

Sales Data Analysis Case Study

Using Adventure Works sample database and Power BI

[View in Power BI](#)



Case study prepared by Mohammad Juned Khan

Business Demand

Hi, Analytics Team.

Management has decided to make improvement in our internal sales reports and we have decided to shift to Power BI dashboard.

Business Question we have are :

- We want to know how much we sold and what product . And sales progress over time (years).
- Analyze our sales on different products and customers.
- It should also include the functionality of filtering the data .
- Compare our value against performance and measure number against the budget.
- The present year is 2021, for same we have budget. Management wants to look for two years of analytics for sales to prepare new strategies and decisions.

Data Analysis Project Roadmap

Ask

- Ask the Right set of Question to understand the requirement and demand for data analysis.

Prepare

- Validate the requirement and document objective.
- Prepare a Plan for data analysis with task description.

Process

- Collect the data and prepare it for analysis (cleaning, transforming).

Analyze

- Analyze the data to answer the business questions.
- Identify trends and key insights.

Share

- Prepare a report to showcase your findings and share it with stakeholders.

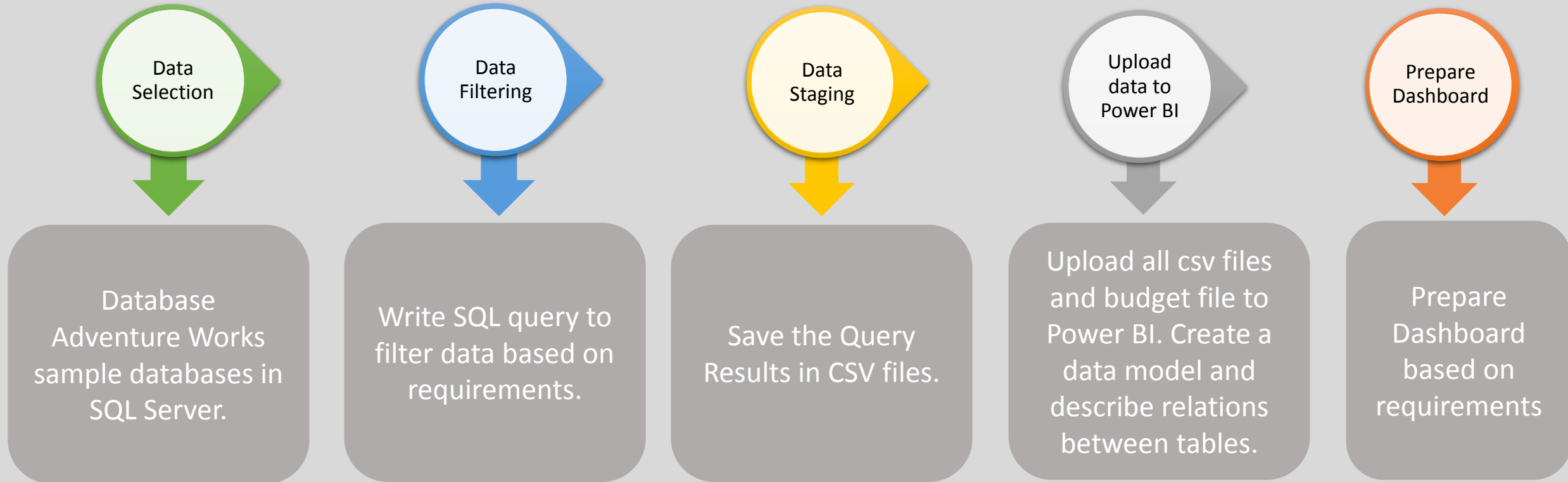
Act

- Validate your findings with help of subject matter expert and make data driven decisions.

