Data Warehouse
Design & Develop

Masoud Mirzakhani
Senior DW/ ETL/ BI Architect

Microsoft SQL Server 2019
Design & Develop

DataToInsight.ir

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- **Bachelor of Science in Information Technology**

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اجزای محیط توسعه

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- Development Workstation
  - ماشینی که بر روی آن ابزار های توسعه را نصب می کنیم.
  - بعد از اتمام توسعه مدل، بایستی آن را بر روی یک سرور بارگزاری نماییم.
  - این بارگزاری با استفاده از یک زبان DDL ای به نام Tabular Model Scripting Language (TMSL) صورت می گیرد.
- Development Server
  - سروری که SSAS بر روی آن نصب شده است.
  - داده پس از Process به این سرور انتقال داده می شود.
- Workspace Database
  - یک دیتابیس موقت است که هنگام توسعه مدل ایجاد می شود.
  - این دیتابیس می تواند در دو حالت زیر ایجاد گردد:
    - Integrated workspace: از سرویس SSASداخلی Visual Studio استفاده می کند.
    - Workspace server: از یک سرویس مستقل SSAS که بر روی ماشین نصب شده است بهره می برد.

فرایند نصب SSAS

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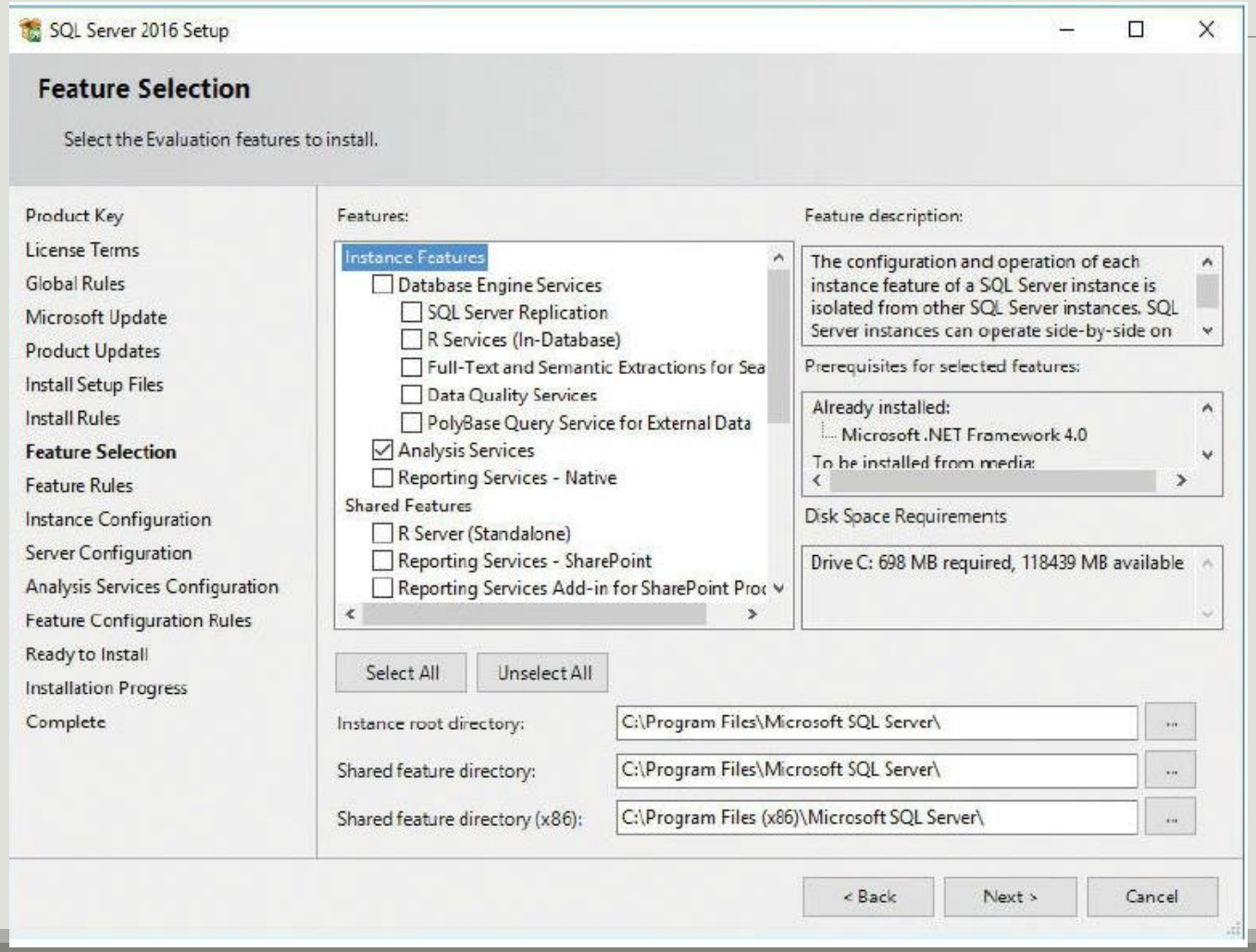


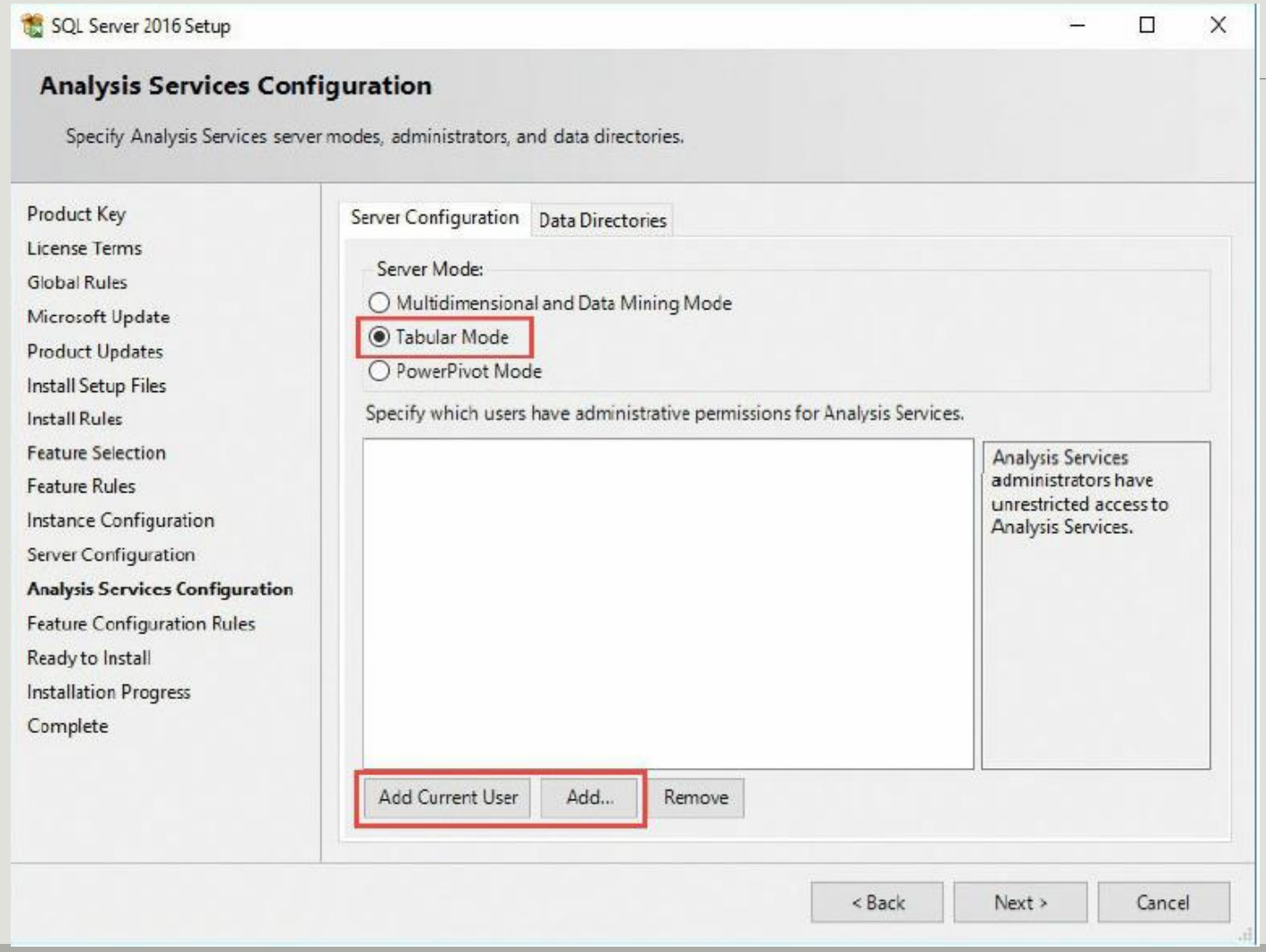
نصب بر روی Development server

https://go.microsoft.com/fwlink/?linkid=866662

فرایند نصب SSAS

DataToInsight.ir

ادامه...



فرایند نصب SSAS

DataToInsight.ir

نصب بر روی Development workstation

- Visual Studio Community Version
  - https://visualstudio.microsoft.com/thank-you-downloading-visual-studio/?sku=Community&rel=16

- Visual Studio “**Microsoft Analysis Services Projects”** Extension
  - https://marketplace.visualstudio.com/items?itemName=ProBITools.MicrosoftAnalysisServicesModelingProjects

Tabular Project

Visual Studio

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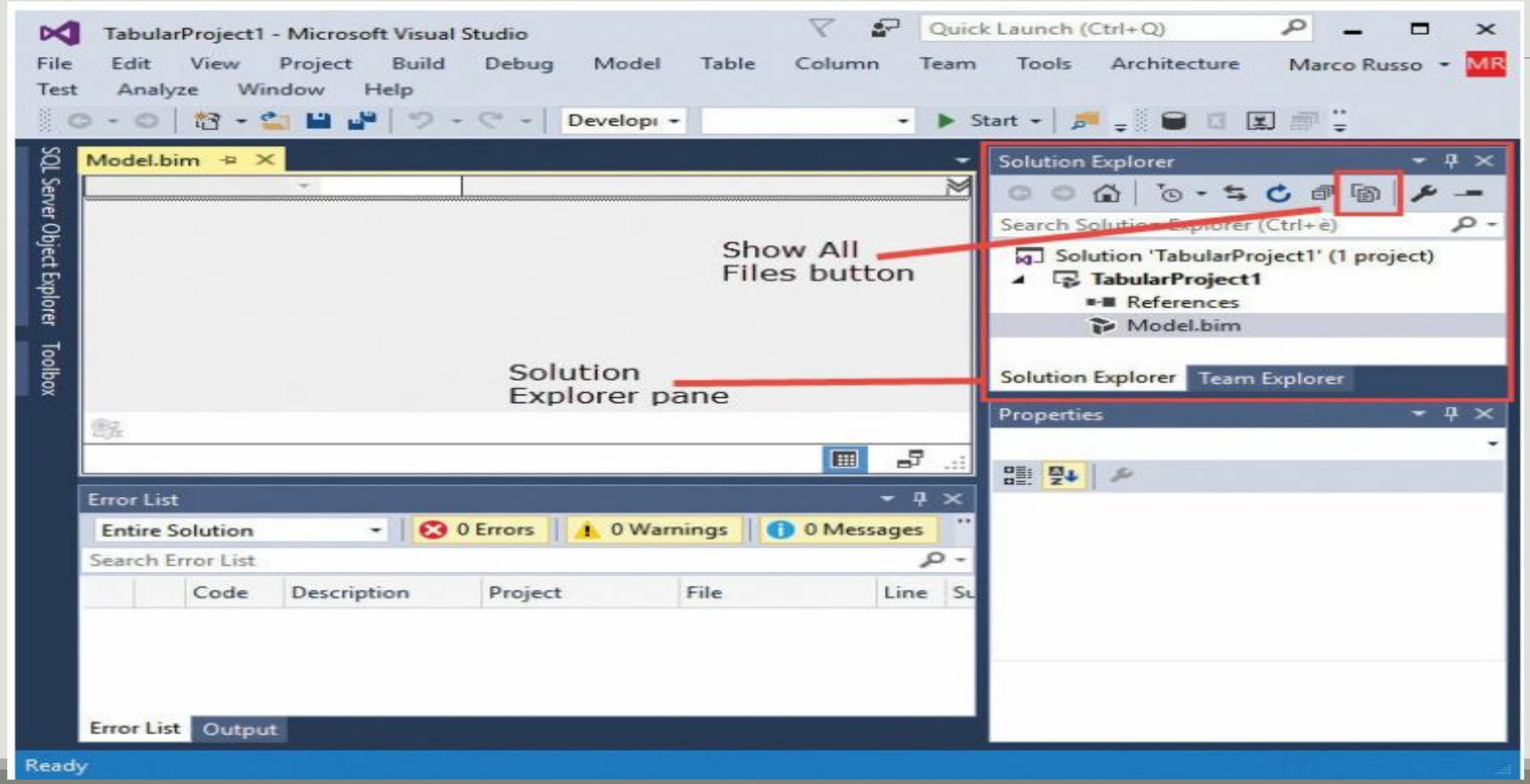

