

Designing Interactive Reports in Power BI Desktop



Agenda

- Designing Interactive Reports
- Importing Custom Visuals
- Publishing a Project to the Power BI Service
- Using the Publish to Web Feature
- Publishing Reports in SharePoint Online
- Implementing Row-level Security (RLS)



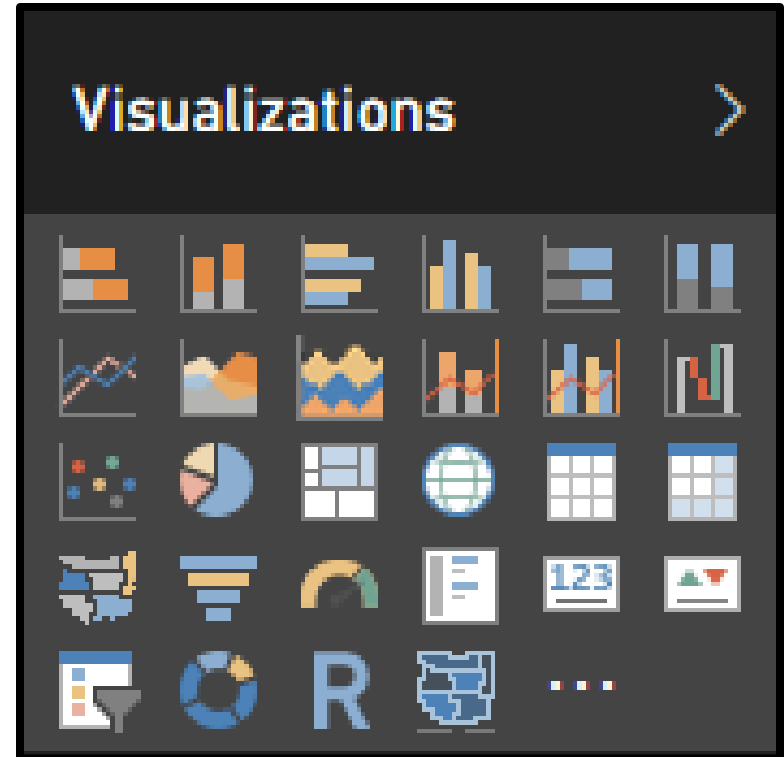
Creating Reports

- Power BI Desktop project contains one report
 - Report within project can contain multiple pages
 - Report pages contains visuals
- Reports can be created using filters
 - You can add filter to a specific visual
 - You can add page-level filters
 - You can add report-level filters
 - You can add interactive filters



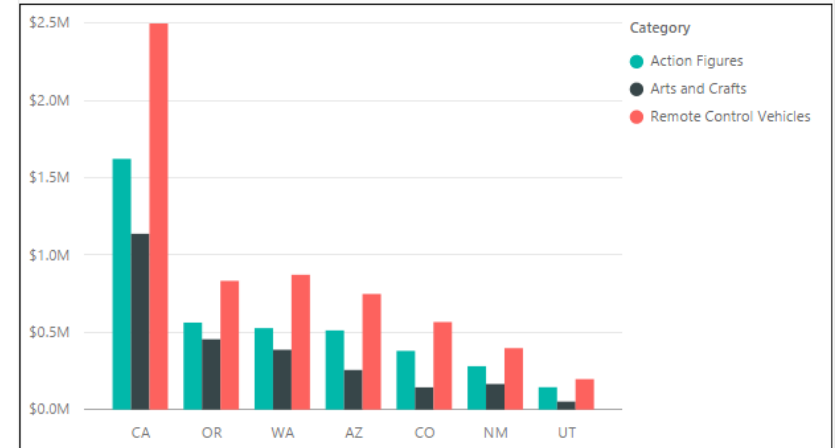
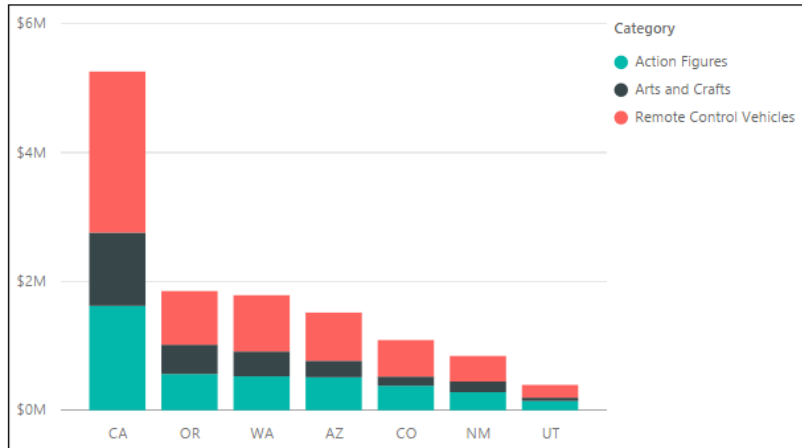
Built-in Visualization Types

- Table and Matrix
- Bar charts and Column charts
- Pie charts and Doughnut chart
- Line chart and Area chart
- Scatter chart and Combo charts
- Card and Multi-row Card
- Treemap
- Waterfall charts
- Funnel charts
- Gauge charts
- Map and Filled Map
- Slicer
- R script visual
- Shape map (in preview)

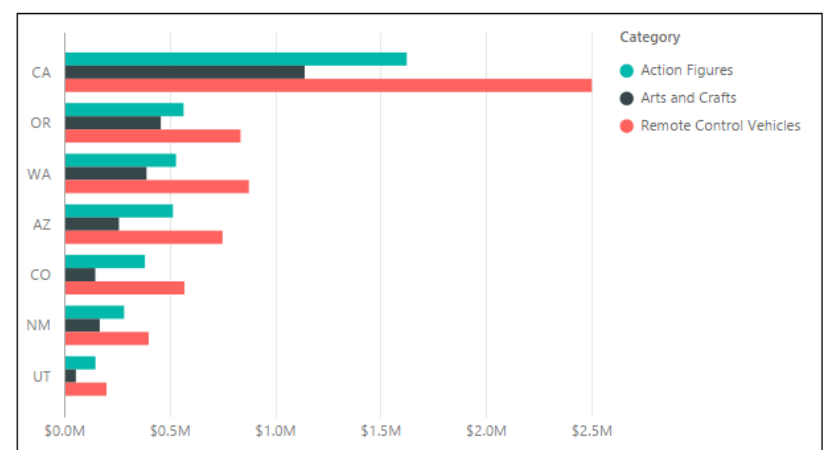
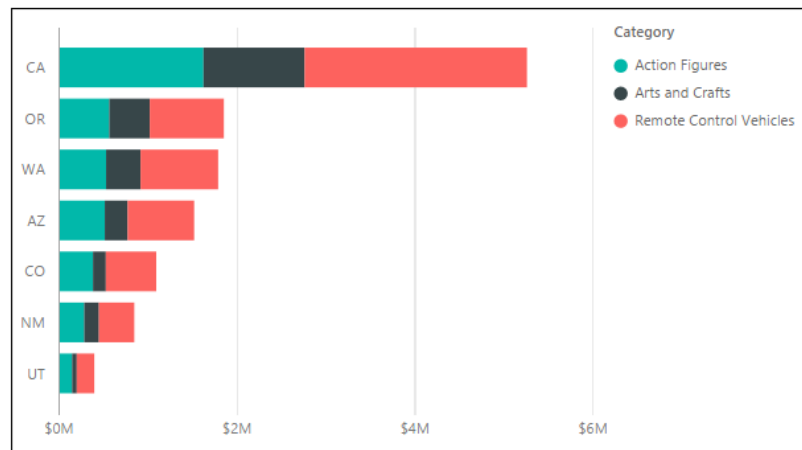


