Assumptions made:

- ABC Mobile Service provider can obtain the geographical location details of phone numbers called by the phone numbers registered with this service, even if the terminating phone number is subscribed to a different service provider.
- There can be multiple phone numbers associated to an account. If the account is of a company, the numbers are generally much larger than if the account is of an individual.
- A company does not have branches, i.e, it has only one geographic location.
- The attribute Account_id in Account_type dimension indicates whether the the account is of an individual or a company.
- Number of connections associated to an account is static.
- There can be multiple towers in one locality.
- Rate plans can be of three types: only talktime, only data or a hybrid of both.

Tables and attributes:

- Fact

  --Caller_phone_number varchar(10) FK

  --Called_phone_number varchar(10)

  --Caller_geography_key varchar(10) FK

  --Called_geography_key varchar(10) FK

  --Call_time_key varchar(10) FK

  --Account_type_key char(10)

  --Rate_plan_key

  --Call_duration time

- Account_phone

  --Phone_number varchar(50) PK

  --Account_id varchar(10) FK

- Account_type

  --Account_id varchar(2) PK

  --Name varchar(50)

--Number_of_connections int

--Start_date date

- Call_time

  --Call_time_id varchar(10)

  --Start_time time

  --End_time time

- Geography

  --Geography_id varchar(10)

  --Tower_id int

  --Country varchar(50)

  --State varchar(50)

  --City varchar(50)

  --Locality varchar(50)

  --Postal_code varchar(10)

- Rate_plan

  --Rate_plan_id varchar(10)

  --Rate_plan_type char(1)