اضافه کردن داده به مدل

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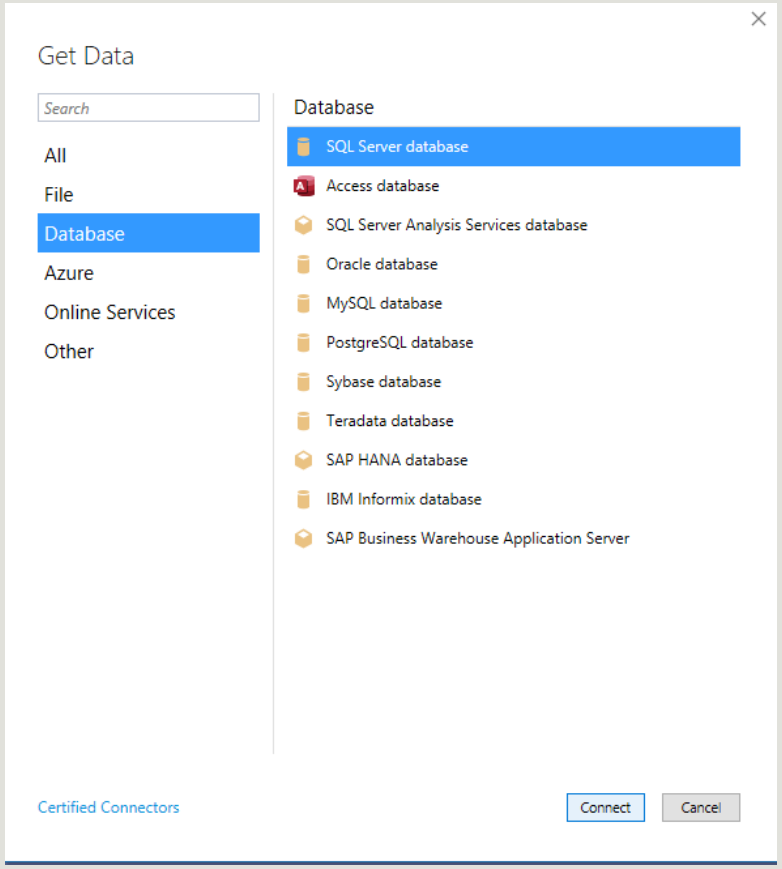
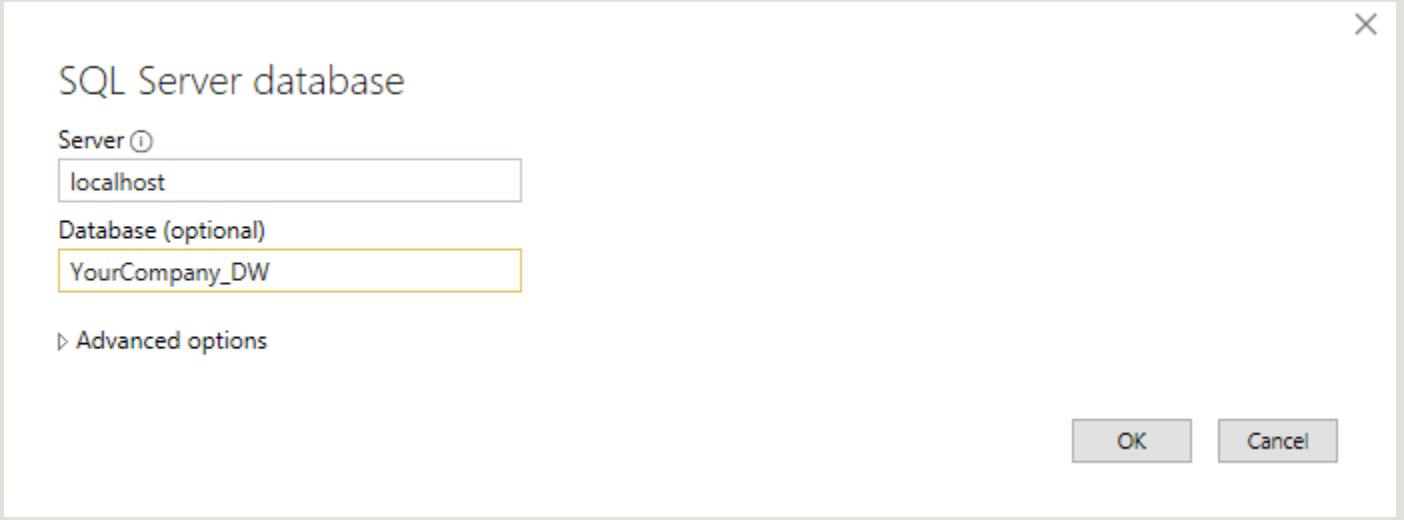
- منابع داده قابل استفاده:
  - Relational databases
  - Multidimensional sources
- Data feeds
  - Open Data Protocol (OData)
  - Reporting Services
- Text files

