



Business Analytics with Power BI

Microsoft Services



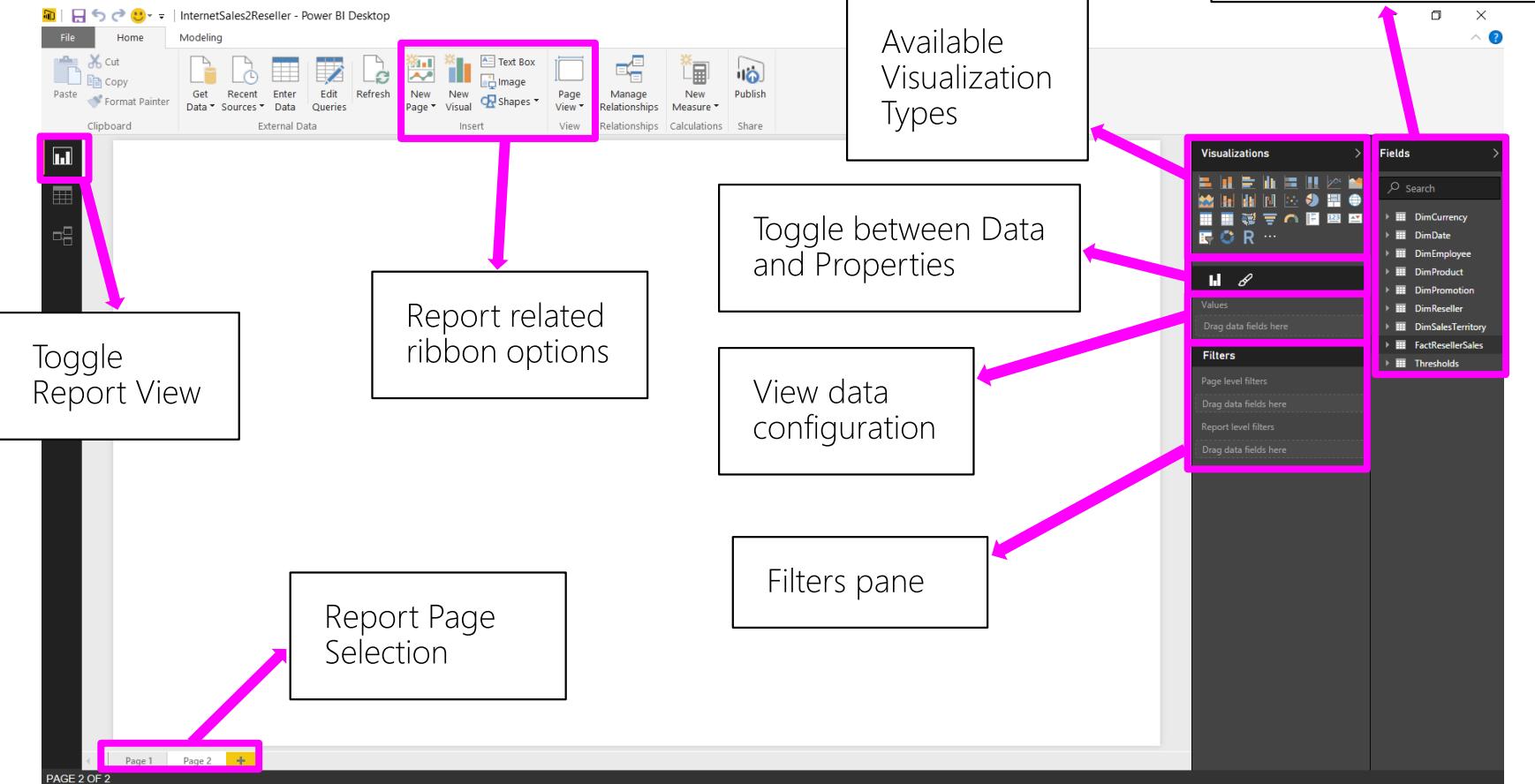
Module 1: Power BI Desktop

Lesson 6: Building a Report

Building a Report

Report View

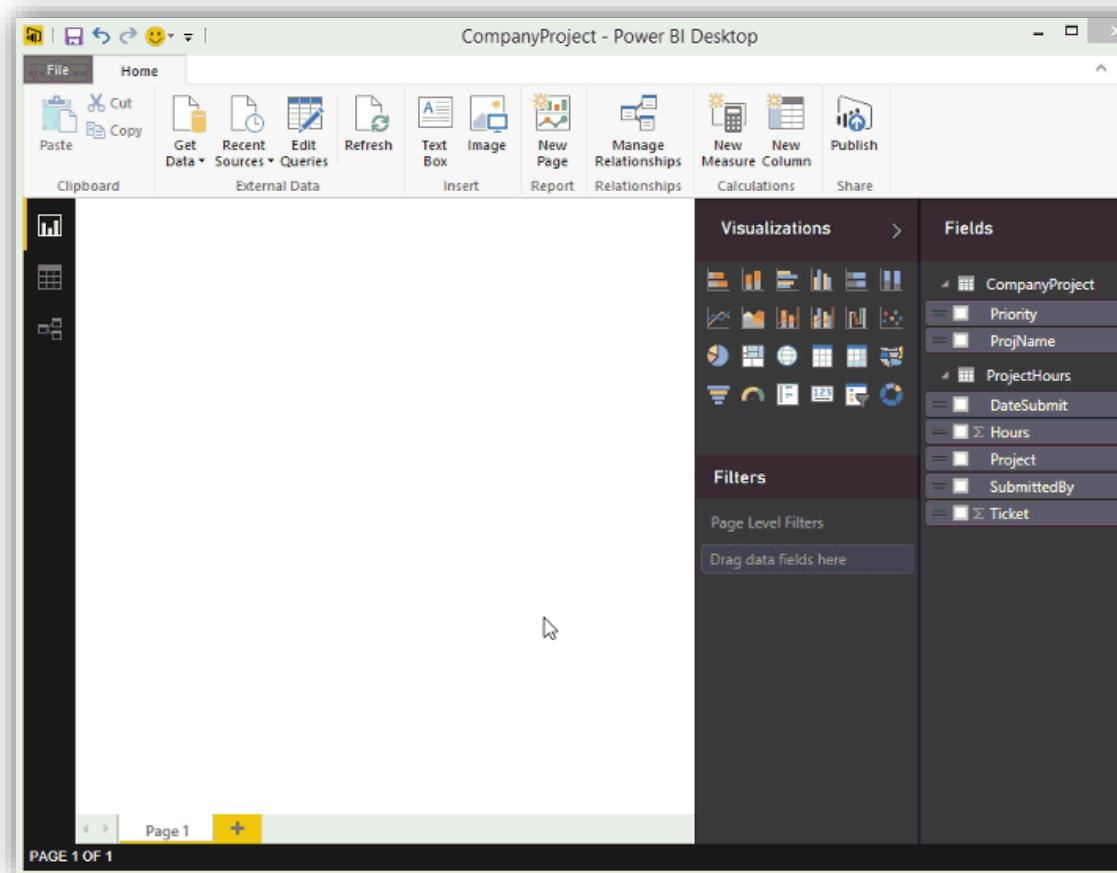
- The first canvas that is presented to the user



Building a Report

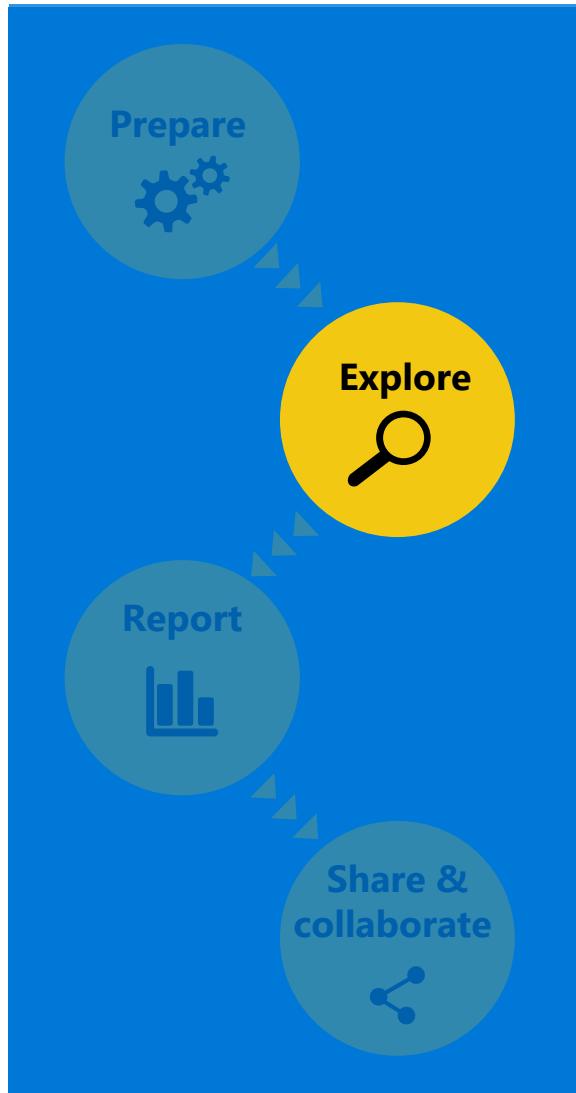
Report View

- Use drag-and-drop and search to build your analysis like a pivot table in Excel



A screenshot of the Power BI Fields list and a Field Properties dialog. A pink arrow points from the "BrandName" field in the Fields list to the "BrandName" field in the Field Properties dialog. The Field Properties dialog shows the field name "BrandName", a description placeholder "Double-click to enter a description", and a tooltip for the field: "'Sales'[Brand Name] All the brands we sell in our stores.'". The Fields list also includes other fields like "Category", "Class", and "Country".

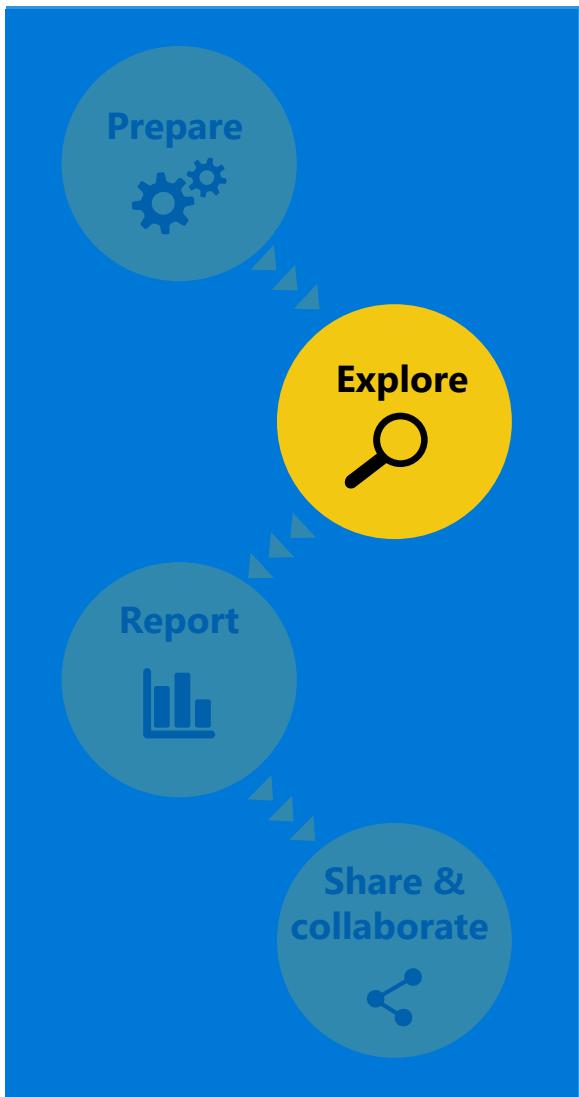
Building a Report



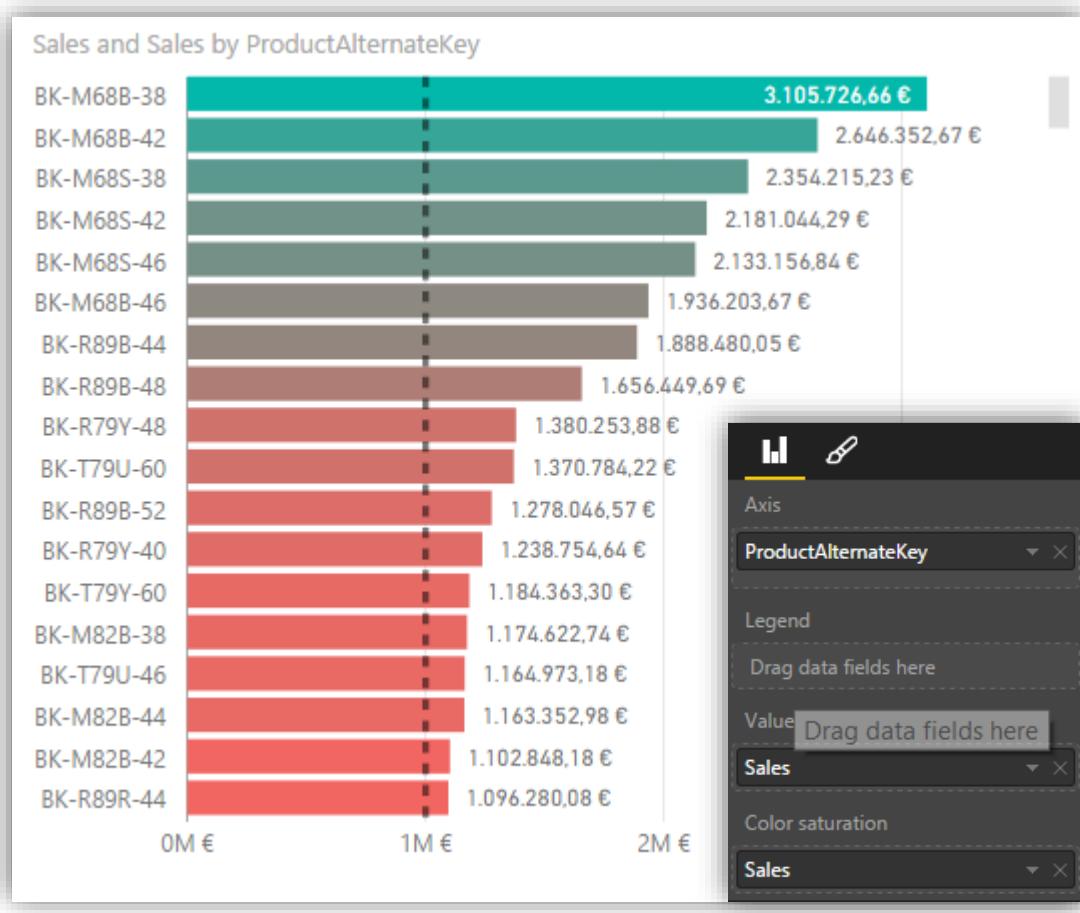
Visualizations

- Several visualizations exist out-of-the box and developed by 3rd party
- Choose the one that **best conveys your message**
- New visualizations are **released frequently**
- **Change easily** between visualizations
- Each visualization has its **own data settings and properties**
- Fine control on **display settings**
- Visualizations can be **responsive**

Building a Report

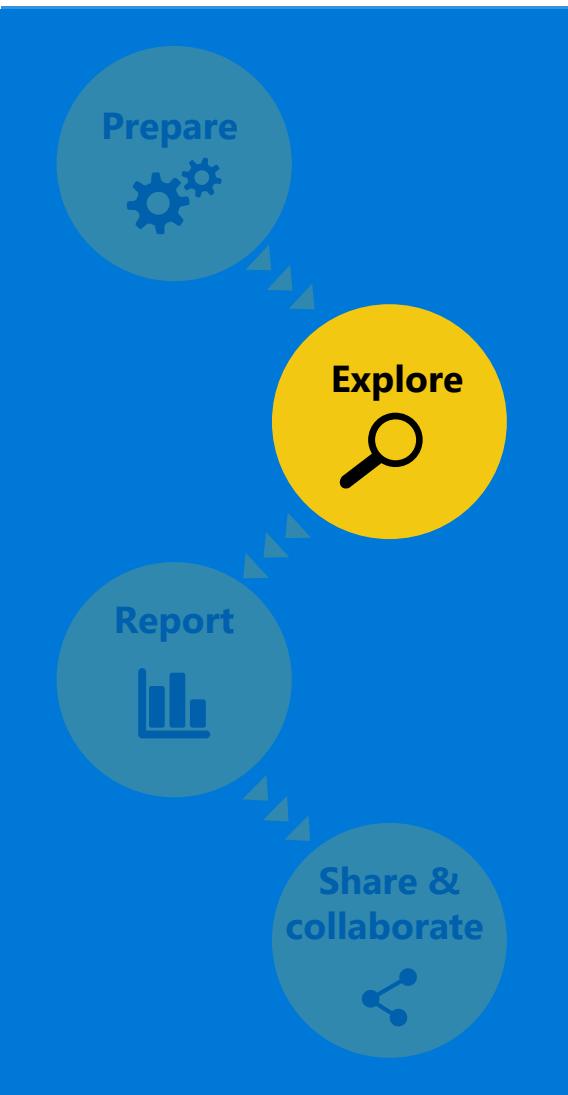


Visualizations – Clustered Bar Chart

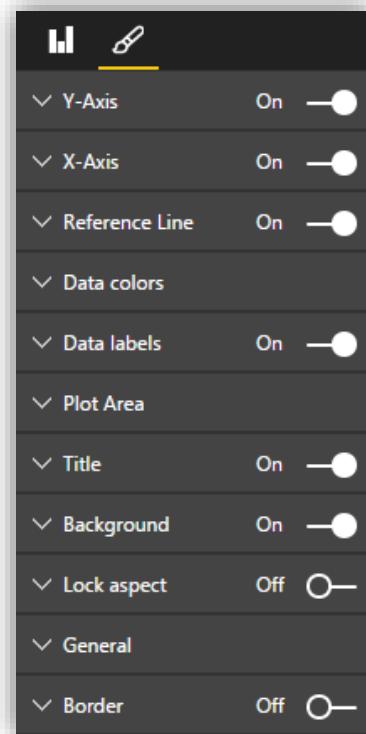


- Allows several items on Axis to enable drill
- Legend will cluster many values per Axis item
- Value will provide the size of the bar
- Color Saturation allows a third dimension on the data
- Possible to rename columns

Building a Report



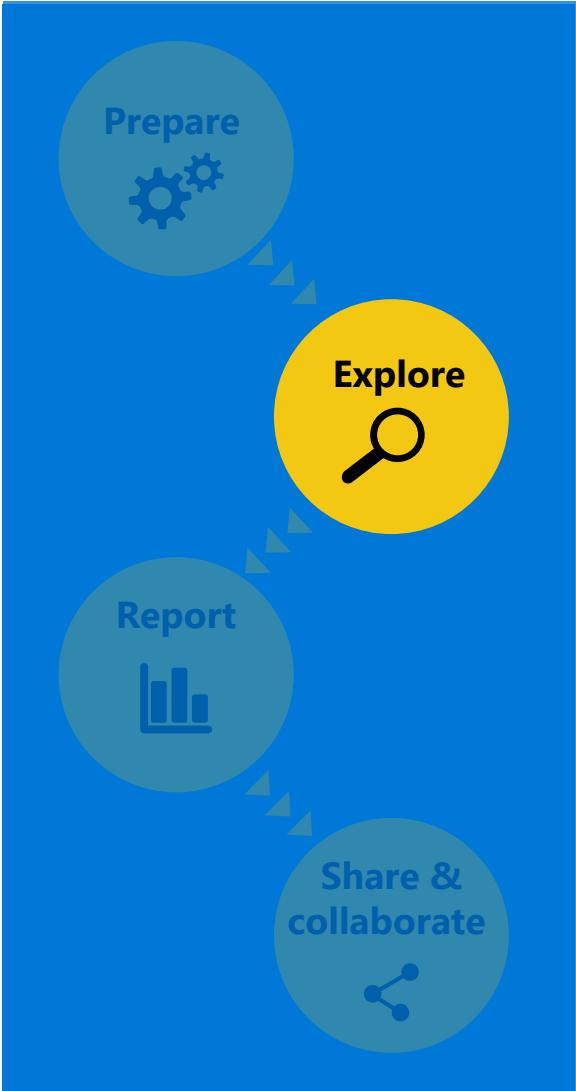
Visualizations – Properties



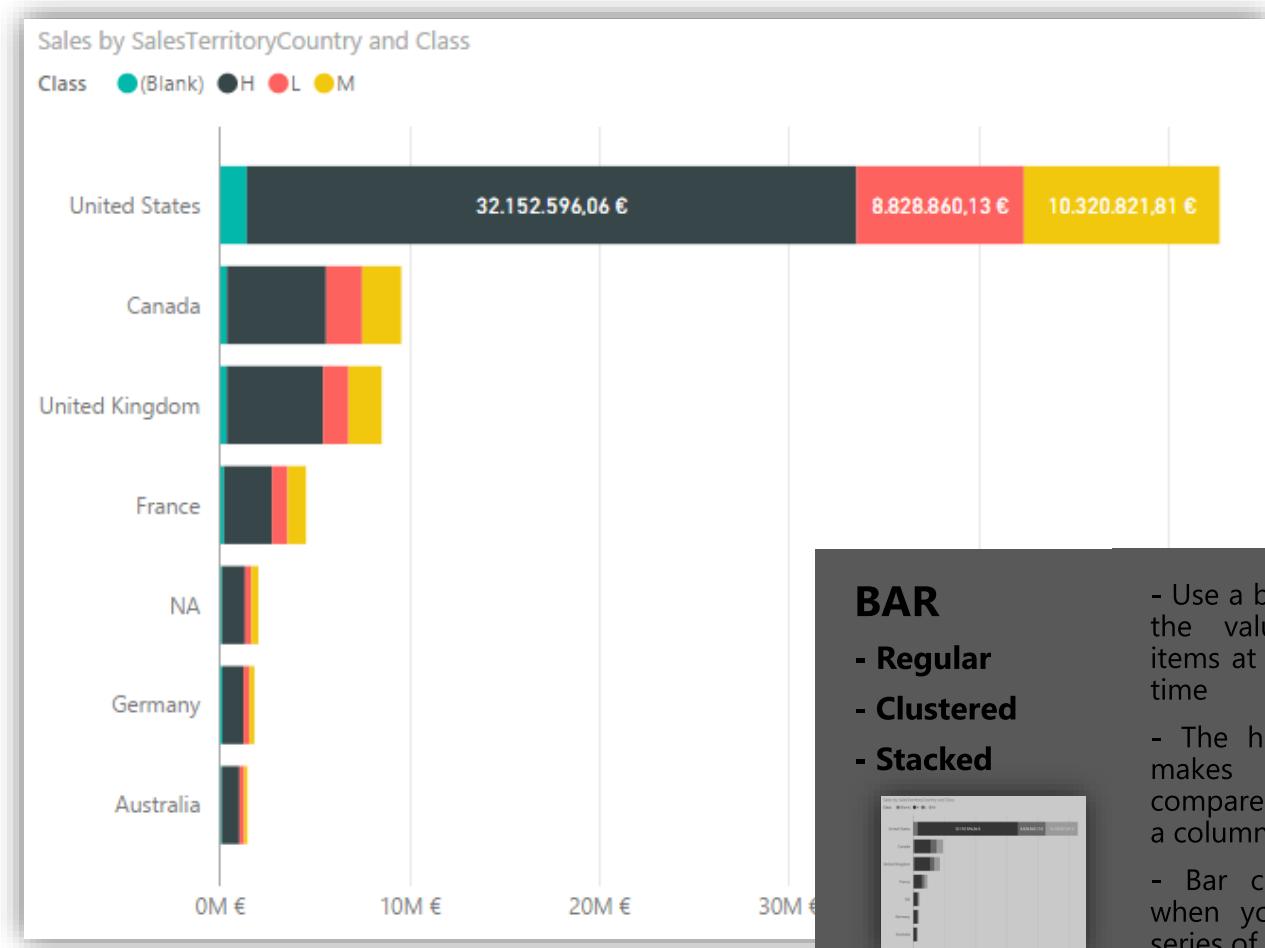
- Enables the X/Y-Axis, control alignment, title and color and scale (Y - linear/log)
- Enables a reference line for a particular value and with formatting options
- Granular control on the color of each axis occurrence
- Display the values associated to a series. Control the unit, color and font
- Plot area formatting, namely define an image as background
- Enable the title and format it
- Enable a background color and define transparency
- Lock the current aspect
- Pixel level control of placement and size
- Enable a border and control its color

* Properties might vary, depending on visualization.

Building a Report

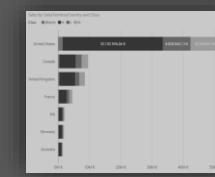


Visualizations – Stacked Bar Chart



BAR

- Regular
- Clustered
- Stacked

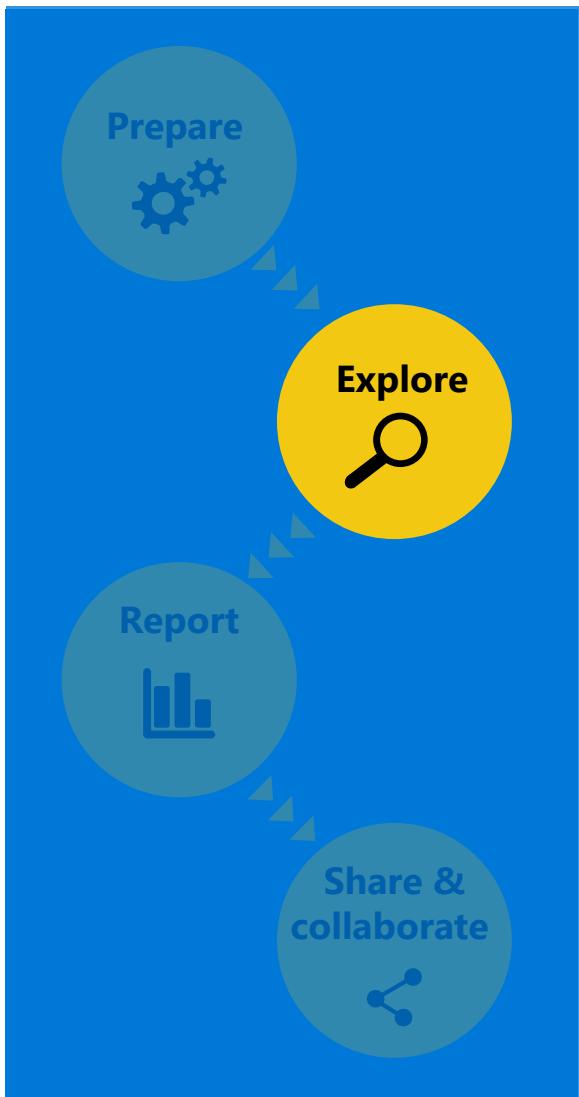


- Use a bar chart to show the values of several items at a single point in time

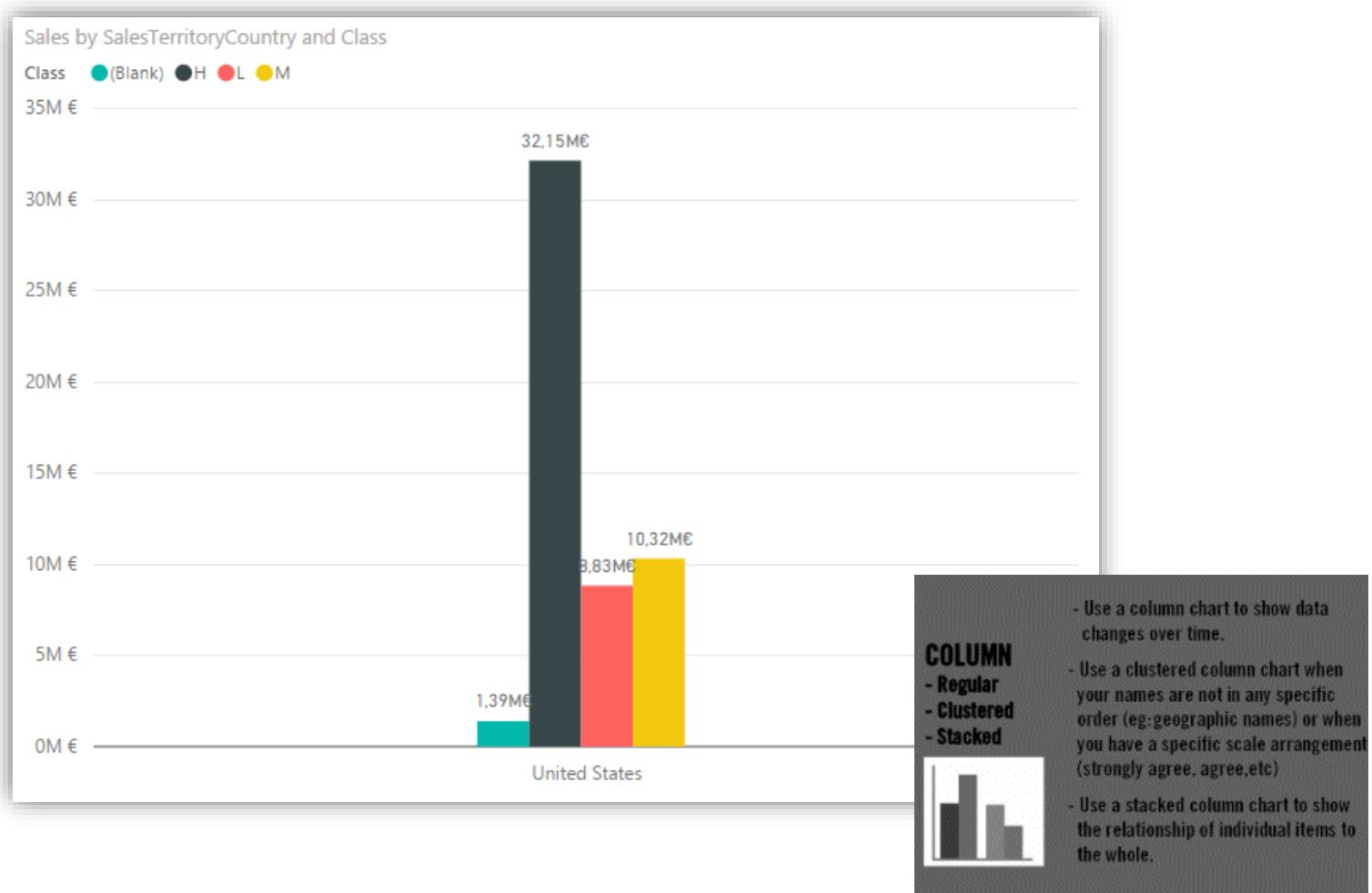
- The horizontal format makes it easier to compare the values than a column chart

- Bar charts are good when you have a long series of labels

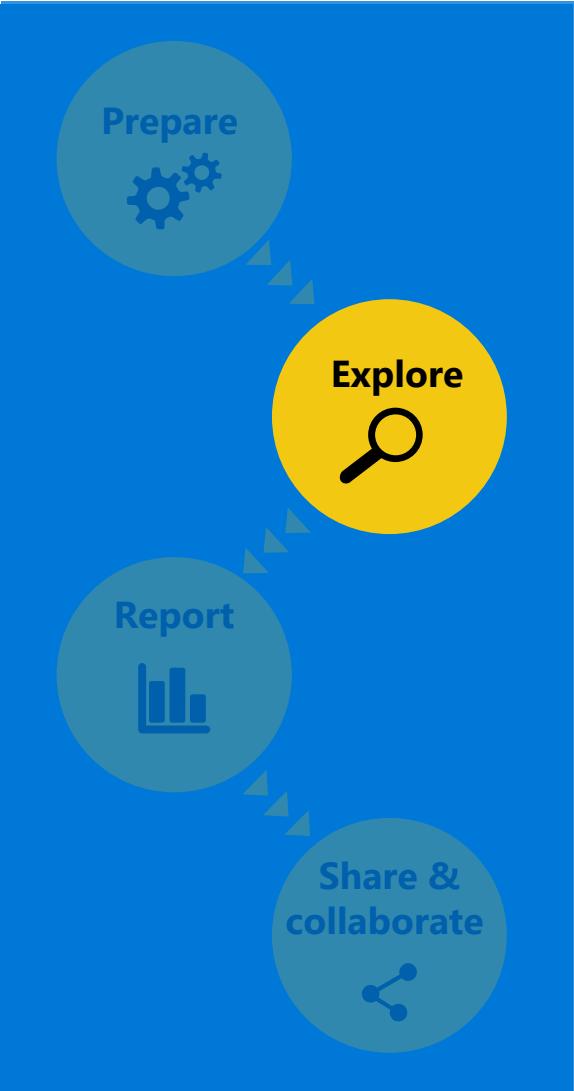
Building a Report



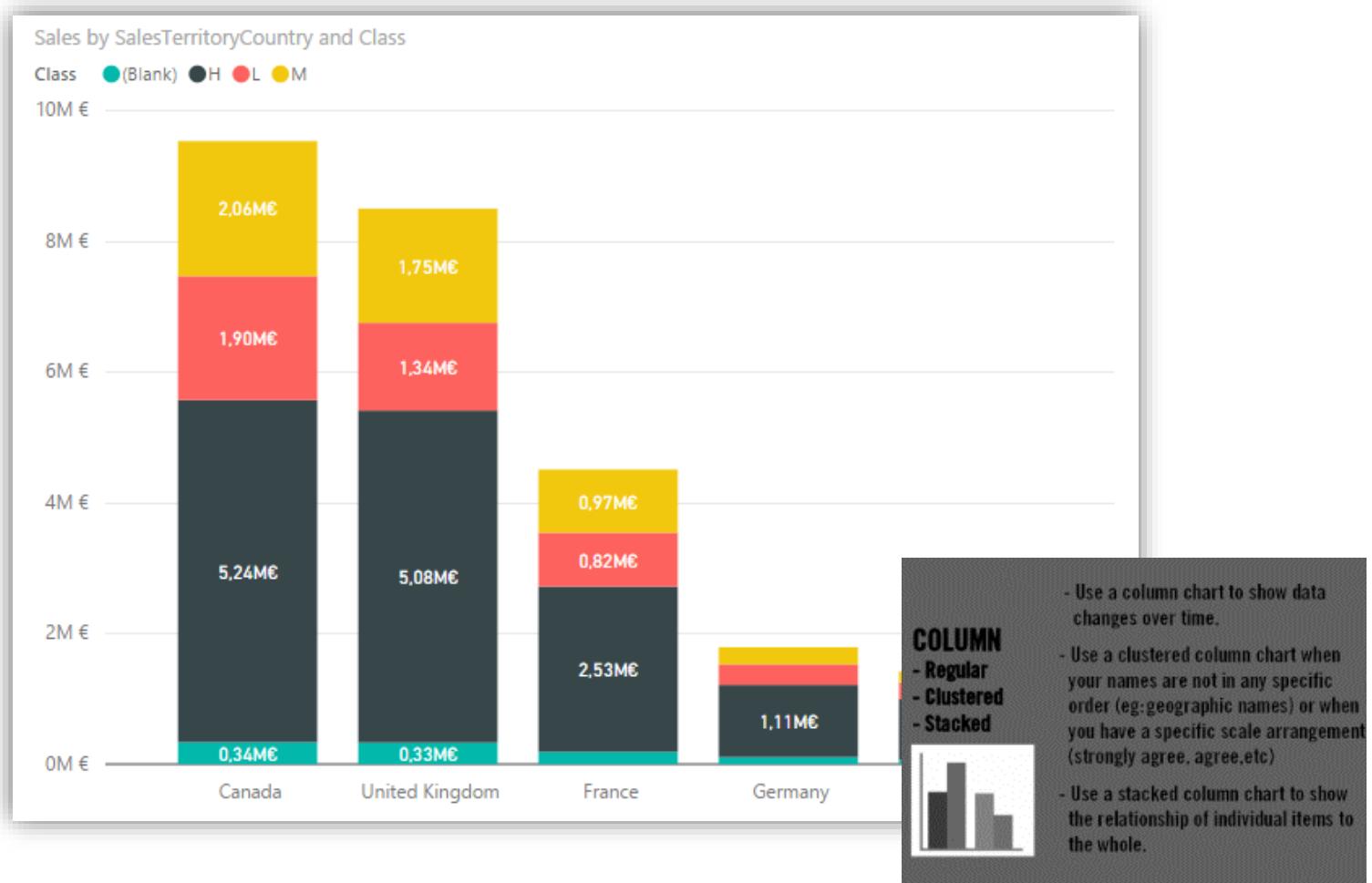
Visualizations – Clustered Column Chart



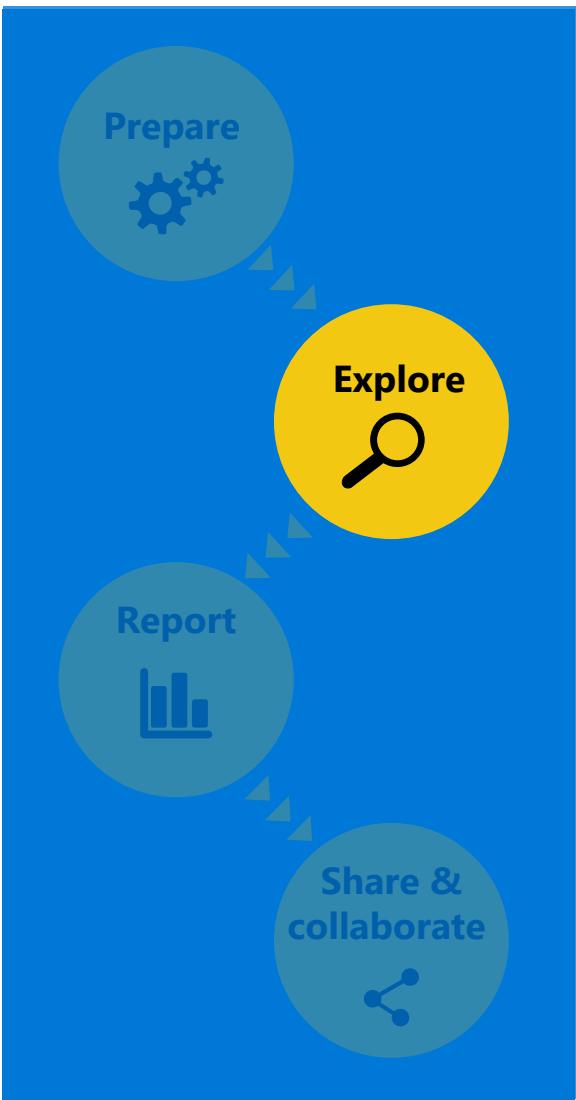
Building a Report



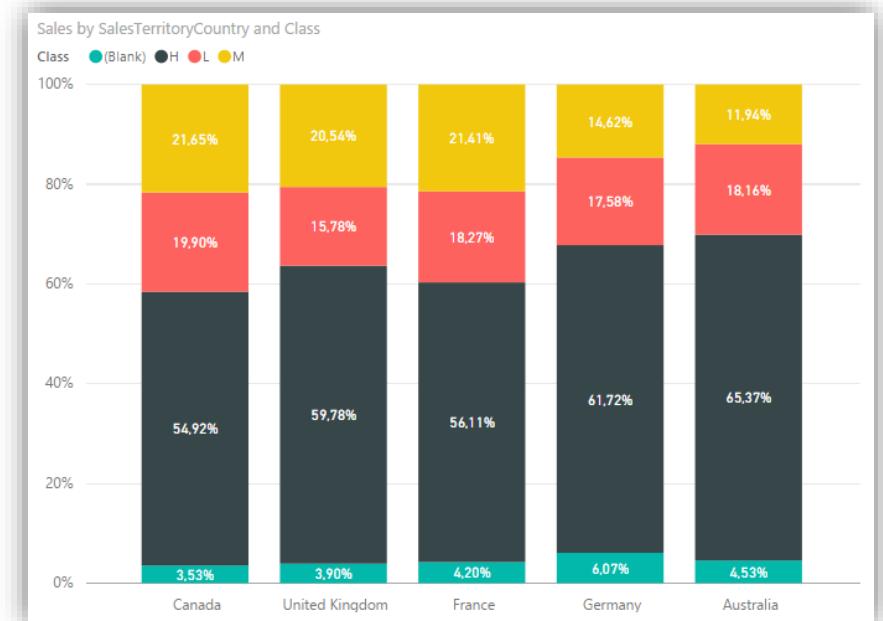
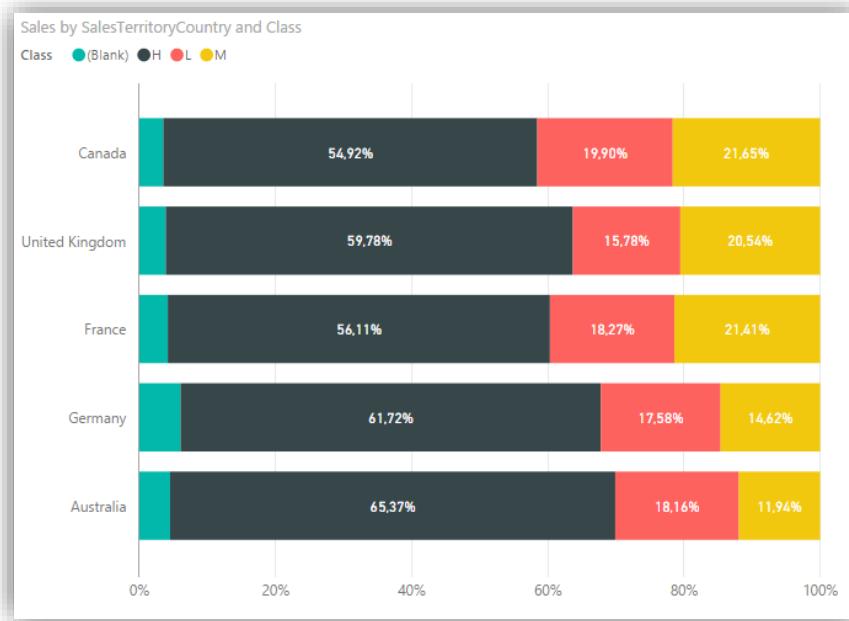
Visualizations – Stacked Column Chart



Building a Report



Visualizations – 100% Stacked Bar and Column Chart



Building a Report

Prepare



Explore



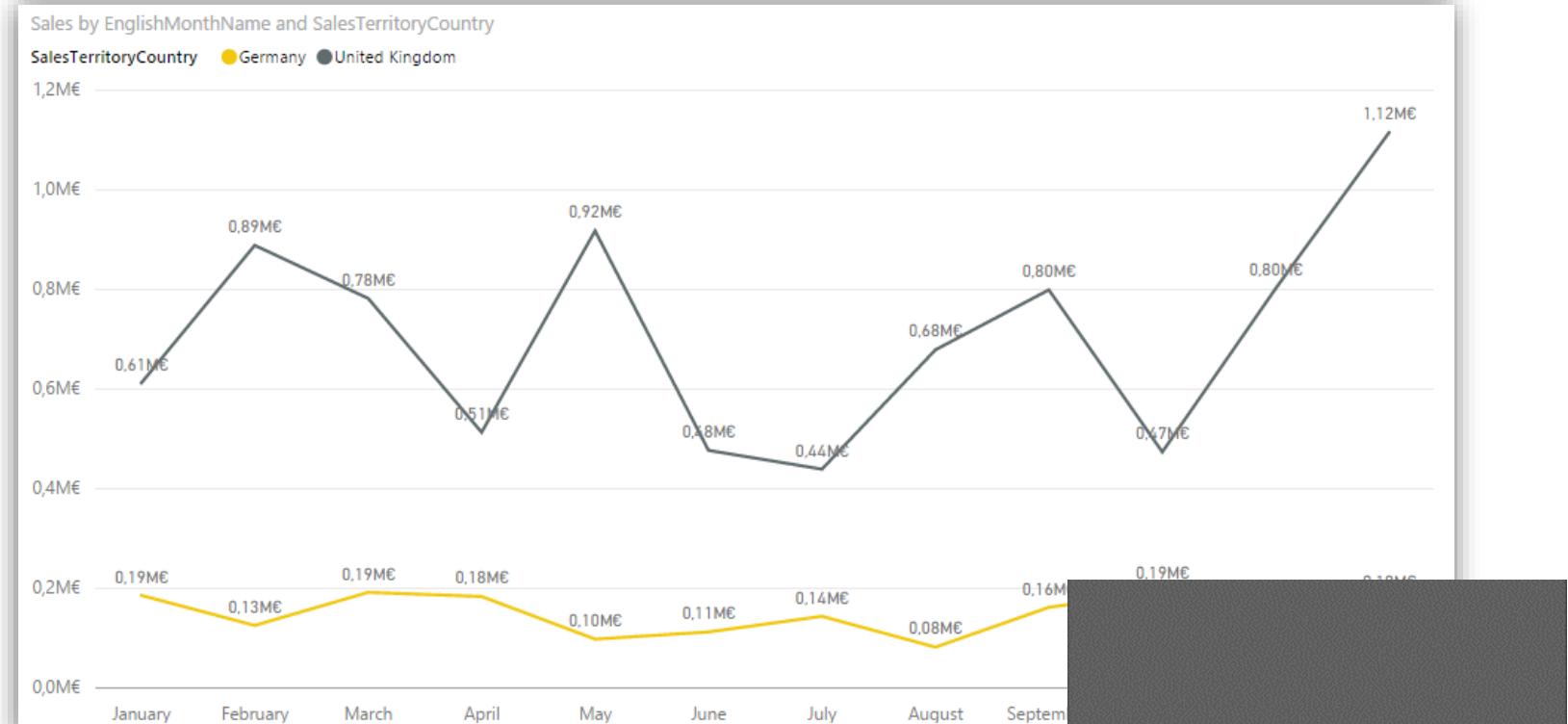
Report



Share & collaborate



Visualizations – Line Chart



LINE



- Use a line chart rather than a column chart to emphasize trends rather than the amount of change.

