Sri Lanka Institute of Information Technology

Data Warehousing & Business IntelligenceAssignment 02 – Report

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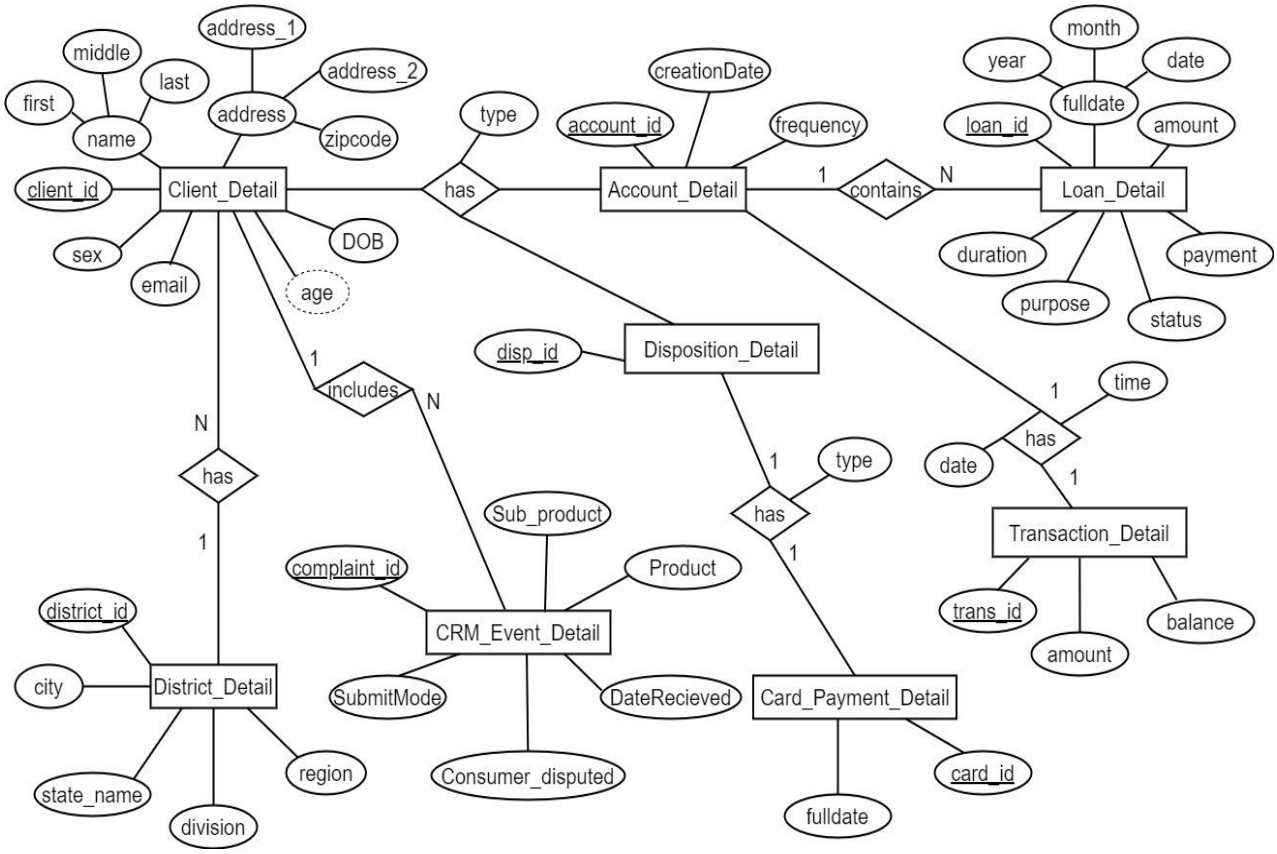
Contents

Data Source for the Assignment 2

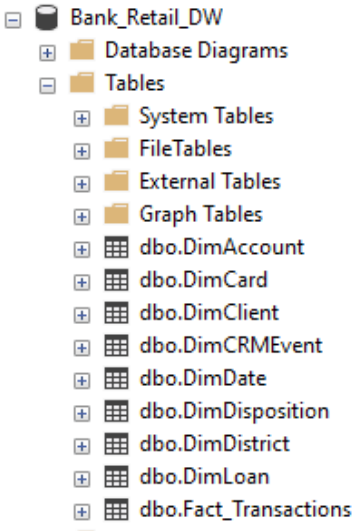
I have chosen a bank retail dataset from data world. This data set reflects combinations between retail banking of clients, related to credit card payments, loans and transactions. Client details, client transaction information, account details, loan details and credit card payment details are some of the key details included in the data set.

The link to the source data setis mentioned below:

https://data.world/lpetrocelli/retail-banking-demo-data



I used a snowflake schema for my data warehouse. There are 8 dimension tables and one fact table.



SSAS Cube Implementation

Tools Used:

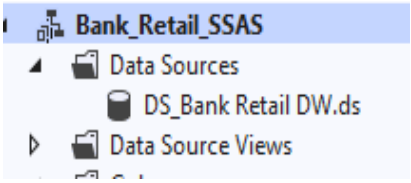
- SQL Server Data Tools
- SQL Server Management Studio

Steps:

1. Create the SSAS Project
2. Create a Data Source
3. Create a Data Source View
4. Create a Cube
5. Deploy the Cube

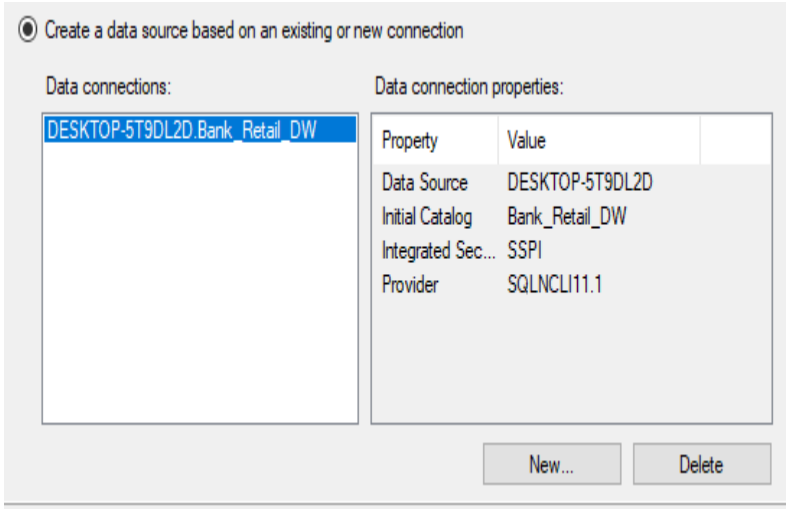
Step 1: Creating the SSAS Project

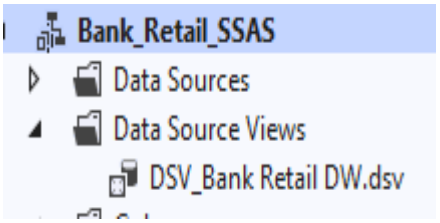
In SQL server Data tools, I created an Analysis Services Multidimensional and Data Mining Project and named it as **Bank_Retail_SSAS.**



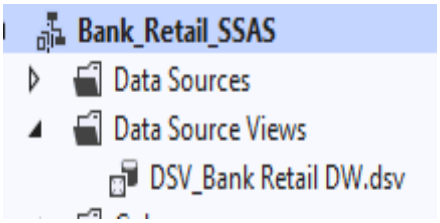
Step 2: Creating a Data Source

Data source defines from where, the cube is extracting data. At this step Icreated connection to the data warehouse.