اضافه کردن داده به مدل

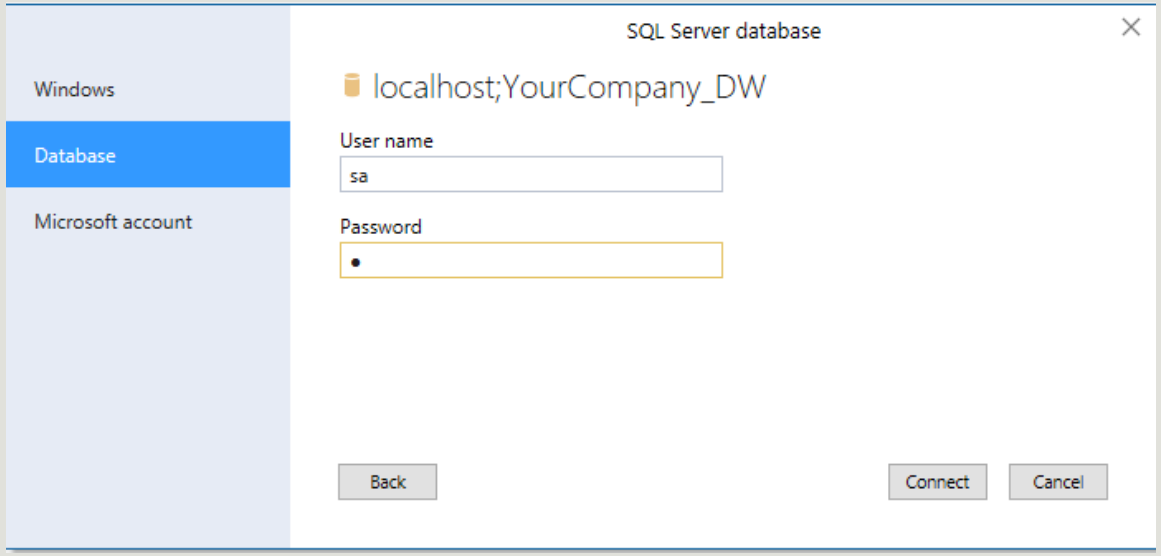
DataToInsight.ir

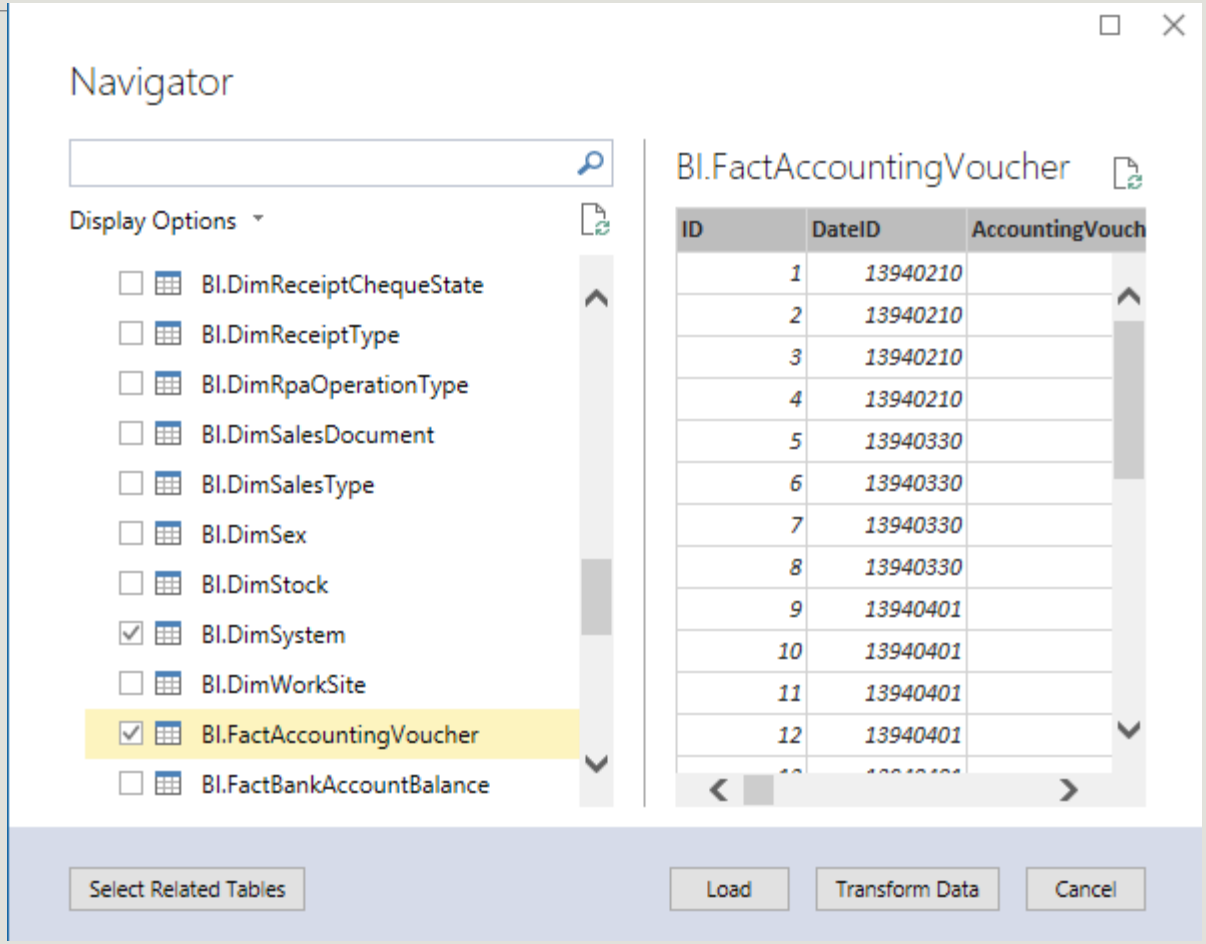




اضافه کردن داده به مدل

DataToInsight.ir





Grid View

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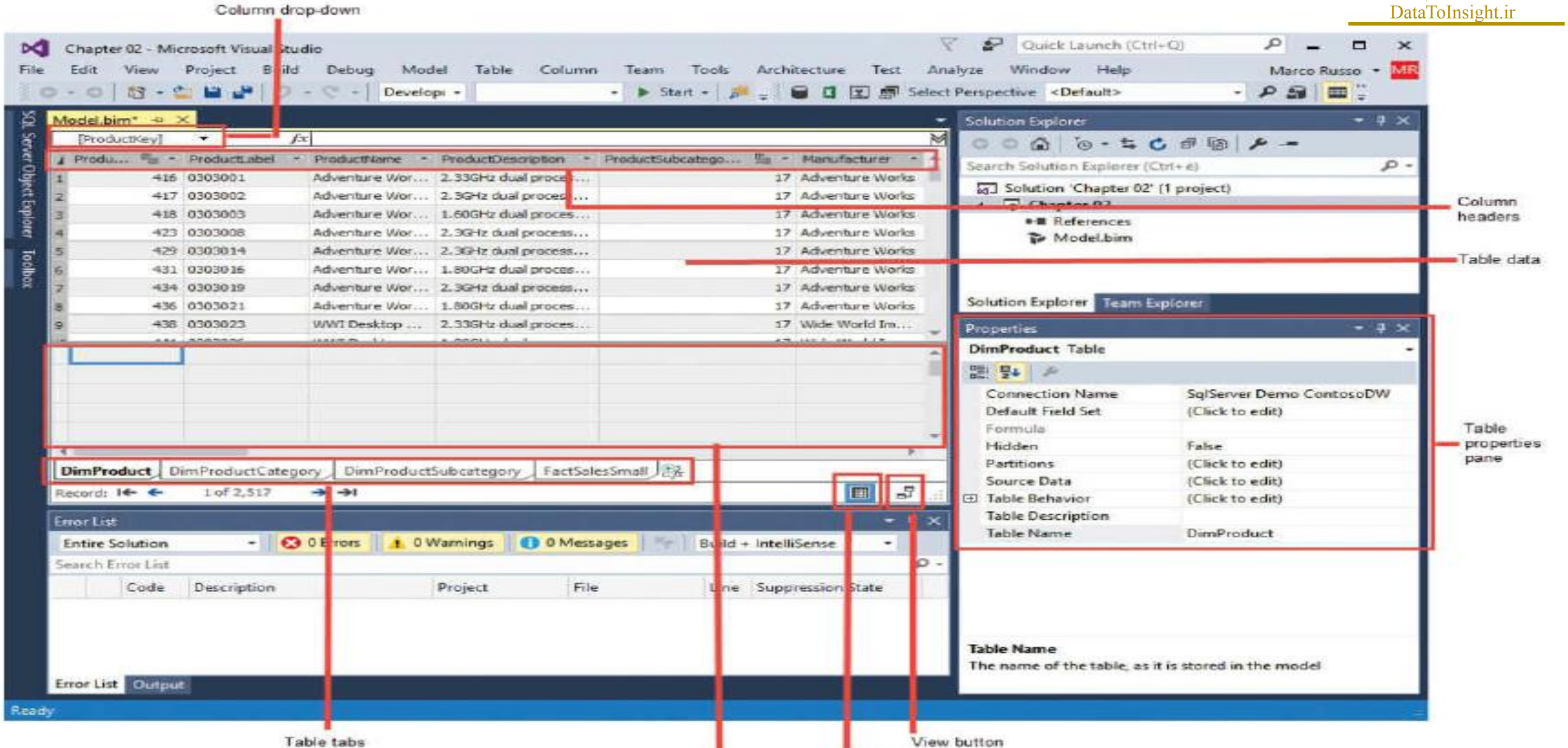
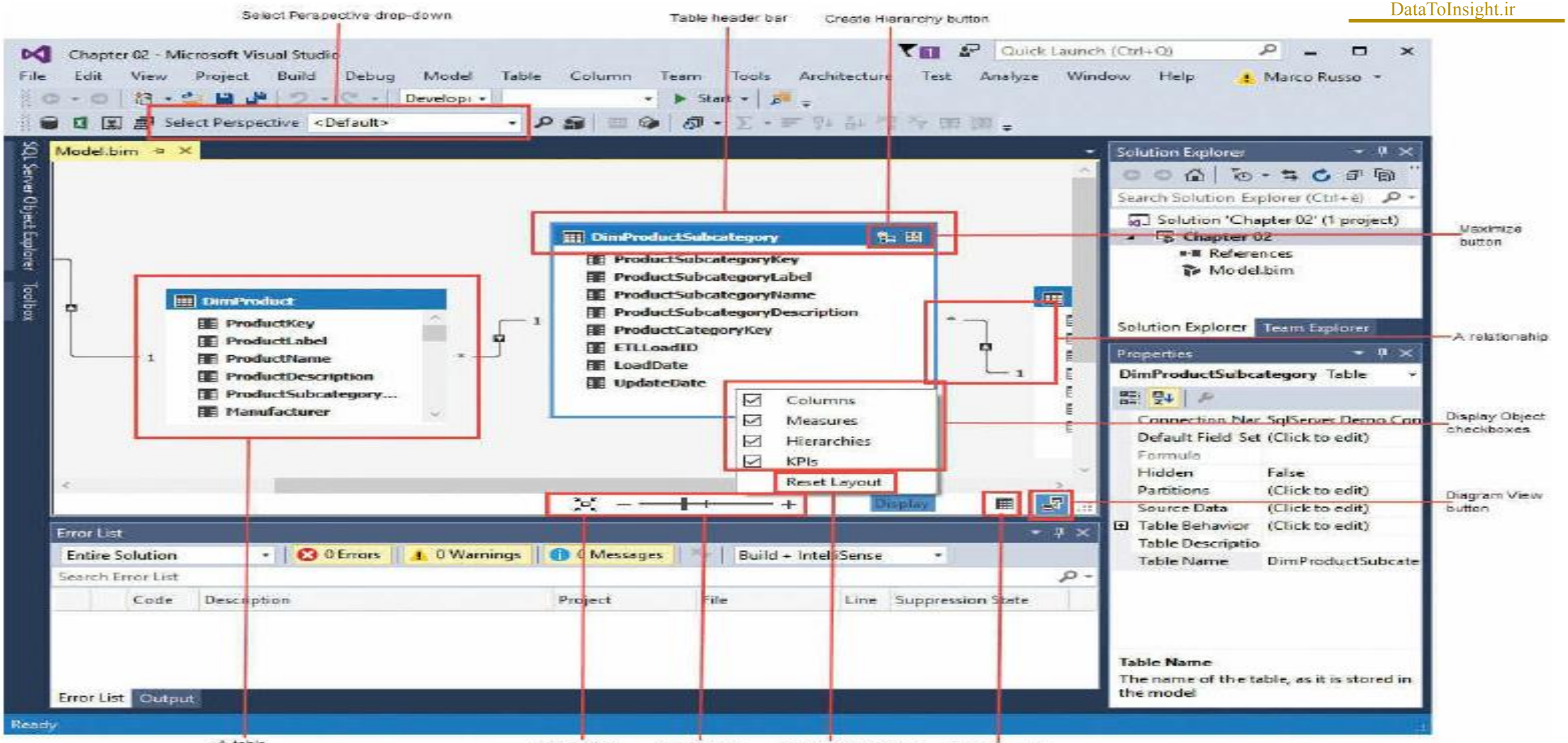


