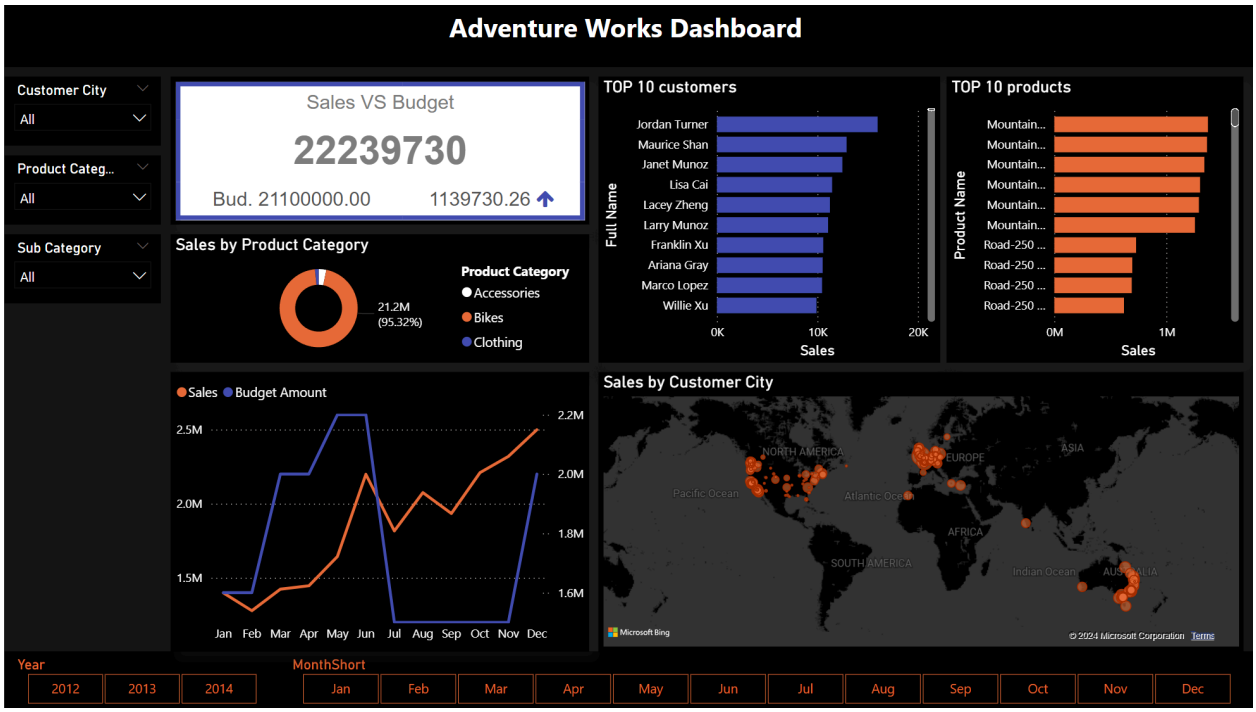
AdventureWorks InternetSales Analysis Report :

By Nouhaila LACHGAR

In this project I worked on my first Data Analysis and Visualization project as a part of my BI portfolio where I analysed the famous AdventureWorks DataWarehouse based on some business requirements, then made a dashboard to visualize the work done

1- Dashboard Overview :



2- Tools used in the project :

SQL Server for database management (here for AdventureWorks)

SQL Server Management Studio to manage the instance created by SQL Server and to query the database wanted for transformation purposes.

