



Power BI Advanced

Data Visualization and Storytelling

Instructor Name

Instructor Title

[Instructor email](#)

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Prerequisites and Setup Steps

Internet connectivity: You must be connected to the internet

- At minimum, a computer with 2-cores and 4GB RAM running Windows 7 / Windows Server 2008 R2 or later
- Microsoft Power BI Desktop requires Internet Explorer 9 or greater
- Verify if you have 32bit or 64bit operating system to decide if you need to install the 32bit or 64bit applications.
 - Search for computer on your PC, right click properties for your computer
 - You will be able to identify if your operating system is 64 or 32 bit based on “system type” as shown below

Download and install Power BI Desktop: Download and install Microsoft Power BI Desktop from

<http://www.microsoft.com/en-us/download/details.aspx?id=45331>. Optionally, you can also install the Power BI Desktop tool from the **Power BI Desktop Install** folder on the flash drive that will be provided on the day of the session. Please choose appropriate 64-bit or 32-bit version depending on your platform. Microsoft Power BI Desktop is available for 32-bit (x86) and 64-bit (x64) platforms

Download Class files:

- Copy Files from your USB to **C:\Power BI_ADV_DataViz** (Please return the USBs)

NOTE: This lab is using real anonymized data and is provided by ObviEnce LLC. Visit their site to learn about their services: www.obvience.com. This data is property of ObviEnce LLC and has been shared for the purpose of demonstrating PowerBI functionality with industry sample data. Any uses of this data must include this attribution to ObviEnce LLC.

Agenda

- What is Story Telling with Data
- Science Behind Data Visualization
- Process Behind Data Visualization
- Dashboards and Reports
- Chart Selection
 - LABS 1 & 2
- Custom Visuals
- Polishing & Formatting
- Report Authoring – Best Practices
- Dashboard Design

COURSE OBJECTIVES



By the end of this course, you gain a better understanding of Storytelling with Data. Specifically you will be able to:

- Understand the need for storytelling with data
- Understand the agile process to creating Power BI data visualizations
- Understand the art behind visualizations
- Gain familiarity with Power BI report layouts and structure
- Understand implications behind choosing the right charts
- Gain familiarity over the use of Power BI custom visuals

What is Story Telling with Data



What is Story Telling with Data

Today's world is filled with Data

- Volume
- Velocity
- Variety

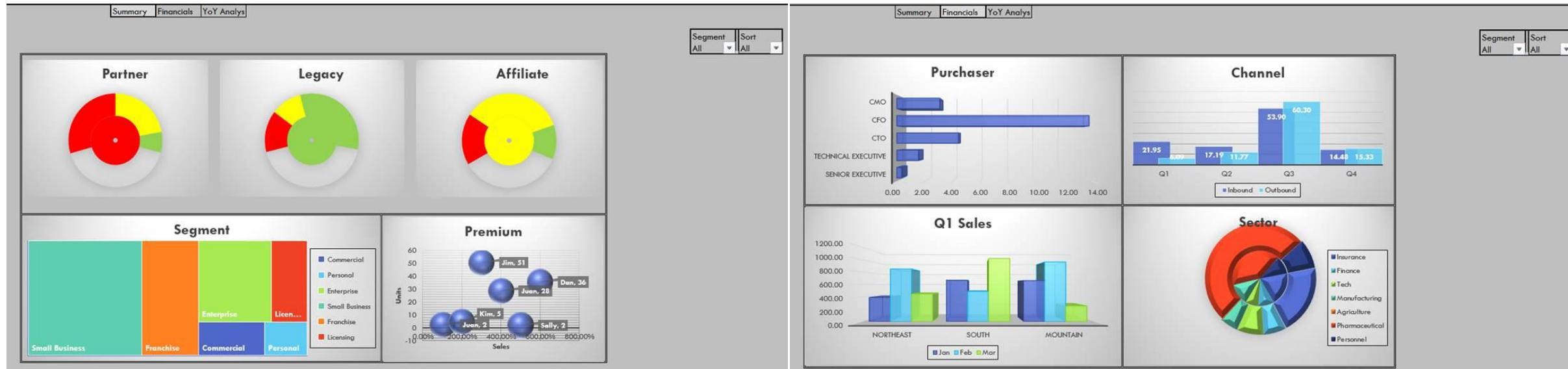


We are drowning in data!!

