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BSc in Applied Data Science Communication

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# **LOCAL PROPERTY PRICE MONITOR OF UK PROPERTY MARKET DASHBOARD DESIGN REPORT**

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### **01. INTRODUCTION**

The Local Property Price Monitor of UK Property Market report is a straightforward and low-cost Power BI based reporting tool that can analyse the property types in Greater Manchester property market. The aim of this report is to extract, illustrate and analyse the data to user friendly information to better understand the local real estate market.

This report provides information about different kinds of property in the United Kingdom. The raw data comes from the UK Price Paid Dataset, which covers the UK property market from 2019 to 2022. This report describes the process of extracting, analysing, illustrating and presenting the data through a dashboard using tables, charts, maps and graphs to find the information about the different property types in the local market.

The process covers the steps of importing data to the Microsoft SQL Server, importing data from Microsoft SQL Server to the Microsoft Power BI, and the steps of creating, developing and presenting the actionable information through a dashboard.

The dashboard is intended to help clients understand data on UK property transactions, detects the changes that occur during each year, the data is summarised and viewed through several types of charts.

## **02. EXPLORATION OF DATA**

### **2.1. Data Set Review**

Transaction ID, Sales Price, Date of Transfer, Postcode, Property Type, Old/New, Duration, Primary Addressable Object Name, Secondary Addressable Object Name, Street, Locality, Town/City, District, County, Type of Price Paid, Record Status are all columns in this data set. They are described below;

1. Transaction ID - A reference number that is generated automatically recording each published sale. The number is unique and will change each time a sale is recorded.
2. Sales Price - The sale price is stated on the transfer deed.
3. Date of Transfer - The date when the sale was completed, as stated on the transfer deed.
4. Postcode - This is the postcode used at the time of the original transaction. Note that postcodes can be reallocated, and these changes are not reflected in the Price Paid Dataset.
5. Property Type (D = Detached, S = Semi-Detached, T = Terraced, F = Flats/Maisonettes, O = Other)
6. Old/New - Indicates the age of the property and applies to all price-paid transactions, residential and non-residential. (Y = a newly built property, N = an established residential building)
7. Duration – Relates to the tenure. (F = Freehold, L= Leasehold etc.)
8. PAON (Primary Addressable Object Name) - Typically, the house number or name.
9. SAON (Secondary Addressable Object Name) - Where a property has been divided into separate units (for example, flats), the PAON (above) will identify the building and a SAON will be specified that identifies the separate unit/flat.
10. Street
11. Locality
12. Town/City
13. District
14. County
15. Type of Price Paid - Indicates the type of Price Paid transaction. (A = Additional Price paid entry includes single residential property sold for value, B = Additional Price paid entry including transfers under power of sale)
16. Record Status - Indicates additions, changes, and deletions to the records. (A = Addition, C = Change, D = Delete)

## 2.2. Importing Data from Excel to a Microsoft SQL Server Management Studio

### Steps to import data from Excel to SQL server.

- First you can Create a new folder in your desktop under the name “**Task 1**” to save the extracted data.
- Next Download the 2019,2020,2021 and 2022 dataset files in CSV format using the link mentioned as follows.

(<https://www.gov.uk/government/statistical-data-sets/price-paid-data-downloads>)

- Preview those 4 data CSV files separately in Microsoft Excel.