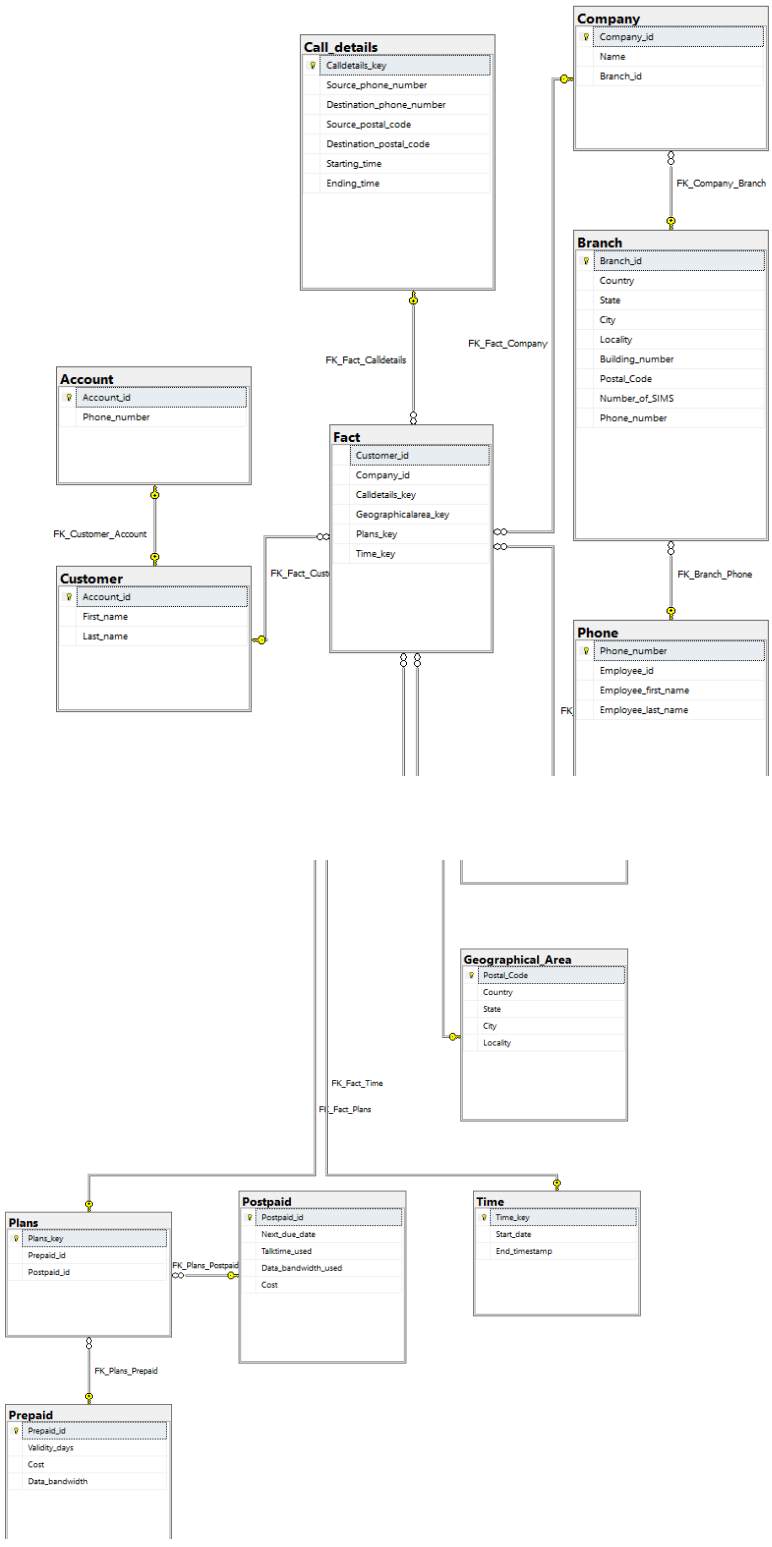
  --Validity_days int

  --Data_bandwidth float

  --Cost float

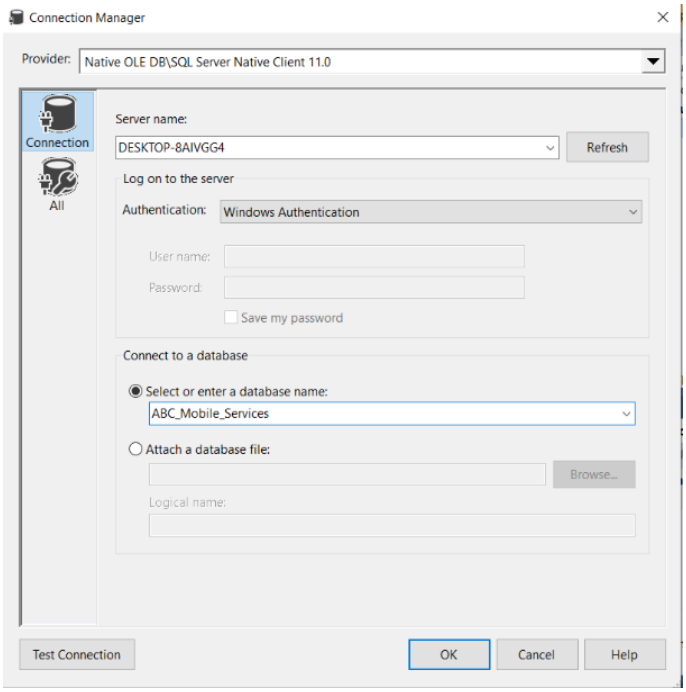
Process:

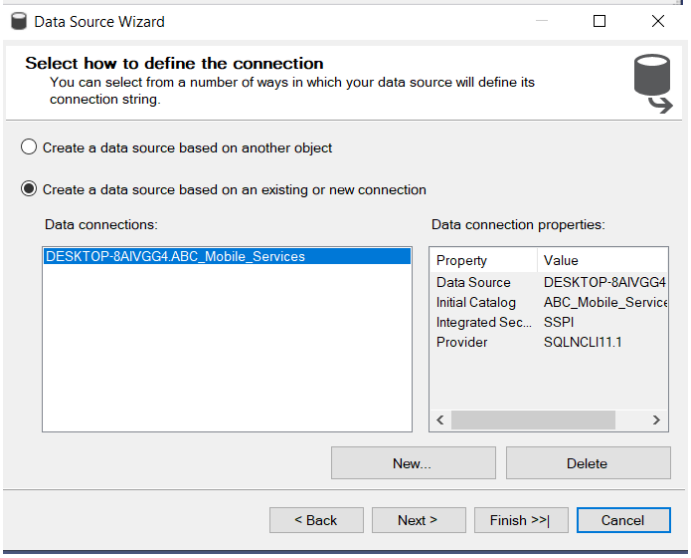
Create the tables in MSSQL



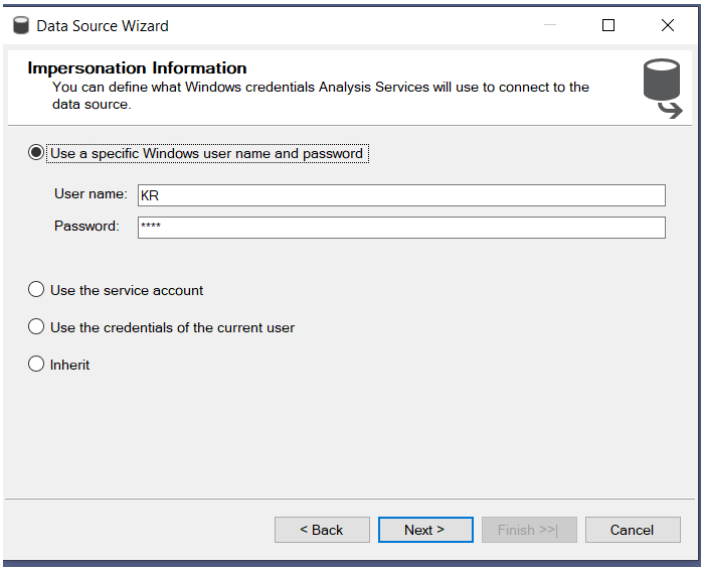
Having created the tables, some values are inserted into the dimension tables.