Column Chart and Bar Chart Variations

- Stacked Column Chart and Clustered Column Chart

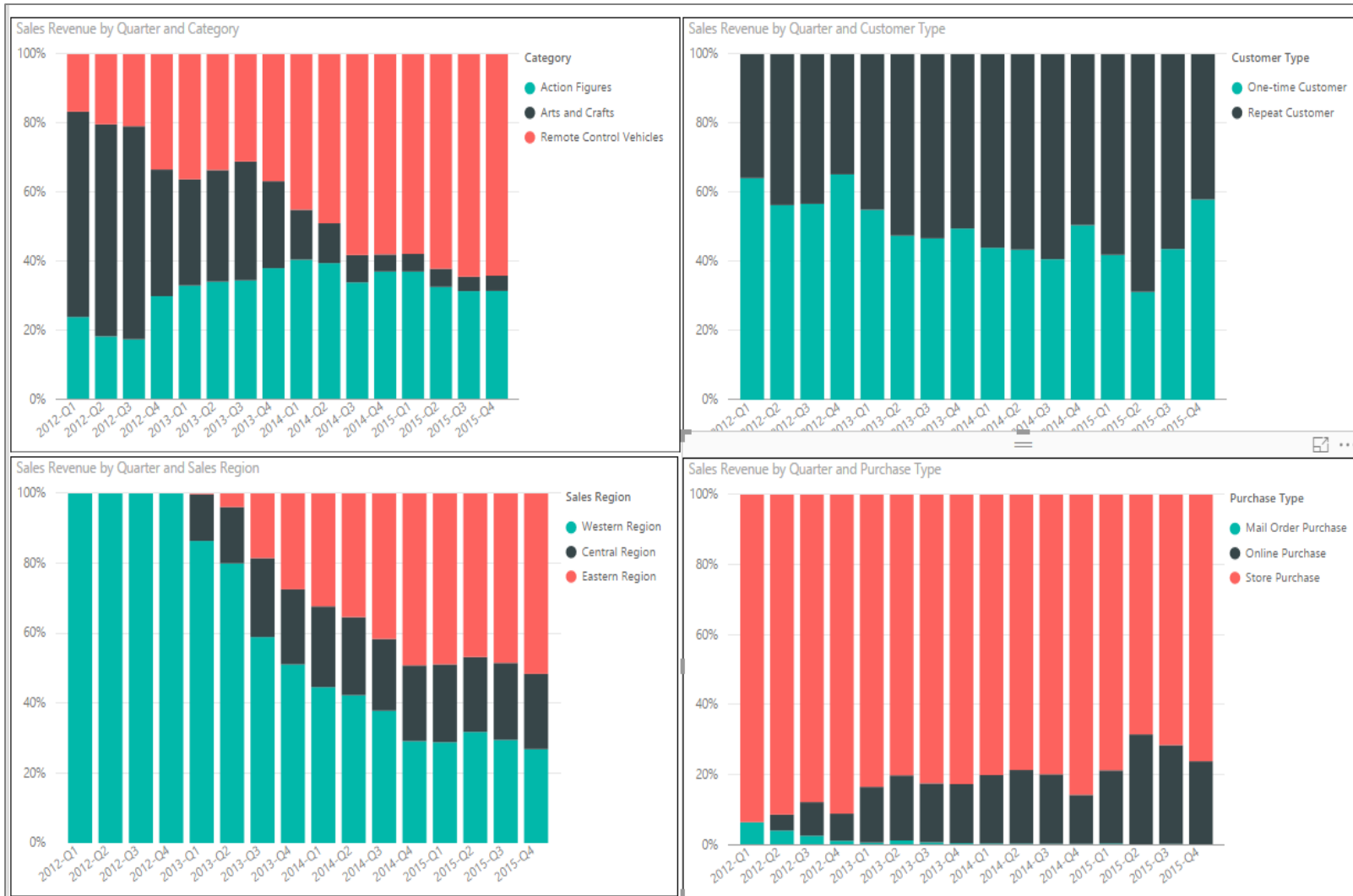


- Stacked Bar Chart and Clustered Bar Chart



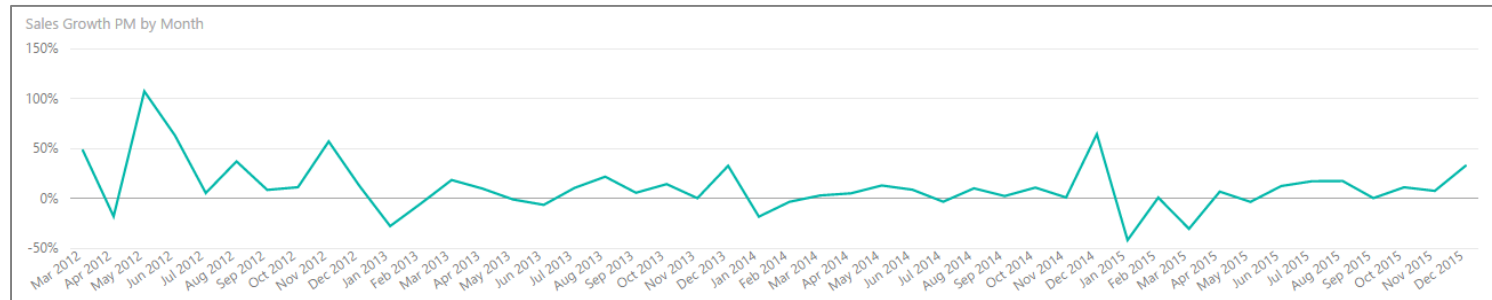
100% Stacked Column Chart

- Used to visual distribution over time across categories

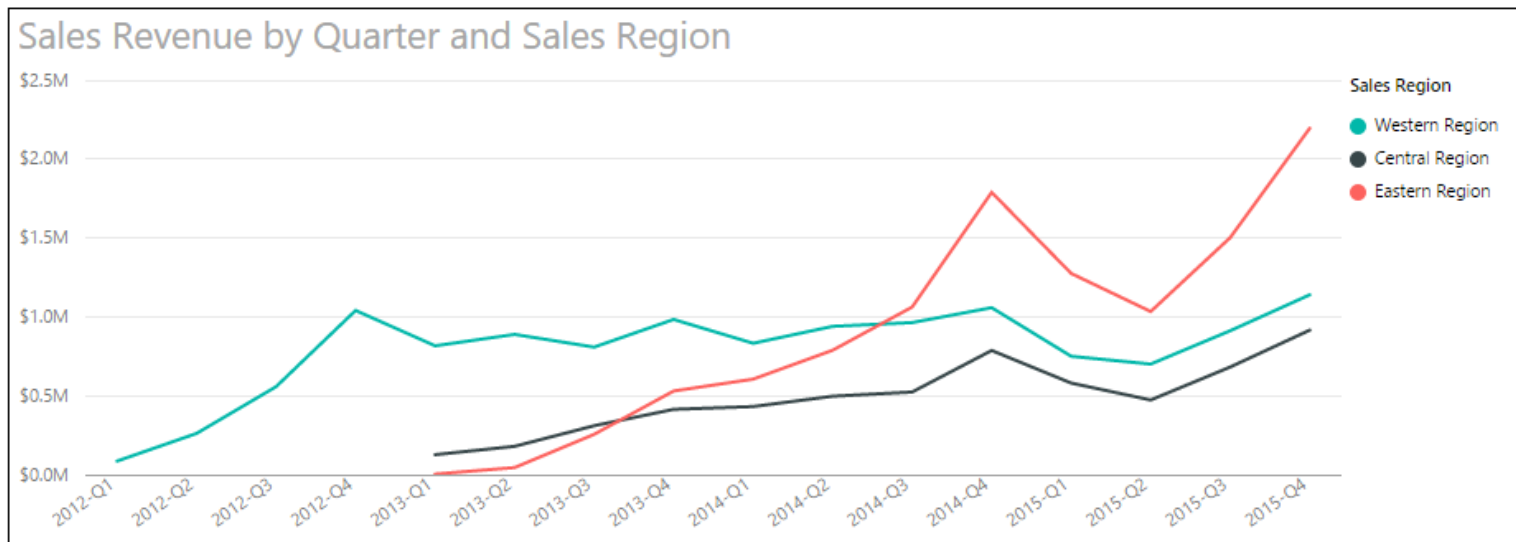


Line Charts

- Visualizes a series of data points across X and Y axis
 - Commonly used for time-based analysis

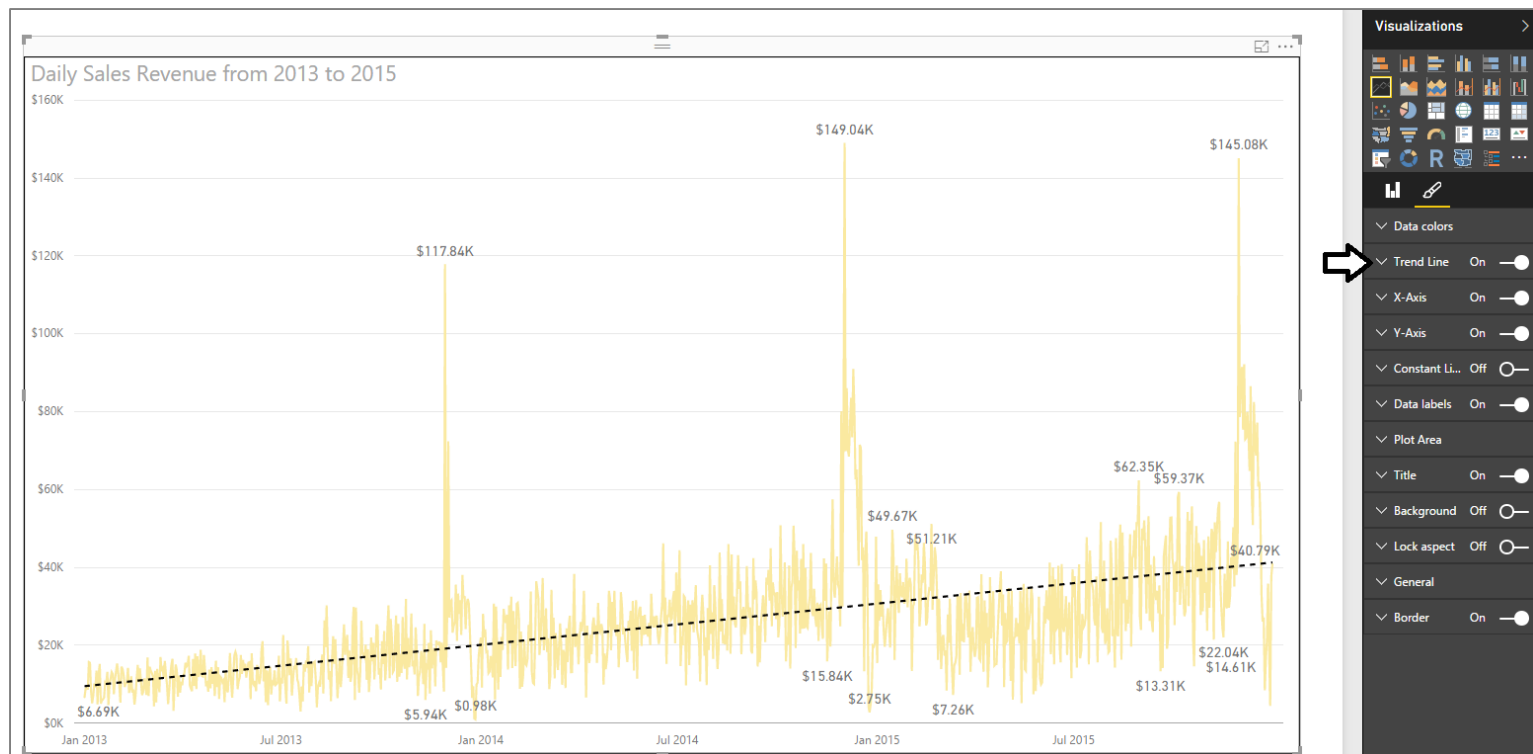


- Add field to Legend to create multiple lines for comparative analysis



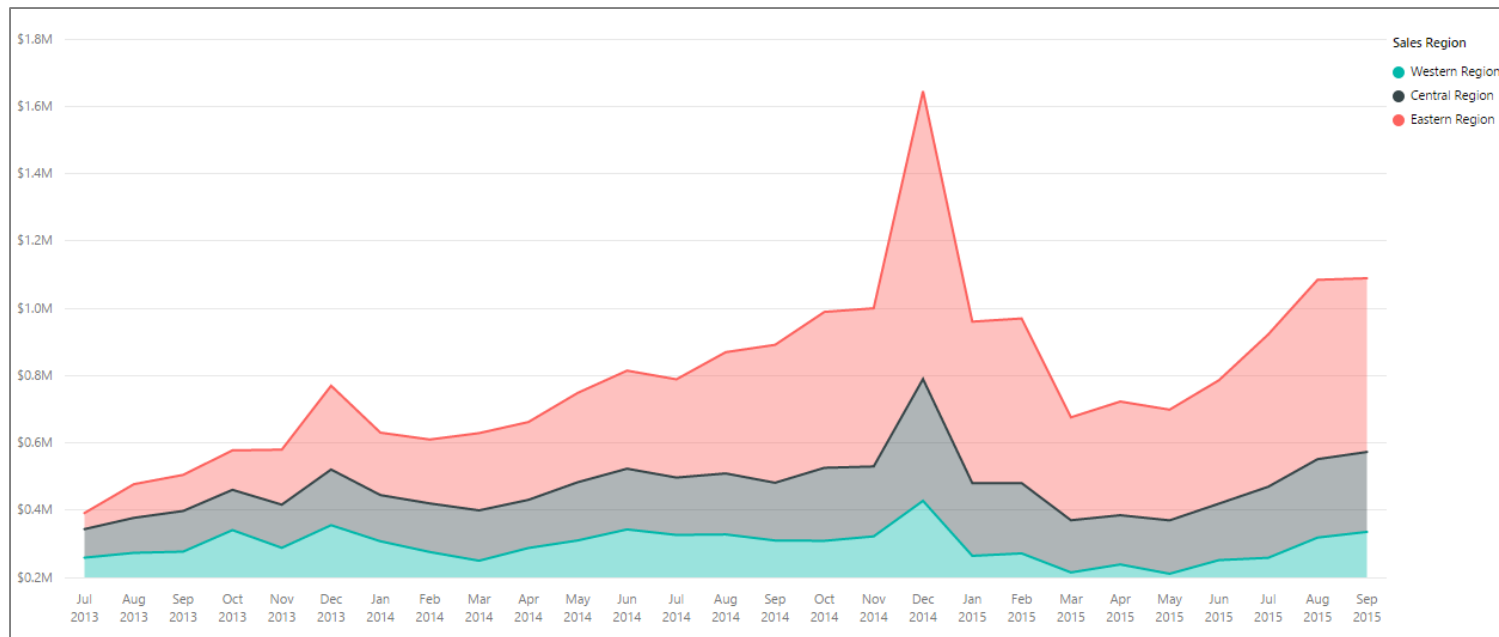
Trend Lines

- Used to visualize trends in series-based data
 - Flattens out the ups and downs
 - Used to determine if values are trending up or down