What is Story Telling with Data



We see reports everyday that all have the same problem

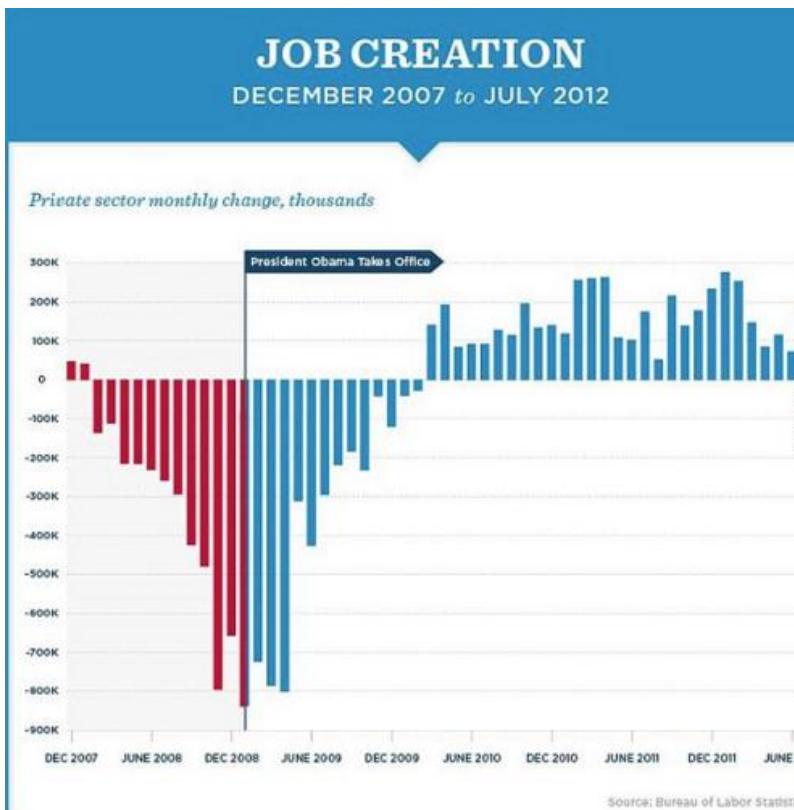


- No story, so the visual does not stick
- 3 D Layering and Drop shadows - Eye sore
- Color scheme, fonts, end up making you look like you are from 1990s
- Use of incorrect charts

What is Story Telling with Data



Are there **visuals** and reports that tell a great story?



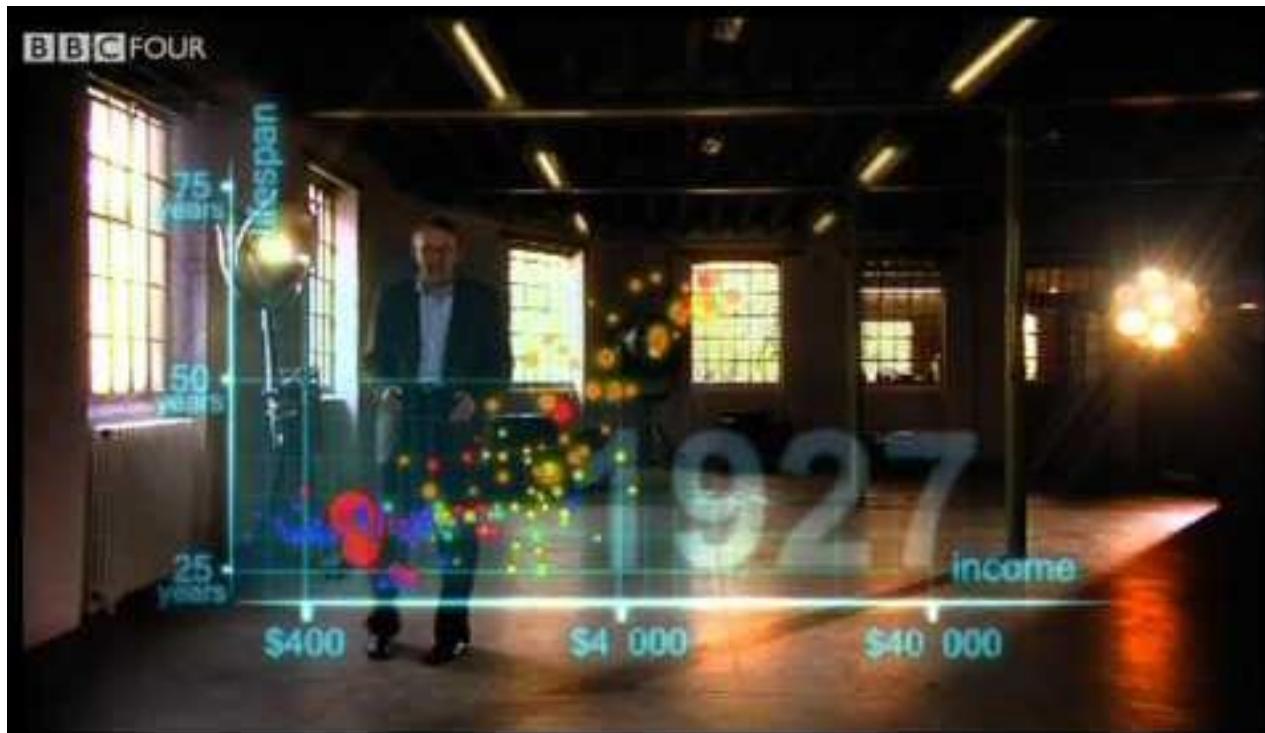
Source: Bureau of Labor Statistics | Nathan Yau

For a visual to work,
they need to tell the
story the author
intended.



What is Story Telling with Data

Are there other ways to tell a great story with data?



Source: The Gap minder foundation, BBC, Youtube.com

Image Source: <http://img.youtube.com/vi/jbkSRLYSOjo/0.jpg>

The Science Behind Data visualization

Science Behind Data Visualization



Most Bad or forgettable reports all have the same problems



- No context
- Excessive precision
- Incorrect measures
- Incorrectly chosen graph
- Clutter
- Inaccurate encoding of data
- Poor layout
- No or poor highlighting
- Unnecessary pictures
- Bad use of colors

How many of these problems can you spot in the example?

