne...	-1

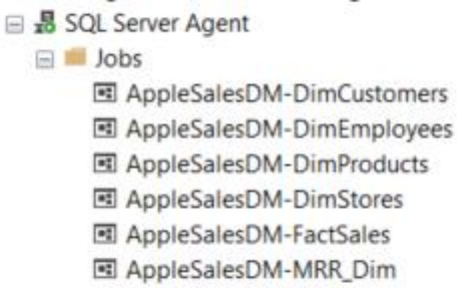
  In the data flow the user variable RowCount is updated using a Row Count transformation.



Variable: User::RowCount

- **Automatic Processing:**

  The data is automatically refreshed daily at 4:00:00 using SQL Agent jobs, the first job executed is the AppleSalesDM-MRR_DIM this job executes the next job and so on:

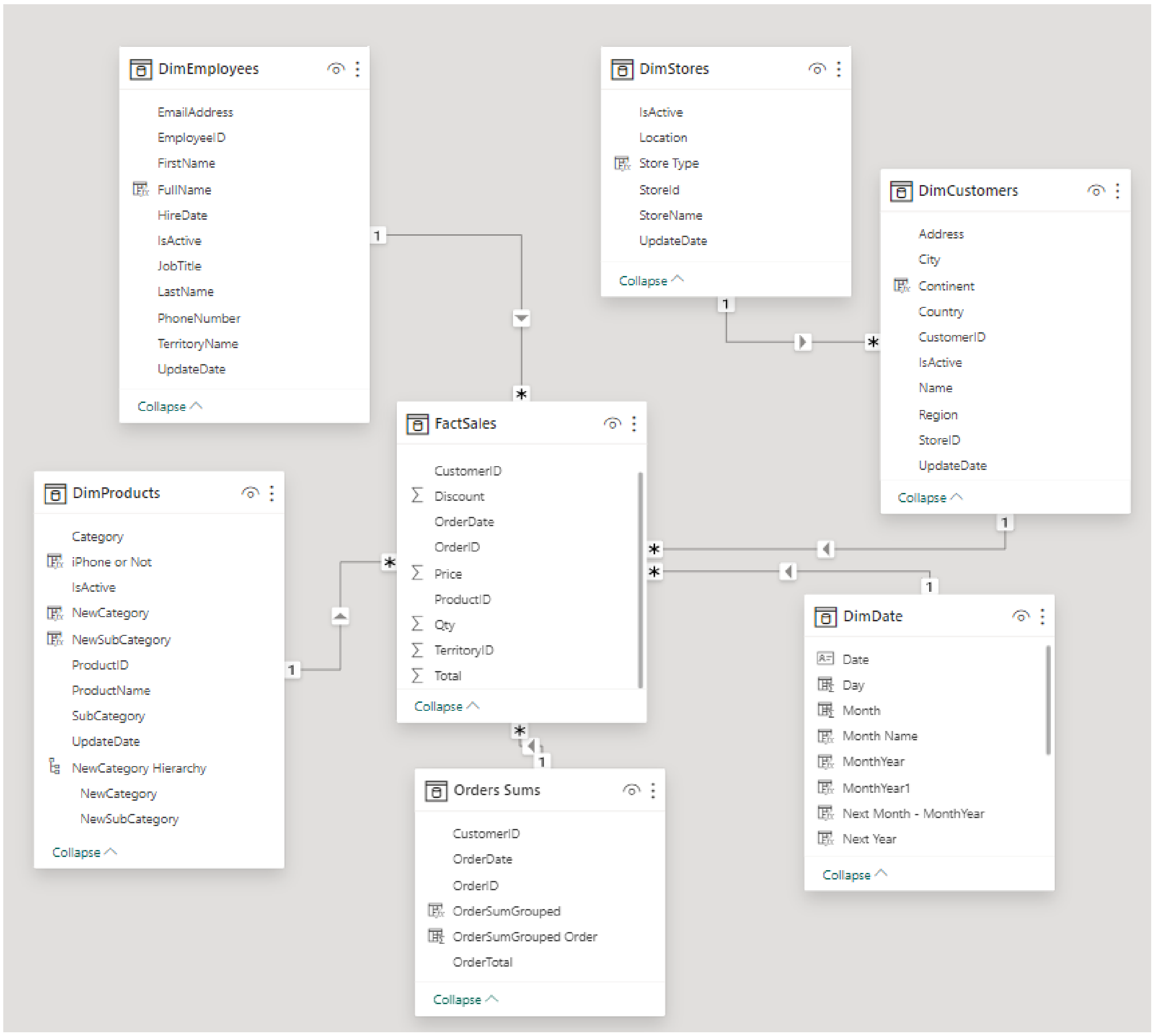


SQL Server Agent
- Jobs
  - AppleSalesDM-DimCustomers
  - AppleSalesDM-DimEmployees
  - AppleSalesDM-DimProducts
  - AppleSalesDM-DimStores
  - AppleSalesDM-FactSales
  - AppleSalesDM-MRR_Dim

4.3. **Visualization in Power BI:**

4.3.1. The reports were created using Power BI Desktop and were published to Power BI Service. The model in the Power BI includes the Fact table and the 5 Dimension tables (not including the product history table). To these tables, a DimDate table was added, together with 3 more tables:

- Orders Sums – an aggregated table calculating the sum for each order. This table was used in a slicer slicing orders by sum groups (e.g. $0-$500, $500-$1,000 etc.). This table was related to FactSales using OrderID.
- Yearly Goals – a table specifying the sales goals for each year (relying on previous year's sales) This table was not connected to the model.
- Monthly Goals - a table specifying the sales goals for each month (relying on sales of the same month on previous year).