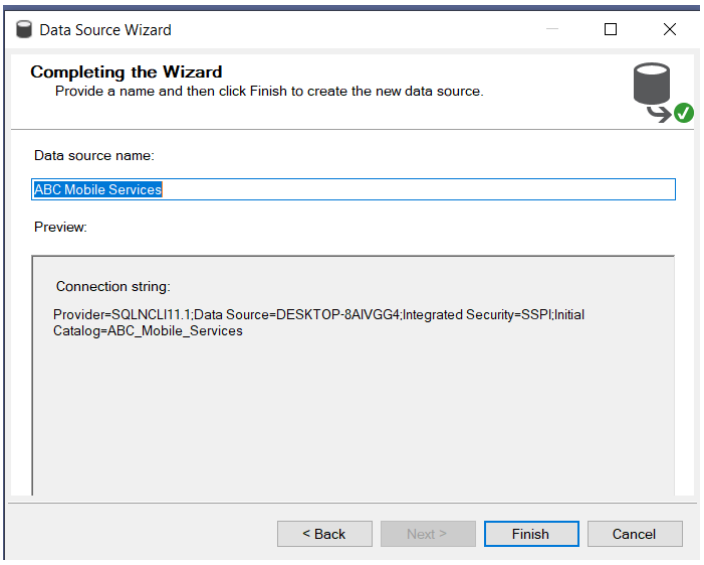
Now we create a project in Visual Studio and establish a connection to the server as follows-