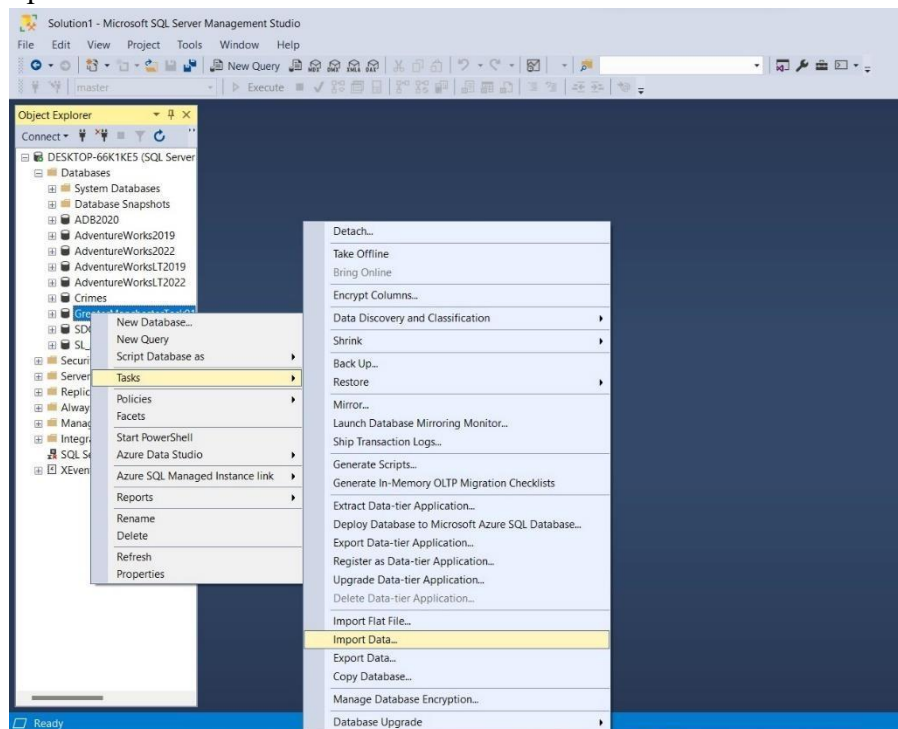
Transaction ID	Price	Date of Trans	Postcode	Property Type	Old/New	Duration	Primary Address	Secondary Address	Street	Locality	Town/City	District	County	PPD Category	Ty	Record Status	Status
8CAC1318-5A	165000	#####	M32 0JL	S	N	F	35	NULL	STANWAY STREET	STRET FORD	MANCHESTER	TRAFFORD	GREATER MA	A		A	
8CAC1318-5A	116000	#####	L9 1DZ	T	N	F	91	NULL	BREEZE HILL	NULL	LIVERPOOL	LIVERPOOL	MERSEYSIDE	A		A	
8CAC1318-5A	60000	#####	L4 0RS	T	N	F	26	NULL	CONINGSBY ROAD	NULL	LIVERPOOL	LIVERPOOL	MERSEYSIDE	A		A	
8CAC1318-5A	192000	#####	W43 1EP	D	N	L	23	NULL	ABBEY ROAD	LOWTON	WARRINGTON	WIGAN	GREATER MA	A		A	
8CAC1318-5A	166000	#####	PR3 0YA	S	N	F	4	NULL	LARCHWOOD	PENWORTHAM	PRESTON	SOUTH RIBBLE	LANCASHIRE	A		A	
8CAC1318-5A	135000	#####	L7 8RU	T	N	F	89	NULL	SAXONY ROAD	NULL	LIVERPOOL	LIVERPOOL	MERSEYSIDE	B		A	
8CAC1318-5A	190000	#####	FY8 4PY	D	N	L	6	NULL	MOLYNEUX PLACE	NULL	LYTHAM ST ANA	FYLDE	LANCASHIRE	A		A	
8CAC1318-5A	169000	#####	PR1 6EP	S	N	F	39	NULL	RONALDS WAY	NULL	PRESTON	PRESTON	LANCASHIRE	A		A	
8CAC1318-5A	92000	#####	M11 4FL	T	N	F	71	NULL	ILFORD STREET	NULL	MANCHESTER	MANCHESTER	GREATER MA	B		A	
8CAC1318-5A	275000	#####	BL6 4AL	D	N	L	30	NULL	CHORLEY NEW ROAD	LOSTOCK	BOLTON	BOLTON	GREATER MA	A		A	
8CAC1318-5A	114000	#####	WN5 8DA	S	N	F	4	NULL	NEWBY SQUARE	NULL	WIGAN	WIGAN	GREATER MA	A		A	
8CAC1318-5A	133000	#####	OL9 0QG	T	N	F	36	NULL	PARK CRESCENT	CHADDERTON	OLDHAM	OLDHAM	GREATER MA	A		A	
8CAC1318-5A	97000	#####	M12 4GP	T	N	F	24	NULL	SEDDON STREET	NULL	MANCHESTER	MANCHESTER	GREATER MA	A		A	
8CAC1318-5A	172000	#####	BL3 1UQ	S	N	F	9	NULL	ENNERDALE CLOSE	LITTLE LEVER	BOLTON	BOLTON	GREATER MA	A		A	
8CAC1318-5A	96000	#####	OL9 7ER	T	N	L	18	NULL	OLD LANE	CHADDERTON	OLDHAM	OLDHAM	GREATER MA	A		A	
8CAC1318-5A	155000	#####	PR1 0YB	S	N	F	15	NULL	MAPLE GROVE	PENWORTHAM	PRESTON	SOUTH RIBBLE	LANCASHIRE	A		A	
8CAC1318-5A	108000	#####	OL9 8HN	T	N	L	59	NULL	TURF LANE	CHADDERTON	OLDHAM	OLDHAM	GREATER MA	A		A	
8CAC1318-5A	114950	#####	WA1 3QJ	T	N	F	18	NULL	FOTHERGILL STREET	NULL	WARRINGTON	WARRINGTON	WARRINGTON	A		A	
8CAC1318-5A	162000	#####	L31 5LN	S	N	F	160	NULL	MOORHEY ROAD	NULL	LIVERPOOL	SEFTON	MERSEYSIDE	A		A	
8CAC1318-5A	135000	#####	M43 7RY	T	N	F	331	NULL	GREENSIDE LANE	DROPSDEN	MANCHESTER	TAMESIDE	GREATER MA	A		A	
8CAC1318-5A	76500	#####	BL4 8BG	T	N	L	27	NULL	GERRARD STREET	KEARSLEY	BOLTON	BOLTON	GREATER MA	A		A	
8CAC1318-5A	202000	#####	L40 4LE	S	N	F	47	NULL	WEAVER AVENUE	BURSCOUGH	ORMSKIRK	WEST LANCASHIRE	LANCASHIRE	A		A	
8CAC1318-5A	223000	#####	M19 2PU	S	N	F	16	NULL	HILBRE ROAD	NULL	MANCHESTER	MANCHESTER	GREATER MA	A		A	
8CAC1318-5A	153000	#####	M34 2AY	T	N	F	152	NULL	ACRE STREET	DENTON	MANCHESTER	TAMESIDE	GREATER MA	A		A	
8CAC1318-5A	74000	#####	BN2 6NS	T	N	F	178	NULL	DOWNHAM STREET	NULL	BLACKBURN	BLACKBURN	WITH BLACKBURN	A		A	

- Now Open SSMS and connect to the SQL server instance
- Create a database called “**GreaterManchesterTask01**”

```
SQLQuery1.sql - DE...K1KE5\Menu J (54))* X
USE master;
GO
CREATE DATABASE GreaterManchesterTask01;
```

- Now Enter the following code into a Query Editor window and execute.
- Expand the object explorer server tree.
- Expand the Database folder.

- Right click on “**GraterManchesterTask01**” Database.
- Select “Tasks”.
- Click to “Import Data”.



- Now click “Next” on the Import data and Export Wizard welcome page.



- You can Select “flat file source” as the data source and enter or browse for the file.

**SQL Server Import and Export Wizard**

**Choose a Data Source**  
Select the source from which to copy data.

Data source: **Flat File Source**

**General**  
Columns  
Advanced  
Preview

Select a file and specify the file properties and the file format.

File name:  **Browse...**

Locale: **English (United States)** ☐ Unicode

Code page: **1252 (ANSI - Latin I)**

Format: **Delimited**

Text qualifier: **<none>**

Header row delimiter: **CSV**

Header rows to skip: **0**

☒ Column names in the first data row.

