

# Designing Interactive Reports in Power BI Desktop



# Agenda

- Designing Interactive Reports
- Creating the Top 5 Products List
- Working with Bookmarks and Drillthrough
- Using Report Themes
- Importing Custom Visuals
- Designing Reports for Mobile Devices
- Publishing Power BI Reports



# 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 visual level filters
  - You can add page level filters
  - You can add drillthrough filters
  - You can add report level 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
- Ribbon chart
- Waterfall chart
- Funnel chart
- Gauge
- Map and Filled Map
- Slicer
- R script visual
- Shape map (in preview)



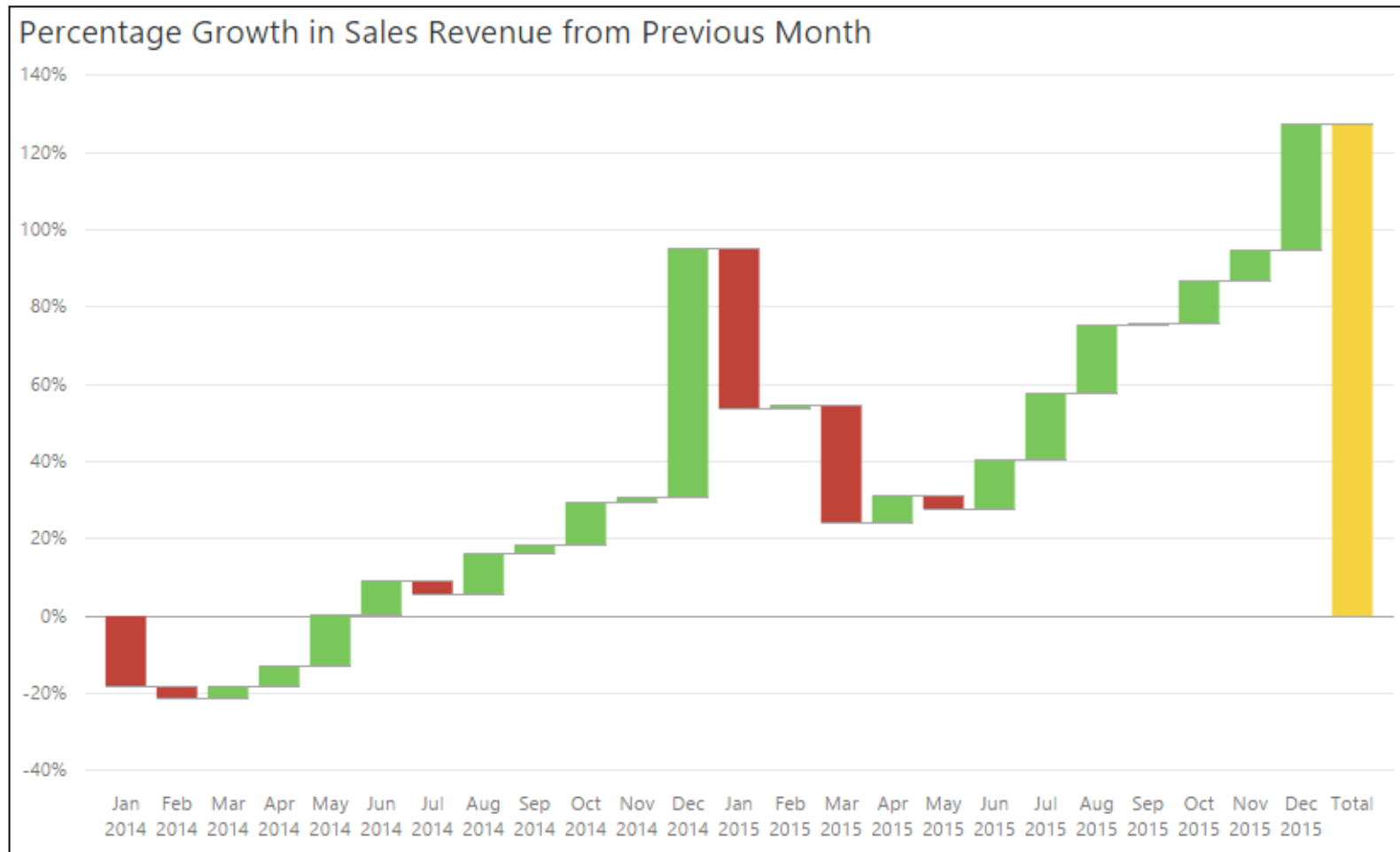
# Example Visual 1: Funnel

- Visualizes distribution across categories as percentage of top value



# Example Visual 2: Waterfall

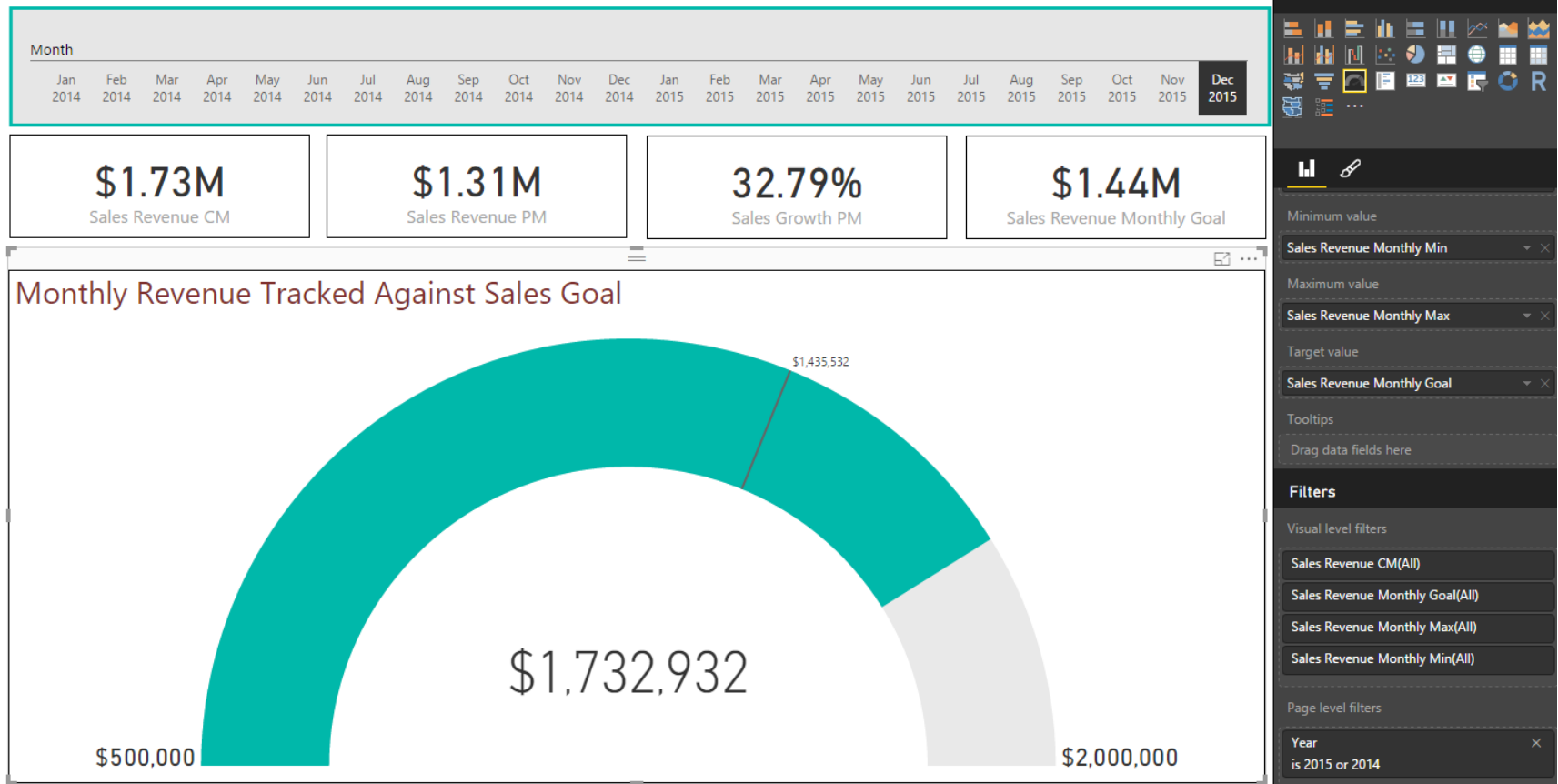
- Visualizes series-based data with positive and negative values