Building a Report

Prepare



Explore



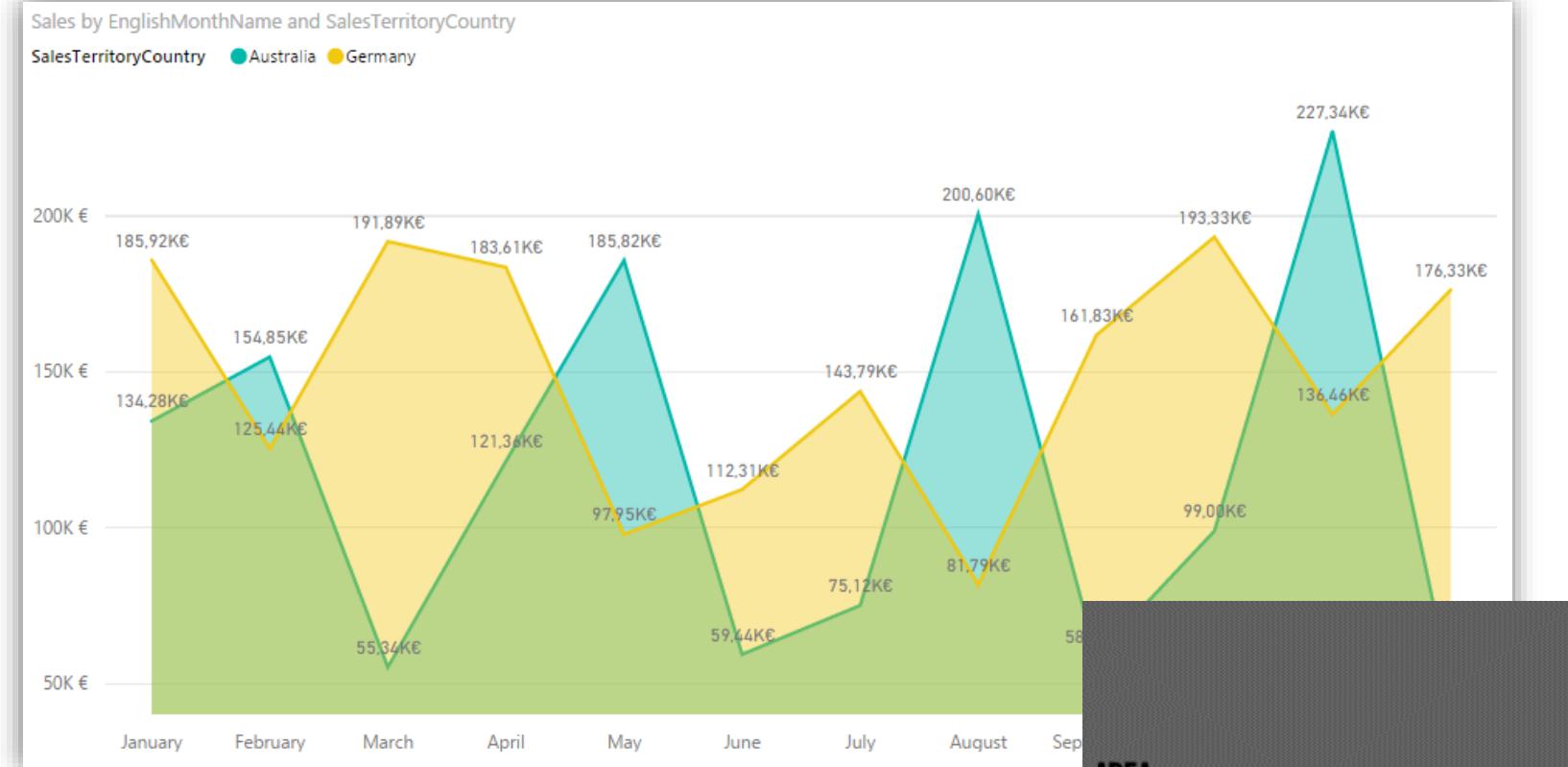
Report



Share & collaborate



Visualizations – Area Chart



AREA



- Use an area chart rather than a stacked column chart when you want to highlight how each of the values change over time.

Building a Report

Prepare



Explore



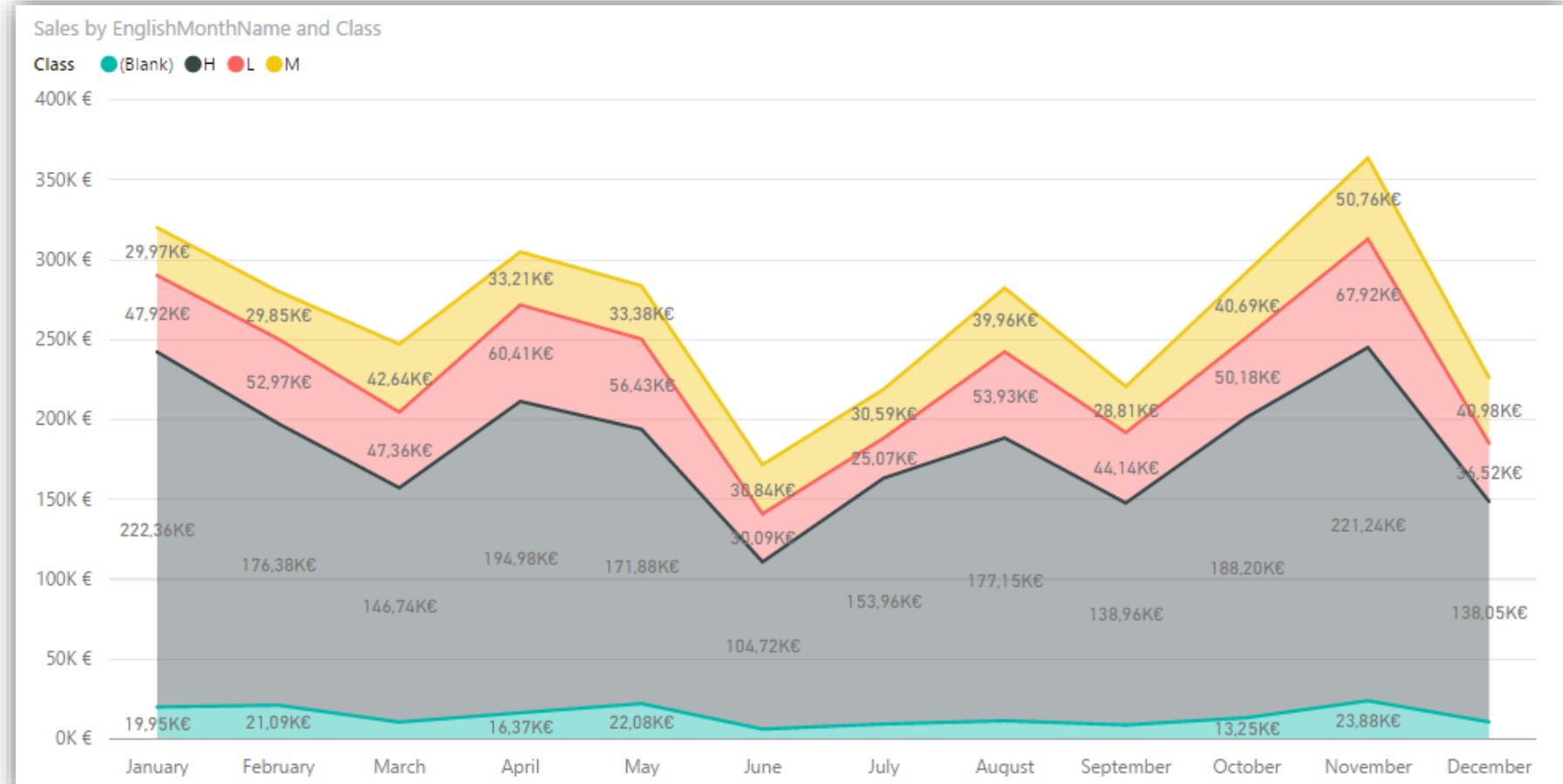
Report



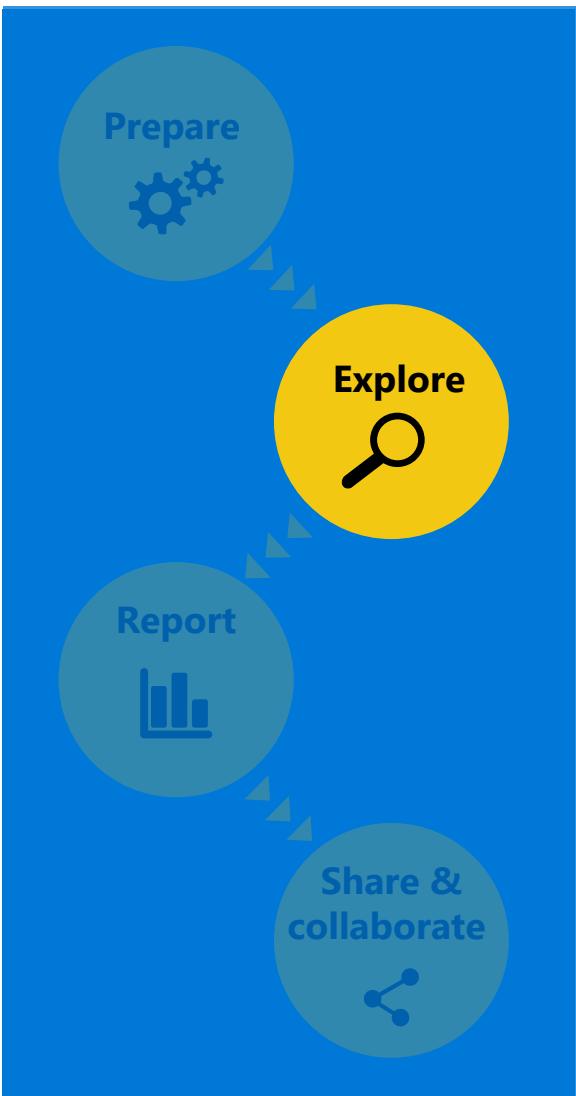
Share & collaborate



Visualizations – Stacked Area Chart



Building a Report



Visualizations – Stacked and Clustered Bar with Line Chart



Building a Report

Prepare



Explore



Report



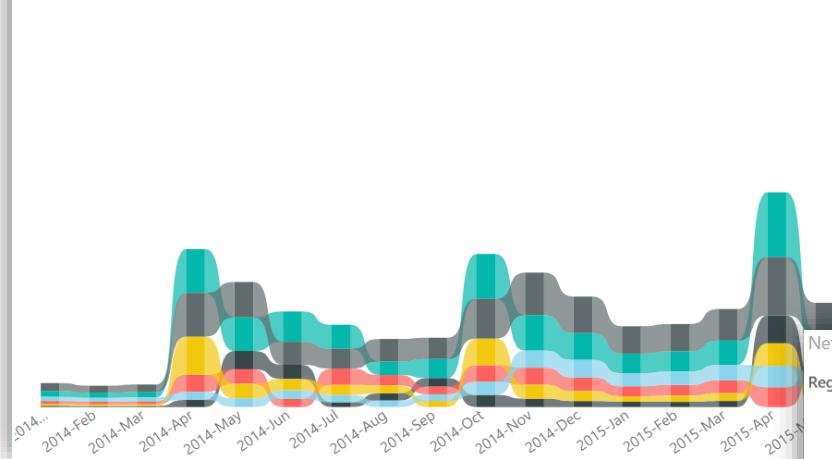
Share & collaborate



Visualizations – Ribbon Chart

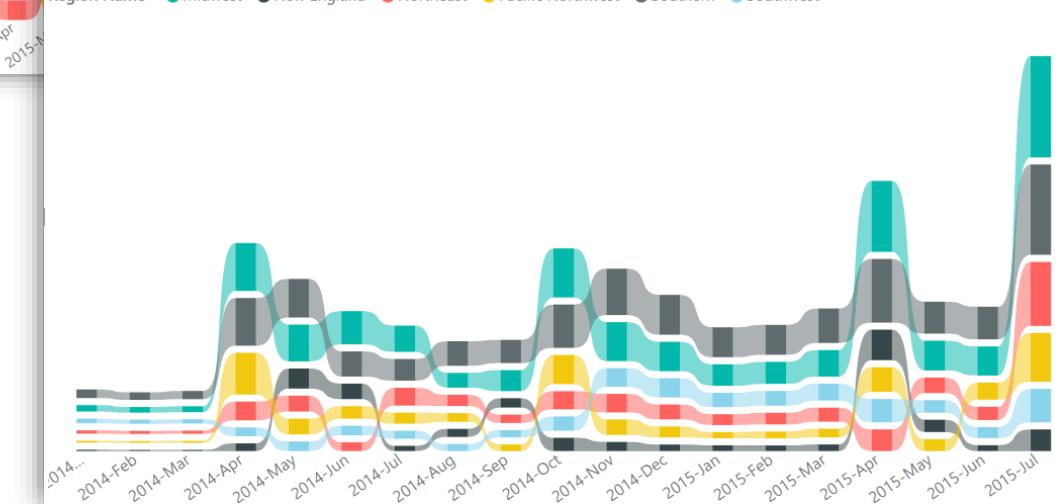
Net Profit by Month and Region Name

Region Name • Midwest • New England • Northeast • Pacific Northwest • Southern • Southwest



Net Profit by Month and Region Name

Region Name • Midwest • New England • Northeast • Pacific Northwest • Southern • Southwest



▲ Ribbons

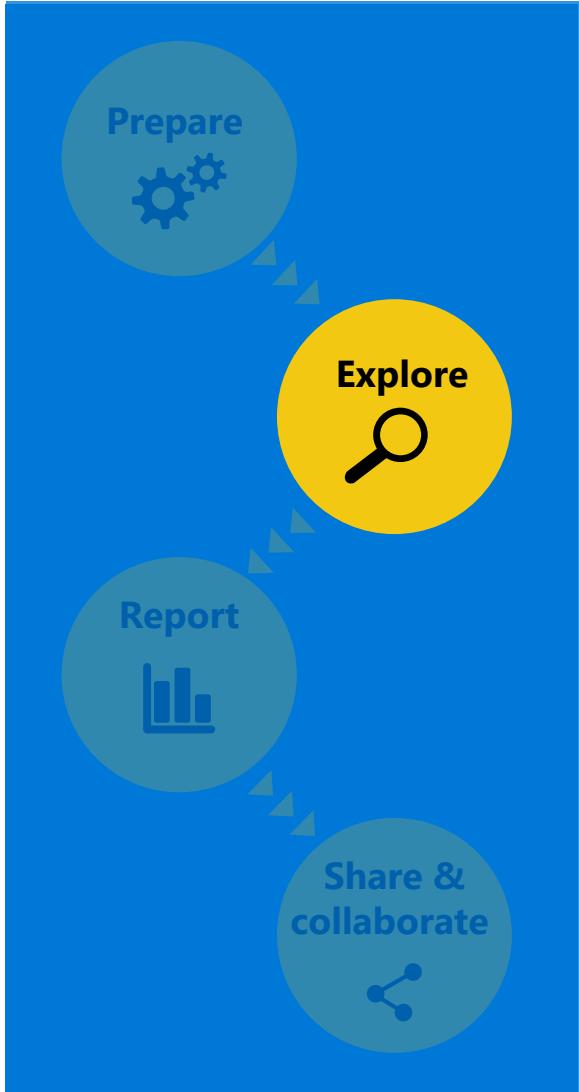
Spacing 7

Match s... On

Transp... 48

Border Off

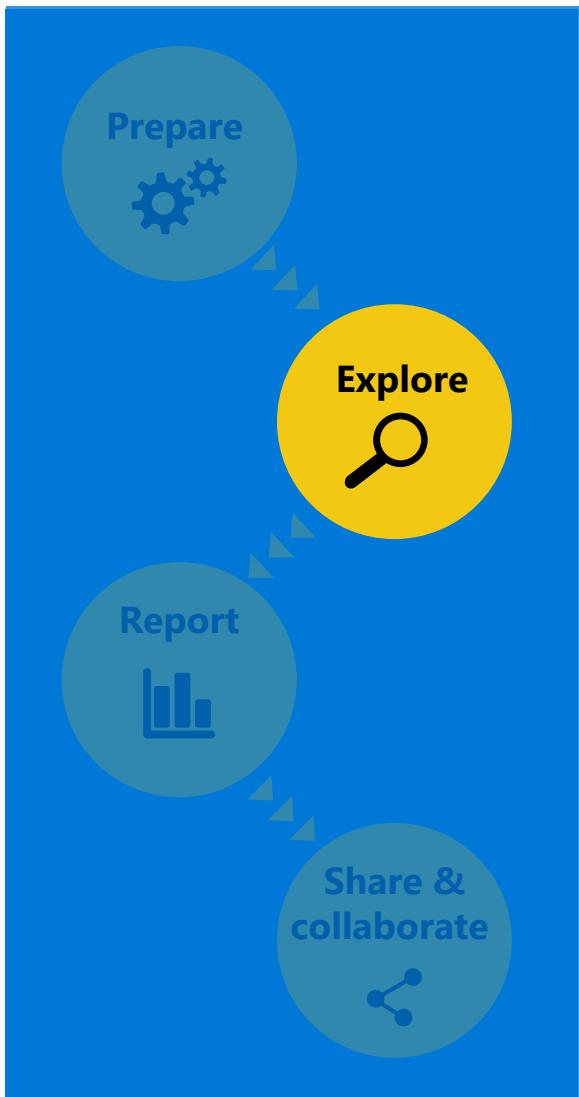
Building a Report



Visualizations – Waterfall Chart

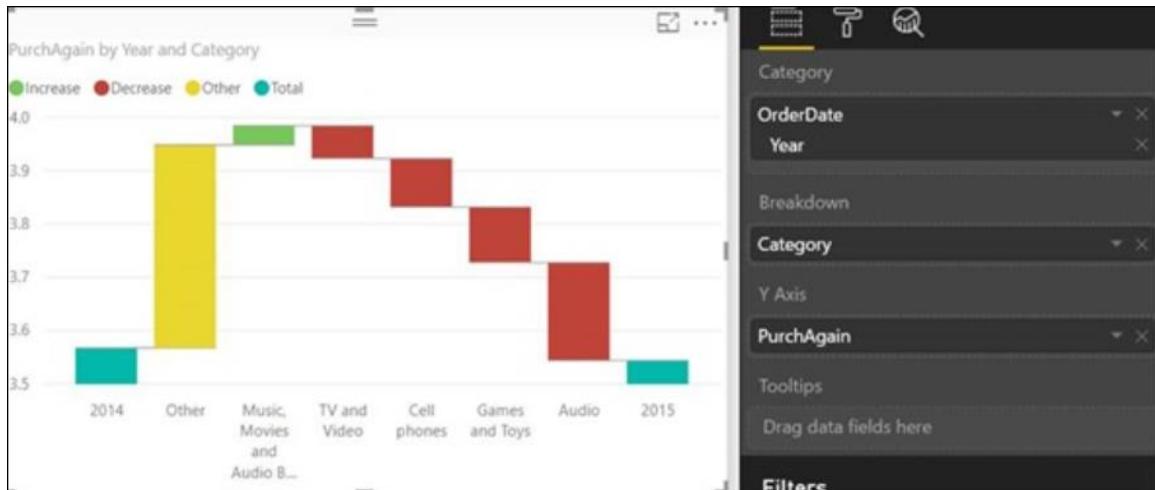


Building a Report



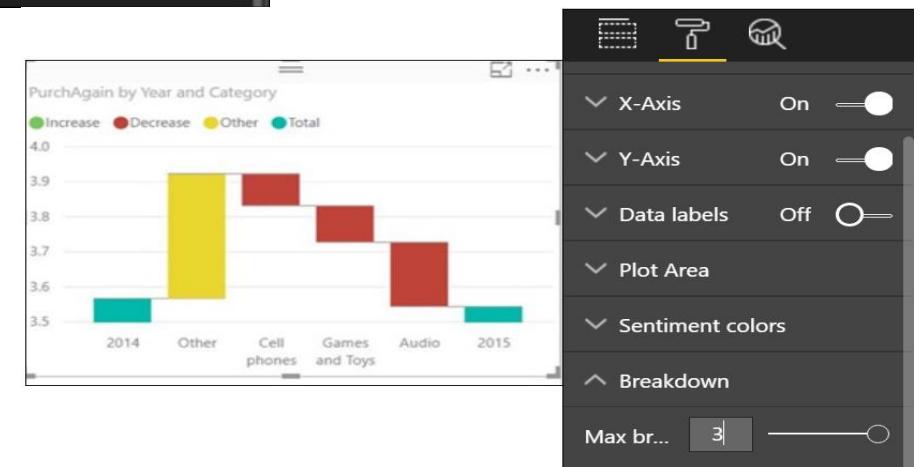
Visualizations – Waterfall Chart

Breakdown - what values were most influential in the change.

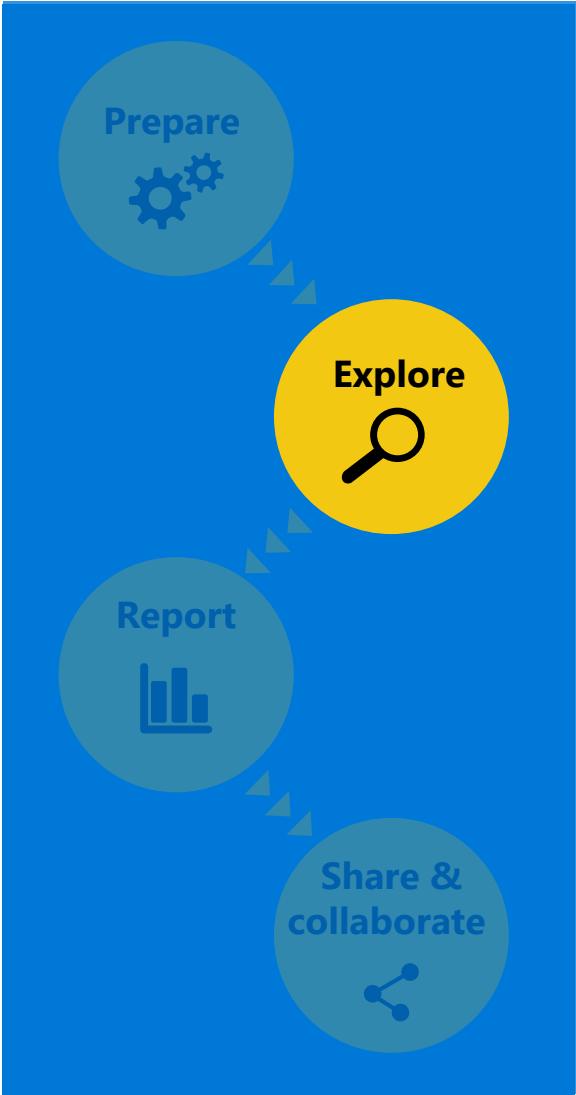


- 'Other' bucket that groups all the other values together.
- Default Top 5 differences

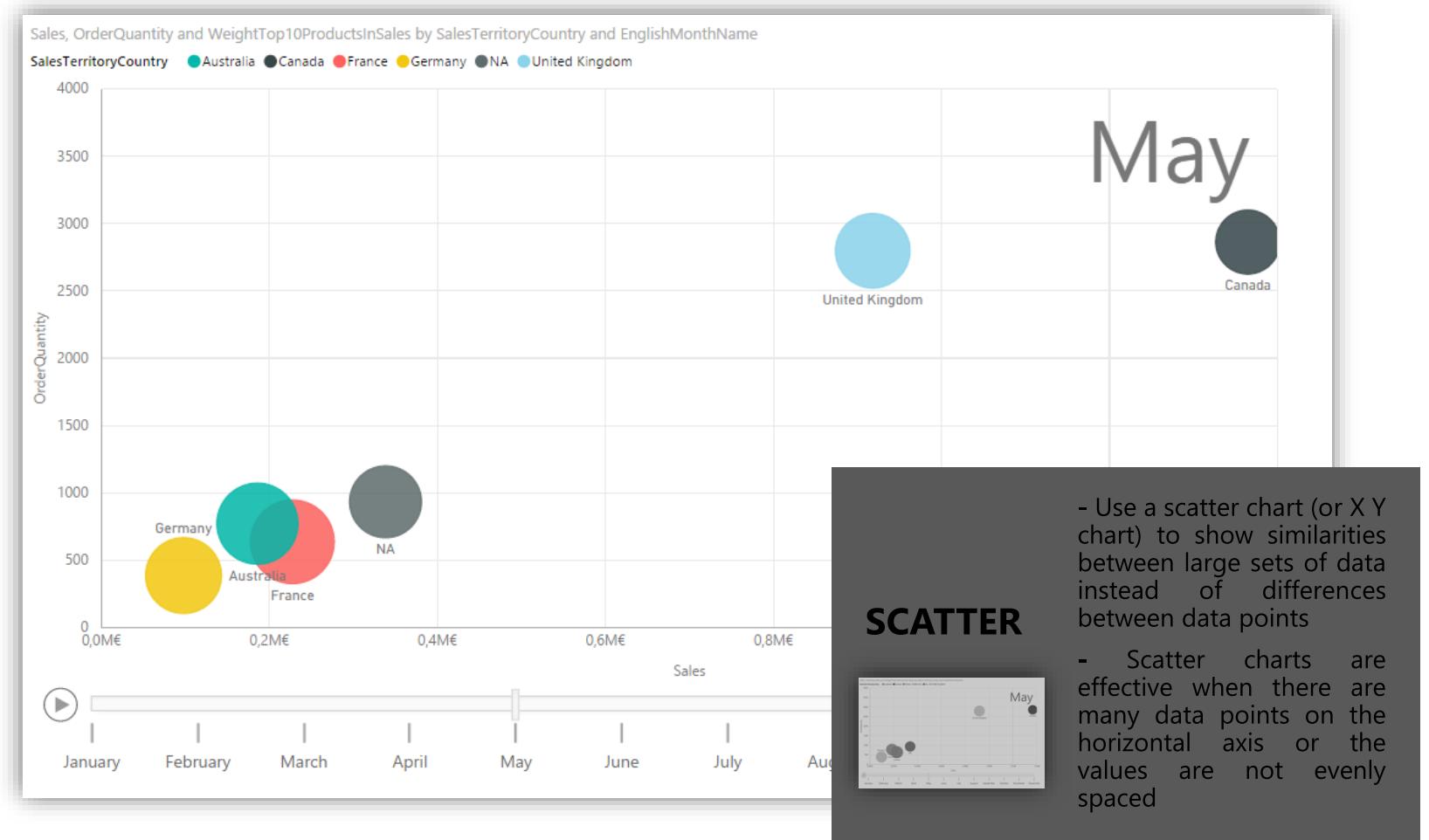
It can be changed by setting Max breakdowns



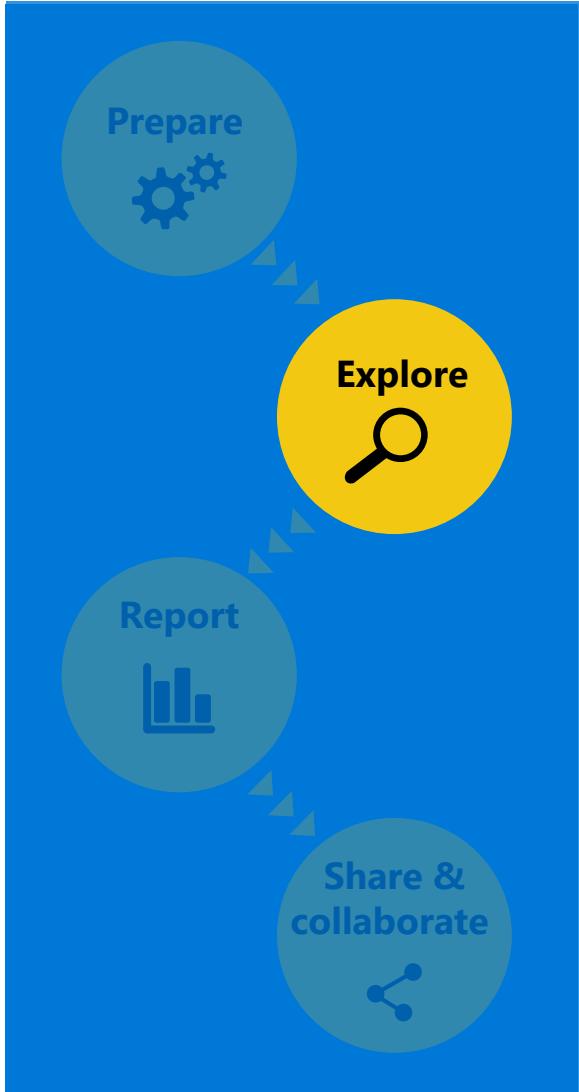
Building a Report



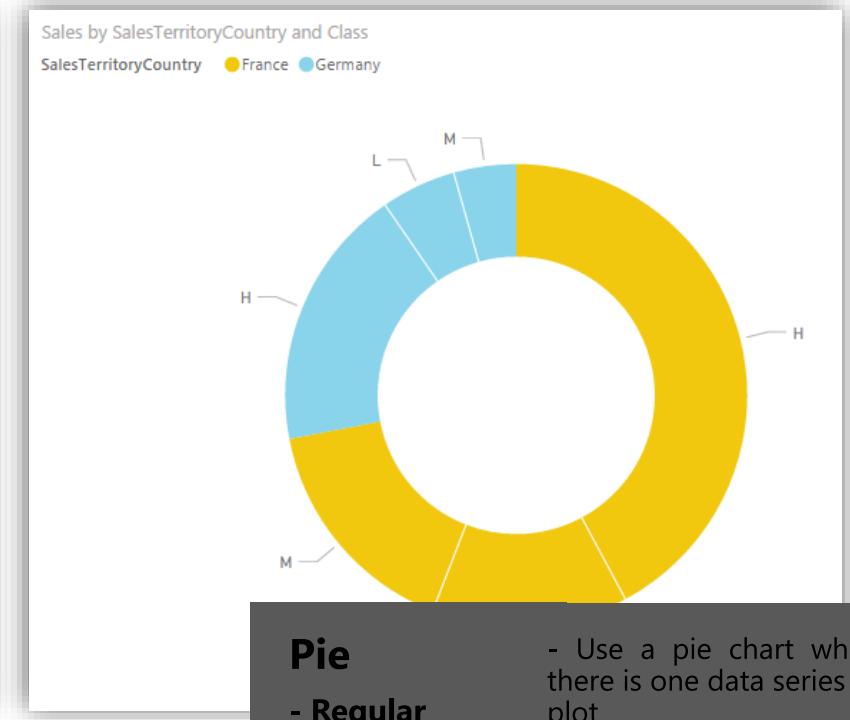
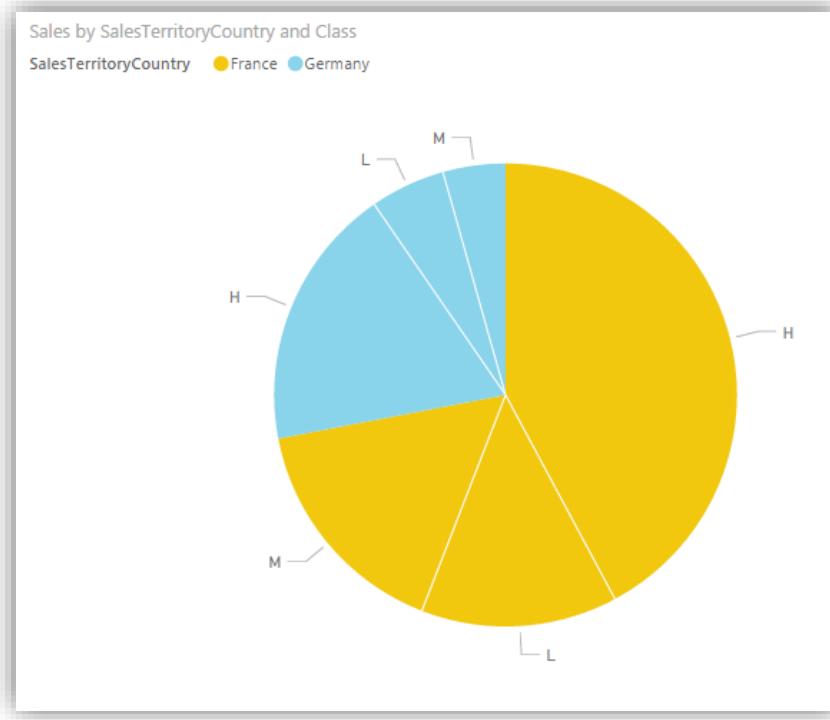
Visualizations – Scatter Chart



Building a Report

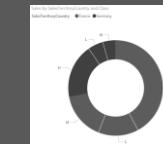


Visualizations – Pie and Donut Chart



Pie

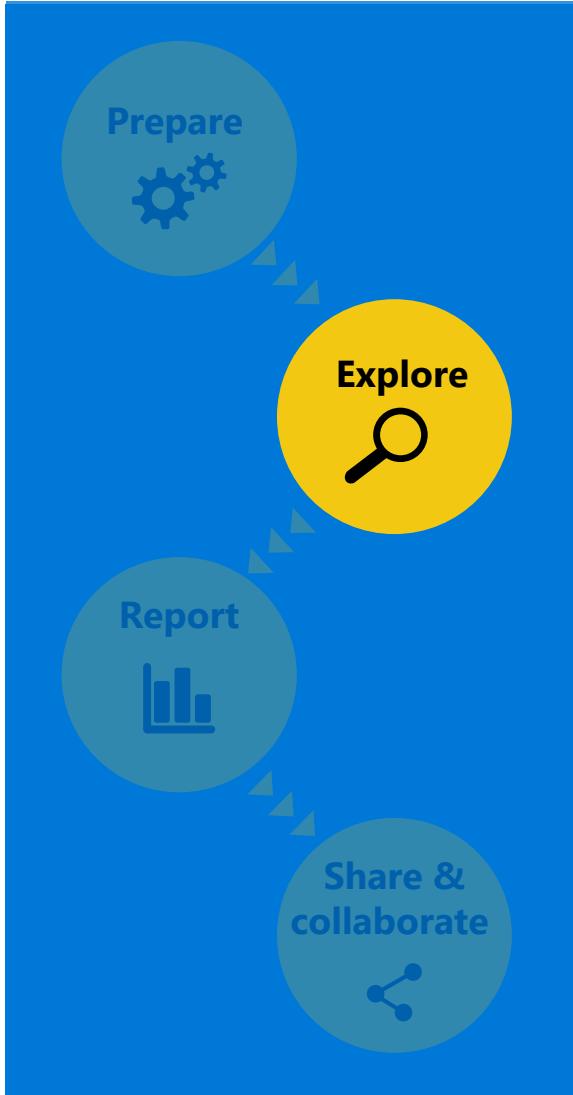
- Regular
- Donut



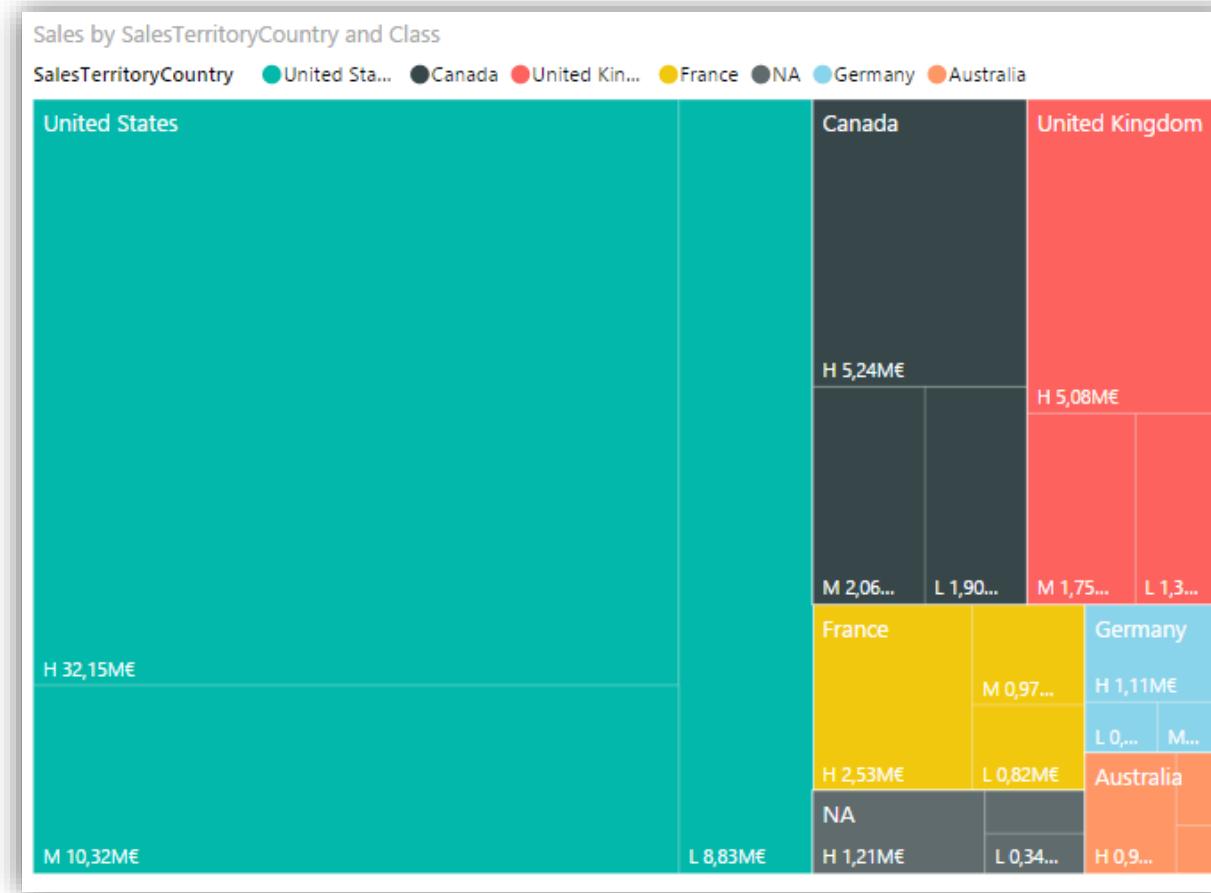
- Use a pie chart when there is one data series to plot

- Pie charts show composition (how categories represent parts of the whole)

Building a Report



Visualizations – TreeMap Chart



Building a Report

Prepare
⚙️

Explore
🔍

Report
📊

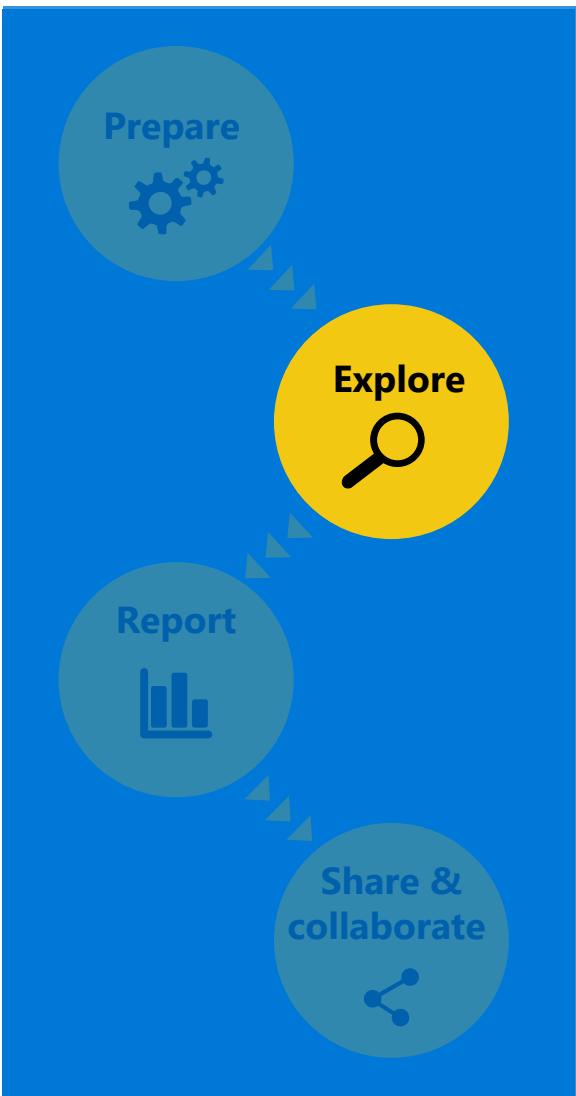
Share &
collaborate
🔗

Visualizations – Map Chart



- Plotting data requires internet connection
- Bing is used to return the location
- Latitude and Longitude can be used, but...
- Location names are also mapped automatically
- Combine attributes in Location for increased accuracy and use data categories