**A valid file name must be selected.**

**Help** **< Back** **Next >** **Finish >>** **Cancel**

**Open**

Documents > workshop 08 > Task 1

Search Task 1

Organize New folder

Name	Date modified	Type	Size
pp-2019	11/27/2023 10:45 AM	Microsoft Excel Co...	144,961
pp-2020	11/27/2023 10:45 AM	Microsoft Excel Co...	127,563
pp-2021	11/27/2023 10:45 AM	Microsoft Excel Co...	152,081
pp-2022	11/27/2023 10:44 AM	Microsoft Excel Co...	134,517

File name:  **CSV files (\*.csv)**

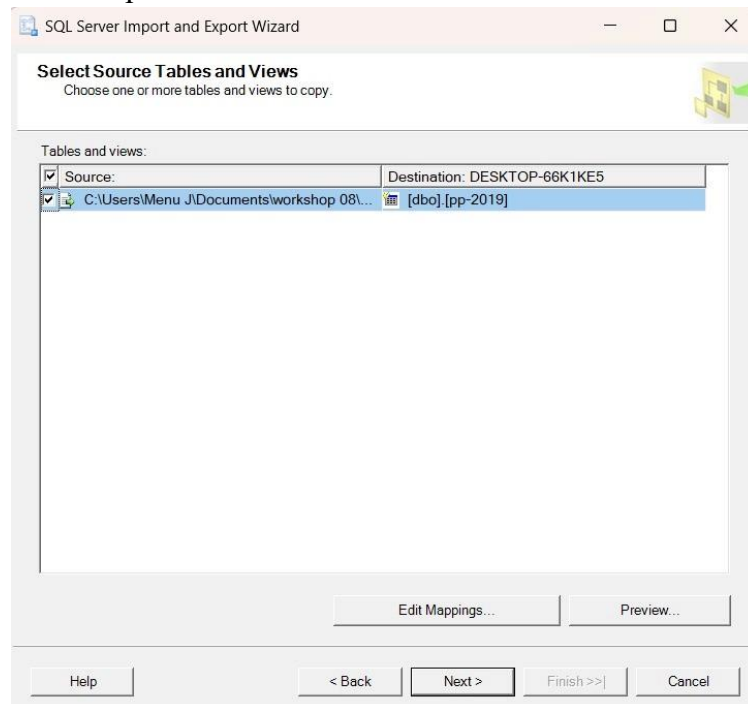
**Open** **Cancel**

- Then go to the “Advanced” tab and change all the column width from 50 to 100.

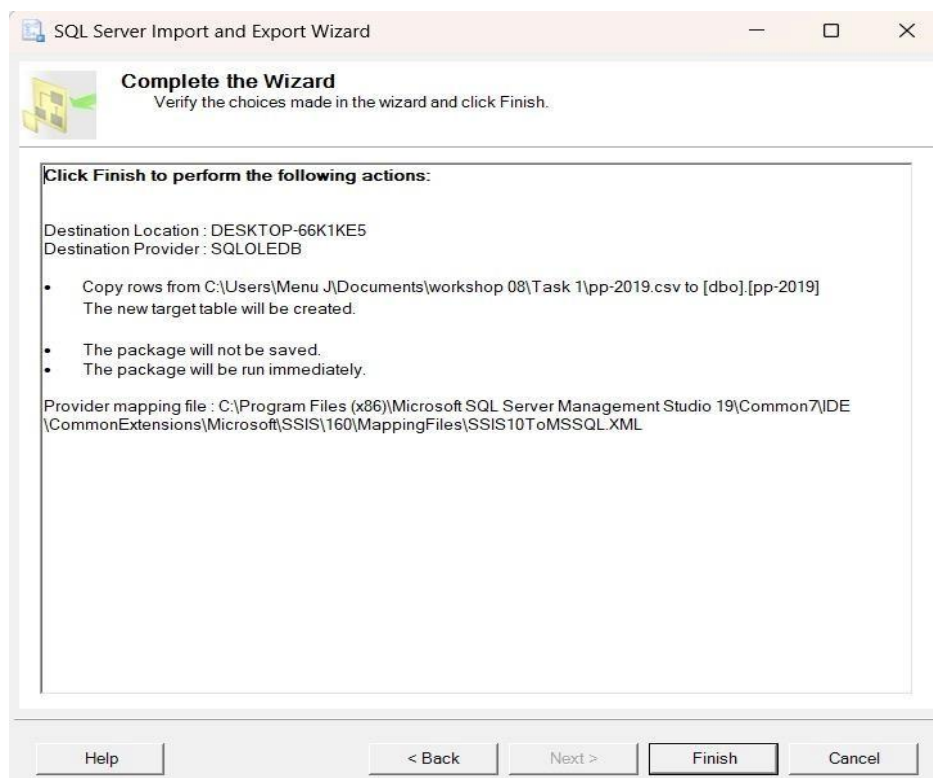




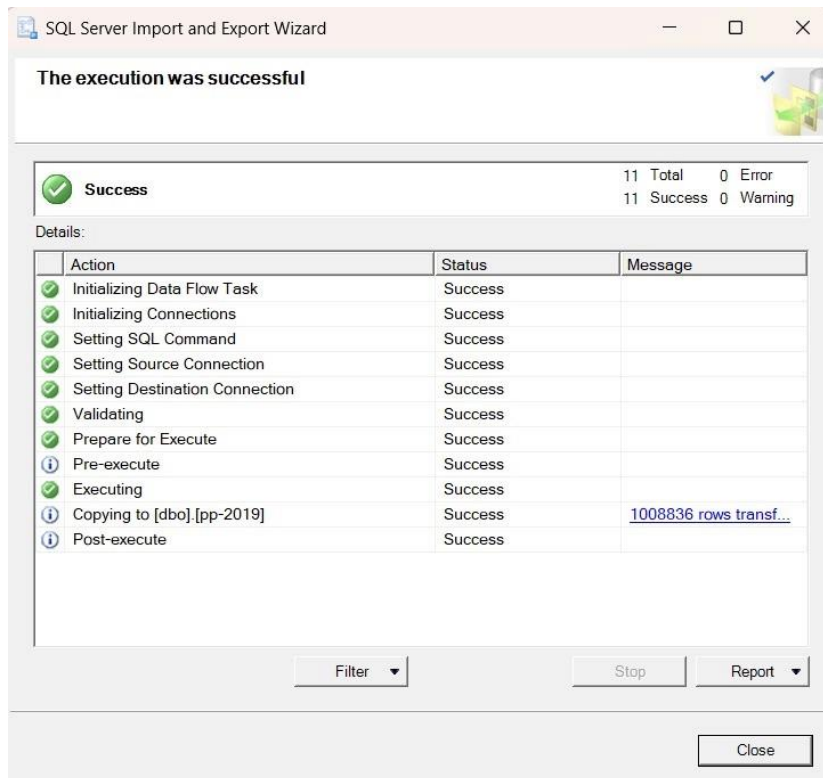
- Click “Next” and Accept the default



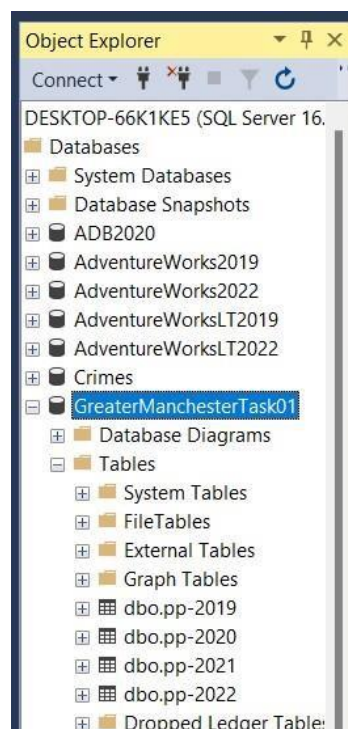
- Click “Finish”.