4.3.2. To create the visuals, the following measures were created in DAX:

Totals:

- Total Customers = IF(ISBLANK(DISTINCTCOUNT(FactSales[CustomerID])), 0, DISTINCTCOUNT(FactSales[CustomerID]))

- Total Orders = IF(ISBLANK(DISTINCTCOUNT(FactSales[OrderID])), 0, DISTINCTCOUNT(FactSales[OrderID]))
- Total Revenue = IF(ISBLANK(SUM(FactSales[Total])), 0, SUM(FactSales[Total]))
- Total Units = IF(ISBLANK(SUM(FactSales[Qty])), 0, SUM(FactSales[Qty]))

Previous Year/Month:

- Previous Year Orders = CALCULATE([Total Orders], SAMEPERIODLASTYEAR(DimDate[Date]))
- Previous Year Sales = CALCULATE([Total Revenue], SAMEPERIODLASTYEAR(DimDate[Date]))
- Previous Year Units = CALCULATE([Total Units], SAMEPERIODLASTYEAR(DimDate[Date]))
- Previous Month Sales = IF(ISBLANK(CALCULATE([Total Revenue], PREVIOUSMONTH(DimDate[Date]))), BLANK(), CALCULATE([Total Revenue], PREVIOUSMONTH(DimDate[Date])))

Change From Last Year/Month:

- YoY Growth = IFERROR([Total Revenue]/[Previous Year Sales] - 1, "NULL")
- YoY Growth Orders = IFERROR([Total Orders]/[Previous Year Orders] - 1, "NULL")
- YoY Growth Units = IFERROR([Total Units]/[Previous Year Units] - 1, "NULL")
- MoM Growth = IFERROR([Total Revenue]/[Previous Month Sales] - 1, BLANK())

YTD and MTD:

- YTD Customers = TOTALYTD([Total Customers], DimDate[Date])
- YTD Sales = TOTALYTD([Total Revenue], DimDate[Date])
- MTD Customers = TOTALMTD([Total Customers], DimDate[Date])
- MTD Sales = TOTALMTD([Total Revenue], DimDate[Date])

Averages:

- Average Monthly Revenue = IF(ISERROR(AVERAGEX(VALUES(DimDate[MonthYear]), [Total Revenue])), 0, AVERAGEX(VALUES(DimDate[MonthYear]), [Total Revenue]))
- Average Orders Per Customer = IF(ISERROR([Total Orders]/[Total Customers]), 0, [Total Orders]/[Total Customers])
- Average Sales Amount Per Customer = IF(ISERROR([Total Revenue] / DISTINCTCOUNT(DimCustomers[CustomerID])), 0, [Total Revenue] / DISTINCTCOUNT(DimCustomers[CustomerID]))
- Average Sales Amount Per Customer Previous Year = IF(ISERROR([Previous Year Sales] / DISTINCTCOUNT(DimCustomers[CustomerID])), 0, [Previous Year Sales] / DISTINCTCOUNT(DimCustomers[CustomerID]))
- Average Sales Amount Per Order = IF(ISERROR([Total Revenue] / DISTINCTCOUNT(FactSales[OrderID])), 0, [Total Revenue] / DISTINCTCOUNT(FactSales[OrderID]))
- Average Units Per Customer = IF(ISERROR([Total Units]/[Total Customers]), 0, [Total Units]/[Total Customers])
- Average Units Per Order = IF(ISERROR([Total Units] / DISTINCTCOUNT(FactSales[OrderID])), 0, [Total Units] / DISTINCTCOUNT(FactSales[OrderID]))

New Customers:

- New Customers =

```
VAR currentCustomers = VALUES(FactSales[CustomerID])

VAR currentDate = MIN(DimDate[Date])
VAR pastCustomers =
CALCULATETABLE(VALUES(FactSales[CustomerID]),ALL(DimDate[Date]),Dim
Date[Date]<currentDate)

VAR newCustomers = EXCEPT(currentCustomers,pastCustomers)

RETURN

IF(ISBLANK(COUNTROWS(newCustomers)), 0,
COUNTROWS(newCustomers))
```

- New Customers % = IF(ISERROR([New Customers]/[Total Customers]), 0, [New Customers]/[Total Customers])

Measures for visuals including monthly and yearly goals:

- Max Month = FORMAT(MAXX(DimDate, DimDate[Date]), "mmm-yyyy")
- Max Year = Year(MAXX(DimDate, DimDate[Date]))
- Monthly Goal = CALCULATE(SUM('Monthly Goals'[Goal]), FILTER('Monthly Goals', 'Monthly Goals'[Next Month - MonthYear] = [Max Month]))
- Monthly Goal Max For Gauge = [Monthly Goal] * 1.2
- Yearly Goal = CALCULATE(SUM('Yearly Goals'[Goal]), FILTER('Yearly Goals', 'Yearly Goals'[Next Year] = [Max Year]))
- Yearly Goal Max For Gauge = [Yearly Goal] * 1.2

- Count of Customers with that Many Orders Grouped =

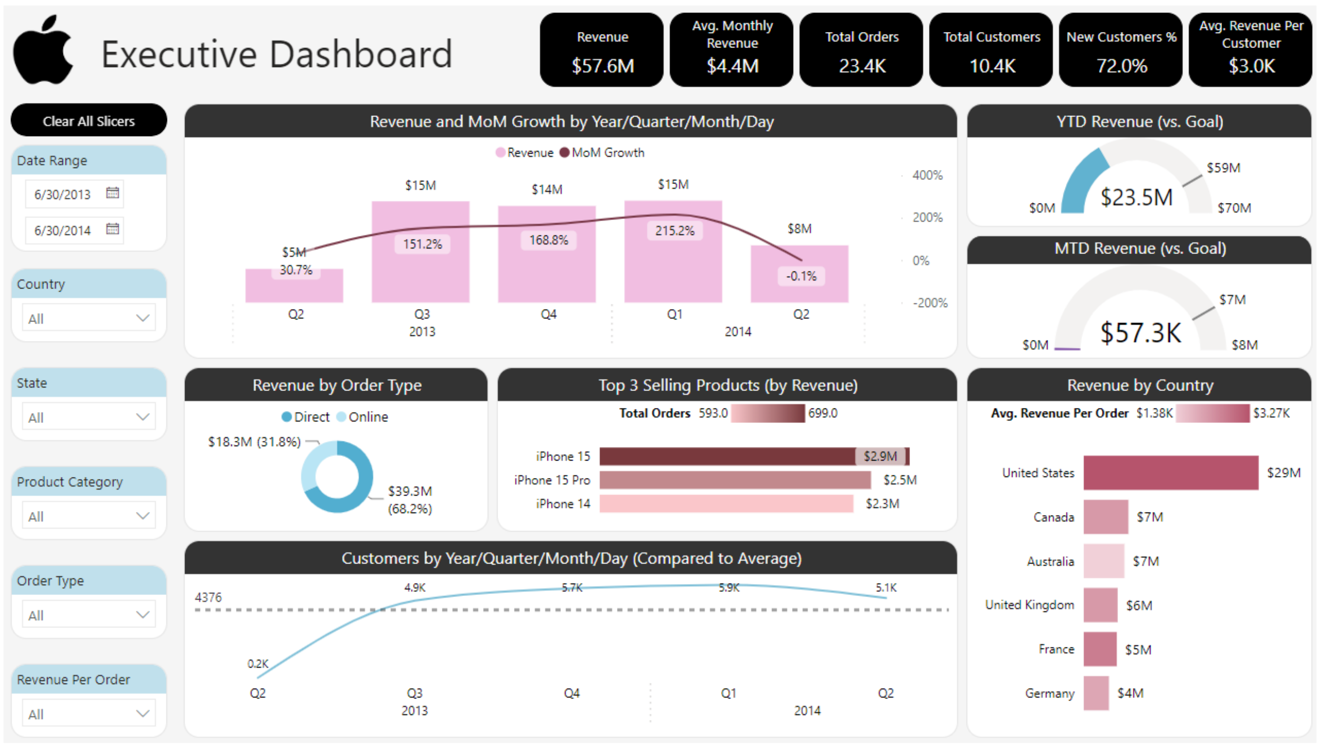
```
VAR _CustomerOrders =
        SUMMARIZE(
        FactSales,
        FactSales[CustomerID],
        "How Many Orders",
        DISTINCTCOUNT(FactSales[OrderID])
        )
RETURN
        COUNTROWS(
        FILTER(
        _CustomerOrders,
        [How Many Orders] >= SELECTEDVALUE(Segment[Bottom]) && [How Many
Orders] <= SELECTEDVALUE(Segment[Top])
))
```

4.3.3. Reports:

The project includes 3 reports: Executive Dashboard, Sales Analysis, Customer Analysis. All the three reports include only data from the last year (i.e. 365 earlier from the max order date)

4.3.3.1. Executive Dashboard:

This report was created to provide a broader look at the company's status, it includes the main KPIs, sales performance vs. goals, and general graphs.