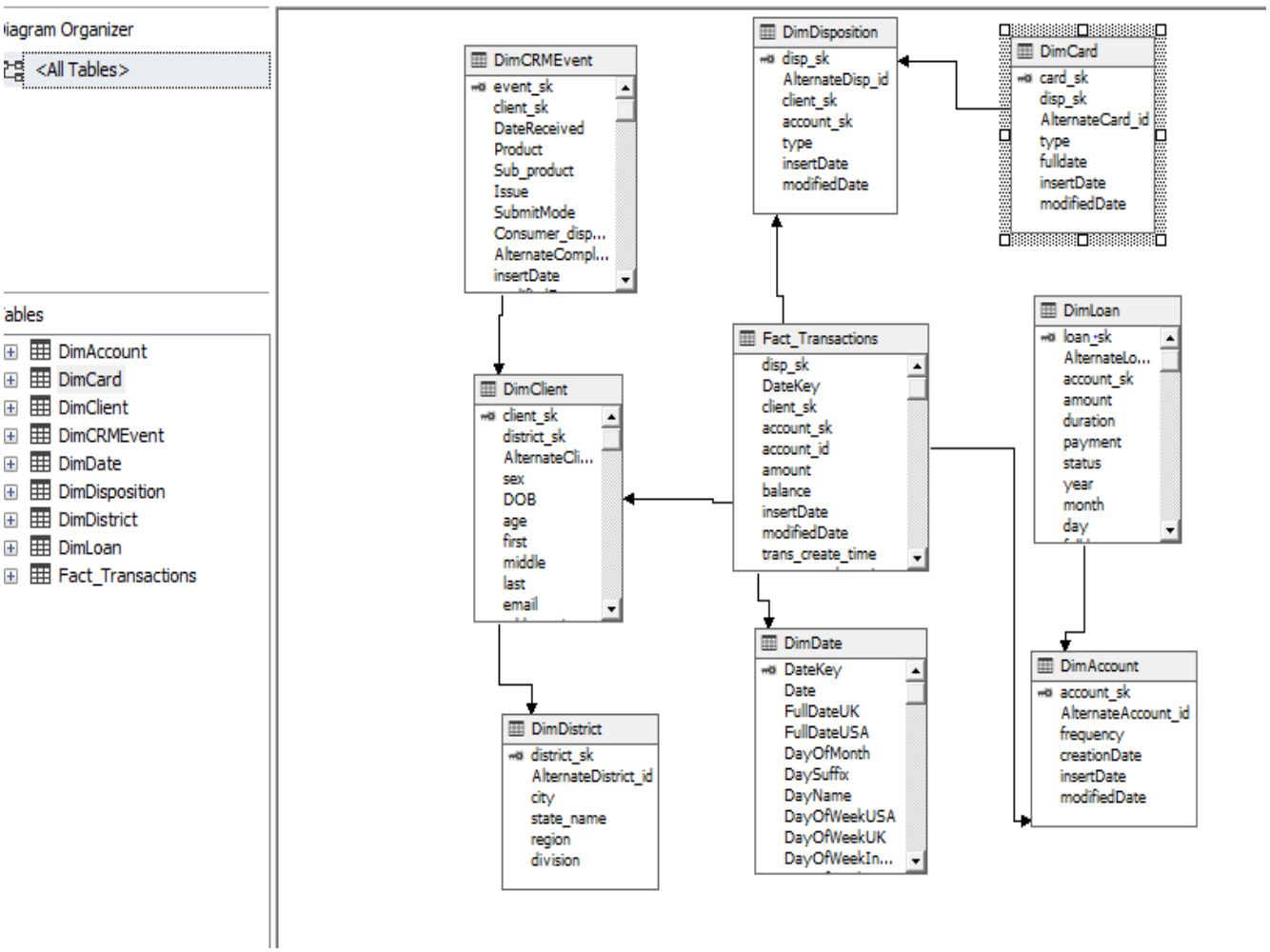




Step 3: Creating a Data Source View

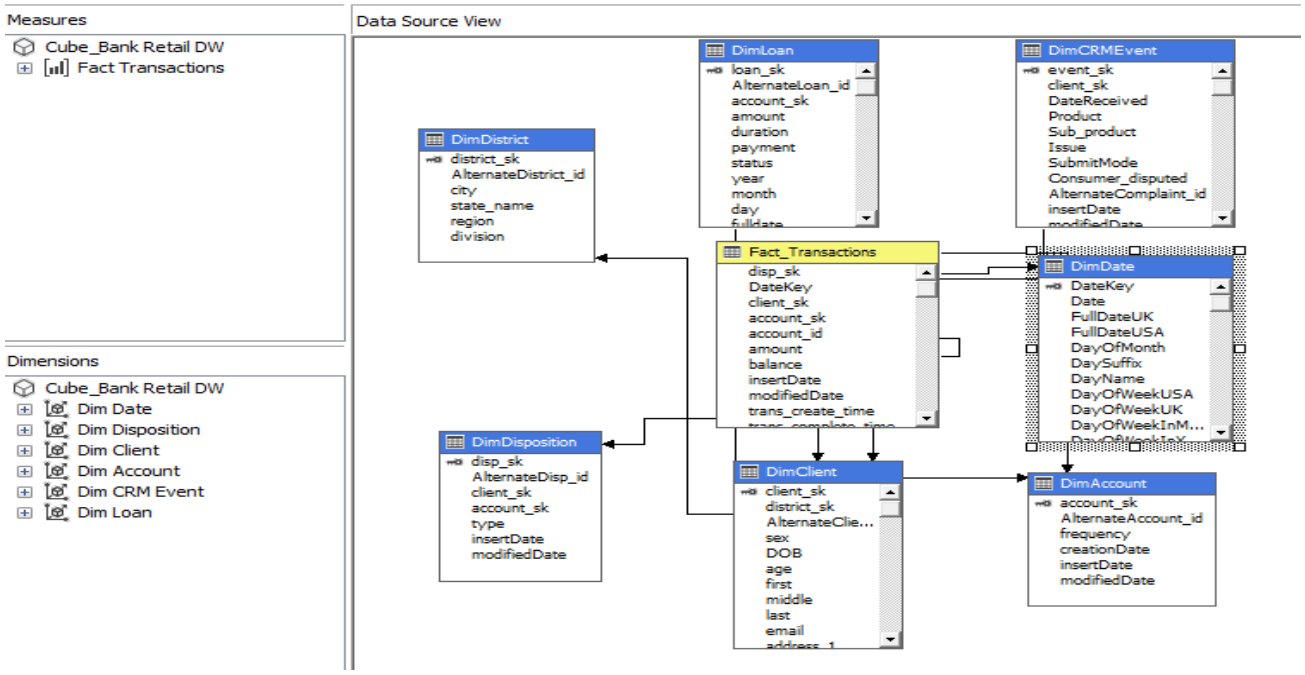


In this step I created a new data source view named DSV_Bank Retail DW and after that I selected all dimension tables and fact table andcreated table links.