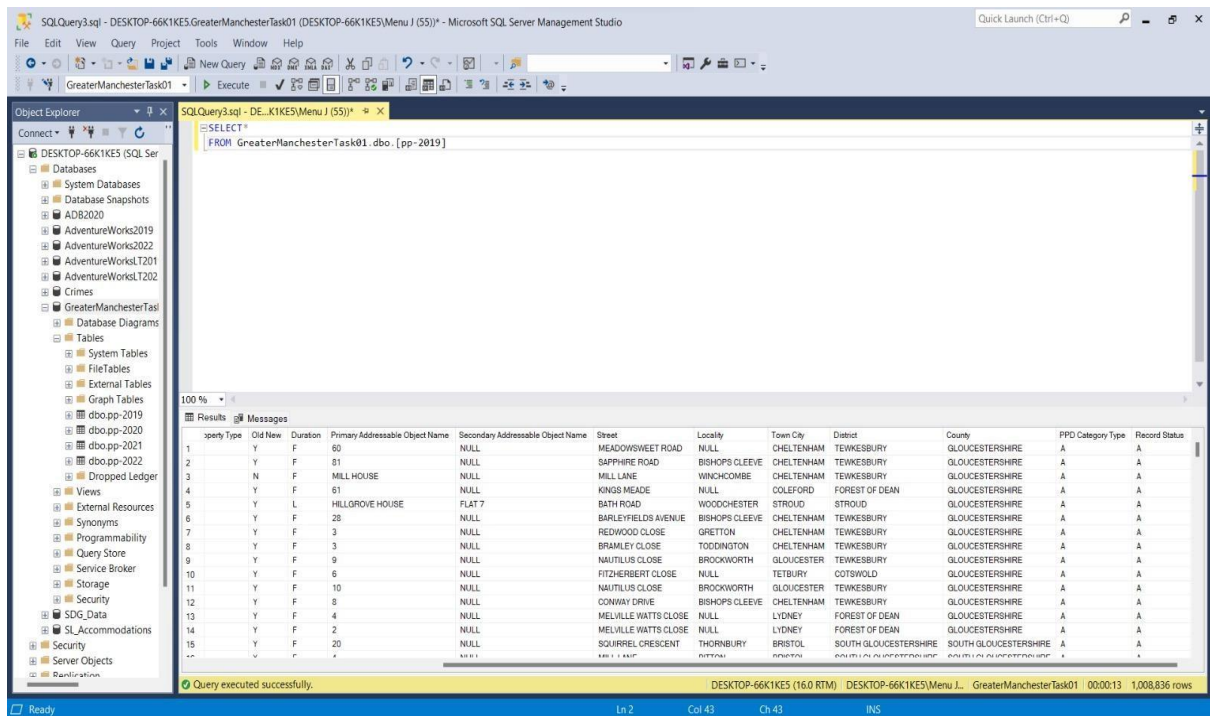
- The execution dialog box appears, if all the data has loaded successfully then click “Close”.



- Now you can see the new table in “**GreaterManchesterTask01**” database under the Object Explorer.



- Repeat the same procedure for three times to add the other three CSV files



- In a new query, type and execute the following code to see the imported data and check the other three tables as follows.

### 2.3. Create view

Using this technique, was able to eliminate a few columns and retrieve the inconsistent data under these stages.

- Under a new query, enter the following code to create a view by attaching all four tables using “UNION ALL” and execute the code.

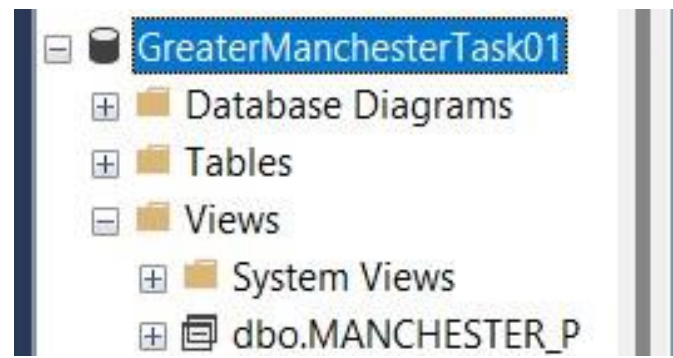
```
SQLQuery View.sql...K1KE5\Menu J (57))
[CREATE VIEW MANCHESTER_P
AS
SELECT[Transaction ID],
CAST([Price] AS MONEY) AS Sales_Price,
CONVERT(nvarchar(30),[Date of Transfer],101) AS Date_of_Transfer,
[Postcode],
[Property Type],
[Duration],
[Town City],
[District],
[County]
FROM [GreaterManchesterTask01].[dbo].[pp-2019]
WHERE county = 'Greater Manchester'
UNION ALL

SELECT[Transaction ID],
CAST([Price] AS MONEY) AS Sales_Price,
CONVERT(nvarchar(30),[Date of Transfer],101) AS Date_of_Transfer,
[Postcode],
[Property Type],
[Duration],
[Town City],
[District],
[County]
FROM [GreaterManchesterTask01].[dbo].[pp-2020]
WHERE county = 'Greater Manchester'
UNION ALL

SELECT[Transaction ID],
CAST([Price] AS MONEY) AS Sales_Price,
CONVERT(nvarchar(30),[Date of Transfer ],101) AS Date_of_Transfer,
[Postcode],
[Property Type],[Duration ],
[Town City],
[District],
[County]
FROM [GreaterManchesterTask01].[dbo].[pp-2021]
WHERE county = 'Greater Manchester'
UNION ALL

SELECT[Transaction ID],
CAST([ Price] AS money) AS Sales_Price,
CONVERT(nvarchar(30),[Date of Transfer ],101) AS Date_of_Transfer,
[Postcode],
[Property Type],
[Duration],
[Town City],
[District],
[County]
FROM [GreaterManchesterTask01].[dbo].[pp-2022]
WHERE county = 'Greater Manchester';
```

- Then you can see the view under the views, in “GreaterManchesterTask01” database.