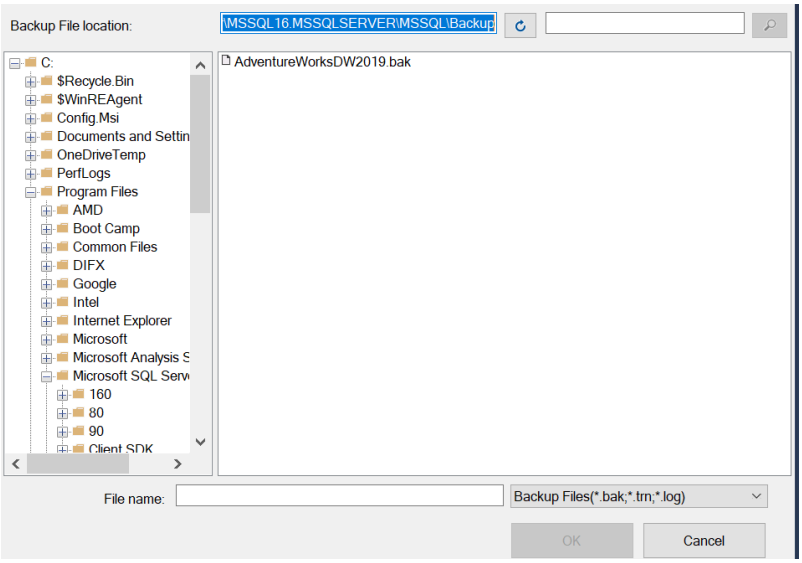
Power BI for data visualization and further data transformation and cleaning.

In addition to the AdventureWorks database, a database provided by Microsoft storing the data of a fictional bicycle manufacturer.

2- Steps of the project :

- **Database Importing :**

Imported the backup version of the database to SSMS



- **Business Requirements Review :**

Reviewed the business requirements to know the necessary data to extract from the original version :

No #	As a (role)	I want (request / demand)	So that I (user value)	Acceptance Criteria
1	Sales Manager	To get a dashboard overview of internet sales	Can follow better which customers and products sells the best	A Power BI dashboard which updates data once a day
2	Sales Representative	A detailed overview of Internet Sales per Customers	Can follow up my customers that buys the most and who we can sell ore to	A Power BI dashboard which allows me to filter data for each customer
3	Sales Representative	A detailed overview of Internet Sales per Products	Can follow up my Products that sells the most	A Power BI dashboard which allows me to filter data for each Product
4	Sales Manager	A dashboard overview of internet sales	Follow sales over time against budget	A Power Bi dashboard with graphs and KPIs comparing against budget.

Hi Nouha!

I hope you are doing well. We need to improve our internet sales reports and want to move from static reports to visual dashboards.

Essentially, we want to focus it on how much we have sold of what products, to which clients and how it has been over time.

Seeing as each sales person works on different products and customers it would be beneficial to be able to filter them also.

We measure our numbers against budget so I added that in a spreadsheet so we can compare our values against performance.

The budget is for 2014 and we usually look 2 years back in time when we do analysis of sales.

Let me know if you need anything else!

// Steven-Sales Manager

- ## Data Transformation :

DIM_Date table :

Needed because we have the time dimension in the requirements above. Here short form of the month attribute was added, and the year started from 2012 based on the request of the Sales Manager.

```sql
-- Cleansed DIM_Date Table --
SELECT
  [DateKey],
  [FullDateAlternateKey] AS Date,
  --[DayNumberOfWeek],
  [EnglishDayNameOfWeek] AS Day,
  --[SpanishDayNameOfWeek],
  --[FrenchDayNameOfWeek],
  --[DayNumberOfMonth],
  --[DayNumberOfYear],
  --[WeekNumberOfYear],
  [EnglishMonthName] AS Month,
  Left([EnglishMonthName], 3) AS MonthShort,   -- Useful for front end date navigation and front end graphs.
  --[SpanishMonthName],
  --[FrenchMonthName],
  [MonthNumberOfYear] AS MonthNo,
  [CalendarQuarter] AS Quarter,
  [CalendarYear] AS Year --[CalendarSemester],
  --[FiscalQuarter],
  --[FiscalYear],
  --[FiscalSemester]
FROM
 [AdventureWorksDW2019].[dbo].[DimDate]
WHERE
  CalendarYear >= 2012
```

DIM_Customer table :