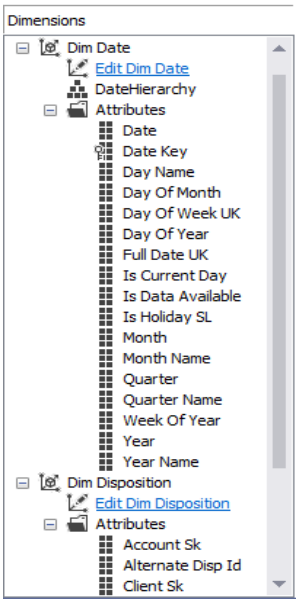


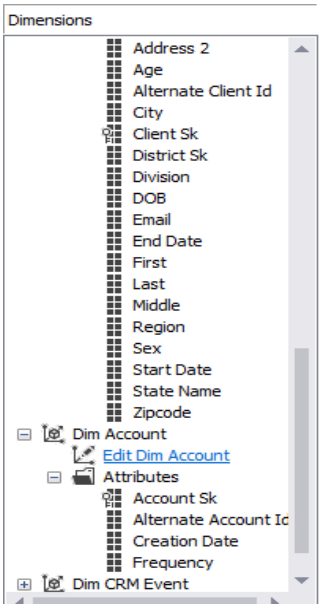
Step 4: Creating a Cube

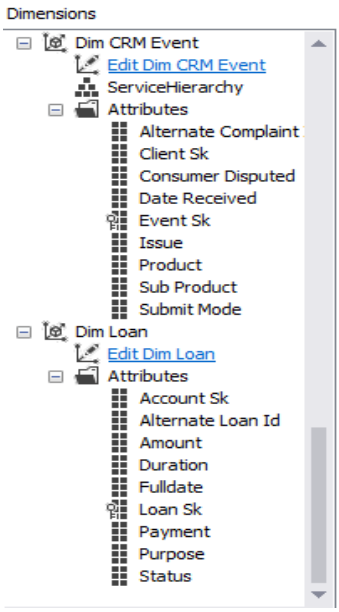
1. The data source view had created with the relevant tables in the previous section. We can use this existing data source to create the Cube.
2. From the “Cube wizard” select all the measures from the “Fact Transactions” fact table which is needed to include in the cube.
3. In the Select New Dimensions page, Selected the dimensions “Dim Disposition”,”Dim client”,” Dim Date”,” Dim Account”,” Dim CRM Event” and “Dim Loan”
4. The cube is named as Cube_Bank_Retail DW



After that I added all the attributes to the dimension tables except SK. (it was already added).



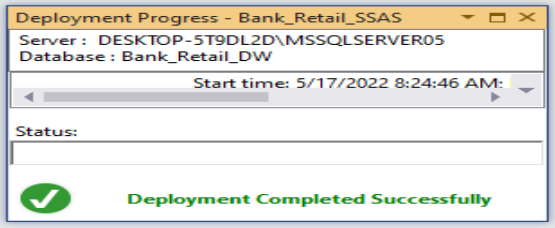




Step 5: Deploy the Cube

Provide connection credentials and deployed the cube.

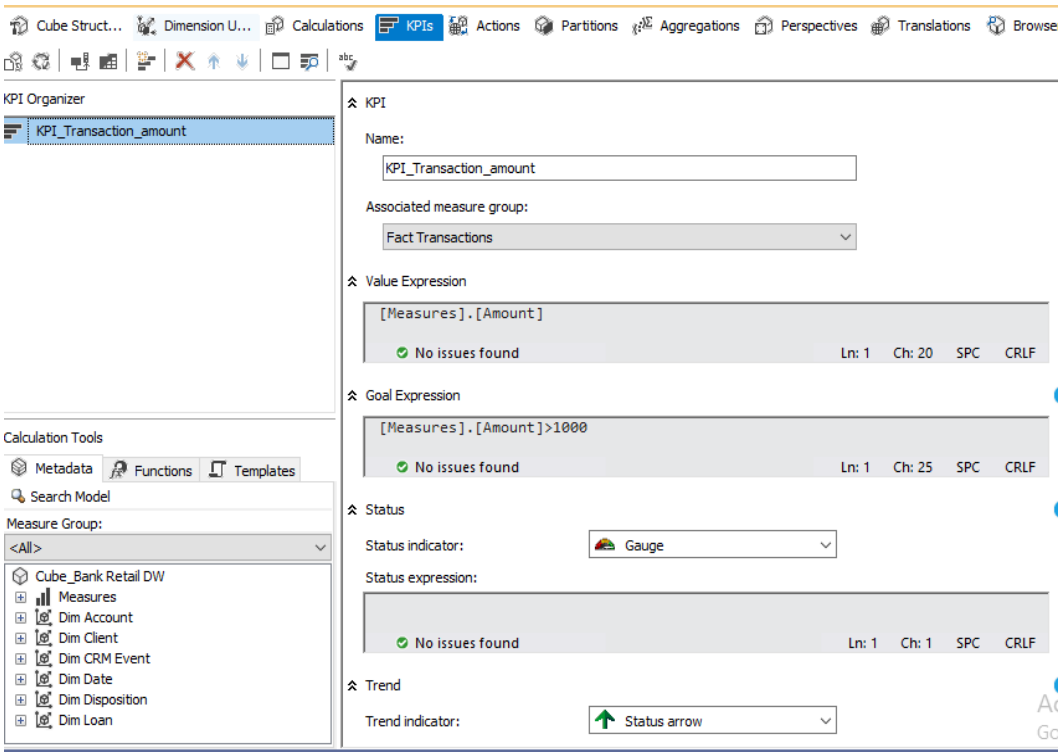
```
Build started...
------ Build started: Project: Bank_Retail_SSAS, Configuration: Development ------
Started Building Analysis Services project: Incremental ....
Hierarchy [Dim Date].[DateHierarchy] : Attribute relationships do not exist between
Dimension [Dim Date] : Avoid visible attribute hierarchies for attributes used as le
Dimension [Dim Disposition] : Create hierarchies in non-parent child dimensions.
Hierarchy [Dim Client].[LocationHierarchy] : Attribute relationships do not exist be
Dimension [Dim Client] : Avoid visible attribute hierarchies for attributes used as
Dimension [Dim Account] : Create hierarchies in non-parent child dimensions.
Hierarchy [Dim CRM Event].[ServiceHierarchy] : Attribute relationships do not exist
Dimension [Dim CRM Event] : Avoid visible attribute hierarchies for attributes used
Dimension [Dim Loan] : Create hierarchies in non-parent child dimensions.
Database [Bank_Retail_DW] : The database has no Time dimension. Consider creating on
Build complete -- 0 errors, 10 warnings
------ Deploy started: Project: Bank_Retail_SSAS, Configuration: Development ------
Performing an incremental deployment of the 'Bank_Retail_DW' database to the 'DESKTO
Generating deployment script...
    Add Cube Cube_Bank Retail DW
    Process Database Bank_Retail_DW
Done
Sending deployment script to the server...
Done
Deploy complete -- 0 errors, 0 warnings
========== Build: 1 succeeded or up-to-date, 0 failed, 0 skipped ==========
========== Deploy: 1 succeeded, 0 failed, 0 skipped ==========
```