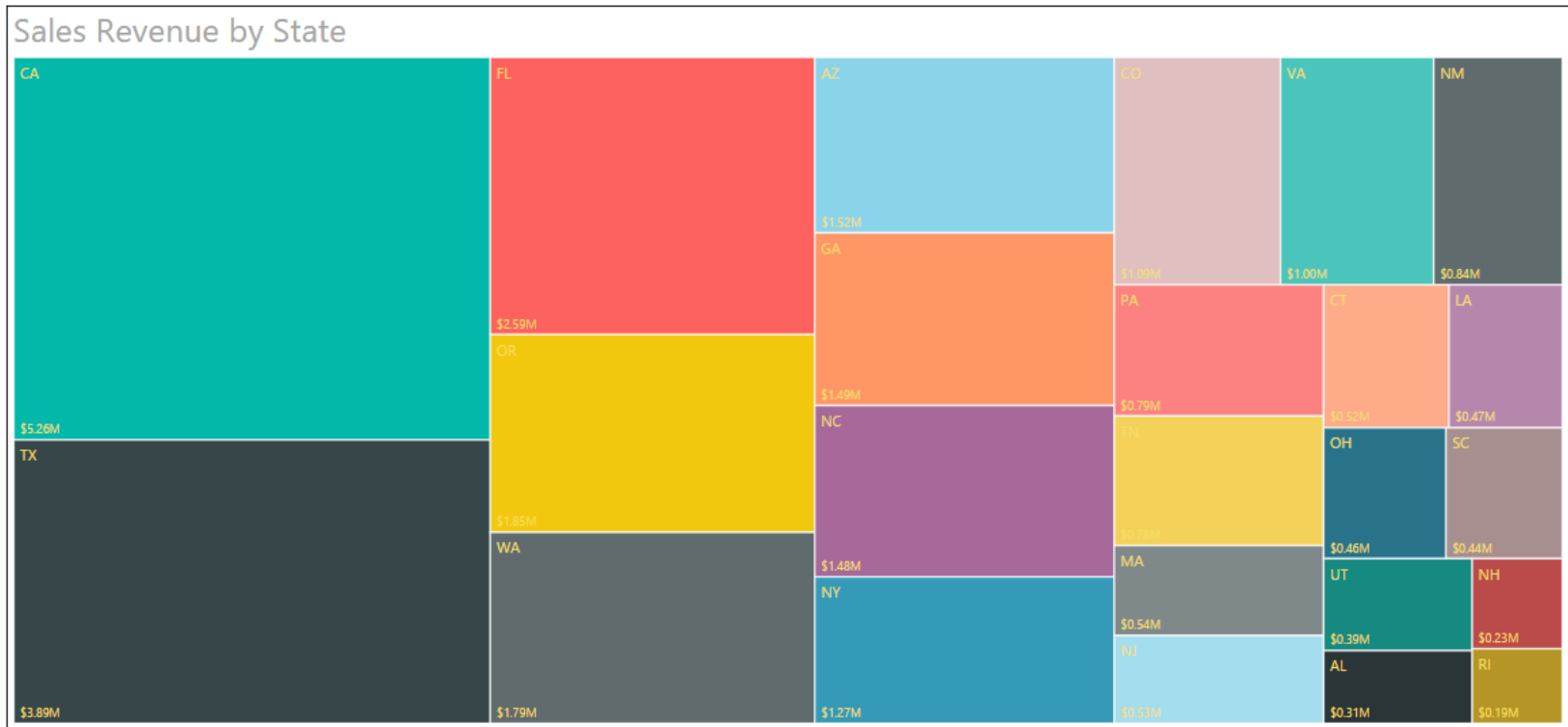
Stacked Area Chart

- Basically, a line chart with a little more personality
 - Areas under lines filled with colors