Needed because we have the Customer dimension in the requirements above. Here only important infos were kept, joined the customer table with the geography one to get infos about customer city

```
 -- Cleansed DIM_Customers Table --
SELECT
  c.customerkey AS CustomerKey,
  --      ,[GeographyKey]
  --      ,[CustomerAlternateKey]
  --      ,[Title]
  c.firstname AS [First Name],
  --      ,[MiddleName]
  c.lastname AS [Last Name],
  c.firstname + ' ' + lastname AS [Full Name],
  -- Combined First and Last Name
  --      ,[NameStyle]
  --      ,[BirthDate]
  --      ,[MaritalStatus]
  --      ,[Suffix]
  CASE c.gender WHEN 'M' THEN 'Male' WHEN 'F' THEN 'Female' END AS Gender,
  --      ,[EmailAddress]
  --      ,[YearlyIncome]
  --      ,[TotalChildren]
  --      ,[NumberChildrenAtHome]
  --      ,[EnglishEducation]
  --      ,[SpanishEducation]
  --      ,[FrenchEducation]
  --      ,[EnglishOccupation]
  --      ,[SpanishOccupation]
  --      ,[FrenchOccupation]
  --      ,[HouseOwnerFlag]
  --      ,[NumberCarsOwned]
  --      ,[AddressLine1]
  --      ,[AddressLine2]
  --      ,[Phone]
  c.datefirstpurchase AS DateFirstPurchase,
  --      ,[CommuteDistance]
  g.city AS [Customer City] -- Joined in Customer City from Geography Table
FROM
  [AdventureWorksDW2019].[dbo].[DimCustomer] as c
  LEFT JOIN [AdventureWorksDW2019].[dbo].[dimgeography] AS g ON g.geographykey = c.geographykey
ORDER BY
  CustomerKey ASC -- Ordered List by CustomerKey
```

DIM_Products table :

Needed because we have the Product dimension in the requirements above.

```sql
 -- Cleansed DIM_Products Table --
SELECT
  p.[ProductKey],
  p.[ProductAlternateKey] AS ProductItemCode,
  --      ,[ProductSubcategoryKey],
  --      ,[WeightUnitMeasureCode]
  --      ,[SizeUnitMeasureCode]
  p.[EnglishProductName] AS [Product Name],
  ps.EnglishProductSubcategoryName AS [Sub Category], -- Joined in from Sub Category Table
  pc.EnglishProductCategoryName AS [Product Category], -- Joined in from Category Table
  --      ,[SpanishProductName]
  --      ,[FrenchProductName]
  --      ,[StandardCost]
  --      ,[FinishedGoodsFlag]
  p.[Color] AS [Product Color],
  --      ,[SafetyStockLevel]
  --      ,[ReorderPoint]
  --      ,[ListPrice]
  p.[Size] AS [Product Size],
  --      ,[SizeRange]
  --      ,[Weight]
  --      ,[DaysToManufacture]
  p.[ProductLine] AS [Product Line],
  --     ,[DealerPrice]
  --      ,[Class]
  --      ,[Style]
  p.[ModelName] AS [Product Model Name],
  --      ,[LargePhoto]
  p.[EnglishDescription] AS [Product Description],
  --      ,[FrenchDescription]
  --      ,[ChineseDescription]
  --      ,[ArabicDescription]
  --      ,[HebrewDescription]
  --      ,[ThaiDescription]
  --      ,[GermanDescription]
  --      ,[JapaneseDescription]
  --      ,[TurkishDescription]
  --      ,[StartDate],
  --      ,[EndDate],
  ISNULL (p.Status, 'Outdated') AS [Product Status]
FROM
  [AdventureWorksDW2019].[dbo].[DimProduct] as p
  LEFT JOIN [AdventureWorksDW2019].[dbo].[DimProductSubcategory] AS ps ON ps.ProductSubcategoryKey = p.ProductSubcategoryKey
  LEFT JOIN [AdventureWorksDW2019].[dbo].[DimProductCategory] AS pc ON ps.ProductCategoryKey = pc.ProductCategoryKey
order by
  p.ProductKey asc
```