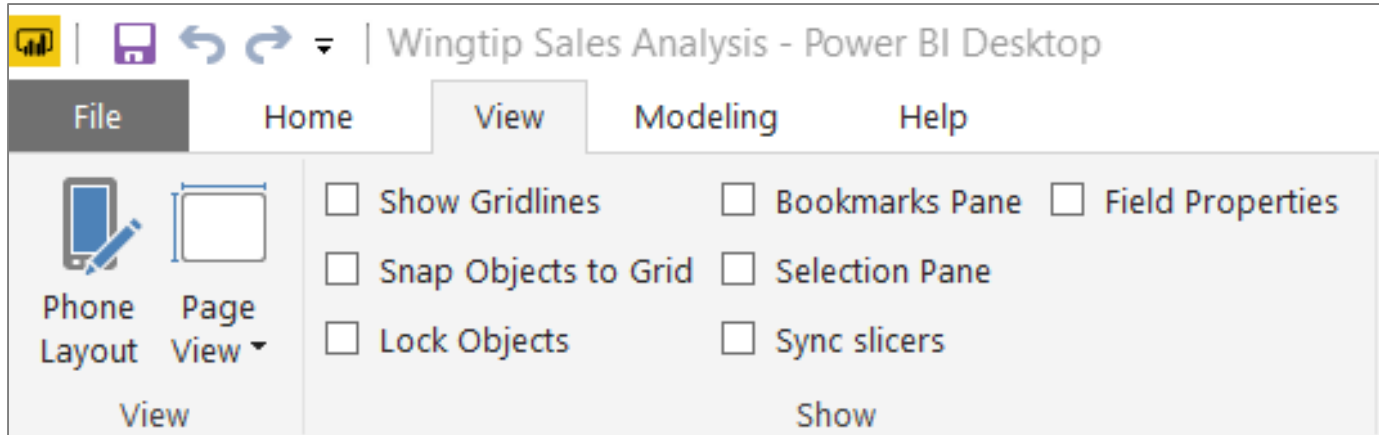


# Example Visual 3: Gauge Visual

- Visualizes how measured value is tracking against goal or budget



# Report Designer Modes and Panes



- **Show Gridlines** mode adds visual guides to report
- **Snap Objects to Grid** mode helps with object placement
- **Lock Objects** mode used to prevent accidental moving
- **Bookmarks Pane** used to create and manage bookmarks
- **Selection Pane** used to select, order, hide & show visuals
- **Sync slicers** pane used for advanced slicer control
- **Field Properties** used to add field description





# Lock Objects Mode

- Prevents accident movement of report objects
  - Locks Objects setting is not saved at project level



# Field Properties Pane

- Allows data model author to add field description

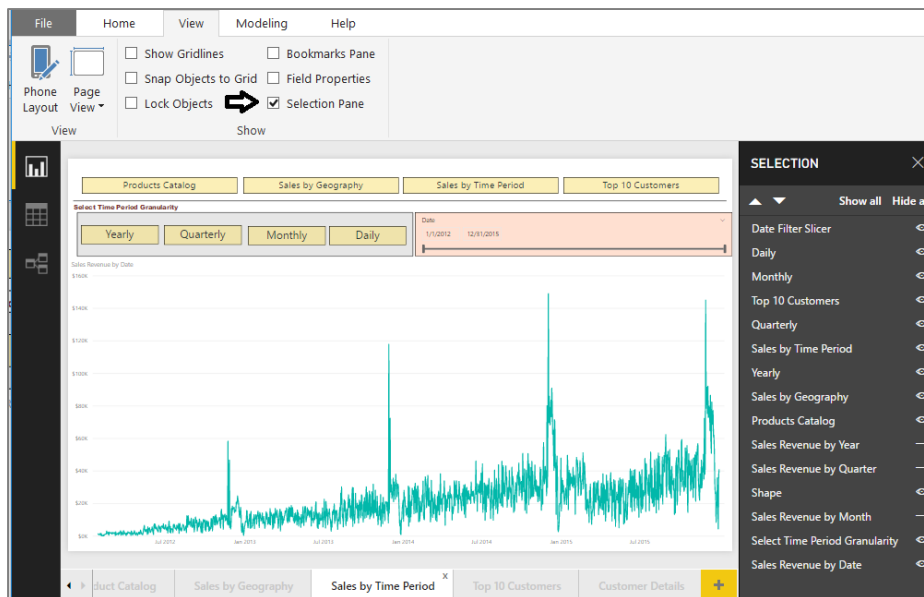


- Data model consumer can see description as tooltip in fields list



# Selection Pane

- Provides control over object on a page
  - You can control whether visual is visible or hidden
  - You can change ordering to control what is on top



**SELECTION** [X]

▲ ▼ Show all Hide all

Date Filter Slicer	👁
Daily	👁
Monthly	👁
Top 10 Customers	👁
Quarterly	👁
Sales by Time Period	👁
Yearly	👁
Sales by Geography	👁
Products Catalog	👁
Sales Revenue by Year	—
Sales Revenue by Quarter	—
Shape	👁
Sales Revenue by Month	—
Select Time Period Granularity	👁
Sales Revenue by Date	👁

# Designing Reports with Interactive Filtering

- Slicers
  - Provide report consumers with intuitive filtering
- Visual Highlighting
  - Filtering applied when user clicks on a visual data element
- Drilldown Mode
  - Allows report consumer to drill into field hierarchy  
*e.g. Sales Region > State > City > Zipcode*
- Drillthrough Pages
  - Allows report consumer to navigate to drillthrough page



# Slicer with Text Field

- Slicer support List and Dropdown modes
  - Slicer create in List mode by default
  - Slicer switched to dropdown mode to conserve vertical space

State Name

- ☐ Alabama
- ☐ Arizona
- ☒ California
- ☐ Colorado
- ☐ Connecticut
- ☐ Florida
- ☐ Georgia
- ☐ Louisiana
- ☐ New Mexico
- ☐ New York
- ☐ North Carolina
- ☐ Ohio
- ☐ Oregon
- ☐ Pennsylvania
- ☐ Rhode Island

State Name

- ☐ Alabama
- ☐ Arizona
- ☒ California
- ☐ Colorado

List  
Dropdown

State Name

California



# Horizontal Responsive Slicers

- Slicer **Orientation** can be set to **Horizontal**
  - Horizontal slicer supports **Responsive** mode
  - Makes it possible to show many slicer choices at once
  - provides best filtering experience for mobile devices



# Slicers with Date Fields

- Slicers with Date fields provide 7 different modes
  - Between, Before and After provide sliders and date pickers



The image shows a date slicer interface. On the left is a vertical menu with seven options: 'Between' (highlighted), 'Before', 'After', 'List', 'Dropdown', and 'Relative'. To the right, the 'Between' mode is active, displaying the title 'First Purchase Date'. Below the title are two date input fields containing '4/1/2012' and '10/1/2012'. Below these fields is a horizontal slider with two circular handles positioned at the dates shown in the input fields.