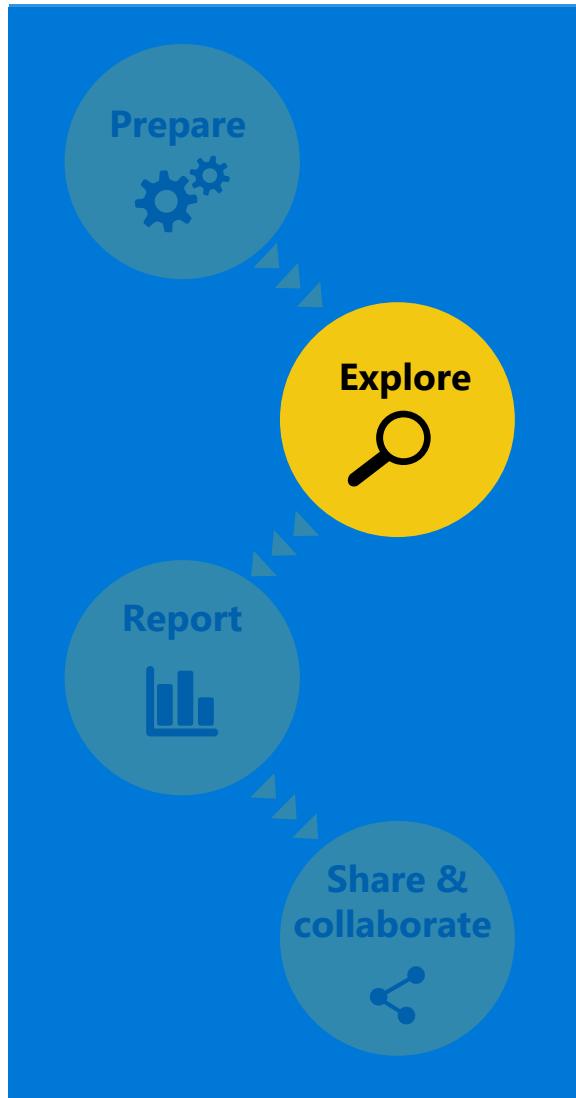
Building a Report



Visualizations – Filled Map Chart

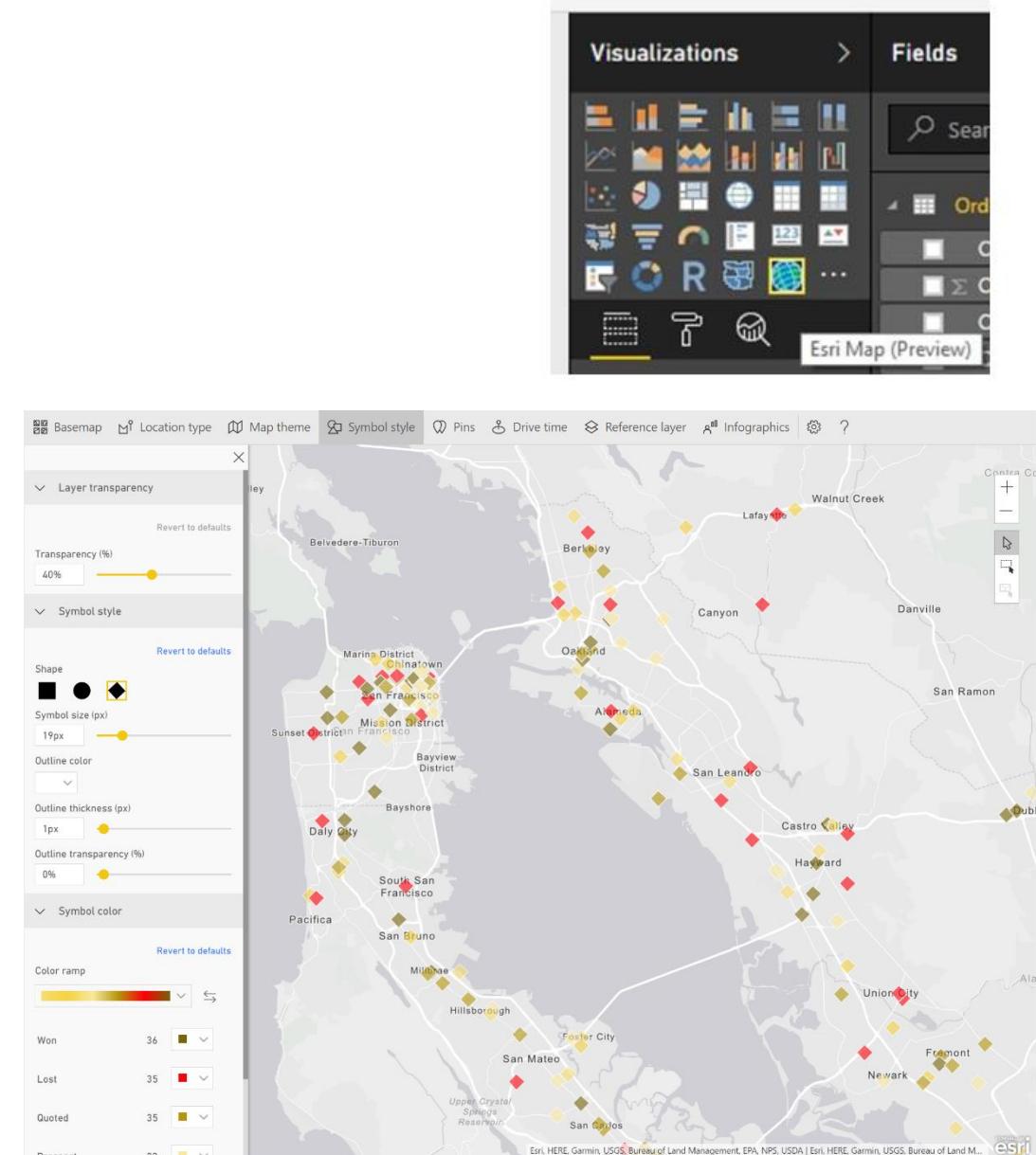


Building a Report

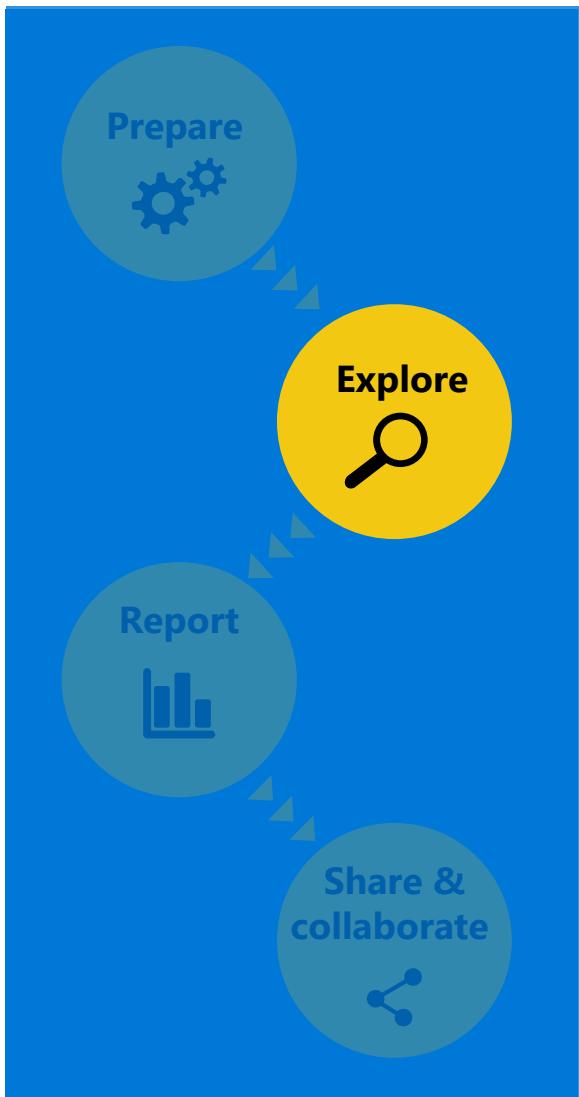


Visualizations – ArcGIS maps

- Use ArcGIS Maps as a Power BI visual
- Different **base maps** (dark gray, light gray, open street maps, and Esri's standard ArcGIS base map)
- Different themes: Points, Points with Size; Heat Map and Clusters
- Additional **Reference Layers** (demographic, public layers)
- Location is adaptive: streets are points, counties are boundaries

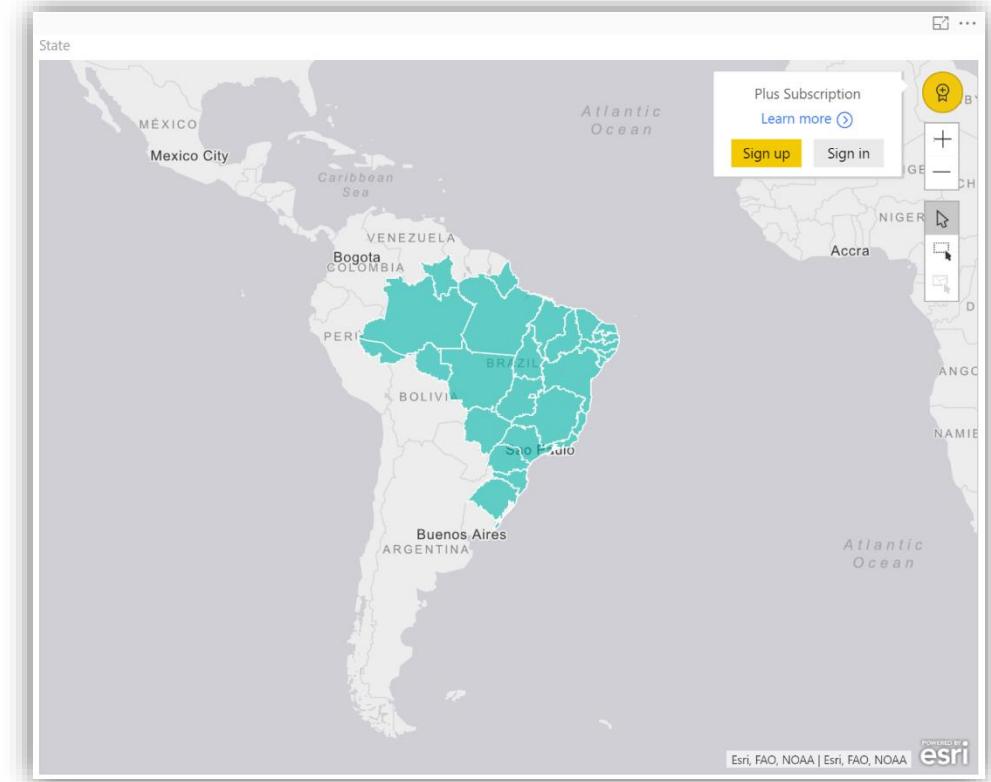


Building a Report

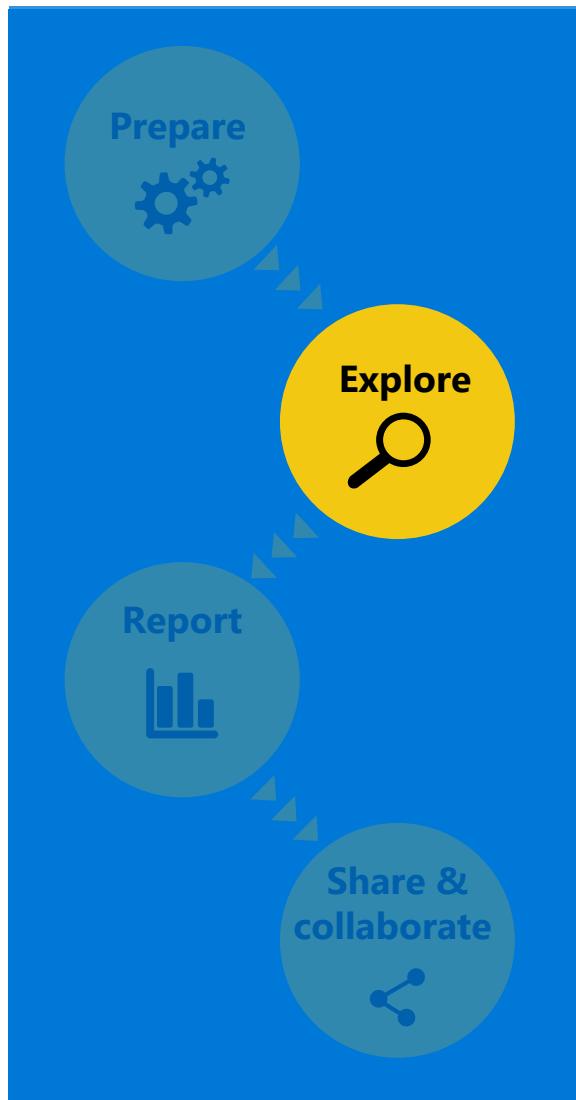


Visualizations – Esri Plus subscription

- Sign up or Sing in from ArcGIS Visualization
- Plus subscription provides additional basemap and global demographics
- Can put up to 5,000 geo locations on your map



Building a Report



Visualizations – Shape Maps (Preview)

- Shows relative comparisons of regions on a map by coloring them differently
- Based on ESRI/TopoJSON maps
- Supports custom maps

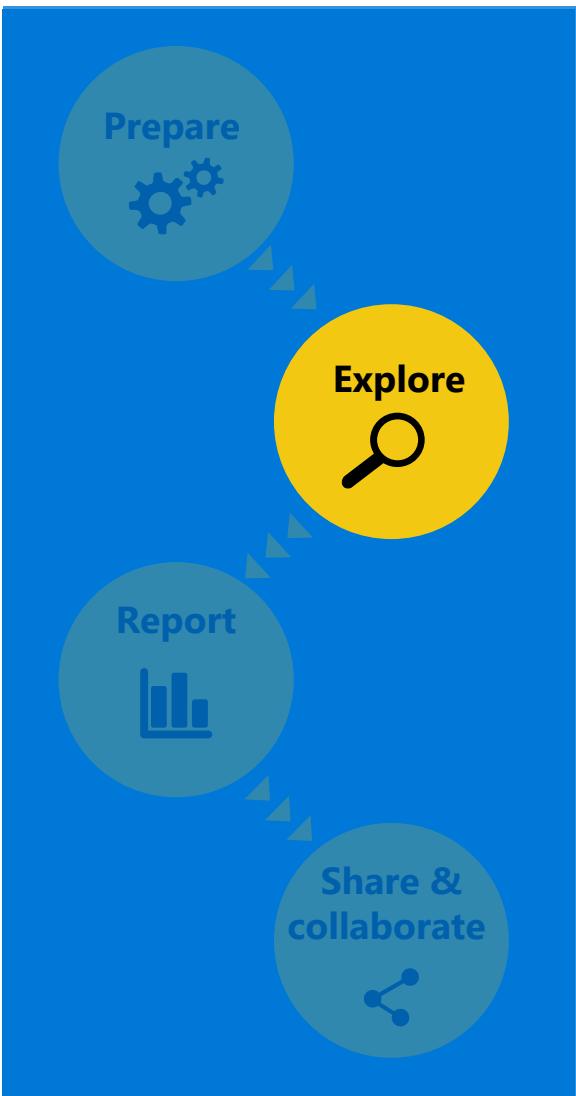
This screenshot shows the Tableau interface with the 'Visualizations' pane open. A 'Shape' visualization icon is selected. In the 'Fields' pane, 'US_States' is chosen as the data source, and 'name' is assigned to the 'Location' shelf. The 'Values' shelf contains 'rnd_value'. A 'Filters' section at the bottom includes 'name(All)' and 'rnd_value(All)'. The 'Shape' card in the center pane shows options like 'Standard Maps' (with 'USA: states' selected), 'Projection', 'Revert to default', 'Data colors', 'Default Color', 'Zoom', 'Title', 'Background', and 'Lock aspect'. A legend titled 'USA: states' is visible on the right.

This screenshot shows the Tableau interface with the 'Visualizations' pane open. A 'Shape' visualization icon is selected. In the 'Fields' pane, 'US_States' is chosen as the data source, and 'name' is assigned to the 'Location' shelf. The 'Values' shelf contains 'rnd_value'. A 'Filters' section at the bottom includes 'name(All)' and 'rnd_value(All)'. The 'Shape' card in the center pane shows options like 'Standard Maps' (with 'USA: states' selected), 'Projection', 'Revert to default', 'Data colors', 'Default Color', 'Zoom', 'Title', 'Background', and 'Lock aspect'. A legend titled 'USA: states' is visible on the right.

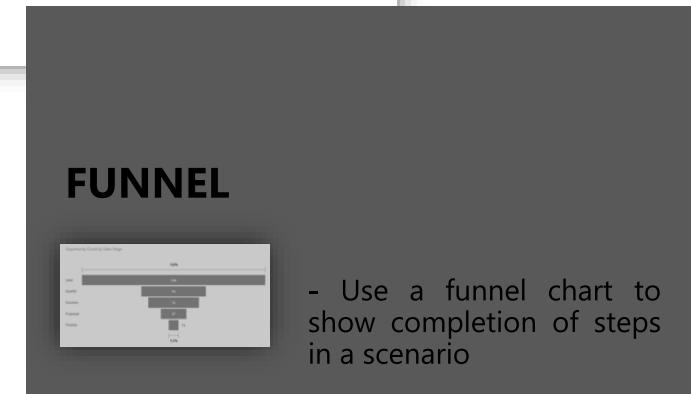
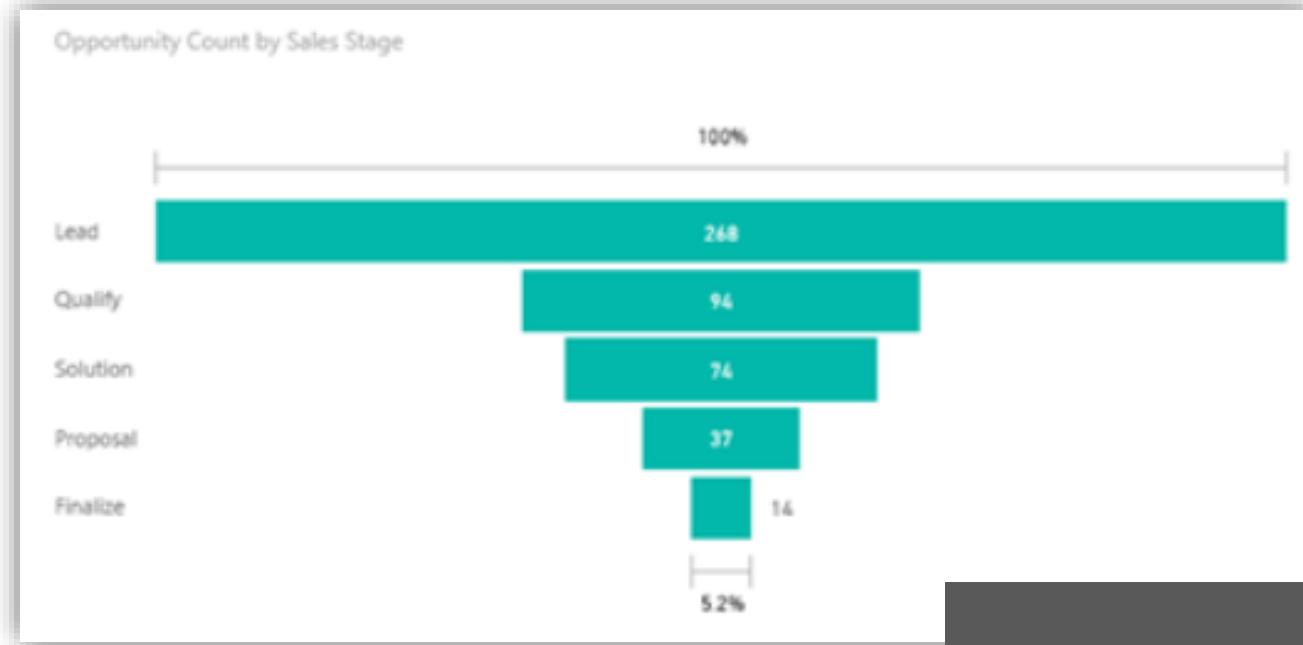


This screenshot shows the Tableau interface with the 'Visualizations' pane open. A 'Shape' visualization icon is selected. In the 'Fields' pane, 'Table1' is chosen as the data source, and 'name' is assigned to the 'Location' shelf. The 'Values' shelf contains 'rnd_value'. A 'Filters' section at the bottom includes 'name(All)' and 'rnd_value(All)'. The 'Shape' card in the center pane shows options like 'Map' (set to 'USA: states'), 'View map keys...', '+ Add Map', 'Project...', 'Revert to default', 'Default Color', 'Zoom', 'Title' (set to 'On'), 'Background' (set to 'Off'), and 'Lock aspect'. A pink arrow points from the number '1' to the 'Map' dropdown menu.

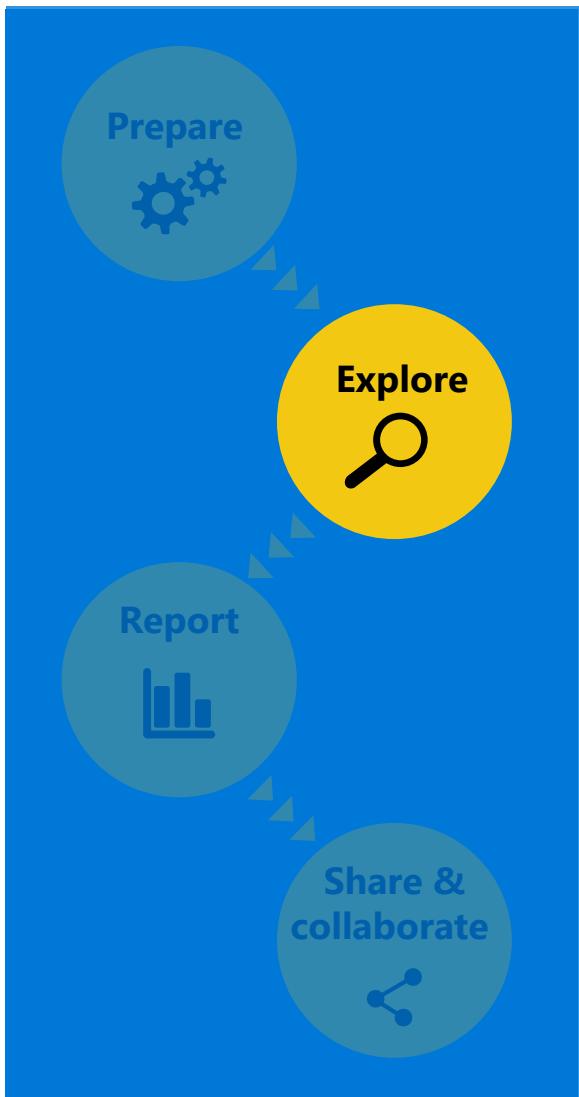
Building a Report



Visualizations – Funnel Chart



Building a Report

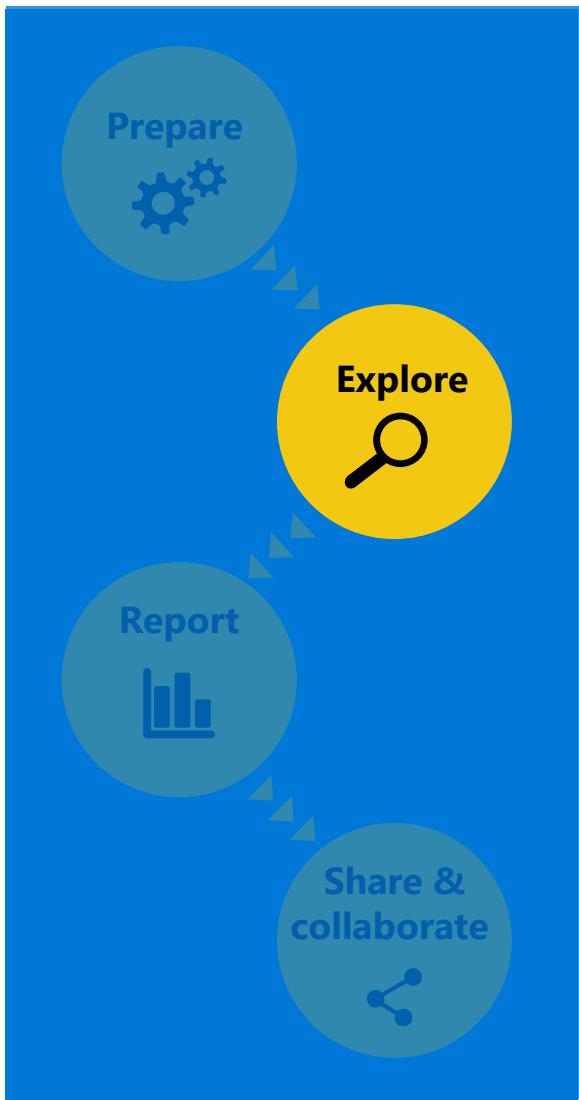


Visualizations – Card and Multi-Row Card

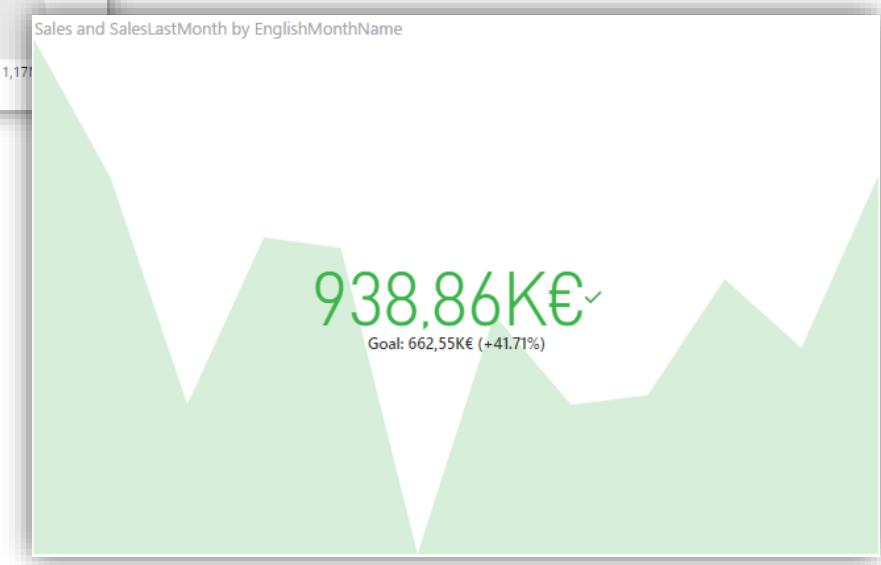
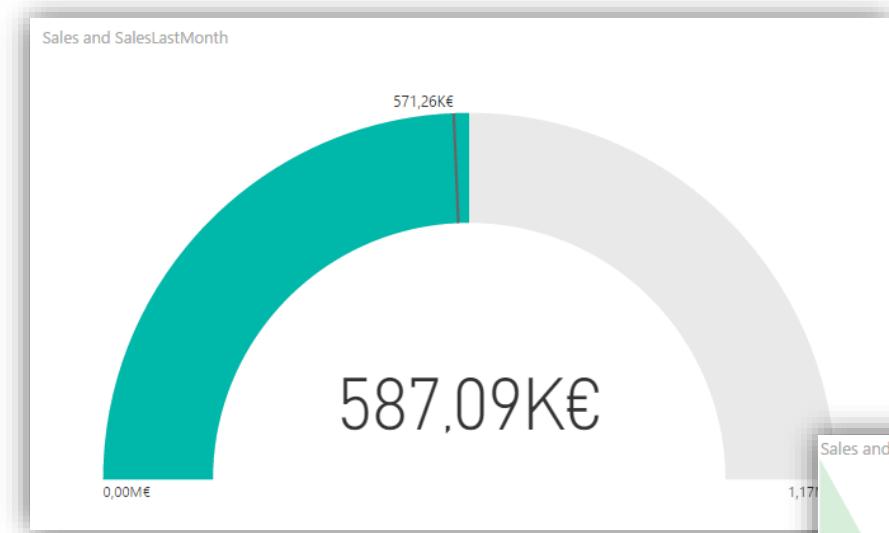
587,09K€
Sales

January	H	2.102.125,2...	2.068.846,72 €
January	L	735.199,95 €	685.600,30 €
January	M	642.080,61 €	639.508,70 €
February	H	1.717.849,5...	1.548.025,29 €
February	L	547.882,23 €	448.408,13 €
February	M	518.169,22 €	504.668,76 €

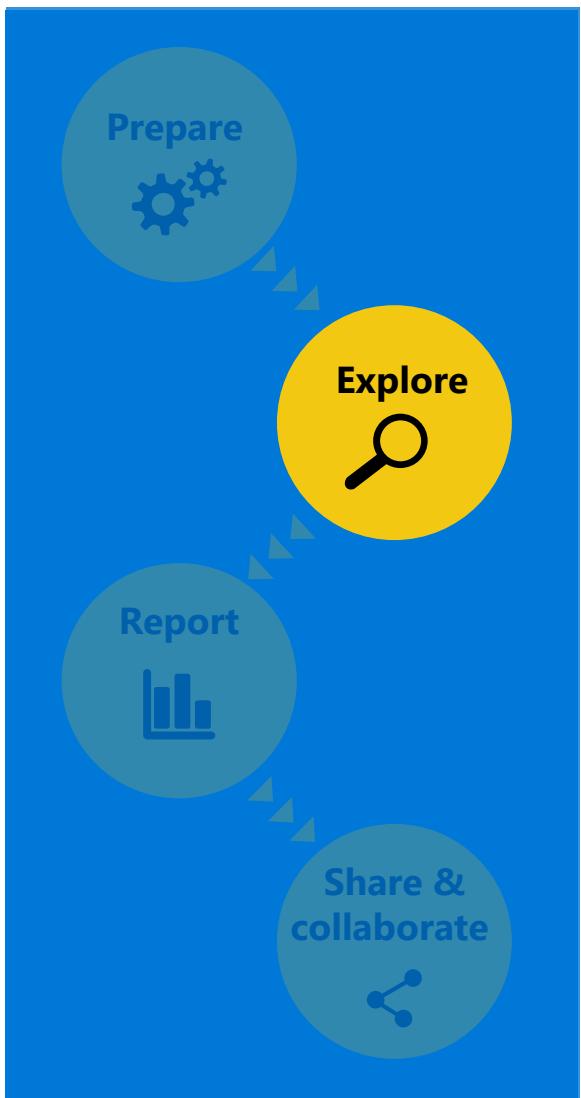
Building a Report



Visualizations – Gauge and KPI



Building a Report



Visualizations – Table and Matrix

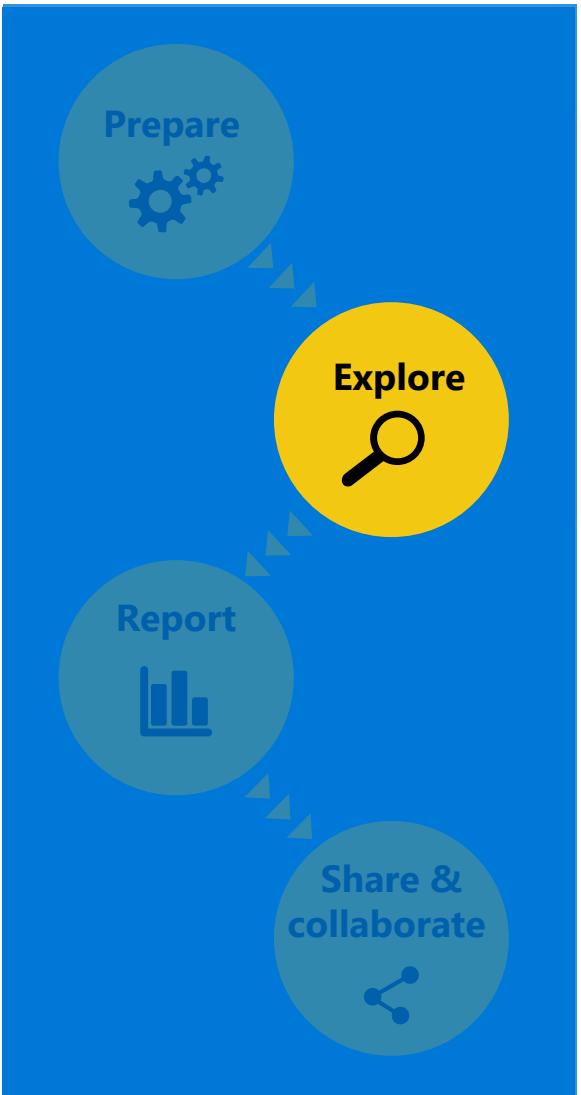
Visualizations – Table and Matrix

The screenshot shows a Microsoft Power BI interface with two main components:

- Table View:** On the left, a table displays monthly sales data. The columns include EnglishMonthName, Class, SalesAmount, and WeightTop10ProductsInSales. The last column uses a color scale from green to red based on its value.
- Matrix View:** On the right, a matrix displays regional revenue data. The rows represent years (CY2013 to CY2015) and categories (Midwest, New England, Northeast, Pacific Northwest, Southern, Southwest, Total). The columns represent regions (Region is not blank, Region is blank, Region is null). Each cell contains a numerical value and a color indicating its magnitude.

A pink arrow points from the context menu of the table's conditional formatting to the "Background color scales" option in the matrix's context menu, illustrating how these features are interconnected.

Building a Report



Visualizations – Table and Matrix

The image illustrates the process of building a report visualization, starting from a raw data table and progressing through conditional formatting settings to a final formatted matrix.

Raw Data Table:

	Category	SubCategory	SalesAmount
1	Audio	Bluetooth Headphones	378,685.86
2		MP4&MP3	482,111.29
3		REconomydring Pen	304,390.85
4	Total		1,165,188.00
5	Cameras and camcorders	Camcorders	2,048,841.00
6		Cameras & Camcorders Accessories	161,040.01
7		Digital Cameras	1,079,453.90
8		Digital SLR Cameras	1,167,697.10
9	Total		4,457,032.01
10	Cell phones	Cell phones Accessories	18,704.00
11		Home & Office Phones	76,156.95
12		Smart phones & PDAs	745,239.00
13		Touch Screen Phones	518,090.00
14	Total		1,358,189.95
15	Computers	Computers Accessories	699,162.40
16		Desktops	1,692,976.80
17		Laptops	3,771,848.75
18		Monitors	2,155,865.00
19		Printers, Scanners & Fax	2,119,935.00
20		Projectors & Screens	5,946,536.00

Conditional Formatting Settings:

The image shows two instances of the "Background color scales" dialog box, which allows users to format cells based on their value.

- Top Dialog:** Shows a "Diverging" color scale from red (Lowest value) to green (Highest value). It includes fields for "Base value" (Net Profit), "Format blank values" (As zero), and sliders for "Minimum", "Center", and "Maximum".
- Bottom Dialog:** Shows a "Color by rules" option selected. It includes a "Rules" section with three defined rules:
 - If value is greater than or equal to Minimum and is less than 100000, then red
 - If value is greater than or equal to 100000 and is less than 1000000, then yellow
 - If value is greater than or equal to 1000000 and is less than 100000000, then green

Final Visualizations:

Two final visual representations are shown, both using the conditional formatting rules defined above:

- Matrix View:** A grid where colors represent sales amounts based on the defined rules. Red cells indicate low sales, yellow cells indicate moderate sales, and green cells indicate high sales.
- Table View:** A standard table view where each cell's background color corresponds to its sales amount according to the established rules.

Building a Report



Visualizations – Table and Matrix

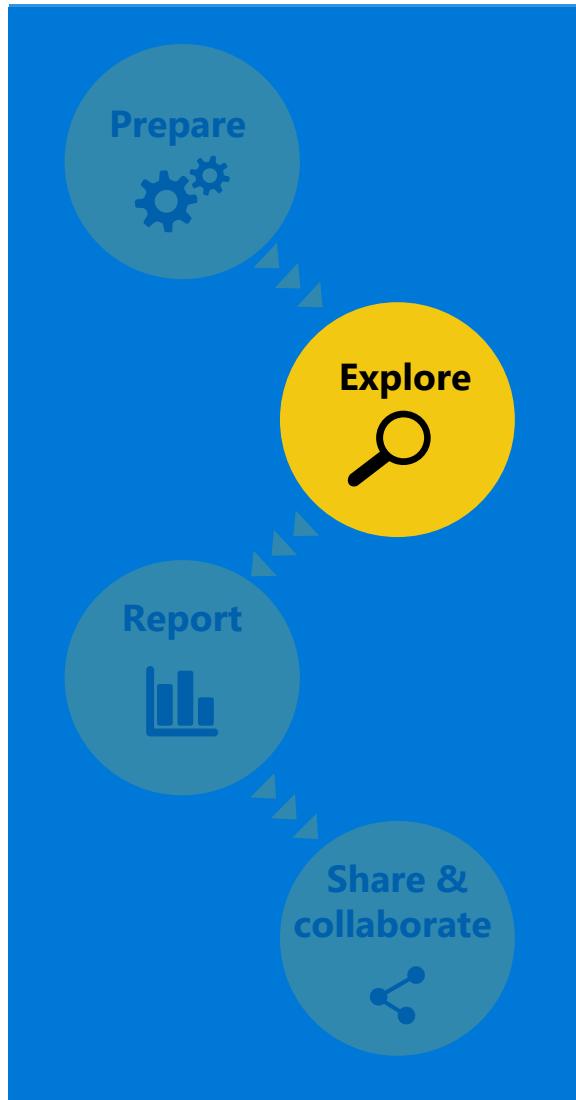
- Contains predefined styles for Table and Matrix
- Matrixes support drilling on Rows or Columns.

The screenshot shows the Power BI Desktop interface with the following details:

- Visual Tools ribbon:** The ribbon is set to "Visual Tools" mode, with tabs for File, Home, Modeling, Format, and Drill.
- Table visualization:** A table is displayed with columns: Color, Class, Year, Quarter, Month, Day, Units, and SalesTax. The data includes rows for various years and quarters.
- Format pane:** The "Format" pane is open on the right, showing the "Visualizations" and "Fields" sections.
- Table style settings:** The "Table style" section is highlighted with a red circle. A detailed view of the "Table style" dropdown menu is shown, listing options such as "None", "Minimal", "Bold header", "Alternating rows", "Contrast alternating rows", "Flashy rows", "Bold header Flashy rows", "Sparse", and "Condensed".

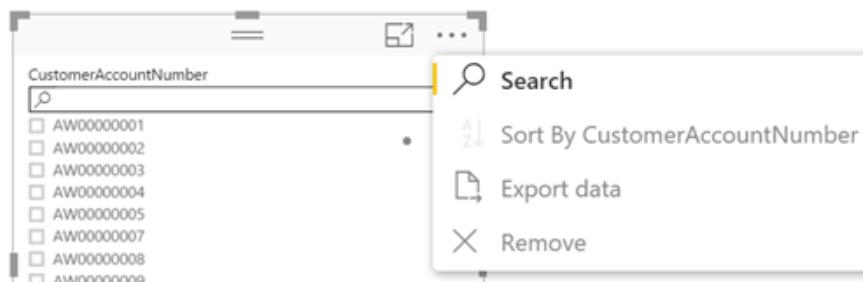
Color	Class	Year	Quarter	Month	Day	Units	SalesTax
Azure	Dlx	2013	Qtr 3	September	29	2	49.30
Azure	Dlx	2013	Qtr 4	October	6	1	23.89
Azure	Dlx	2014	Qtr 2	May	12	2	49.30
Azure	Dlx	2014	Qtr 2	May	16	4	95.54
Azure	Dlx	2014	Qtr 2	May	31	3	71.66
Azure	Dlx	2014	Qtr 2	June	6	2	49.30
Azure	Dlx	2014	Qtr 2	June	8	3	73.95
Azure	Dlx	2014	Qtr 4	October	4	4	98.65
Azure	Dlx	2015	Qtr 4	October	16	1	23.89
Azure	Dlx	2015	Qtr 2	April	10	1	24.65
Azure	Dlx	2015	Qtr 2	May	30	5	123.25

Building a Report



Visualizations – Slicers

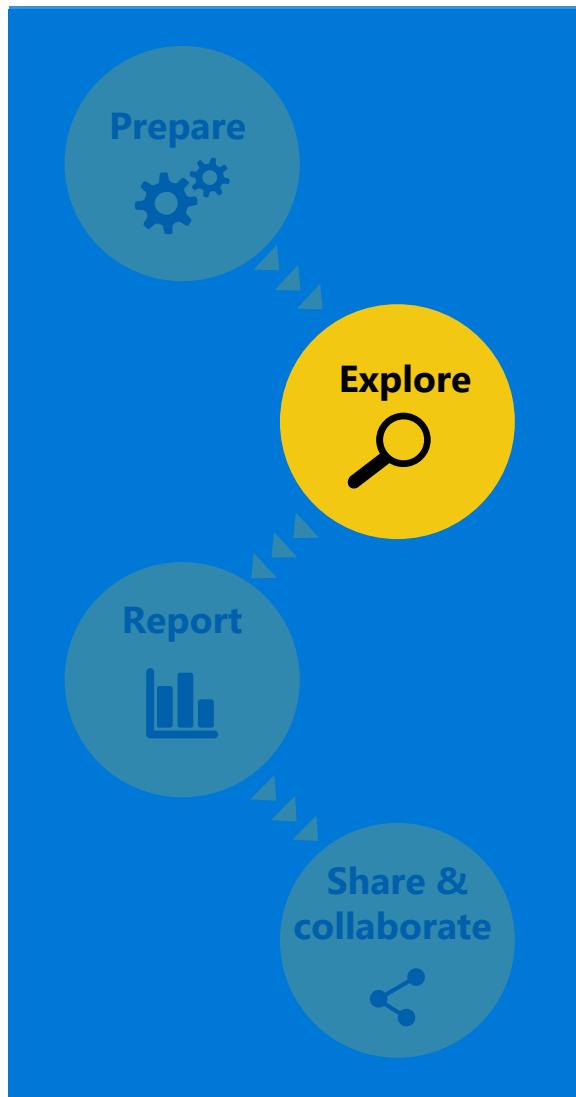
- Filter data on multiple visualization (similar to Excel slicers)
- Allow **Select All**
- Multi and Single selection
- Special slicers for date field (relative!) and numeric
- Slicers are **searchable**



A composite screenshot of several Power BI visualizations:

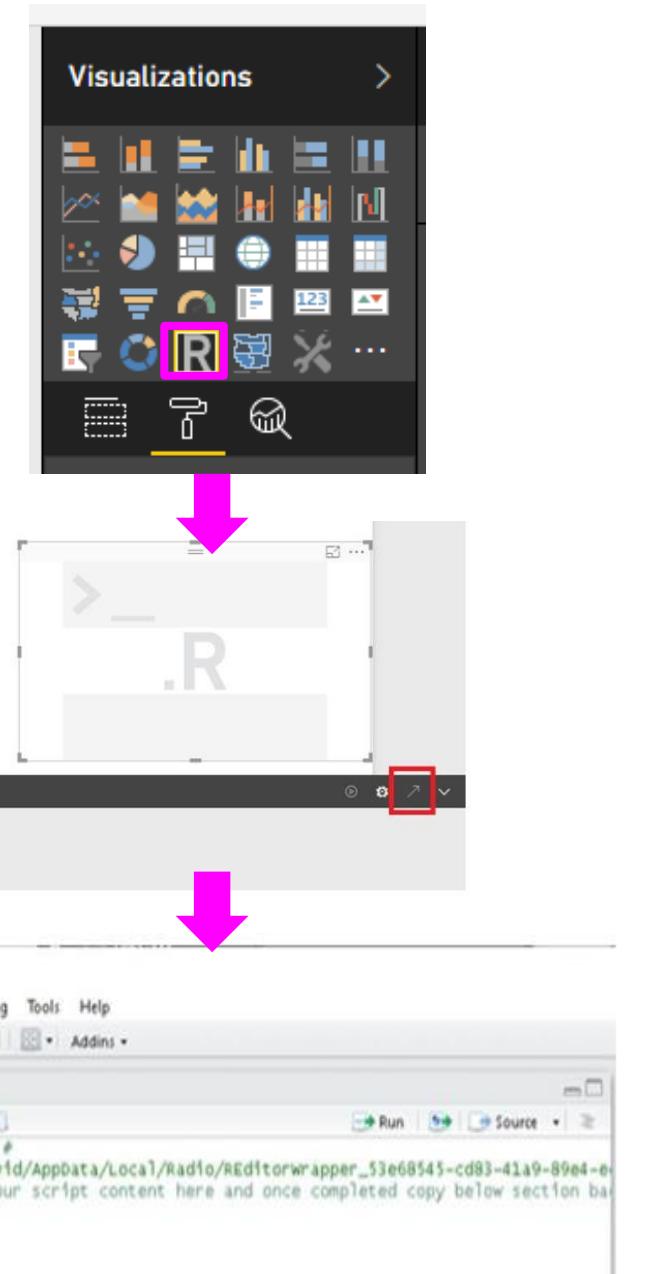
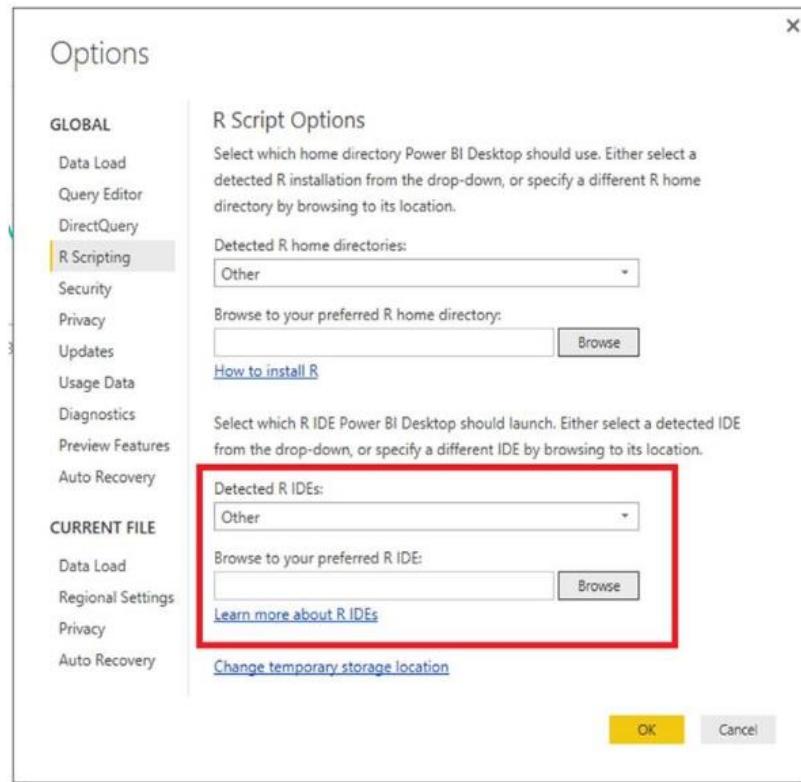
- EnglishMonthName**: A horizontal slicer showing months from January to June. The month "May" is highlighted.
- Order Date**: A date range slicer set between 7/15/2010 and 3/20/2013. It includes a date calendar for March 2013 where the 20th is selected.
- Date**: A date slicer showing 'Last 1 Years' from 13-06-2016 to 12-06-2017.
- CalendarYear**: A vertical slicer listing years from 2005 to 2014. The years 2008, 2010, and 2011 are checked.
- Country**: A dropdown slicer showing a list of countries: Australia, Canada, France, Germany, and others. The country "Germany" is selected.
- Visual**: A dropdown slicer showing a list of countries: Australia, Canada, France, and Germany. The country "Germany" is selected.