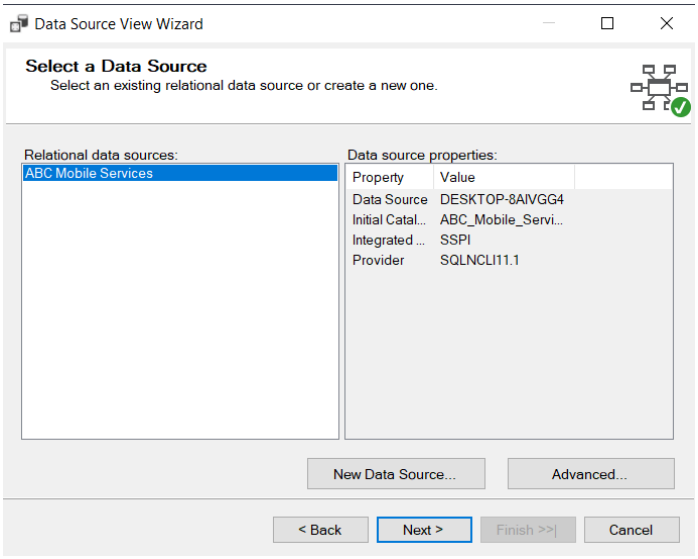


Adding the data source-

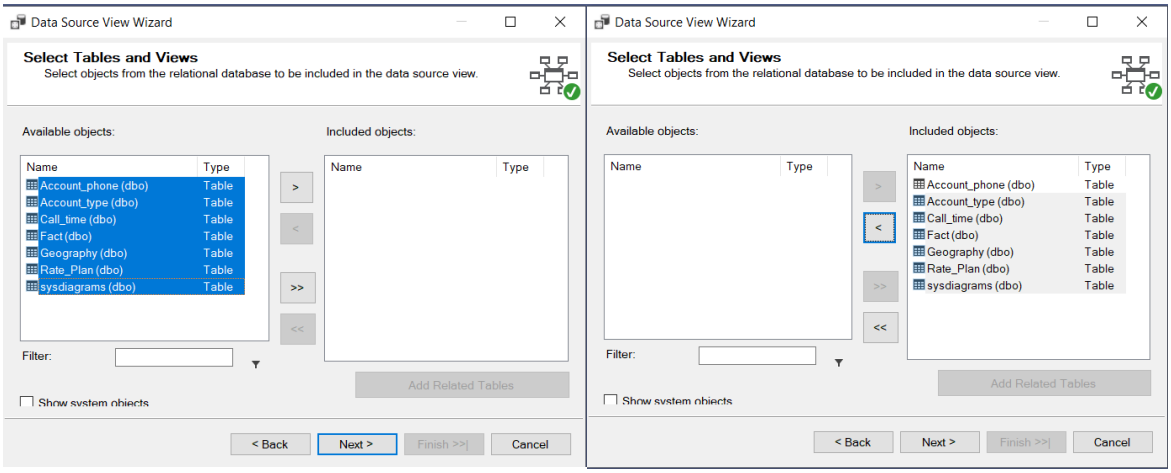


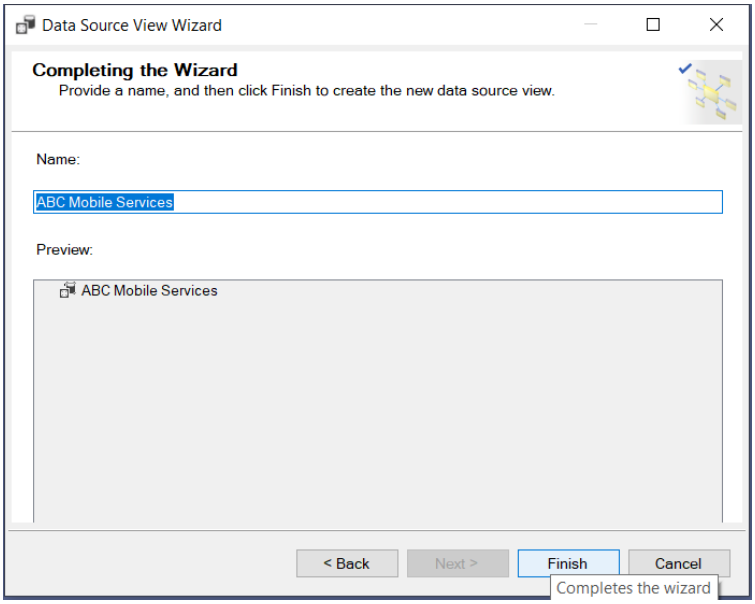


Creating the data source view-

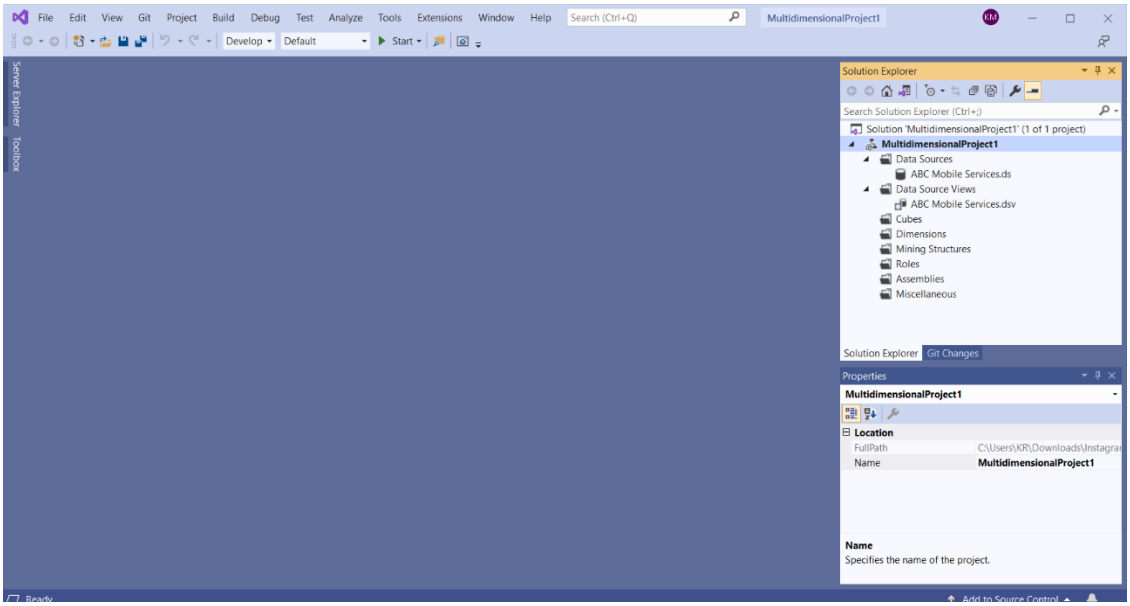