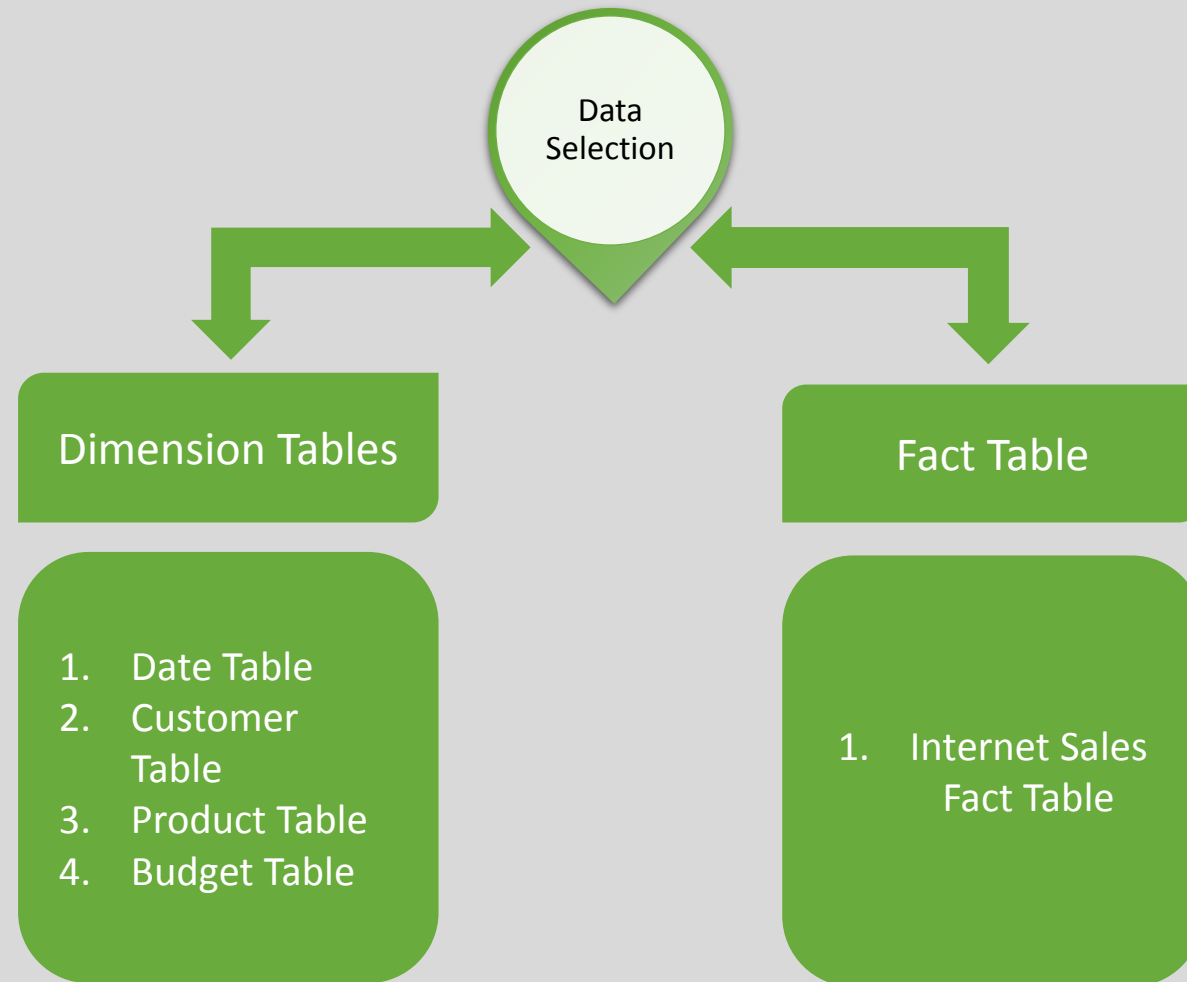
User Story

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.

Project Steps



Data Selection From SQL Database



Data Selection and Filtering

1. Date Table

Date Dimension table cleaning

/***** Script for Filtering Date Dimension for Sales Analytics from Data Set *****/

```
SELECT [DateKey]
      ,[FullDateAlternateKey] AS Date
      ,[EnglishDayNameOfWeek] AS Day
      ,[EnglishMonthName] AS Month
      ,LEFT([EnglishMonthName],3) as MonthName
      ,[MonthNumberOfYear] AS MonthNumber
      ,[CalendarQuarter] AS Quarter
      ,[CalendarYear] AS Year

FROM [AdventureWorksDW2014].[dbo].[DimDate]
WHERE
CalendarYear >= 2019
```

Data Selection and Filtering

2. Customer Table

Customer Dimension table cleaning

```
/****** Script for Filtering and Cleaning Customer data *****/
```

```
SELECT c.[CustomerKey] AS CustomerKey
      ,c.[FirstName] AS [First Name]
      ,c.[LastName] AS [Last Name]
      --full name --
      ,c.[FirstName] + ' ' + [LastName] AS [Full Name],
      CASE c.[Gender] WHEN 'M' THEN 'MALE' WHEN 'F' THEN 'FEMALE' END AS Gender
      ,c.[DateFirstPurchase] AS [DateFirstPurchase]
      ,g.[City] AS [Customer City]
      ,g. [EnglishCountryRegionName] AS [Country]
FROM [AdventureWorksDW2014].[dbo].[DimCustomer] AS c
LEFT JOIN [AdventureWorksDW2014].[dbo].[DimGeography] AS g on g.[GeographyKey] = c.[GeographyKey]
ORDER BY
[CustomerKey] ASC
```


Data Selection and Filtering

3. Product Table

Product Dimension table cleaning

/****** Script for product table *****/

```
SELECT p.[ProductKey] ,p.[ProductAlternateKey] AS [ProductItemCode] ,p.[EnglishProductName] AS [Product Name]
-- Get the product Sub Category
,ps.[EnglishProductSubcategoryName] AS [Product Sub-Category]
-- Get Product Category
,pc. [EnglishProductCategoryName] AS [Product Category] ,p.[Color] AS [Product Color] ,p.[Size] AS [Size] ,p.[ProductLine] AS
[Product Line] ,p.[ModelName] AS [Product Model Name]
,p. [EnglishDescription] AS [Product Description] ,ISNULL(p.[Status],'Outdated') AS [Product Status]
FROM [AdventureWorksDW2014].[dbo].[DimProduct] AS p
-- First join the product table with Sub Category table
LEFT JOIN [AdventureWorksDW2014].[dbo].[DimProductSubcategory] AS ps ON
ps.[ProductSubcategoryKey] = p.[ProductSubcategoryKey]
-- then join the Sub Category table with Category table
LEFT JOIN [AdventureWorksDW2014].[dbo].[DimProductCategory] AS pc ON
ps.[ProductCategoryKey] = pc.[ProductCategoryKey]
ORDER by p.[ProductKey] ASC
```

Data Selection

4. Budget Table

	A	B	C	D
1	Date	Budget		
2	1/1/2020	\$ 800,000.00		
3	2/1/2020	\$ 800,000.00		
4	3/1/2020	\$ 1,000,000.00		
5	4/1/2020	\$ 1,000,000.00		
6	5/1/2020	\$ 1,100,000.00		
7	6/1/2020	\$ 1,100,000.00		
8	7/1/2020	\$ 1,500,000.00		
9	8/1/2020	\$ 1,500,000.00		
10	9/1/2020	\$ 1,500,000.00		
11	10/1/2020	\$ 1,500,000.00		
12	11/1/2020	\$ 1,500,000.00		
13	12/1/2020	\$ 2,000,000.00		
14	1/1/2021	\$ 800,000.00		
15	2/1/2021	\$ 800,000.00		
16	3/1/2021	\$ 1,000,000.00		
17	4/1/2021	\$ 1,000,000.00		
18	5/1/2021	\$ 1,100,000.00		
19	6/1/2021	\$ 1,100,000.00		

Data Selection and Filtering

1. Internet Sales Fact Table

Internet Sales Fact table cleaning

```
/****** Script for Cleaning Internet Sales Table *****/  
SELECT [ProductKey] ,[OrderDateKey]  
 ,LEFT([OrderDateKey],4) AS OrderYear  
-- To Extract Order year.  
 ,[DueDateKey] ,[ShipDateKey]  
 ,[CustomerKey] ,[SalesOrderNumber]  
 ,[SalesAmount]  
FROM [AdventureWorksDW2014].[dbo].[FactInternetSales]  
WHERE  
-- To Extract Internet Sales of last 2 year from present year.  
-- We use YEAR(GETDATE()) function to get present date.  
LEFT([OrderDateKey],4)>= YEAR(GETDATE())-2  
ORDER BY  
[OrderDateKey] ASC
```

Data Staging

Store The Query
Results in CSV file

The screenshot displays the SQL Server Enterprise Manager interface. The 'Results' tab is active, showing a table with 11 rows of customer data. The first row is selected. A right-click context menu is open over the table, with the 'Save Results As...' option highlighted. The status bar at the bottom indicates 'Query executed successfully.' and 'BABARKAHN-PC\SQL'. A watermark 'Screenshot Added' is visible in the bottom right corner.