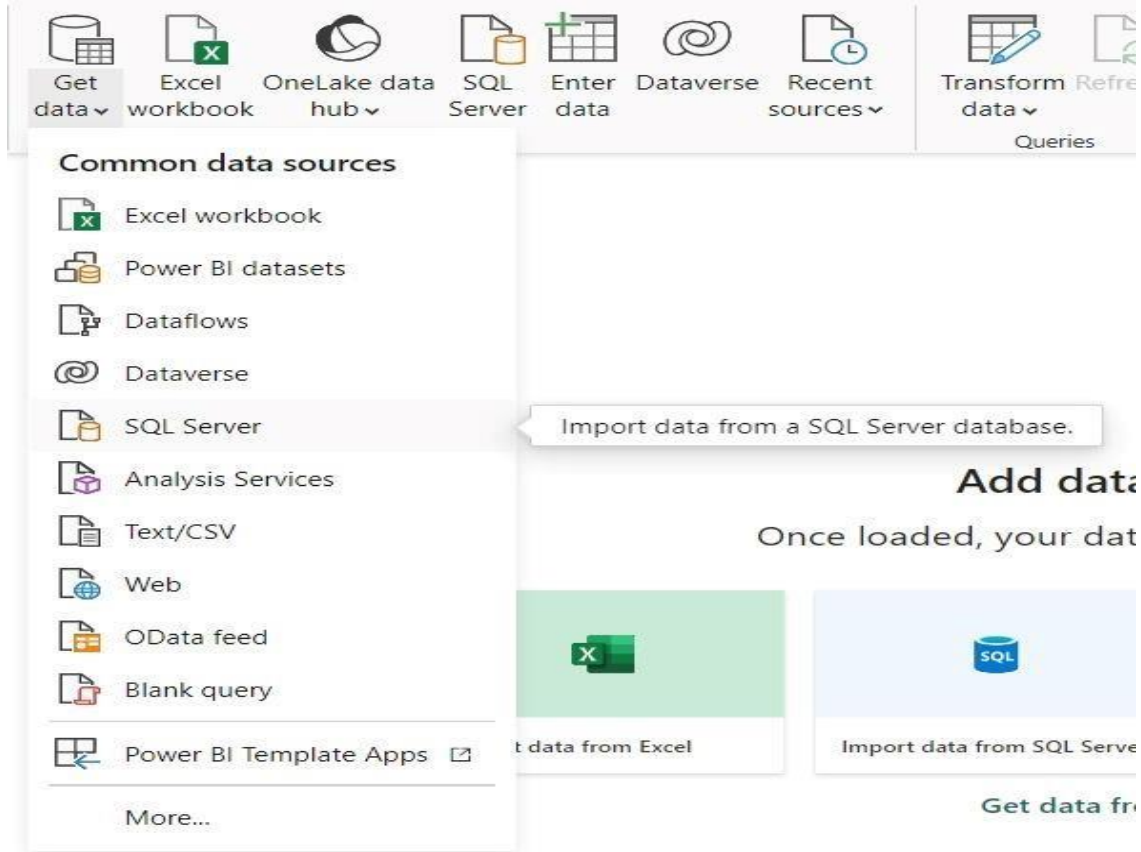


### 03. DASHBOARD DESIGN AND IMPLEMENTATION

#### 3.1. Importing Data from the SQL Server Management Studio to Microsoft Power BI

To import the view data set to power BI

- Firstly, open the Microsoft Power BI desktop and click “Get Data” under the “Home” tab.



- Next click “SQL Server” under the “Common Data Sources” to import data from the SQL Server database.

SQL Server database

Server ⓘ

DESKTOP-66K1KE5

Database (optional)