Creating a KPI

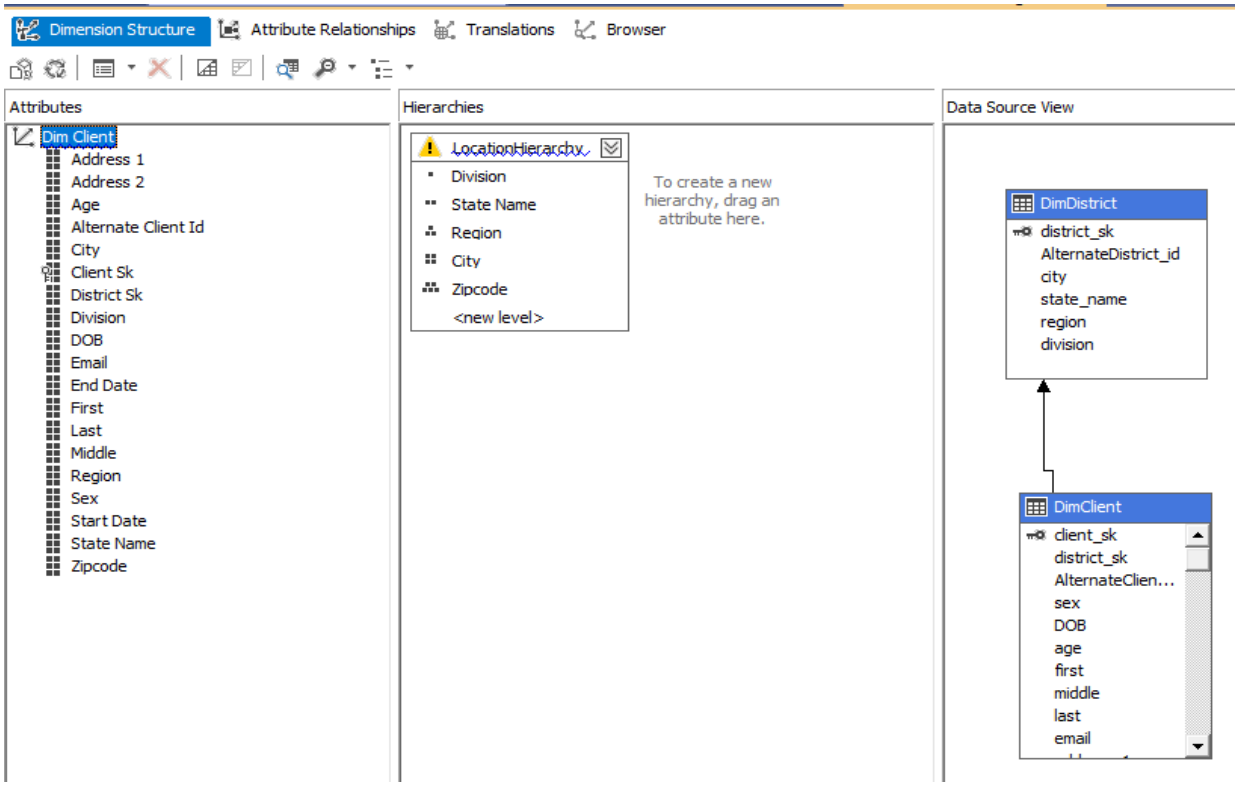
A Key Performance Indicator is the measurable value that demonstrates how effectively the company is achieving its key business objectives.

Here, I created a KPI to check transaction amount greater than 1000.



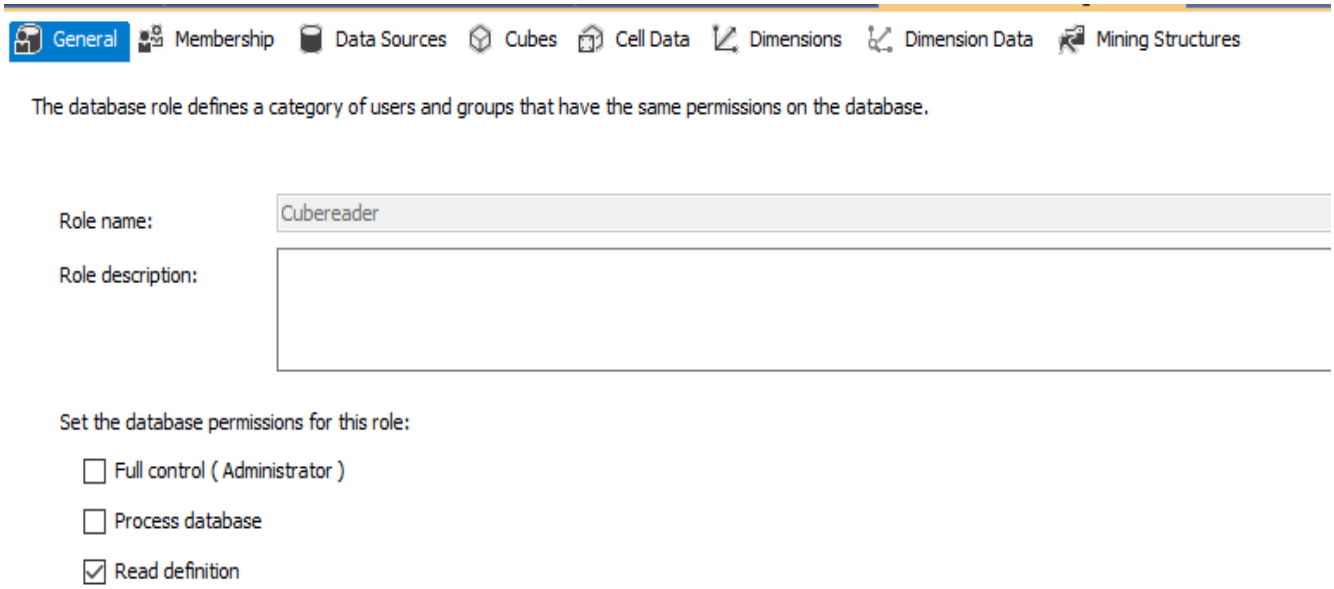
Creating Hierarchy

Created hierarchy in District Dimension.