Select all available objects to be included-

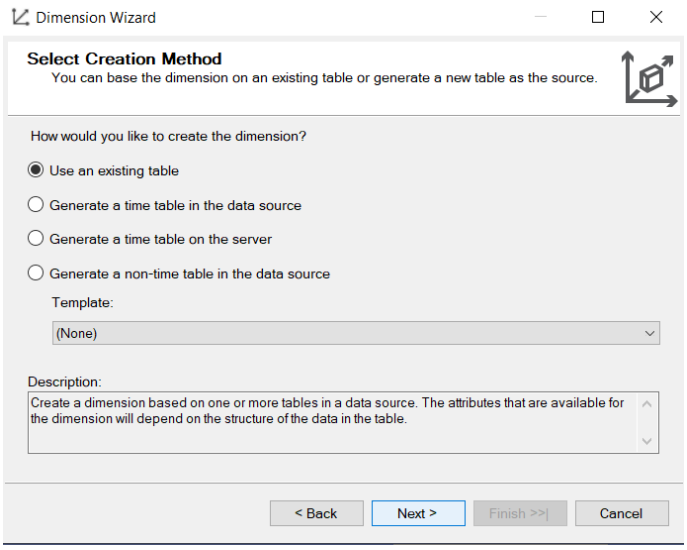


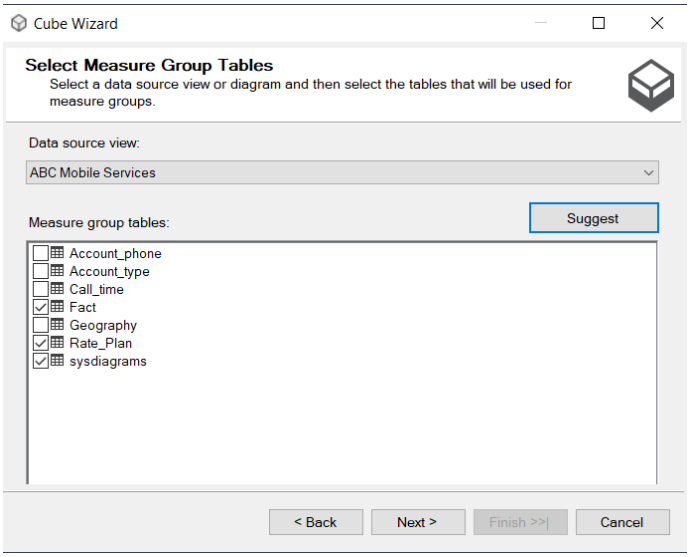


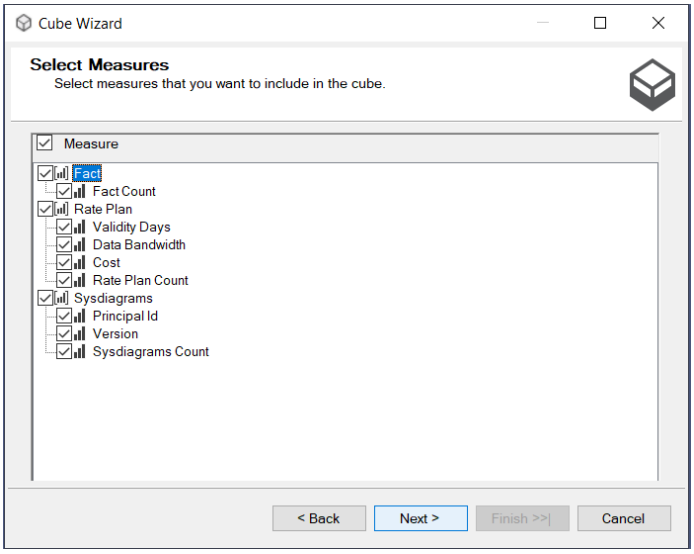
Notice ABC Mobile Services added to the Data Sources and Data Source Views in the Solution Explorer