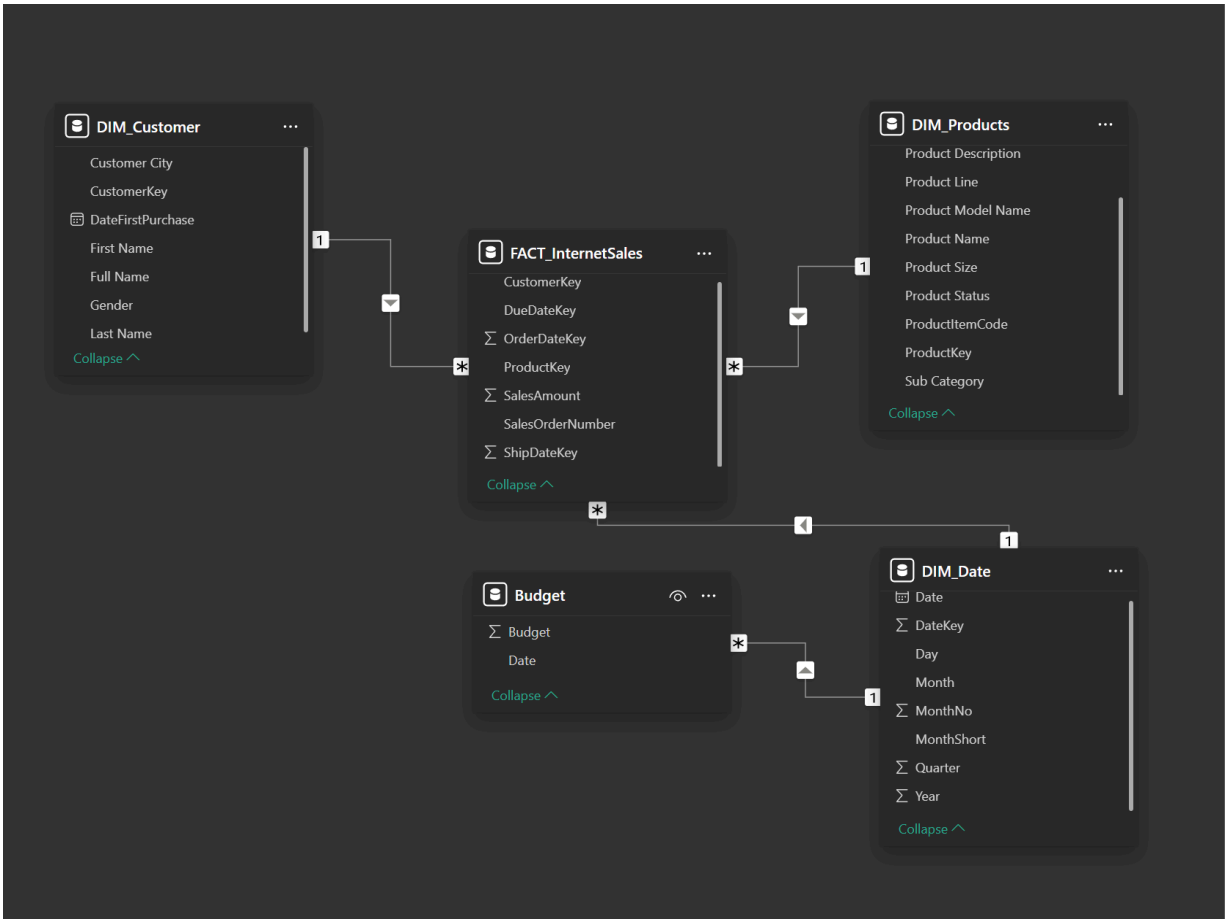
FACT_InternetSales table :

Needed since InterenetSales is the type of sales included in the requirements above.

```
 -- Cleansed FACT_InternetSales Table --
SELECT
  [ProductKey],
  [OrderDateKey],
  [DueDateKey],
  [ShipDateKey],
  [CustomerKey],
  --  ,[PromotionKey]
  --  ,[CurrencyKey]
  --  ,[SalesTerritoryKey]
  [SalesOrderNumber],
  --  [SalesOrderLineNumber],
  --  ,[RevisionNumber]
  --  ,[OrderQuantity],
  --  ,[UnitPrice],
  --  ,[ExtendedAmount]
  --  ,[UnitPriceDiscountPct]
  --  ,[DiscountAmount]
  --  ,[ProductStandardCost]
  --  ,[TotalProductCost]
  [SalesAmount] --  ,[TaxAmt]
  --  ,[Freight]
  --  ,[CarrierTrackingNumber]
  --  ,[CustomerPONumber]
  --  ,[OrderDate]
  --  ,[DueDate]
  --  ,[ShipDate]
FROM
  [AdventureWorksDW2019].[dbo].[FactInternetSales]
WHERE
  LEFT (OrderDateKey, 4) >= 2012 -- Ensures we only bring two years of date from extraction from 2014.
ORDER BY
  OrderDateKey ASC
```