Creating Role

I created a role named cubereader with permission read definition



Demonstration of OLAP Operations

Tools used:

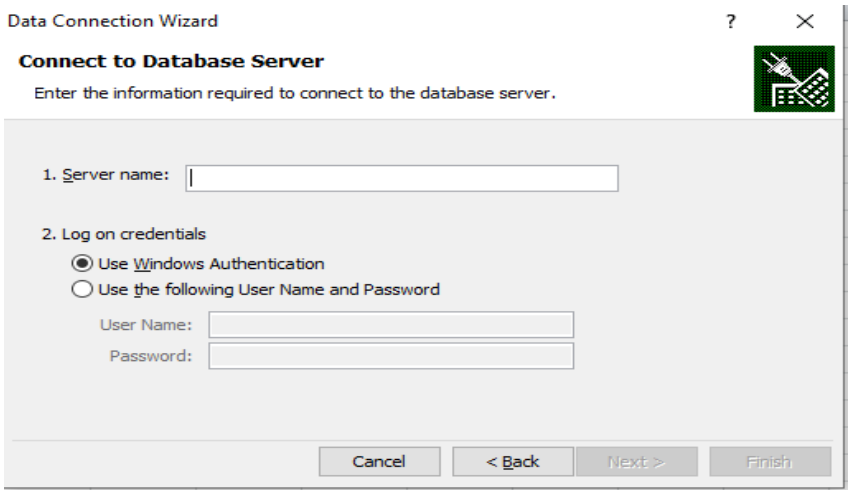
• Microsoft Excel

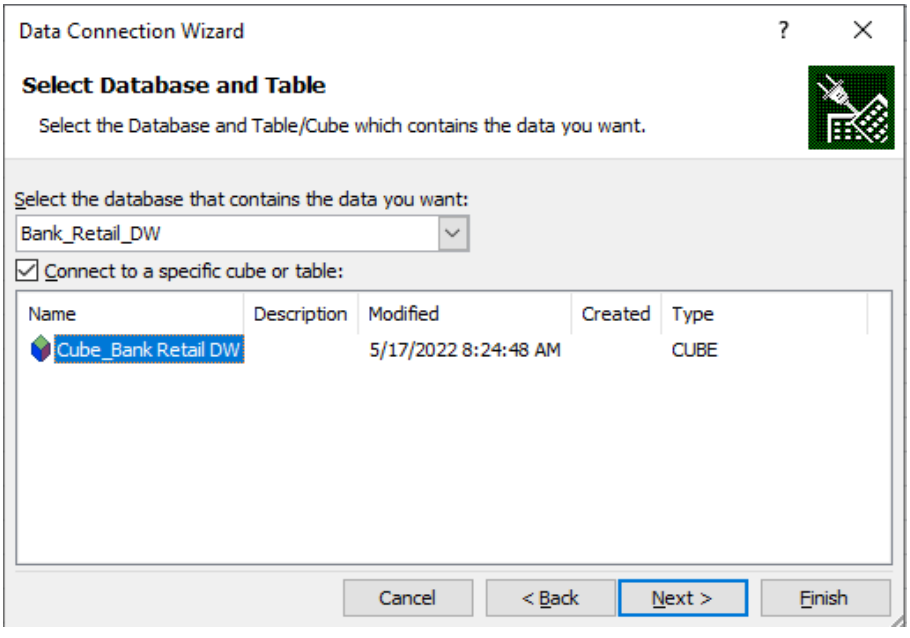
• SQL Server Management Studio

Connecting cube excel

Connecting Excel to SSAS Cube without MDX.

- In the Excel sheet Data tab, select From Other Sources Then from Analysis Service.

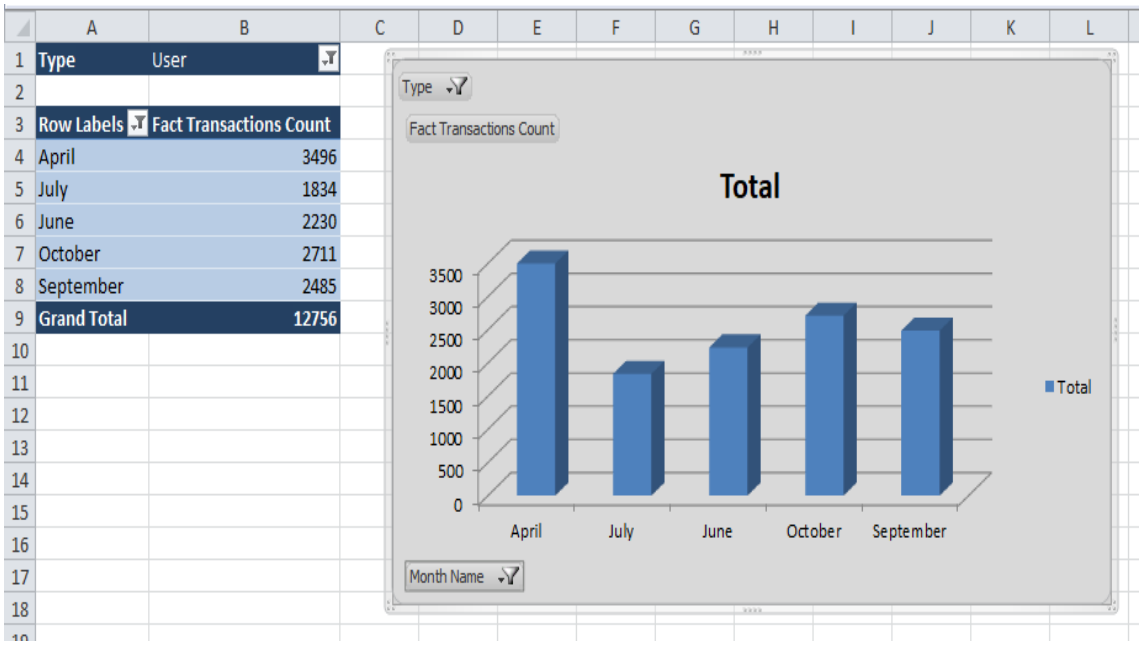




OLAP Operations

Slice

• A new sub cube is created using one dimension.