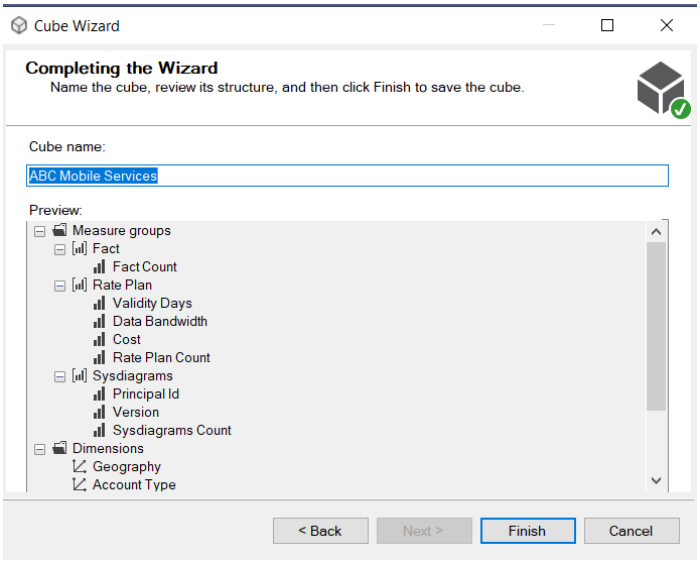


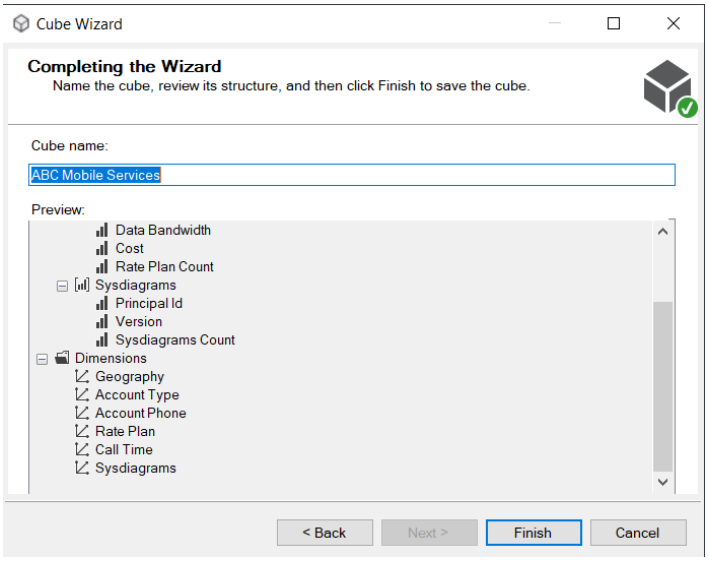
Add the dimensions and making the cube-



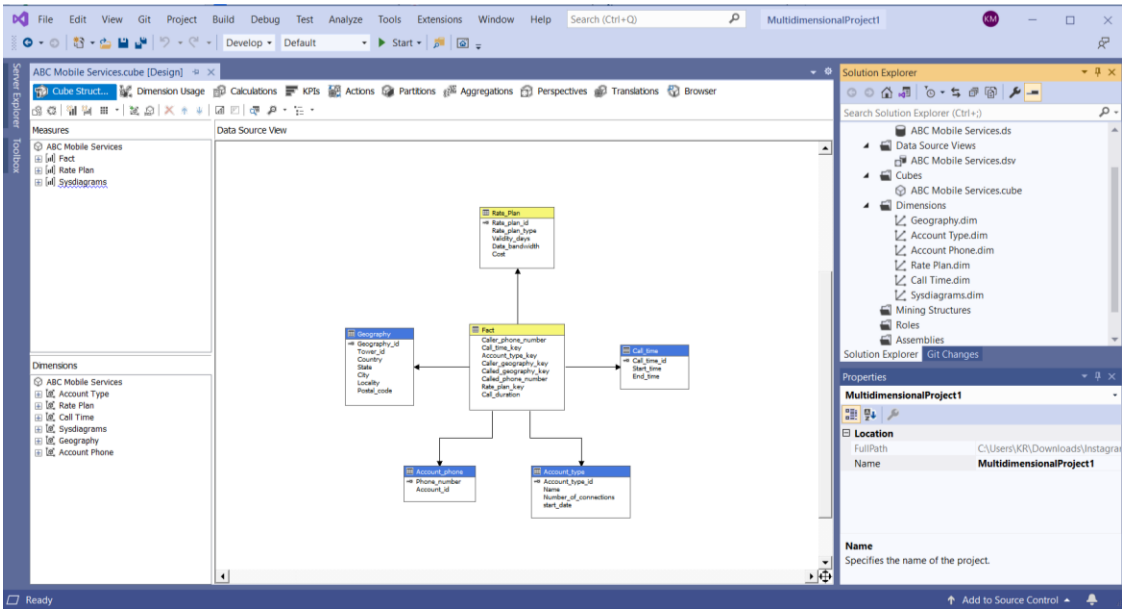

Cube Wizard
Select Measure Group Tables
Select a data source view or diagram and then select the tables that will be used for measure groups.
Data source view:
ABC Mobile Services
Measure group tables:
Suggest
Account_phone
Account_type
Call_time
Fact
Geography
Rate_Plan
sysdiagrams
< Back
Next >
Finish >>|
Cancel


Cube Wizard
Select Measures
Select measures that you want to include in the cube.
Measure
Fact
Fact Count
Rate Plan
Validity Days
Data Bandwidth
Cost
Rate Plan Count
Sysdiagrams
Principal Id
Version
Sysdiagrams Count
< Back
Next >
Finish >>|
Cancel