Science Behind Data Visualization



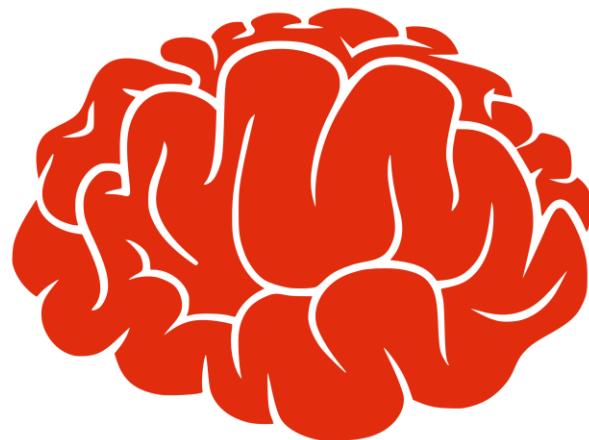
You will learn to identify and fix each of these problems!!



Science Behind Data Visualization



To build great visualizations you have to understand Cognitive science



Visual memory system takes up 70% of all sensors in brain

Iconic memory

Short Term
memory

Long Term
memory

Science Behind Data Visualization



How does information pass from one part of memory to another

The diagram features a blue funnel shape. Inside, the words "Iconic memory" are written in large white font at the top. Below them, in smaller white font, is "Short Term memory". At the very bottom, in even smaller white font, is "Long Term Memory". This visual metaphor represents how information moves from a temporary storage stage to long-term storage.

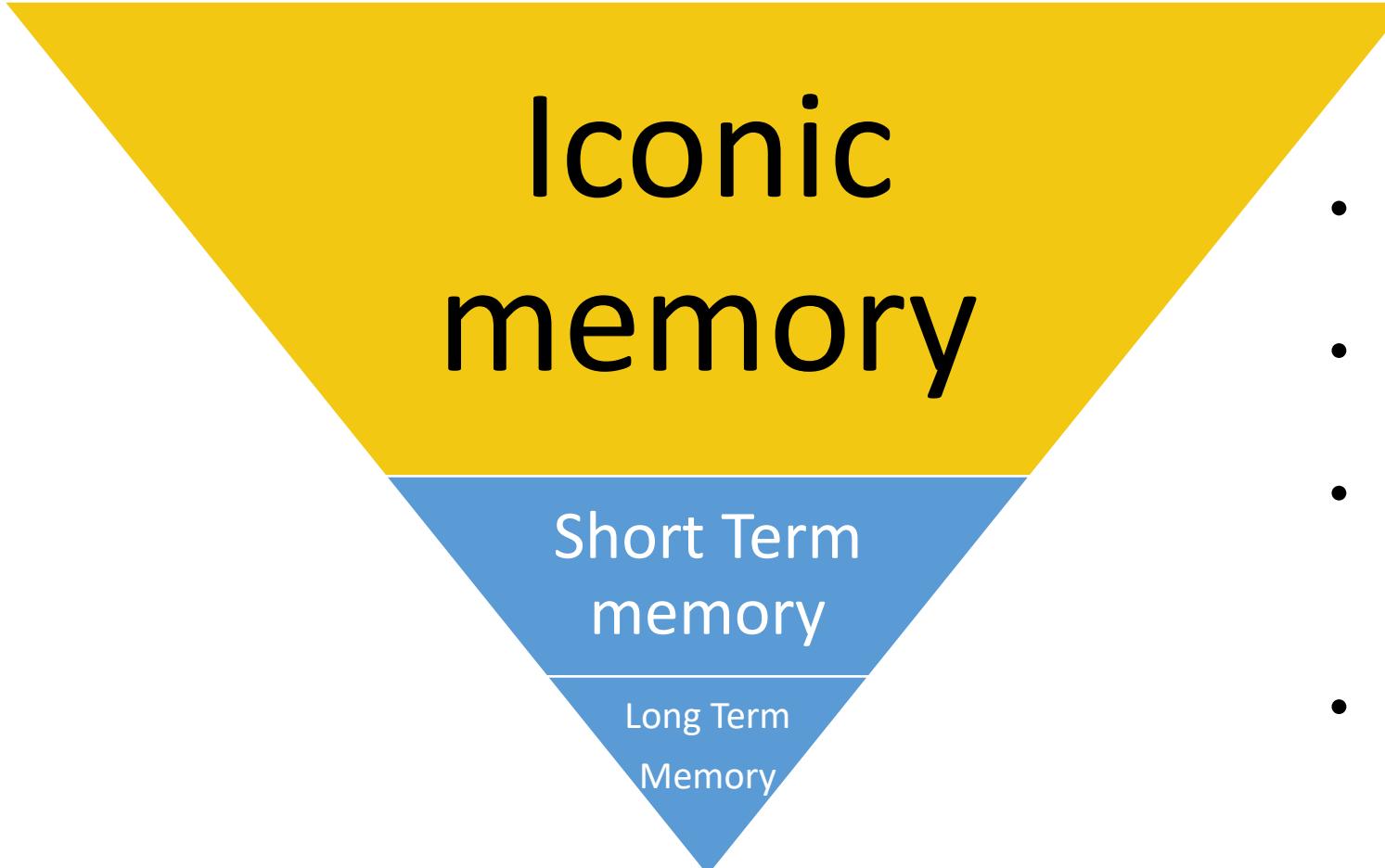
Iconic
memory

Short Term
memory

Long Term
Memory



Iconic Memory



A funnel diagram illustrating memory storage levels. The top section is yellow and labeled "Iconic memory". The middle section is blue and labeled "Short Term memory". The bottom section is dark blue and labeled "Long Term Memory".