Building a Report

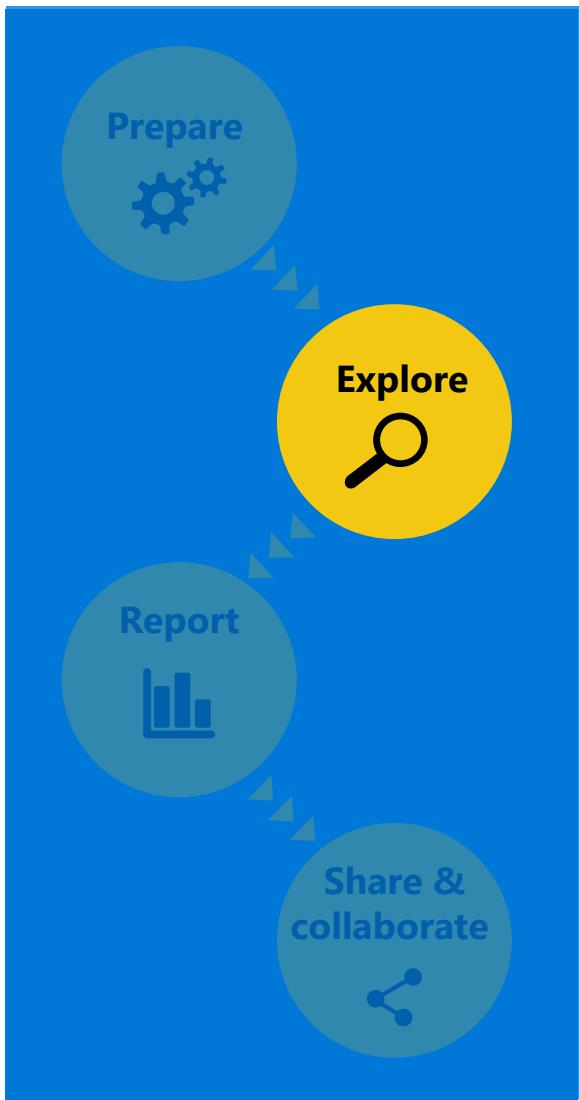


Visualizations – R Script visual

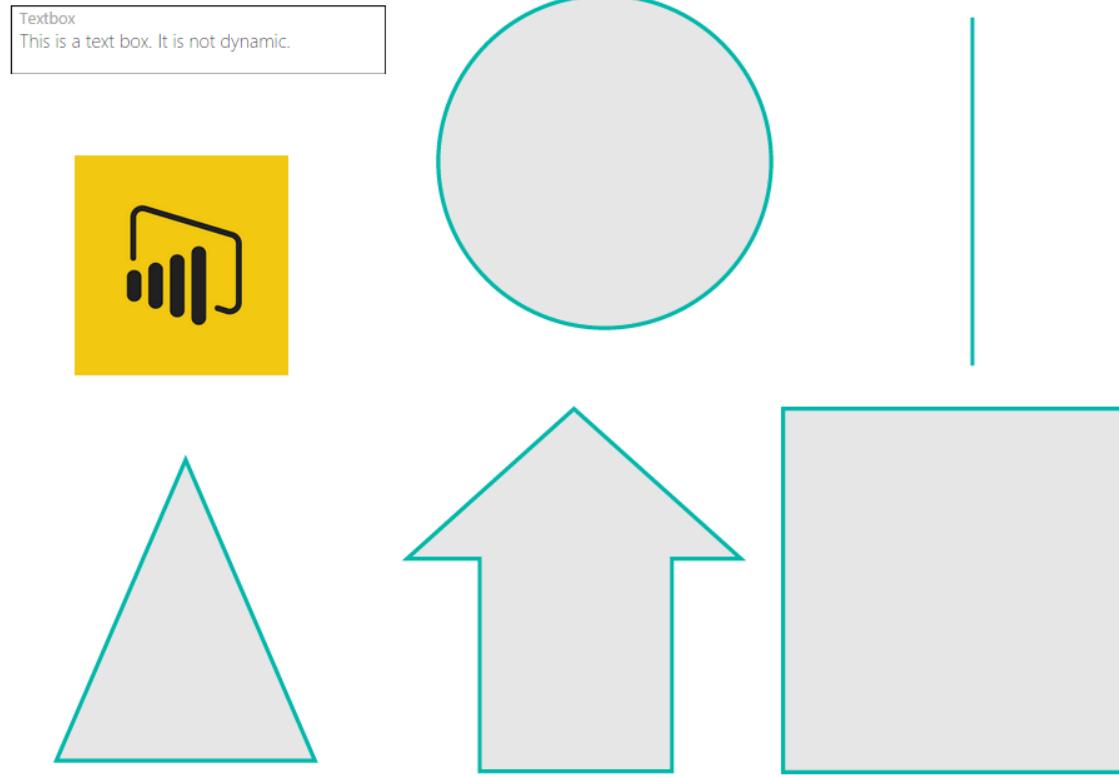
- Create charts based on R script
- Choose your favorite R IDE to edit script



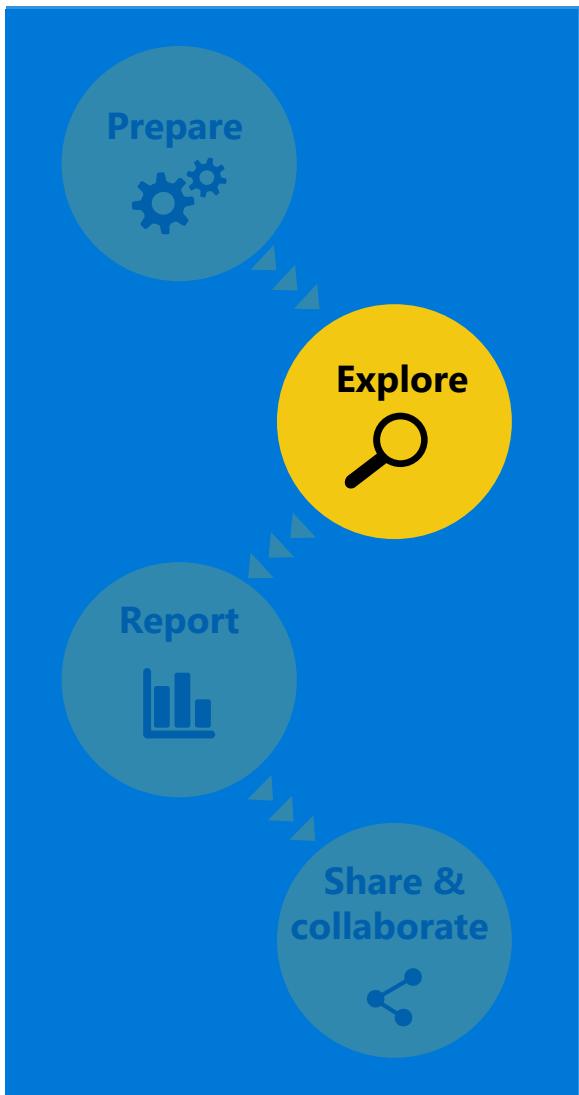
Building a Report



Visualizations – Textboxes, Images and Shapes

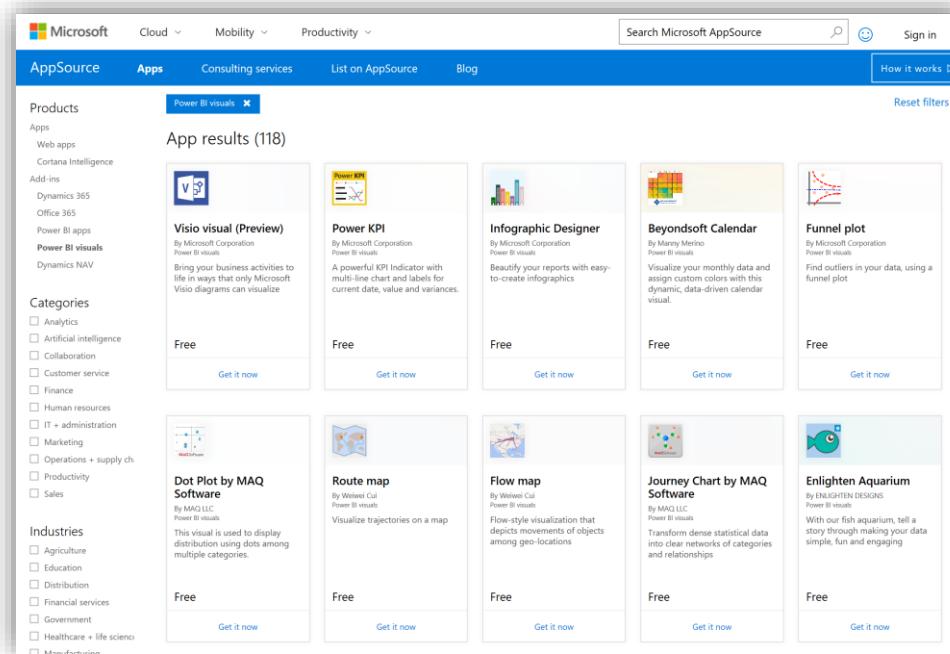


Building a Report

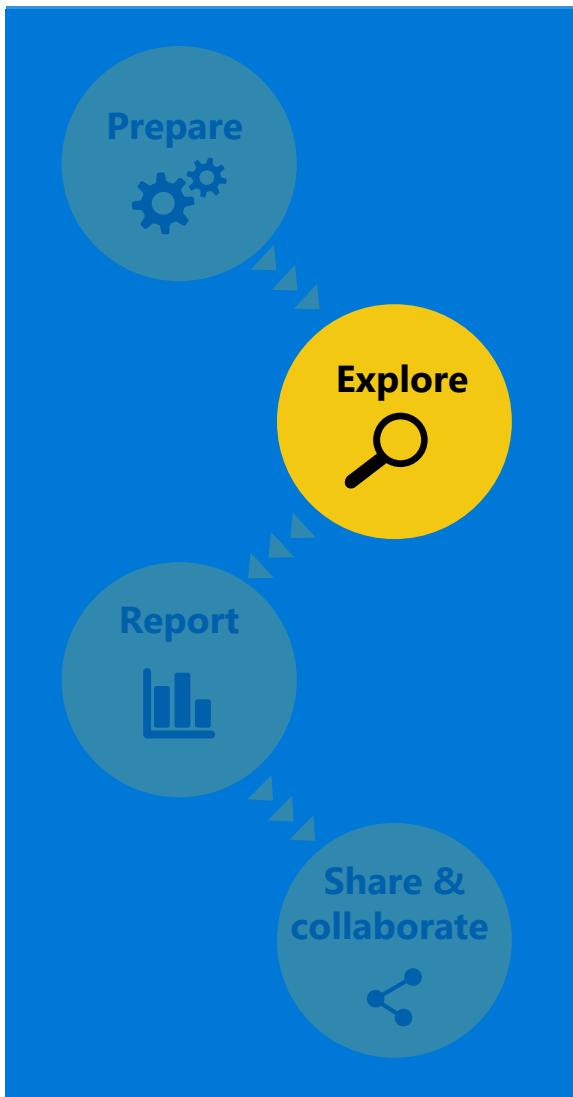


Visualizations – Custom Visualizations

- Microsoft enabled 3rd party, or you, to build your own Visuals
- After you build them, you can use them or you can share with the community
- If you share, we will do a quality check and make it available at
<https://appsource.microsoft.com/en-us/marketplace/apps?product=power-bi-visuals>



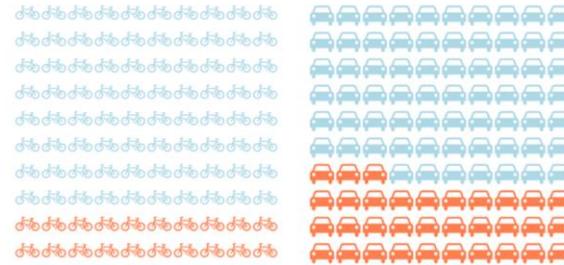
Building a Report



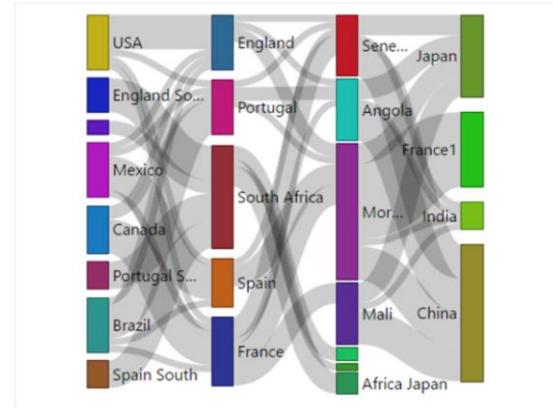
Visualizations – Custom Visualizations



Synoptic Panel by OKViz



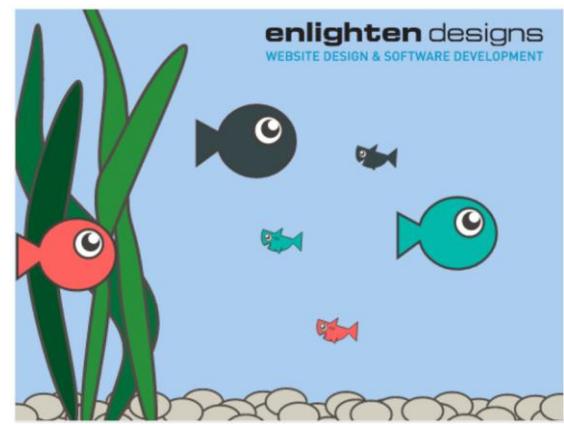
20%
Bicycle
33%
Car



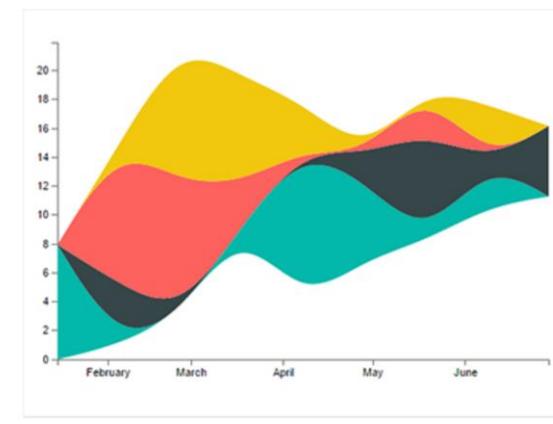
Sankey Chart



Word Cloud

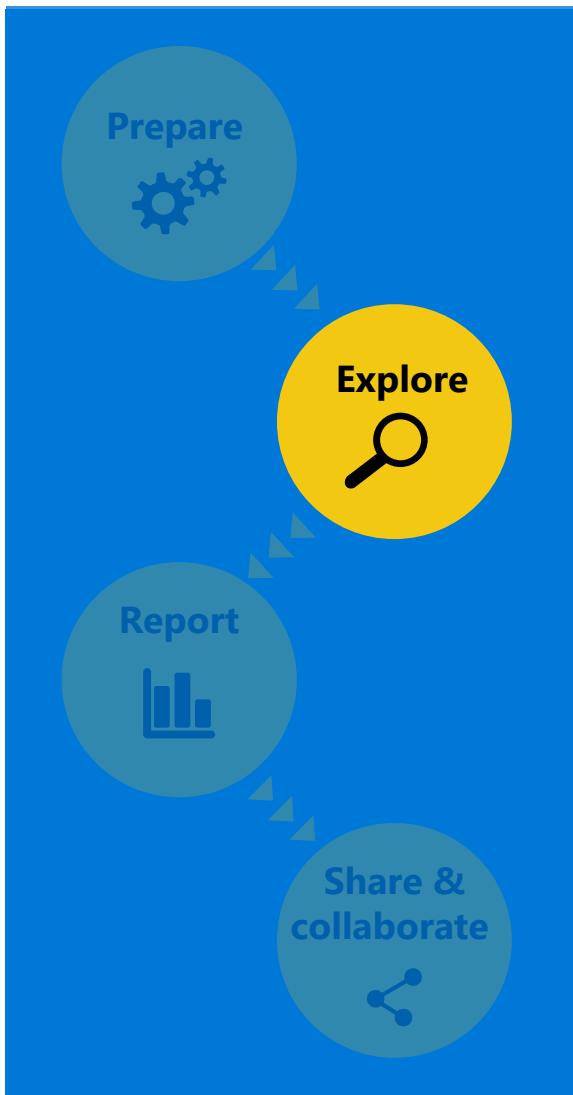


Enlighten Aquarium



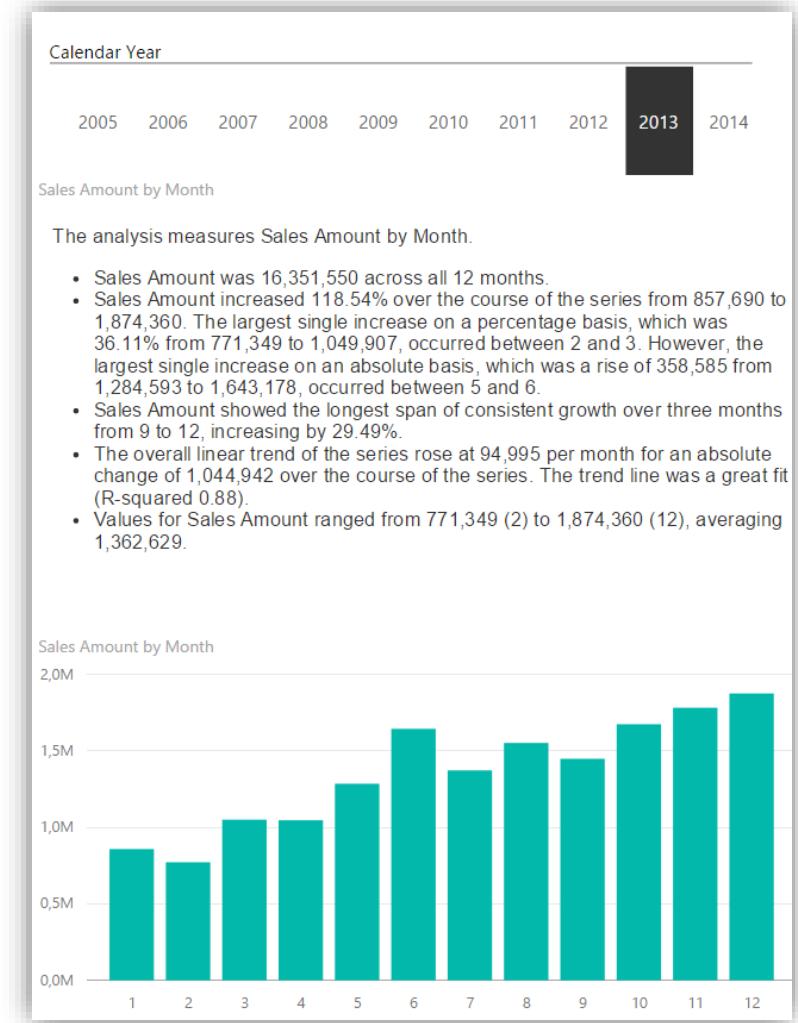
Stream Graph

Building a Report

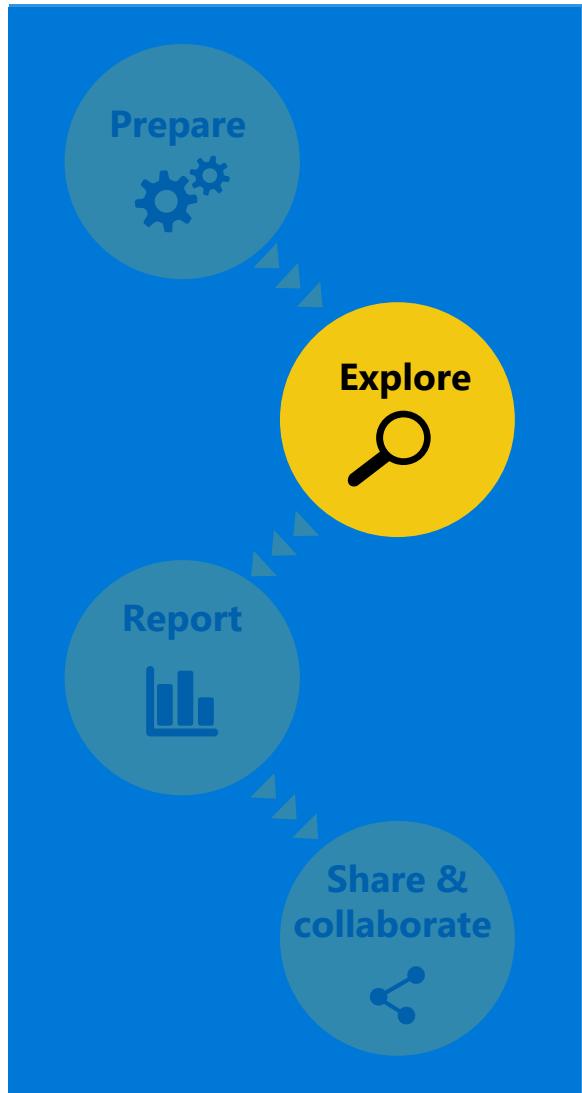


Visualizations – Custom Visualizations – Natural Language Narratives

- Sometimes a picture is not worth a thousand words
- Get your **data narrated** in natural language, automatically
- **Easily share** these conclusions with others and speed-up the analysis process
- Reacts to **filtering**
- Just choose the dimensions and values and configure nouns

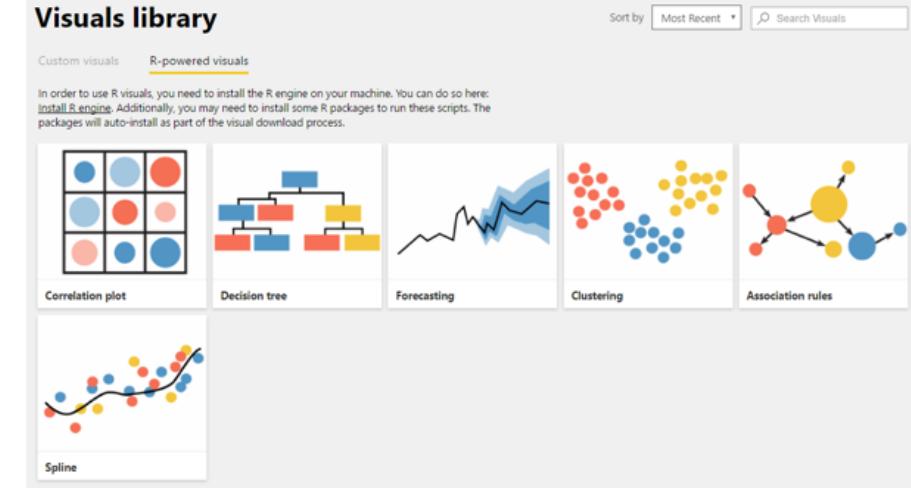
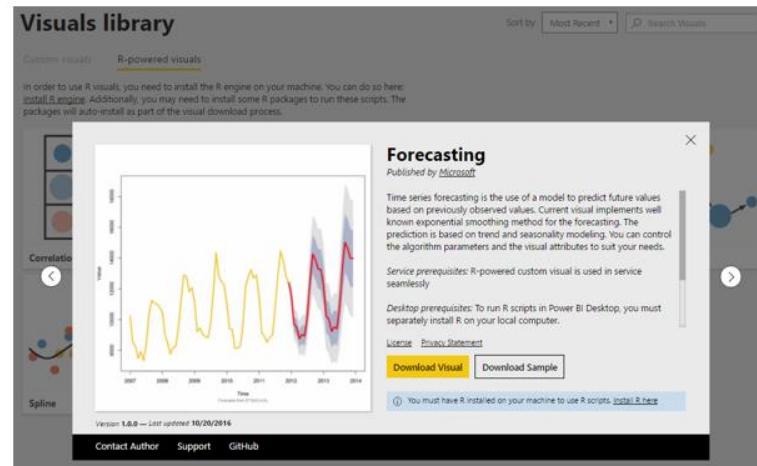


Building a Report



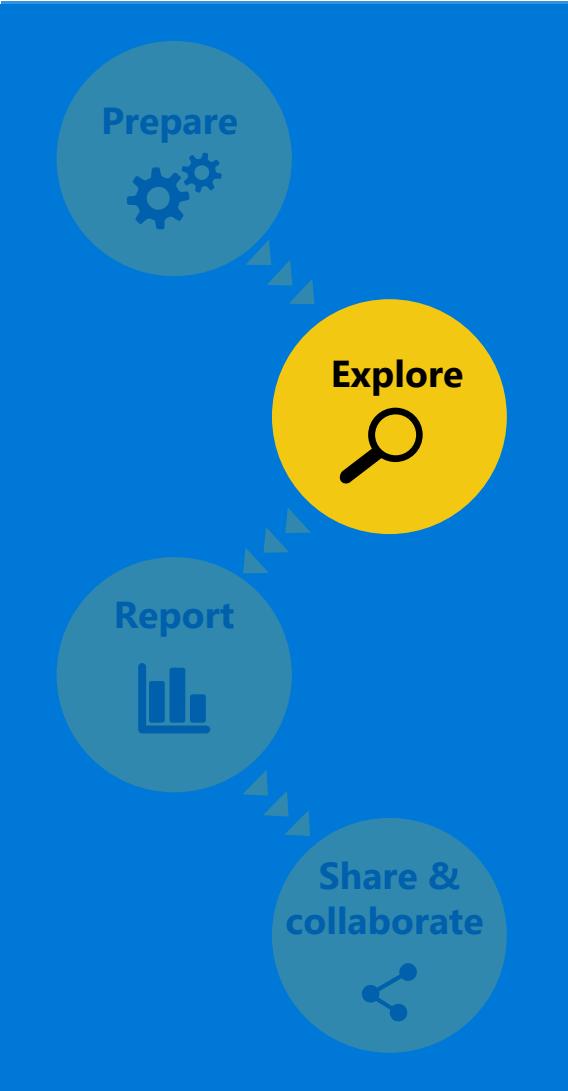
Visualizations – Custom Visualizations

- R-powered custom visuals
- Download and import the R-powered custom visuals like any regular custom visuals



A screenshot of the Power BI visualization editor. The left side shows a 'Visualizations' pane with various chart icons. The right side shows a 'Fields' pane where data is mapped to visual fields. The 'Date' field is mapped to 'Date' and 'Value' fields, and the 'Price' field is mapped to 'Price'. The 'Fields' pane also includes a 'Search' bar and a 'Table 0' section with checkboxes for 'Change %', 'Date', 'High', 'Low', 'Open', and 'Price'.

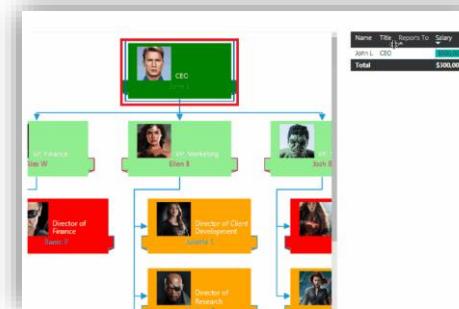
Building a Report



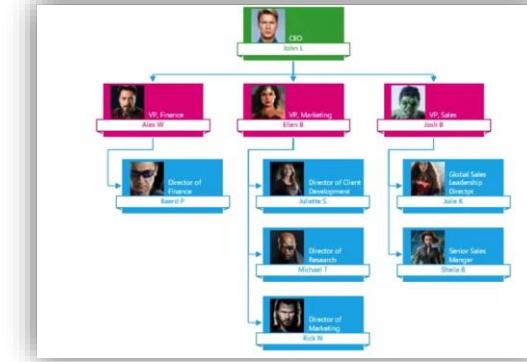
Visualizations – Custom Visualizations

- Visio Visual custom visuals (public preview)
- Used for:
 - interconnected workflows
 - real-world layouts
 - fishbone diagrams for root-cause analysis
 - organizational charts for assessing the impact of hierarchies on process decisions and people management

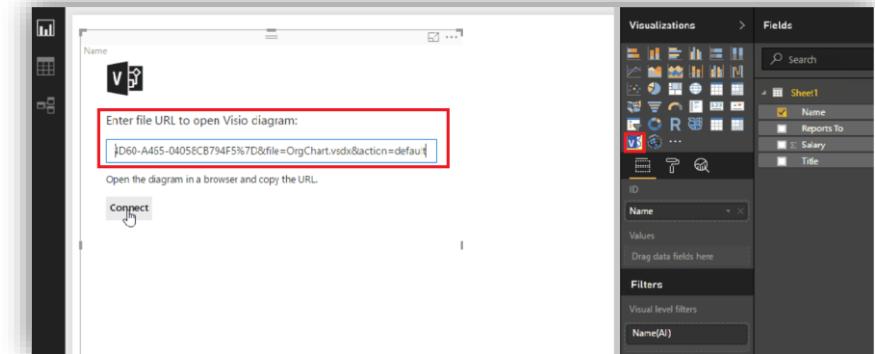
- 4 Get the mapped results to the chart both with total numbers and with the interactivity



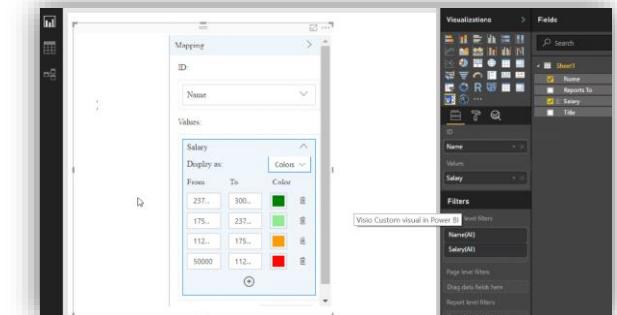
- 1 Create a visio organization chart with data and save



- 2 Add the custom visio visual as any other and connect to the url of the diagram saved



- 3 Make the mapping and add data values



Building a Report

Prepare



Explore



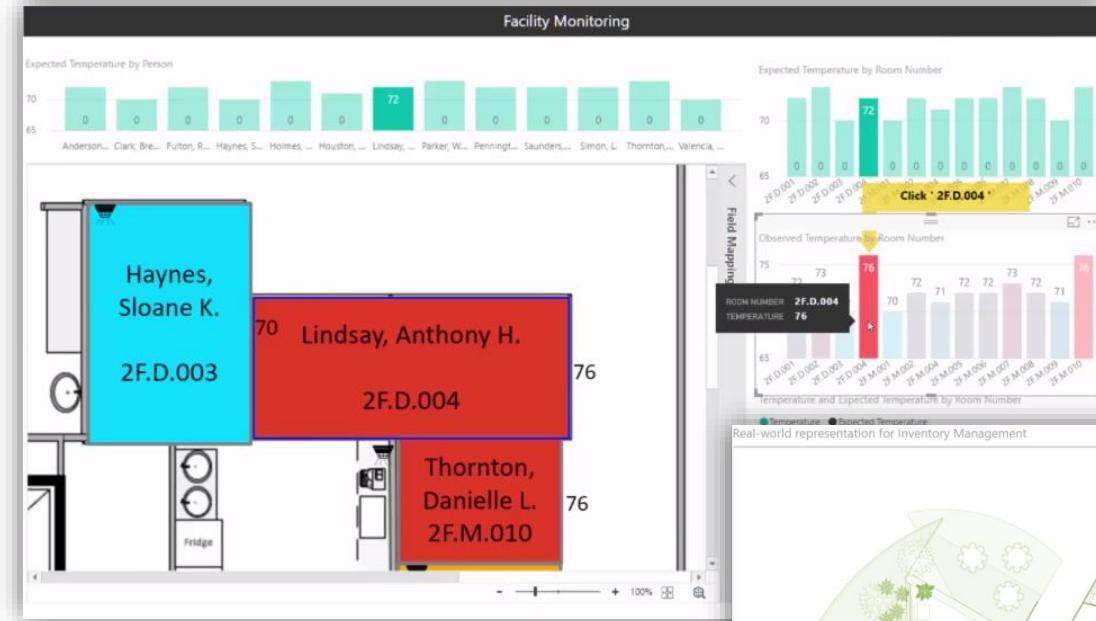
Report



Share & collaborate



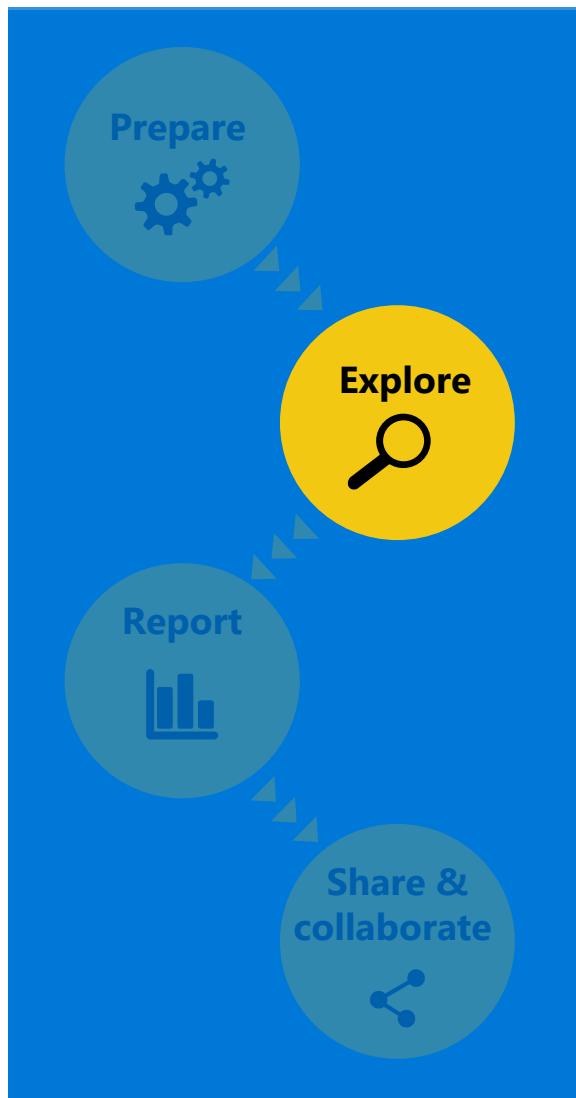
Visualizations – Custom Visualizations



- Maps data automatically
- Requires label uniqueness



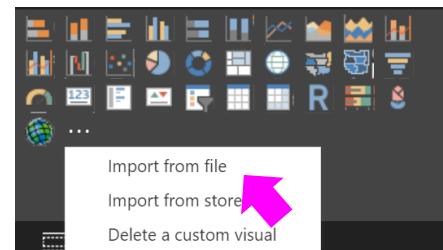
Building a Report



Visualizations – Custom Visualizations

1 Download the visual from file. It will be a .pbviz file

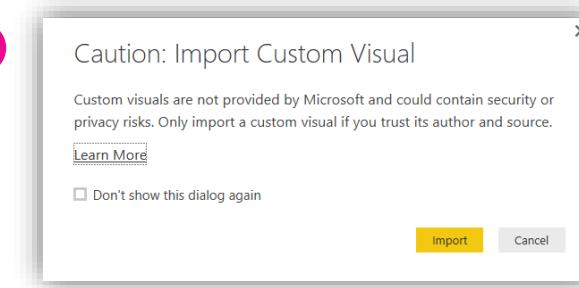
2



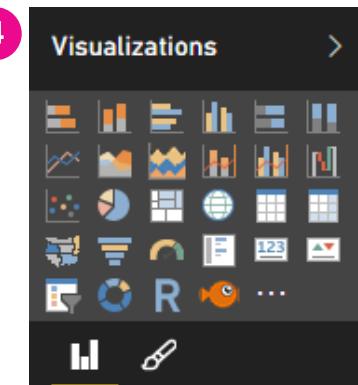
OR



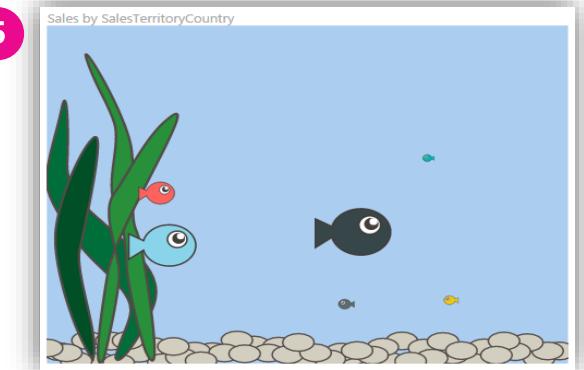
3



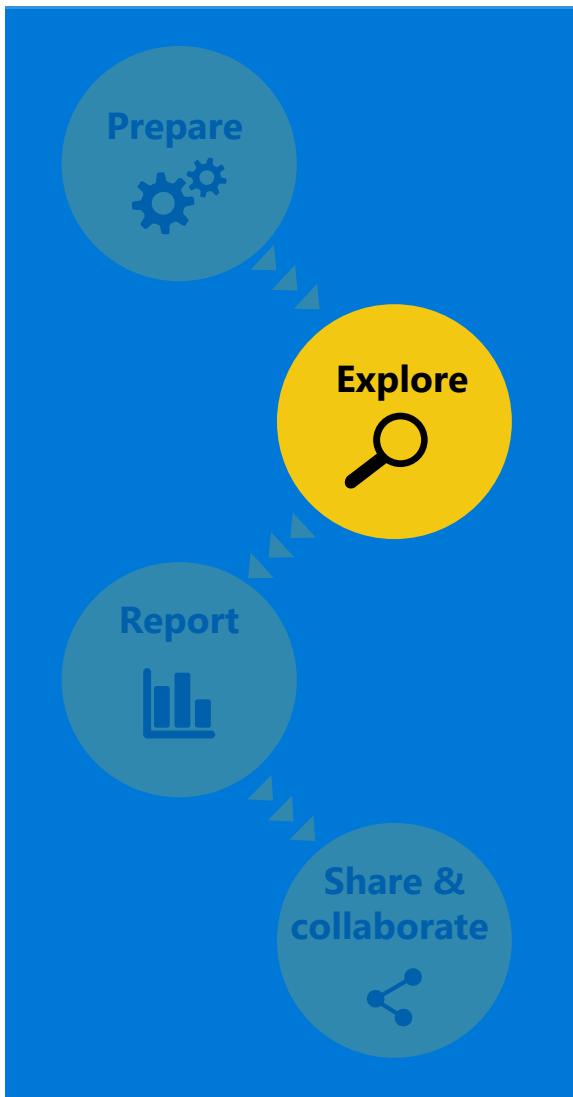
4



5



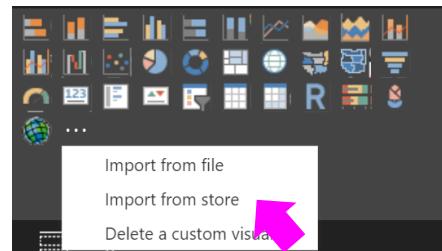
Building a Report



Visualizations – Custom Visualizations

1 Download/Import the visual from Store. It will be a .pbviz file

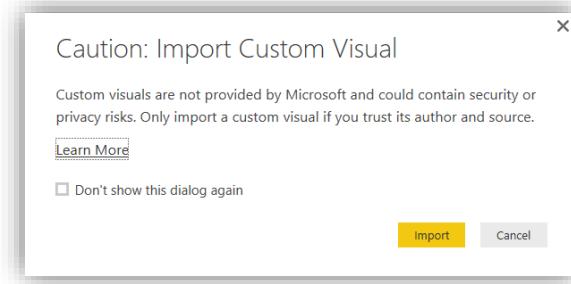
2



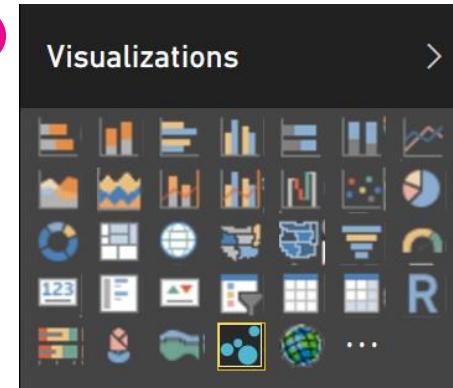
OR



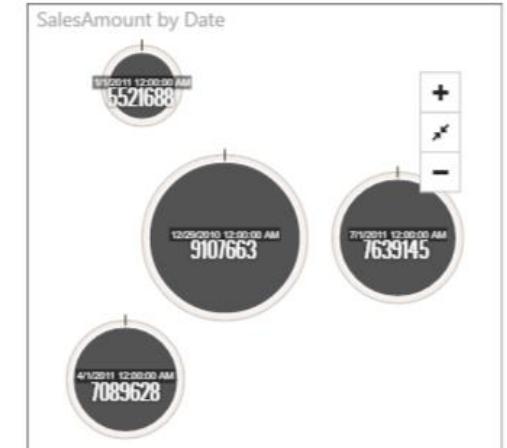
3



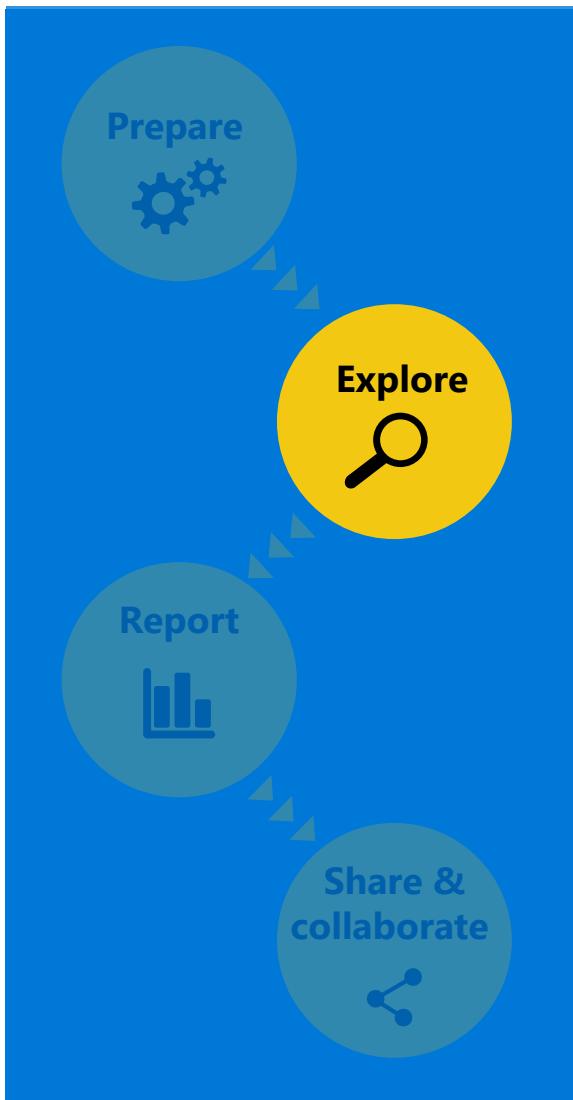
4



5

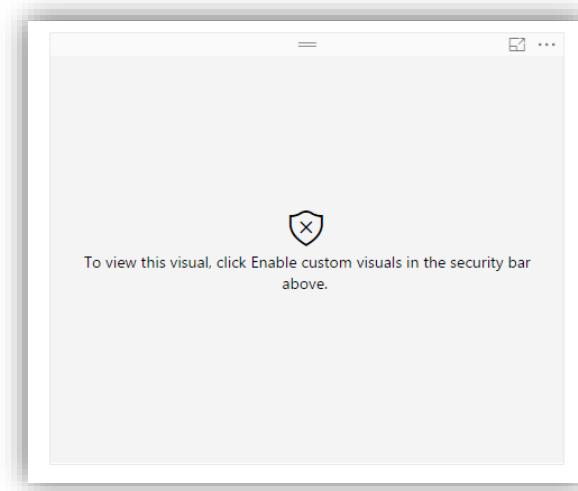
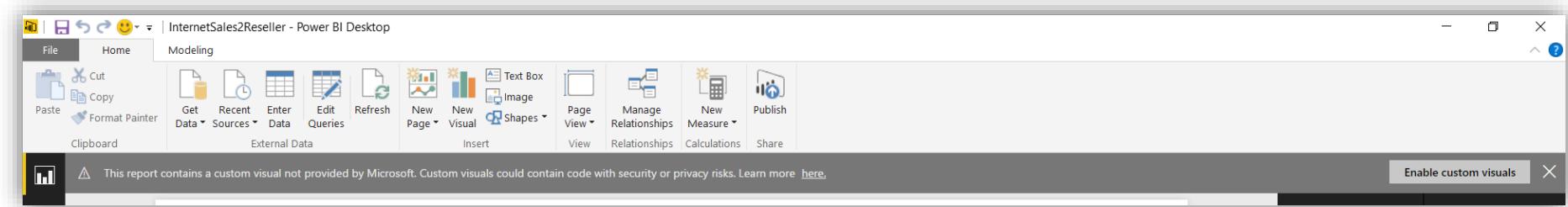