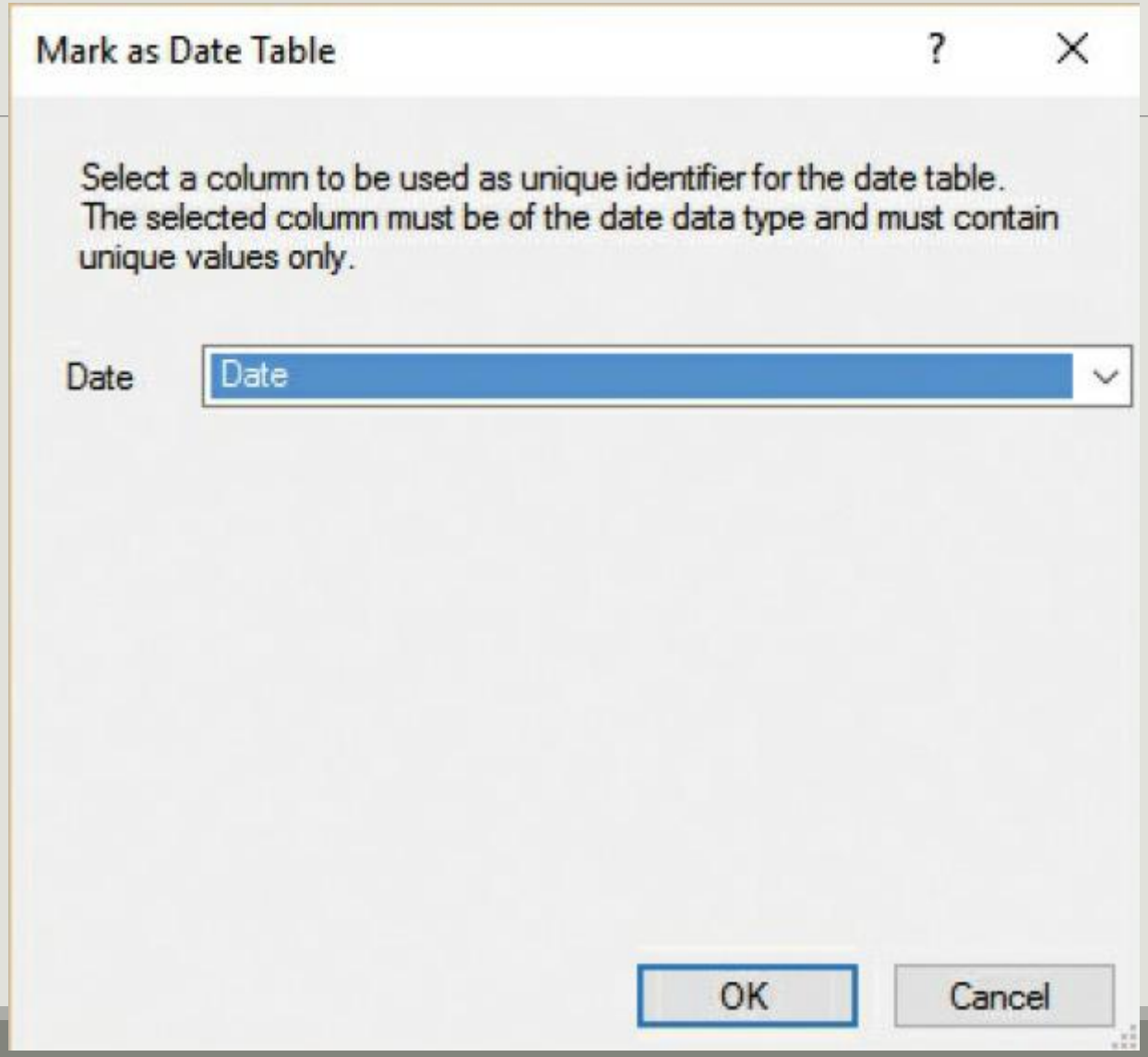
Model View

DataToInsight.ir



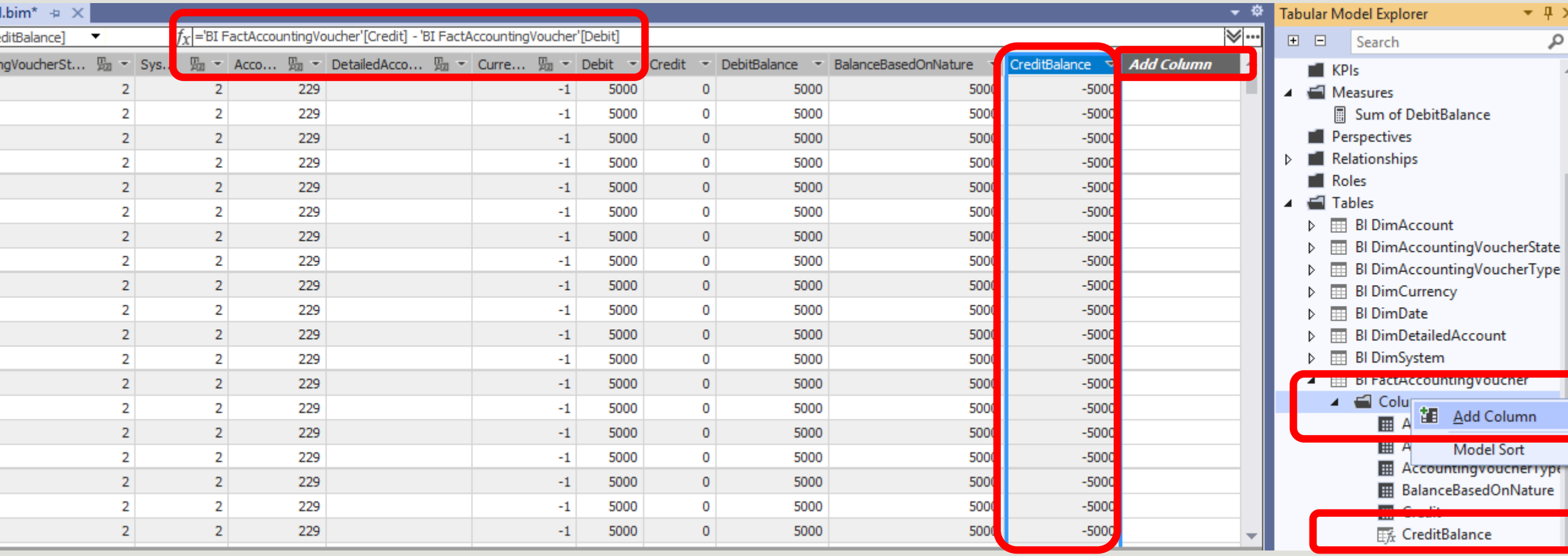
DimDate

DataToInsight.ir



Calculated Column

DataToInsight.ir



Calculated Column

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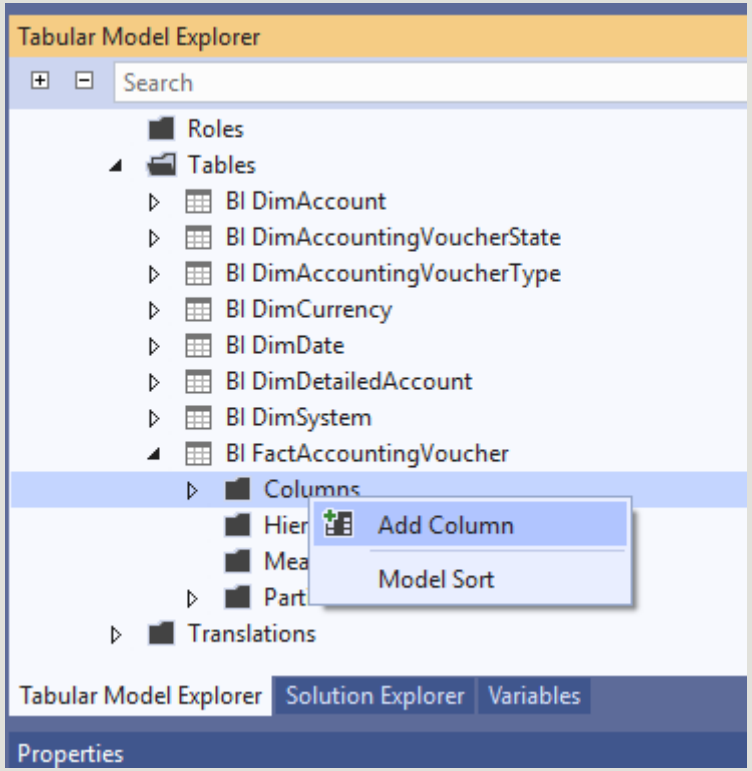
- = 'BI FactAccountingVoucher'[Credit] - 'BI FactAccountingVoucher'[Debit]
- = YEAR('BI DimDate'[GregorianDate])
- = "Y " & YEAR('BI DimDate'[GregorianDate])

روش دوم



Column Properties

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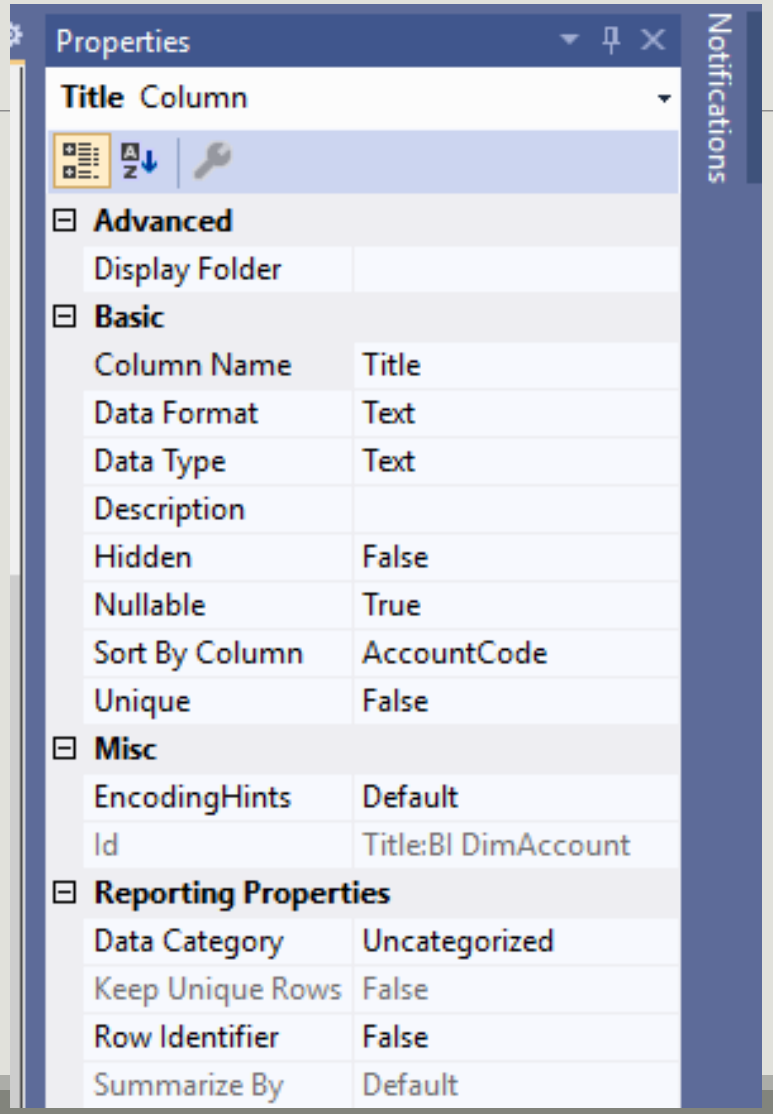
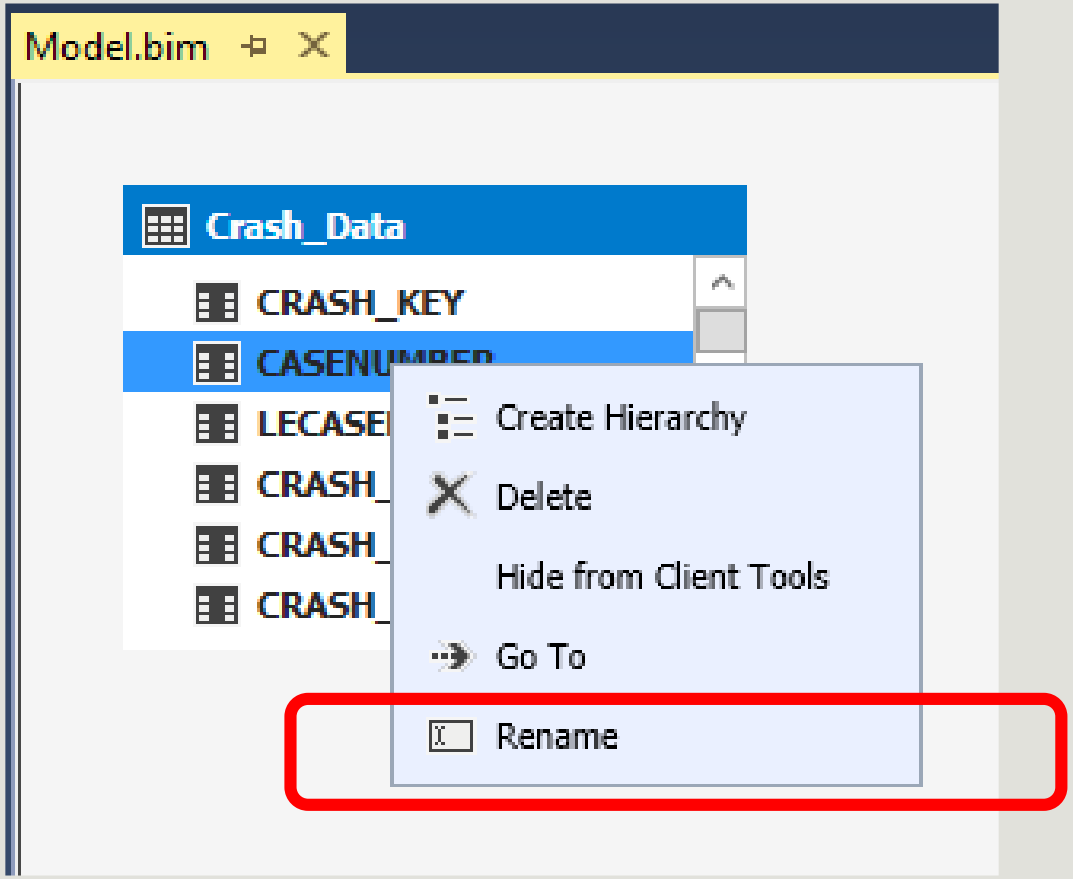
- Hidden
- Sort By Column
- Summarized By
- Display Folder