	CustomerKey	First Name	Last Name	Full Name	Gender	DateFirstPurchase	Customer City	Country
1	11000	Jon	Yang	Jon Yang	MALE	2018-01-19	Rockhampton	Australia
2	11001	Eugene	Huang	Eugene Huang	MALE	2018-01-15	Seaford	Australia
3	11002	Ruben	Torres	Ruben Torres	MALE	2018-01-07	Hobart	Australia
4	11003	Christy	Zhu	Christy Zhu	FEMALE	2017-12-29	North Ryde	Australia
5	11004	Elizabeth	Johnson	Elizabeth Johnson	FEMALE	2018-01-23	Wollongong	Australia
6	11005	Julio	Ruiz	Julio Ruiz	MALE	2017-12-28	Seaford	Australia
7	11006	Janet	Alvarez	Janet Alvarez	FEMALE	2018-01-19	Seaford	Australia
8	11007	Marco	Mehta	Marco Mehta	MALE	2018-01-19	Seaford	Australia
9	11008	Rob	Verhoff	Rob Verhoff	MALE	2018-01-19	Seaford	Australia
10	11009	Shannon	Carlson	Shannon Carlson	FEMALE	2018-01-19	Seaford	Australia
11	11010	Jacquelyn	Suarez	Jacquelyn Suarez	FEMALE	2018-01-19	Seaford	Australia

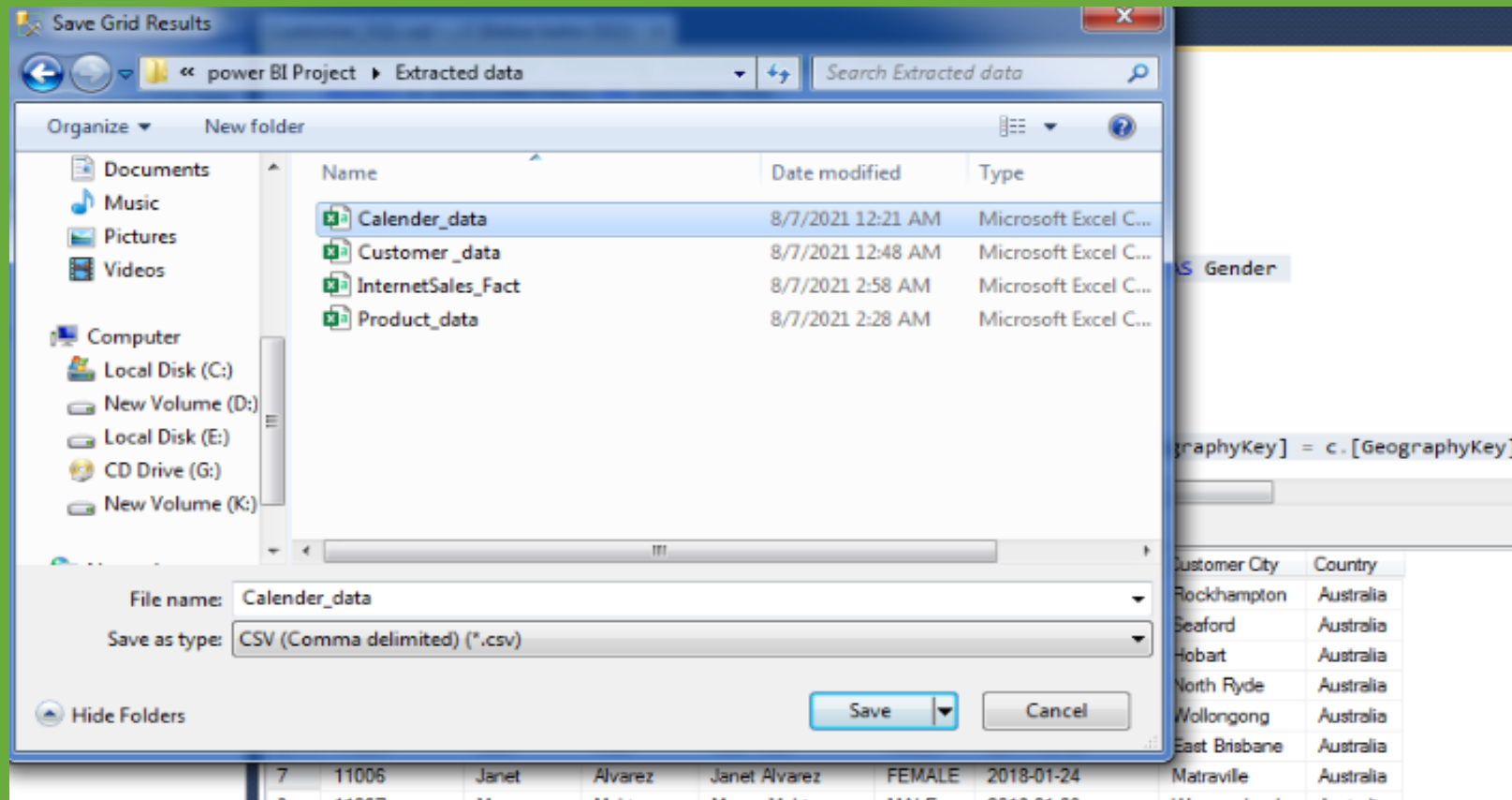
Query executed successfully. | BABARKAHN-PC\SQL

00:00:01 18484 rows

Screenshot Added

Data Staging

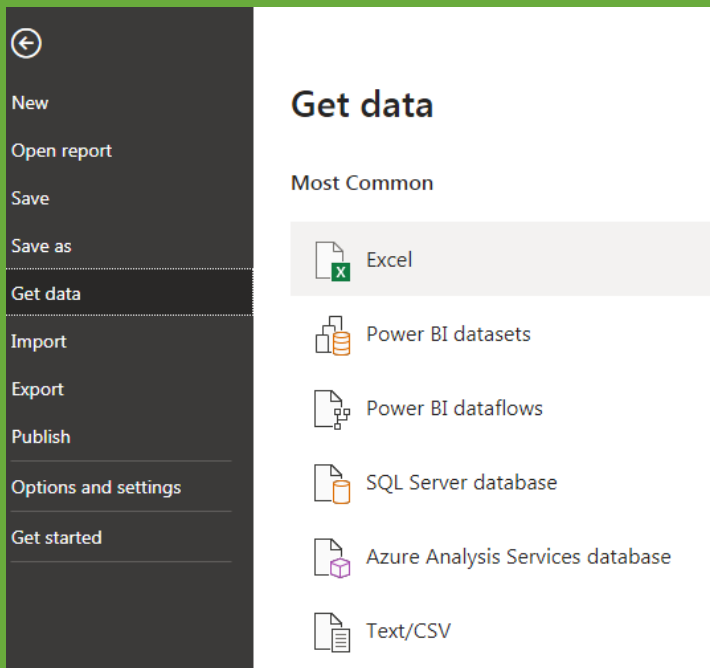
Save the CSV file in local system storage