KPI Cards:

- Revenue
- Average Monthly Revenue
- Total Orders
- Total Customers
- New Customers %
- Average Revenue Per Customer

Graphs:

- Revenue and MoM Growth by Year/Quarter/Month/Day (Drill Mode)
- YTD Revenue compared to yearly goal – goal and max value on the gauge, change according to the time range.
- Month Revenue compared to monthly goal - goal and max value on the gauge, change according to the time range.
- Revenue by Order Type
- Top 3 Selling Products by Revenue
- Customers by Year/Quarter/Month/Day (Drill Mode) Compared to Average
- Revenue by Country – Color by Average Revenue per Order

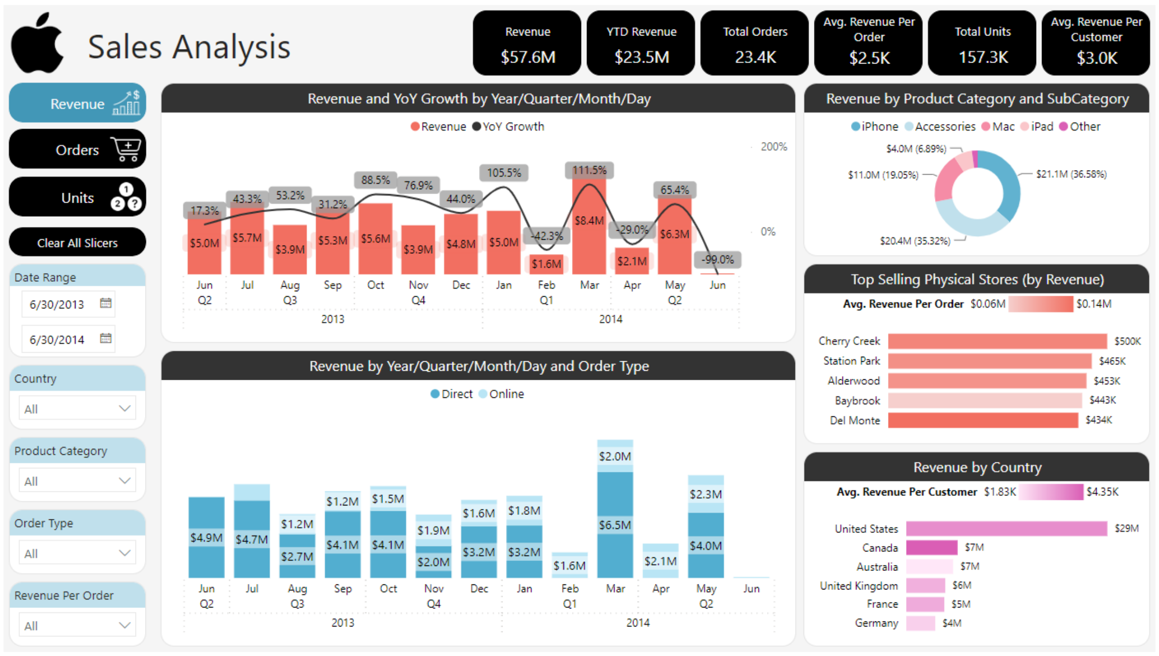
Slicers:

- Date Range
- Country
- State

- Product Category
- Order Type
- Revenue Per Order (grouped)

4.3.3.2. Sales Analysis:

This report was created for the sales department to follow and understand sales performance to achieve the department's goals.
In its initial state, the graphs present revenue data. Using the three buttons on the to right, the user can control the data shown in the graphs and change it to orders data, and units data.



KPI Cards (same for all 3 states):

- Revenue
- YTD Revenue
- Total Orders
- Average Revenue per Order
- Total Units
- Average Revenue Per Customer

Slicers (same for all 3 states):

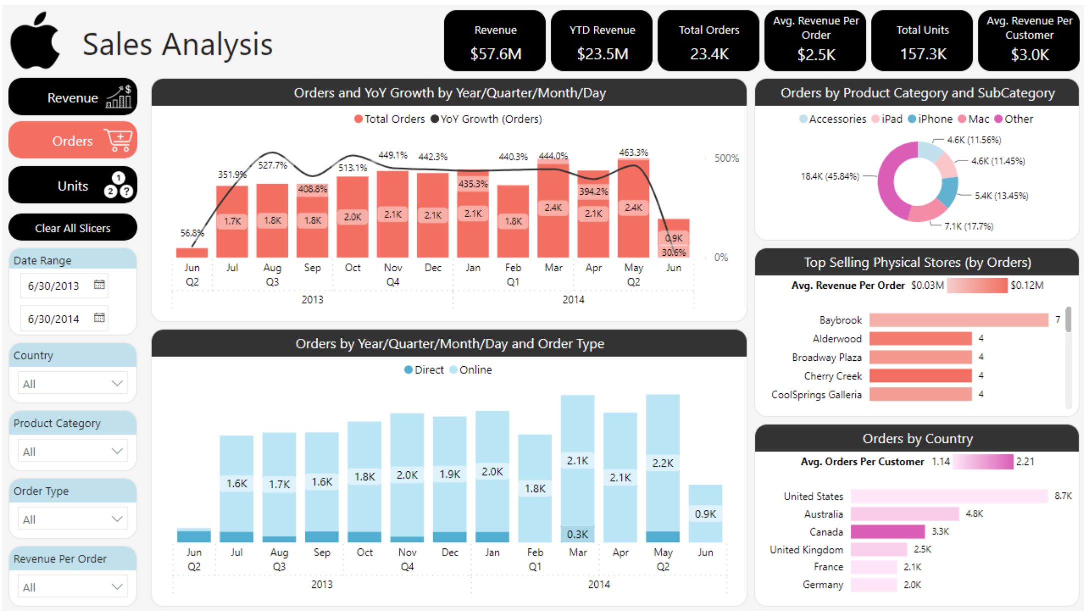
- Date Range
- Country
- Product Category
- Order Type
- Revenue Per Order (grouped)