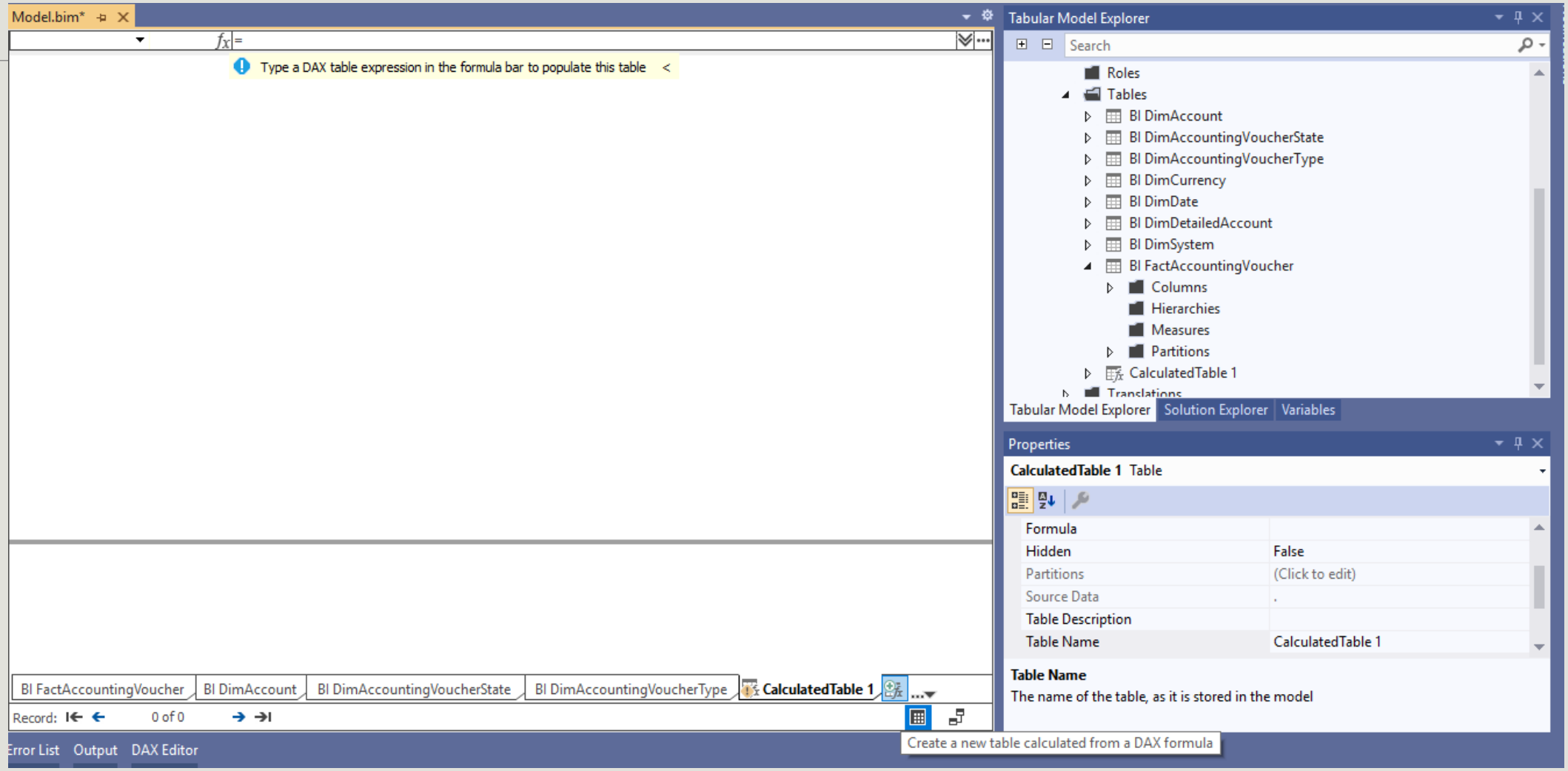
Renaming Column

DataToInsight.ir



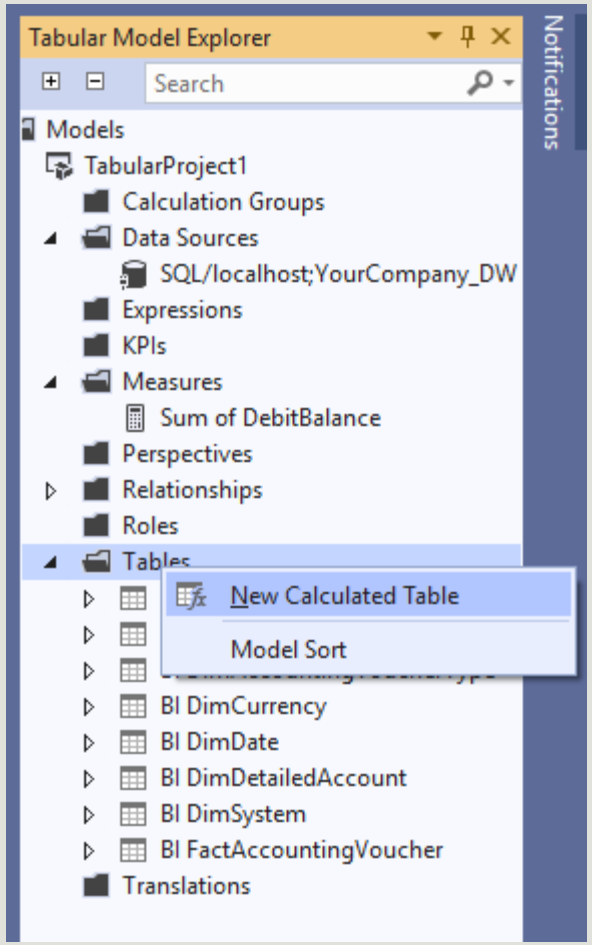
Calculated Table

DataToInsight.ir



Calculated Table

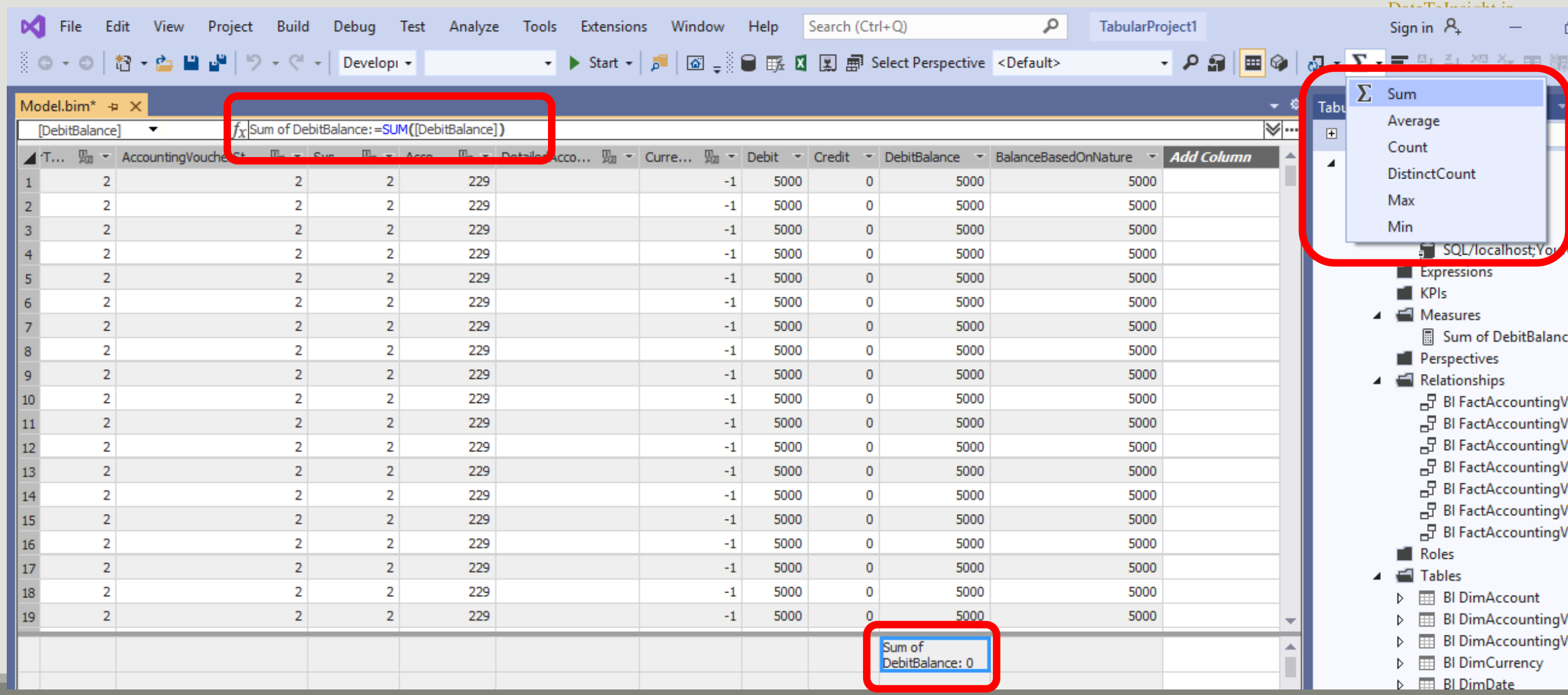
DataToInsight.ir



روش دوم

- =CALENDAR("1/1/2020","1/1/2021")
- =YEAR(DateTable[Date])
- =MONTH(DateTable[Date])
- =FORMAT(DateTable[Date],"MMM")
  - "M": returns month number
  - "MM": returns the 2-digit month number
  - "MMM": returns the first three characters of the month name
  - "MMMM": returns the full length of the month name
- =WEEKDAY(DateTable[Date],1)
- =WEEKDAY(DATEADD(DateTable[Date],1,DAY))
- =FORMAT(WEEKDAY(DateTable[Date]), "DDD")

Measure


File Edit View Project Build Debug Test Analyze Tools Extensions Window Help
Search (Ctrl+Q)
TabularProject1
Sign in
Start
Select Perspective
<Default>
Model.bim*
[DebitBalance]
Sum of DebitBalance:=SUM([DebitBalance])
Add Column
Sum
Average
Count
DistinctCount
Max
Min
Expressions
KPIs
Measures
Sum of DebitBalanc
Perspectives
Relationships
Roles
Tables
BI DimAccount
BI DimCurrency
BI DimDate
Sum of DebitBalance: 0

Measure

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- Sum_debit_balance:= SUM('BI FactAccountingVoucher'[DebitBalance])
- count_records:= COUNT('BI FactAccountingVoucher'[ID])

- SSAS column summarized by options:
  - Sum
  - Average
  - Count
  - DistinctCount
  - Max
  - Min

Key Performance Indicator

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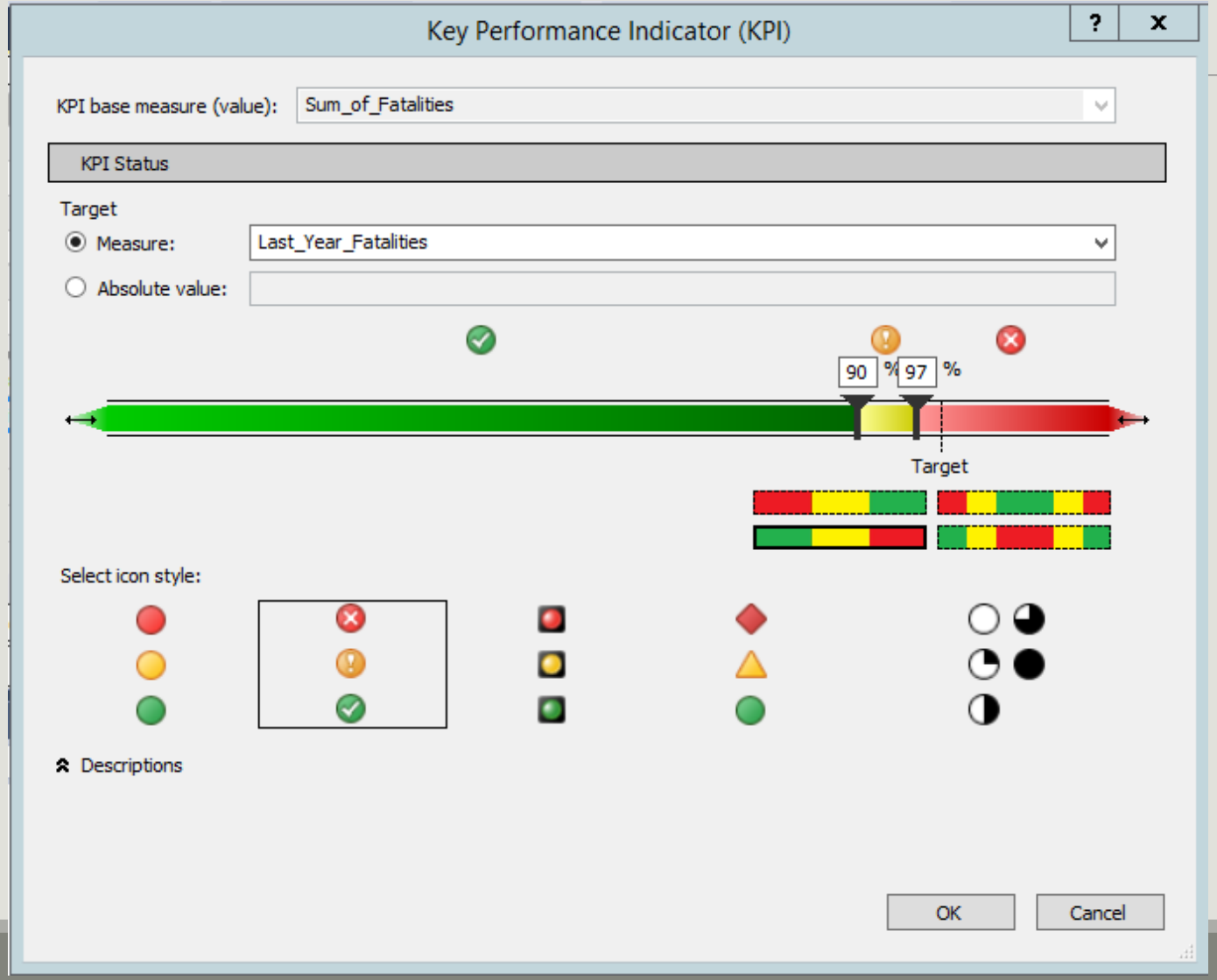


KPIها، مقادیری برای سنجیدن اهداف کسب و کار هستند

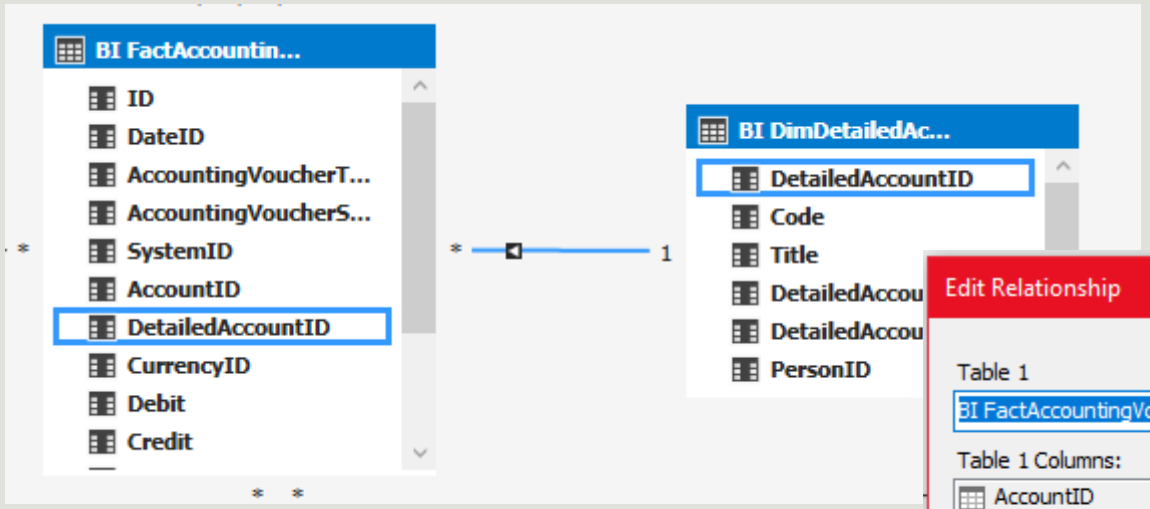
از آن ها می توانیم برای مانیتور کردن عملکرد واقعی سازمان در مقابل اهداف برنامه ریزی شده یا بوجه های پیش بینی شده استفاده کرد.