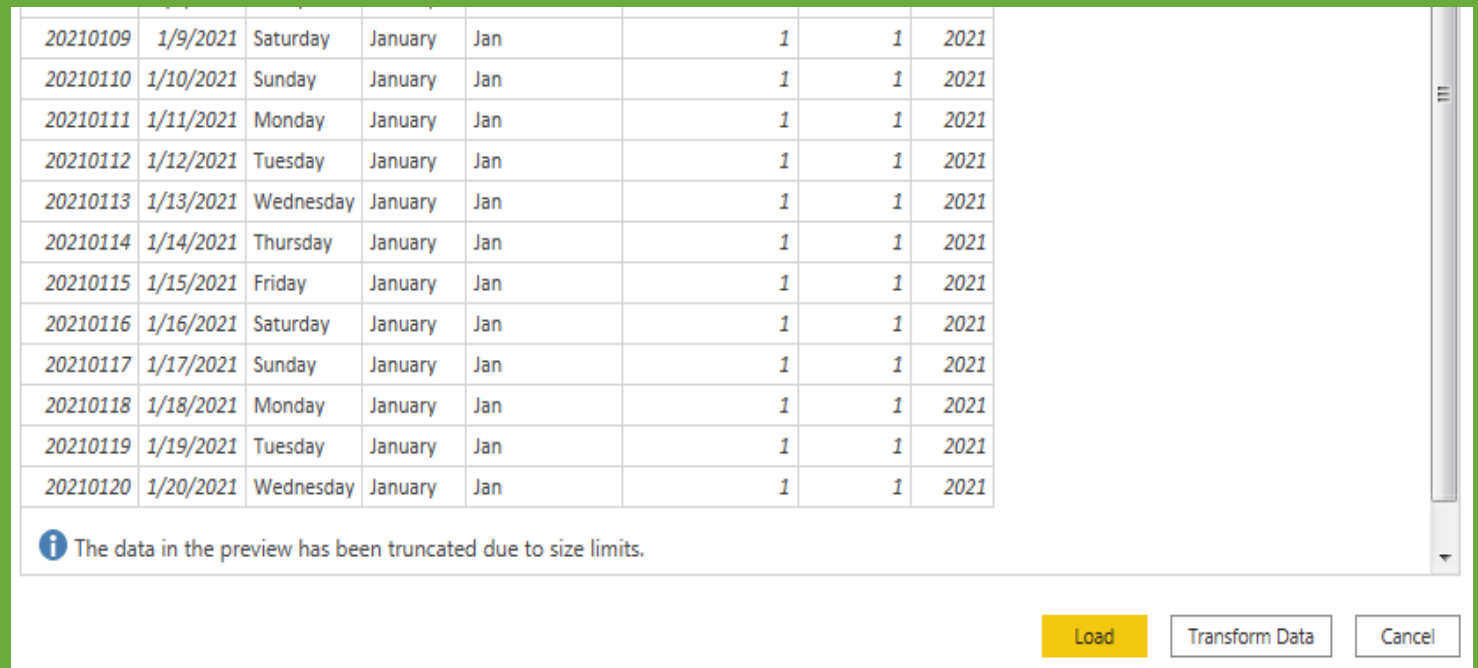
Upload Data in Power BI

Upload all data files in
Power BI

Step 1- Go to Files, select Get
Data and then Text/CSV option

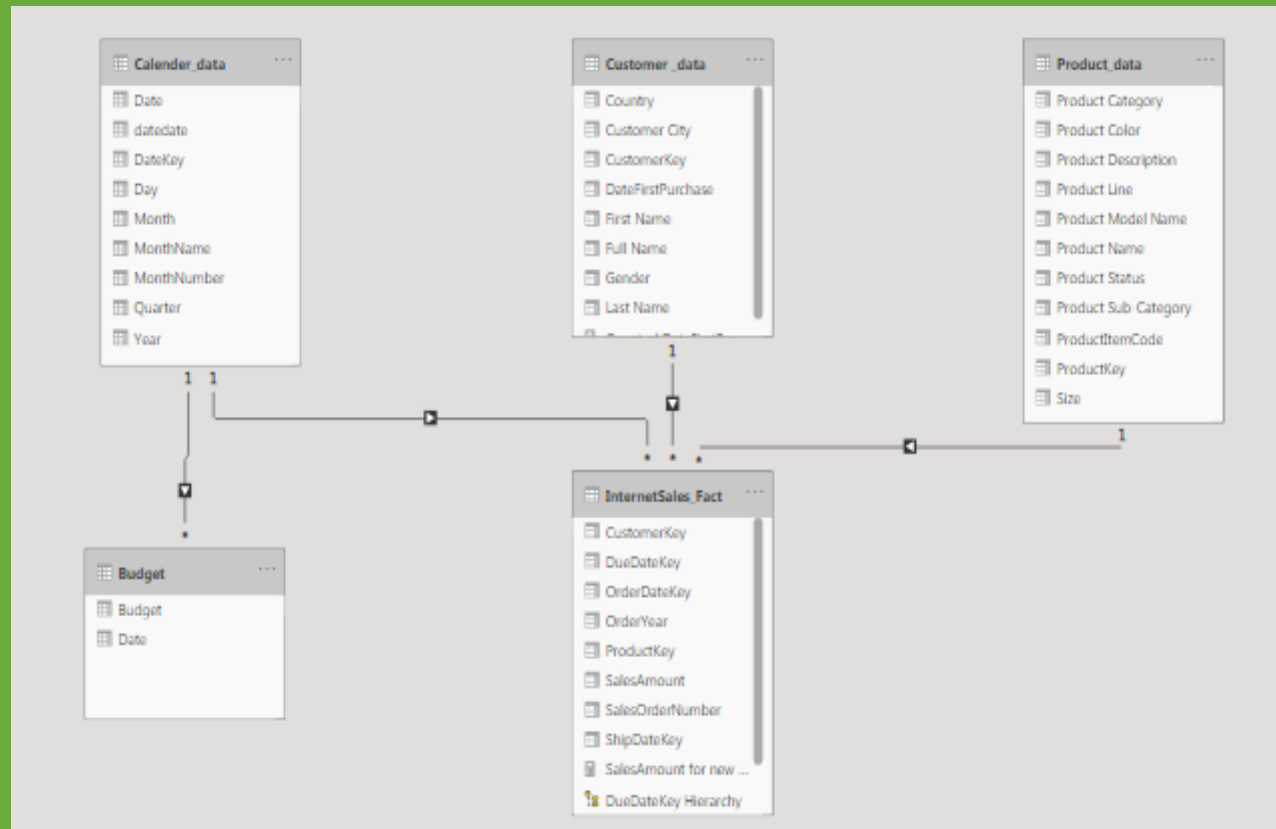


Step 2-Select file you have in
Staging Area and then load it



Data Model in Power BI

Create a data model
for dashboard



Create Dashboard in Power BI

Dashboard Detail

Pages required

1. Sales Overview
2. Product Overview
3. Customer Overview
4. Influence and Forecast
5. Q & A

SALES DASHBOARD

2019

2020

2021

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

Country

All

Customer City

All

Product Category

All

Product Sub-Category

All

22.24M

Sales

21M

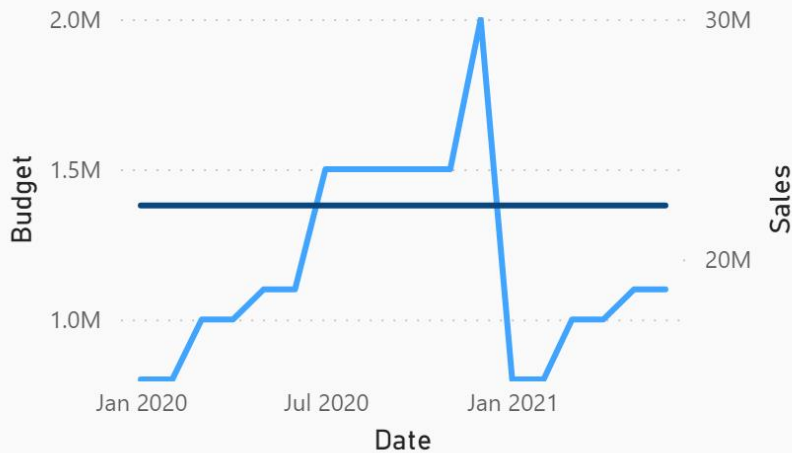
Budget_amount

105.40%