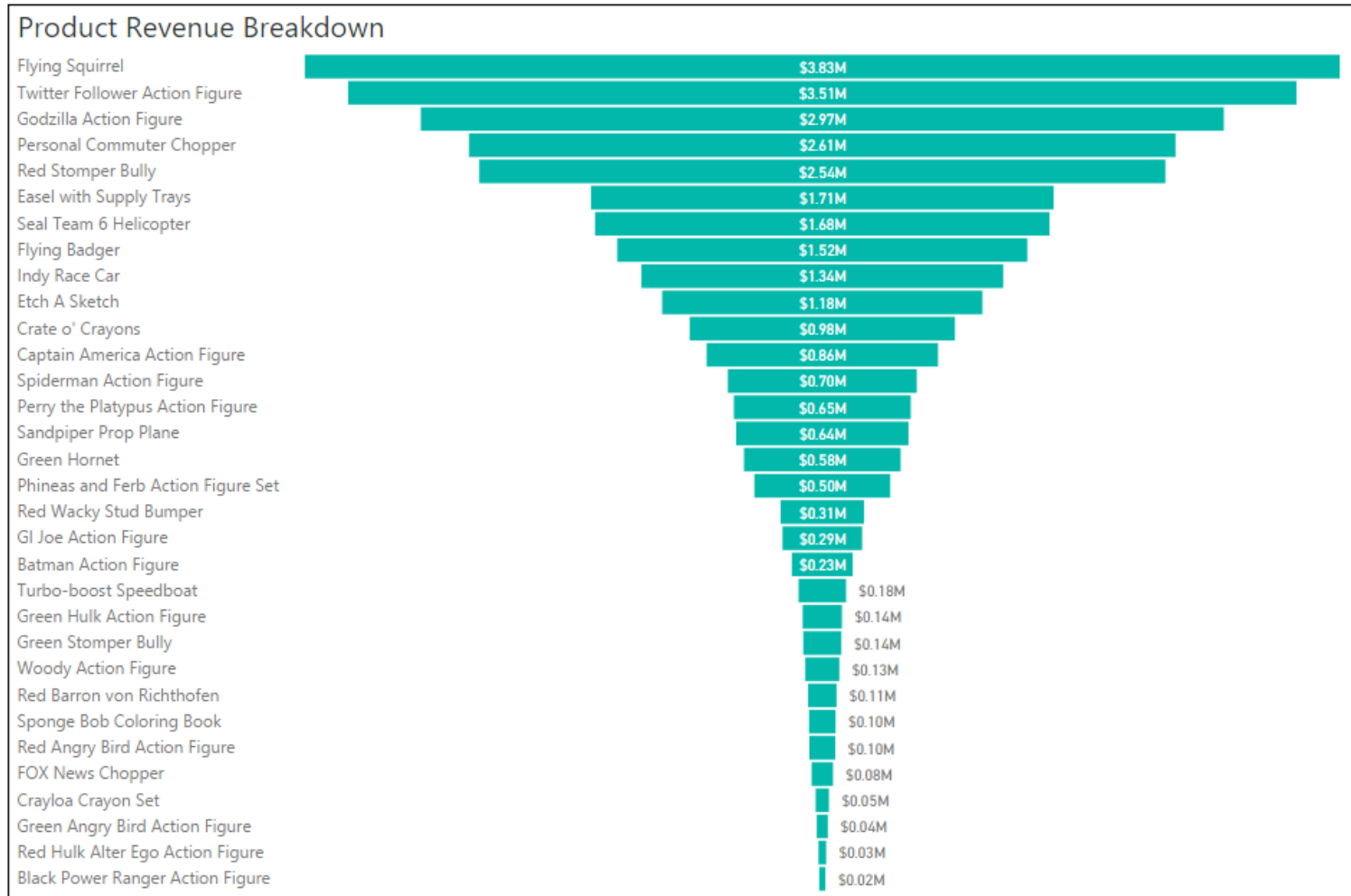
Treemap

- Simple visualization of category distribution



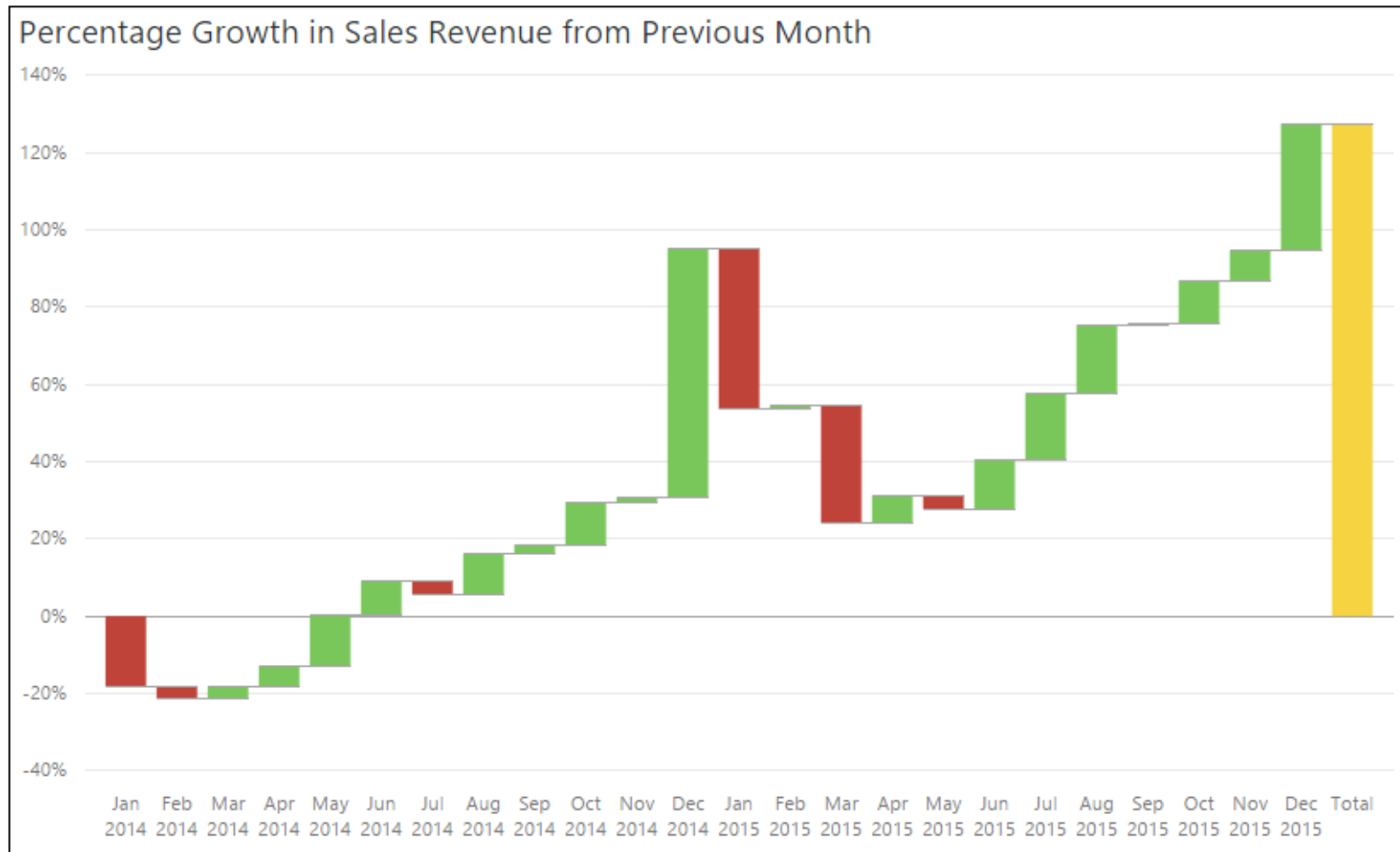
Funnel

- Visualizes distribution across categories as percentage of top value



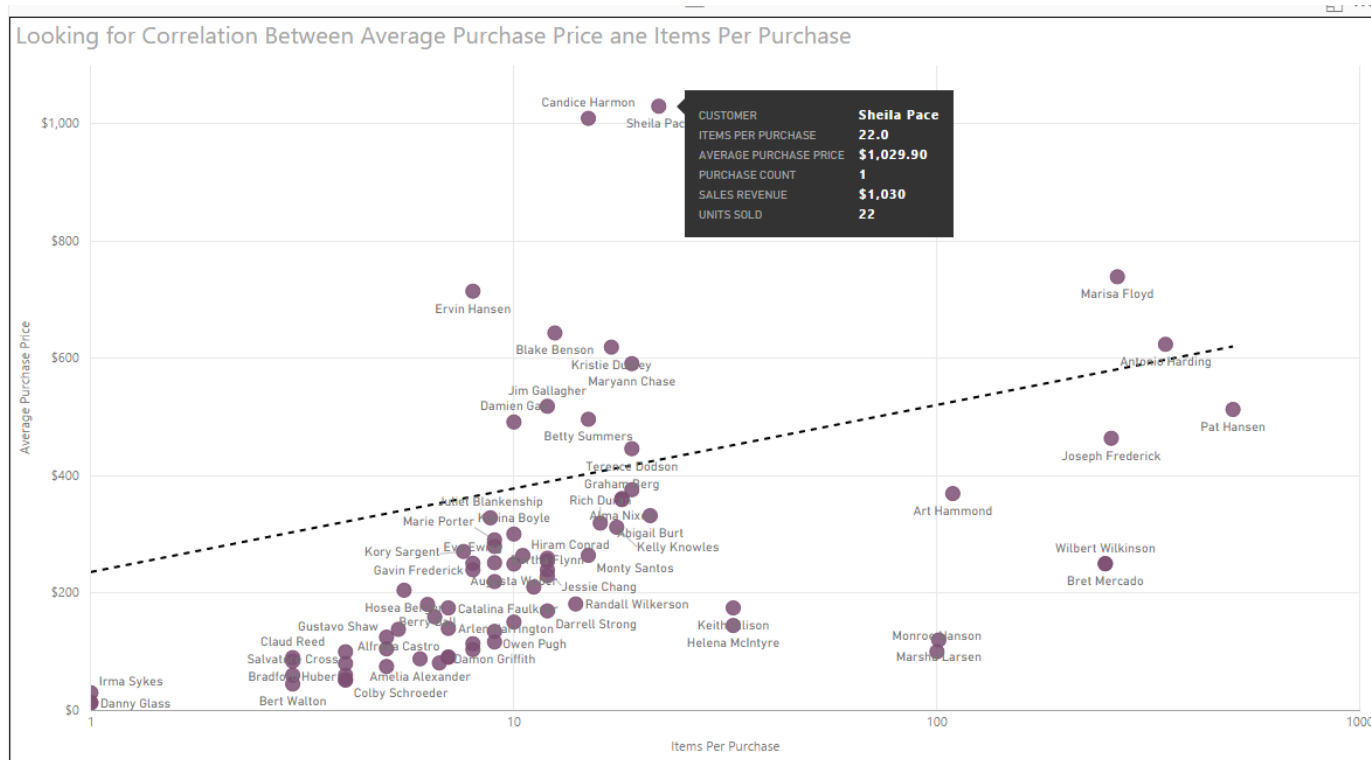
Waterfall

- Visualizes series-based data with positive and negative values



Scatter Chart

- Visualizes set of data points when looking for correlation
 - Scatter chart used to discover correlation between two variables
 - Each data point has two values which are mapped to X and Y axis

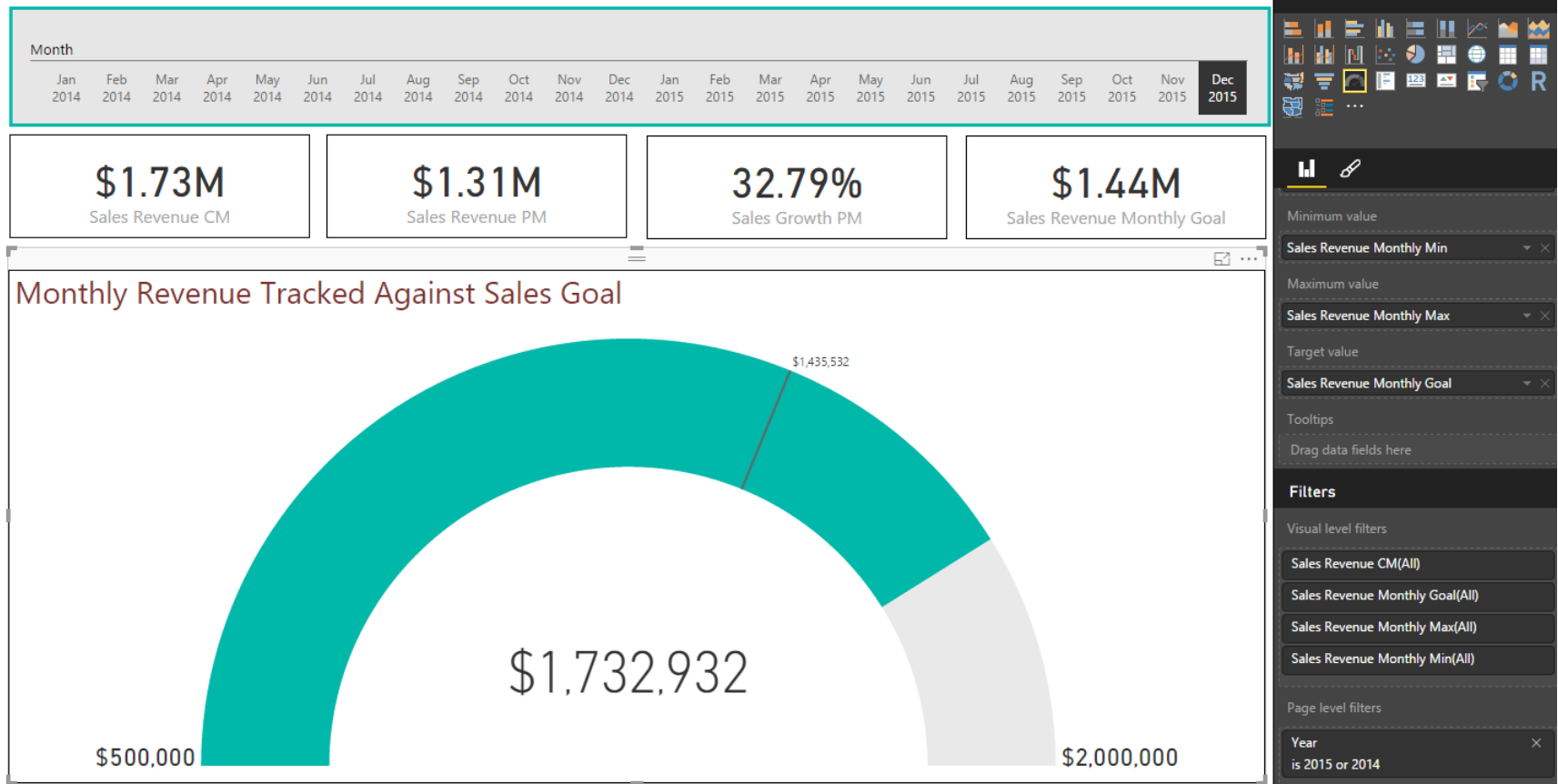


se price?