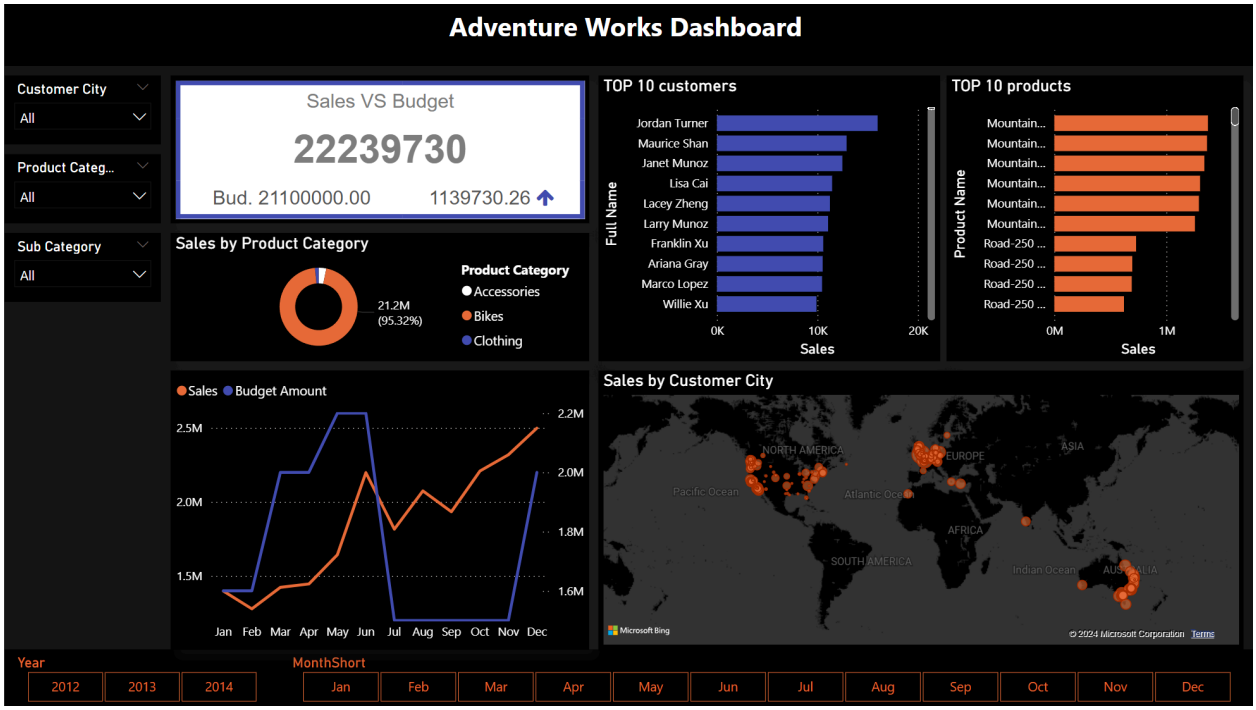
- **Data Model Conception :**

Linked the InternetSales fact table with the Time, Customer and Product dimensions, in addition to the Budget fact table from the excel file added to compare with sales



- **Data Visualizations :**

In the canvas, I added KPI graph to measure Sales VS Budget, added product category and subcategory to as a filter, top saled products and top saler customers, a map for the geographic aspect, and a timeline to visualize all the measures chronologically



This project was made with the help of a youtube tutorial serie by Ali Ahmed but with some modifications to play around tools and learn more about their functionality

The whole project with scripts and report will be found in [my github] portfolio.