Sales / Budget

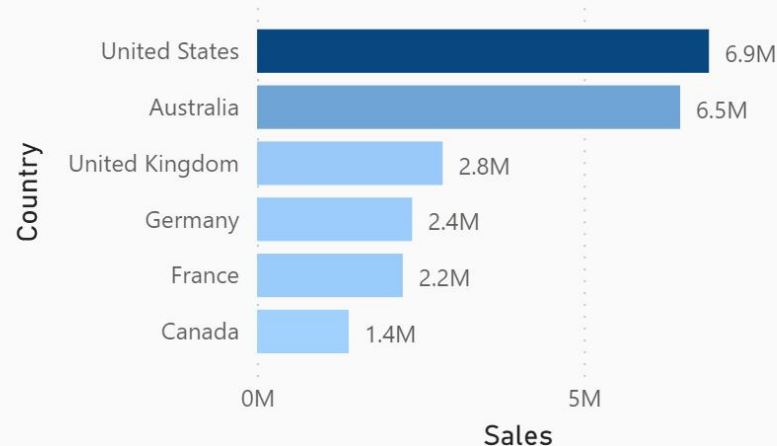
Budget and Sales by Date

Budget Sales



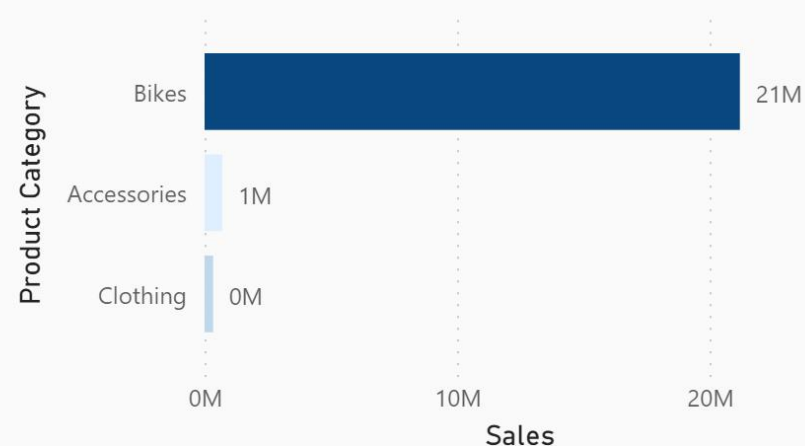
Sales by Country

Count of Customers by Country 1.57K 7.82K

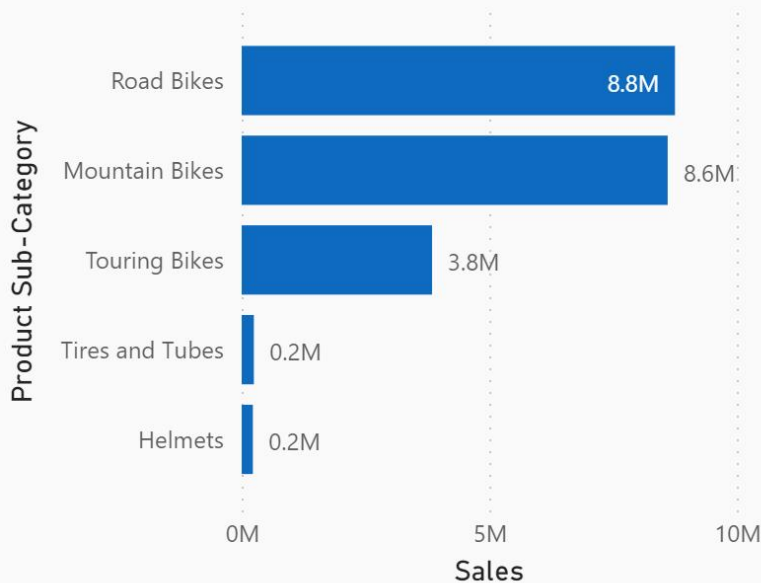


Sales by Product Category

Count of Product Category 35 125



Sales by Product Sub-Category



Sales by Customer City





Customers Overview

Country

All

Customer City

All

Product Category

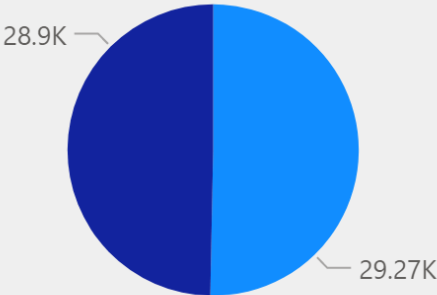
All

Product Sub-Category

All

Sales Order by Gender

MALE FEMALE



2019

2020

2021

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

58.17K

Total Customers

22.24M

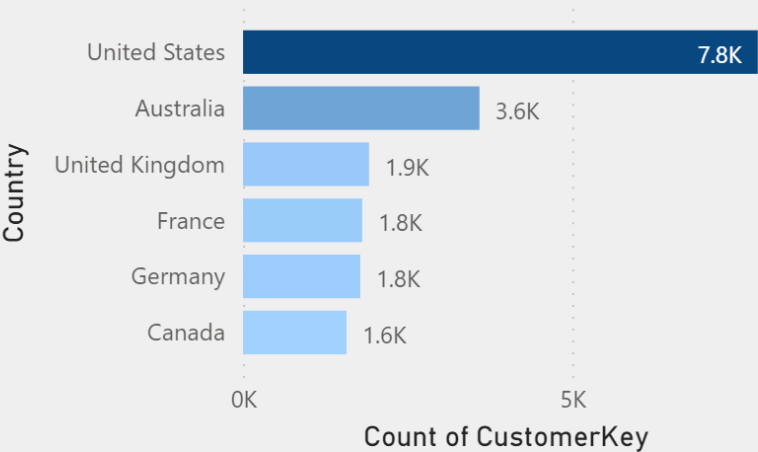
Sales fomr new Customer

2.81%

First order Purchase YoY%