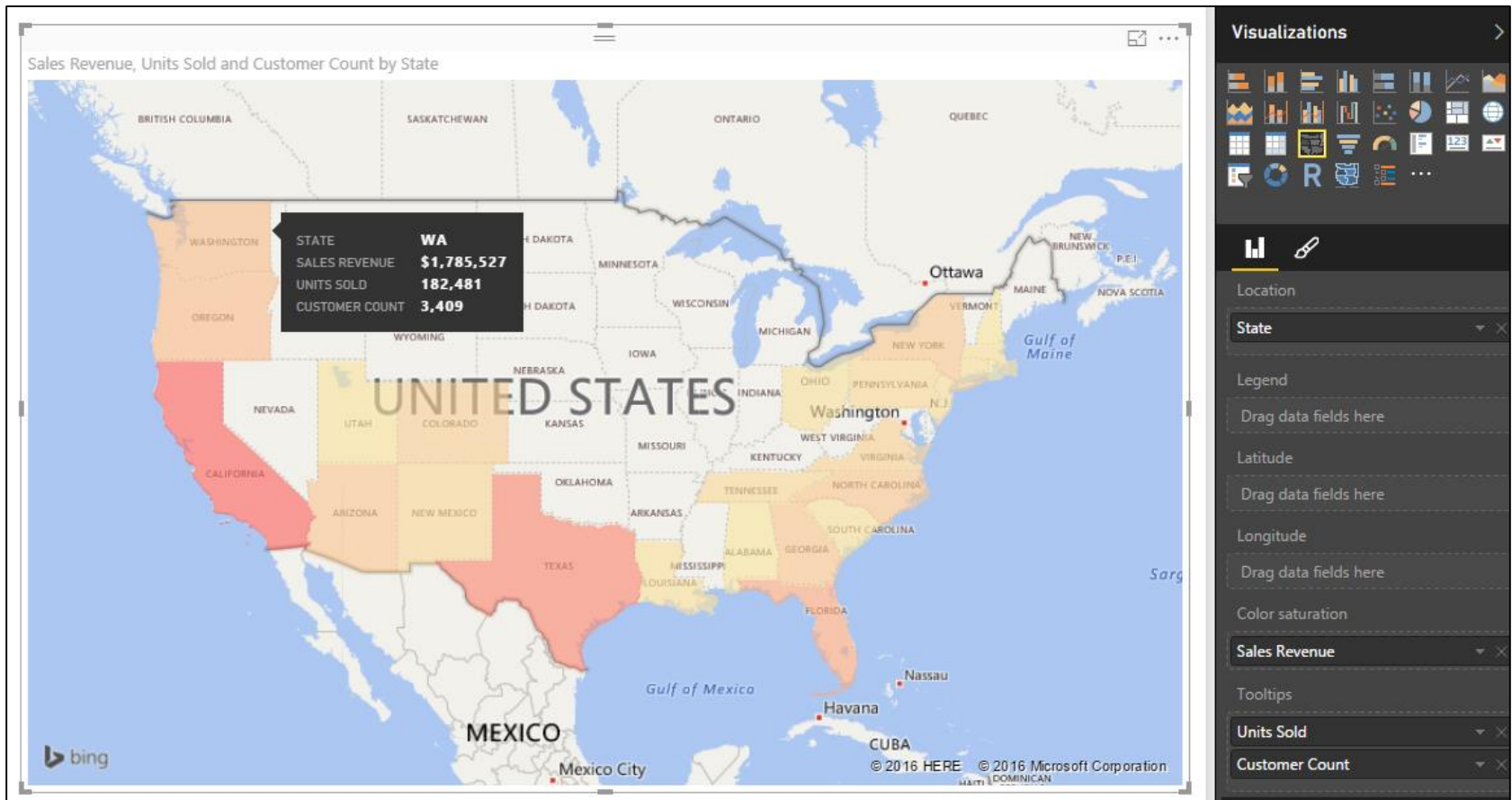
Gauge Visual

- Visualizes how measured value is tracking against goal or budget



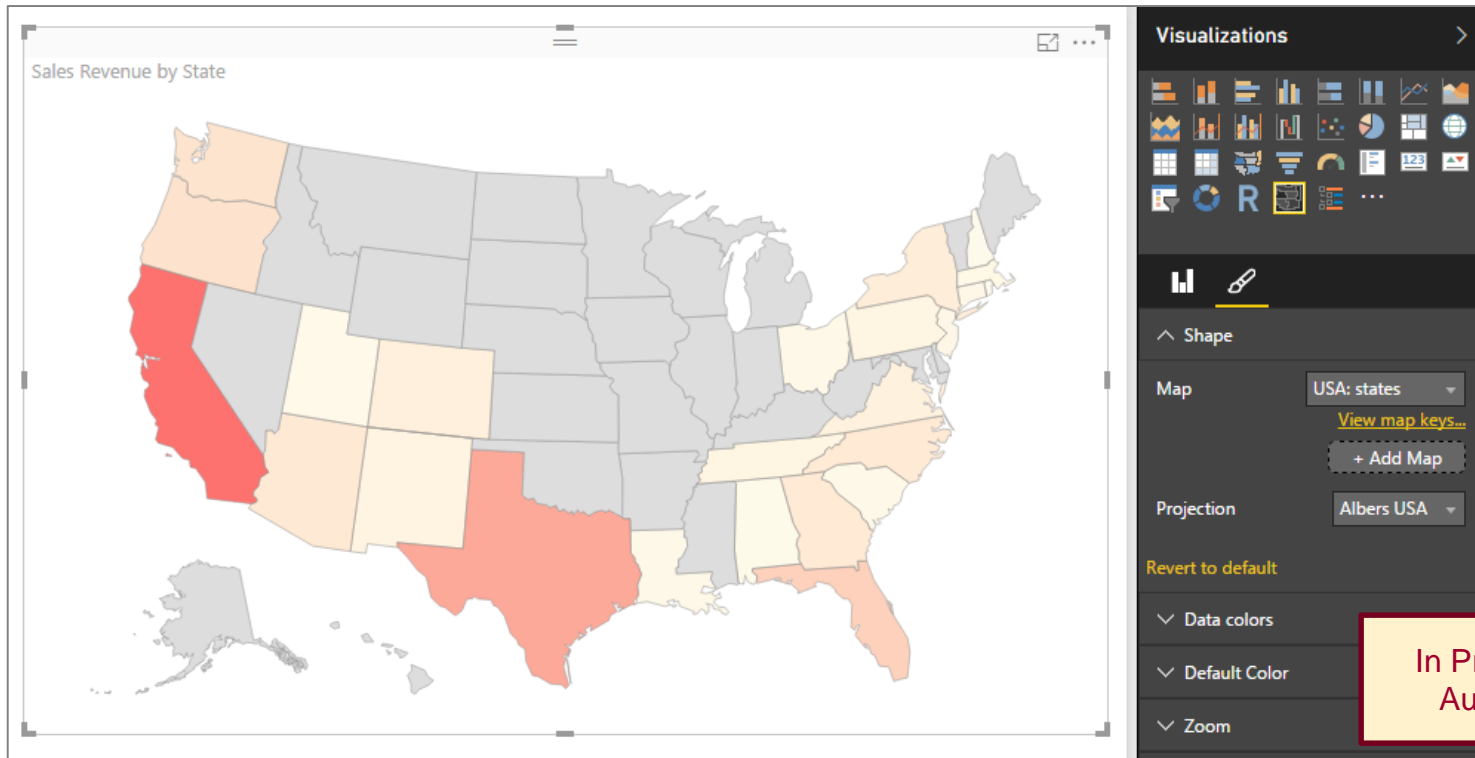
Filled Map

- Visualizes distribution across states and countries



Inline Shape Map

- Similar to filled map with a few important exceptions
 - Based on **TopoJSON** map format created by ESRI
 - Allows for creation of custom maps using JSON
 - Create maps for geography, seating arrangements, floor plans, etc.





DEMO

Exploring Power BI Visuals

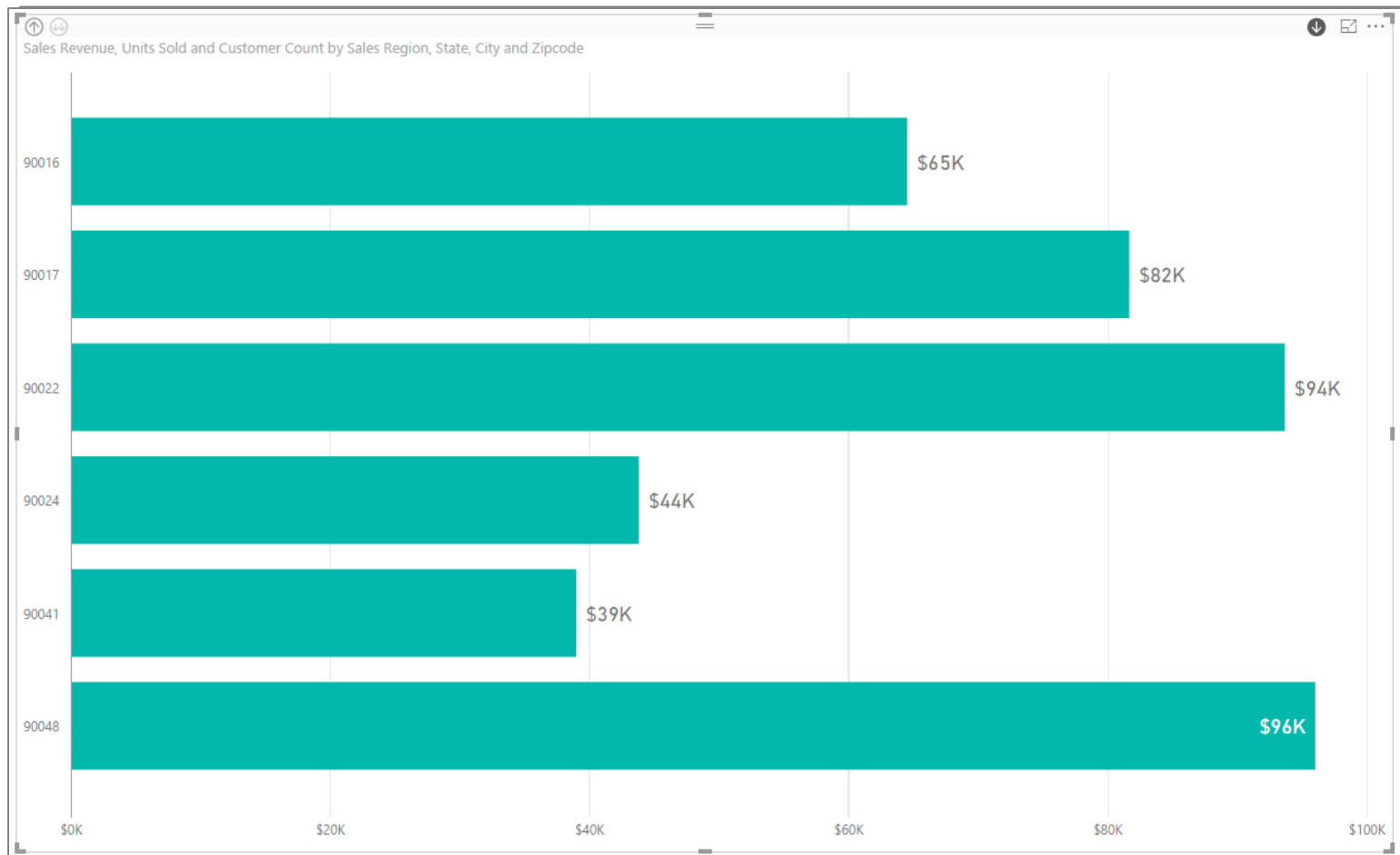
User Interaction with Slicers & Highlighting

- Provides user with interactive filtering control



User Interaction using Drill Actions

- Drill Actions supported when using hierarchies
 - You must enable drilldown mode in visual



Ranking Products By Sales using RANKX

- DAX provides RANKX function for ranking
 - Can be used to track top 5 products by sales revenue

```
Product Rank =  
RANKX(  
    ALL(Products),  
    CALCULATE( SUM(Sales[SalesAmount]) )  
)
```

- You can sort and filter on output of RANKX function

Product Rank ▲	Product	Sales Revenue
1	Flying Squirrel	\$3,828,783
2	Twitter Follower Action Figure	\$3,508,806
3	Godzilla Action Figure	\$2,970,735
4	Personal Commuter Chopper	\$2,613,193
5	Red Stomper Bully	\$2,538,233

Product Rank ▲

is less than or equal to...

Show items when the value:

is less than or equal to ▼

5

☒ And ☐ Or

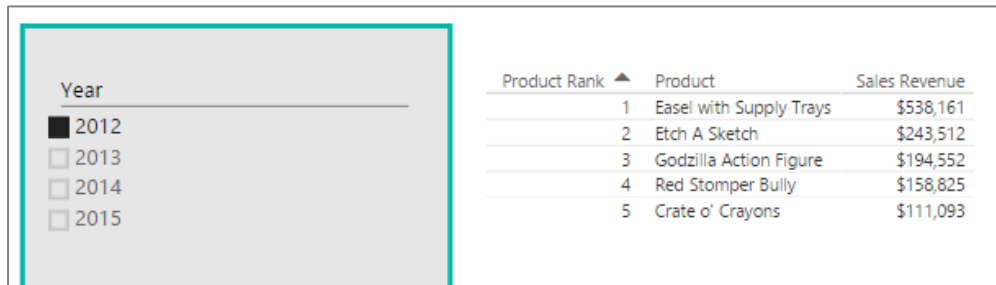
▼

Apply filter



Problems with the Filter Context

- RANKX function is affected by filter context
 - Sometimes you get the results you are expecting



The screenshot shows a filter pane on the left with 'Year' selected. The main area displays a table with product rankings and sales revenue.

Product Rank	Product	Sales Revenue
1	Easel with Supply Trays	\$538,161
2	Etch A Sketch	\$243,512
3	Godzilla Action Figure	\$194,552
4	Red Stomper Bully	\$158,825
5	Crate o' Crayons	\$111,093

- Sometimes you might get unexpected results



The screenshot shows a filter pane on the left with 'Year' and 'Category' filters. The main area displays a table with product rankings and sales revenue.

Product Rank	Product	Sales Revenue
2	Twitter Follower Action Figure	\$3,508,806
3	Godzilla Action Figure	\$2,970,735

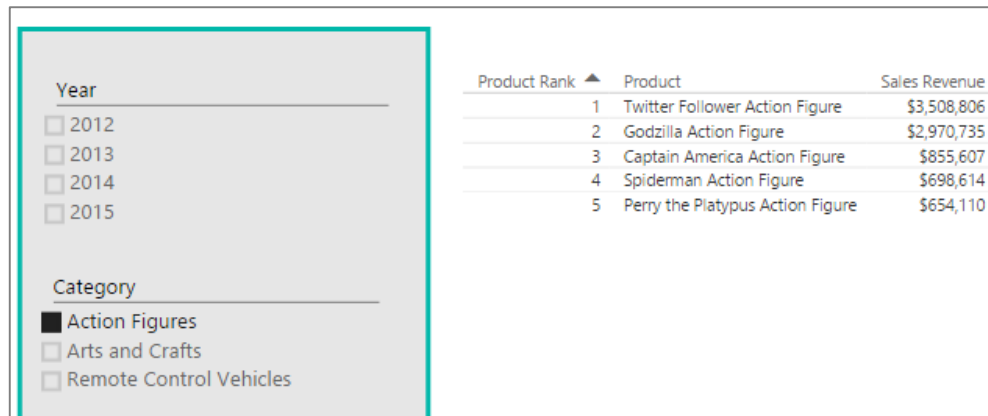


Writing Context Aware DAX Code

- When using RANKX...
 - It's recommended to call **HASONEVALUE** function
 - When calling ALL function, pass one or more columns

```
Product Rank =  
IF(  
    HASONEVALUE(Products[Product]),  
    RANKX(  
        ALL( Products[Subcategory], Products[Product] ),  
        CALCULATE( SUM(Sales[SalesAmount]) )  
    )  
)
```

- Ranking function now evaluates product ranking for specific Category










The screenshot shows a Power BI interface. On the left is a filter pane with two sections: 'Year' and 'Category'. Under 'Year', there are checkboxes for 2012, 2013, 2014, and 2015. Under 'Category', there are checkboxes for 'Action Figures' (which is selected with a black square), 'Arts and Crafts', and 'Remote Control Vehicles'. On the right is a table with three columns: 'Product Rank' (with an upward arrow icon), 'Product', and 'Sales Revenue'. The table contains five rows of data.