Building a Report

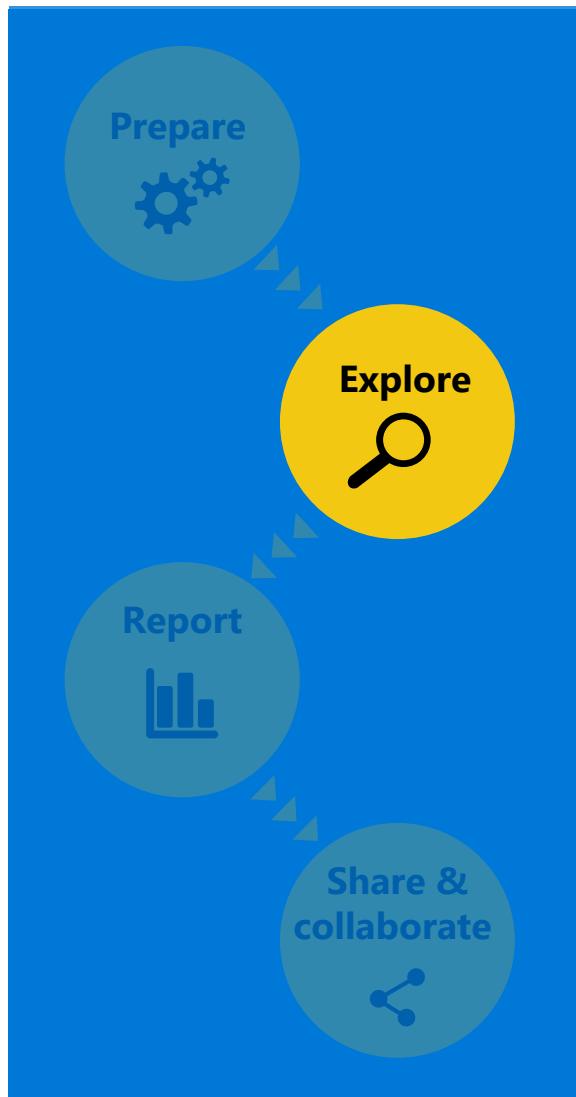


Visualizations – Custom Visualizations

- Next time you open the report you'll be prompted to enable custom visuals

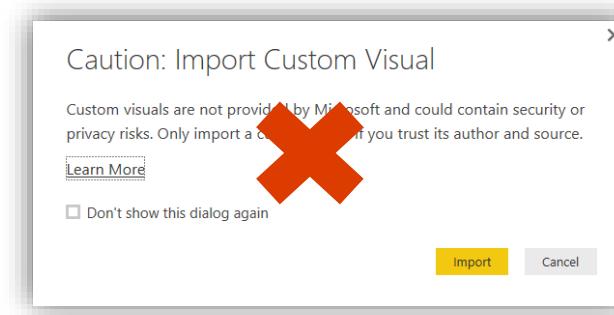
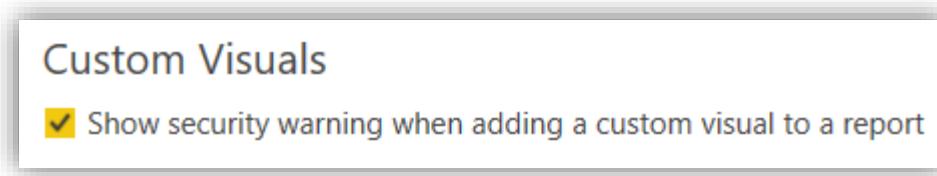


Building a Report



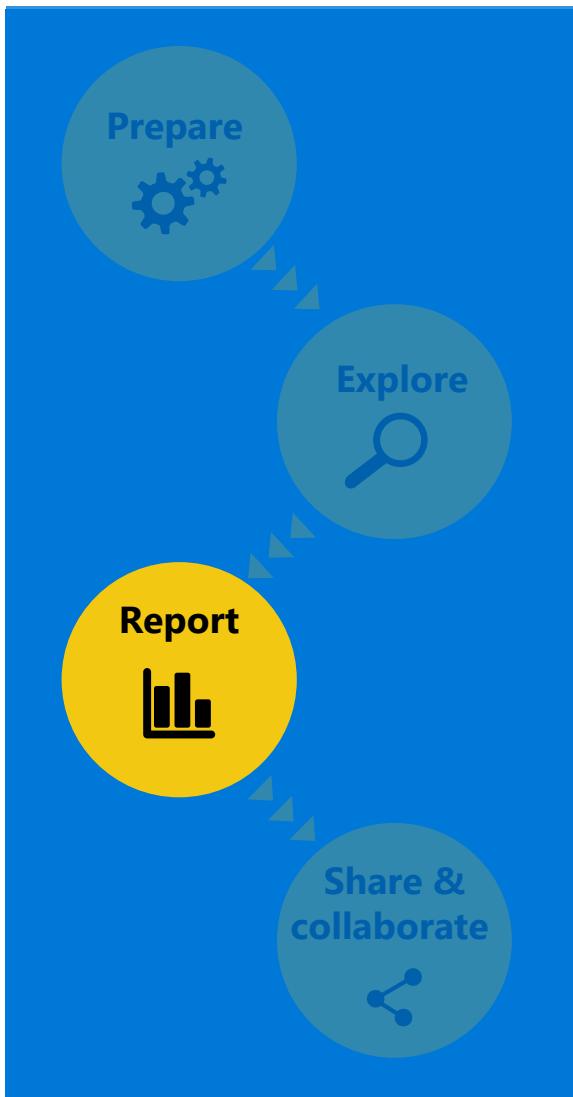
Visualizations – Custom Visualizations

- You **can't disable** that verification, only the warning when you first import custom visuals



- Custom visuals have to be added to each report (.pbix file) and they are not automatically updated

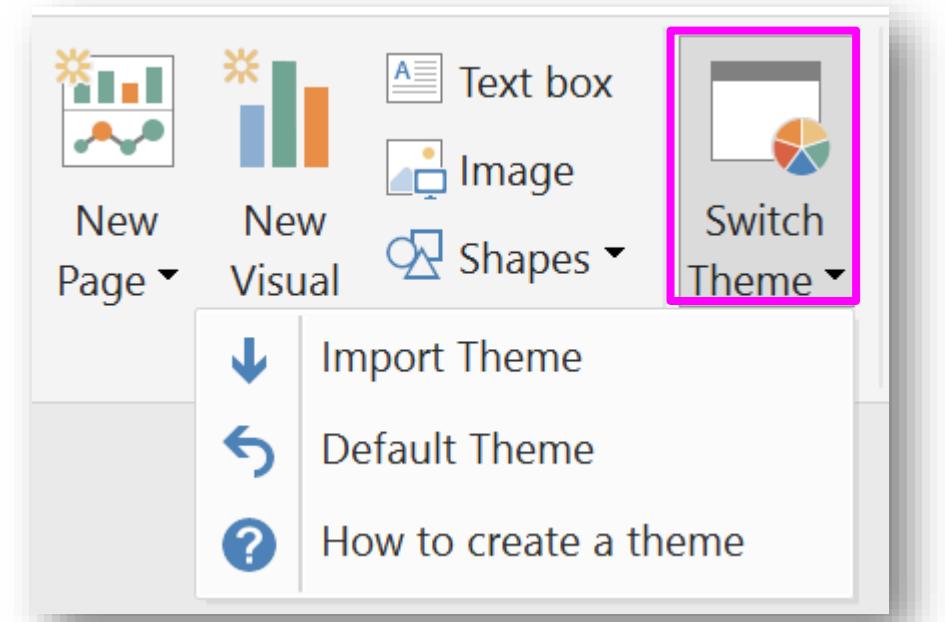
Building a Report



Report Themes

- Define your **custom color palette**
- Definition of **theme json file**
- The theme will be **applied to all visualizations** (except if custom data points were defined)
- The theme gets applied in the service, too.

```
visualstyles: {  
    visualName: {  
        styleName: [{  
            cardName: [{  
                propertyName: propertyName  
            }]  
        }]  
    }  
}
```

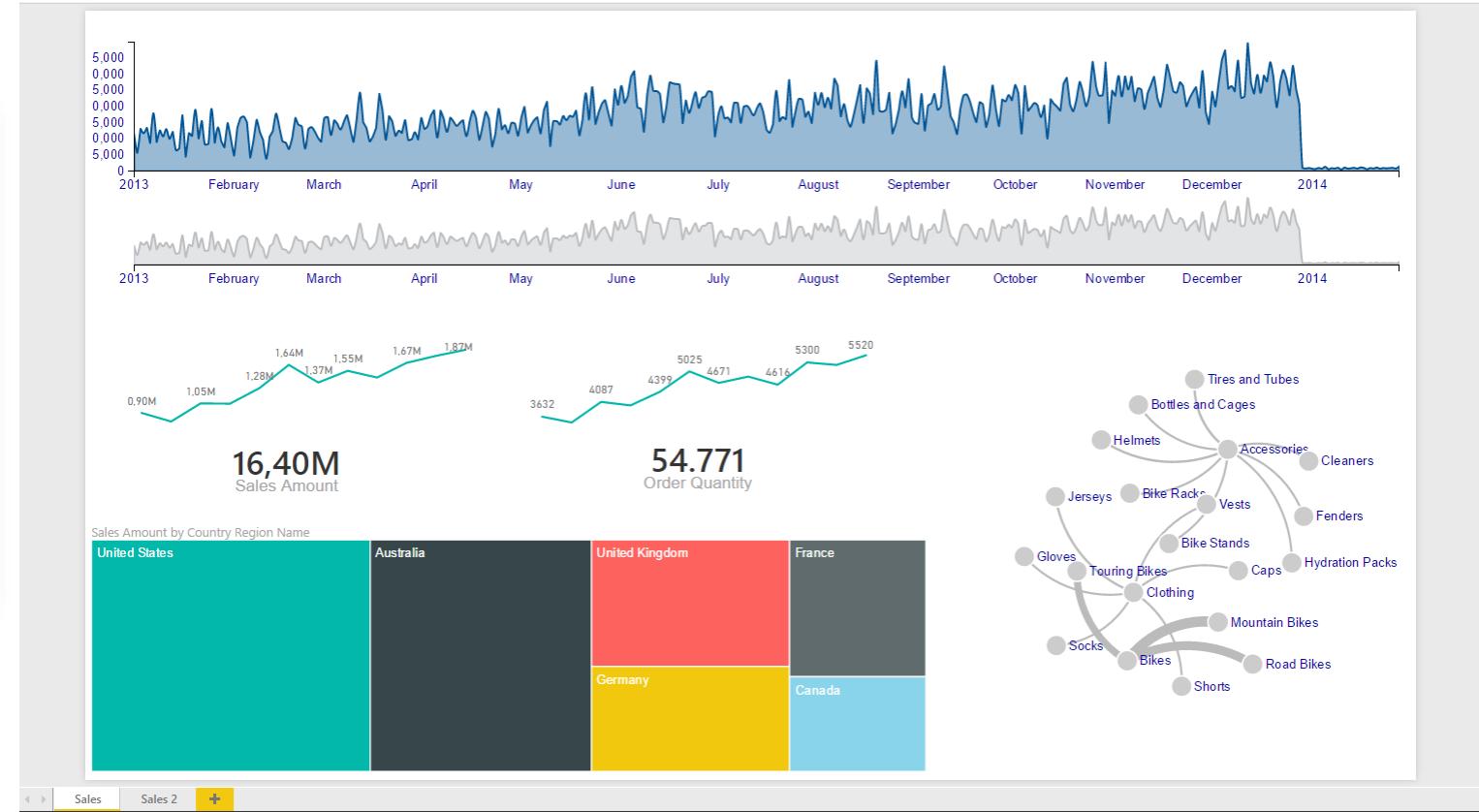


```
{  
    "name": "waveform",  
    "dataColors": [ "#31B6FD", "#4584D3", "#5BD078", "#A5D028", "#F5C040", "#05E0DB",  
    "#3153FD", "#4C45D3", "#5BD0B0", "#54D028", "#D0F540", "#057BE0" ],  
    "background": "#FFFFFF",  
    "foreground": "#F2F2F2",  
    "tableAccent": "#5BD078"  
}
```

Building a Report

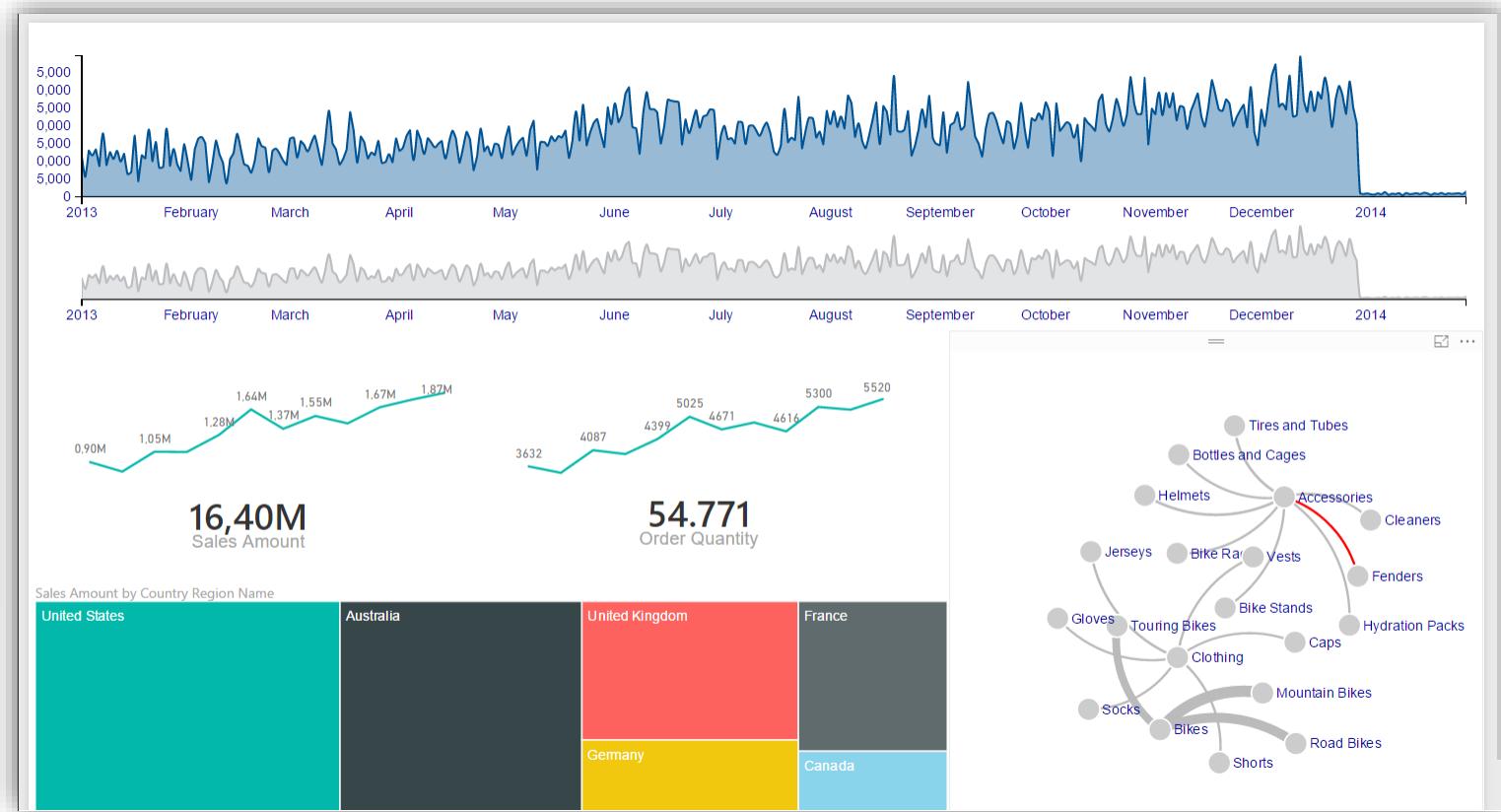
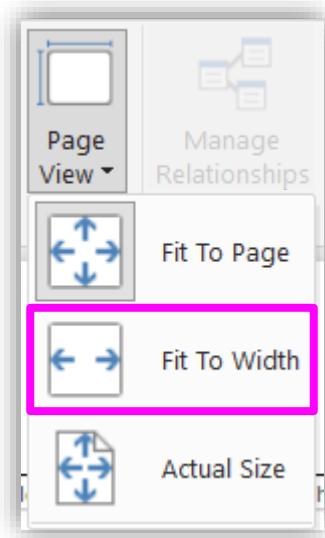


Page View



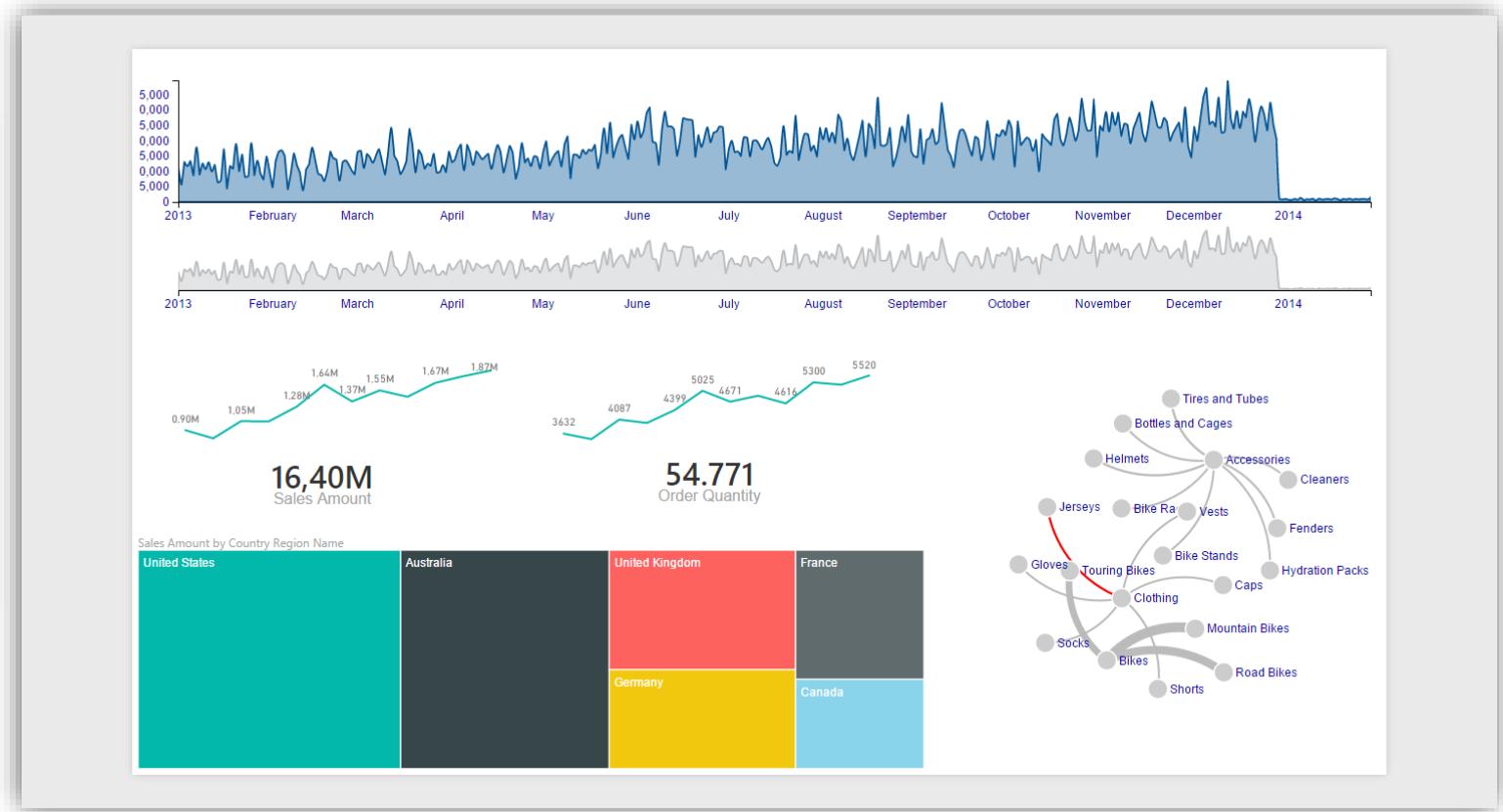
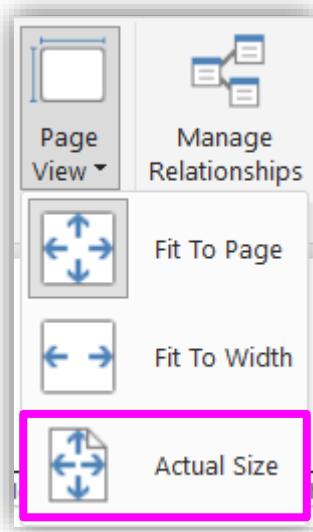
Building a Report

Page View



Building a Report

Page View

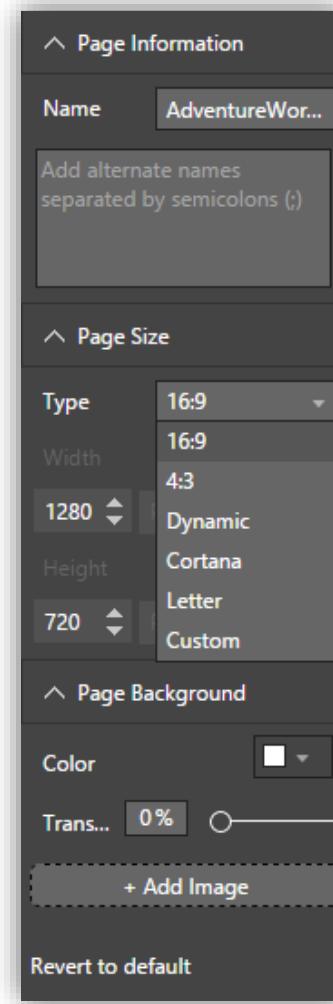


Building a Report



Page Properties

- Name
- Page Size and Format
- Page Background (both color and image)

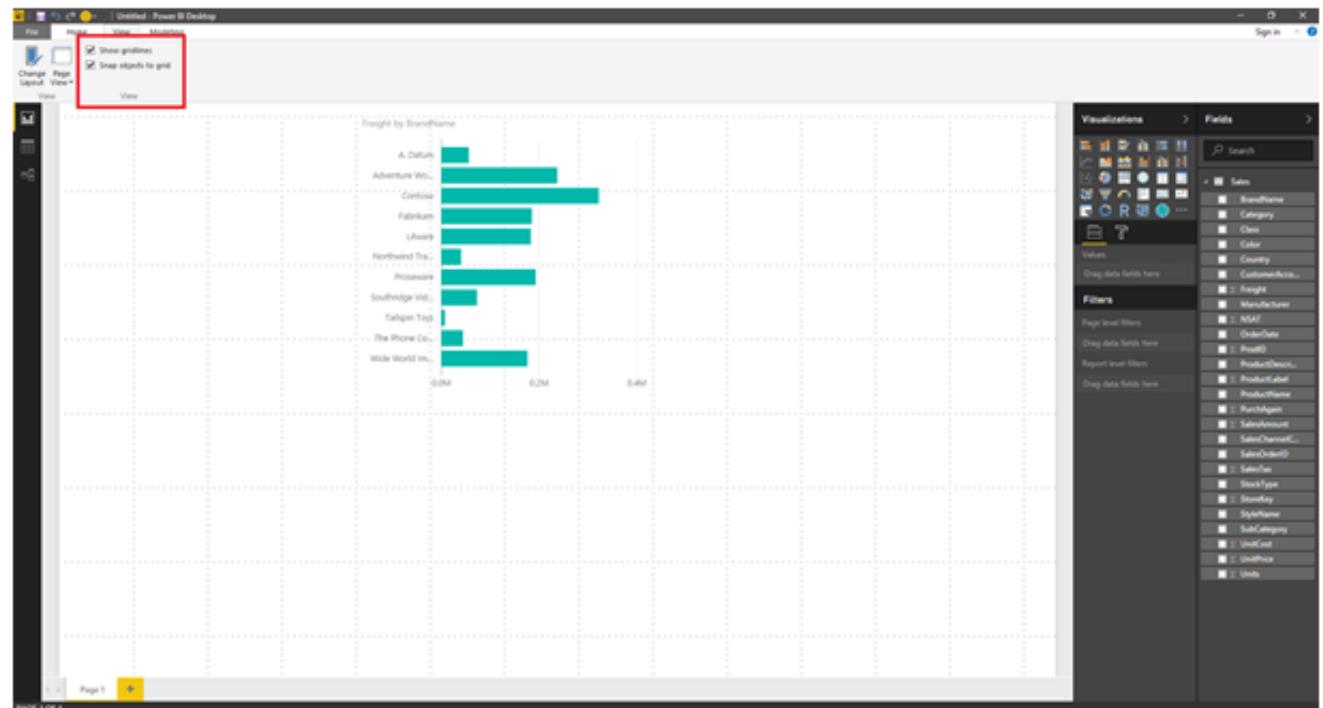


Building a Report

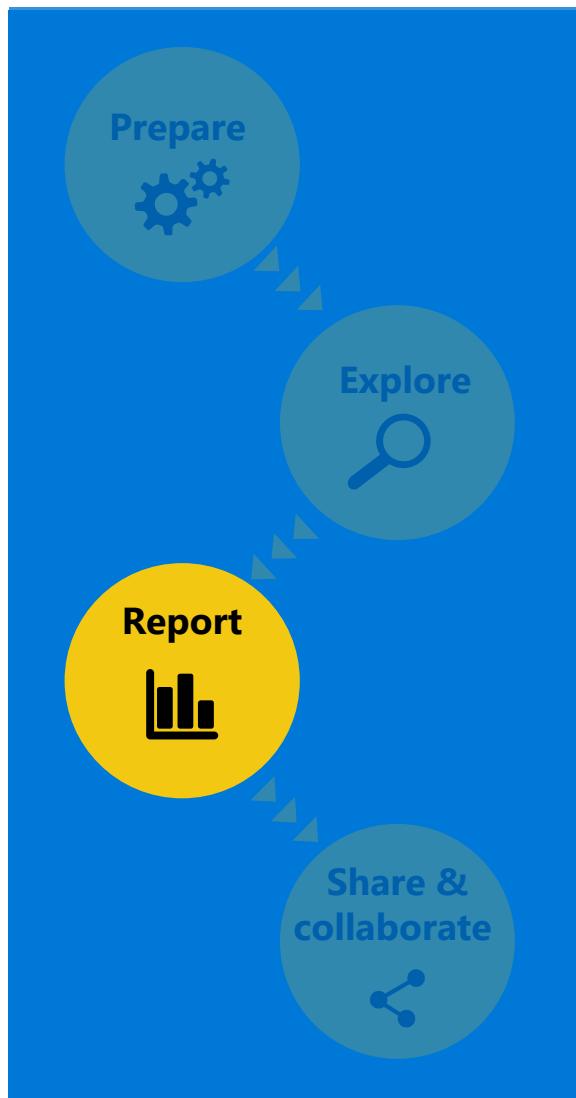


Report gridlines and snap to grid

- Enable gridlines on your report canvas while authoring
- Snap to gridlines

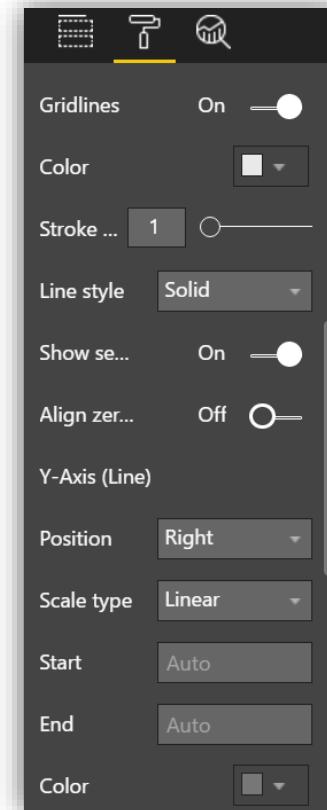
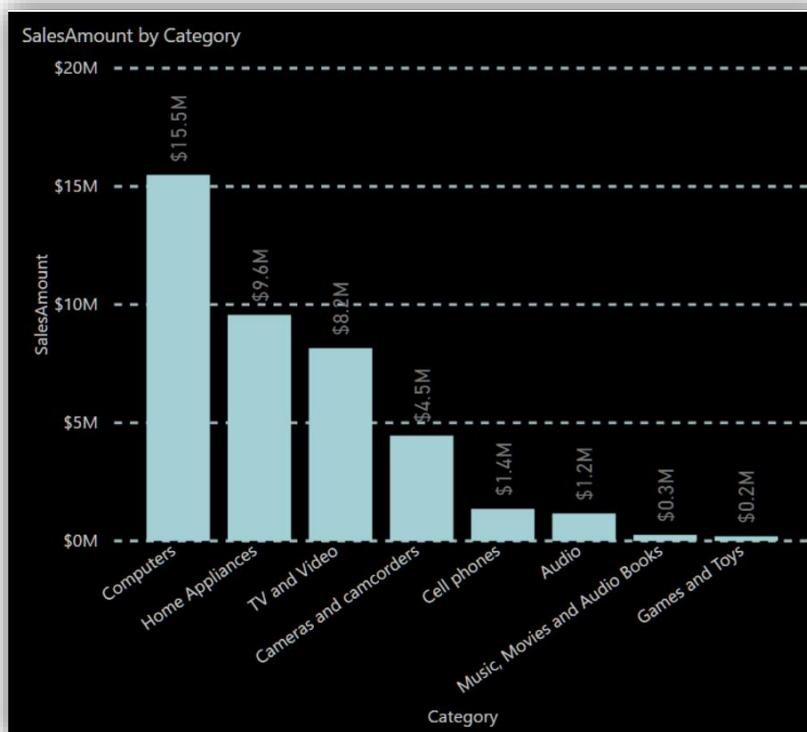


Building a Report

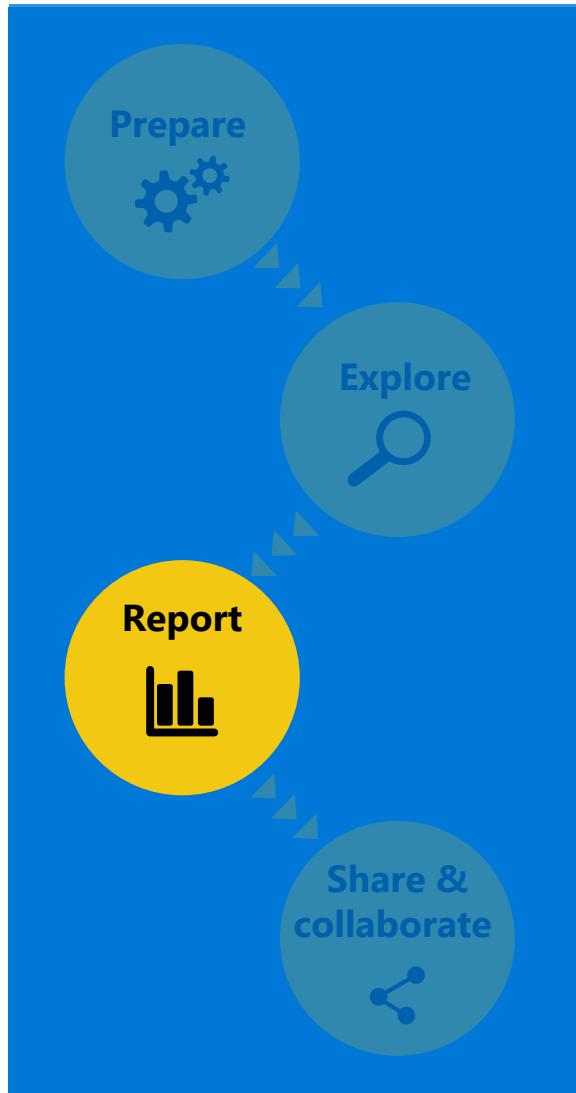


Cartesian Gridline Style Control

- It is possible to turn the gridlines on or off and change the color, stroke width, and style
- It is especially useful if you tend to create dark themed reports and need your gridlines to stand out better.



Building a Report



Numerical fields and aggregations

- Any **numerical field** can have a summarization other than its default
- A numerical field with default “Do not summarize” can still be aggregated in the field pane
- Measures cannot change their aggregation

The screenshot shows the Power BI Field pane with the 'Values' section selected. A numerical field, 'SalesAmount', is listed with a dropdown arrow next to it. A pink box highlights this dropdown. A context menu is open over the dropdown, also highlighted with a pink box. The menu items are: Remove field, Sum (checked), Average, Minimum, Maximum, Count (Distinct), Count, Standard deviation, Variance, and Median.

Rows
CalendarYear
EnglishMonthName

Columns
Drag data fields here

Values
Total Sales Amount
Total Sales Amount C...
SalesAmount
Count of CurrencyKey

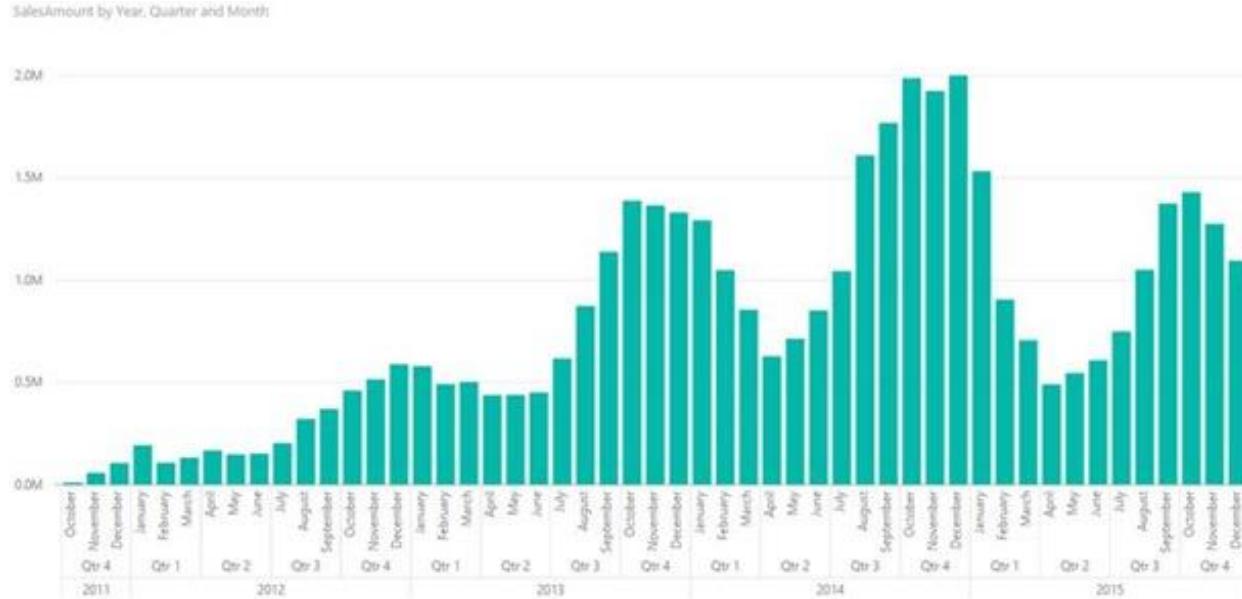
Filters
Visual level filters
CalendarYear(All)
Count of CurrencyKey(All)
EnglishMonthName(All)
NewColumn.ListPrice(All)
NewColumn.ListPrice(Count)

Dim Territories
Dim SalesTerritory
Fact Internet Sales
Carrier Tracking
Currency Key
Customer Key
Customer POI
Discount Amount
Due Date
Due Date Key
Extended Amount
Freight

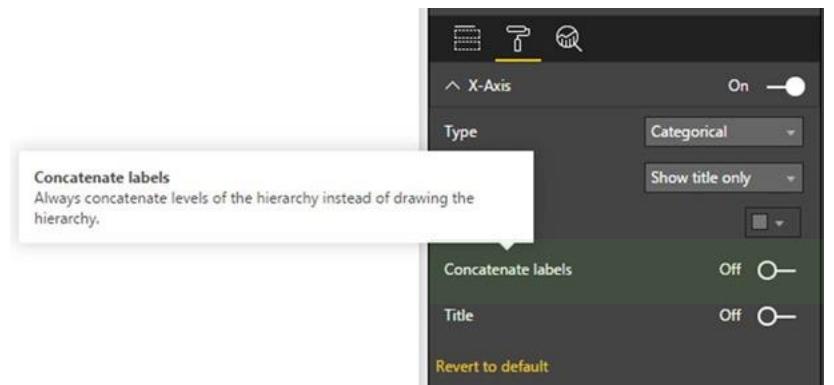
Remove field
Sum
Average
Minimum
Maximum
Count (Distinct)
Count
Standard deviation
Variance
Median

Building a Report

Visualizations – Hierarchical Axis



You can use hierarchical labels by turning off the label concatenation experience in the formatting pane

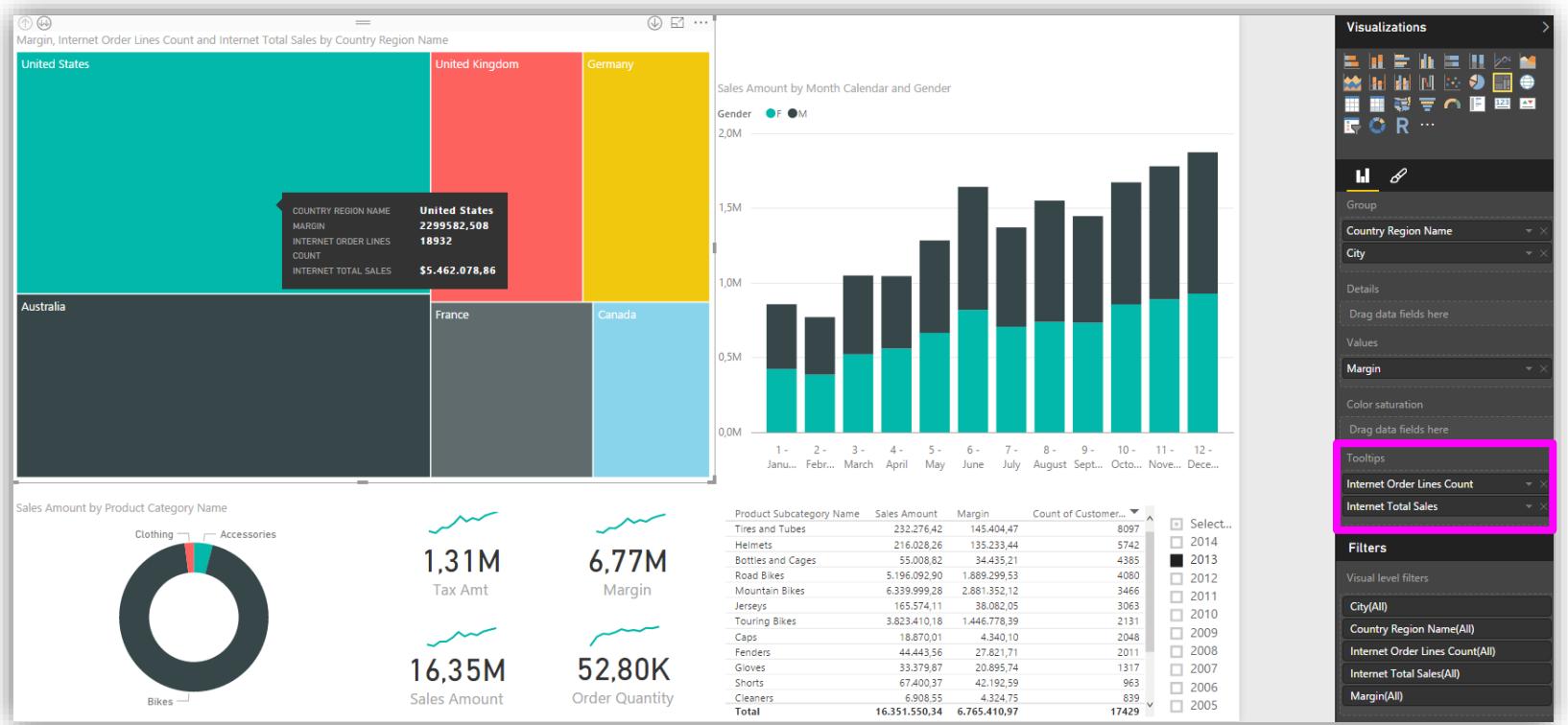


Building a Report



Tooltips

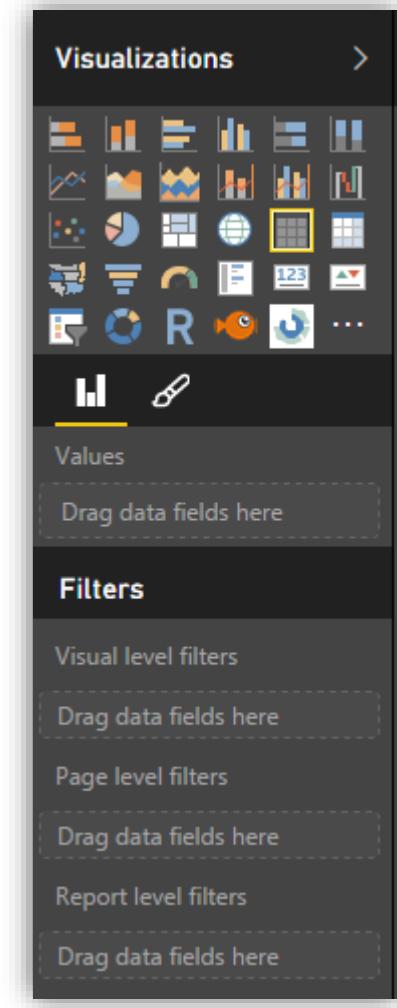
- Provide additional context when hovering over a series in a visualization
- They are customizable but only Measures or aggregations can be shown