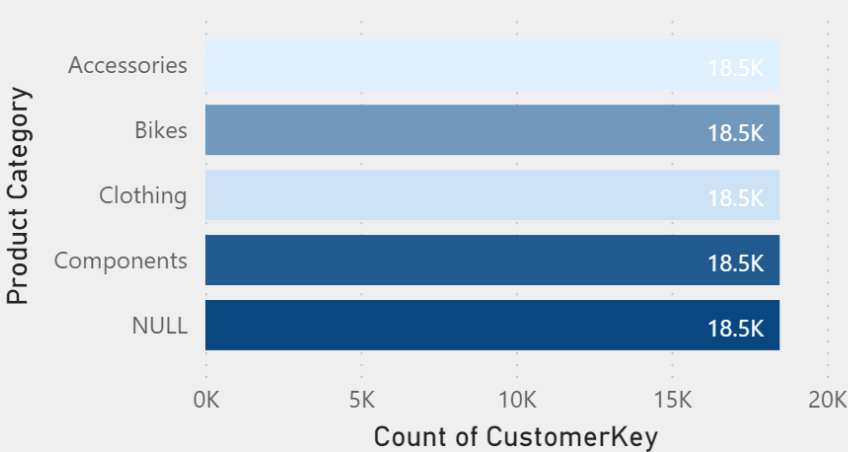
Customer by Country

Customers by Country 1.57K 7.82K

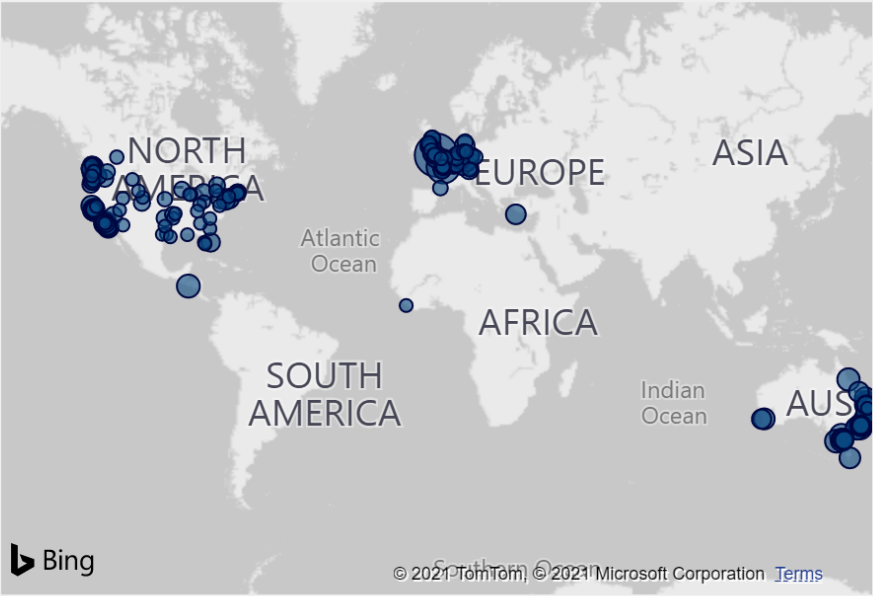


Customer by Product Category

Customers by Product Category 35 209



Sales by Customer City



Full Name	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Jordan Turner	4.80K			11.20K	16.00K
Maurice Shan				12.91K	12.91K
Janet Munoz				12.49K	12.49K
Lisa Cai			11.47K		11.47K
Lacey Zheng				11.25K	11.25K
Larry Munoz			11.07K		11.07K
Franklin Xu			6.94K	3.65K	10.59K
Ariana Gray				10.53K	10.53K
Marco Lopez				10.47K	10.47K
Willie Xu		9.91K			9.91K
Katrina Tang	9.80K				9.80K
Nichole Nara		9.72K			9.72K
Kaitlyn Henderson	9.72K				9.72K
Total	4,771.45K	5,307.44K	5,398.43K	6,762.41K	22,239.73K