Iconic
memory

Short Term
memory

Long Term
Memory

- Can take large volume of data
- Lasts only a fraction of a second
- 99% of information discarded unless useful
- Only “interesting data” is passed to Short Term Memory



Spark the Iconic Memory – Mute the background noise



Things that can distract

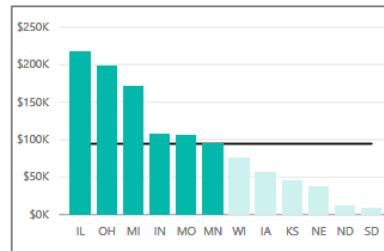
- Bright colors all over the report
- Thick borders every where
- Grid lines
- Too much precision with numbers
- No highlights

Iconic Memory

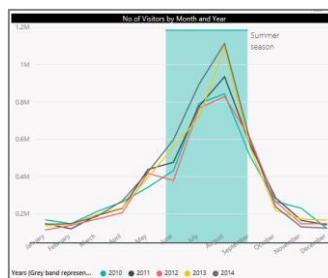


Spark the Iconic memory – Precognitive attributes

Very Precise Quantitative Perception: Length and 2D Positioning



Not Very Precise Quantitative Perception: Width, Size, Intensity, Blur

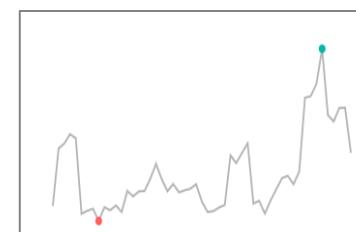


Sales was up 20% YoY



No Quantitative Perception = Orientation, Shape, Enclosure, Added Marks

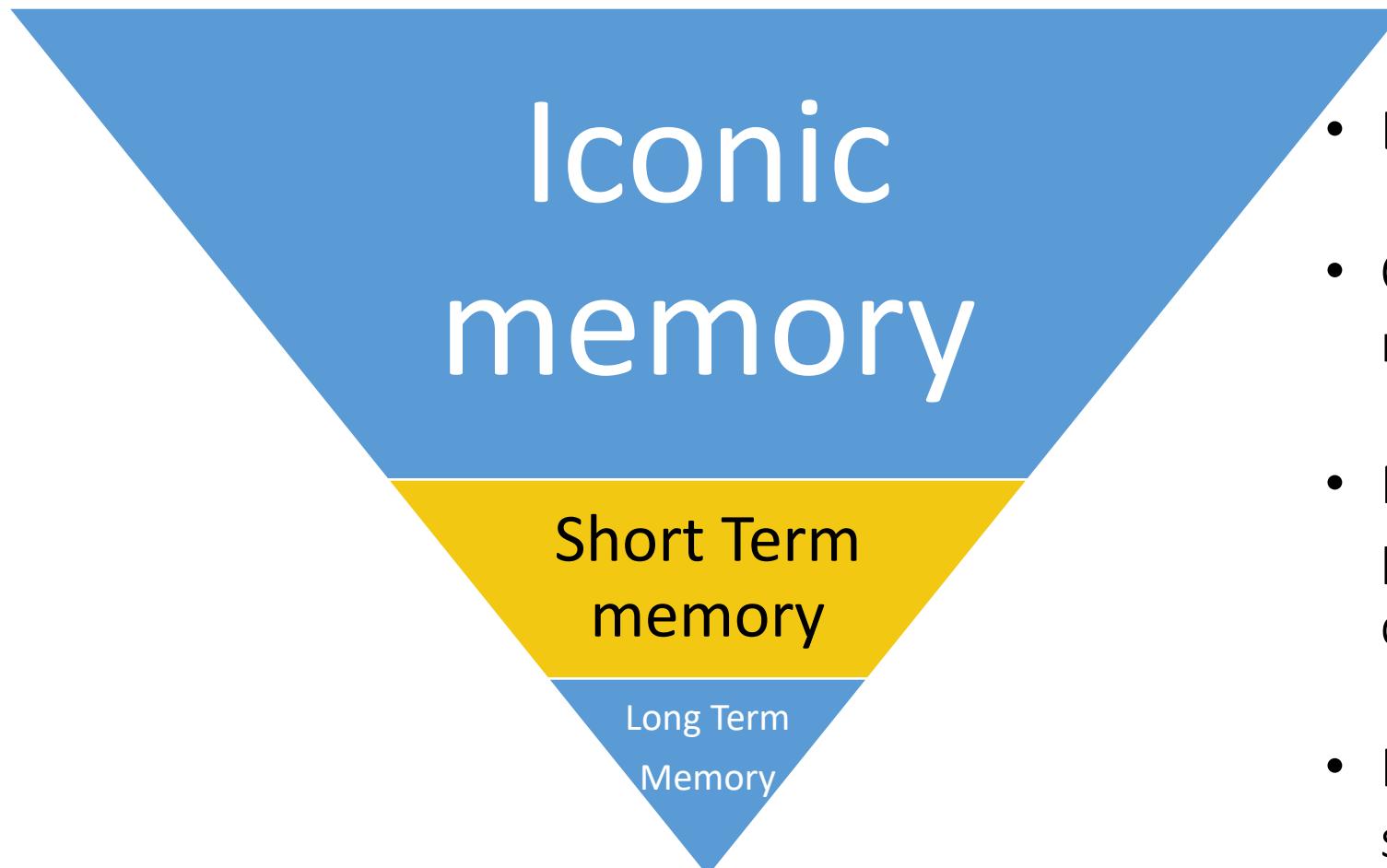
Region	Total Sales M	Sales YoY
South	\$1,566,447	10.66%
MidWest	\$992,456	5.42%
NorthEast	\$931,919	11.98%
Pacific	\$758,435	13.94%
Mountain	\$283,976	27.43%
	\$133	▼ -85.34%