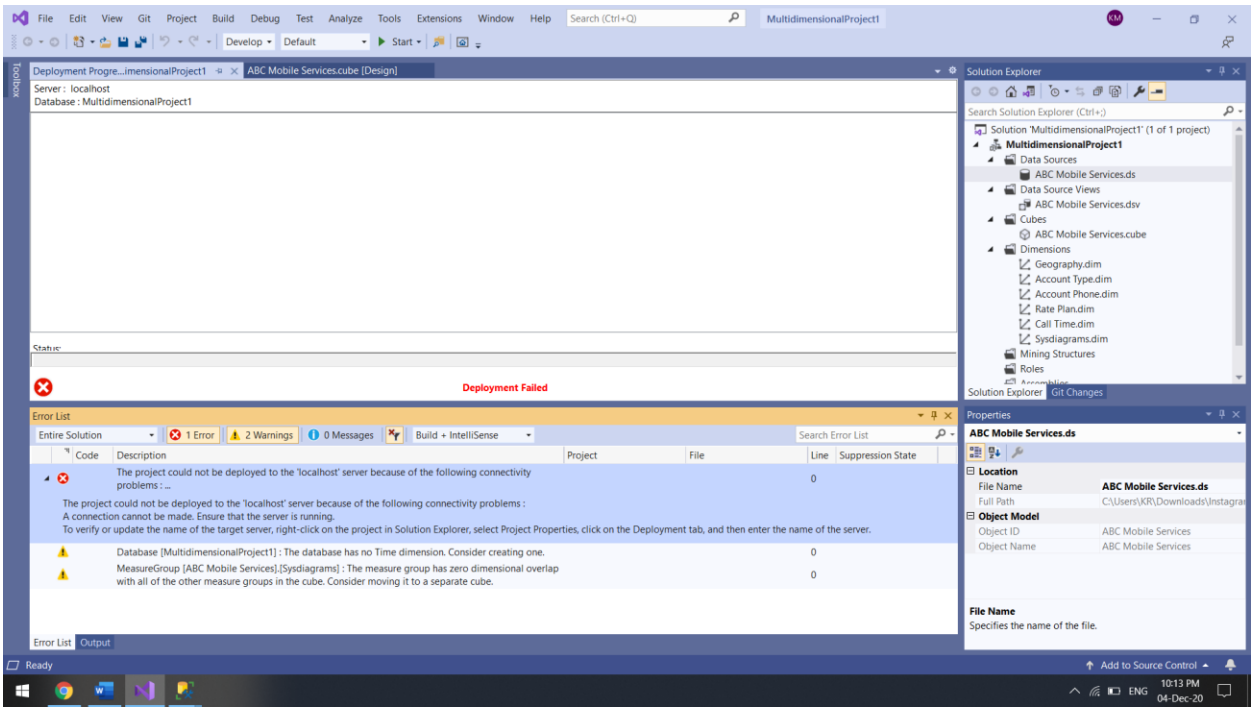

Cube Wizard
Completing the Wizard
Name the cube, review its structure, and then click Finish to save the cube.
Cube name:
ABC Mobile Services
Preview:
Measure groups
Fact
Fact Count
Rate Plan
Validity Days
Data Bandwidth
Cost
Rate Plan Count
Sysdiagrams
Principal Id
Version
Sysdiagrams Count
Dimensions
Geography
Account Type
< Back
Next >
Finish
Cancel



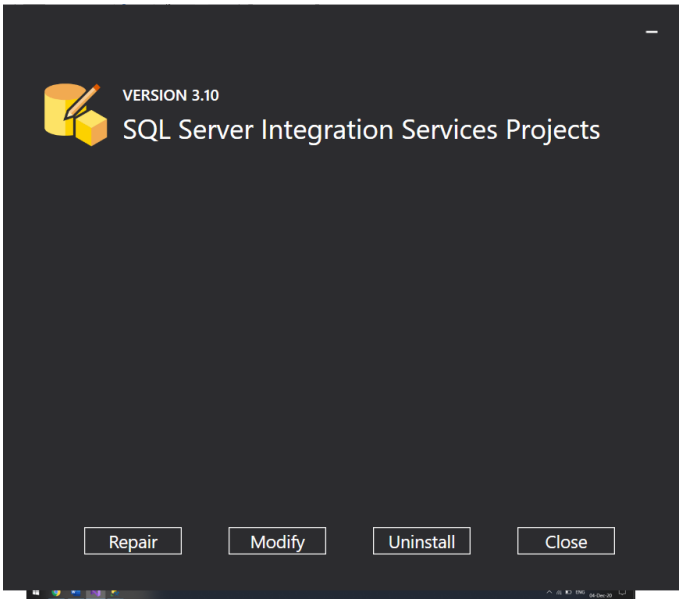
And after building the model, we get this data source view-



Deploying the model gave me some errors-



I tried to install SQL Server Analysis Services with SQL Server Data Tools (following this link), but I got an error in doing that despite trying several times. I clicked on Repair several times but it gave me errors.