Graphs (revenue state):

- Revenue and YoY Growth by Year/Quarter/Month/Day (Drill Mode)
- Revenue by Year/Quarter/Month/Day (Drill Mode) and by Order Type
- Revenue by Product Category/SubCategory (Drill Mode)

- Top 5 Selling Stores (by Revenue)
- Revenue by Country – Color gradient by Average Revenue per Customer

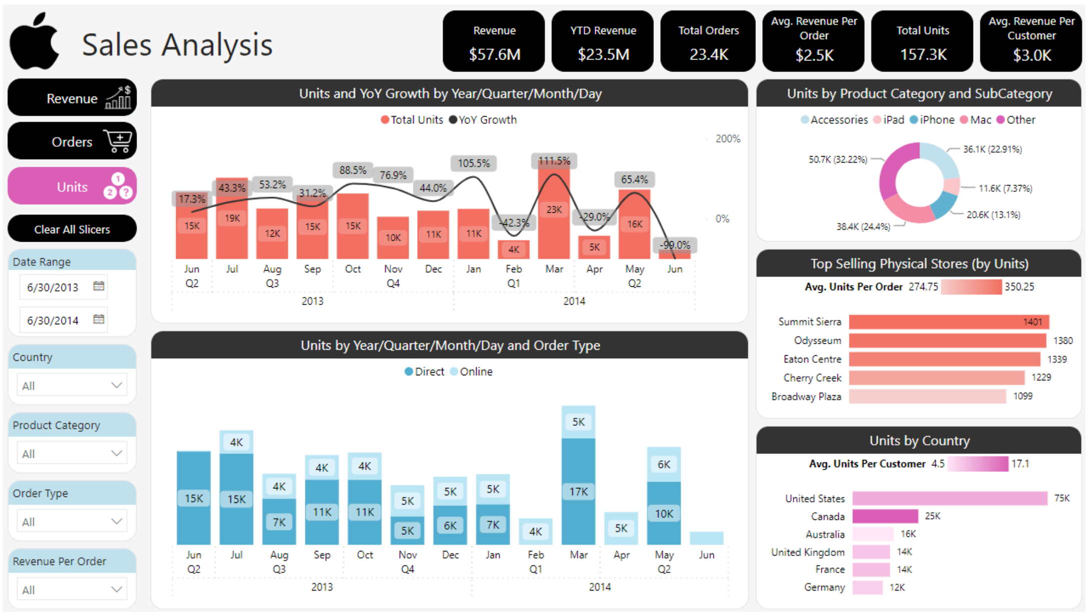
<u>Orders State:</u>



Graphs (orders state):

- Orders and YoY Growth by Year/Quarter/Month/Day (Drill Mode)
- Orders by Year/Quarter/Month/Day (Drill Mode) and by Order Type
- Orders by Product Category/SubCategory (Drill Mode)
- Top 5 Selling Stores (by Orders)
- Revenue by Country – Color gradient by Average Orders per Customer

<u>Units State:</u>



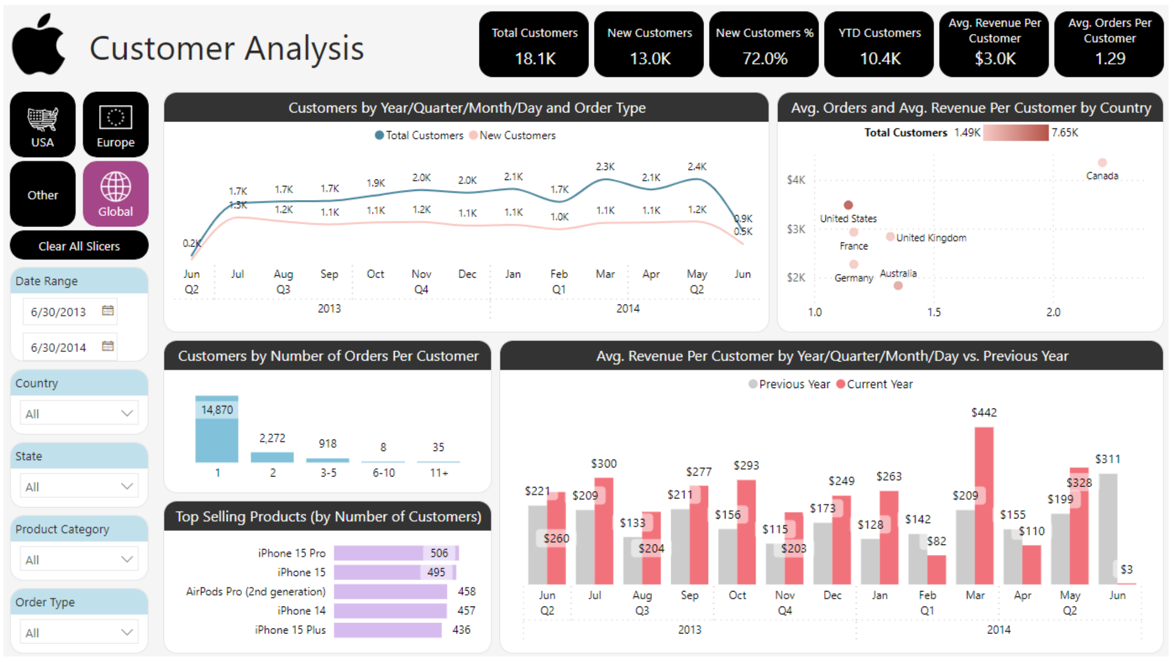
Graphs (units state):