- Relative mode filter based on current date (e.g. last 30 days)



The image shows a date slicer interface in 'Relative' mode. The title 'First Purchase Date' is at the top. Below it are three input fields: a dropdown menu with 'Last' selected, a text box with '30', and another dropdown menu with 'Days' selected. Below these fields, there is a calendar icon followed by the date range '3/31/2018 - 4/29/2018'.





# Slicer Sync

- Slicer visual & filtering can be synchronized across pages

The screenshot displays the Microsoft Power BI interface. The 'View' ribbon is active, showing options for 'Show Gridlines', 'Snap Objects to Grid', 'Lock Objects', 'Bookmarks Pane', 'Selection Pane', and 'Sync slicers' (which is checked). The 'Visual tools' pane is also visible, showing 'Format' and 'Data / Drill' options. The main visual area shows a 'Sales Region' slicer with three buttons: 'Western Region' (selected), 'Central Region', and 'Eastern Region'. The 'Sync Slicers' task pane is open on the right, showing a table of slicers and their sync status across pages.

SYNC SLICERS		
Add and sync with all pages, or select specific pages:		
Page name		
Sales by Geography	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sales by Time Period	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sales Revenue Growth	<input checked="" type="checkbox"/>	<input type="checkbox"/>



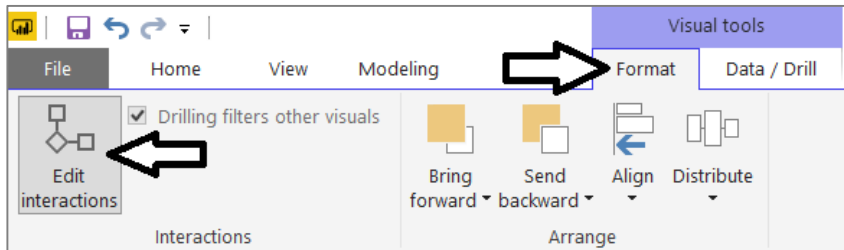
# User Interaction with Slicers & Highlighting