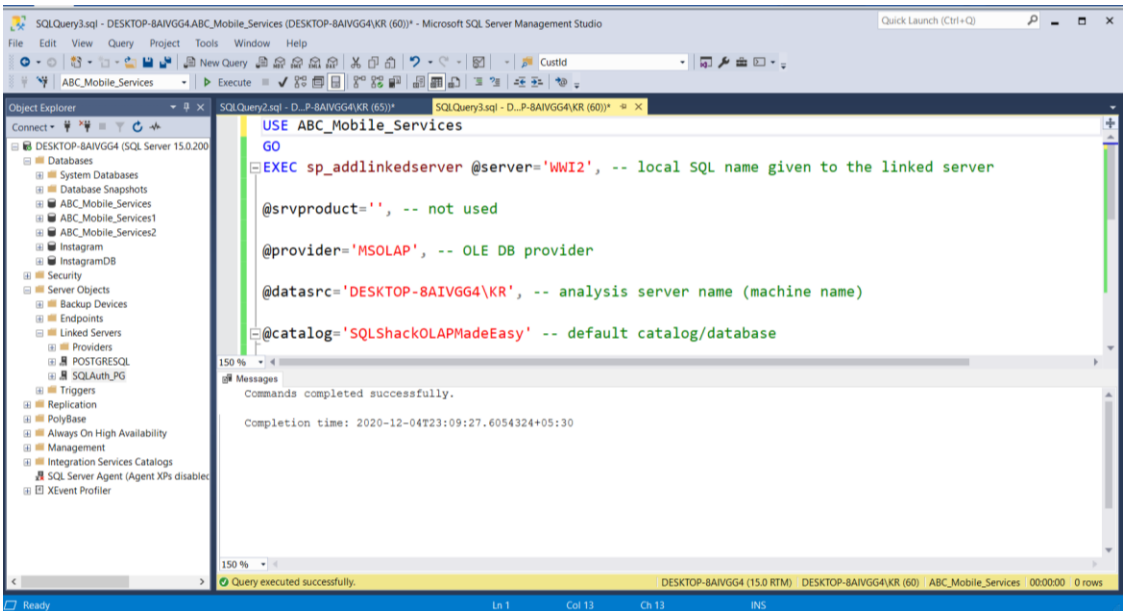


As an alternative, I tried to make a linked server like demonstrated in this website article and use OPENQUERY. As the website mentions, with a Linked Server configured, the Database Engine can act as a proxy to SSAS by using the T-SQL OPENQUERY function in SQL. The OPENQUERY function takes as arguments the Linked Server name and an MDX query (as a string), and returns a table object that can

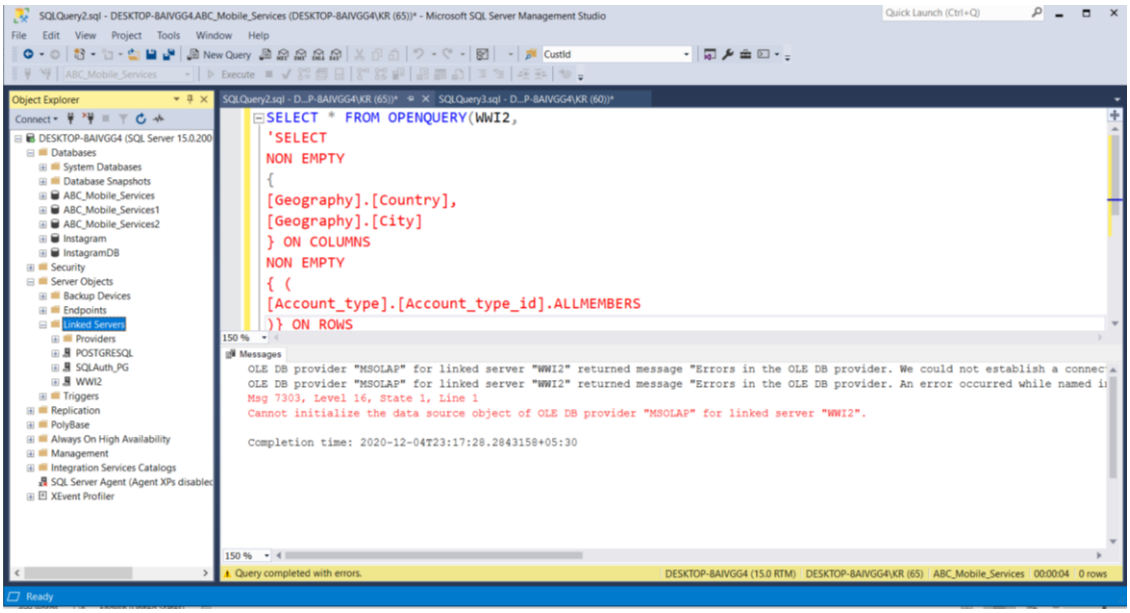
be manipulated in a SQL SELECT statement like a traditional table. Note that the query string is limited to 8000 characters in length.

However, this didn't work for me.

Creating the linked server-



I got the following error message.



To run MDX queries, since a cube has many dimensions, we need to represent certain attributes on columns and certain on rows and then the corresponding measures.

Excel can also be used for analysis.