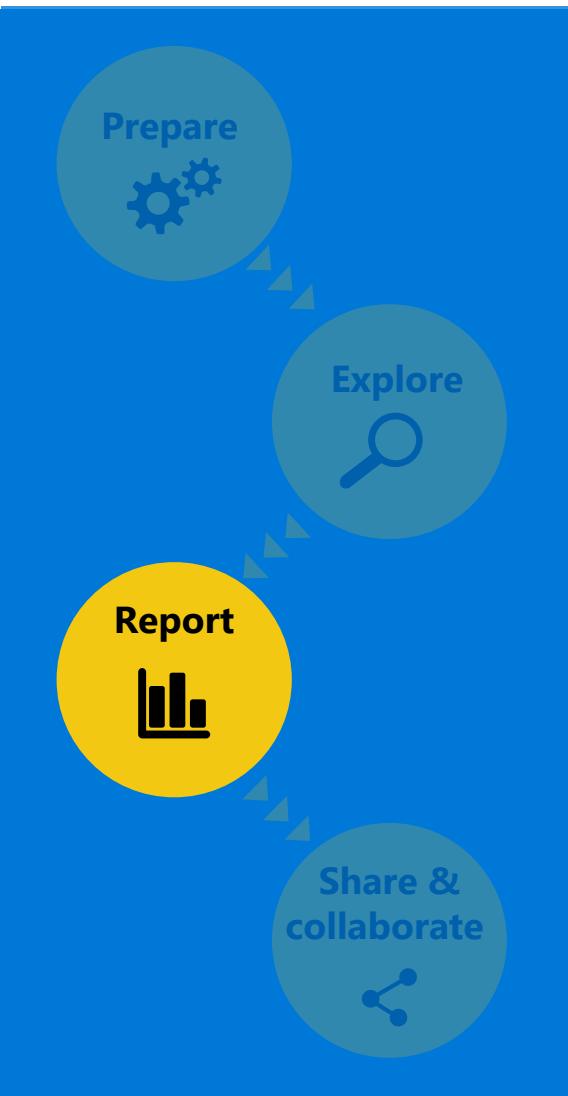
Building a Report

Report Filtering

- Filters can be applied at three different levels:
- **Visual** – The filter only applies to the current visualization
- **Page** – The filter applies for every visualization on the page
- **Report** – The filter applies for every visualization for every page in the report (file)

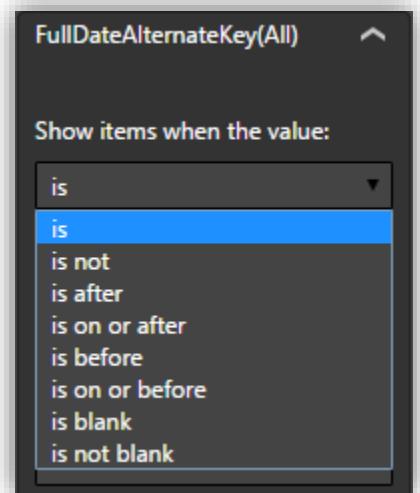
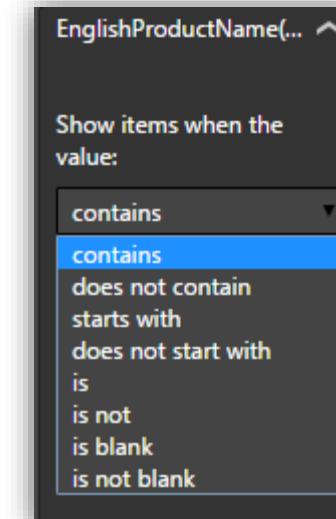
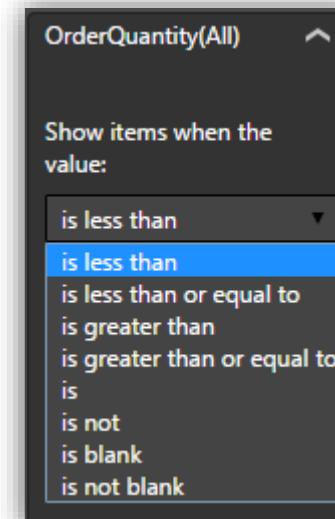
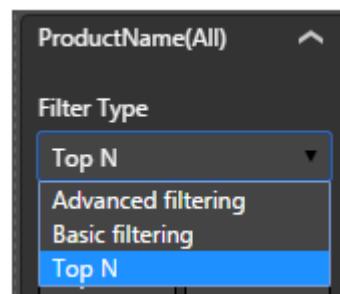
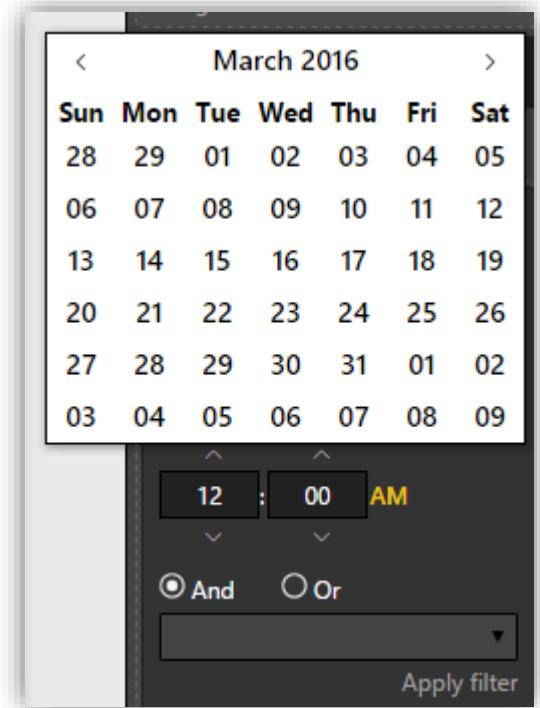


Building a Report



Report Filtering

- Drag the desired field to the desired **filter area** and configure
- Set **AND** or **OR** conditions
- Different options for **numeric**, **string** and **date** fields
- Advanced filtering



Building a Report



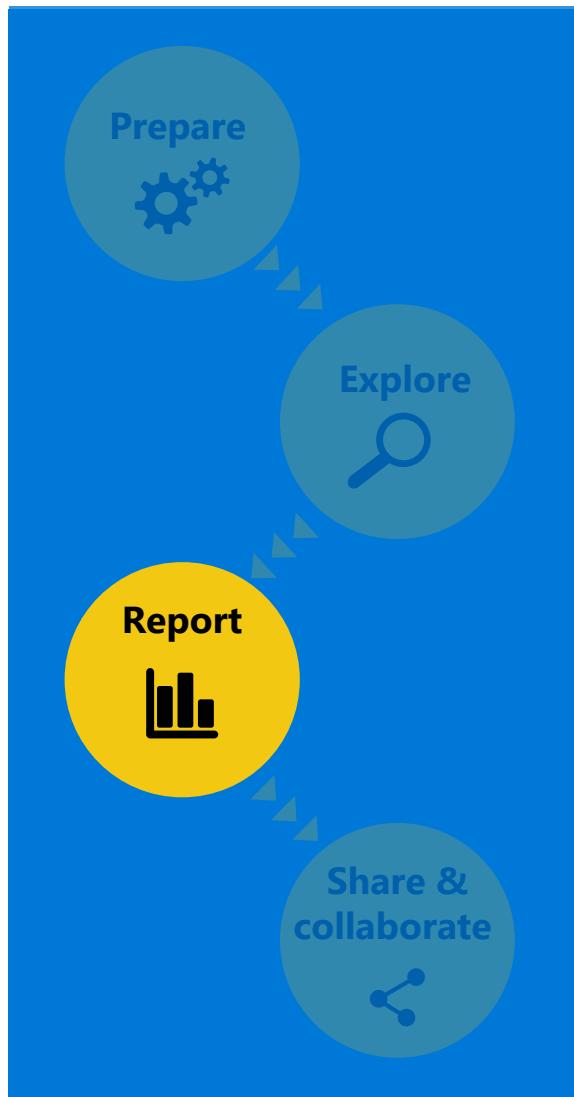
Report Filtering

- Drag the Date field to the desired **filter area** and configure
- Relative Date filtering

The figure shows three sequential screenshots of a filtering interface:

- Screenshot 1:** A dropdown menu titled "Filter Type" with options: "Basic filtering", "Advanced filtering", "Basic filtering" (disabled), "Relative date filtering" (selected and highlighted in blue), and "Top N".
- Screenshot 2:** A dropdown menu titled "Filter Type" set to "Relative date filtering". It asks "Show items when the value:" and lists "is in the last", "is in the last" (selected and highlighted in blue), "is in this", and "is in the next". Below it is a checked checkbox "Include today" and a "Apply filter" button.
- Screenshot 3:** A dropdown menu titled "Filter Type" set to "Relative date filtering". It asks "Show items when the value:" and lists "is in the last" (selected and highlighted in blue), "30", "days" (selected and highlighted in blue), "days", "weeks", "calendar weeks", "months", "calendar months", "years", and "calendar years".

Building a Report



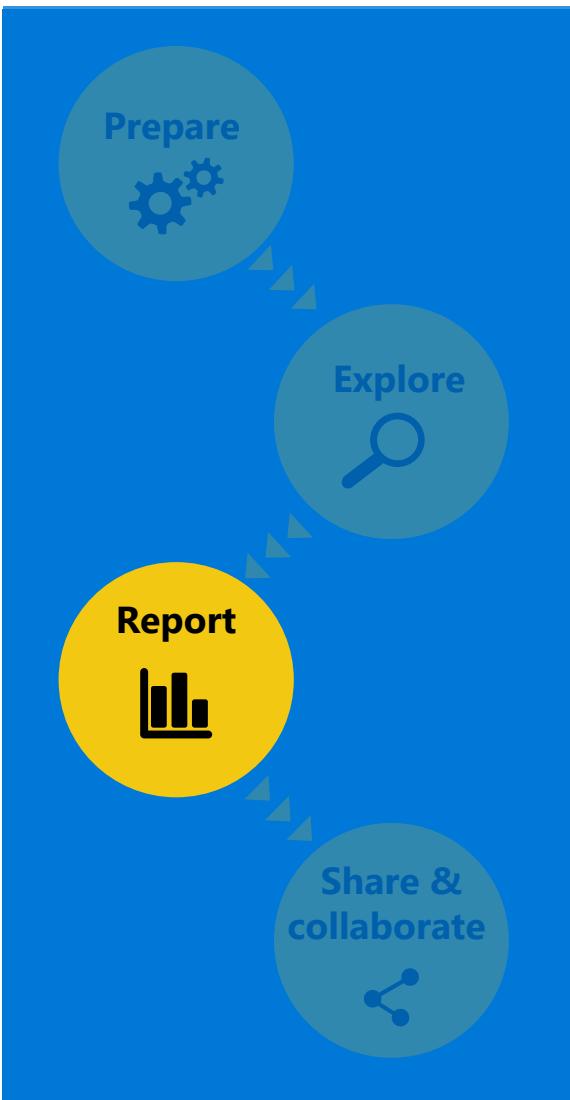
Report Filtering

- And Basic filtering
- Filters on measures differ in behavior when placed at different filtering levels
- Visual Level – the filter is for the aggregated values (default is sum)
- Page or Report Level – the filter is applied at row level
- Include/Exclude data points

EnglishMonthName(All)		
Select All		
January	310	
February	282	
March	310	
April	300	
May	310	
June	300	
July	310	
...	...	
	210	

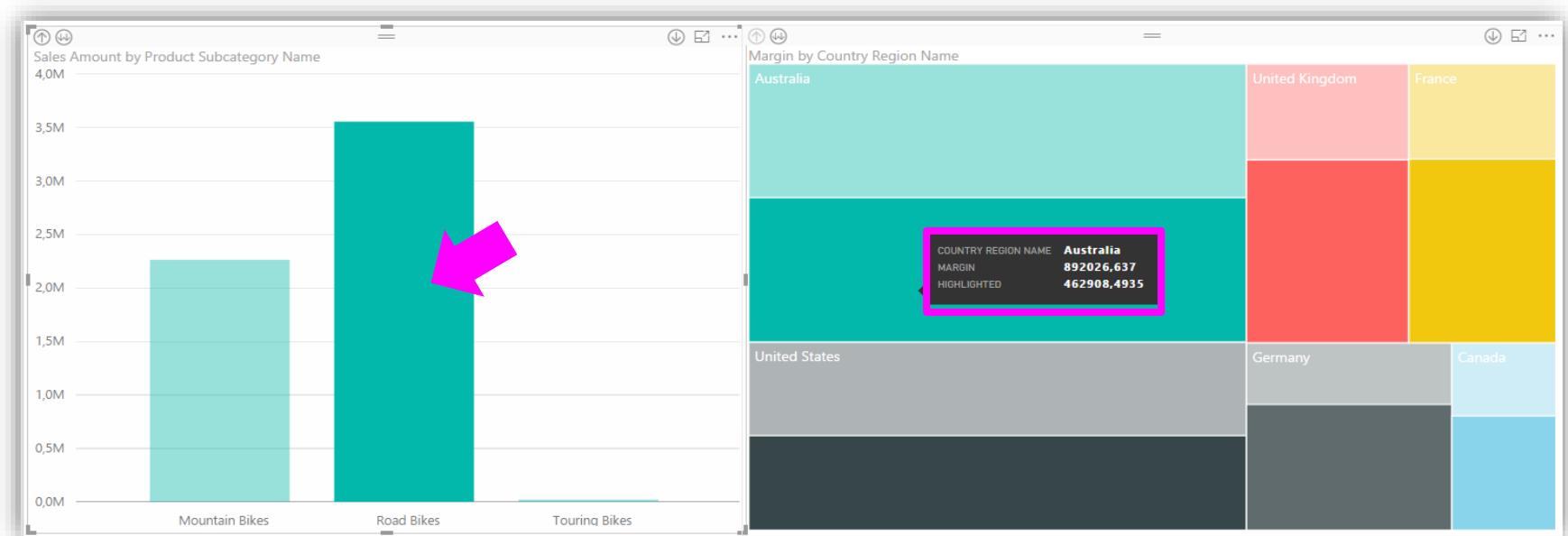


Building a Report



Cross-Filtering and Cross-Highlight

- Clicking or drilling on a visualization element, filters other visualizations
- A tooltip displays the highlighted portion and the total
- Click an empty space to clear the filter



Building a Report



Visual Interactions

- You can control interactions between visualizations
- Click a visualization, the master, and on the other visualizations select the type of interactivity

A screenshot of the Microsoft Power BI ribbon interface. The 'Format' tab is selected. Within the 'Format' tab, the 'Edit Interactions' button is highlighted with a pink box. Below the ribbon, a bar chart titled 'SalesAmount by Size' is displayed. Above the chart are three filter icons: a funnel (cross-filter), a pie chart (cross-highlight), and a circle with a slash (no filtering).

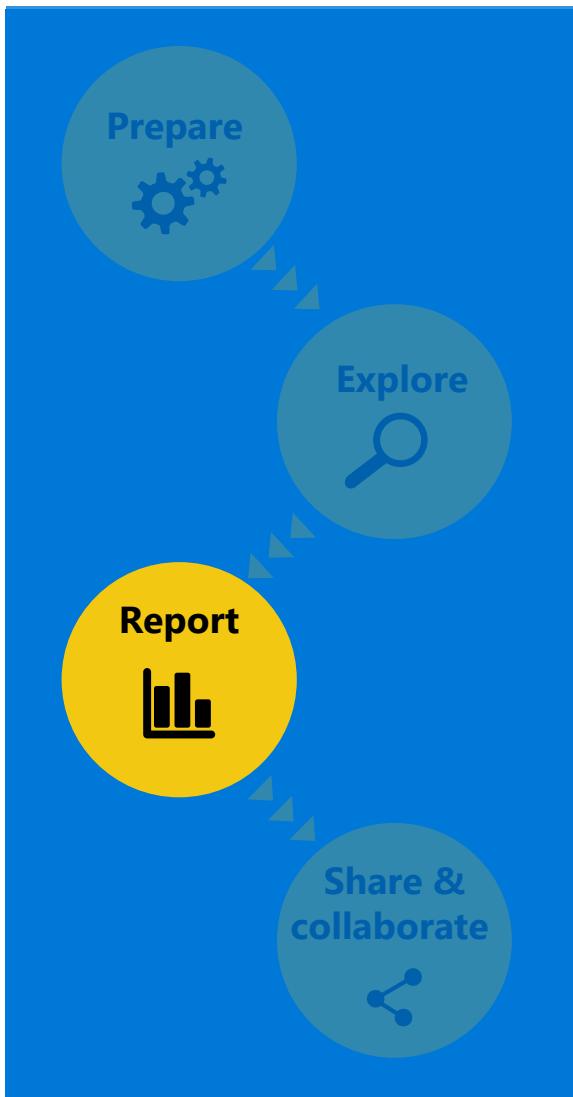
Icon	Description
Funnel	This option enables cross-filter
Pie Chart	This option enables cross-highlight
Circle with slash	This option disables filtering

This option enables cross-filter

This option enables cross-highlight

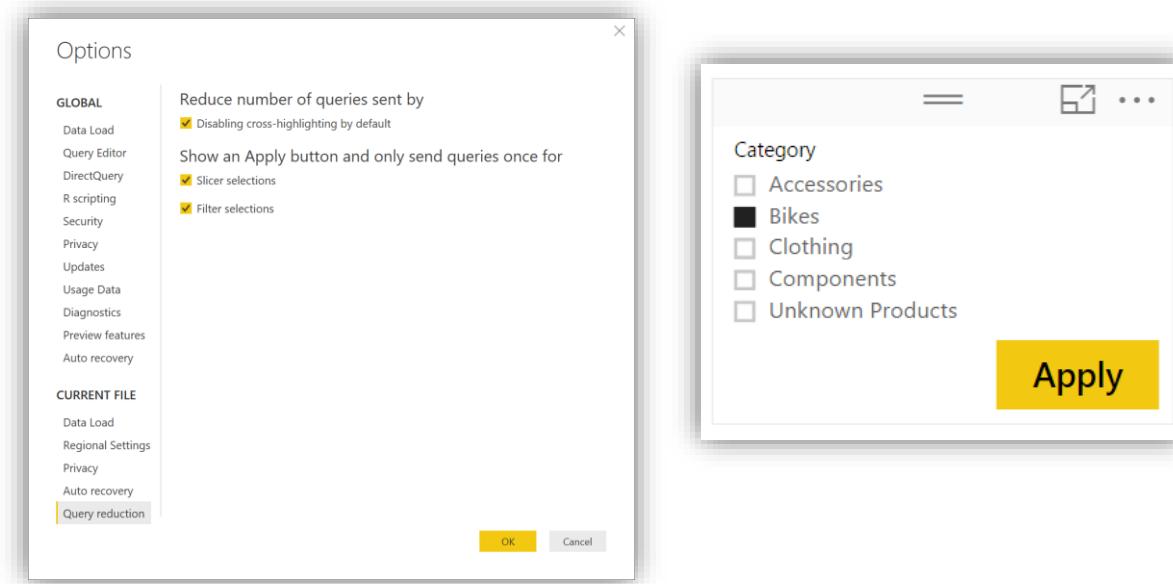
This option disables filtering

Building a Report



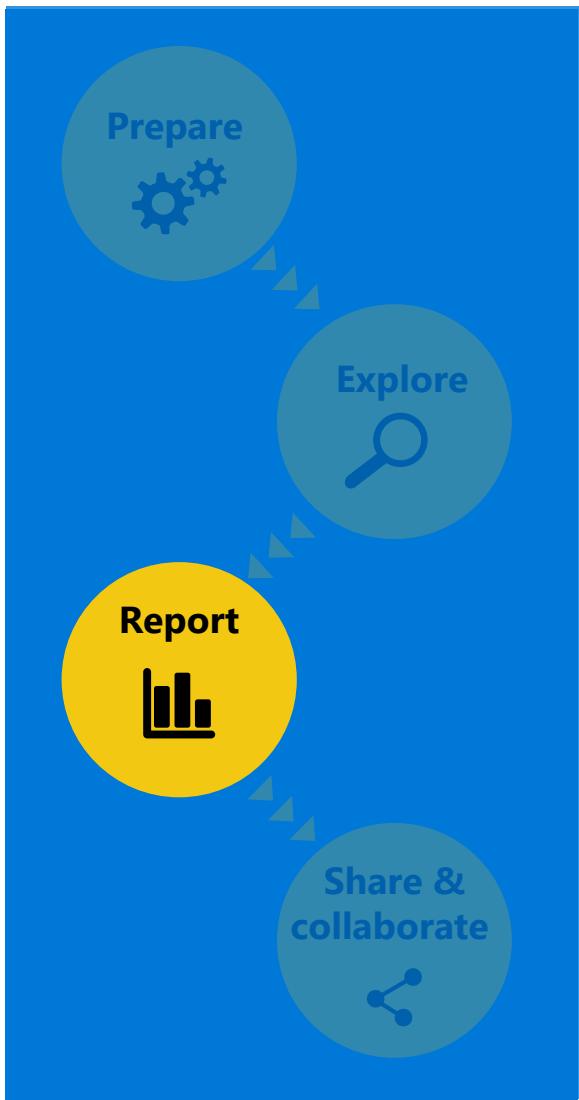
Query reduction

- You can **reduce the number of queries** when you use slicers or filters
- It is useful for **very large** or **very slow** data sources in DirectQuery
- Set to enable an "Apply" button that will appear in the objects



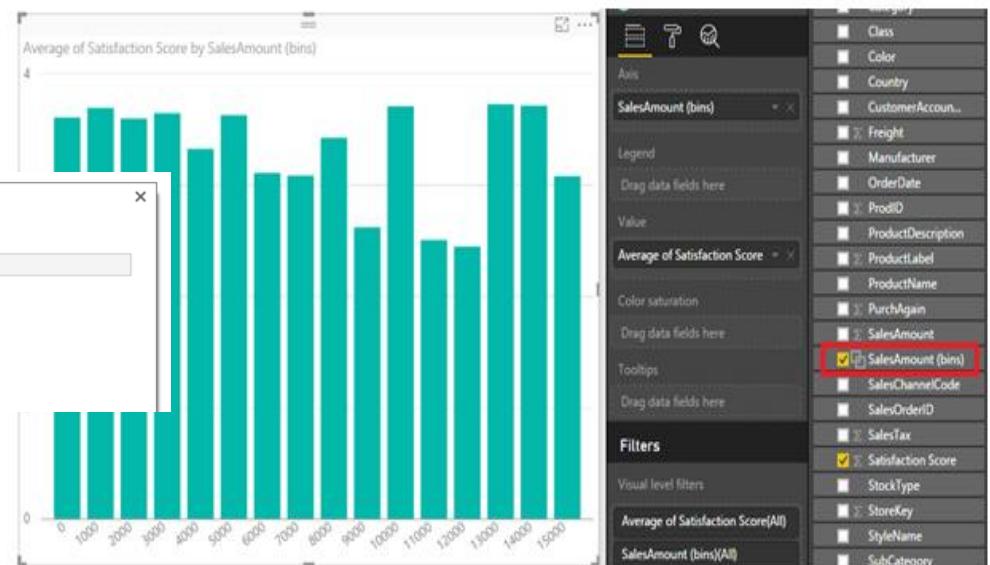
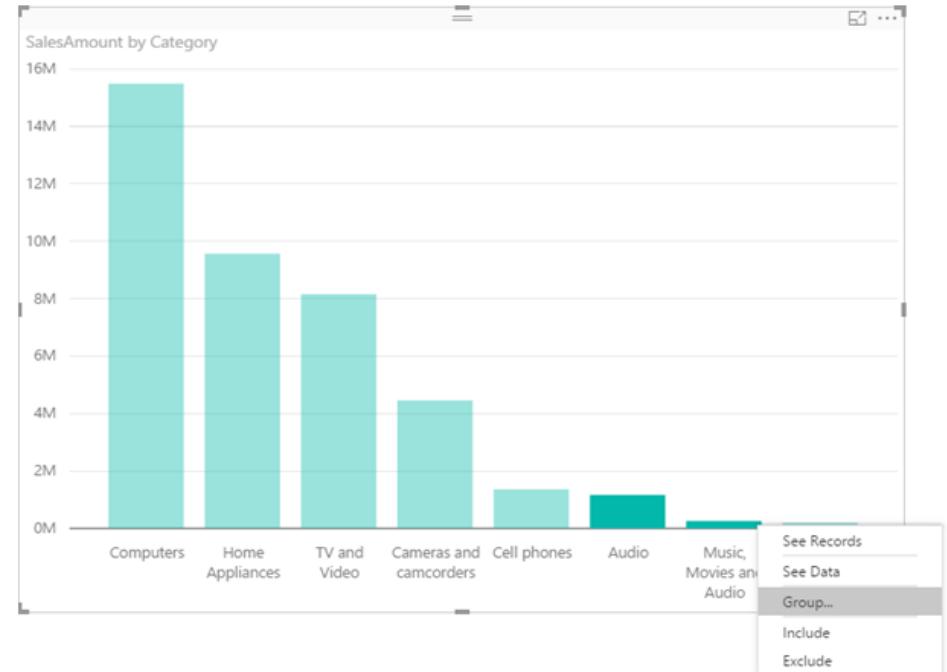
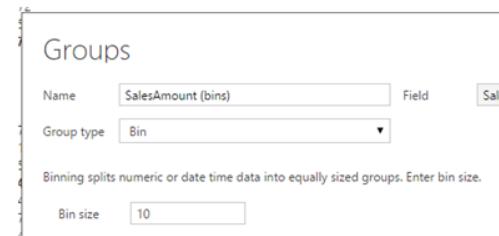
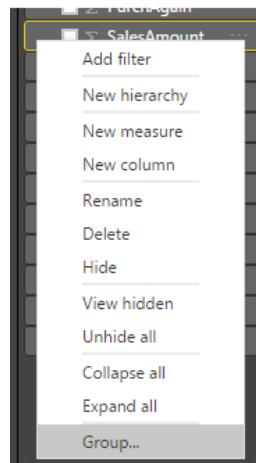
Demonstration Visual Interactions

Building a Report

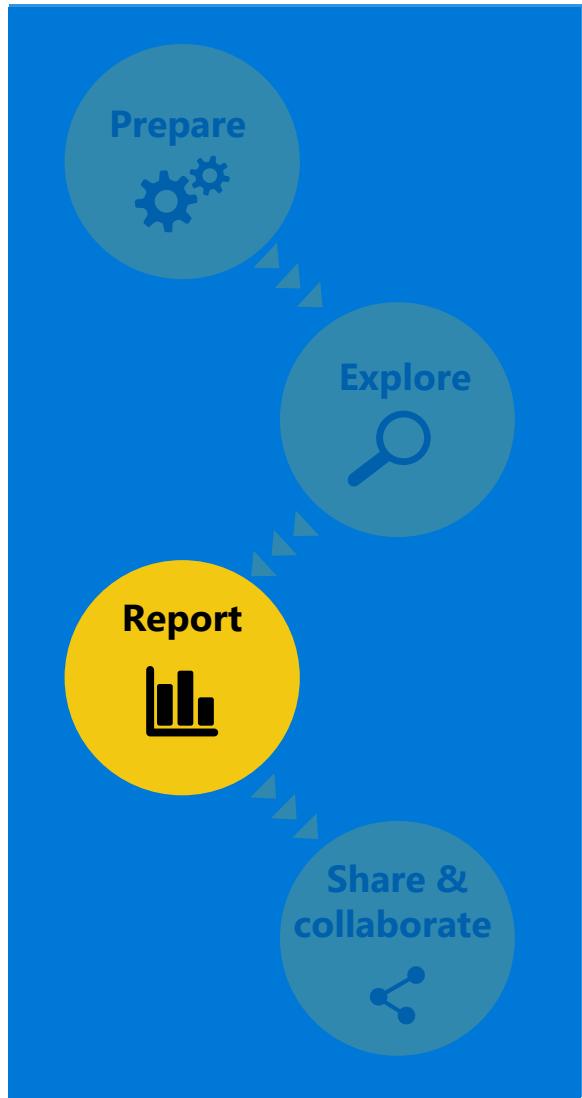


Grouping and Binning

- Group up points on your visual to easily explore and analyze related categories
- Bin on numerical and time fields to create data categories

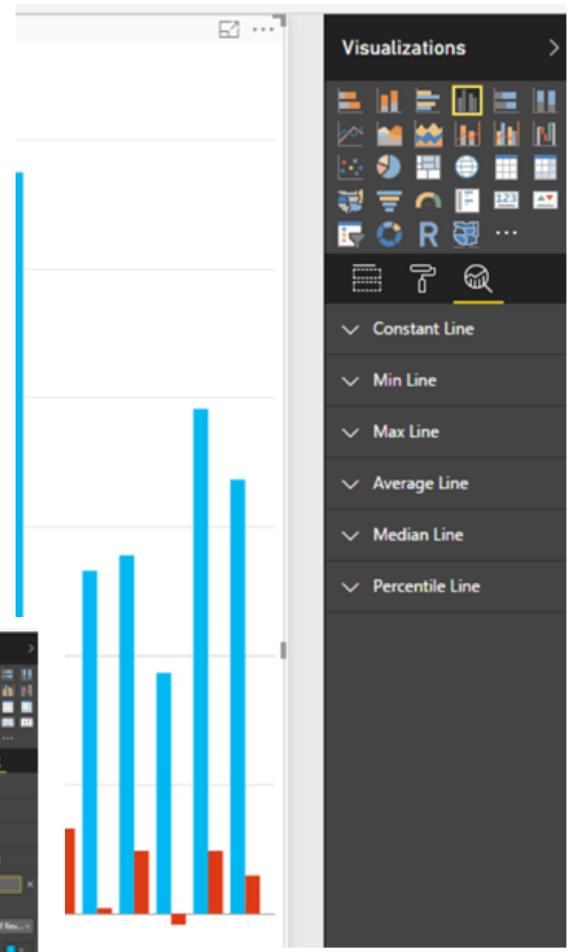
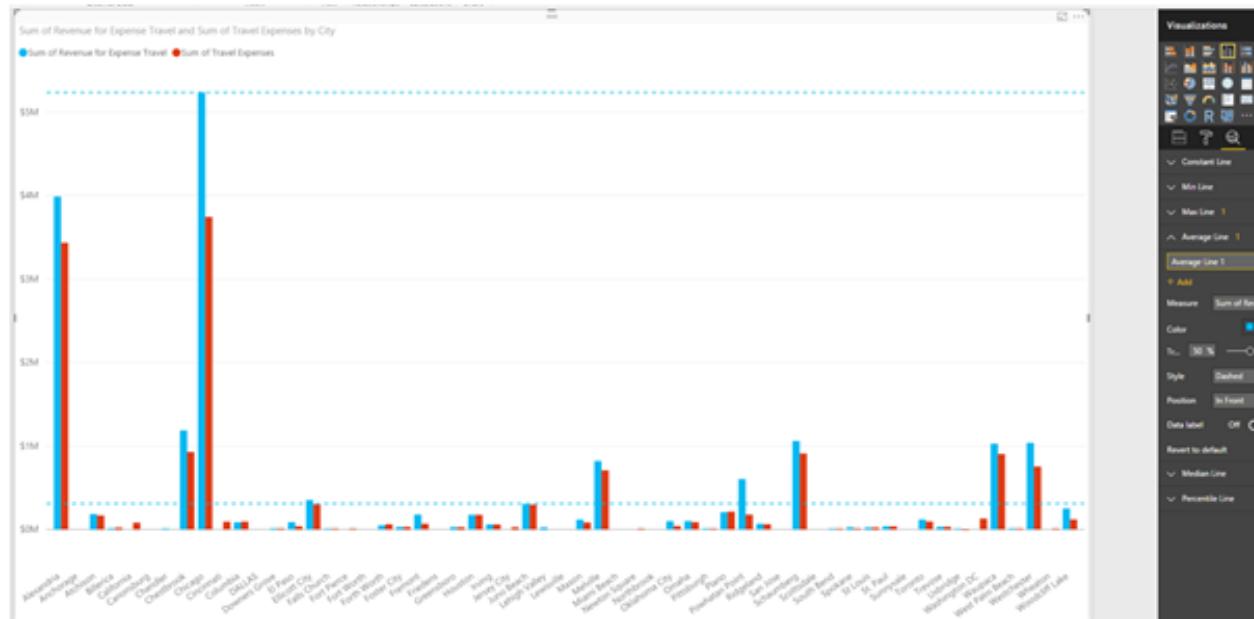


Building a Report



Analytics pane

- **Analytics pane** will be the central location for all analytical features
- Add dynamic reference lines and trend lines on charts
- **More** analytical features will be added in future



Building a Report

Clustering

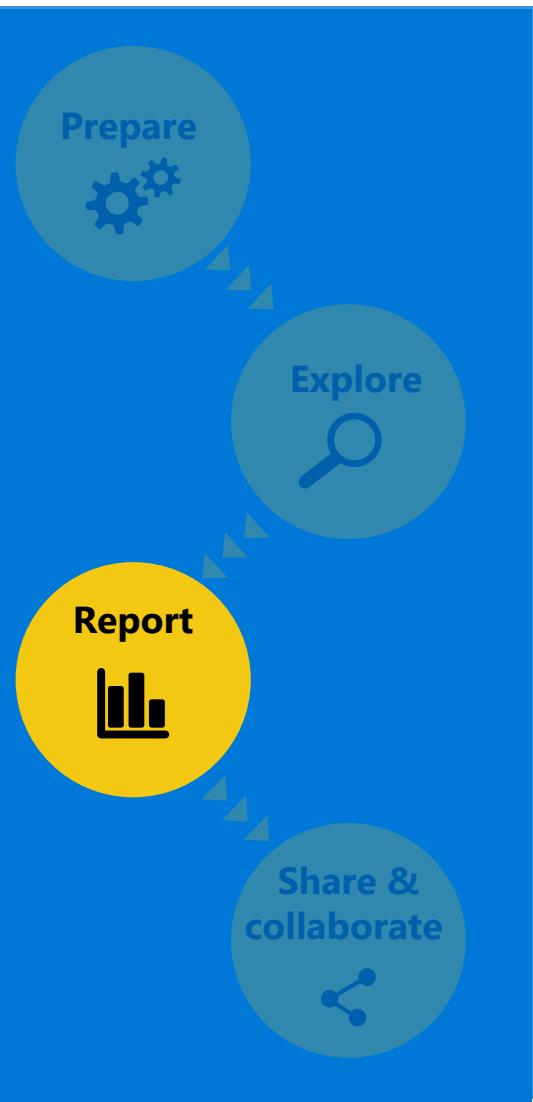
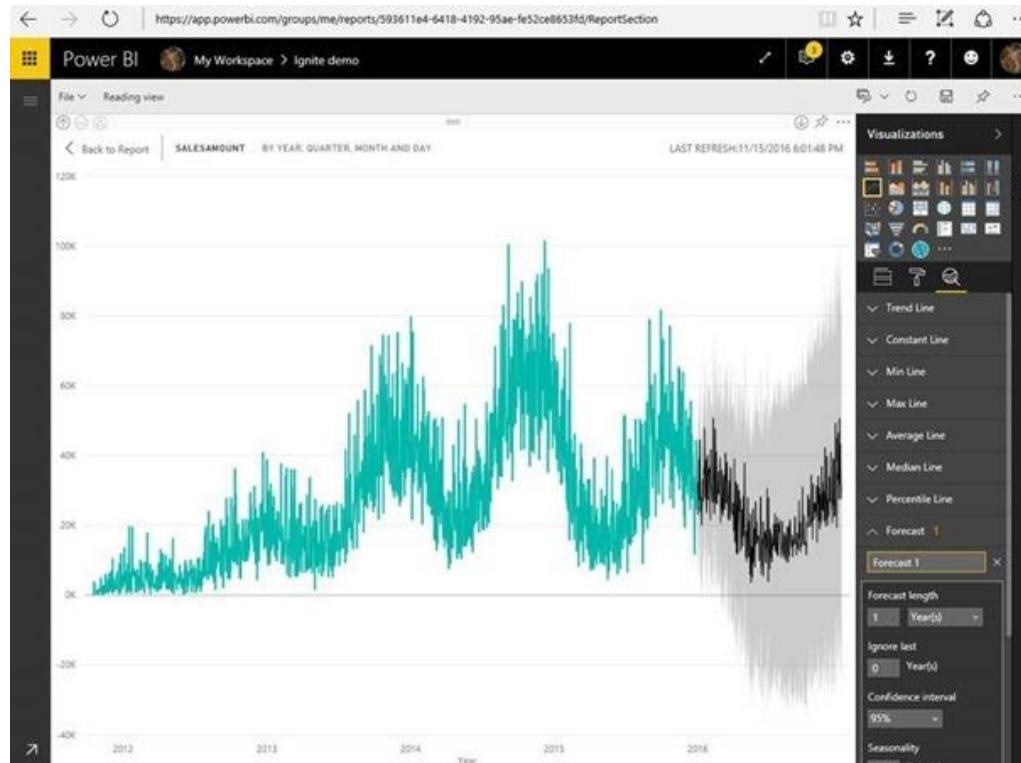
- Clustering lets you quickly find groups of similar data points in a subset of your data



Building a Report

Forecasting

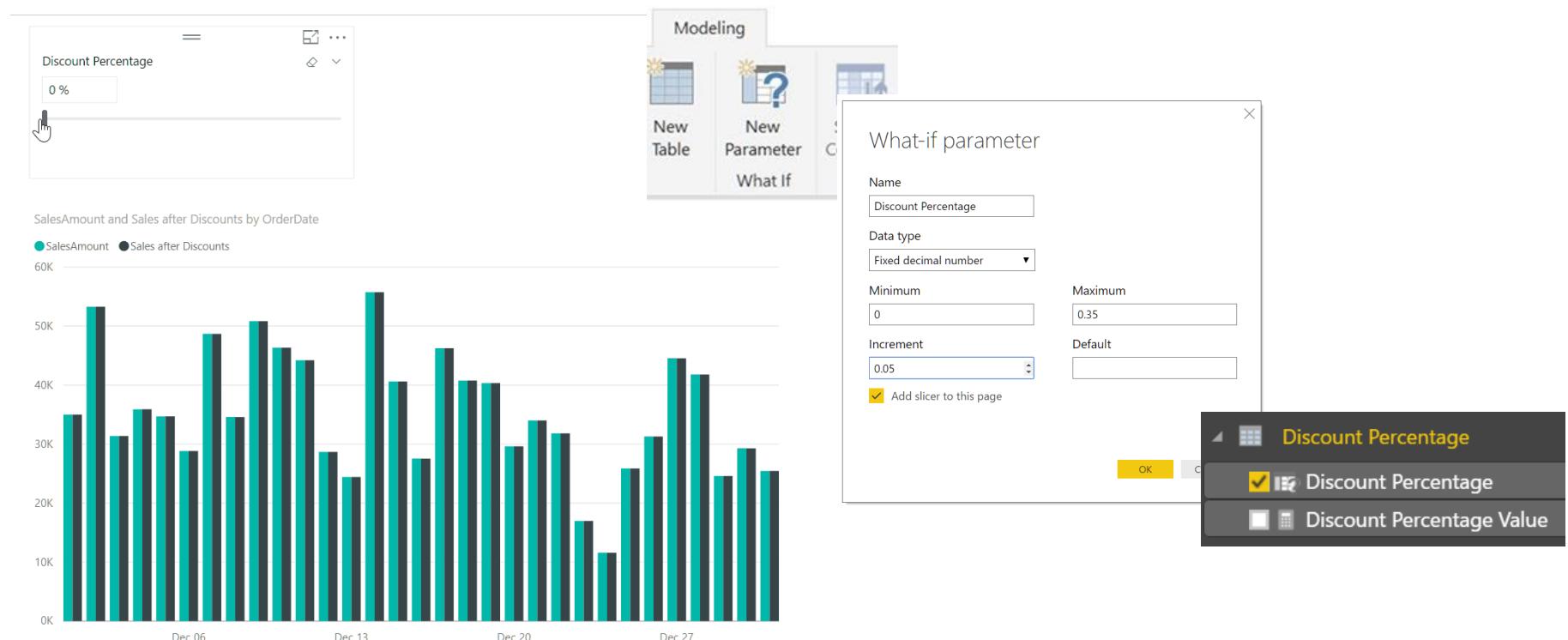
- You can use the forecasting feature on your line chart to do **predictive analytics** on your data.
- Built-in predictive forecasting models to **automatically detect the step** (monthly/weekly/annually) and seasonality in your data to provide forecasting results.



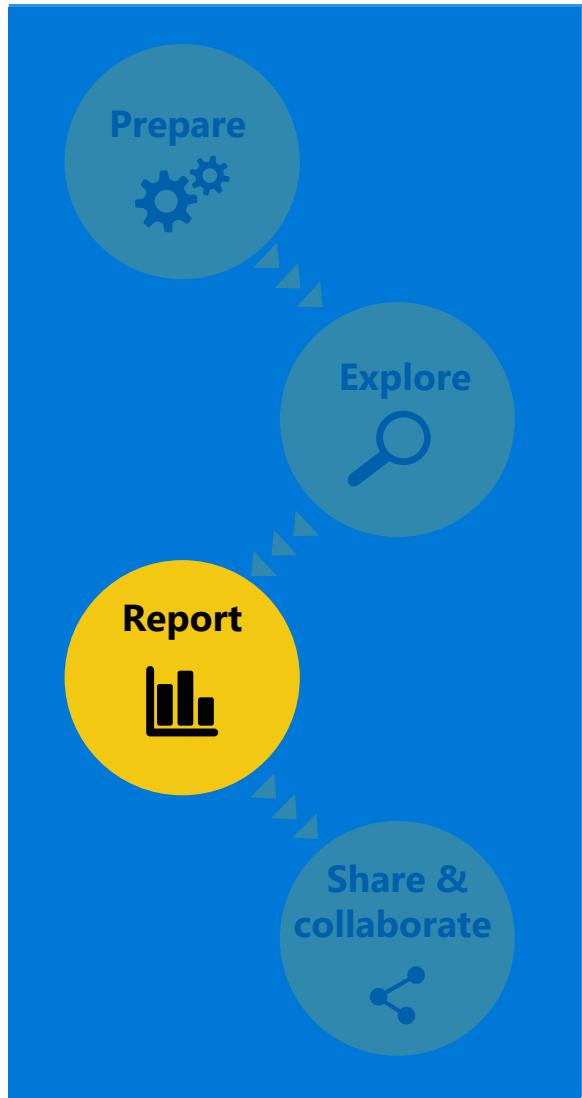
Building a Report

What-If Parameter

- Create new parameters and use it for what-if analysis
- You have to **apply it** in your own calculations

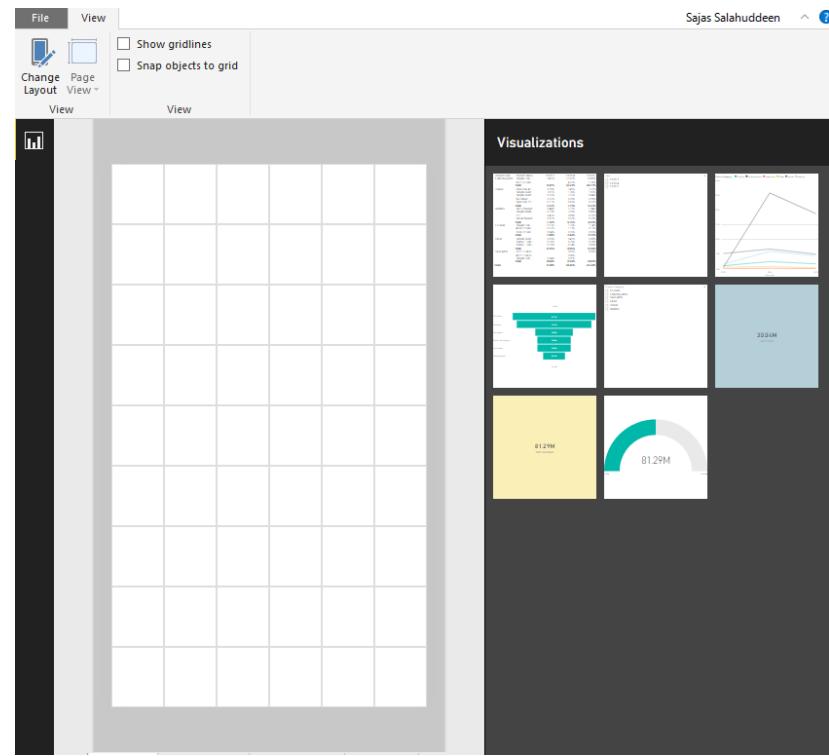
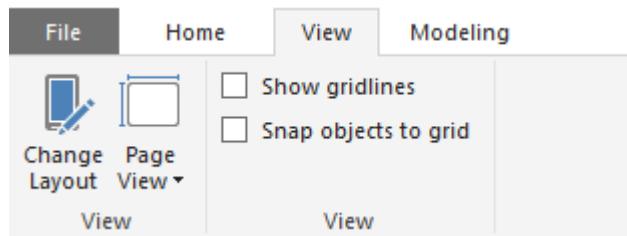


Building a Report



Mobile report layout (Preview)

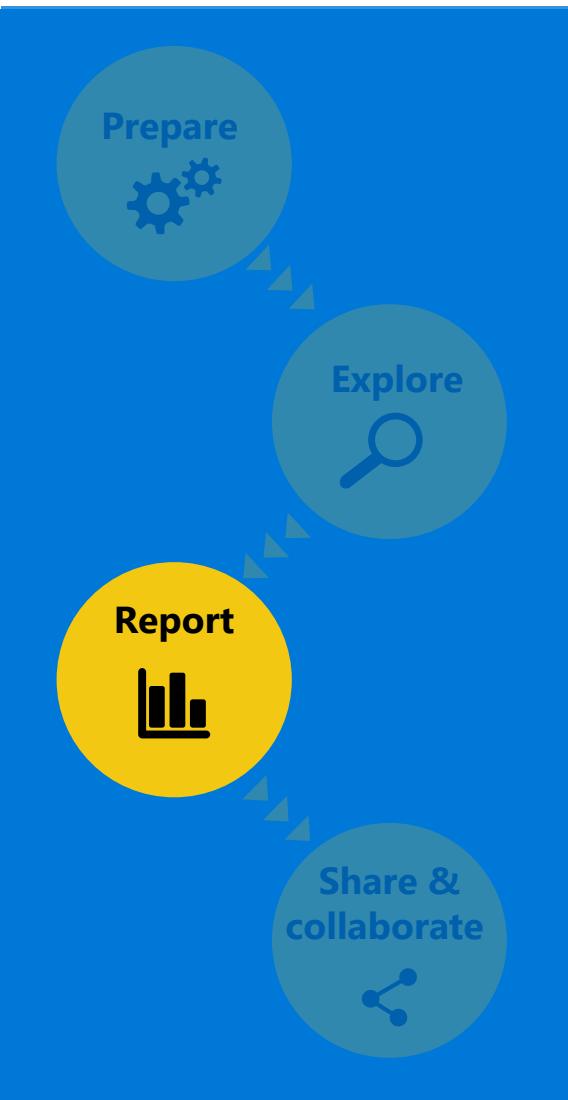
- Create report **layouts specific to mobile** devices



- After publishing, anyone who views this report on their **Power BI mobile app will see the phone layout of the report**



Building a Report



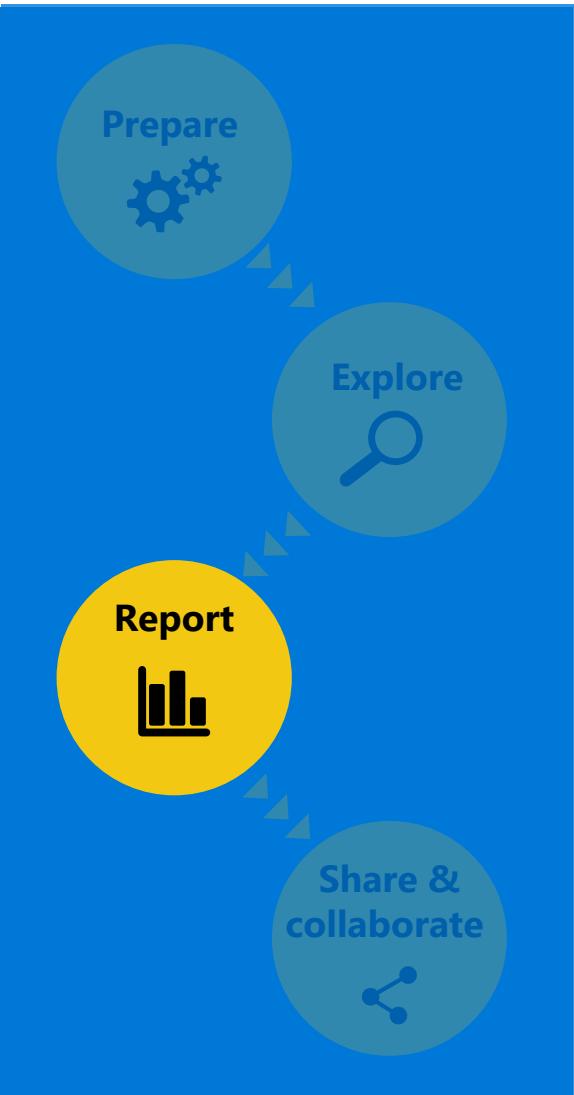
Drill down and up

- It is possible to **navigate across attributes** if they are stacked on a particular area of a visualization (down/up/across)
- Those attributes don't have to be **natural hierarchies**, all of them can be mixed.