- Provides user with interactive filtering control

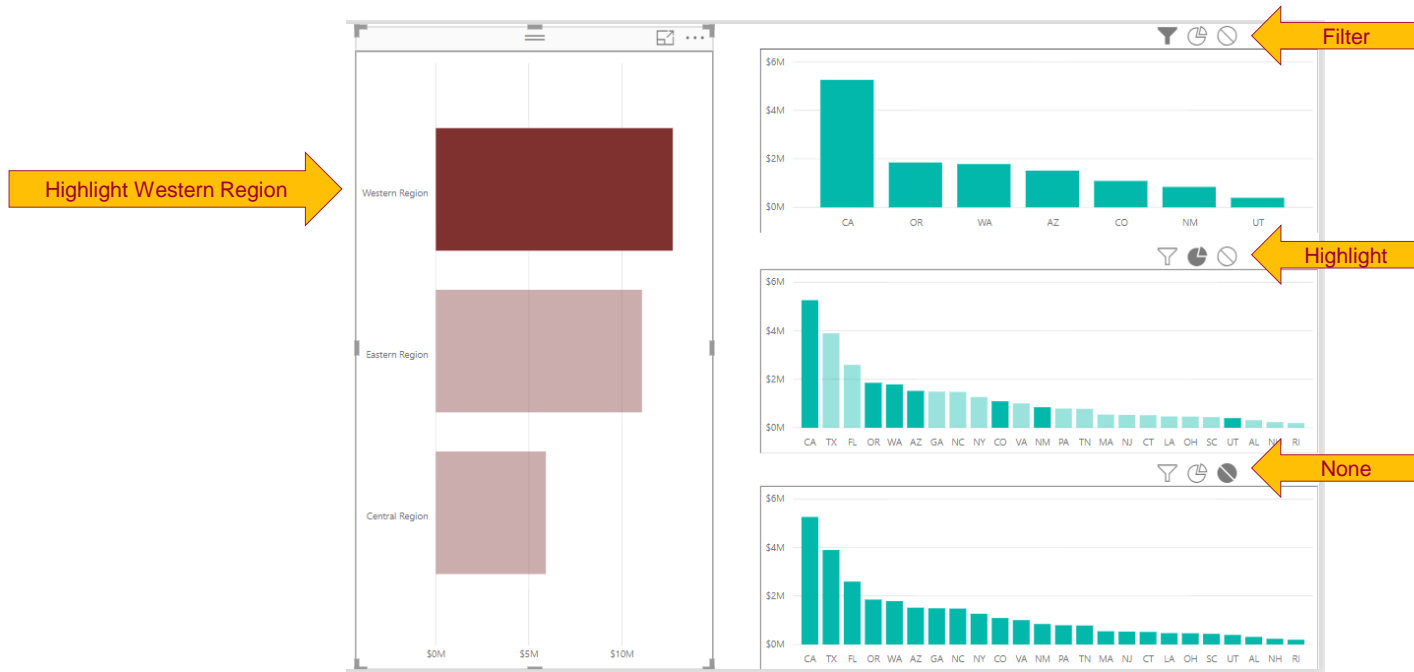


# Edit Highlight Interactions Across Visuals

- Click **Edit interactions** button on **Format** tab of ribbon

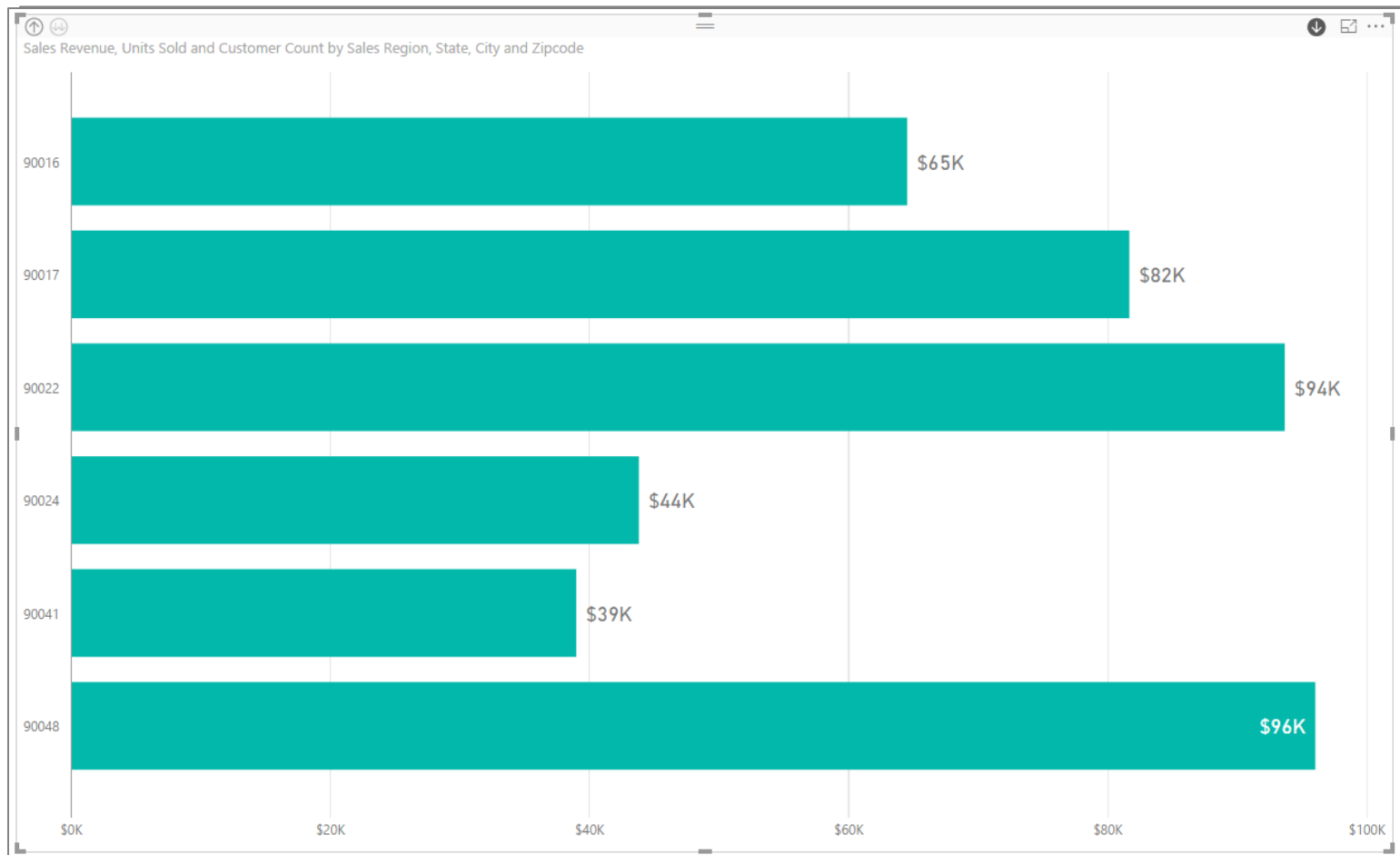


- Select a visual and then configure interactions with other visuals



# User Interaction using Drill Actions

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



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# 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

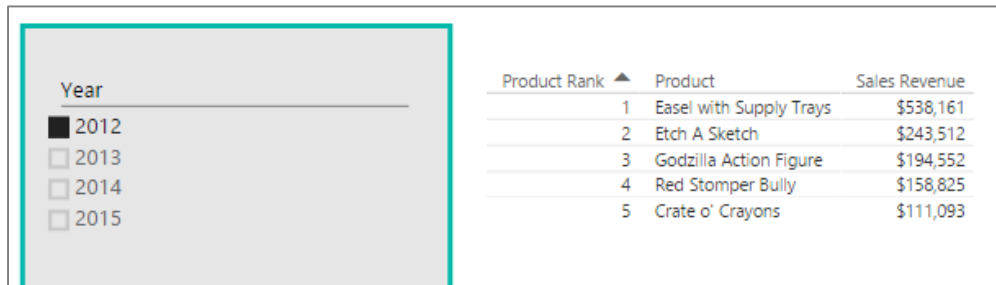
▼

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 panel on the left with a 'Year' section containing checkboxes for 2012, 2013, 2014, and 2015. The 2012 checkbox is selected. To the right is a table with three columns: 'Product Rank' (with an upward arrow), 'Product', 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 panel on the left with two sections: 'Year' with checkboxes for 2012, 2013, 2014, and 2015, and 'Category' with checkboxes for Action Figures, Arts and Crafts, and Remote Control Vehicles. The 'Action Figures' checkbox is selected. To the right is a table with three columns: 'Product Rank' (with an upward arrow), 'Product', 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










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

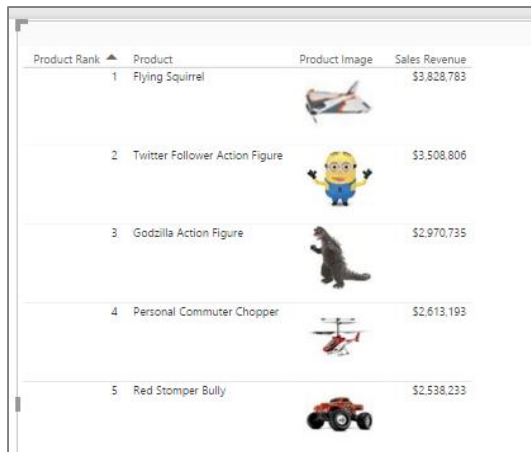


# Getting It Right






- 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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  - Importing Custom Visuals
  - Publishing Power BI Reports



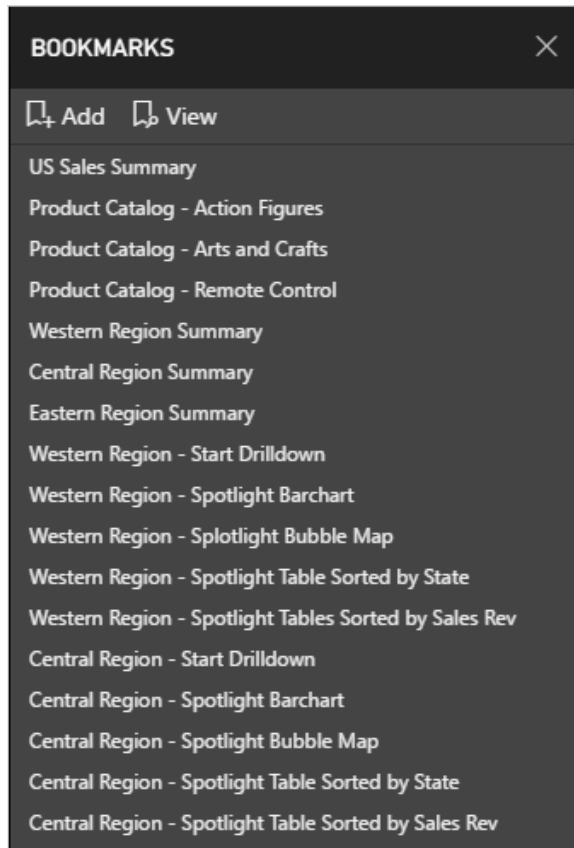
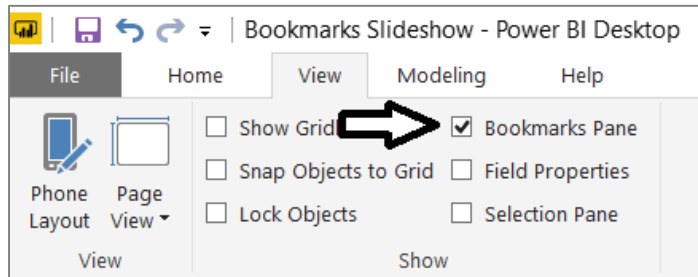
# What are Bookmarks

- Snapshot of recorded settings which can include...
  - Current page
  - Filters
  - Slicers
  - Visual sort order
  - Drill location
  - Visibility
  - Spotlighting
- Bookmarks provide the foundation for story telling
  - Bookmarks are supported in reports only
  - Bookmarks are **NOT** supported in dashboards