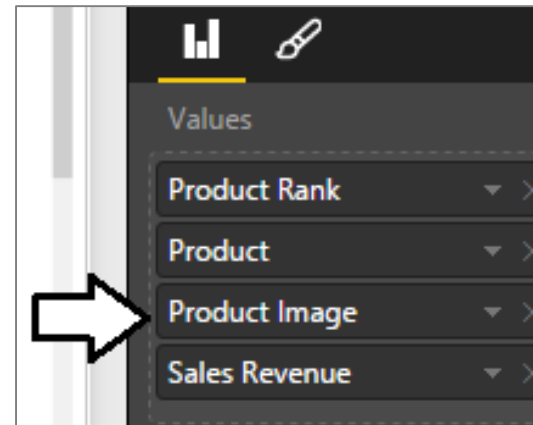
Product Rank	Product	Sales Revenue
1	Twitter Follower Action Figure	\$3,508,806
2	Godzilla Action Figure	\$2,970,735
3	Captain America Action Figure	\$855,607
4	Spiderman Action Figure	\$698,614
5	Perry the Platypus Action Figure	\$654,110



More Ranking Evaluation Problems

- Adding new column to table creates new problem
 - Ranking run separately for each separate Product Image
 - Every product has unique Product Image and is given rank of 1

Product Rank	Product	Product Image	Sales Revenue
1	Batman Action Figure		\$40,395
1	Black Power Ranger Action Figure		\$4,223
1	Captain America Action Figure		\$125,110
1	Crate o' Crayons		\$322,711
1	Crayloa Crayon Set		\$12,868
1	Easel with Supply Trays		\$928,620
1	Etch A Sketch		\$293,175

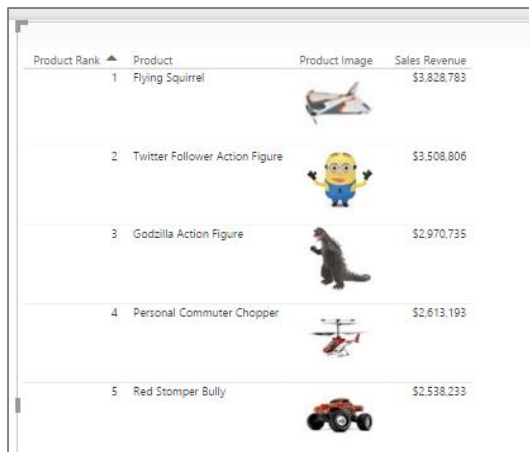


Getting It Right






- Call to RANKX must be modified again
 - You must specify which columns to factor into ranking

```
Product Rank =  
IF(  
    HASONEVALUE(Products[Product]),  
    RANKX(  
        ALL( Products[Subcategory], Products[Product], Products[Product Image] ),  
        CALCULATE( SUM(Sales[SalesAmount]) )  
    )  
)
```

- Context-aware DAX code corrects problems with visual



A screenshot of a Power BI table visual displaying a ranked list of products. The table has four columns: 'Product Rank' (with a sort arrow), 'Product', 'Product Image', and 'Sales Revenue'. The data is sorted by rank, showing the top five products. Each row includes a small image of the product.

Product Rank	Product	Product Image	Sales Revenue
1	Flying Squirrel		\$3,828,783
2	Twitter Follower Action Figure		\$3,508,806
3	Godzilla Action Figure		\$2,970,735
4	Personal Commuter Chopper		\$2,613,193
5	Red Stomper Bully		\$2,538,233



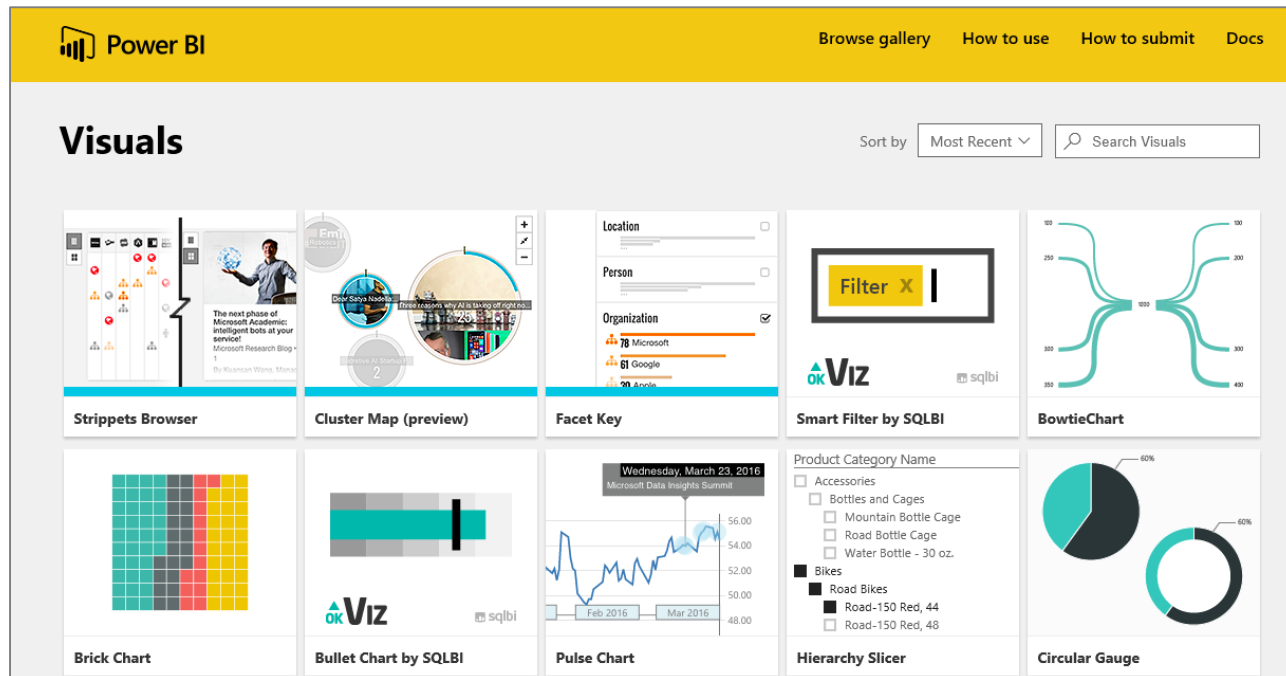
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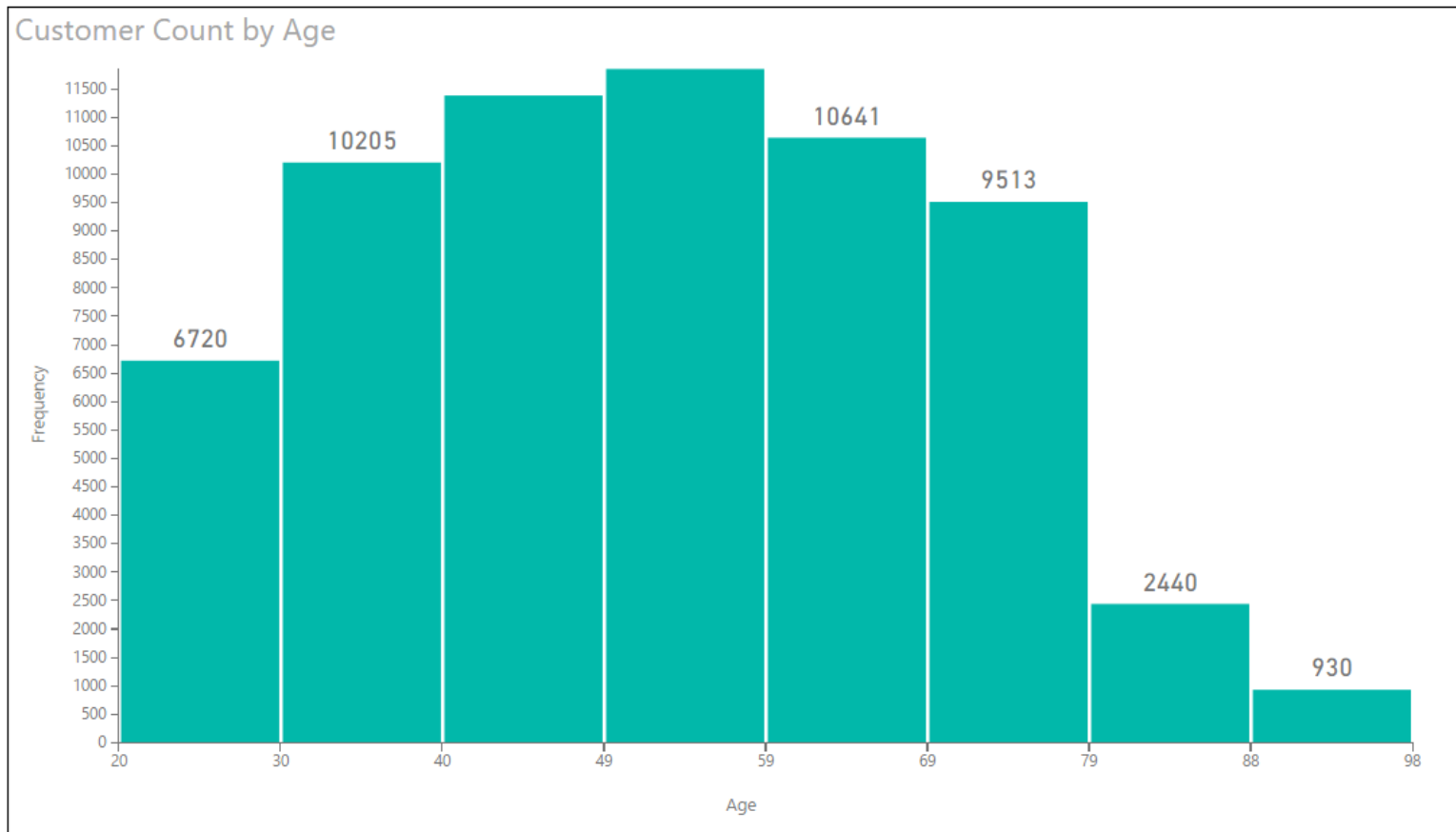
Custom Visual Gallery

- Power BI Framework for Visuals is Extensible
 - Developers can extend Power BI with Custom Visuals
 - Microsoft Hosts gallery of custom visuals
 - Gallery located at <https://app.powerbi.com/visuals/>