Short Term Memory



Short Term Memory



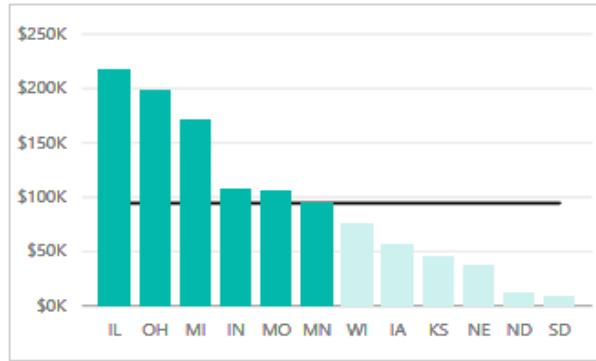
- Lasts only a few seconds
- Can take in 3 to 5 pieces of info at most
- Memory tries to form these 3-5 pieces using patterns it detects in data
- If these pieces of info do not have a story the data will not pass to Long Term Memory



Short Term Memory

Spark the Short Term Memory – Gestalt's principles

**Proximity
Similarity**



Continuity

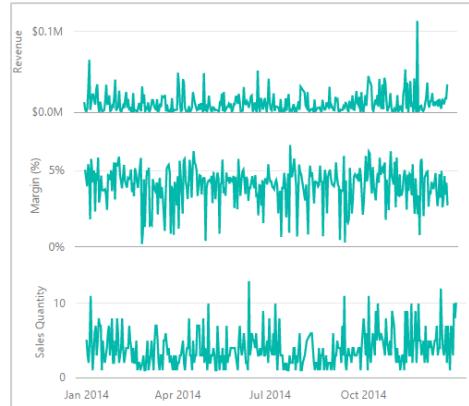
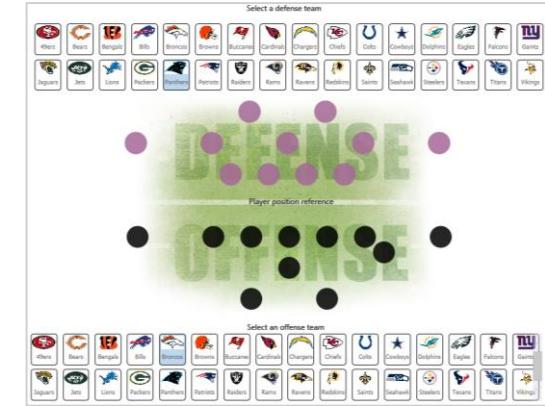
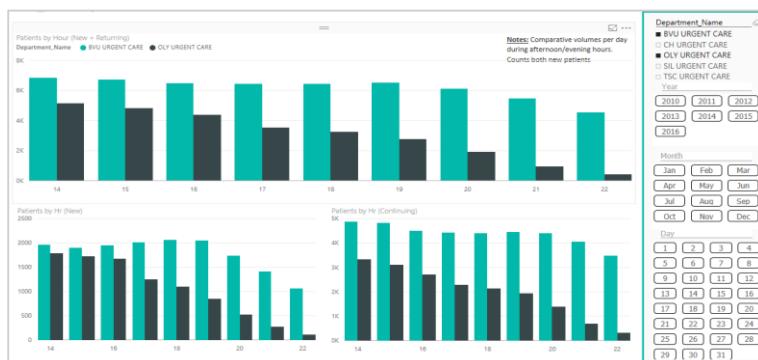