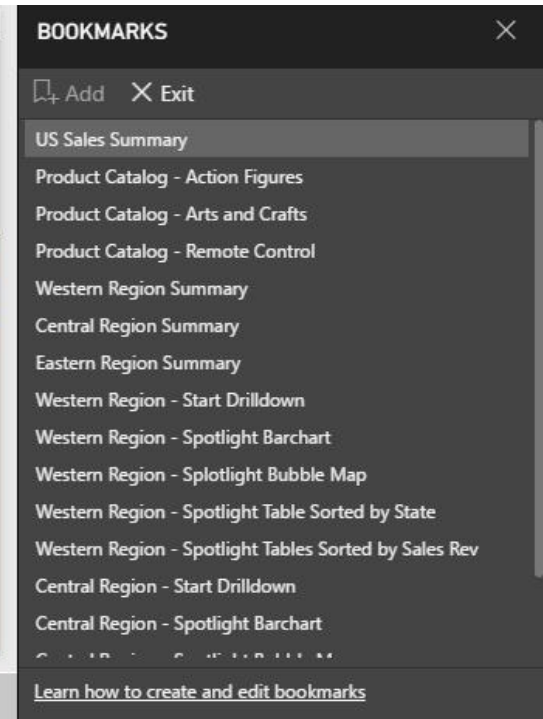
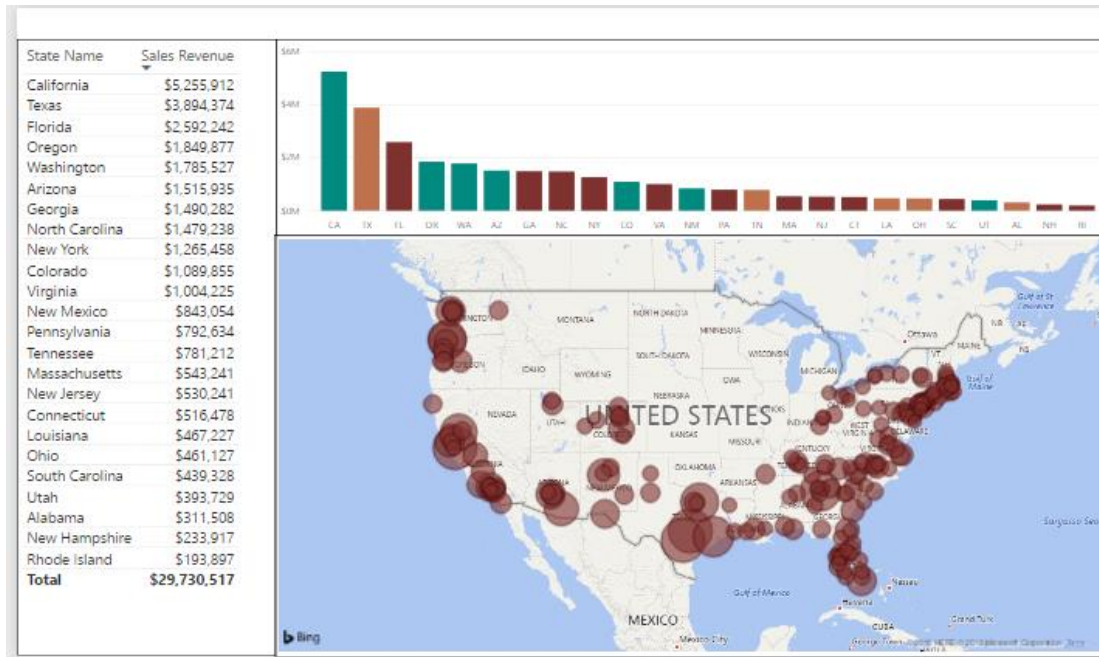
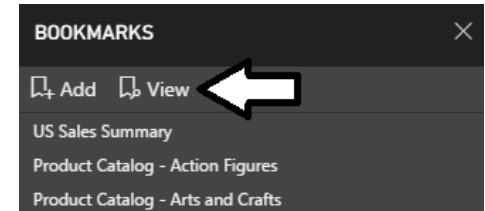
# Bookmarks Pane

- Provide ability to create and manage bookmarks



# Bookmarks as a Slide Show

- Bookmarks can be viewed as slide show
  - Start slide show by clicking View button
  - Consumer can step through one bookmark at a time



Bookmark 1 of 17

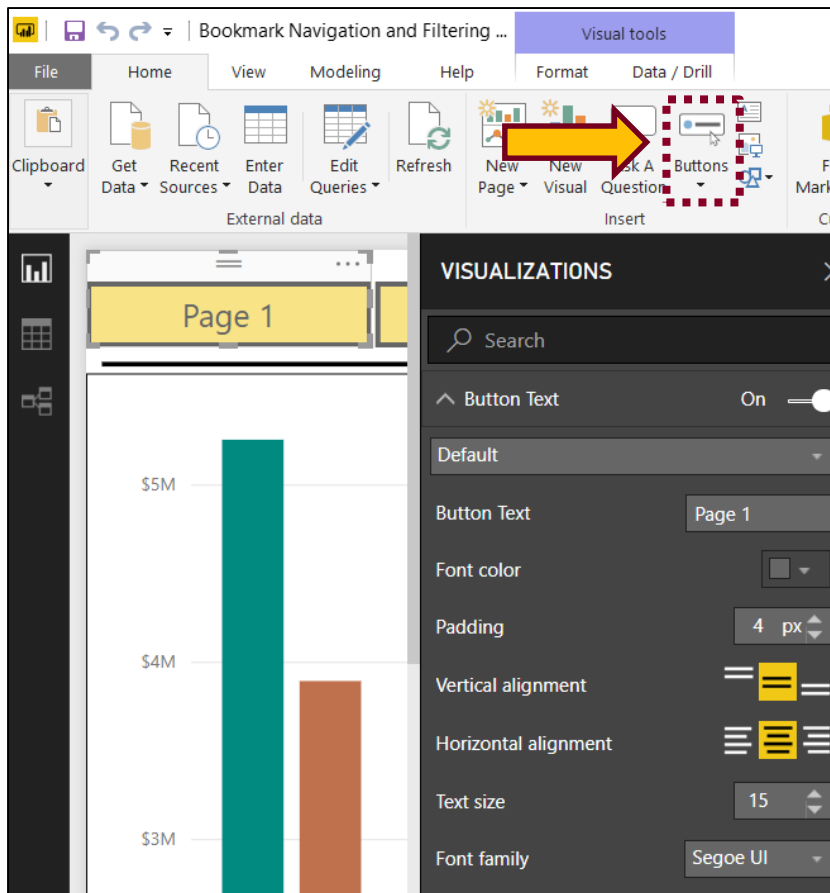
US Sales Summary





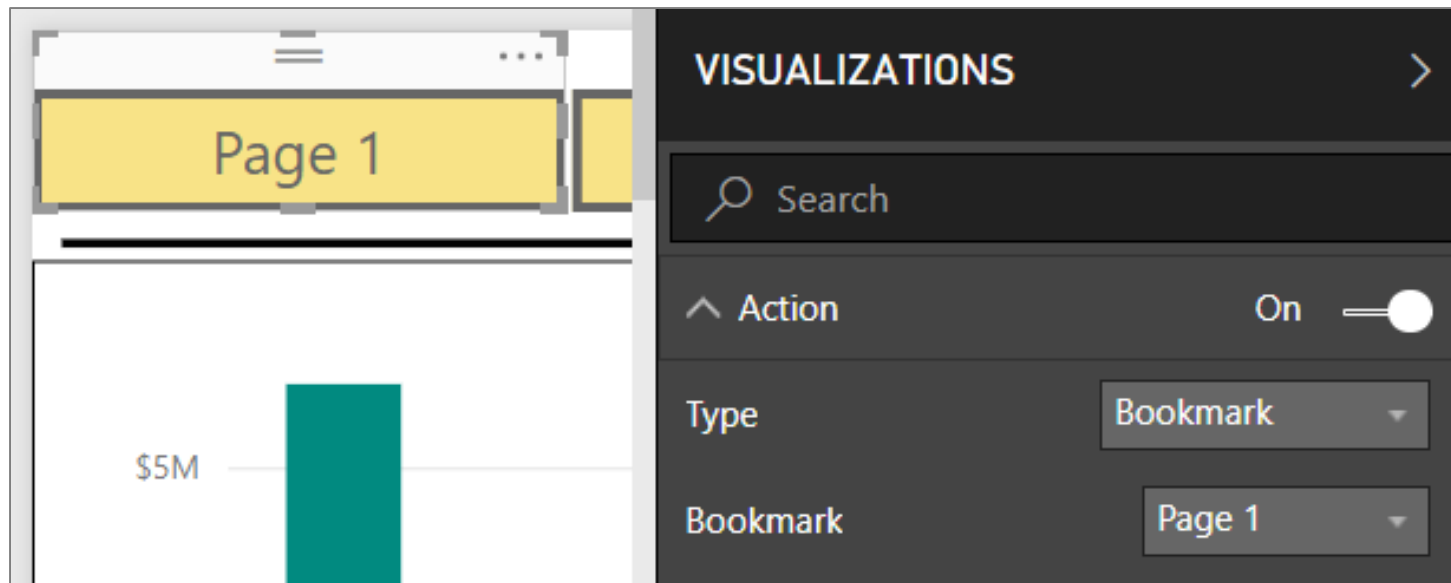
# Creating a Button

- Buttons can be added to report pages to apply a bookmark
  - Button can be create with icon and/or text