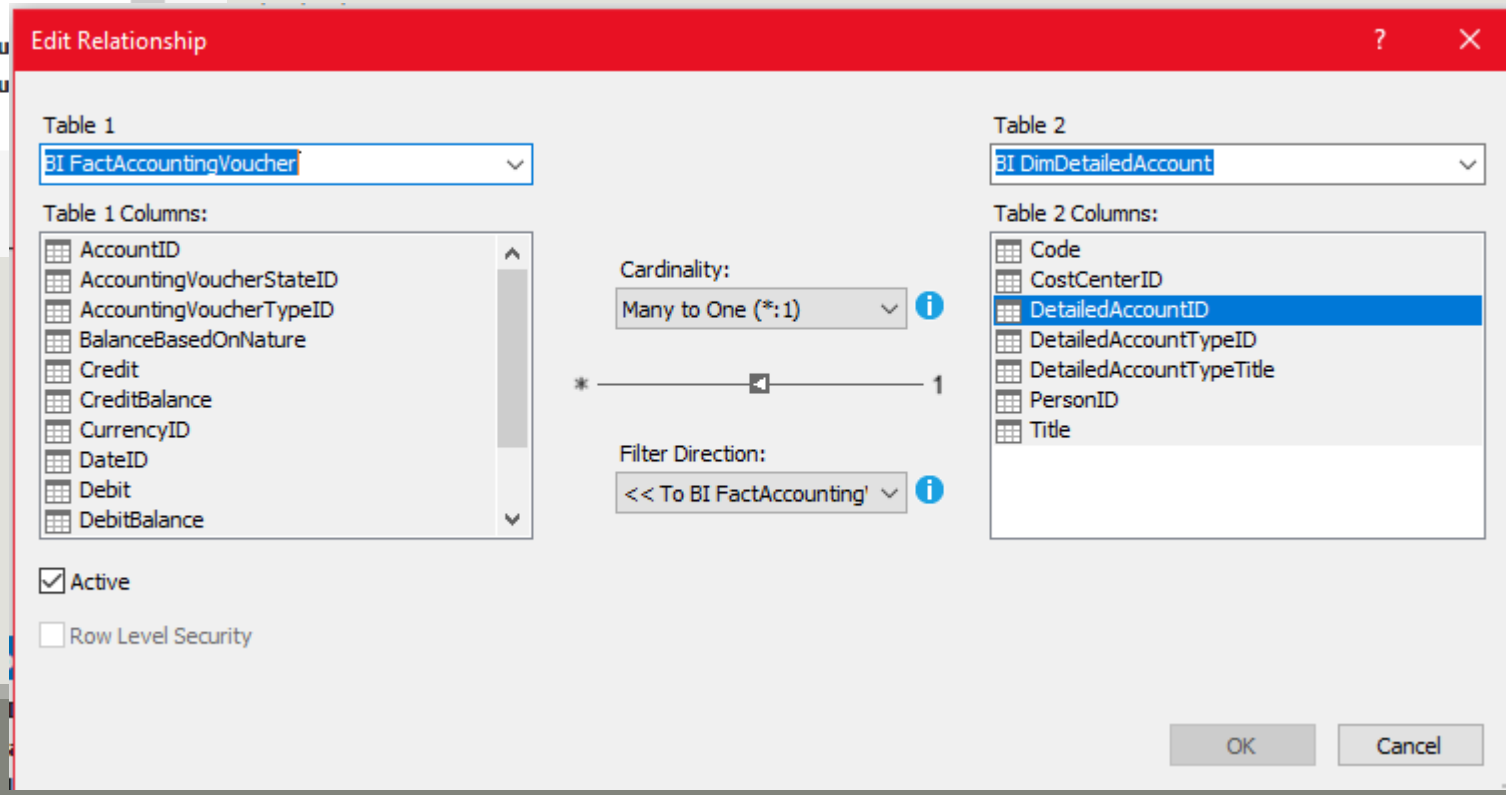
ویژگی های KPI:

- **Value**
- **Goal**
- **Status**

Relations

DataToInsight.ir





Relations

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Cardinality
- Many to One (*:1)
- One to Many (1:*)
- One to One (1:1)

Filter Direction
- single direction
- Bidirectional

Active

Relations

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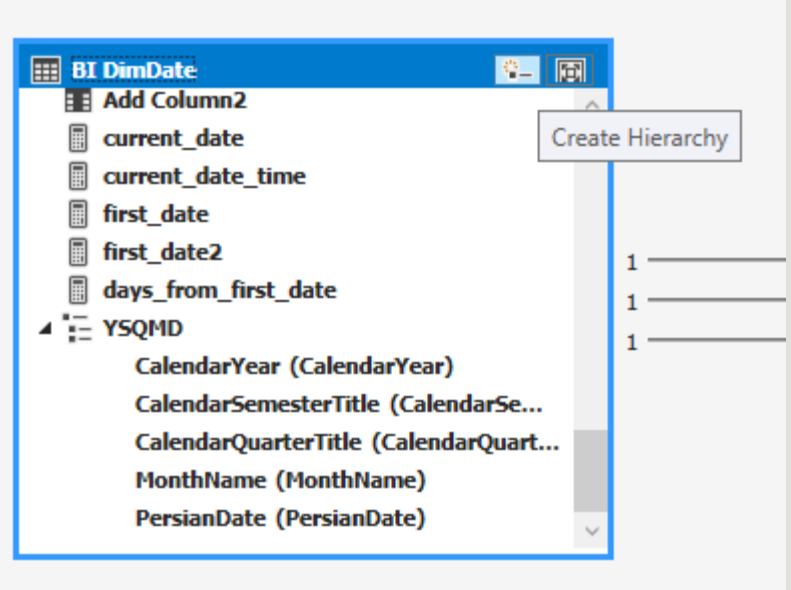
- ایجاد روابط
  - به صورت دستی
  - به صورت اتوماتیک

Relations

DataToInsight.ir

- **پیاده سازی Role Playing Dimension**

Hierarchy



You can think of them as predefined pathways through your data that help your users explore down from one level of granularity to another in a meaningful way.

You should build hierarchies when one-to-many relationships exist between the columns in a single table because this usually indicates the existence of an underlying pattern in the data itself.

when certain columns are frequently grouped together in reports. For example, a retailer might want to drill down from Product Category to Brand to Style to Color to Product, even if there is a many-to-many relationship among Brand, Style, and Color.

Translations

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https://www.sqlbi.com/tools/ssas-tabular-translator/

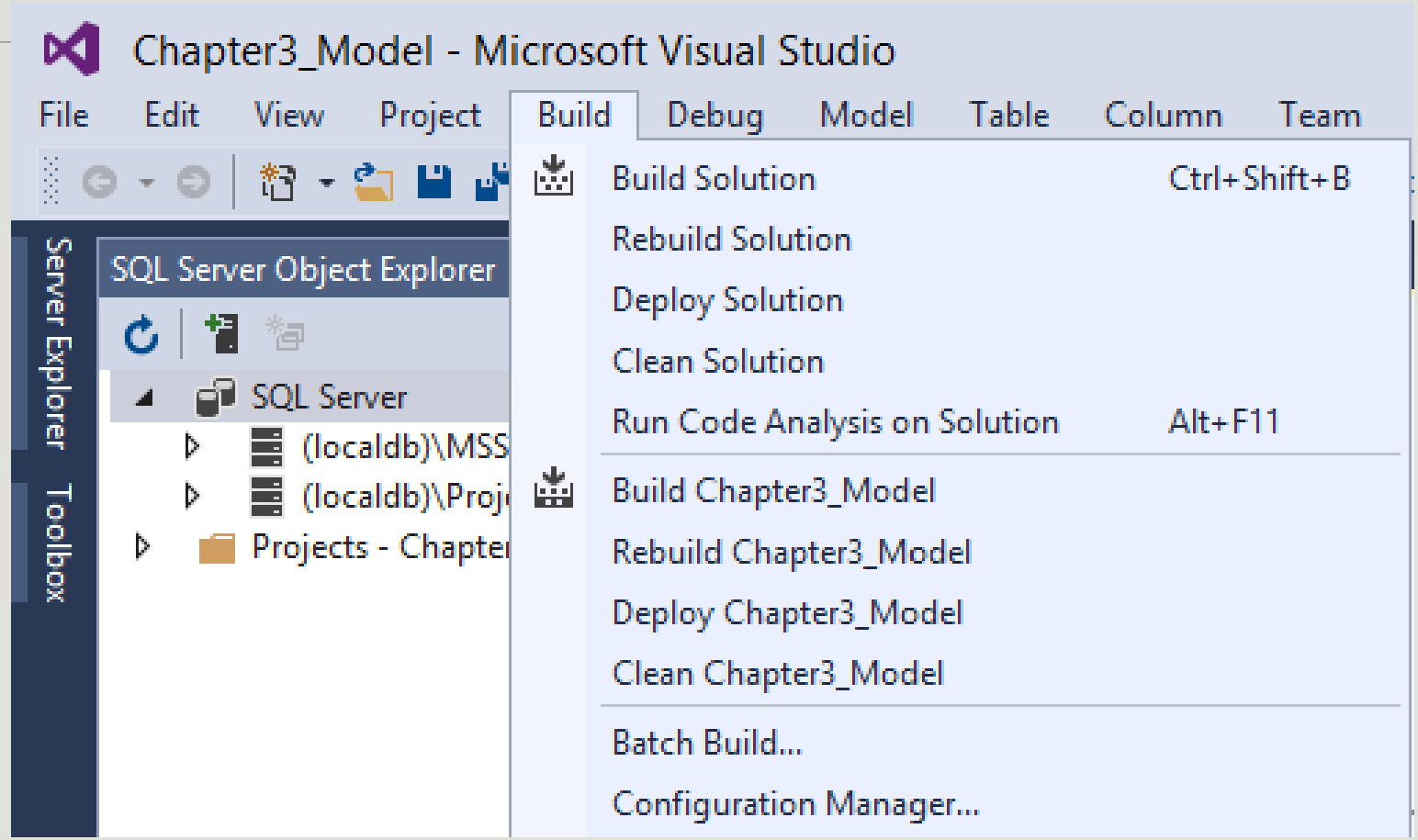
Deploy

DataToInsight.ir

Deployment of your model is the final step to getting the data accessible to your users for

reporting. You have designed and built your model in Visual Studio. In order for others to

see and use it, you need to push the design and data to the Analysis Services server.