PRODUCT OVERVIEW

Country

All

Customer City

All

Product Category

All

Product Sub-Category

All

2019

2020

2021

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

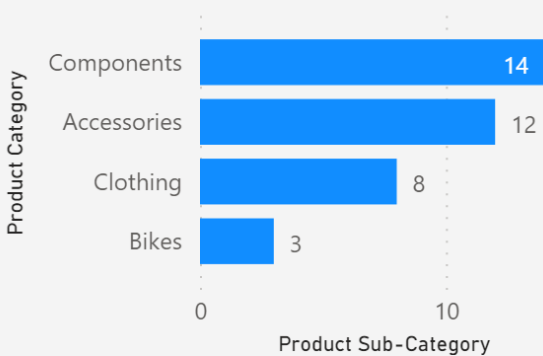
504

Total Products

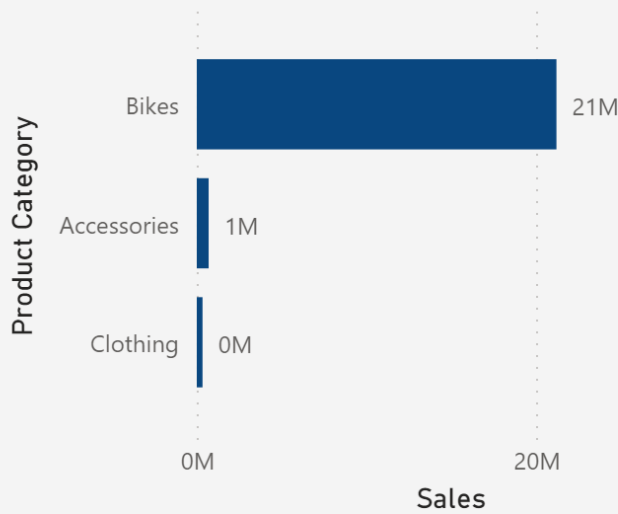
5

Total Categories

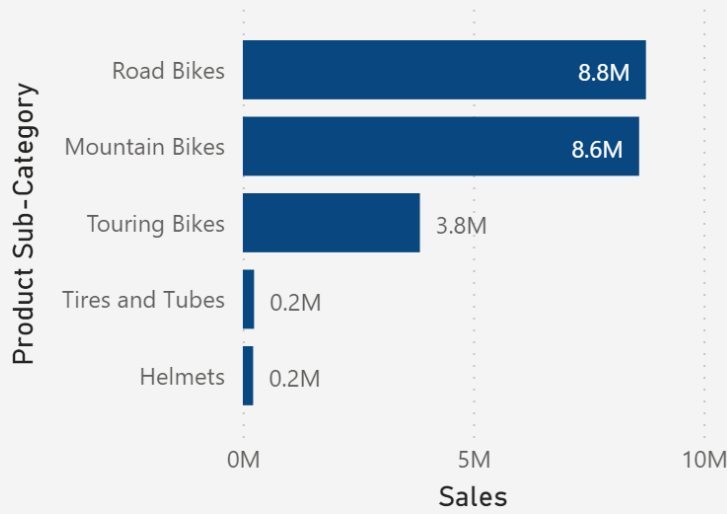
Sub Category Distribution



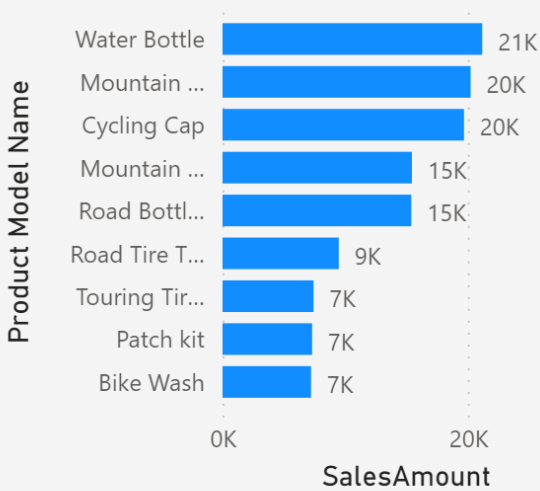
Sales by Product Category



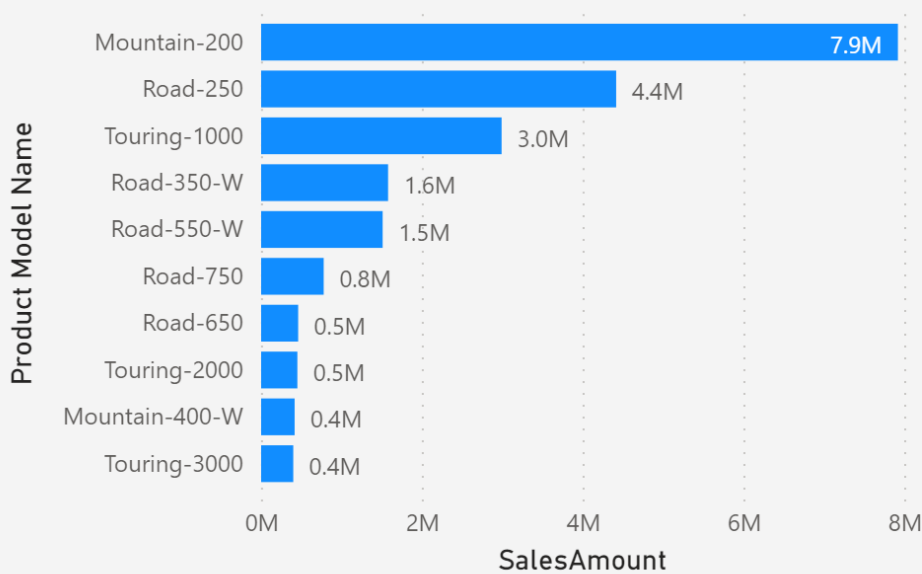
Sales by Product Category



Lowest Selling Products



Top Selling Product



Product Category	2019	2020	2021	Total
Accessories	2.15K	668.24K	30.37K	700.76K
Bike Racks		36.96K	2.40K	39.36K
Bike Stands	0.16K	37.68K	1.75K	39.59K
Bottles and Cages	0.28K	55.01K	1.51K	56.80K
Cleaners		6.91K	0.31K	7.22K
Fenders	0.11K	44.44K	2.07K	46.62K
Helmets	0.91K	216.03K	8.40K	225.34K
Hydration Packs	0.11K	38.93K	1.26K	40.31K
Tires and Tubes	0.58K	232.28K	12.68K	245.53K
Bikes	5,839.70K	15,359.50K		21,199.20K
Mountain Bikes	2,263.42K	6,340.00K		8,603.42K
Road Bikes	3,554.88K	5,196.09K		8,750.98K
Touring Bikes	21.39K	3,823.41K		3,844.80K
Total	5,842.49K	16,351.55K	45.69K	22,239.73K