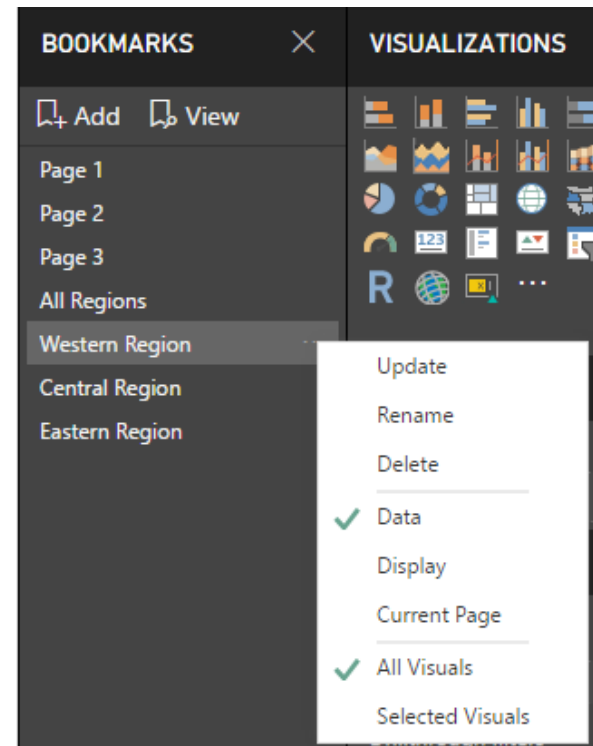
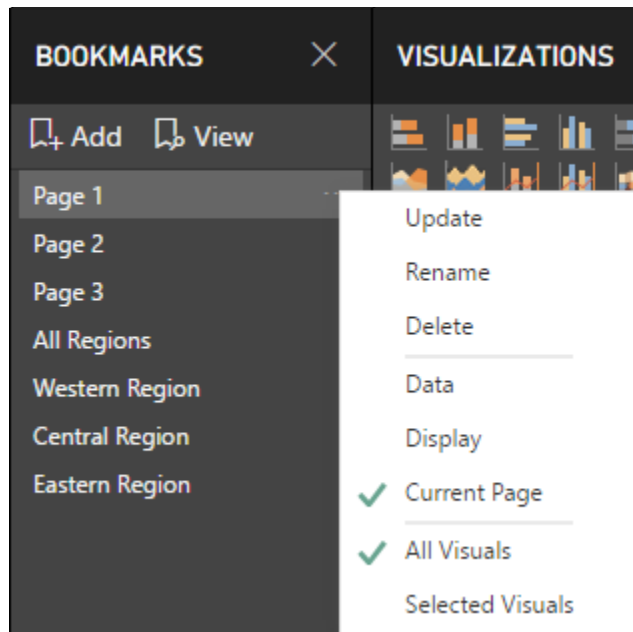
# Button Action Used to Apply Bookmark

- Button action can apply a bookmark
  - Button responds to standard click in Power BI Service
  - Button requires CONTROL + click in Power BI Desktop



# Bookmarks Types

- Bookmarks can capture or ignore certain types of data
  - Data (filtering and slicers)
  - Display (visible or hidden)
  - Current Page (page navigation)





**DEMO**

# Working with Bookmarks and Drillthrough



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# Report Themes

- Report can be styled using report theme
  - Provides consistency across reports for styling and branding
  - Report theme defined using JavaScript Object Notation (JSON)
  - Today report themes must be defined using JSON editor
  - Microsoft plans to release WYSIWYG theme designer later in 2018

```
CPT Demo Report Theme.json  -P X
{
  "name": "CPT Demo Report Theme",
  "background": "#fff8dd",
  "foreground": "#9F1B30",
  "tableAccent": "#fbc737",
  "dataColors": [ "#9F1B30", "#D16B2C", "#FEBF0F", "#fdae61", "#abdda4", "#66c2a5",
    "#3288bd", "#5e4fa2", "#bbbbbb", "#999999", "#666666", "#333333" ],
  "visualStyles": {
    "*": {
      "*": {
        "*": [ {
          "fontSize": 8,
          "fontFamily": "Cambria Math",
          "color": {
            "solid": {
              "color": "#000000"
            }
          }
        }
      ]
    }
  }
}
```





**DEMO**

## Working with Report Themes



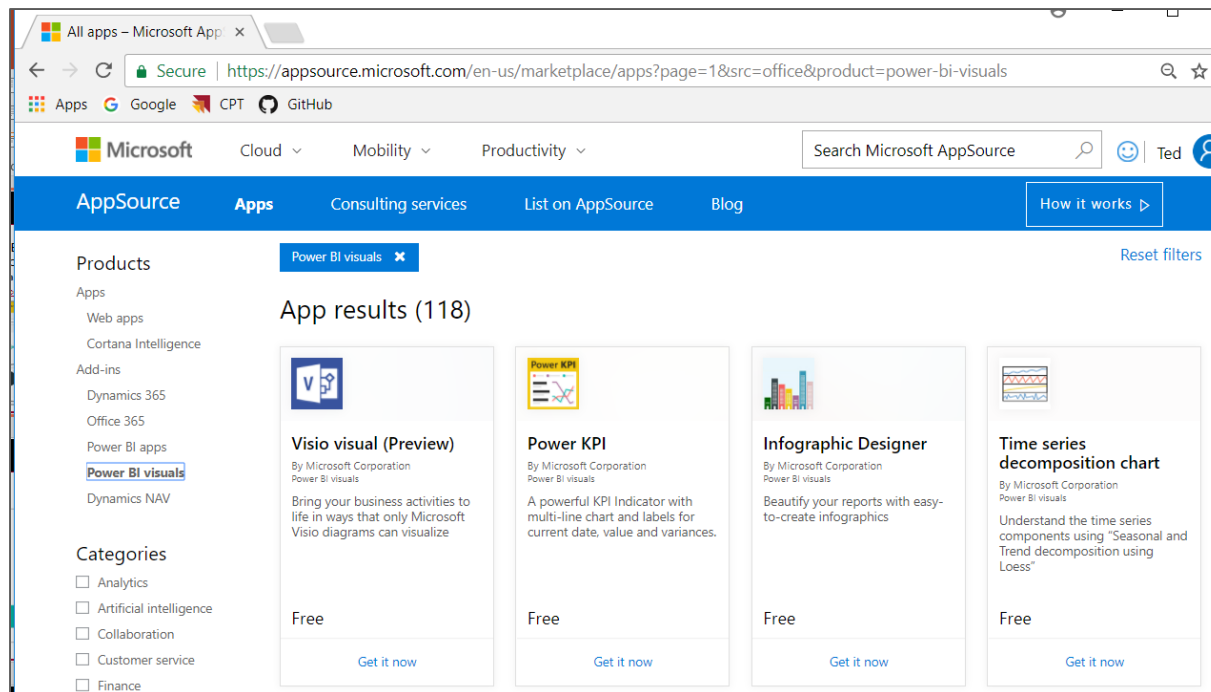
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# Custom Visuals for Power BI