Figure & Ground



**Enclosure
Symmetry**



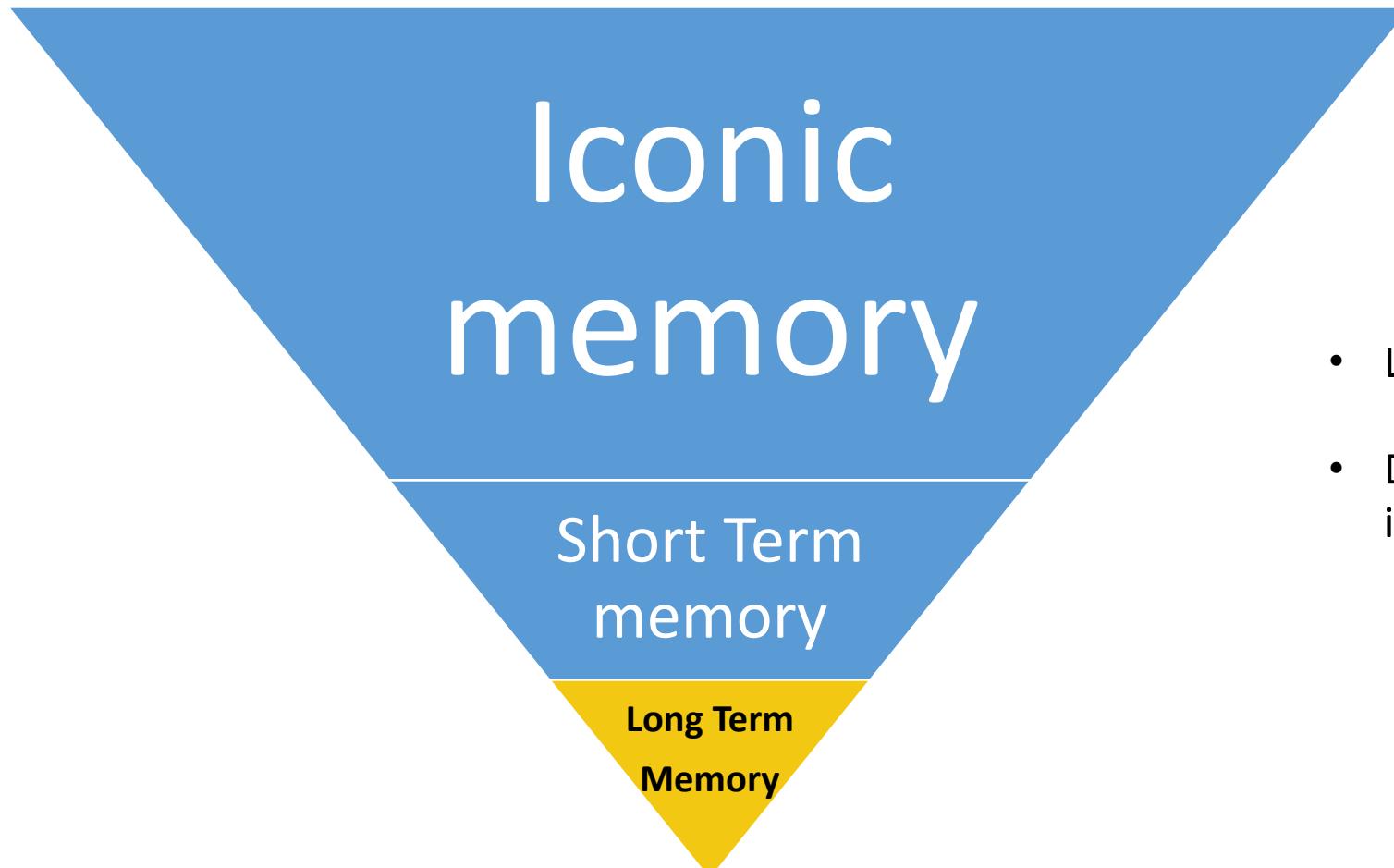
**Continuity
Symmetry**



Long Term Memory



Long Term Memory



- Lasts for a Long Time
- Data needs to be in Long Term Memory to induce decision making



Sparkling Long Term Memory

- Have a **clear call for action**
- Use Pre-cognitive Techniques **Spark Interest**
- Use Gestalt's principles **Data Pattern**
- Connect dots using Text/Audio to tell a story