Key Influences

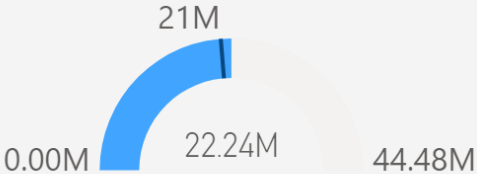
105.40%

Budget Growth

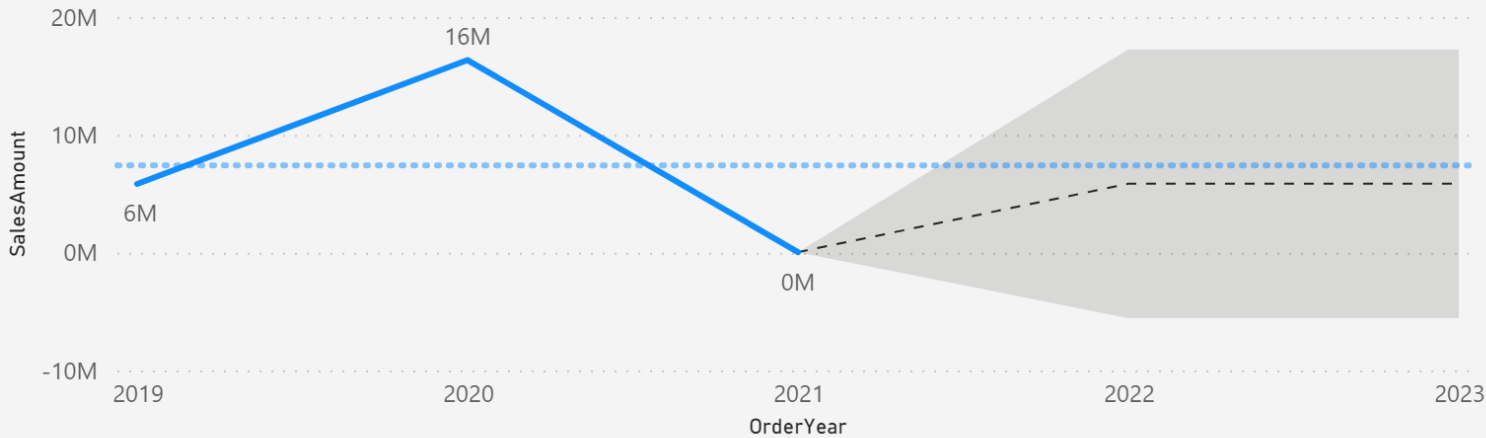
\$1.14M

Variance

Performance



Sales Forecast for next two years

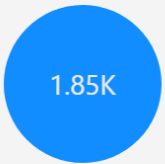


Key influencers Top segments



When is SalesAmount more likely to be ?

We found 2 segments and ranked them by Average of SalesAmount and population size. Select a segment to see more details.



Segment 1

1.85K

6737



Segment 2

1.4K

6238

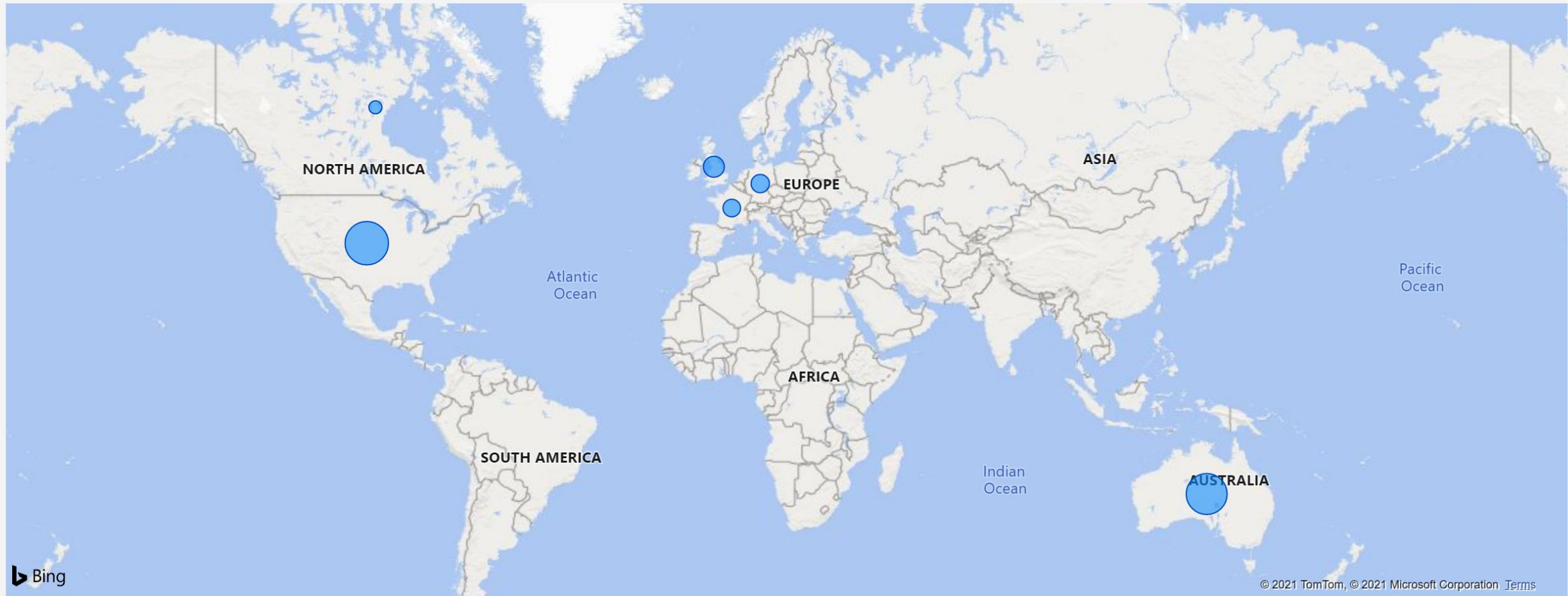
Average of SalesAmount



Population count

SALES DASHBOARD QUESTIONS AND ANSWER PAGE

top 10 country by sales

Showing results for Top 10 country of customer data by sales of internet sales facts



Is this useful?  

Act

ACT Phase

The Dashboard will help the management to take:-

1. Form new strategies to increase the sales of product.
2. It will help Marketing and sales team to focus on potential customers.
3. Management can make decisions based on key finding and facts.
4. It help in retaining the customers.
5. Influence and Forecast will help management achieve business goals.
6. Q & A will help management get customized answers.

Case study prepared by Mohammad Juned Khan