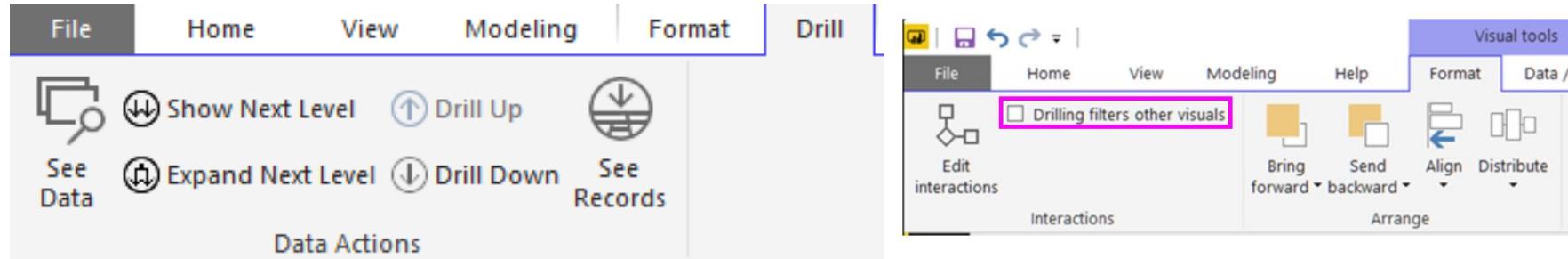
- Drill features works on bar and line charts

Building a Report

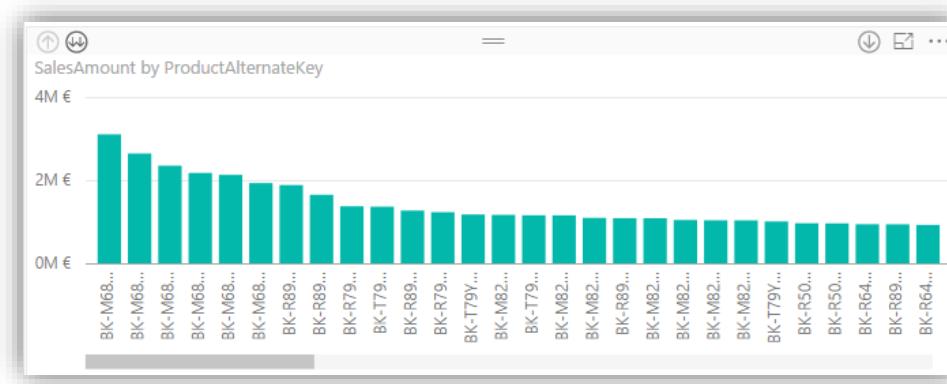


Drill to records

- Drill ribbon allows controlling of drilling operations

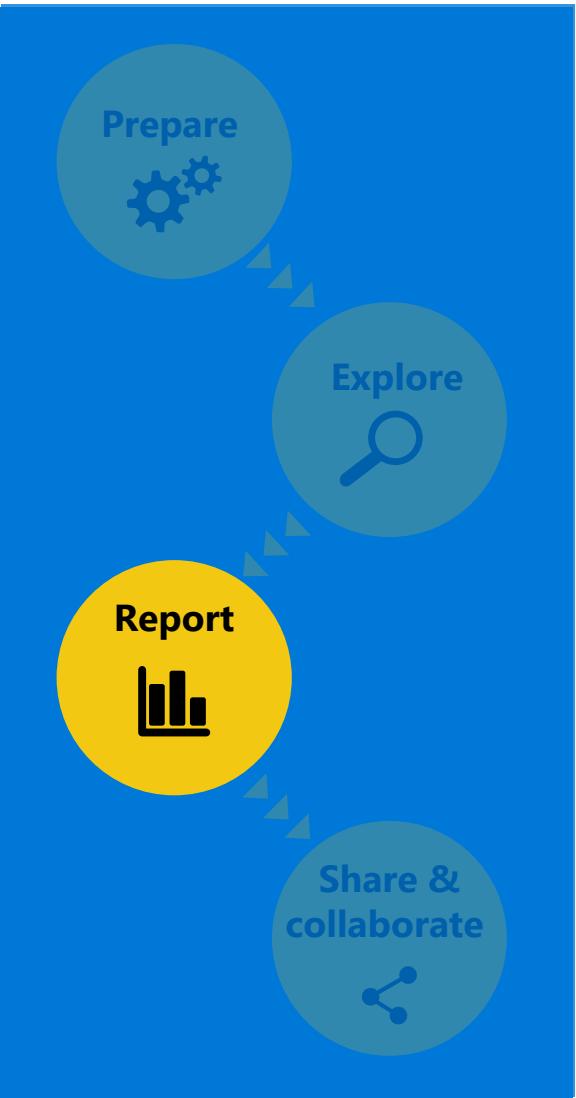


- See records drills-through detail, for a clicked data point, and See Data displays data also in tabular format



ProductAlternateKey	Class	SalesAmount	SalesOrderNumber	CarrierTrackingNumber	CustomerOrderNumber	OrderDate
BK-M68B-42	H	19.186,12 €	S007297	584A-4ZCZ-B9	P0552179365	29 de Setembro de 2013
BK-M68B-42	H	17.086,98 €	S011822	E0E1-45C1-07	P0845178563	28 de Janeiro de 2013
BK-M68B-42	H	16.059,81 €	S047441	2582-4E47-98	P07569166535	29 de Fevereiro de 2012
BK-M68B-42	H	15.653,67 €	S053518	5712-444B-BC	P0841197199	28 de Fevereiro de 2013
BK-M68B-42	H	15.653,67 €	S061199	EFA0-4D12-A2	P02552199779	30 de Junho de 2013
BK-M68B-42	H	14.349,20 €	S063291	9860-437E-88	P0845151318	31 de Julho de 2013
BK-M68B-42	H	14.349,20 €	S069437	AEEF-448B-A6	P012702116983	29 de Outubro de 2013
BK-M68B-42	H	13.769,84 €	S011127	9324-4F6A-80	P0551151765	28 de Janeiro de 2011
BK-M68B-42	H	13.769,84 €	S017046	52CC-460F-83	P0145001618	30 de Abril de 2013
BK-M68B-42	H	13.769,84 €	S057105	3AEF-4472-91	P018676113963	30 de Abril de 2013
BK-M68B-42	H	13.769,84 €	S071936	95F1-4758-A0	P08671170385	29 de Novembro de 2013
BK-M68B-42	H	12.811,78 €	S049166	142E-4351-A4	P0845115490	31 de Julho de 2012
BK-M68B-42	H	12.392,95 €	S051090	8BDE-4471-8E	P013688110947	28 de Dezembro de 2012
BK-M68B-42	H	12.392,95 €	S053573	F674-4899-89	P08671117196	28 de Fevereiro de 2013
BK-M68B-42	H	12.392,95 €	S054131	902C-4430-97	P08671117196	28 de Fevereiro de 2013
BK-M68B-42	H	12.392,95 €	S058863	6A0C-4495-8C	P0841129336	30 de Maio de 2013
BK-M68B-42	H	12.392,95 €	S059068	87CC-4490-96	P0771512509	30 de Maio de 2013
BK-M68B-42	H	12.284,59 €	S046645	F857-4A6D-9C	P01711132491	29 de Dezembro de 2011
BK-M68B-42	H	11.065,13 €	S052095	575E-4F7A-9C	P0446165095	28 de Outubro de 2012
BK-M68B-42	H	11.065,13 €	S053012	89ED-4505-8D	P07424134796	28 de Outubro de 2012
BK-M68B-42	H	11.015,95 €	S051120	C2D0-4670-B0	P010324111289	28 de Dezembro de 2012
BK-M68B-42	H	11.015,95 €	S053011	5C8E-4430-A1	P08671117196	28 de Janeiro de 2013
BK-M68B-42	H	11.015,95 €	S053055	3543-4472-84	P0525194090	30 de Janeiro de 2013
BK-M68B-42	H	11.015,95 €	S053566	798E-4713-94	P0771516811	28 de Fevereiro de 2013
BK-M68B-42	H	11.015,95 €	S055241	F7DC-4907-89	P01658818880	30 de Março de 2013
BK-M68B-42	H	11.015,95 €	S058905	BB0C-4C44-A2	P0845186382	30 de Maio de 2013
BK-M68B-42	H	11.015,95 €	S063212	B54D-4C63-85	P05684113881	31 de Julho de 2013
BK-M68B-42	H	11.015,95 €	S069561	C39A-4B35-99	P01757411968	29 de Novembro de 2013
BK-M68B-42	H	11.015,95 €	S071934	1240-4C47-93	P01365919942	29 de Dezembro de 2011
BK-M68B-42	H	9.857,67 €	S066624	E085-4A71-8E	P077151188876	16 de Fevereiro de 2013

Building a Report

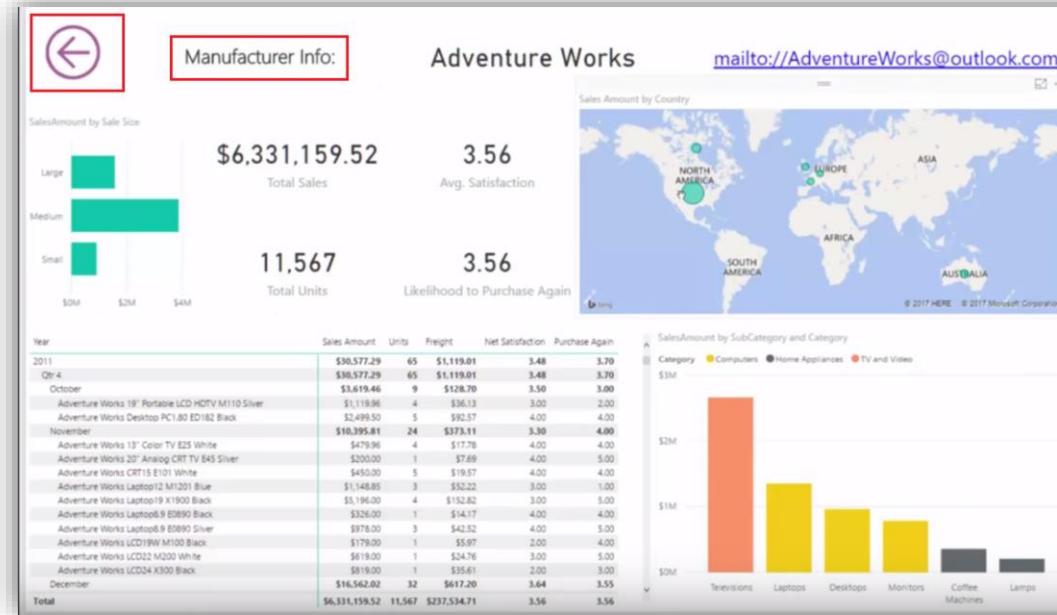


Drill through

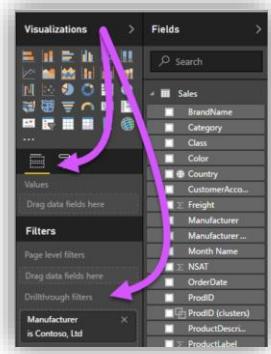
- It is possible to create a page in your report that **focuses on a specific entity** - such as a supplier, or customer, or manufacturer.
- With that focused report page, users can right-click on a data point in other report pages, and drill through to the focused page to get details that are filtered to that context.

Create a focused report specific to a category

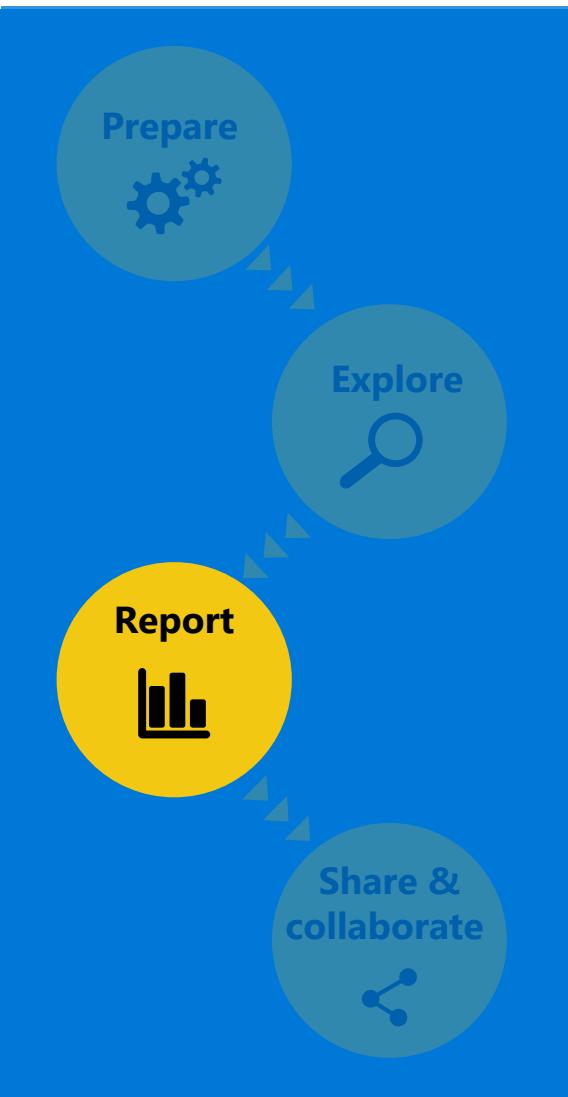
Back button will be created by default



Add the category column to drill through filters



Building a Report



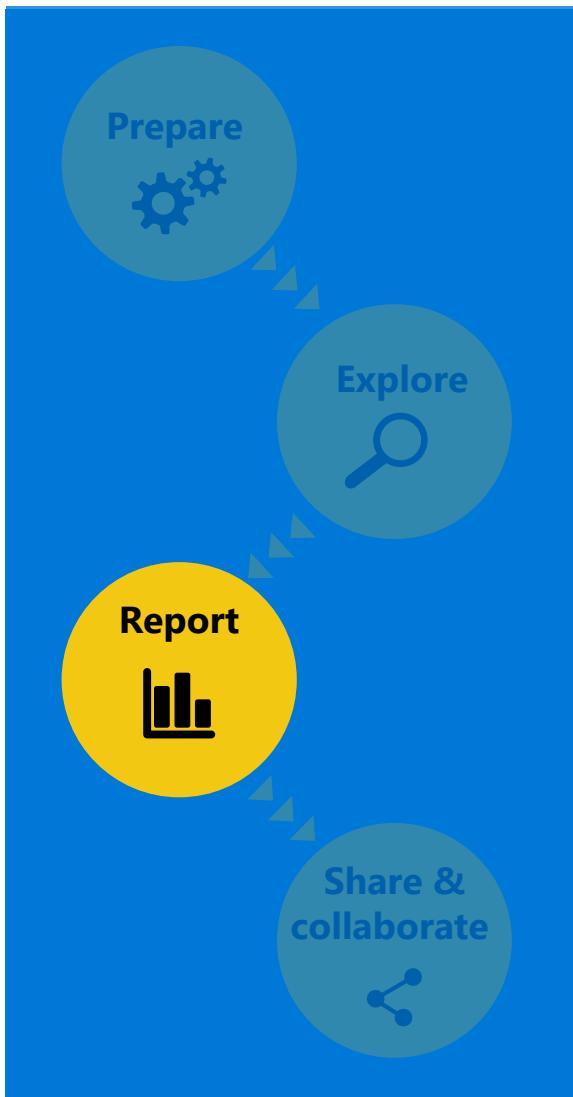
Drill through

- Right-click on a data point in your report that uses the field you put into the drill through filters well on your drill through page
- A context menu appears, letting you drill through to that page.

A screenshot of a Microsoft Power BI report showing a context menu. The menu items are: See Data, Include, Exclude, Drillthrough, and Manufacturer Data. A pink arrow points from the 'Drillthrough' option to the 'Contoso, Ltd' row in the table below. The table has columns: Manufacturer, Manufacture, Order Date, Category, and SubCategory. The rows show data for various manufacturers like 'A. Datum', 'Corporation', 'Adventure Works', and 'Contoso, Ltd'.

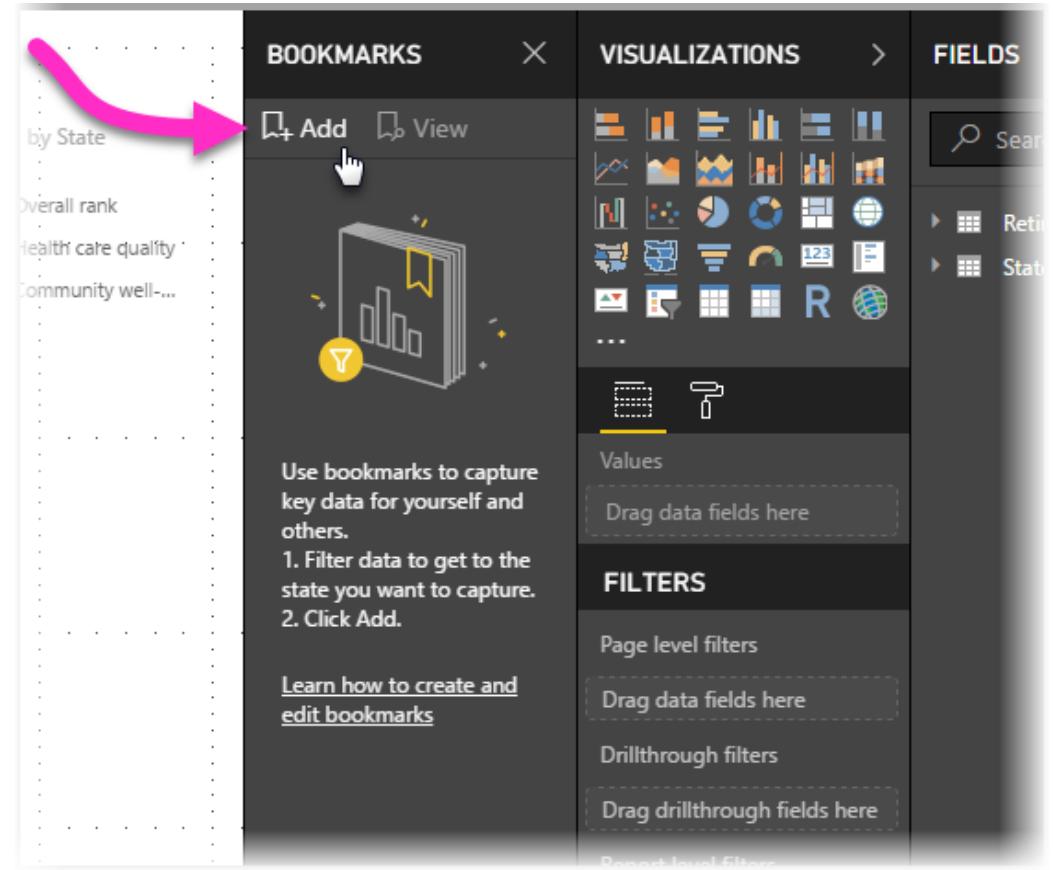
Manufacturer	Manufacture	Order Date	Category	SubCategory
A. Datum	See Data	Thursday, December 2015	Cameras and camcorders	Digital Camera
Corporation	Include	Thursday, December 2015	Cameras and camcorders	Digital SLR Camera
A. Da	Exclude	Thursday, December 2015	Computers	Desktop Computer
Corpor	Drillthrough	► Thursday, December 31, 2015	Manufacture Data	Monitor
Adventure				
Works				
Contoso, Ltd		Thursday, December 31, 2015	Cameras and camcorders	Camera Camcor Accesso
Total				

Building a Report

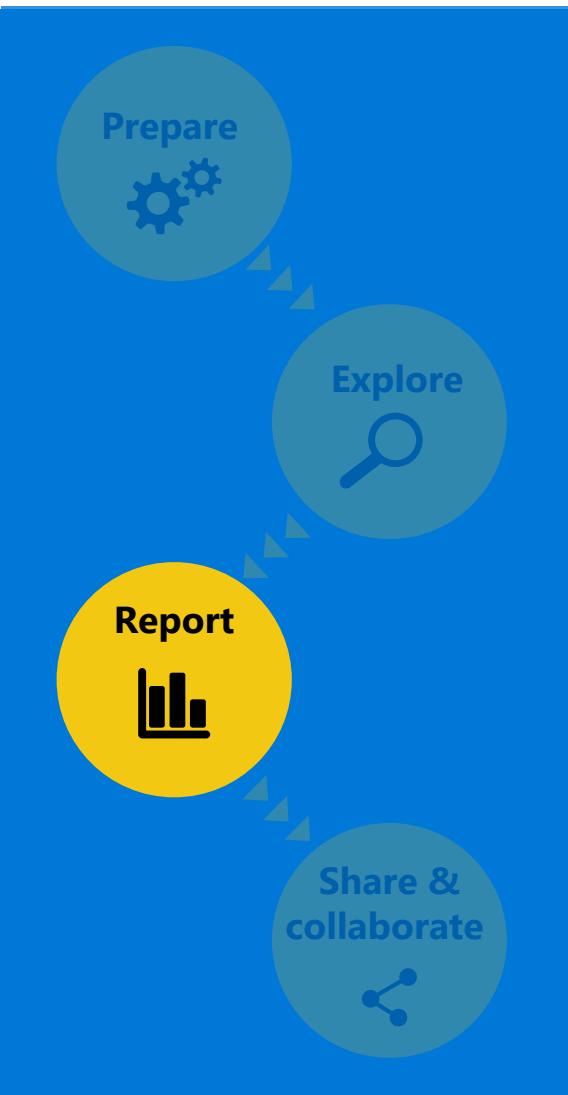


Bookmarking (Oct. Preview)

- Save interesting states as part of your report.
- Pick up where you left off in your analysis.
- Create PowerPoint-like presentation of your report.
- Create report navigation, and more.



Building a Report



Bookmarking (Oct. Preview)

- Turn on **Preview** feature.
- Add bookmarks by opening bookmarks pane.
- Set up report to look how you want and click the Add button under Bookmarks.
- Rename or rearrange the bookmarks as necessary.
- Use bookmark by simply clicking a bookmark from the bookmark pane; or
- Use View option to use bookmarks as a story or in a presentation.

Options

GLOBAL

Data Load
Query Editor
DirectQuery
R scripting
Security
Privacy
Updates
Usage Data
Diagnostics
Preview features
Auto recovery

Preview features

The following features are available for you to try in this release. Preview features might change or be removed in future releases.

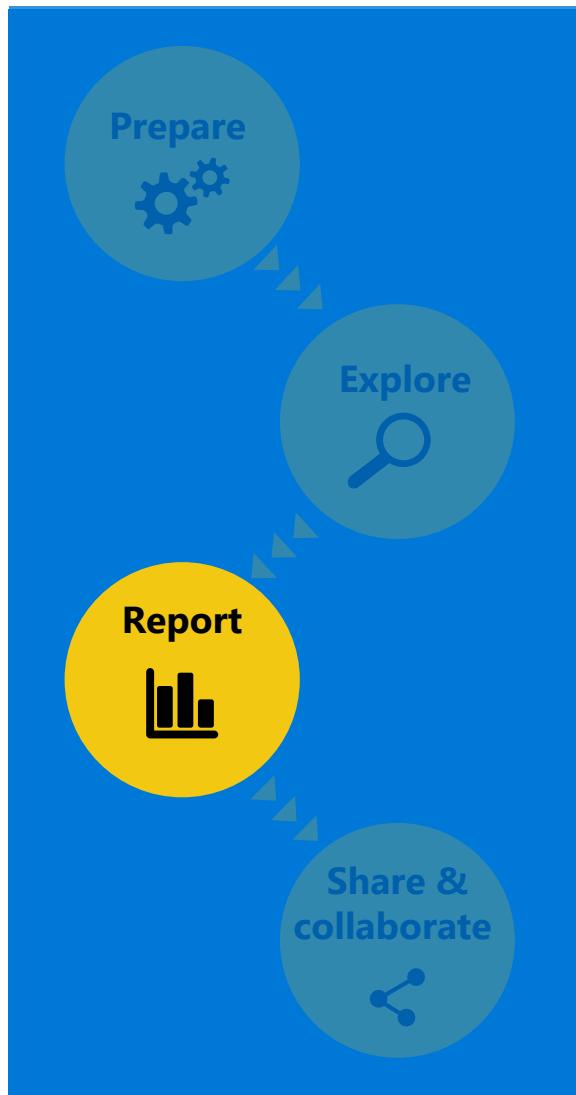
- Shape map visual [Learn more](#)
- Custom report themes [Learn more](#)
- Numeric range slicer [Learn more](#)
- Spanish language support for Power BI Q&A [Learn more](#)
- Quick measures [Learn more](#)
- Custom data connectors [Learn more](#)
- Bookmarks [Learn more](#)



The image contains three screenshots of the Power BI 'BOOKMARKS' pane:

- Screenshot 1:** Shows the 'BOOKMARKS' pane with the '+ Add' button highlighted with a red box.
- Screenshot 2:** Shows a list of bookmarks. The 'View' button next to the first item is highlighted with a red box.
- Screenshot 3:** Shows a detailed view of a bookmarked page. The 'View' button at the top of the pane is highlighted with a red box.

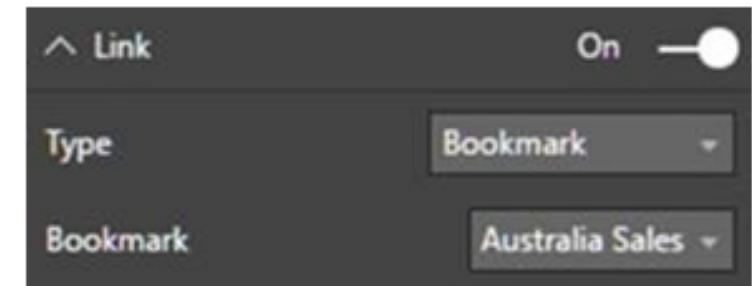
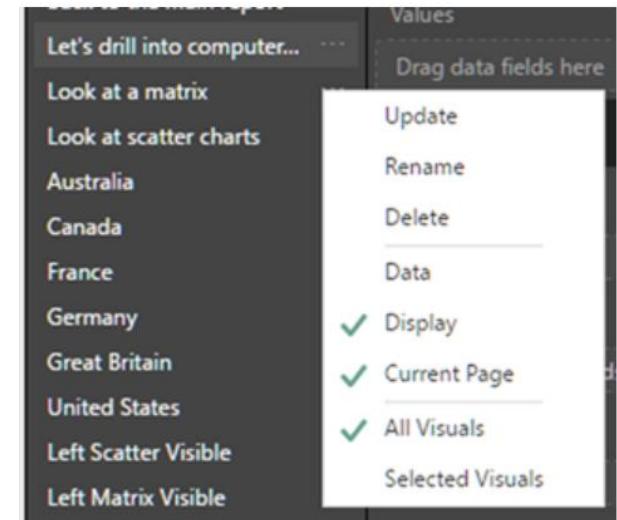
Building a Report



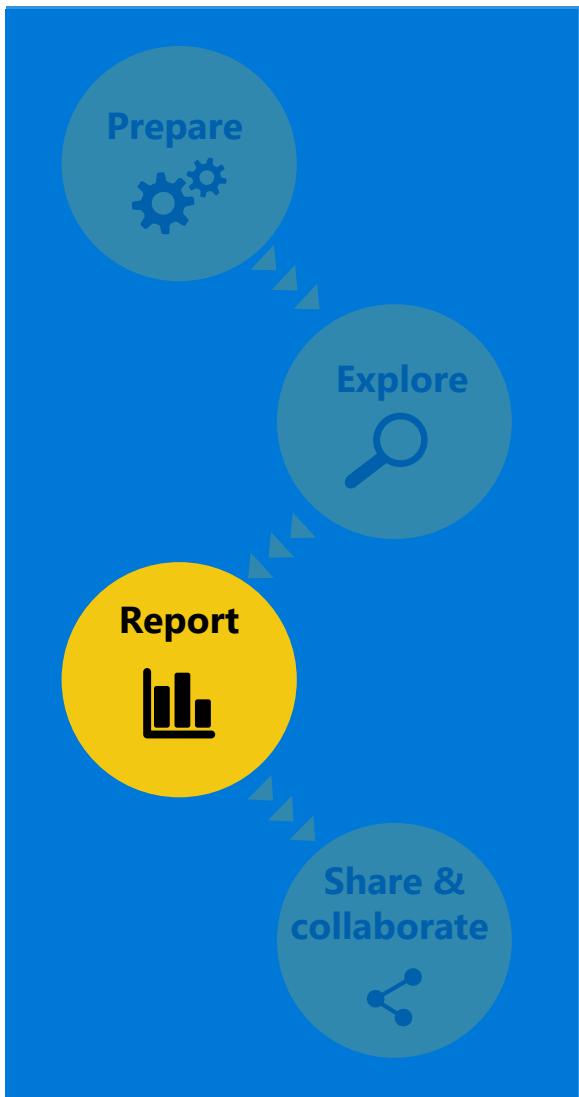
Bookmarking (Oct. Preview)

- Bookmark will include the following:
 - the current page
 - Filters
 - Slicers
 - Sort order
 - Drill location
 - Visibility (more on this later)
 - Any of the “focus” modes
- Bookmark links are available for shapes and images; great feature for creating custom navigation in reports.

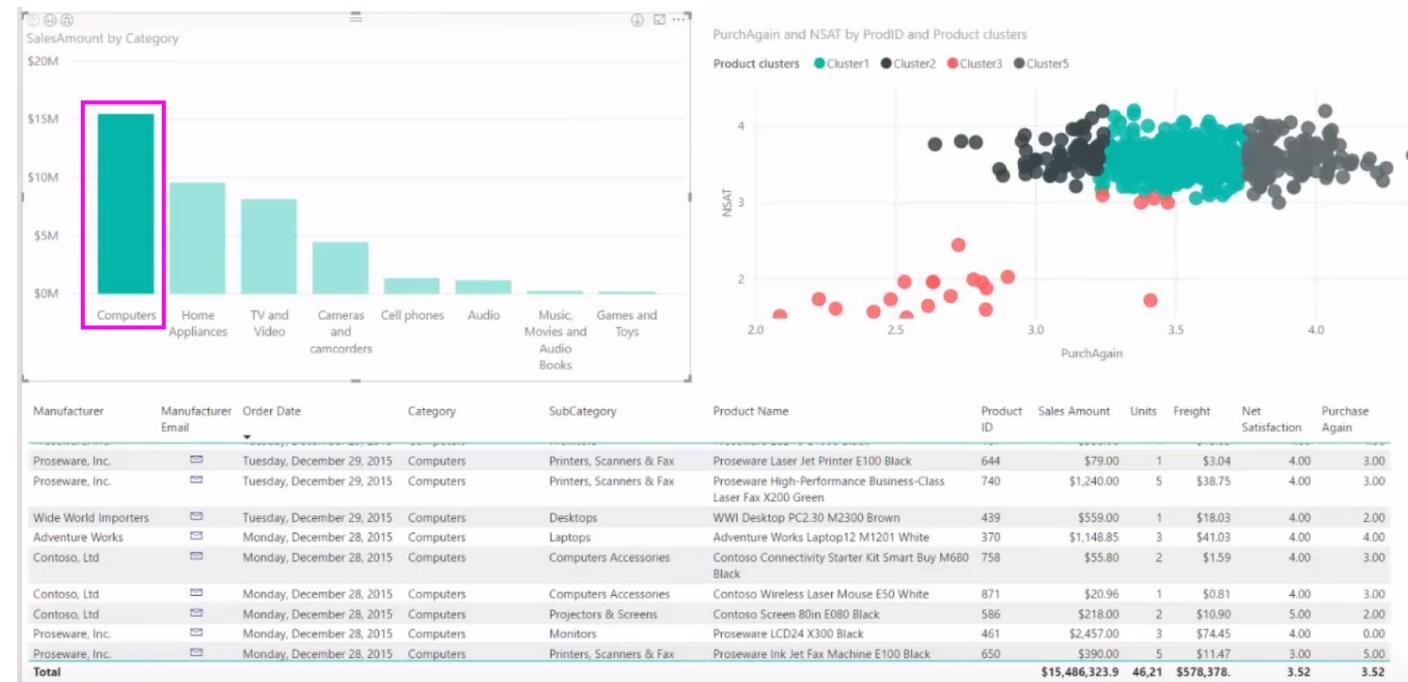
Flexible Bookmarks



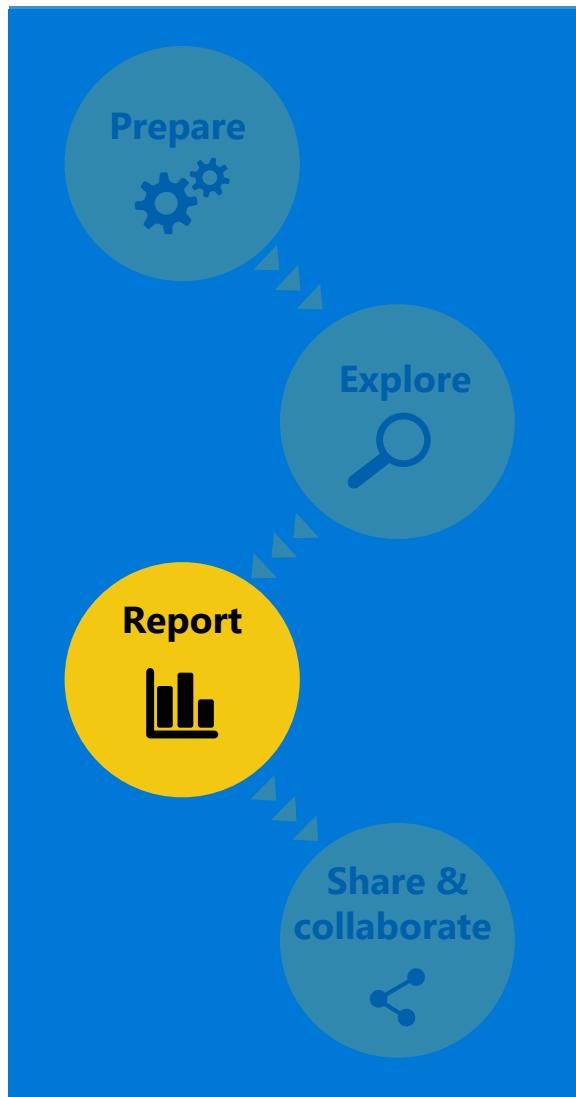
Building a Report



Bookmark Cross-highlighting

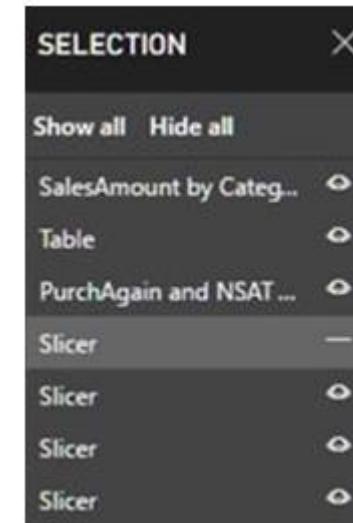
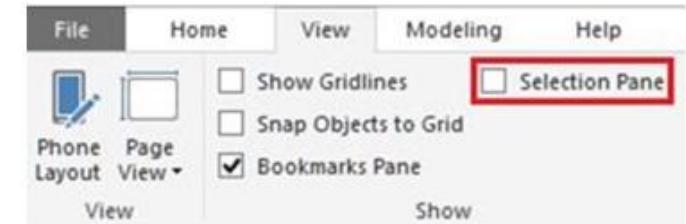


Building a Report

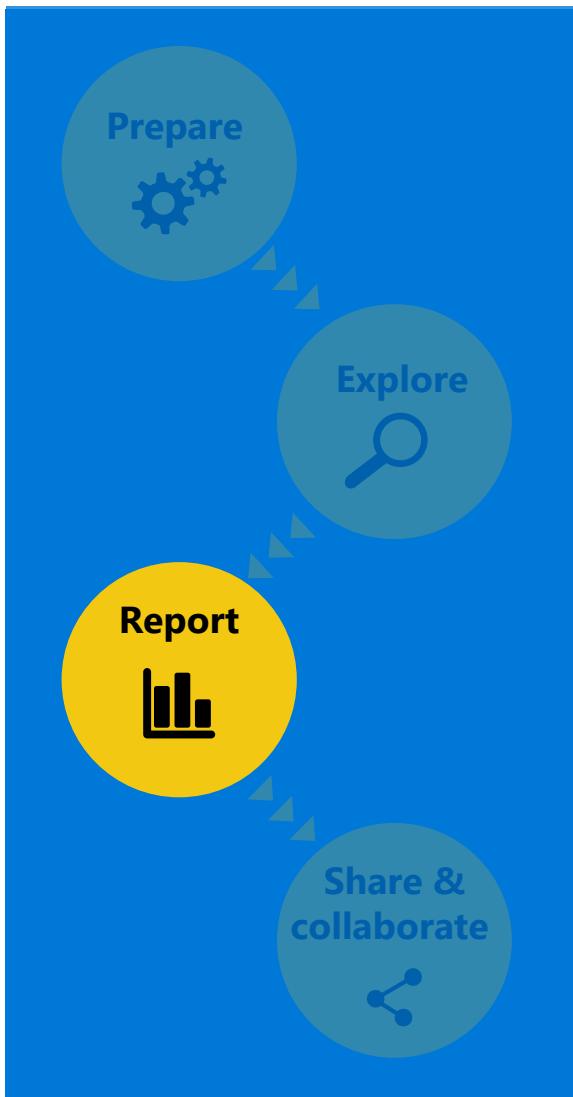


Selection Pane

- Lists out all objects on the current report page and allows you to **select** the visual from here.
- Hide visuals on the report through this pane.
- Combine this feature with bookmarking to create interesting reports.
- Very useful feature for **storytelling** purposes.