The Process Behind Data Visualization

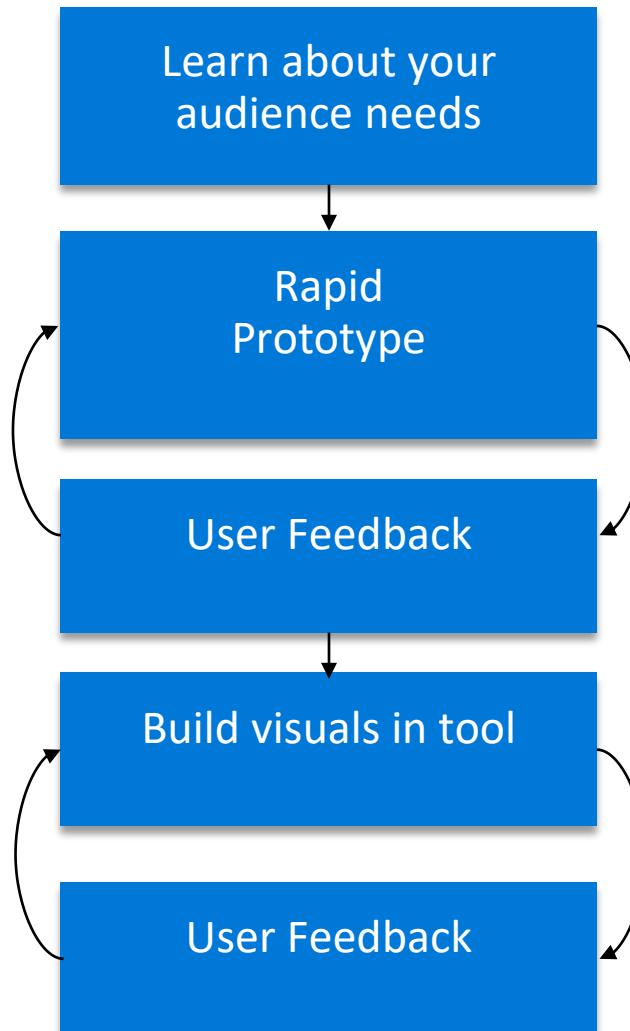
Data Structure & Data Grain



Top 5 Questions

Who? Where?
What? How Many?
When? Why?

Start Visuals with Sample Data



Use Whiteboard or Storyboard to plan POC

Think Agile!!



Convert the Story to a Data Model

List your big questions:

1. What is my Total Sales for a Selected Year and Region?
2. How is my Total Sales doing Year Over Year?
3. How are my Units trending for various States in my region?
4. How is my Sales doing by Channel, Device, Category for selected Year?
5. Which categories are performing best to worst by Total Sales ?

What are you
Measuring?

Units
Total Sales
Gross Profit

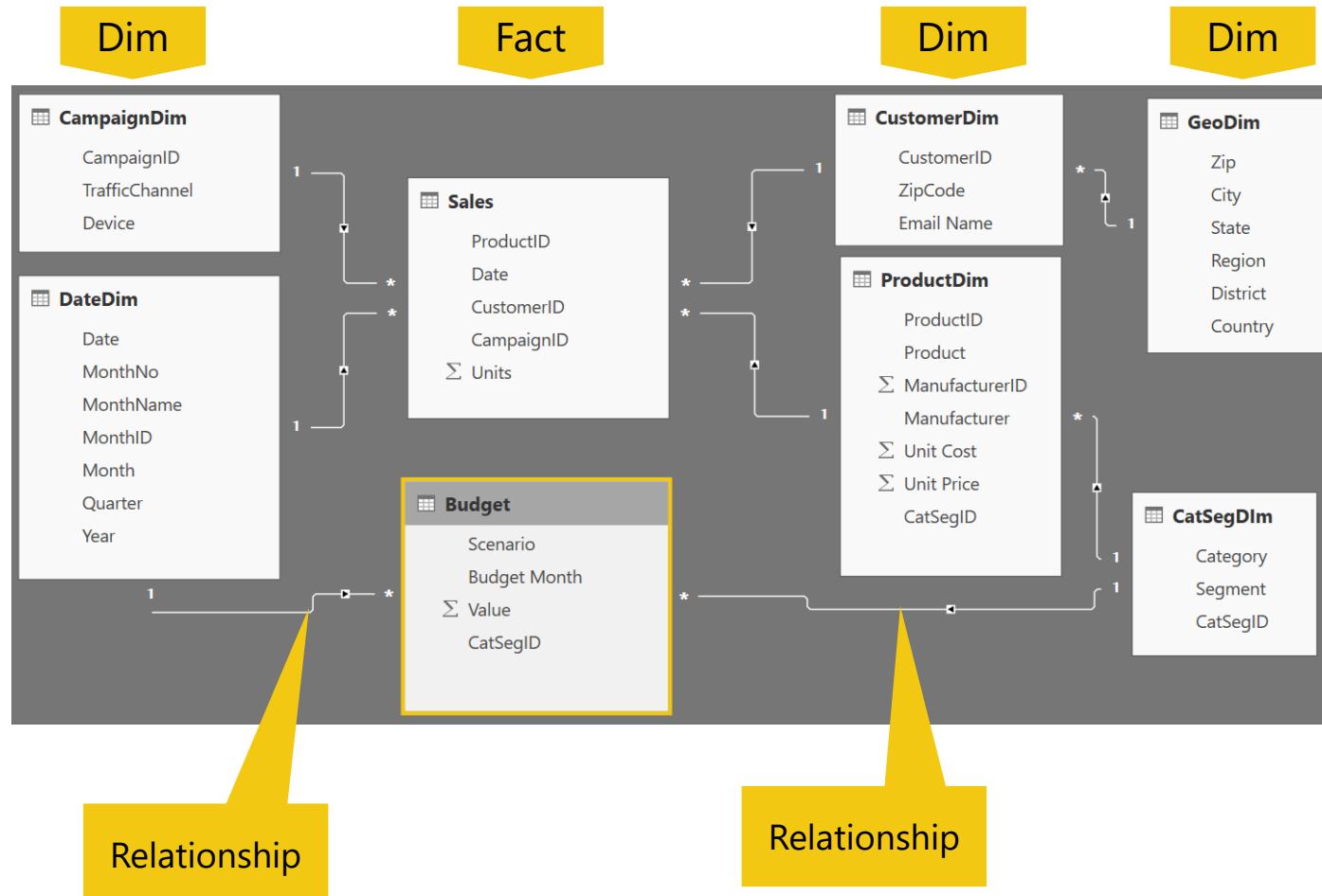
These are **Measures**
which live in **Fact**
tables

How are you
describing or Slicing?