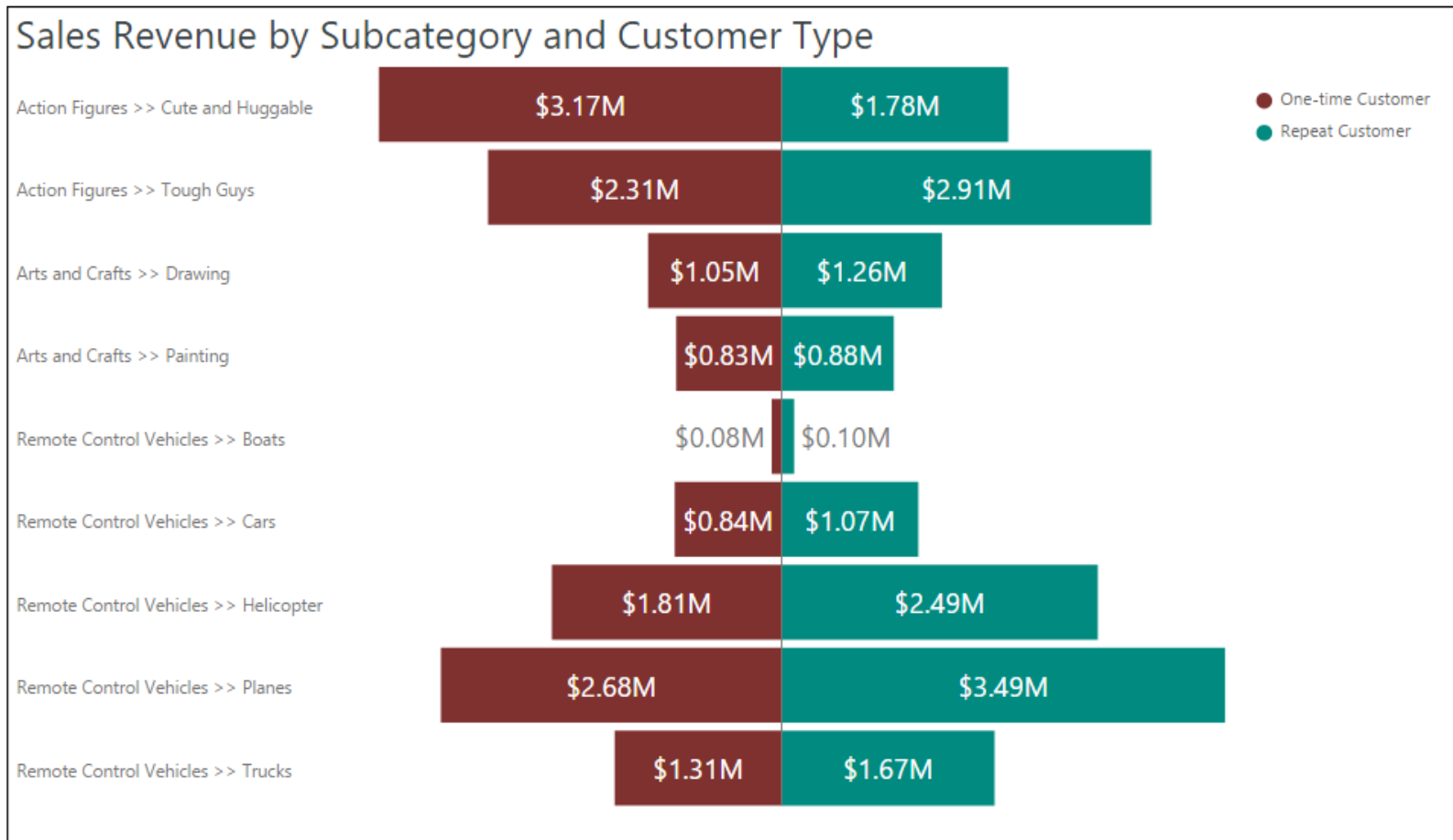
Histogram

- Custom Visual Example 1



Tornado Chart

■ Custom Visual Example 2



Spark Lines

- Custom Visual Example 3

Holiday Season Data Analysis

Daily Sales in Q4 of 2012



Daily Sales in Q4 of 2013



Daily Sales in Q4 of 2014



Daily Sales in Q4 of 2015



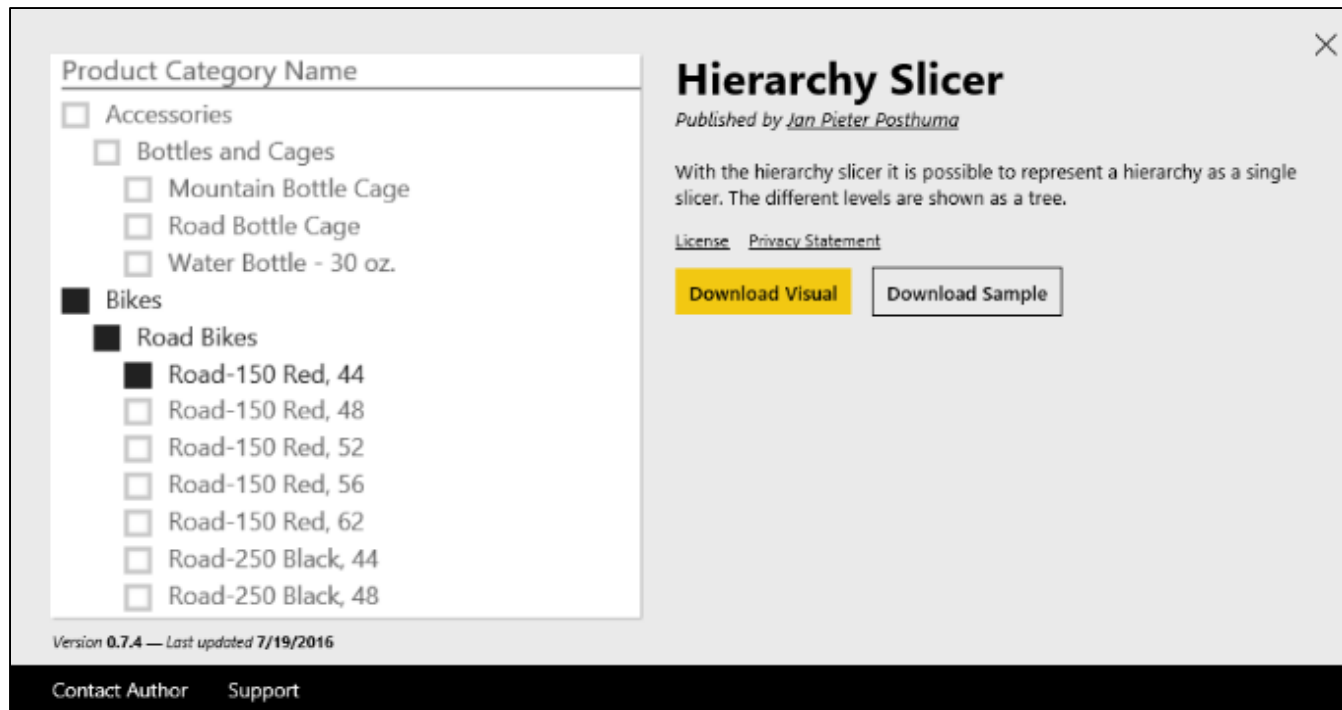
Hierarchy Slicer

■ Custom Visual Example 4



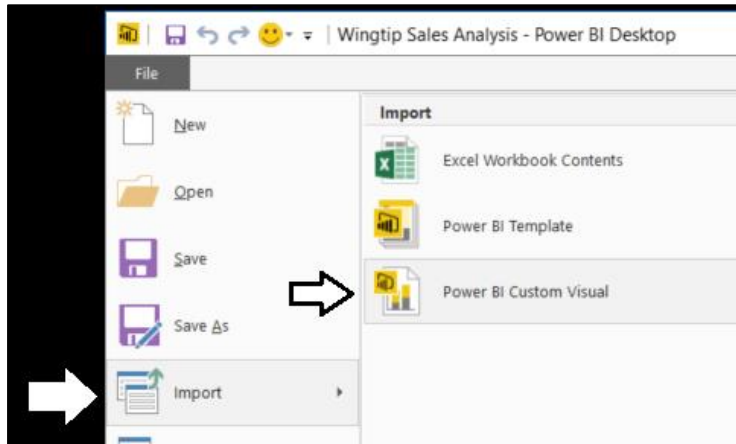
Downloading & Importing a Custom Visual

- Visual must be downloaded from Visuals Gallery
 - Custom Visual files packaged in PBIVIZ File
 - Custom Visual can be imported into Power BI Desktop project
 - Custom Visual can be imported into workspace in Power BI service

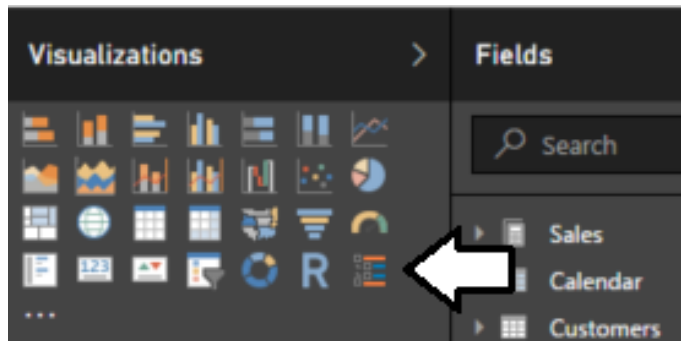


Importing a Custom Visual

- Import custom visual into Power BI Desktop project
 - Execute **Import > Power BI Custom Visual** menu command



- After import, Custom Visual appears in **Visualizations** list



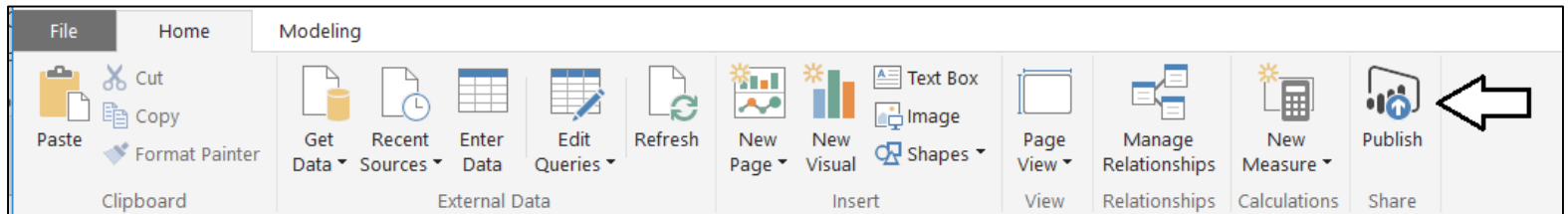
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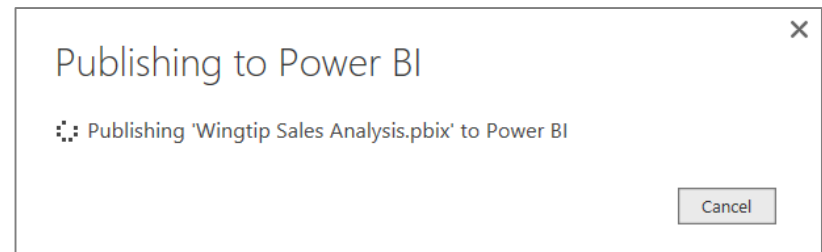
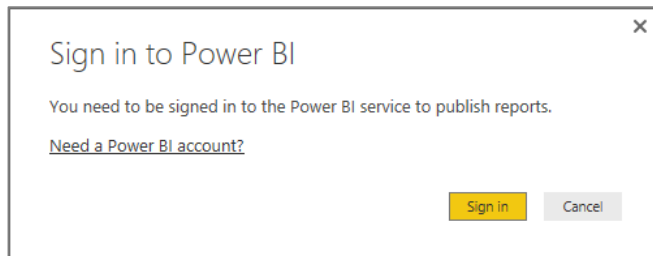