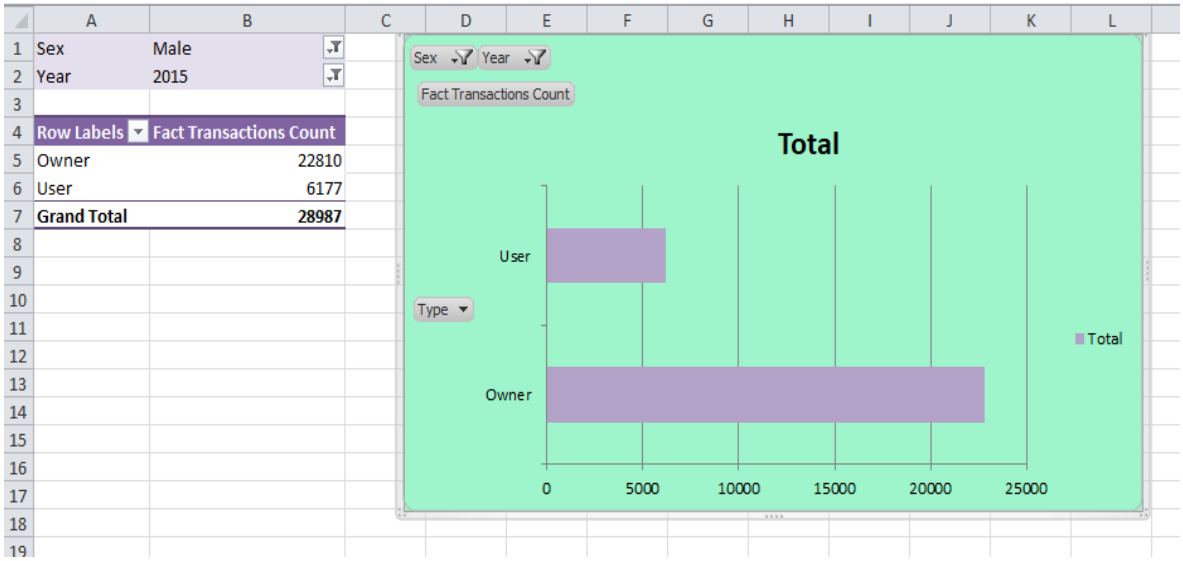


Dice

• Dice is similar to slice.

• But here two or more dimensions are resulted in the creation of a sub cube.

• Here the dimensions DimDate(Year),DimDisposition(type), Fact_Transactions and DimClient(sex) results in creation of the subcube.

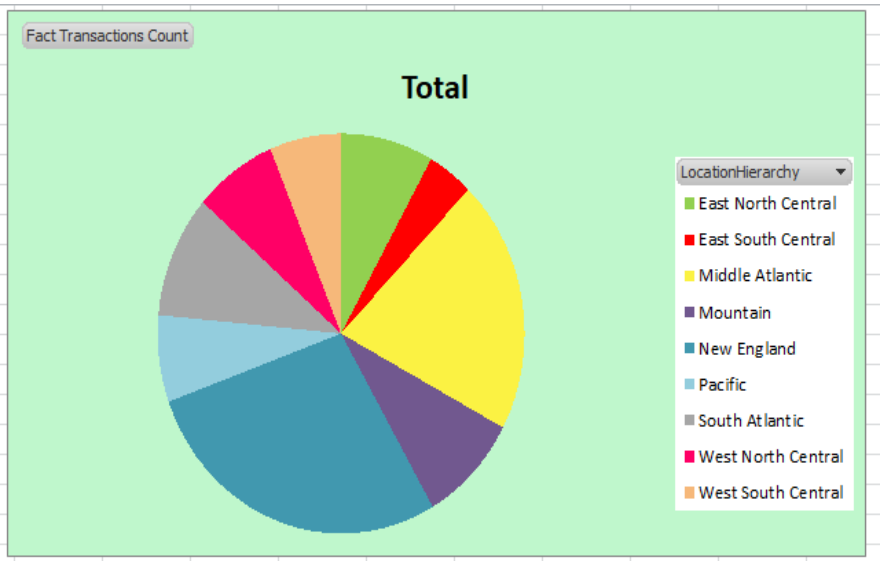


Roll Up

- Roll up is known as “consolidation” or “aggregation”.

- Here roll up operation is performed climbing up the location concept hierarchy of DimDistrict.

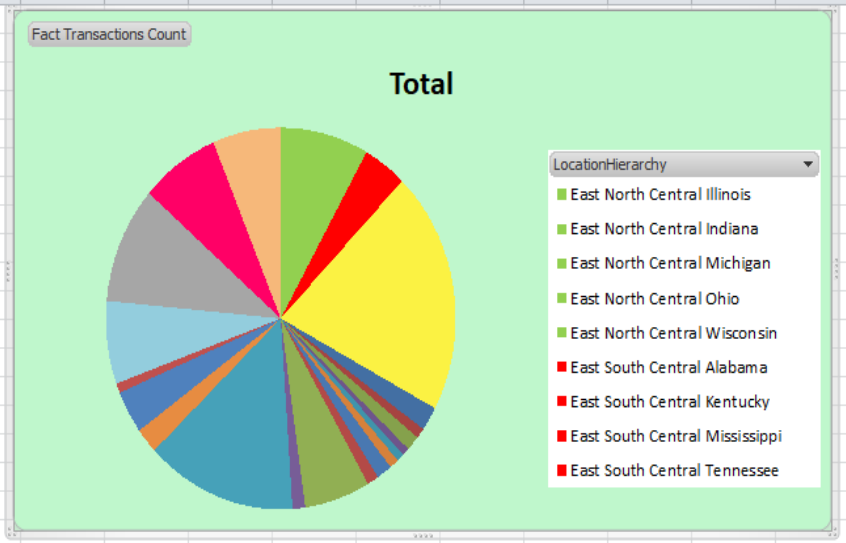
Row Labels	Fact Transactions Count
East North Central	14275
East South Central	7075
Middle Atlantic	36053
Mountain	15537
New England	48602
Pacific	12298
South Atlantic	17368
West North Central	12763
West South Central	11029
Grand Total	**175000**



Drill Down

- In drill down data is fragmented into smaller parts.
- It can be done via moving down the concept hierarchy increasing the dimension.
- Here data hierarchy of DimDistrict is drilled down.