Data Connectivity mode ⓘ

☒ Import

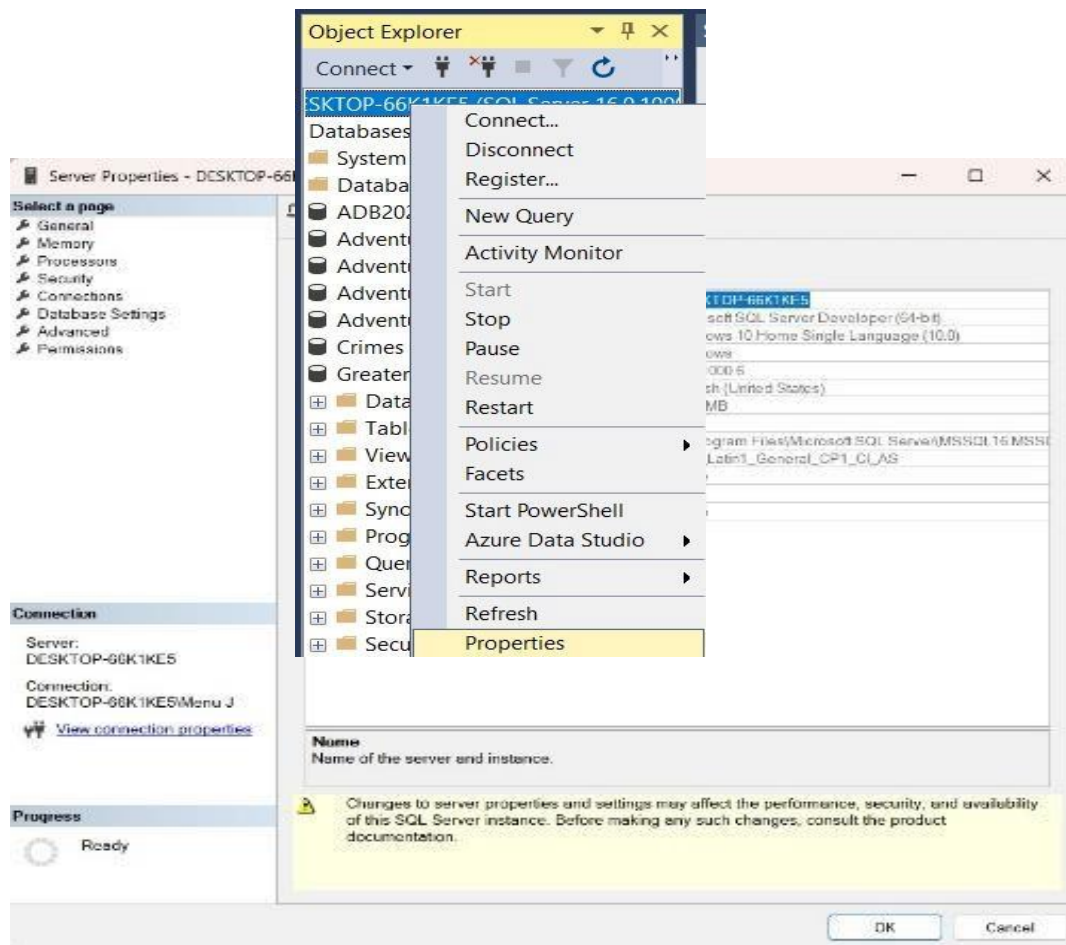
☐ DirectQuery

Advanced options

OK Cancel

- Now go to the server's name under Objects Explorer.
- Then click "Properties".
- Copy the Server name "DESKTOP-66K1KE5" and paste it to the "Server" under SQL Server database in Microsoft Power BI
- Click the "GreaterManchesterTask01" database from the "Navigator" and click the "MANCHASTER\_P" view and click "Load" to load the database to create the dashboard.





## Navigator

Display Options

- DESKTOP-66K1KE5 [9]
  - AdventureWorks2019
  - AdventureWorks2022
  - AdventureWorksLT2019
  - AdventureWorksLT2022
  - Crimes
  - GreaterManchesterTask01 [6]
    - MANCHESTER\_P**
    - Property\_Sales\_Trend
    - pp-2019
    - pp-2020
    - pp-2021
    - pp-2022
    - SDG\_Data
    - SLAcommodations