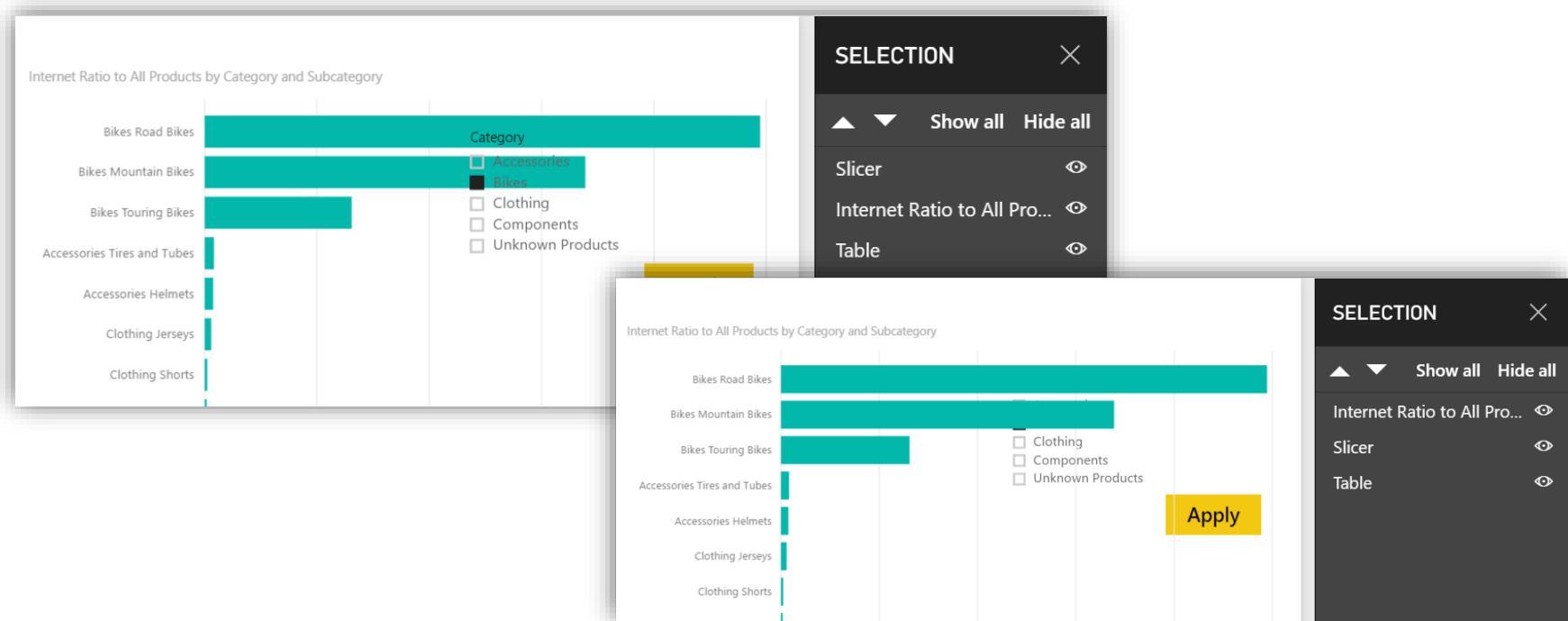


Building a Report



Visual selection and Control ordering

- Easily change which overlapping objects show on top on the canvas
- Objects higher in Selection list show in front of objects lower in the list

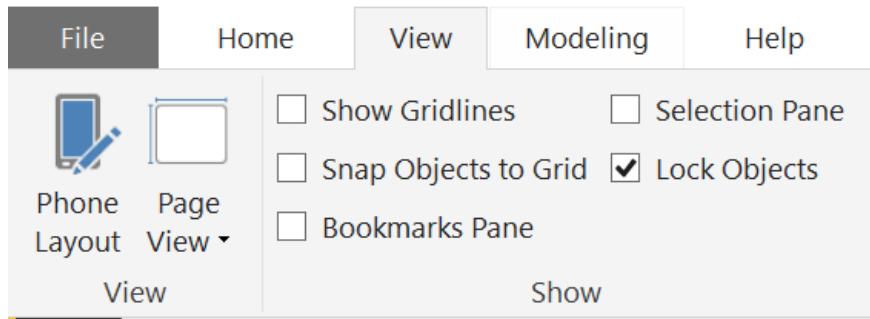


Building a Report

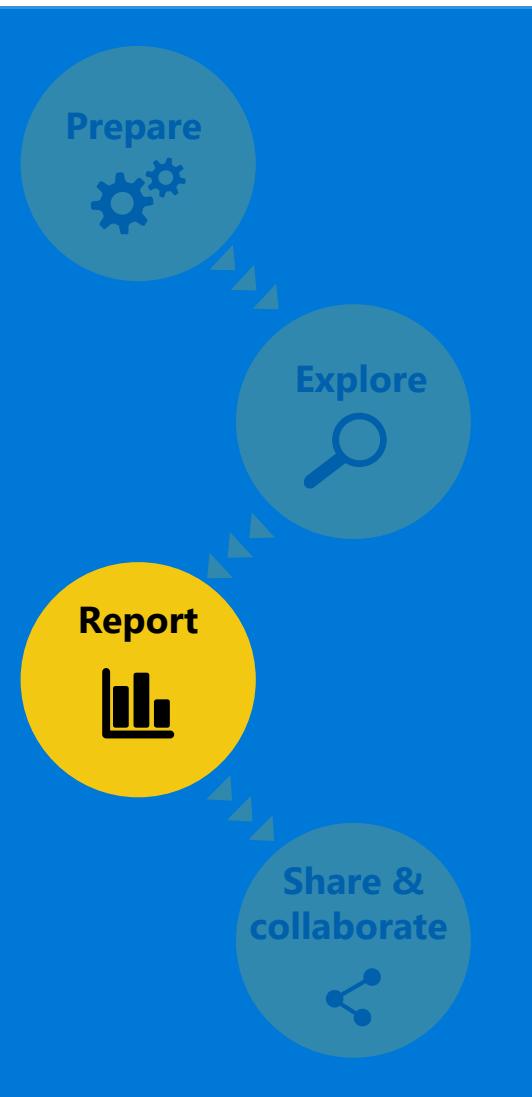


Lock objects

- Prevent from **accidental movement** of objects
- Lock Objects option will turn off **resize and move** objects
- This setting **isn't saved** with the report, so you need to enable it **any time** you want to use it

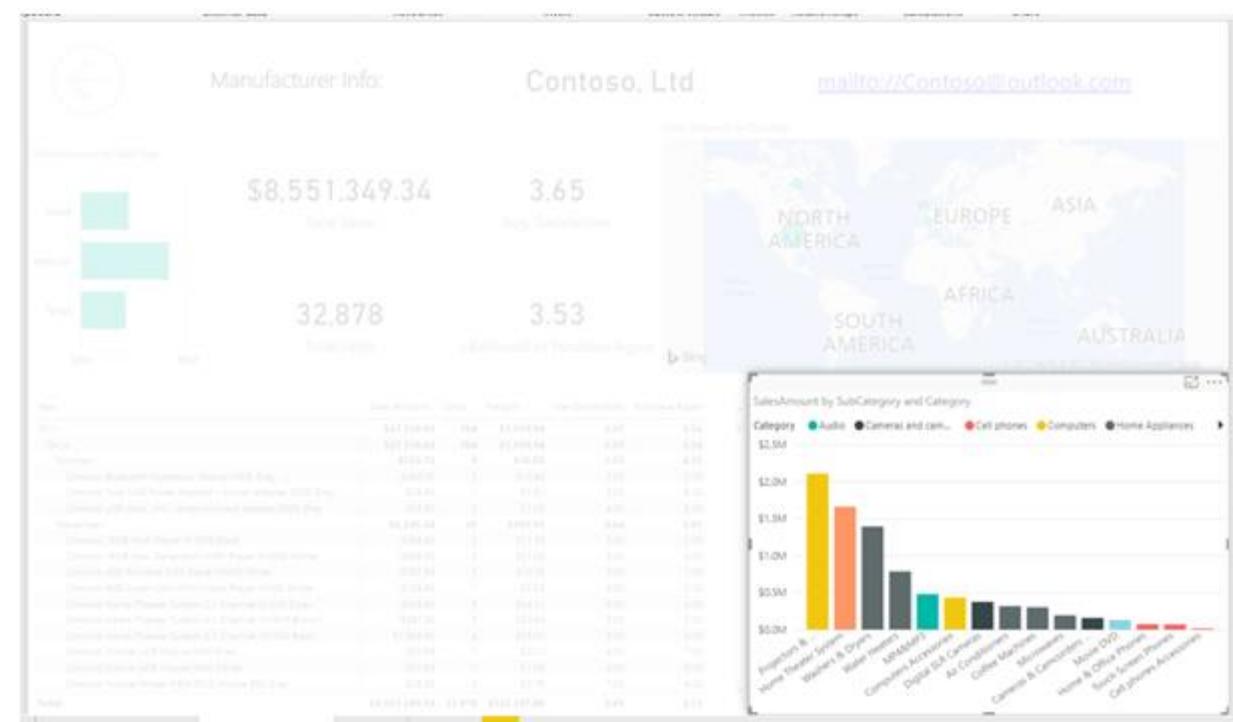
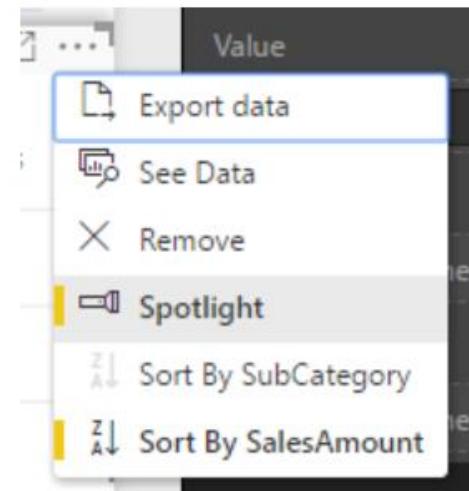


Building a Report

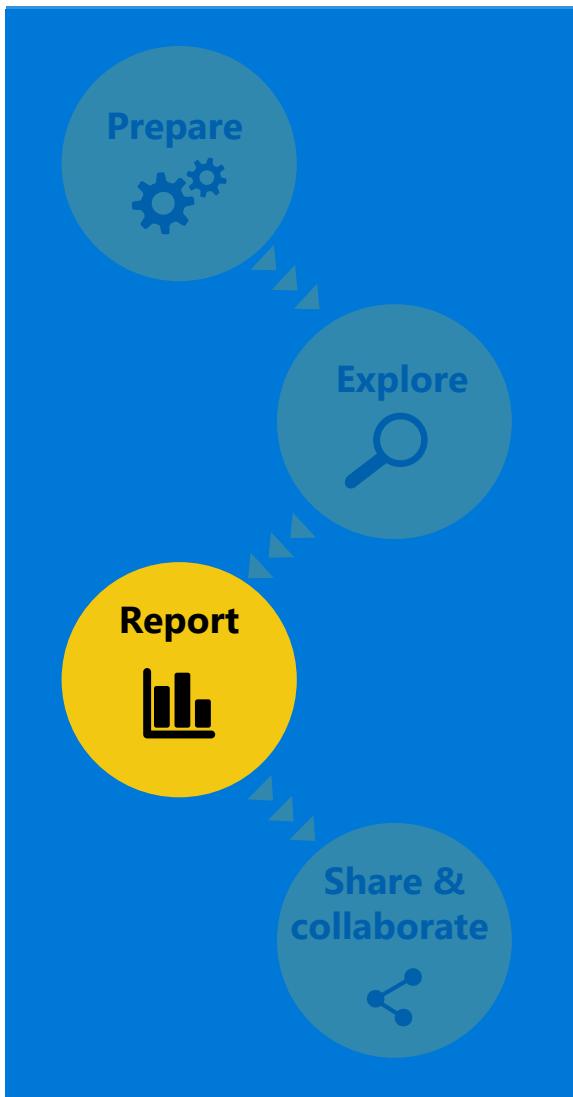


Spotlight

- Call attention to a specific visual without losing context during presentations.
- This feature can be included as part of a bookmark.

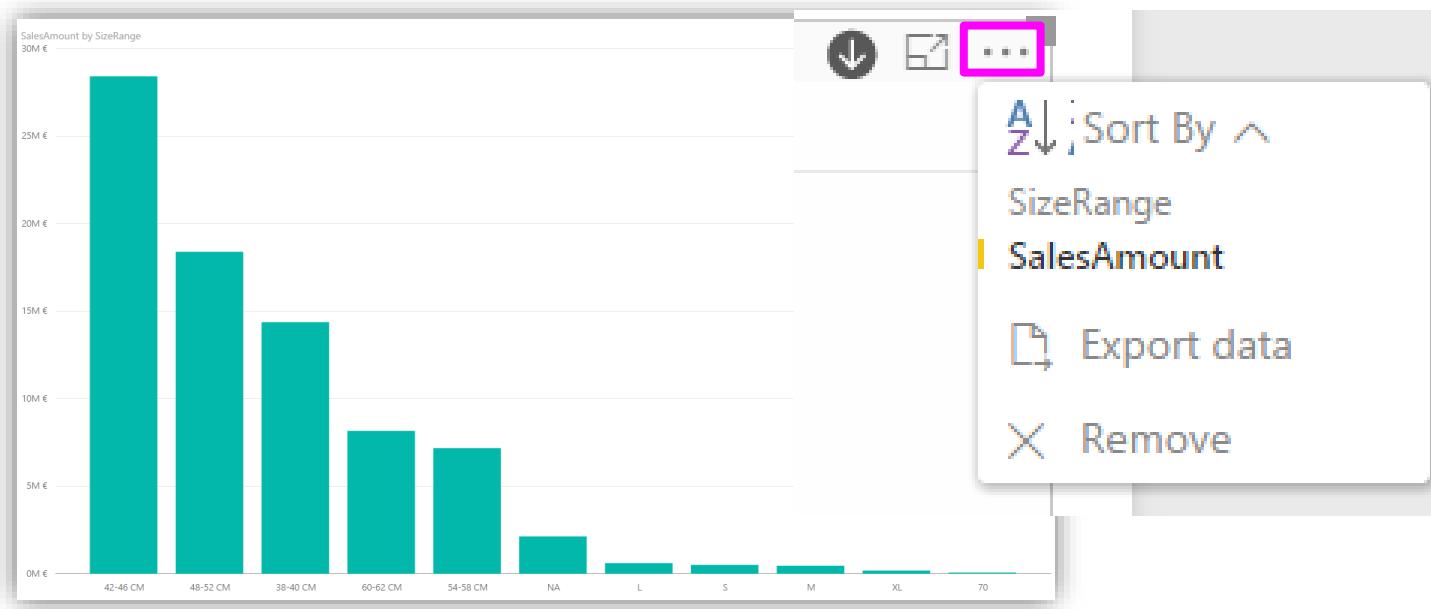


Building a Report

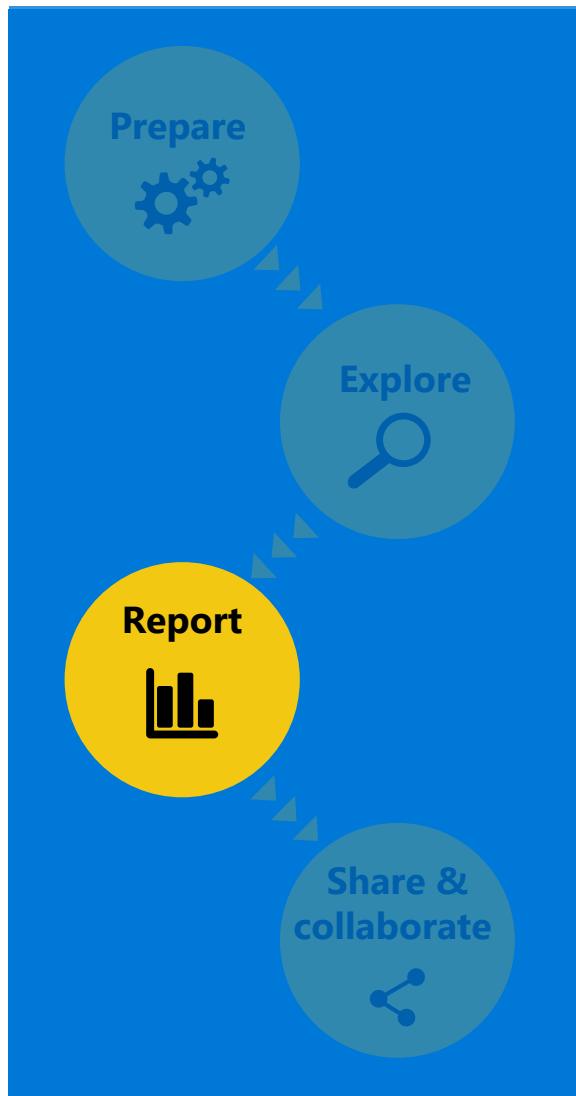


Sorting

- It is possible to **sort** data according to **numeric values** or to **data categories**, for each **visualization**
- For categories, the order that is used is either **alphabetical** (or **numerical**) or the **custom sort** order
- Data can be presented **ascending** or **descending**

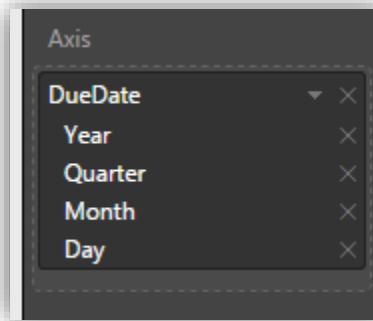


Building a Report

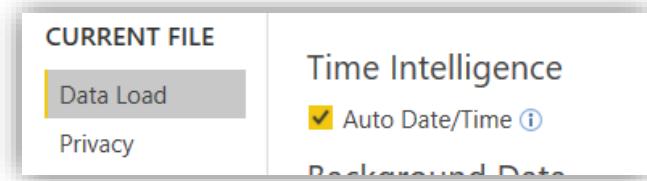


Automatic Date Features

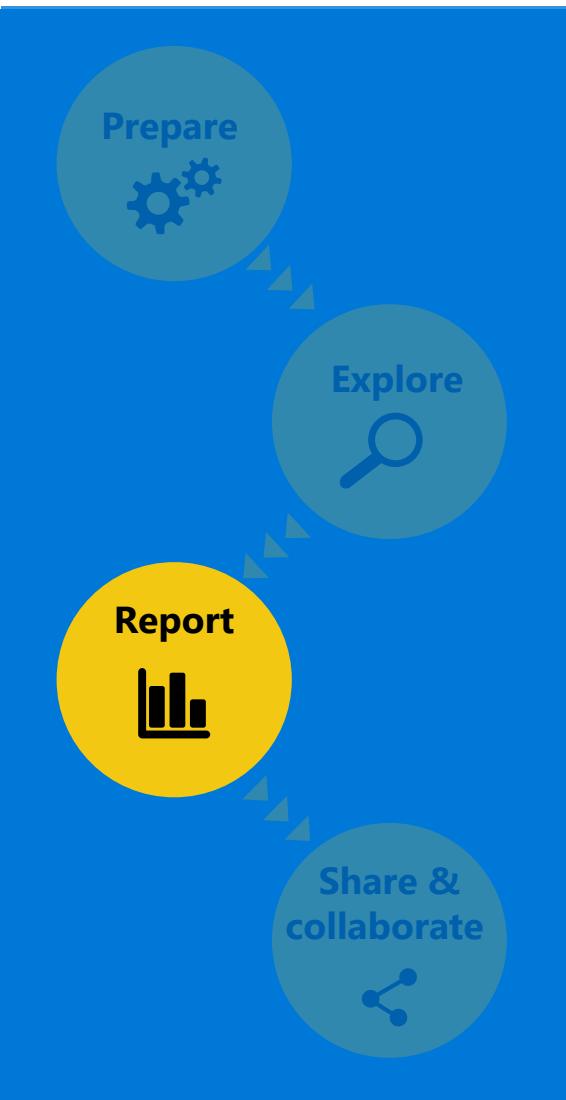
- Automatic detection of DateTime fields
- DateTime Fields are automatically expanded when added to a visualization and drilling is enabled



- The DateTime field **cannot** be connected to an **external table**
- Enable or disable under Options and Data Load

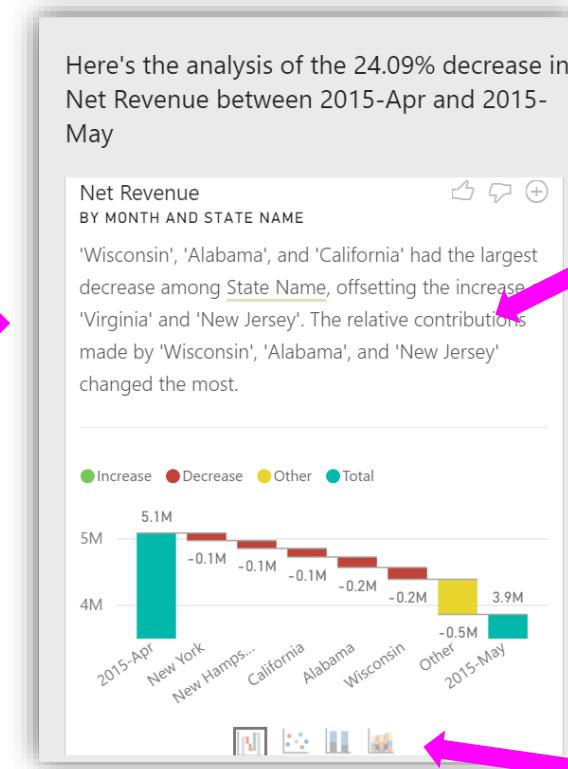
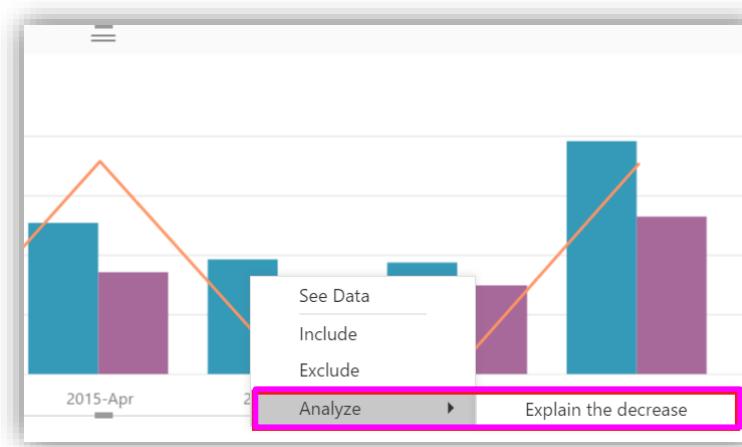


Building a Report



Increase/Decrease Insights (Preview)

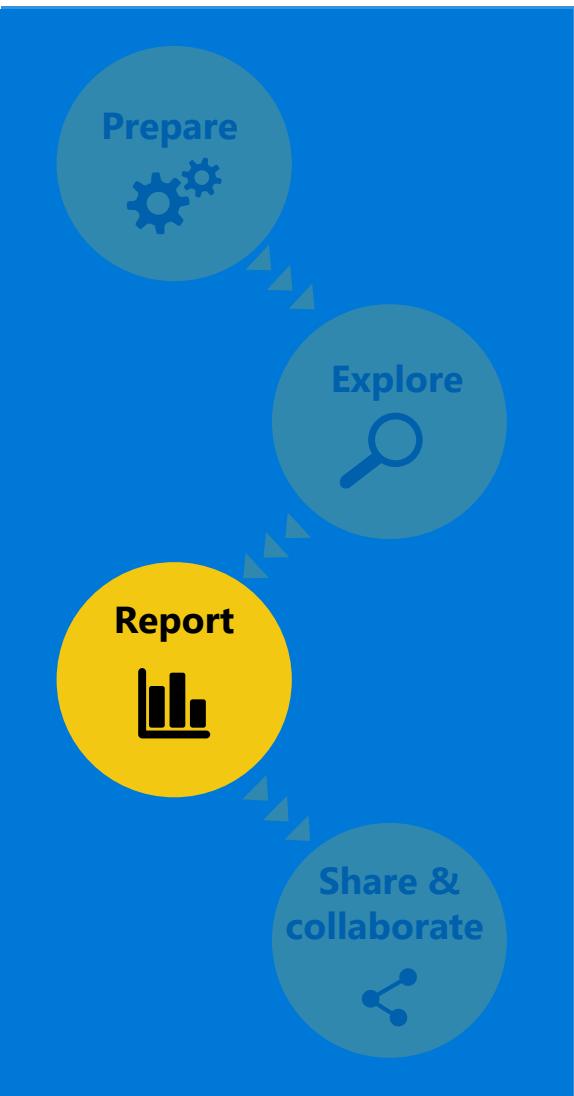
- Right click on a bar or a data point in a line chart
- Ask us to explain why the data point increased or decreased compared to the data point before it.



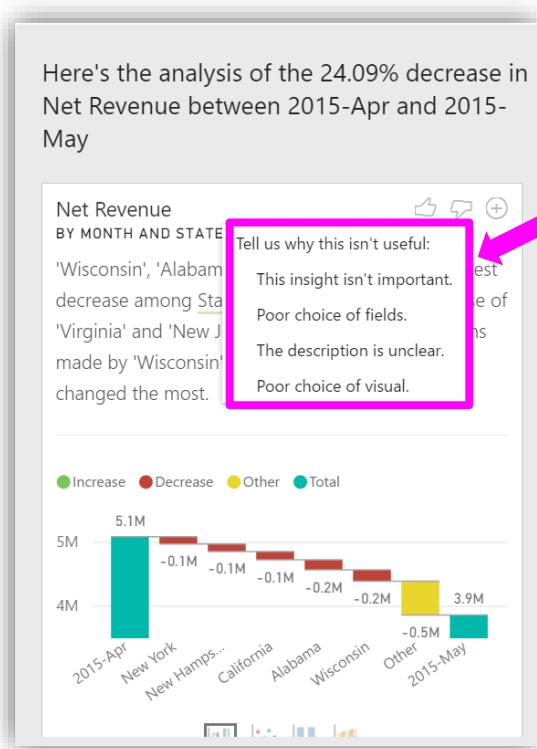
machine learning algorithms

waterfall chart,
scatter chart,
stacked column
chart or
the ribbon chart

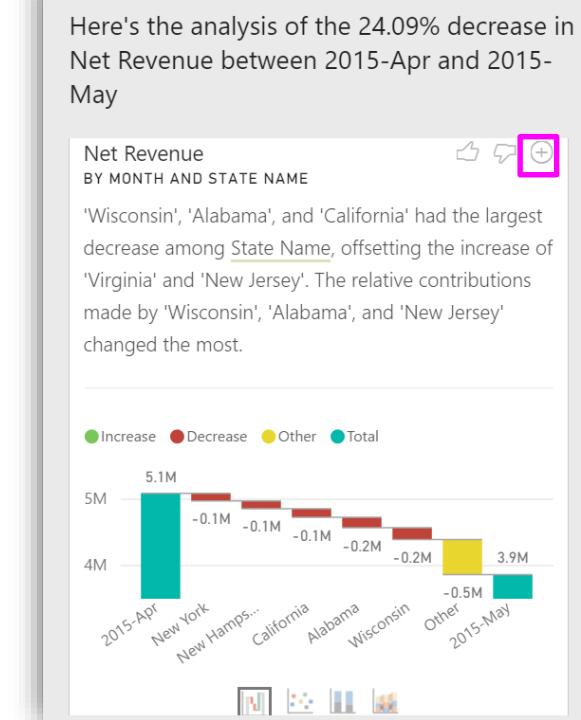
Building a Report



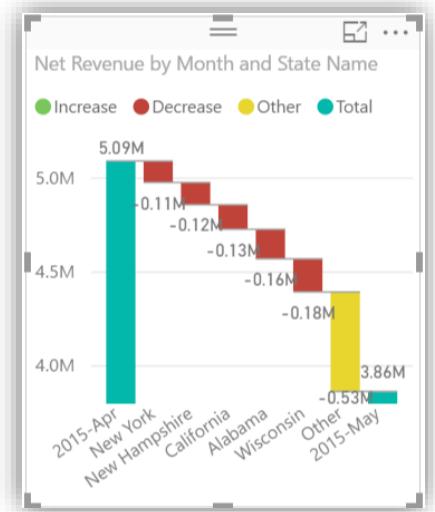
Increase/Decrease Insights (Preview)



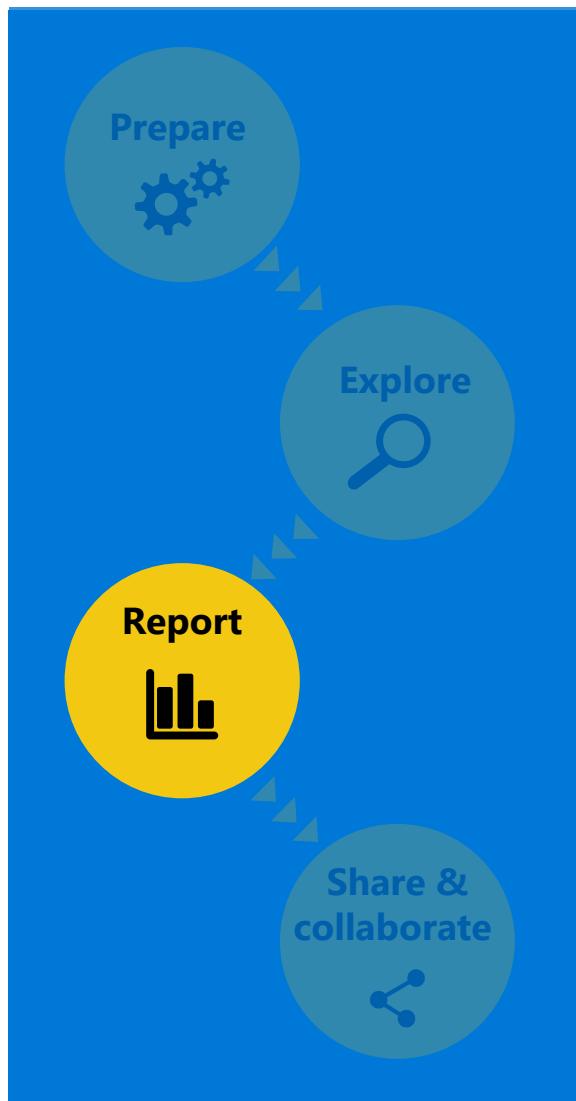
Give feedback to MS to improve ML algorithms



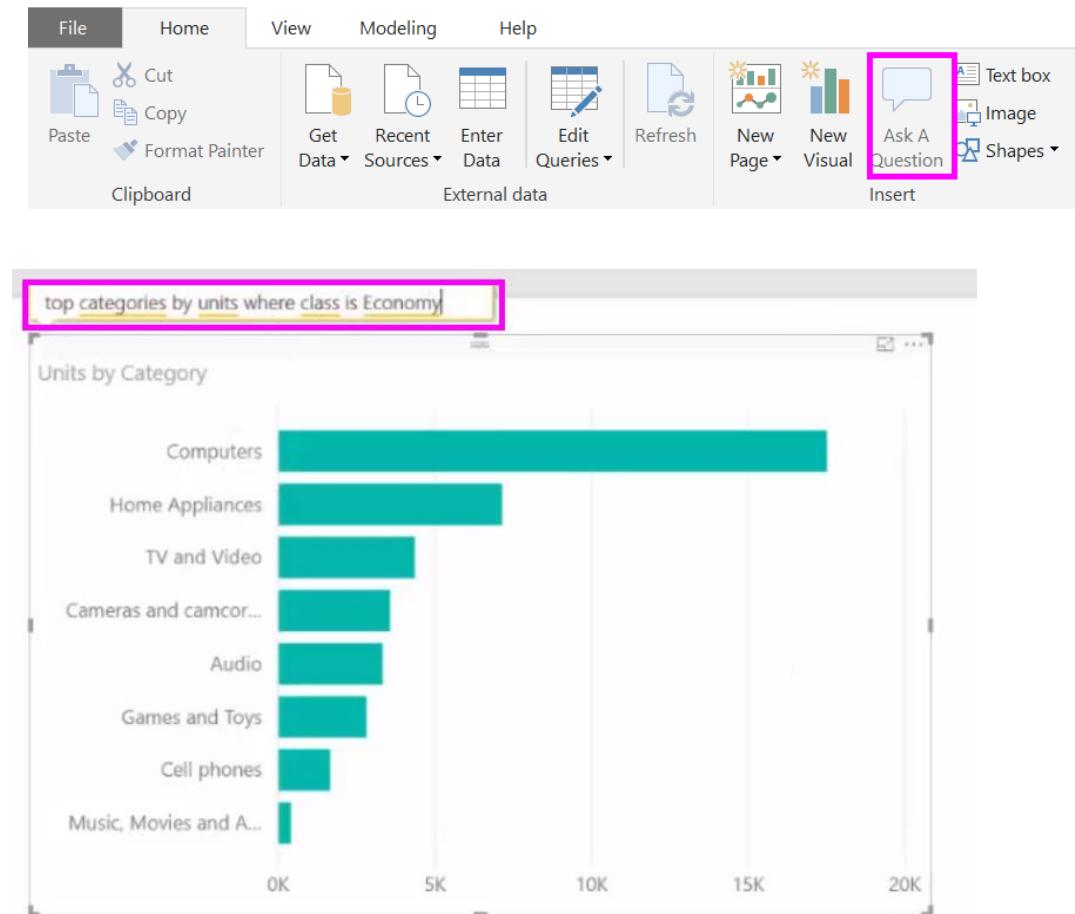
Add an insight as a visual to your report



Building a Report



Q&A For Report Creation

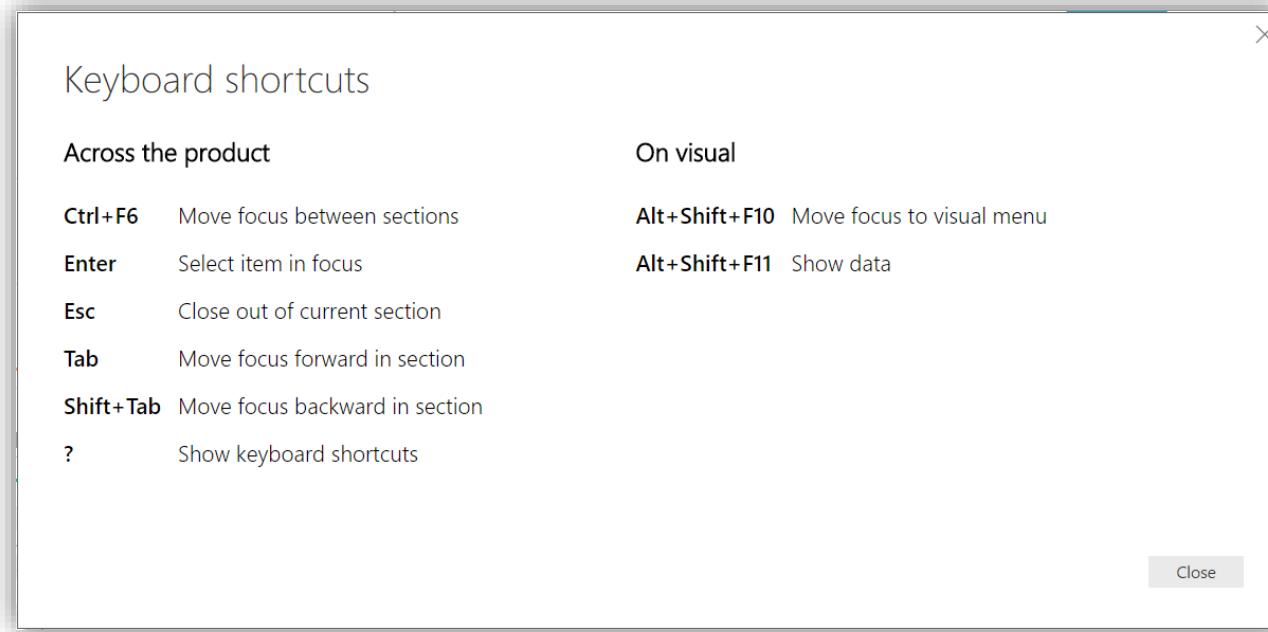


Building a Report

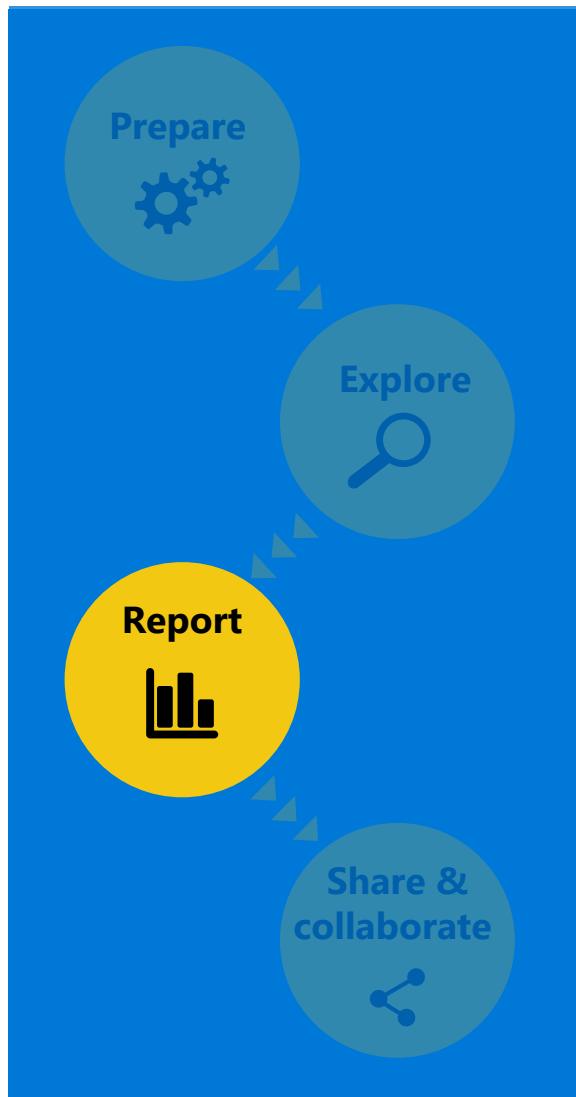


Keyboard Shortcuts

Click "?" to access keyboard shortcuts

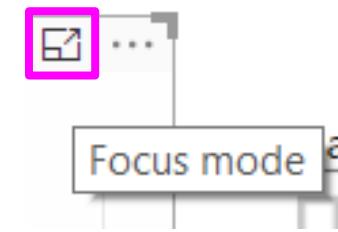
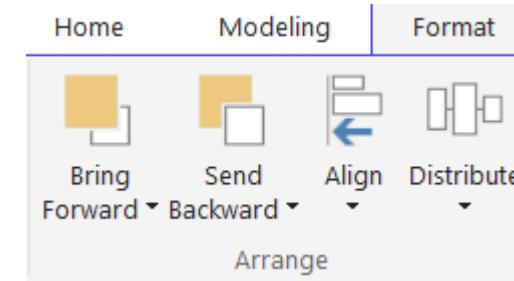
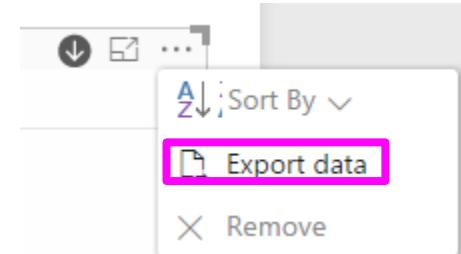


Building a Report



Other Reporting Features

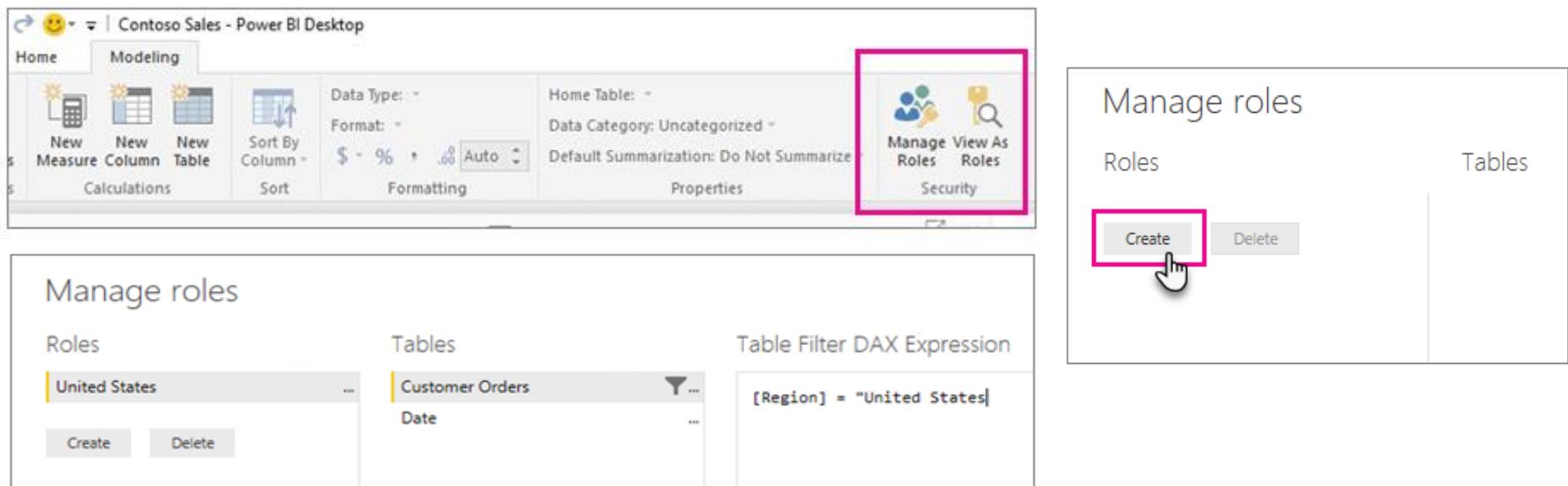
- Data for a visualization can be **exported** as .csv file
- Alignment and Depth can be controlled
- Focus mode pops-up the visualization
- It is possible to **overlay** visualizations



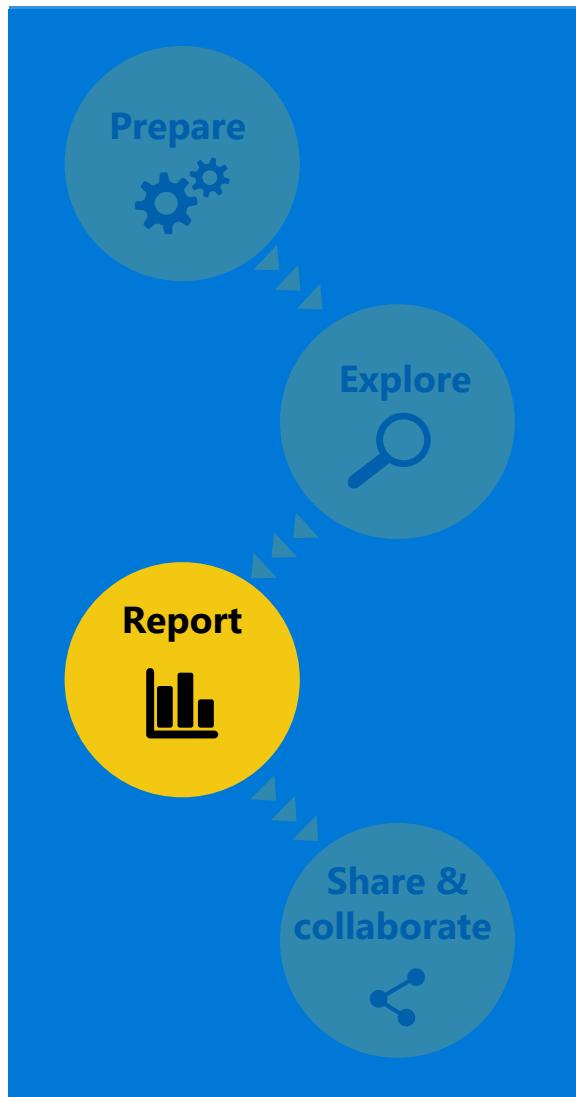
Building a Report

Row-Level-Security (Creation)

- Define **roles** and **rules** within Power BI Desktop to restrict the data users see
- Supported for both Imported models and DirectQuery connections
- Rules (or filters) defined within roles **restrict data at the row level**
- Rules are defined using **DAX**

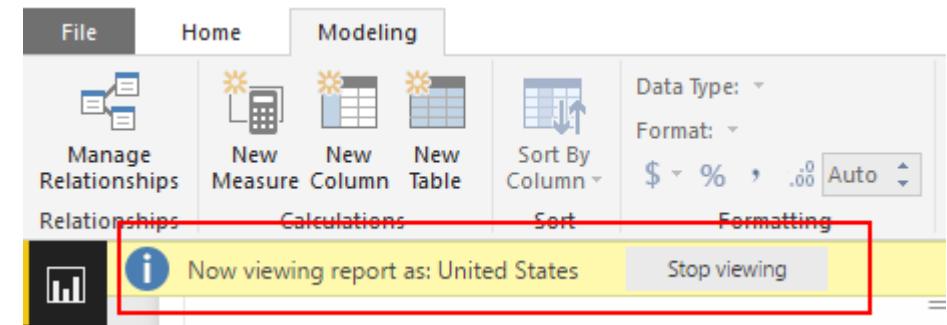
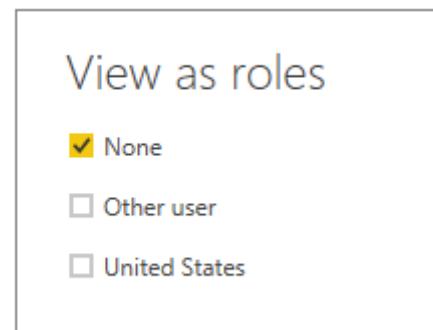
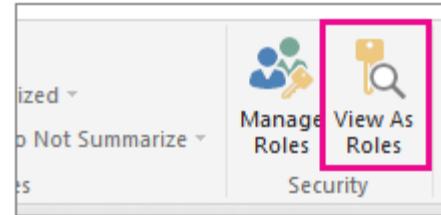


Building a Report



Row-Level-Security (Validation)

- Test the results of the role within Power BI Desktop



Note that users are assigned to a role within the Power BI service after the solution is published

Lab 1 Exercise 4: Exploring and Reporting