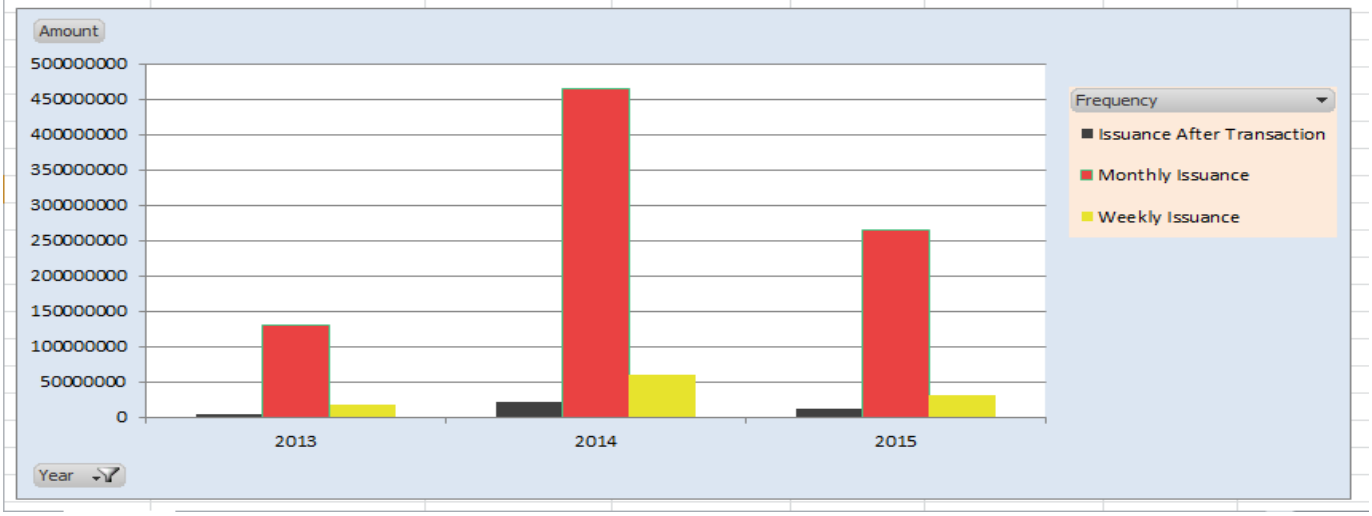
Row Labels	Fact Transactions Count
East North Central	14275
Illinois	7105
Indiana	2082
Michigan	2166
Ohio	1652
Wisconsin	1270
East South Central	7075
Alabama	1748
Kentucky	1936
Mississippi	1257
Tennessee	2134
Middle Atlantic	36053
New Jersey	2323
New York	30453
Pennsylvania	3277
Mountain	15537
Arizona	3561
Colorado	1531
Idaho	2244



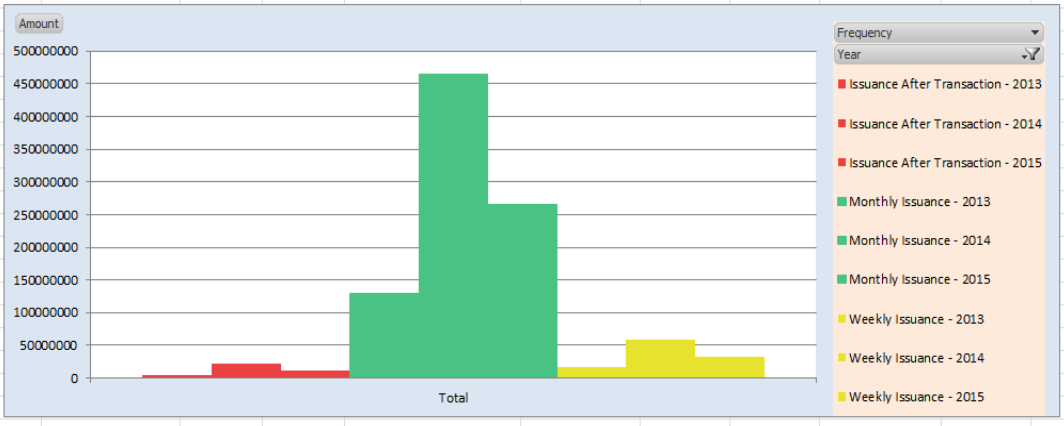
Pivot

• Pivot is a visualization operation which rotates the data axes in view to provide an alternative presentation of the data.

Amount	Column Labels			
Row Labels	Issuance After Transaction	Monthly Issuance	Weekly Issuance	Grand Total
2013	5088635.3	130133062	16997112.8	152218810.1
2014	22464462.2	464597164.3	59466195.7	546527822.2
2015	11846594.1	265152069.6	31743317.1	308741980.8
Grand Total	**39399691.6**	**859882295.9**	**108206625.6**	**1007488613**



	Column Labels												
	Issuance After Transaction			Issuance After Transaction	Monthly Issuance			Monthly Issuance	Weekly Issuance			Weekly Issu	Grand Total
	2013	2014	2015		2013	2014	2015		2013	2014	2015		
Amount	5088635.3	22464462.2	11846594.1	39399691.6	130133062	464597164.3	265152069.6	859882295.9	16997112.8	59466195.7	31743317.1	108206626	1007488613



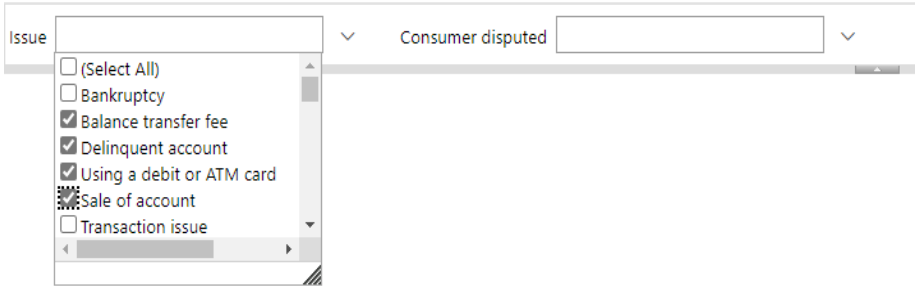
SSRS Reports

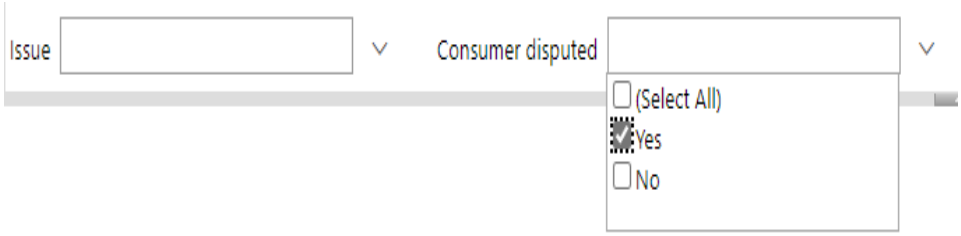
Report 01 - Report with matrix

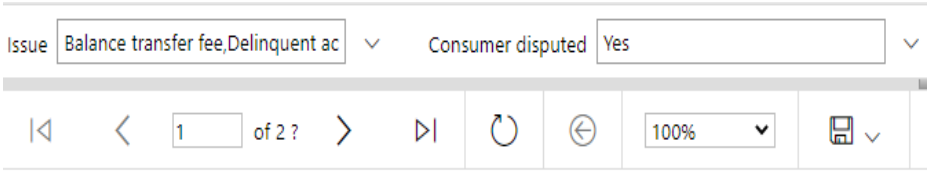
Account frequency type wise monthly transaction report