- 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://appsource.microsoft.com>



# Histogram

- Custom Visual Example 1



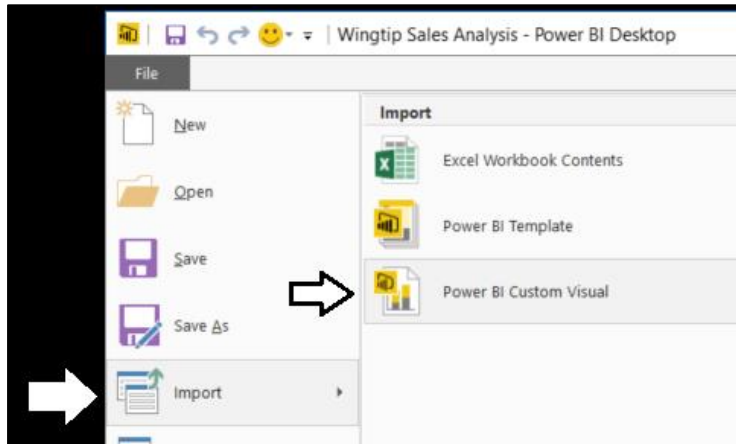
# Hierarchy Slicer

## ■ Custom Visual Example 2

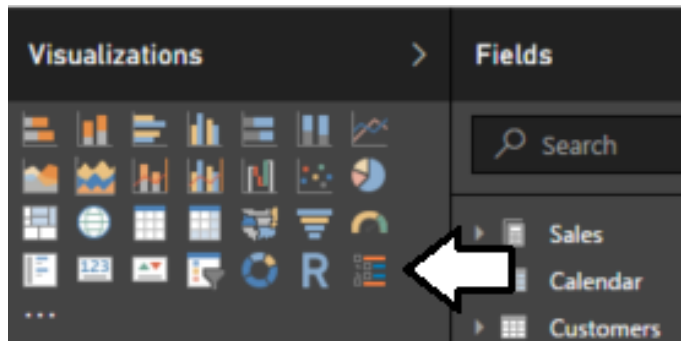


# Importing a Custom Visual

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



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



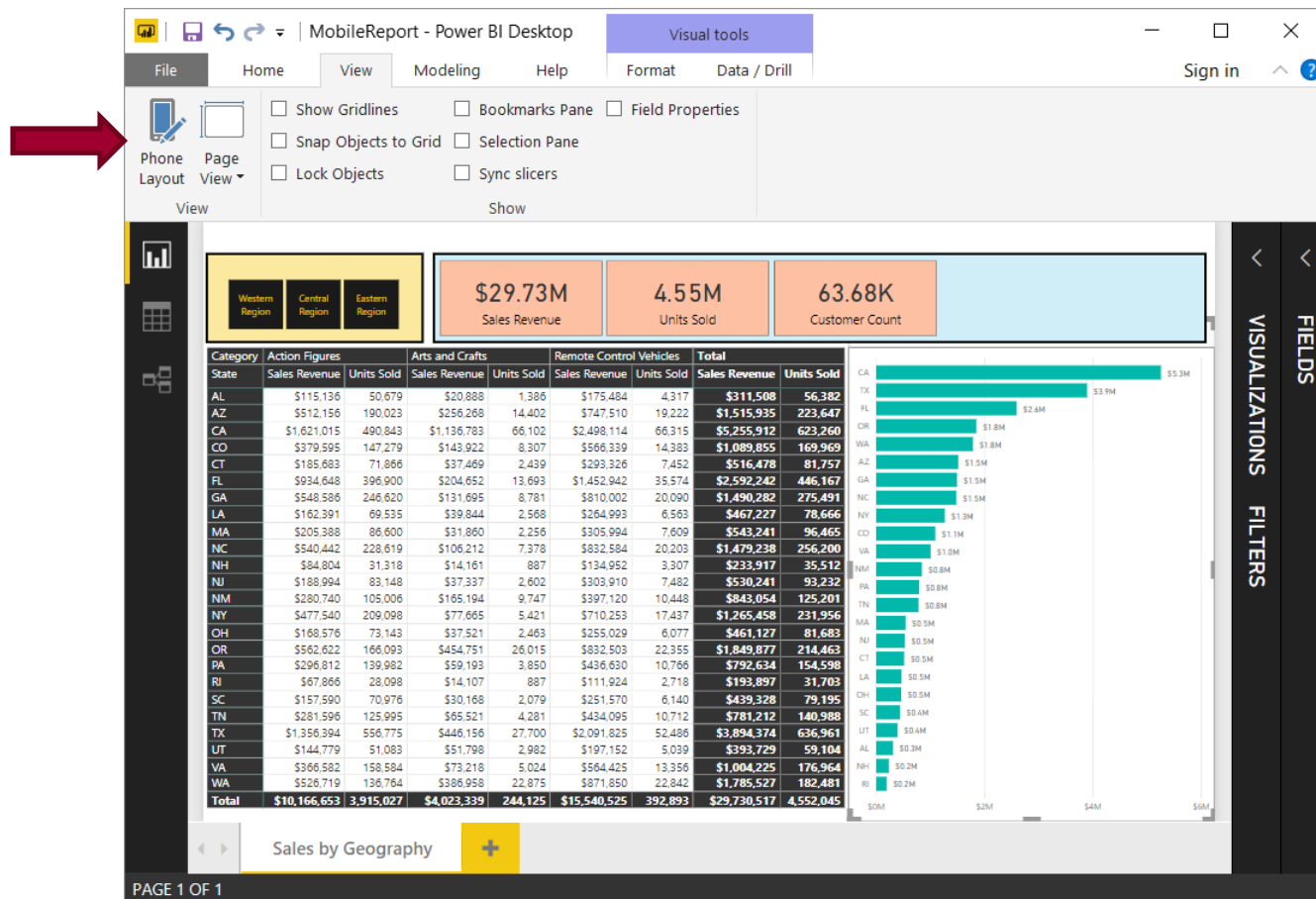
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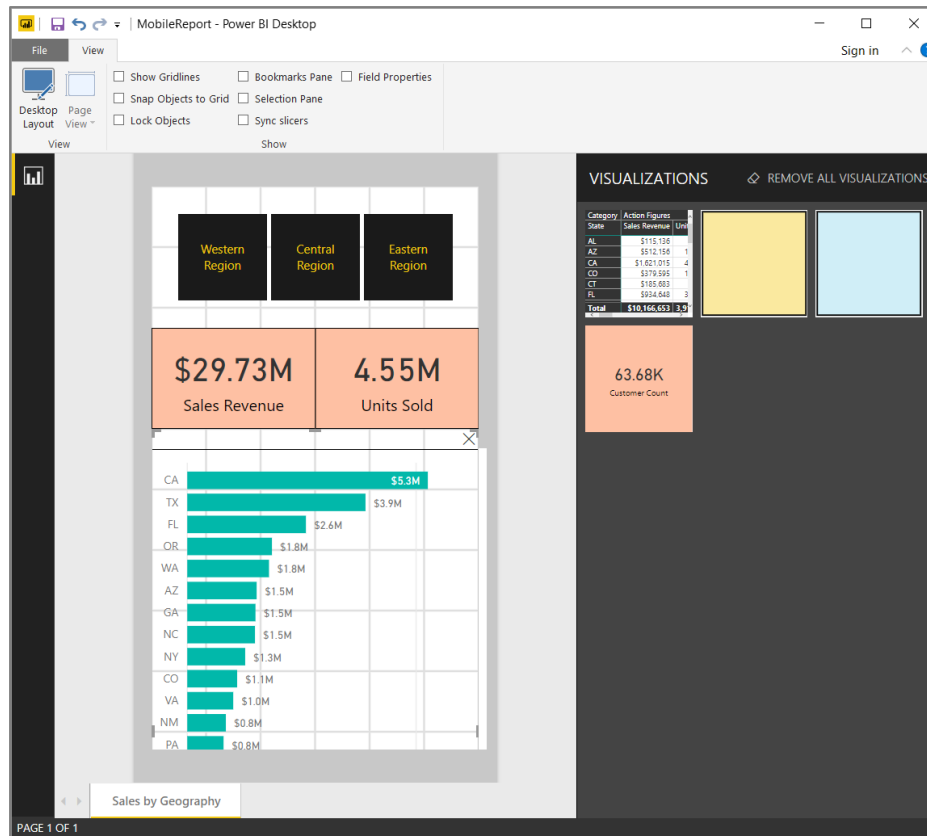
# Designing Reports for Mobile Devices