- Units and YoY Growth by Year/Quarter/Month/Day (Drill Mode)

- Units by Month/Day (Drill Mode) and by Order Type
- Units by Product Category/SubCategory (Drill Mode)
- Top 5 Selling Stores (by Units)
- Revenue by Country – Color gradient by Average Units per Customer

4.3.3.3. Customer Analysis:

This report was created for the customers department to better understand Apple's customer behavior to achieve the department's goals.



KPI Cards:

- Total Customers
- New Customers
- New Customers %
- YTD Customers
- Average Revenue per Customer
- Average Orders per Customer

Graphs:

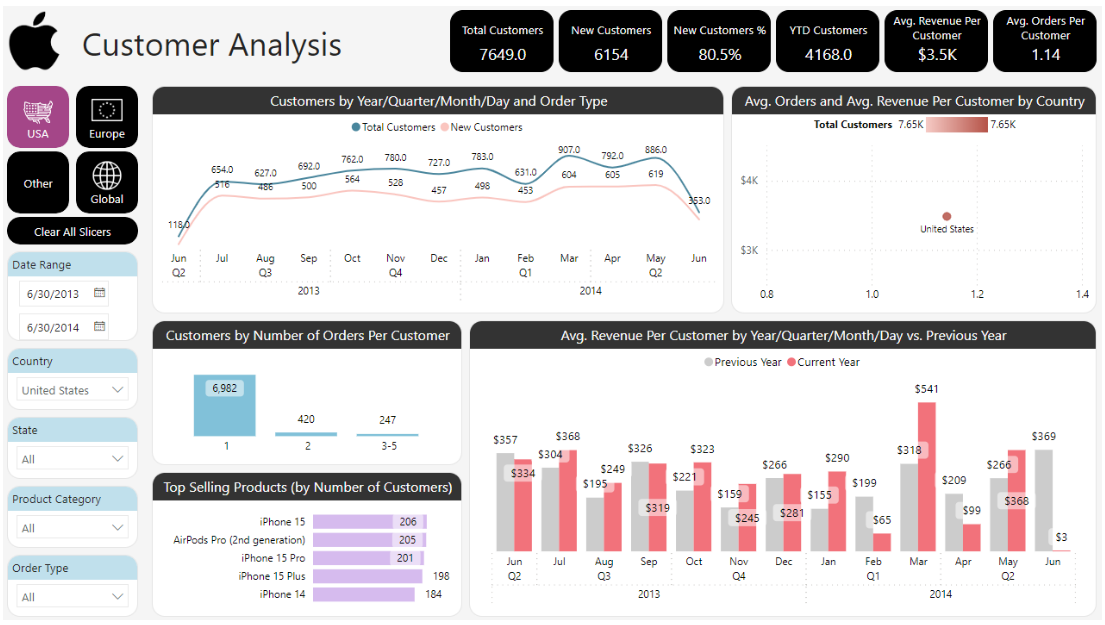
- Customers by Year/Quarter/Month/Day (Drill Mode)
- Average Orders per Customer and Average Revenue Per Customer by Country – Color gradient by Total Customers
- Customers by Number of Orders per Customer – This bar chart, specified for the chosen time range (can be changed using the Date Range slicer), how many customers ordered once, twice, 3-5 time, 6-10 time, and more than 10.
- Top 5 Selling Products by number of customers.
- Average Revenue per Customer by Month/Day (Drill Mode) vs. Previous Year

Slicers:

- Date Range

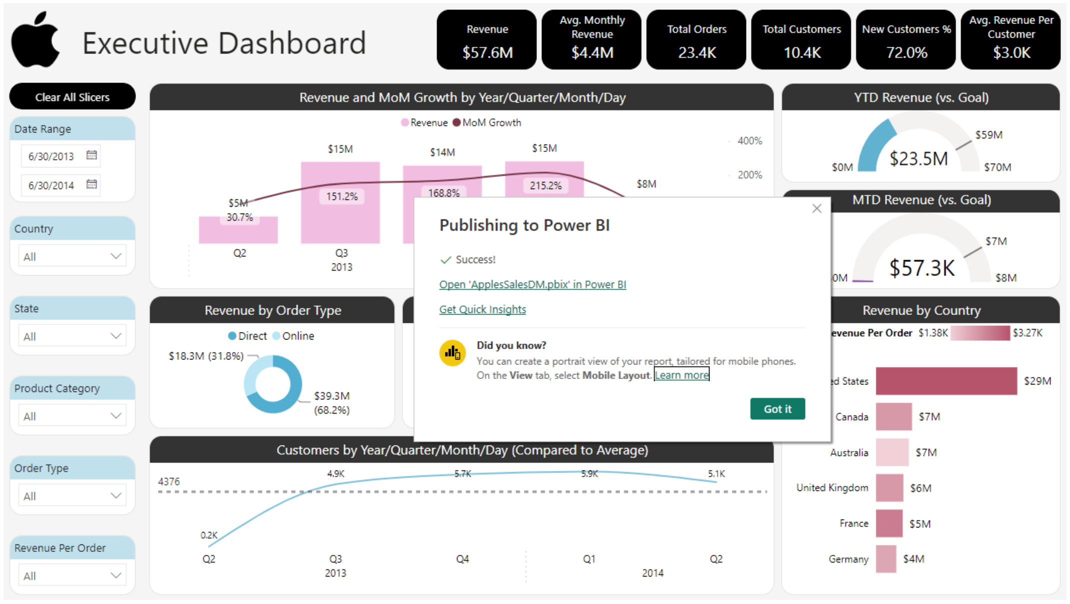
- Country
- State
- Product Category
- Order Type

Using the 4 buttons on the top left, the user can slice the data according to major customer populations: USA, Europe (France, Germany, and United Kingdom), Other (Australia and Canda), and global – presenting data from all countries.



Customer Analysis
Total Customers 7649.0
New Customers 6154
New Customers % 80.5%
YTD Customers 4168.0
Avg. Revenue Per Customer $3.5K
Avg. Orders Per Customer 1.14
USA
Europe
Other
Global
Clear All Slicers
Date Range
6/30/2013
6/30/2014
Country
United States
State
All
Product Category
All
Order Type
All
Customers by Year/Quarter/Month/Day and Order Type
Total Customers
New Customers
Avg. Orders and Avg. Revenue Per Customer by Country
Total Customers 7.65K 7.65K
United States
Customers by Number of Orders Per Customer
6,982
420
247
1
2
3-5
Top Selling Products (by Number of Customers)
iPhone 15 206
AirPods Pro (2nd generation) 205
iPhone 15 Pro 201
iPhone 15 Plus 198
iPhone 14 184
Avg. Revenue Per Customer by Year/Quarter/Month/Day vs. Previous Year
Previous Year
Current Year

4.3.4. After creating the reports in Power BI Desktop, they were published to Power BI Service, and an app was created - [Final Project – Adi Aljadeff - Apple](#).



Publishing to Power BI

✓ Success!

