Free Training Transcript: Analysis with Cubes and MDX

Welcome to this video on using cube data sources and MDX. You can download the Exercise workbook to follow along in your own copy of Tableau, though you will also need to download the data source as cubes cannot be extracted.

MDX

OLAP or "cube" data sources use the MDX language rather than SQL to define calculations. This video does not teach MDX, but rather shows how to use it in Tableau. One of the many uses of calculated members via MDX is to define new groupings that were not created by the cube's architect.

Creating a Calculated Member for Grouping

Here, we'd like to group some of the members of the Sub-Category "Office Supplies" together into a "Small Items" group. I've colored coded them orange in the view. Note that the version of superstore used in this video does not match the other videos.

If we select the desired items and bring up the tooltip, there is no Grouping icon. We'll have to write a Calculated Member to define them as grouped together. Right click in the data pane and choose "Calculated Members…" Press the New button under the first pane on the right. In the Name box, type "Small Items". Next we will define where the member belongs in the hierarchy. Rather than creating a new level of hierarchy like grouping using a relational data source, we are creating a new member within the existing hierarchy level that will be composed of other existing members. We want this "Small Items" member to be part of Office Supplies in the Product Group hierarchy. So we'll select the "[Products].[Product Group]" Hierarchy. Lastly, for Parent, choose "Selected Member" then choose "Office Supplies".

Now we need to write out the MDX to group these members together. I'm pasting in this calculation to save time, but you can see the basic MDX structure for putting Dimension members together. [Product].[Product Groups].[Office Supplies].[Envelopes] + [Product].[Product Groups].[Office Supplies].[Pens & Art Supplies] + [Product].[Product Groups].[Office Supplies].[Scissors, Rulers and Trimmers] + [Product].[Product Groups].[Office Supplies].[Labels] + [Product].[Product Groups].[Office Supplies].[Rubber Bands]

Members of the hierarchy are referenced using the "bracket and dot" notation, and the plus sign says to bring them together. If you are following along, try and type in the first two, and you can complete the others later. Click the "Check Formula" button to make sure we haven't made any errors. The calculation is valid, so we'll click ok.

We now see there is a new bar in the viz for "Small Items", alongside the sub-categories

that make it up. This is very different from a relational data source, but the cube also allows us to filter out those sub-categories without affecting new one. Select the ones we don't want and "Exclude". In the data pane, note the product groups hierarchy now has an equal sign to indicate we've created a calculated member in that hierarchy.

Cohort Calculations

A cohort calculation returns a measure when a dimension has a certain value. For example, we might make a "West Sales" calculation "IF [Region] = 'West' then [Sales] END". If we try and create a Calculated Field using a cube data source, we cannot bring in a dimension; only measures are available. For any logic based on dimensions, we must use MDX to create a calculated member.

We will create a new calculated member just as before. Right clicking in the data pane and selecting calculated members. We'll click new, and this time we'll name it "West Sales". This time, we do want it in the [Measures] hierarchy. And here's the calculation we'll enter. ([Measures].[Sales] , [Customer].[Customer Geography].[Region].[West]). This is the syntax to return a specific part of the larger Sales Measure. We're asking for the [Sales] member of the Measures hierarchy, then placing a comma, then putting in the place in the hierarchy we want to limit the sales to, in this case the West region within the customer geography hierarchy.

Unlike Tableau calculations, there are no hints or function names available for the MDX calculations. You will have to learn MDX and know what your desired calculations and member names are on your own. However, all Calculated Members can be edited from this single menu. Cubes do not behave exactly like relational data sources; rather than showing Null for all of the regions other than West, a cohort defined this way will still show values for all regions in the hierarchy, but the measure value will be identical for all of them (it will be the value for West only). Keep this in mind as you work with MDX and calculated members to get the results you want in Tableau.

There are many other examples of uses of MDX and Calculated Members in the Tableau Knowledge Base.

Conclusion

Thank you for watching this training video on cubes and MDX. We invite you to continue with the Free Training videos to learn more about using Tableau.