- Many reports will not render properly on mobile devices
  - Phone Layout used to create separate version for mobile devices



# Designing a Phone Layout

- Phone layout view allows you to select specific visuals
  - Only include report visuals that render correctly on mobile devices
  - You position visuals according to form factor of mobile device





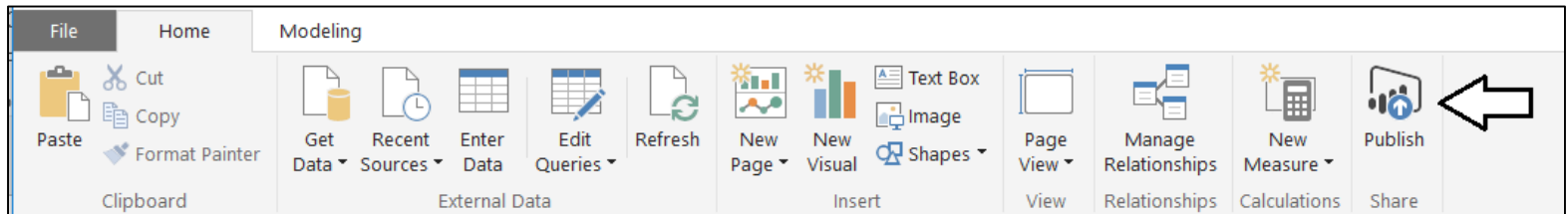
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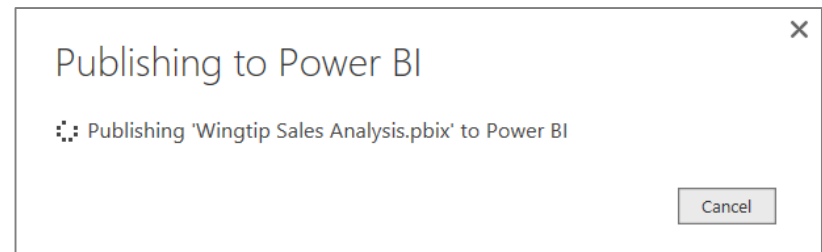


# Publishing a Power BI Desktop Project

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



- Requires logging into your Office 365 account

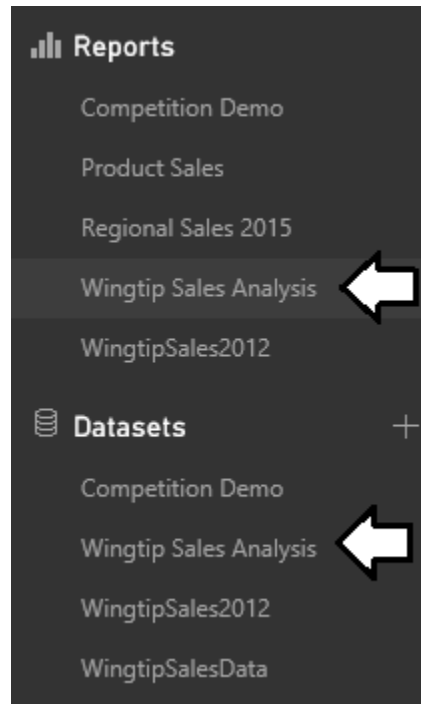


- Published articles added to a specific workspace



# 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



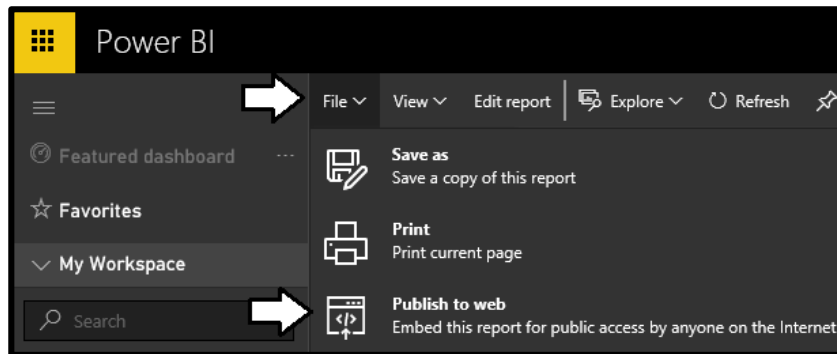
# Dataset Configuration

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

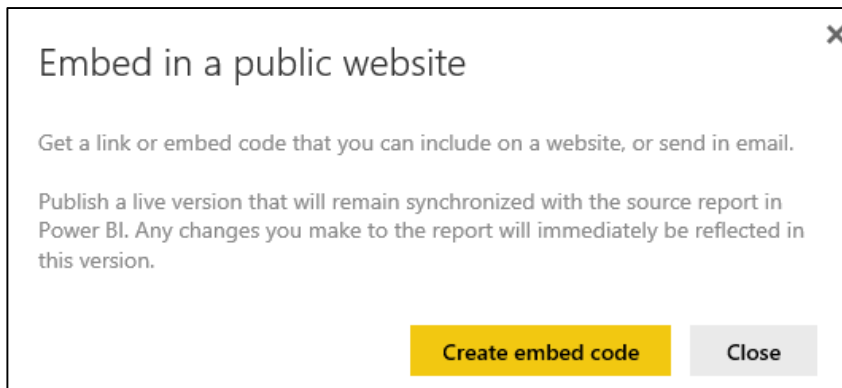


# Publish to Web

- **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

The screenshot shows the 'Share' dialog box in Power BI. The 'Link' option is selected, and the URL <https://app.powerbi.com/view?r=eyJrIjojYTM3YjlkNzctNWY5My00YTUyL> is displayed in a text box. Below it, the 'HTML' option is also shown, with the code `<iframe width="933" height="700" src="https://app.powerbi.com/view?r=eyJrIjojYTM3YjlkNzctNWY5My00YTUyL"` in a text box. A 'Size' dropdown menu is visible, showing '933 x 700 px'. The 'Close' button is at the bottom right.





The background of the slide is a close-up, low-angle shot of a server rack. The rack is filled with numerous server units, each featuring a grid of small, glowing blue lights. The perspective is looking up the length of the rack, creating a sense of depth and scale. The overall color palette is dominated by deep blues and bright cyan from the lights.

**DEMO**

## **Using the Publish to Web and Publish to SharePoint Features**

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