Deploy

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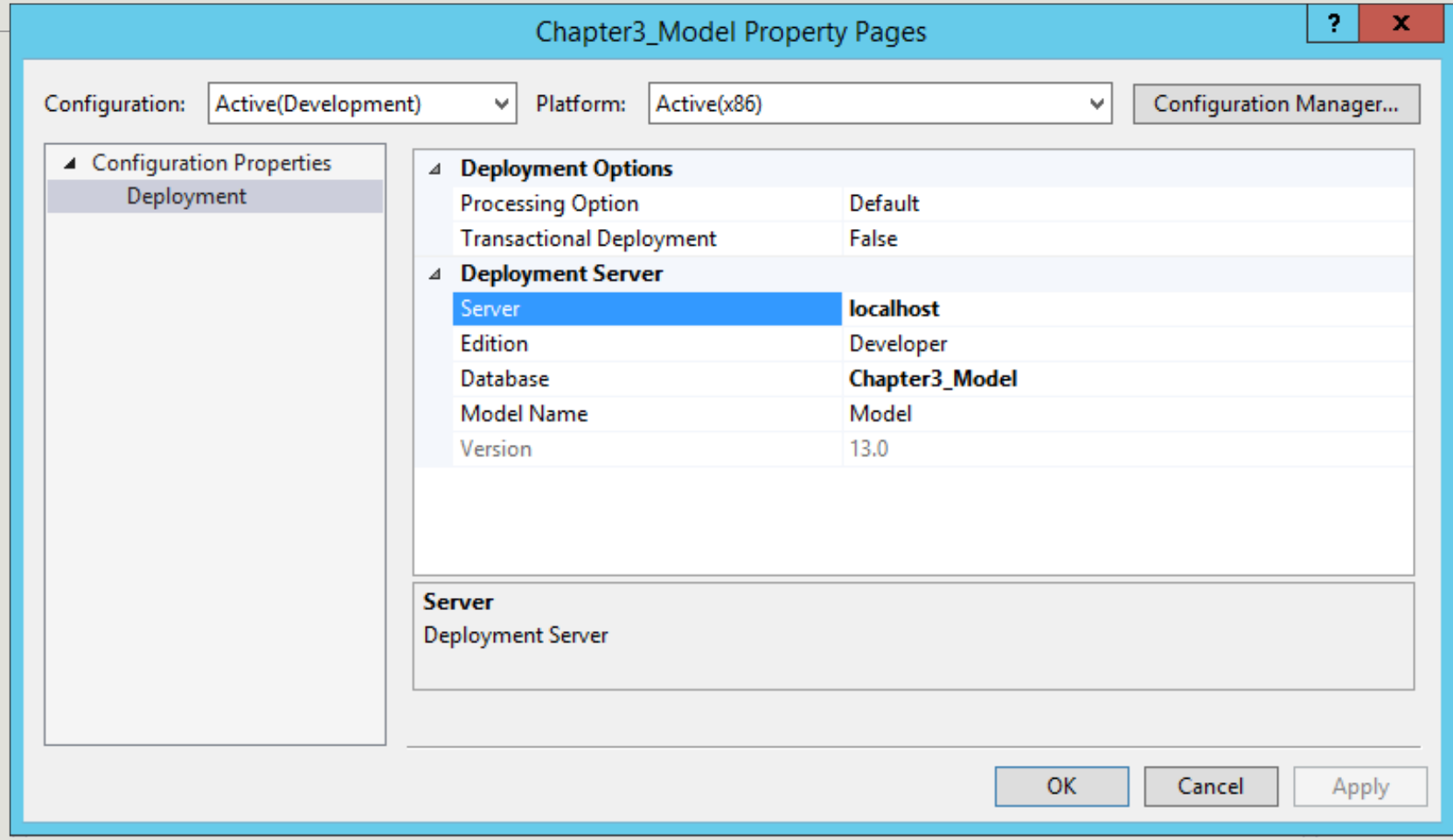

Browsing Your Data

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- SQL Server Management Studio
- Microsoft Excel
- Microsoft Power BI Desktop

Perspectives

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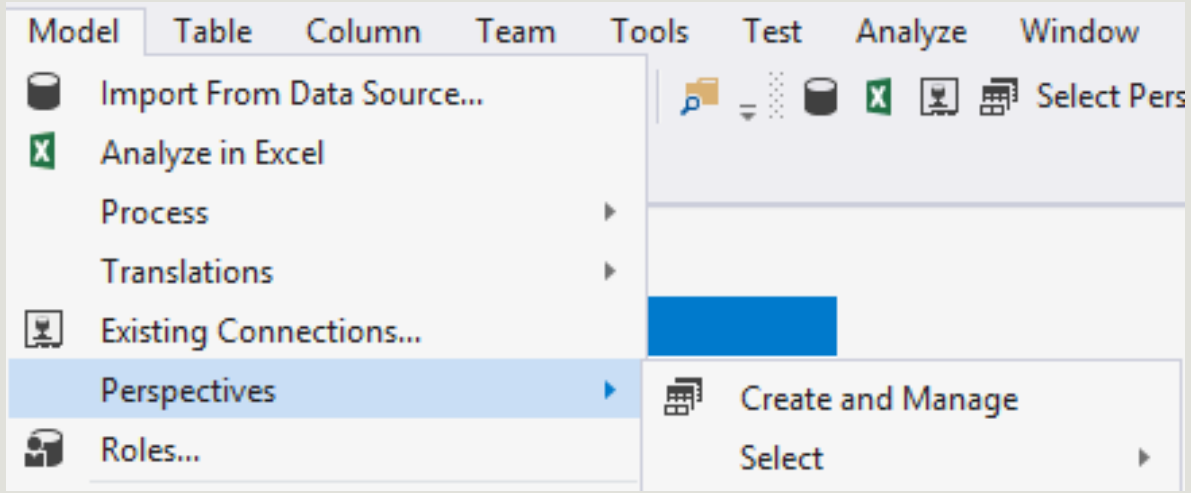
Perspectives enable you to create views of the

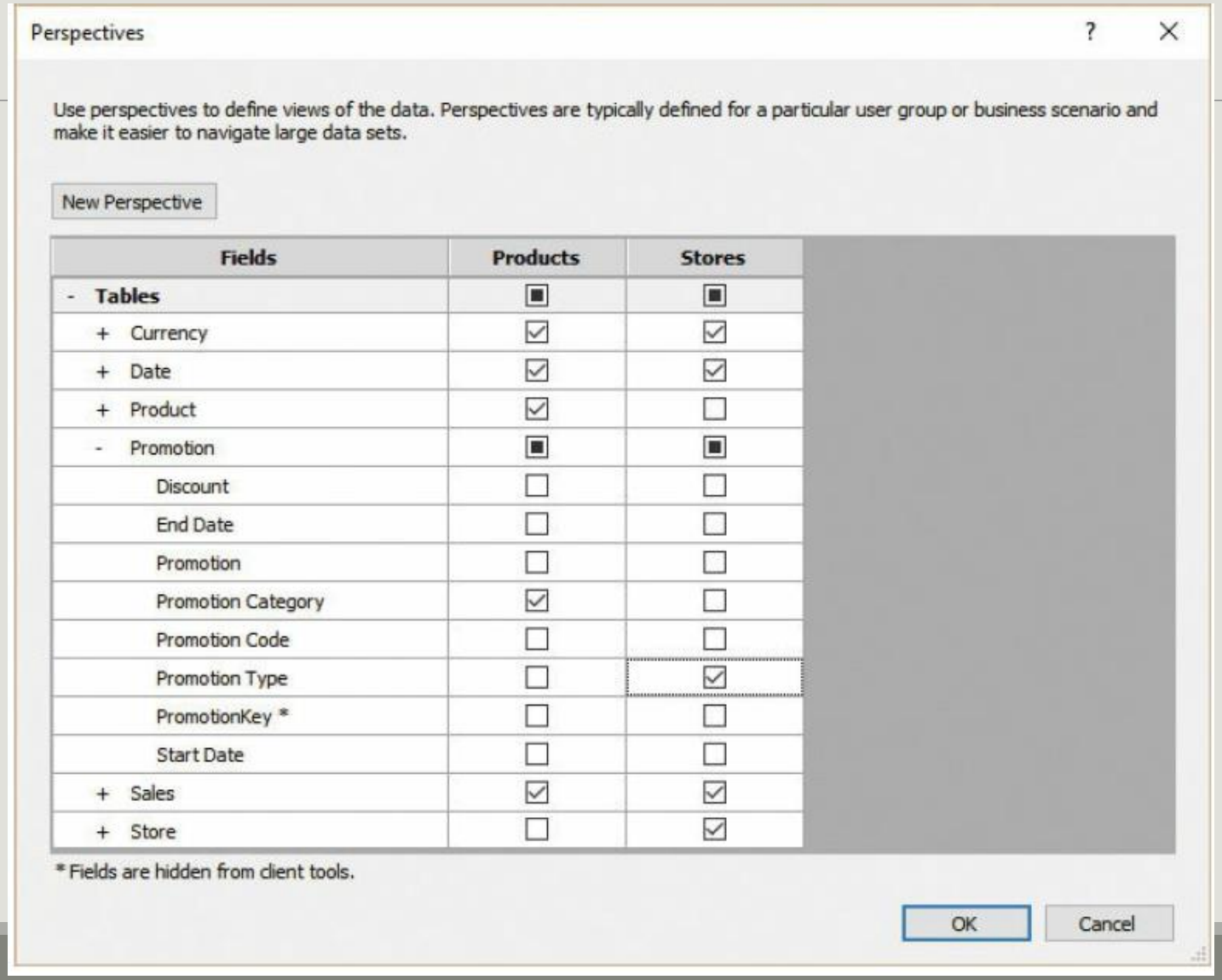
model that are limited in size based on your requirements. Using our example, you could

create a perspective that limits the data to being greater than 2010 and weather accidents

that occurred under rain and severe winds.



Perspectives



DataToInsight.ir

Partitions

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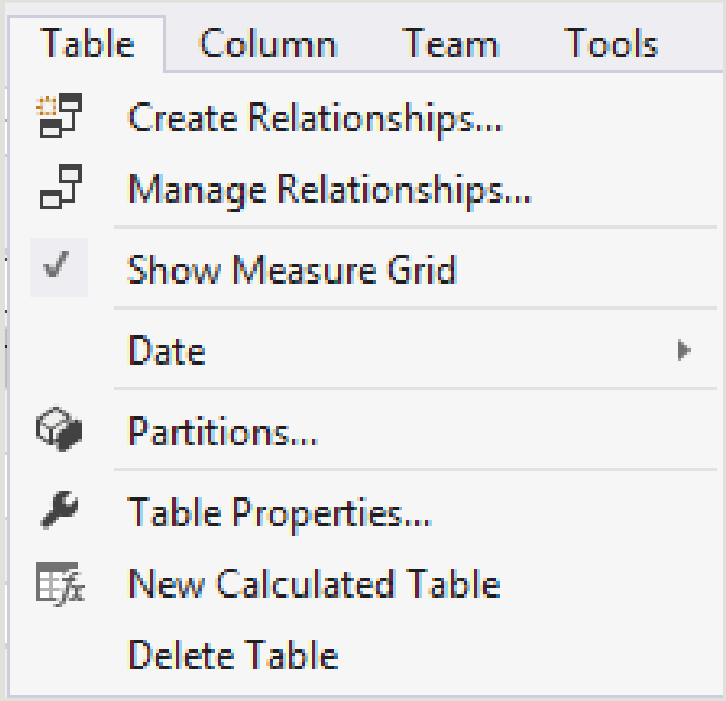
Partitions in Analysis Services enable you to break up your data into manageable parts.

Typically, you use them when you want to limit the amount of data you need to process in

the model when the data is updated.