Publishing a Power BI Desktop Project

- Power BI Desktop provides **Publish** command
 - Used to publish project to Power BI service



- Requires logging into your Office 365 account

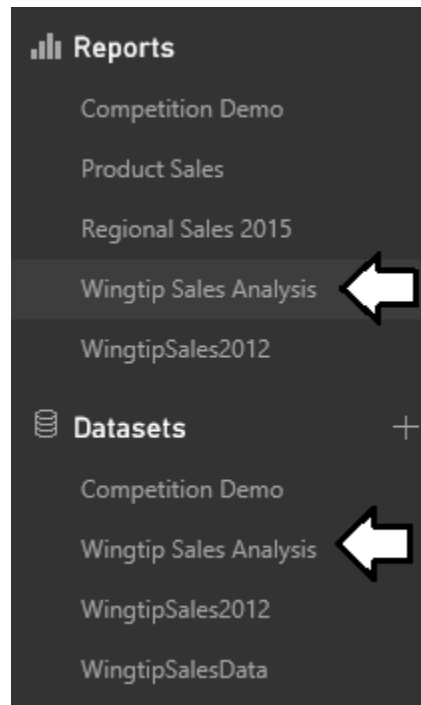


- Published articles added to a specific workspace



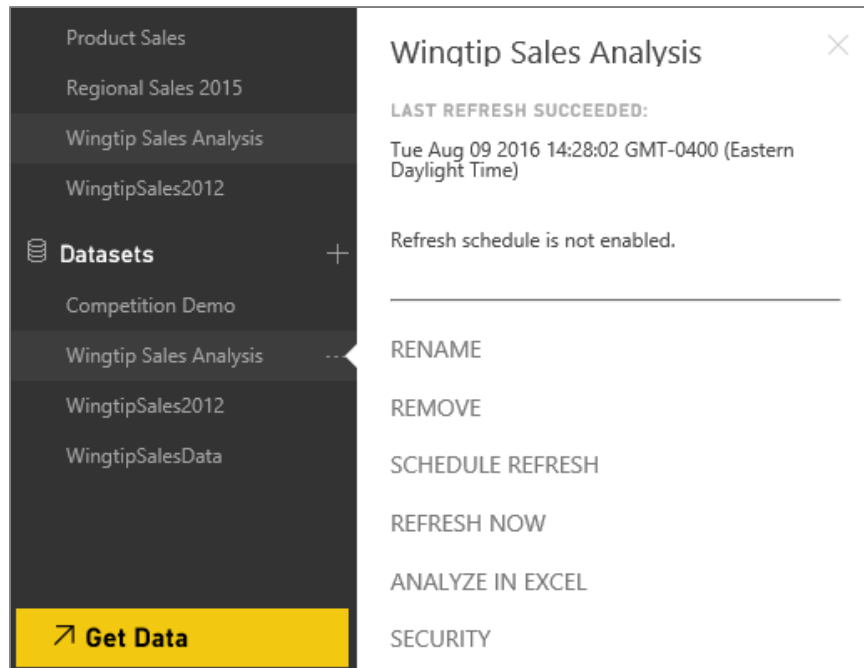
Examining What's Been Published

- What does project publishing add to workspace?
 - One dataset with same name as project
 - One report with same name as project



Dataset Configuration

- You can configure Dataset after its been published
 - Configure data source credentials
 - Configure refresh schedule
 - Configure Row-level Security



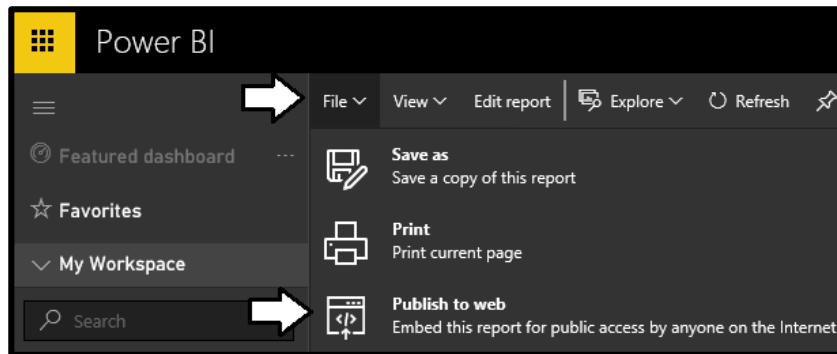
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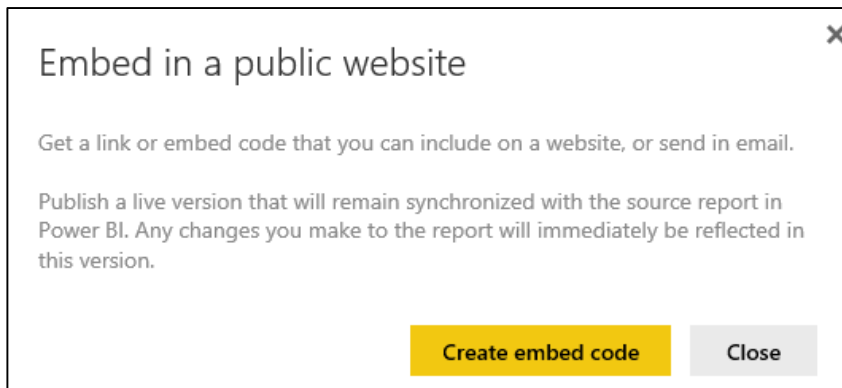


Publish to Web

- **Publish to Web** command available on reports
 - Not supported for reports and datasets which implement RLS



- **Publish to Web** command used to generate embed codes



Generating Embed Codes

- Used to provide anonymous access to report
 - Provide link which can be posted, emailed or texted
 - Provides **iFrame** HTML element for embedding in public web site

Success! ✕

Link you can send in email

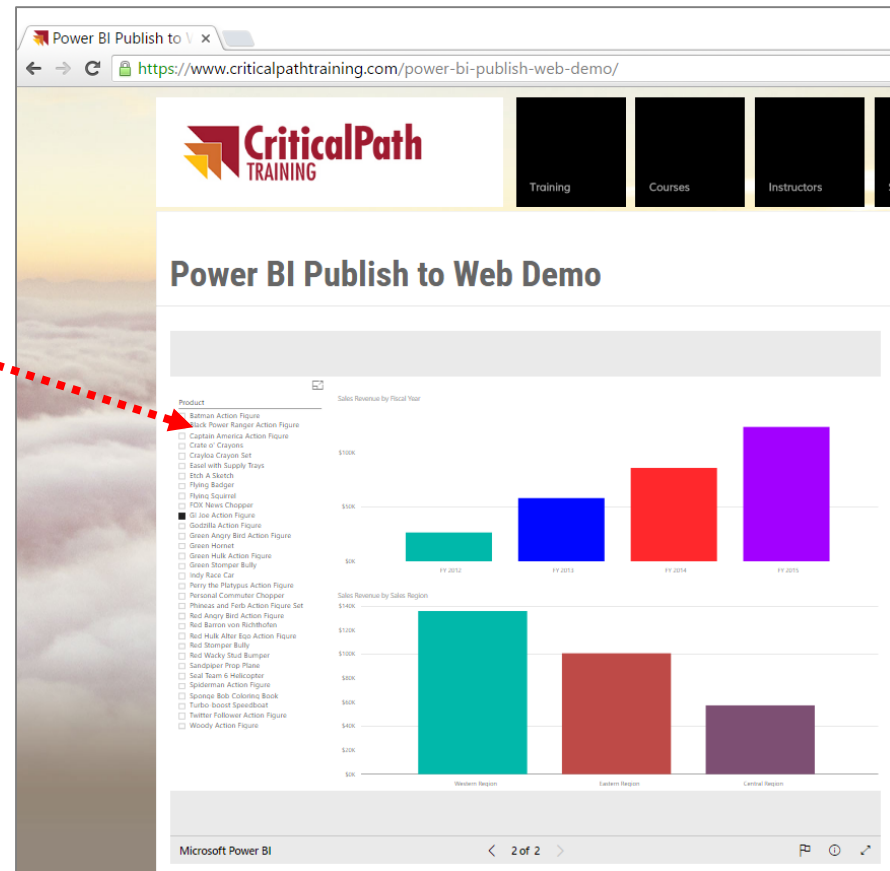
<https://app.powerbi.com/view?r=eyJrljoiYTM3YjlkNzctNWY5My00YTUyLl>

Html you can paste into your blog or website

`<iframe width="933" height="700" src="https://app.powerbi.com/view?r=eyJrljoiYTM3YjlkNzctNWY5My00YTUyLl" />`

Size

Close



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DEMO

Using the Publish to SharePoint Feature

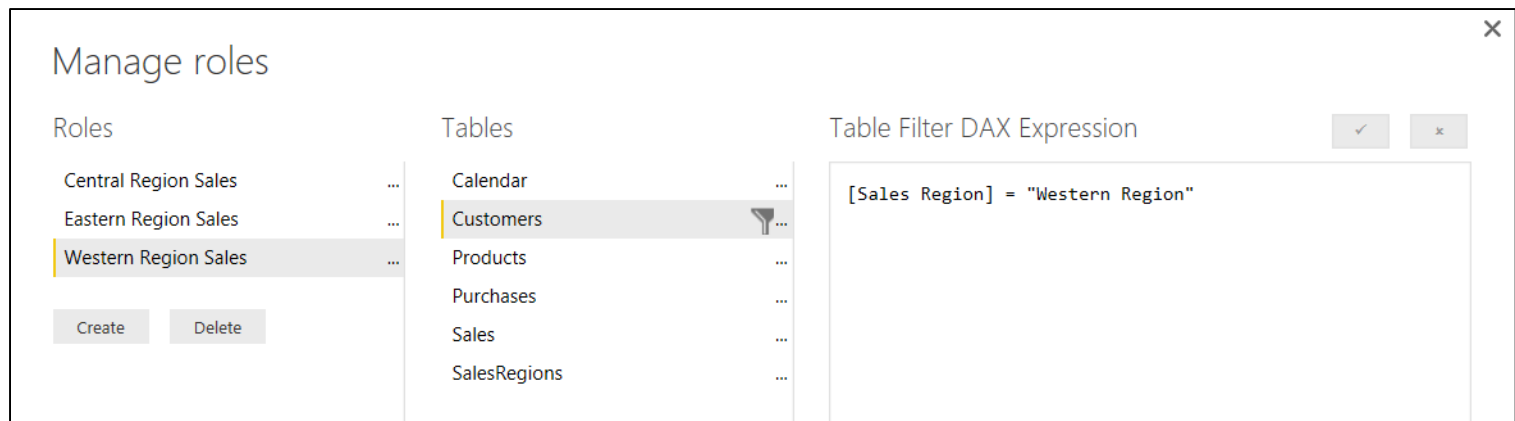
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What Is Row-level Security (RLS)

- Security Scheme based on Named Roles
 - Roles are defined using Power BI Desktop
 - Each role is scoped to the dataset within a PBIX project
- Role defined using one or more DAX expressions
 - DAX expressions restrict which rows are accessible





DEMO

Configuring Row-level Security

Summary

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