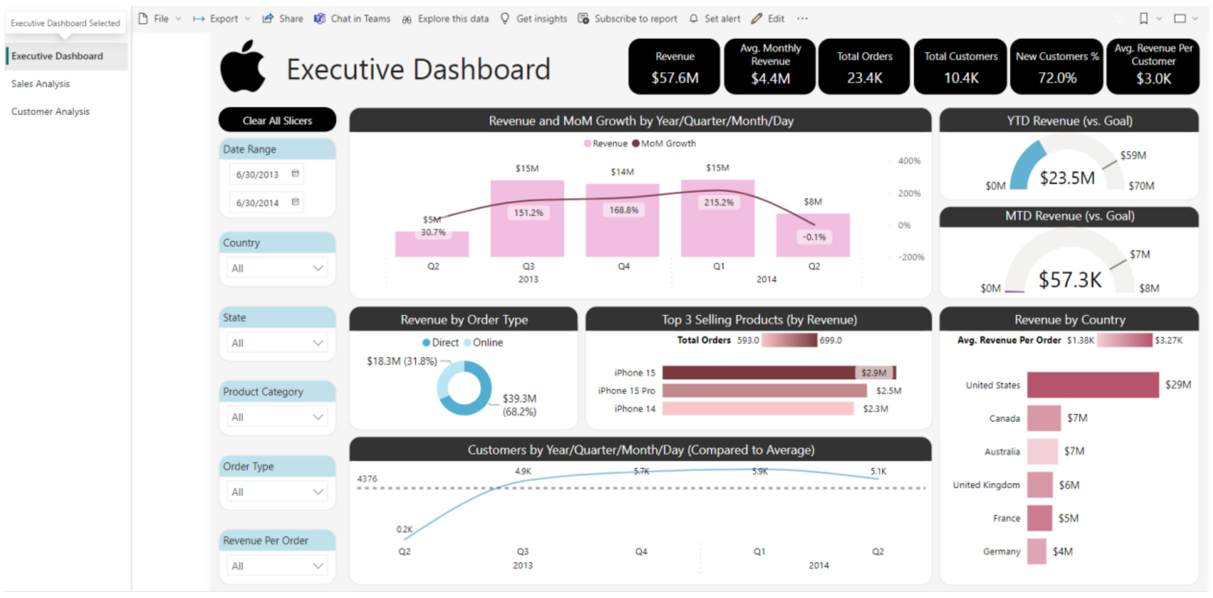
Open 'ApplesSalesDM.pbix' in Power BI

Get Quick Insights

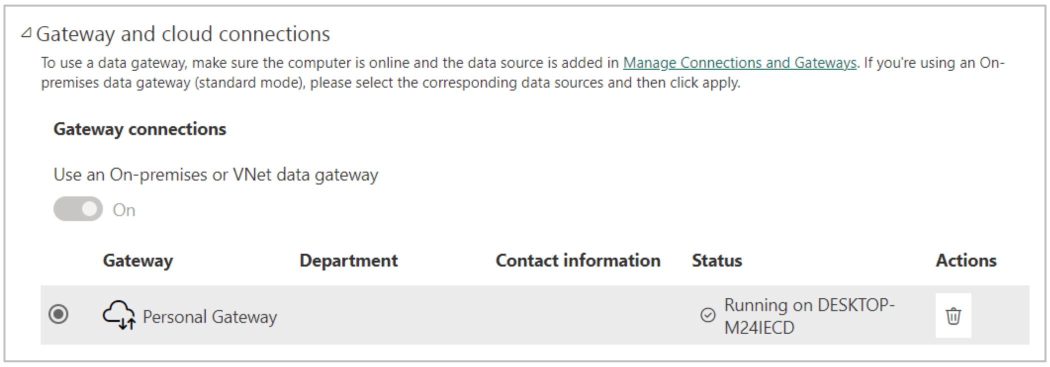
Did you know?

You can create a portrait view of your report, tailored for mobile phones. On the **View** tab, select **Mobile Layout**. Learn more

Got it



4.3.5. The data is refreshed daily at 5:00:00 (after the refresh of the data mart occurs), for this purpose, a personal gateway was created:



⊿ Gateway and cloud connections

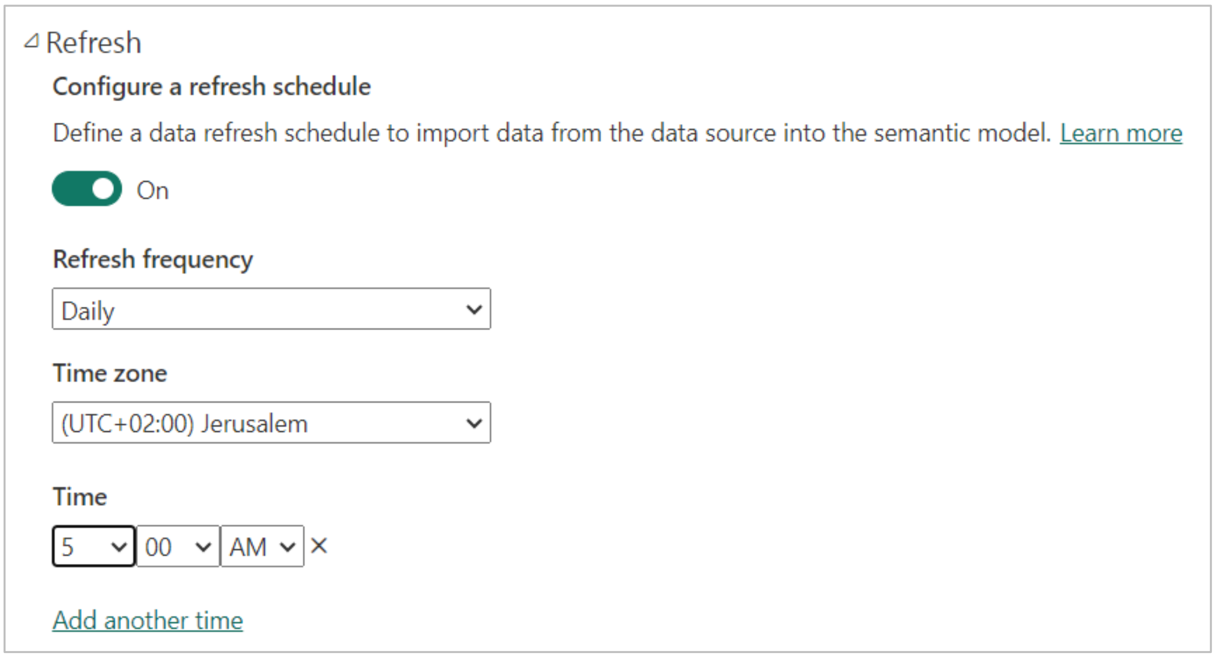
To use a data gateway, make sure the computer is online and the data source is added in Manage Connections and Gateways. If you're using an On-premises data gateway (standard mode), please select the corresponding data sources and then click apply.

Gateway connections

Use an On-premises or VNet data gateway

On

	Gateway	Department	Contact information	Status	Actions
●	Personal Gateway			Running on DESKTOP-M24IECD	



⊿ Refresh

Configure a refresh schedule

Define a data refresh schedule to import data from the data source into the semantic model. Learn more

On

Refresh frequency

Daily

Time zone

(UTC+02:00) Jerusalem

Time

5 00 AM ✕

Add another time