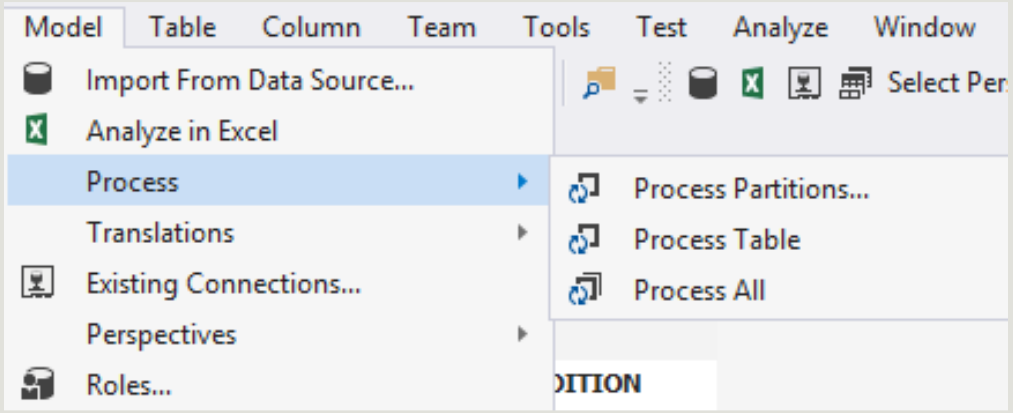


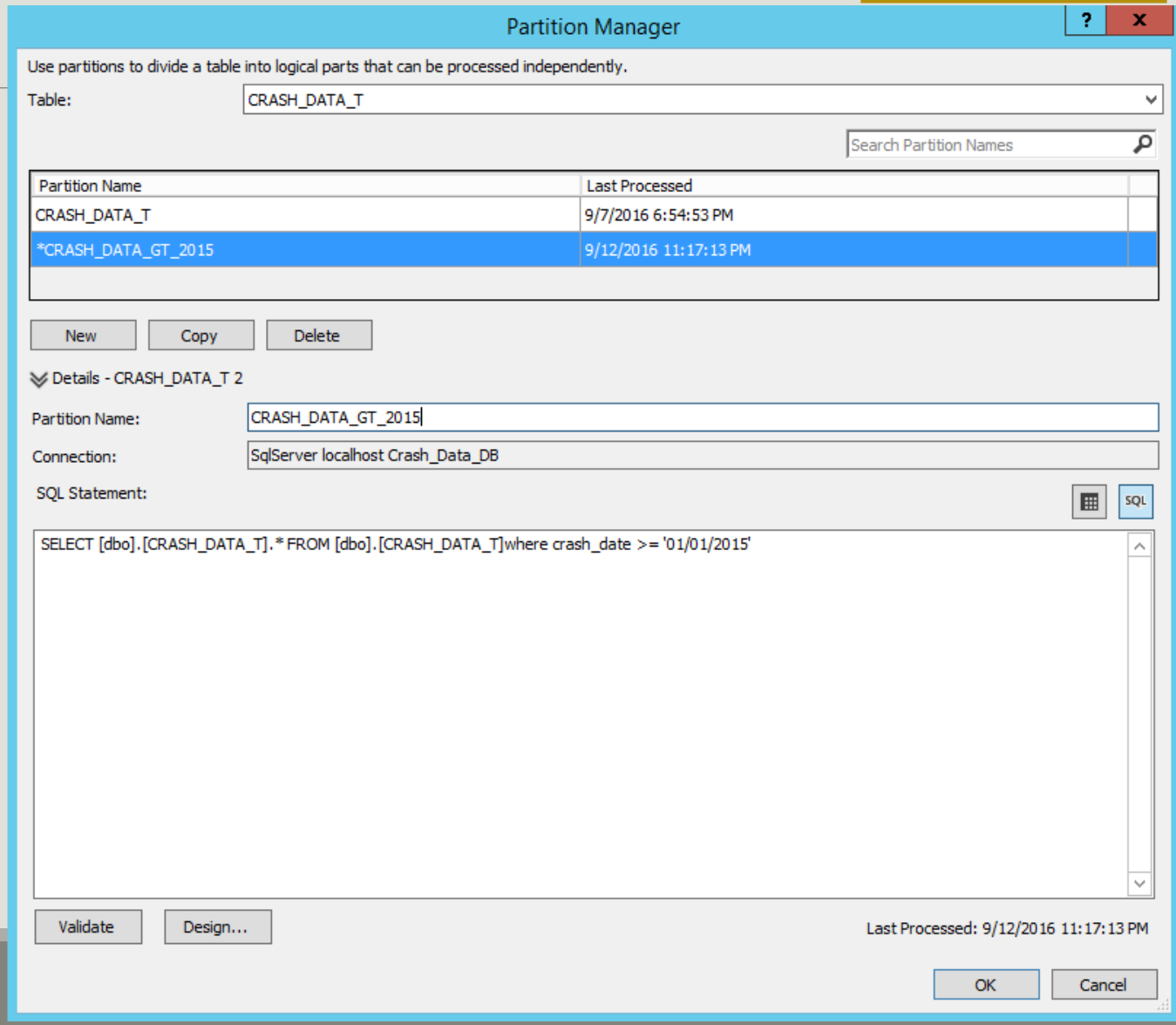
Partitions

DataToInsight.ir

SELECT [dbo].[CRASH_DATA_T].* FROM [dbo].[CRASH_DATA_T]

where crash_date >= '01/01/2012‘





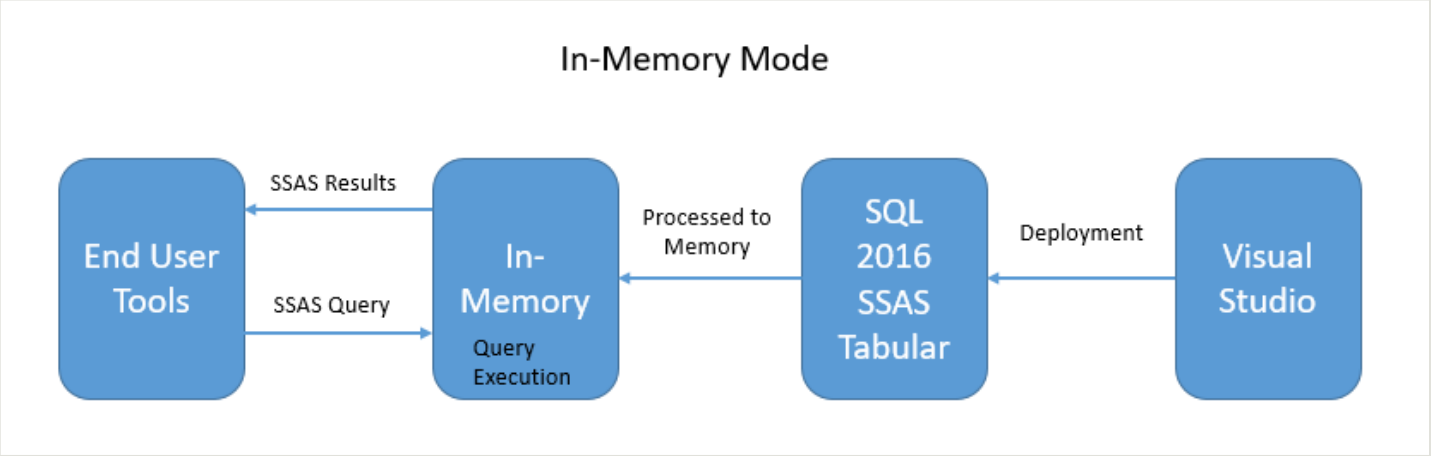
In-Memory Vs. DirectQuery

DataToInsight.ir

In-memory (Default) Queries are answered using the data stored in cache.

First, since all data is cached in-memory, you have to ensure your server has memory, not only for the adequate dataset

Another limitation of in-memory mode is having to keep the data refreshed



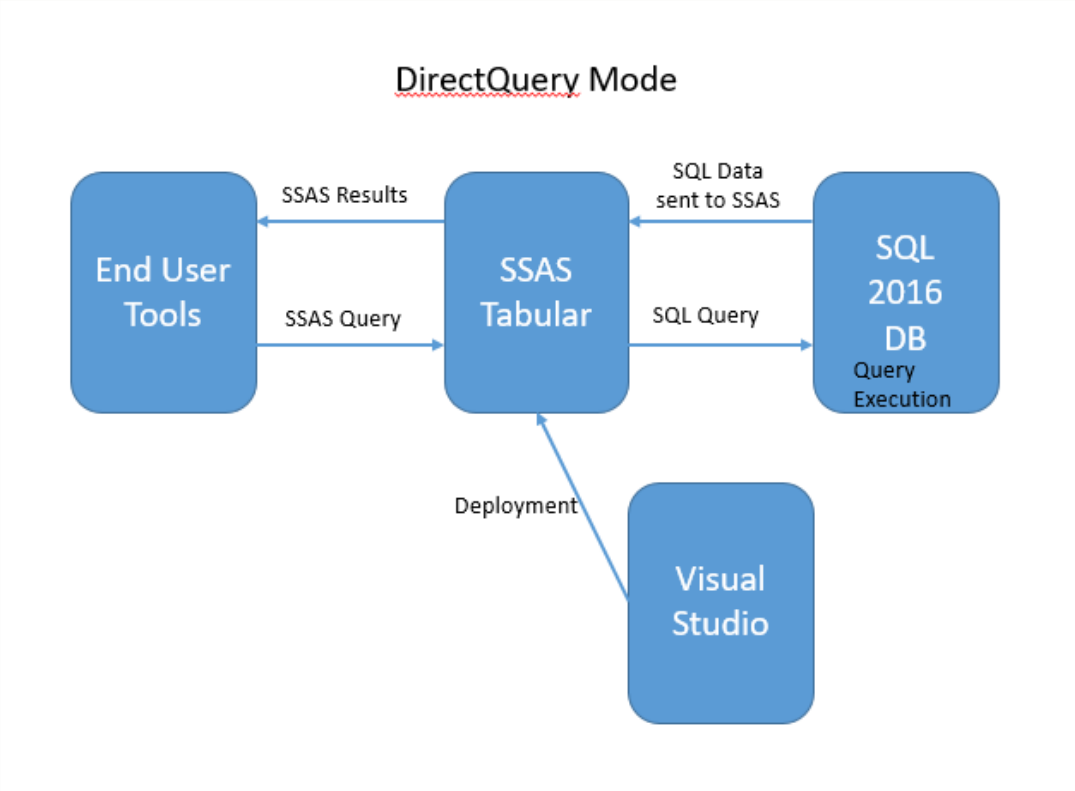
In-Memory Vs. DirectQuery

DataToInsight.ir

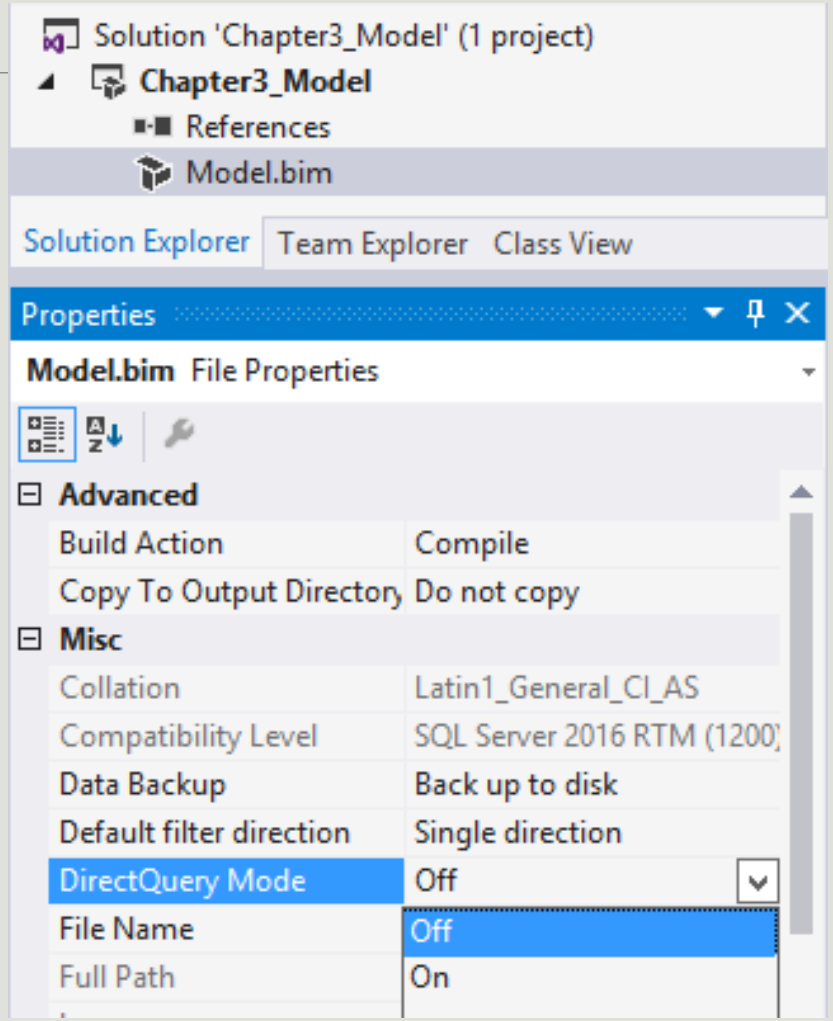
DirectQuery Queries are answered by accessing the data directly from the relational database.

The default setting for your project is to have DirectQuery Mode turned off. While this setting is off, queries against the data will be directed at the in-memory VertiPaq cache.

Data is loaded into the VertiPaq cache when you process the model. One limitation to be mindful of is the amount of data you are loading and how much memory your server has available. The additional details on the benefits and limitations of DirectQuery will be provided in the later recipes.



In-Memory Vs. DirectQuery

DataToInsight.ir

Feature	Restriction
Data source	Can only pull from a single relational database
Calculated tables	Calculated Tables are not supported in DirectQuery models
Query limit	By default DirectQuery is limited to 1 million rows
Stored procedures	Tables cannot be defined from stored procedures
DAX	formulas DAX formulas that cannot be converted to SQL syntax will return an error