Month	Type	Type	Total
February	Monthly Issuance	Monthly Issuance	**21139781.3000**
April	Monthly Issuance	Monthly Issuance	**69022718.1000**
March	Monthly Issuance	Monthly Issuance	**652945286.0000**
October	Monthly Issuance	Monthly Issuance	**66998065.5000**
Total	**342823481.8000**	**467282369.1000**	**810105850.9000**

Report 02 - Report with more than one parameter







Issue and consumer disputed wise CRM event report

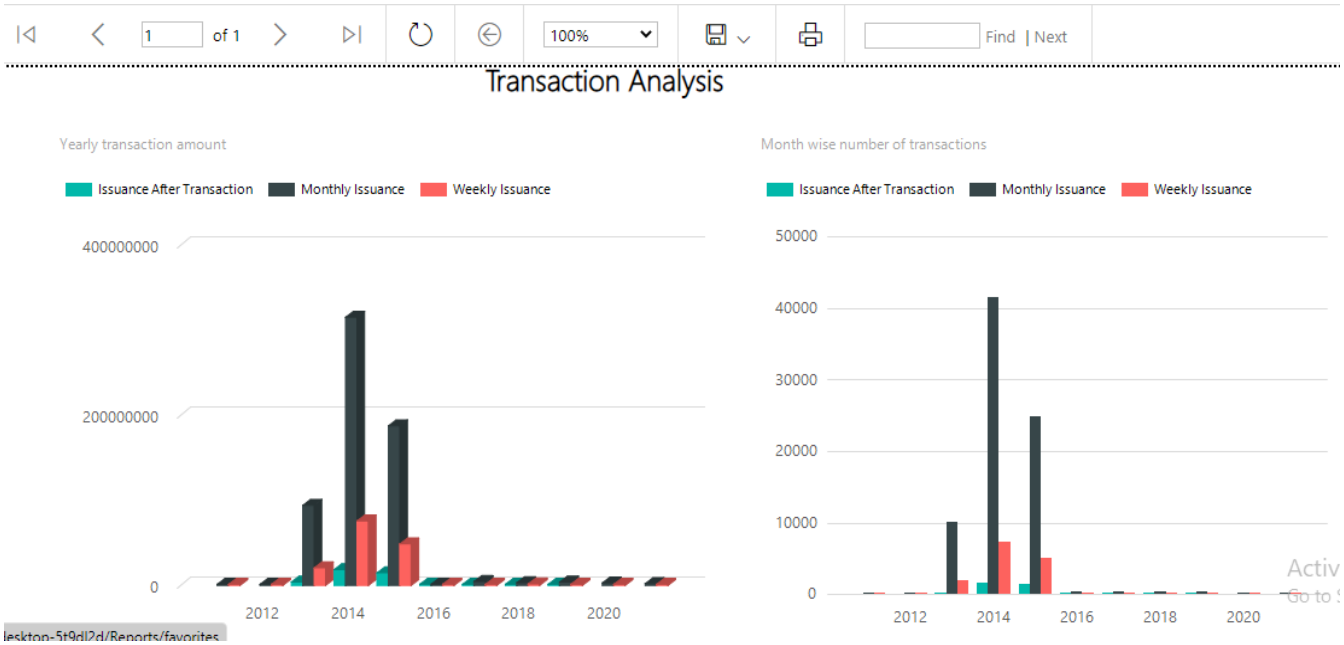
Product	Sub product	Submit Mode	Date Received
Bank account or service	Other bank product/service	Web	11/9/2016 12:00:00 AM
Bank account or service	Other bank product/service	Web	11/9/2016 12:00:00 AM
Bank account or service	Other bank product/service	Web	11/9/2016 12:00:00 AM
Bank account or service	Other bank product/service	Web	11/9/2016 12:00:00 AM
Bank account or service	Other bank product/service	Web	11/9/2016 12:00:00 AM

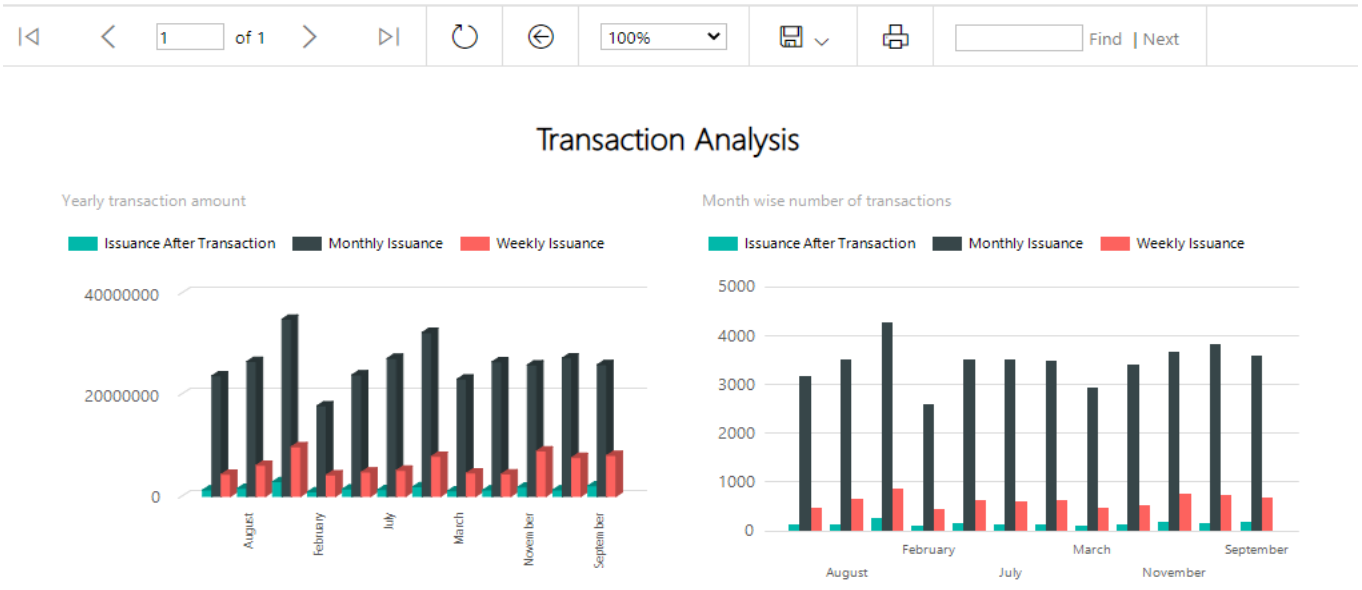
Report 3: Create an SSRS drill-down report.

Year and month wise loan amount obtained by clients

Report 4: Create an SSRS drill-through report.

This chart shows amount of transactions done in years and we can view number of transactions done during each month by clicking an





Power BI Dashboard