Select Related Tables

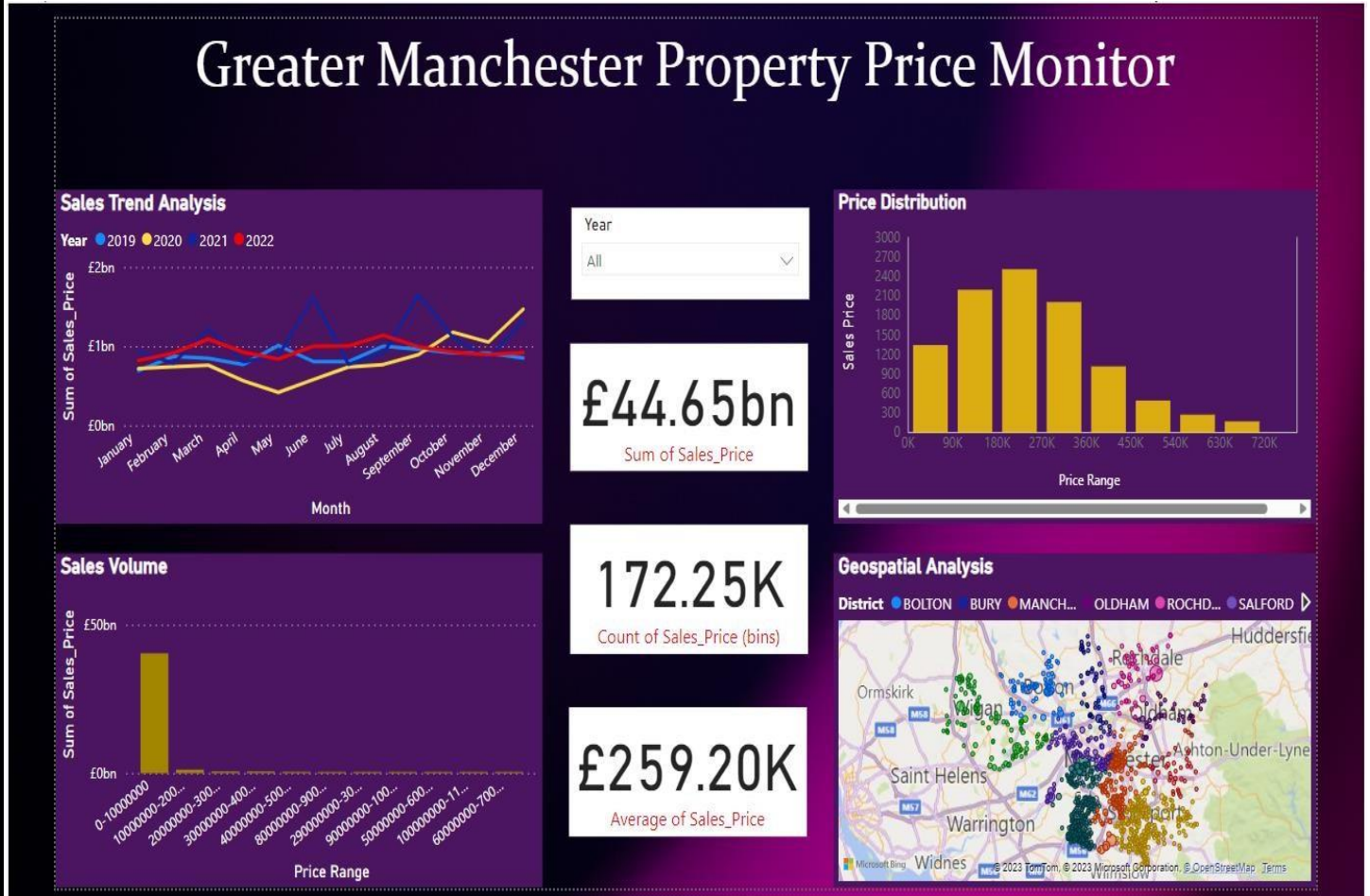
MANCHESTER\_P

Transaction ID	Sales Price	Date of Transfer	Postcode
[8A7882B0-4E9A-5CB0-E053-6B04A8C0F504]	300,000.00	4/24/2019 0:00	WAC
[8A7882B0-50C1-5CB0-E053-6B04A8C0F504]	540,000.00	4/24/2019 0:00	WAC
[8A7882B0-5011-5CB0-E053-6B04A8C0F504]	375,000.00	5/9/2019 0:00	WAC
[8A7882B0-50D9-5CB0-E053-6B04A8C0F504]	63,000.00	4/5/2019 0:00	WAC
[8A7882B0-50D1-5CB0-E053-6B04A8C0F504]	190,000.00	4/1/2019 0:00	CW5
[8A7882B0-50D2-5CB0-E053-6B04A8C0F504]	135,000.00	1/25/2019 0:00	CH4
[8A7882B0-5013-5CB0-E053-6B04A8C0F504]	250,000.00	5/7/2019 0:00	SK3
[8A7882B0-50D4-5CB0-E053-6B04A8C0F504]	430,000.00	3/27/2019 0:00	CW4
[8A7882B0-50D5-5CB0-E053-6B04A8C0F504]	289,000.00	4/25/2019 0:00	WAC
[8A7882B0-50D6-5CB0-E053-6B04A8C0F504]	68,000.00	4/16/2019 0:00	WAC
[8A7882B0-50D7-5CB0-E053-6B04A8C0F504]	955,000.00	5/2/2019 0:00	SK10
[8A7882B0-50D9-5CB0-E053-6B04A8C0F504]	160,000.00	4/15/2019 0:00	WAC
[8A7882B0-50D6-5CB0-E053-6B04A8C0F504]	605,000.00	4/9/2019 0:00	CW1
[8A7882B0-50D1-5CB0-E053-6B04A8C0F504]	93,000.00	4/26/2019 0:00	WAC
[8A7882B0-50D0-5CB0-E053-6B04A8C0F504]	195,996.00	4/26/2019 0:00	SK11
[8A7882B0-50D0-5CB0-E053-6B04A8C0F504]	55,000.00	4/25/2019 0:00	CW4
[8A7882B0-50D0-5CB0-E053-6B04A8C0F504]	78,000.00	5/2/2019 0:00	WAC
[8A7882B0-50ED-5CB0-E053-6B04A8C0F504]	215,000.00	5/9/2019 0:00	CW6
[8A7882B0-50E1-5CB0-E053-6B04A8C0F504]	115,000.00	4/29/2019 0:00	WAC
[8A7882B0-50E2-5CB0-E053-6B04A8C0F504]	200,000.00	4/30/2019 0:00	SK10
[8A7882B0-50E3-5CB0-E053-6B04A8C0F504]	700,000.00	5/8/2019 0:00	WAC
[8A7882B0-50E4-5CB0-E053-6B04A8C0F504]	146,800.00	4/26/2019 0:00	CW1
[8A7882B0-50E5-5CB0-E053-6B04A8C0F504]	227,000.00	5/17/2019 0:00	CW2

Load Transform Data Cancel



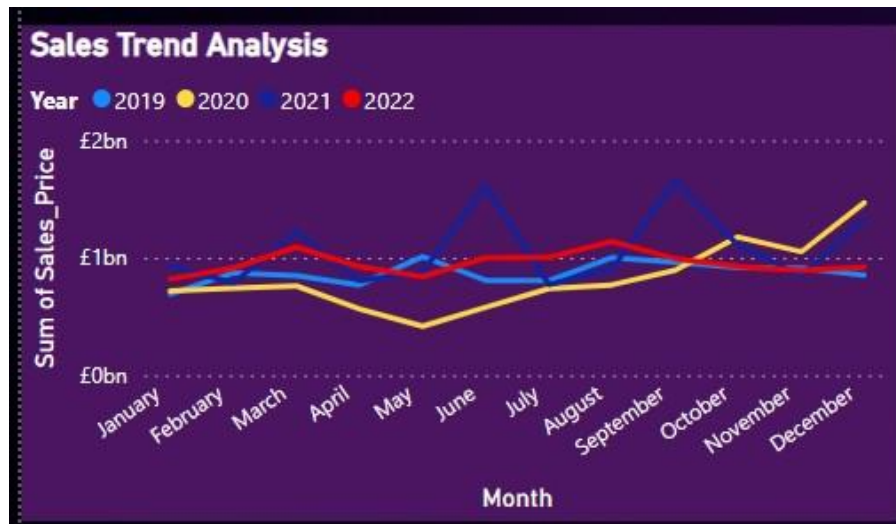
### 3.2. Dashboard Illustration



### 3.3. Dashboard Overview

#### 3.3.1. Analysis Overview

- Sales Trend Analysis



The Sales Trend Analysis is depicted using a line chart where the Y-axis represents the Sum of Sales Price and the X-axis represents the Months in a year. The line chart shows the monthly sales trend analysis for the four years 2019, 2020, 2021, 2022.

Through the analysis we can see that the property sales are below one billion euros at the beginning of the four years and by the end of the year, the month of December, the trend is increased exceeding one billion euros only in the years 2020 and 2021.

This analysis allows to analyse the recurring patterns, seasonal highlights of the property sales and the diminishing patterns over the four years.

- **Price Distribution**

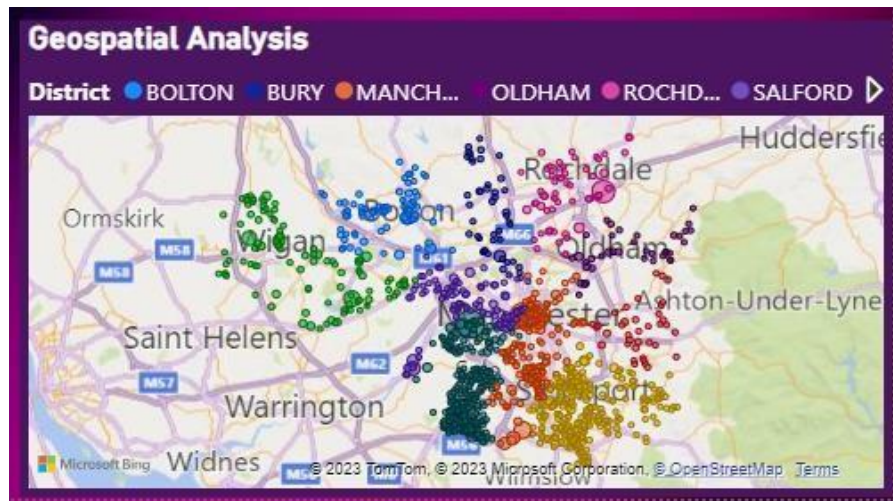


The Price Distribution of the property prices is depicted using a histogram where the Y-axis represents the Sales Price as the sales price bins and the X-axis represents the Price Range. The histogram shows the price count in each sales price ranges over four years 2019, 2020, 2021, 2022.

Through this analysis we can see a high count about, more than 2400 but less than 2700 between the price range 180K and 270K. A low count about, more than 0 but less than 300 between the price range 630K and 720K.

We can identify a positive skewness with a long right tail in this analysis. Through this histogram analysis, we can identify the irregularities of the sales prices over the price ranges. •

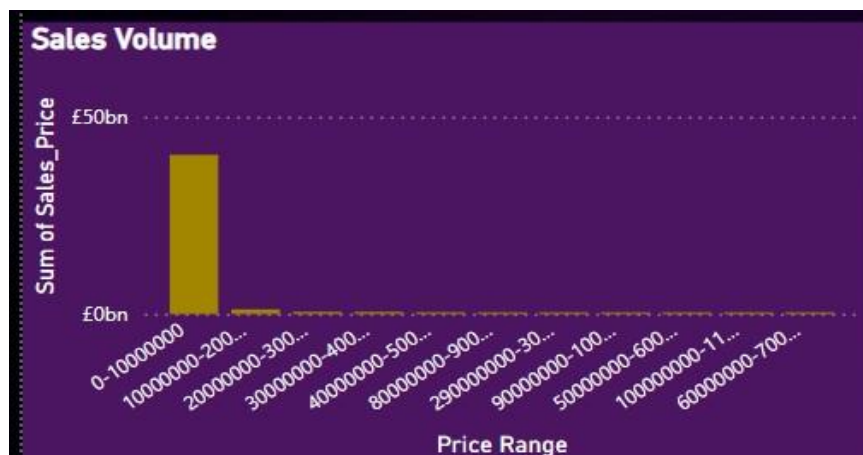
### Geospatial Analysis



The Geospatial Analysis shows the property price distribution of the local property over the region. The Postcode of the property sold were taken as the Location, the District as the Legend and the Sum of Sales Prices as the Bubble Size of the Map for the Geospatial Analysis.

We can see high and low concentration of sales prices over certain regions.

### • Sales Volume



The Sales Volume is depicted through a clustered column chart. The Y-axis shows the Sum of Sales Price and the X-axis represents the Price Range. The clustered column chart shows the volume of the sum of sales price over the price ranges.

Accordingly, through this analysis, we can see that more than 40 billion euros are within the range of 0-10,000,000 and 10,000,000-20,000,000. Which is the highest sales volume. It can

be seen that the sales volumes keep diminishing passing each range compared to the other range.

### **3.3.2. Dashboard Purpose**

A data dashboard is a management tool for monitoring, analysing, and displaying information such as performance displays, parameters, and data points. The goal of creating this dashboard is to provide information about the UK property price market that will aid in understanding. You have some knowledge about the client's property items, which will enable you to extract all data into one simple graphic that delivers immediate measurable results and is straightforward to use.

#### **1. Sales Trend Analysis:**

- Visual: A line graph depicting monthly property sales over time.
- Goal: Identify peak months, seasonal patterns, or market trends by understanding the overall trend in property sales.

#### **2. Price Distribution:**

- Visual: A histogram depicting the price distribution of real estate.
- Goal: Identify the most common price bands and outliers by analysing the range and frequency of property prices.

#### **3. Geospatial Analysis:**

- Visual: Map visualization of regional sales distribution.
- Goal: Identify areas with higher or lower sales activity, assisting users in understanding the regional dynamics of the real estate market.

#### **4. Sales Volume:**

- Visual: A column or bar chart indicating the quantity of sales in various price brackets.
- Goal: Identify market segmentation and buyer preferences by analysing the number of sales within particular price ranges

### **3.3.3. Insights and Limitations**

- **Insights**

This dashboard provides an accurate and a deep understanding about the local property market in Greater Manchester region in the United Kingdom through the Sales Trend Analysis, Price Distribution Analysis, Geospatial Analysis and through the Sales Volume Analysis.

- **Limitations** 1. Data Quality:

The quality and the accuracy of the dashboard depends on the quality of the data extracted and collected. If, the quality of the data collected is not good then the quality of the dashboard will also not be good.

- 2. Information Overload:

The information and data that must be shown thoughtfully, if not, it can cause confusion to the user. Since there is a huge set of information, the data must be arranged accordingly so not to overwhelm the user.

- 3. Design Complexity:

Since, there is a lot of design options, this leads to complexity in the design selection and when the design of the dashboard is too complex it can lead the users to be confused where they won't be able to grasp the key concepts of the dashboard.

### **3.3.4. Recommendations**

The main aim of a dashboard is to understand the information provided and grasp the key concepts presented in the dashboard in order to make effective informed decisions.

In order to design a proper user-friendly dashboard, the quality of the data extracted and collected must be consistent, accurate and be reliable.

The data must be arranged and the dashboard design must be simple and pleasing to the eye of the user, so that the user would neither be overwhelmed or be confused.

- **Real estate investors**

Real estate investors can highlight the important facts and information through Strategic Action Cards which promotes the key insights of the data collected.

They can display the essential plans and strategies which are relevant to them and their objectives in cards.

And arrange the data so that it is friendly for the user.

- **Policy makers**

They present their policies implemented under different categories based on their domain such as policy regulations, new policy implementations and policy strategies into cards.

And present the data and information in a simple and easily understandable manner.

#### **04. CONCLUSION**

This report provides information about different kinds of property in the United Kingdom. This process includes the extraction of the property data from the years 2019, 2020, 2021 and 2022 respectively. Where they are incorporated to the SQL Database Server then to the Microsoft Power BI using the T-SQL.

This method ensured the ease of access to the data collected for the visual representation of the data as charts, graphs and maps using tables and views.

This dashboard consists of the Sales Trend Analysis, the Price Distribution Analysis, the Geospatial Analysis and the Sales Volume Analysis which provides an accurate and a deep understanding about the local property market in Greater Manchester region in the United Kingdom.

This dashboard allows the Stakeholders to make Informed Decisions such as,

It allows, Real estate agents can analyse the data and decide whether to increase or decrease the market price of the property depending on various factors such as the season, the region and etc...

The Government can make decisions by analysing and studying the local property market and its' valuations and implement policies to promote the sales of the property for accommodating purposes or decide to renovate the area for government purposes.

The Buyers or Property Investors can analyse the data and make decisions regarding the property to buy, the season to buy the property on and the favourable price range to conduct the necessary price transactions at.

The stakeholders can forecast the market trends of the local property market and forecast the market and make decisions based on these trends and forecasts.

It also allows the stakeholders to manage the risks more effectively by changing and adjusting the strategies and plans more effectively.