By Time (Year, Month)
By Geography (Region, State or City)
By Campaign (Channel or Device)

These are
Attributes that live
in **Dimension** tables

Convert Story to Data Model



- Measures (e.g. Units or Sales) live on Fact tables
- Descriptive attributes (e.g. Campaign, Customer name) live on Dimension tables
- Relationships tie the data together so you can slice your measures by your attributes

Dashboards and Reports



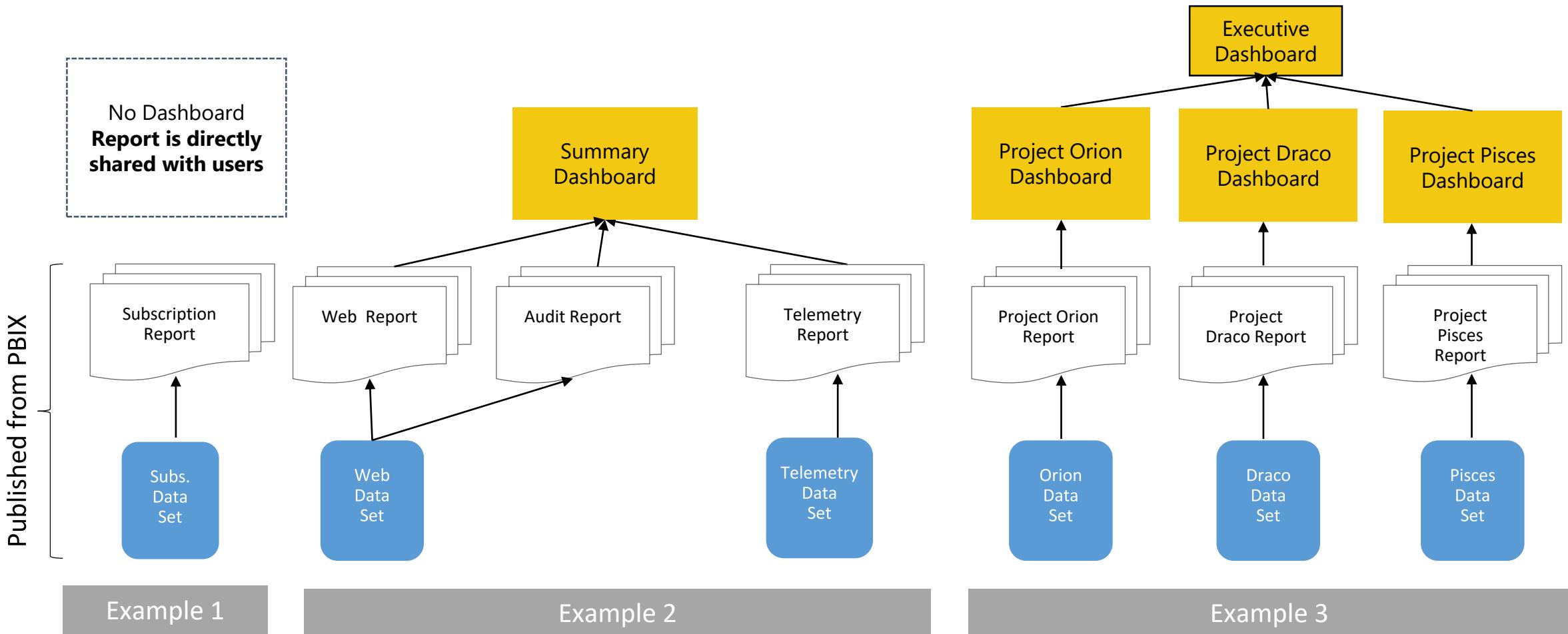
Terminology & Definitions

A Power BI **dashboard** is a single page, often called a canvas, that uses visualizations to tell a story. Because it is limited to one page, a well-designed dashboard contains only the most-important elements of that story.

A Power BI **report** is a multi-perspective view into a dataset, with visualizations that represent different findings and insights from that dataset. A report can have a single visualization or pages full of visualizations.

Workspaces are containers for dashboards, reports, workbooks, and datasets in Power BI. There are two types of workspaces: **My workspace* and app (group) workspaces.

Data Sets, Reports, Dashboards (in Service)



- Data sets contain the Data Model with tables (created by Power Queries) with relationships and DAX calculations.
- The same Data set can be used to build multiple reports
- A report can only be built from 1 data set
- A Dashboard can be built from multiple reports and/or multiple dashboards

Layouts: Dashboard vs Report



Dashboard Layout



Typically provides snapshot of Business overview and may contain data from multiple reports

Report Layout

Performance Comparison Across Segments				
Segment	Sales	Monthly V T B	Daily Ave Sales	VTB
Accessory	\$1,067,508	[Color-coded bar]	[Line chart]	173,908.60
Convenience	\$2,554,423	[Color-coded bar]	[Line chart]	-260,215.44
Moderation	\$7,533,866	[Color-coded bar]	[Line chart]	1,201,974.45
Total	\$11,155,796	[Color-coded bar]	[Line chart]	1,115,667.61

Typically answers 1 Business Question

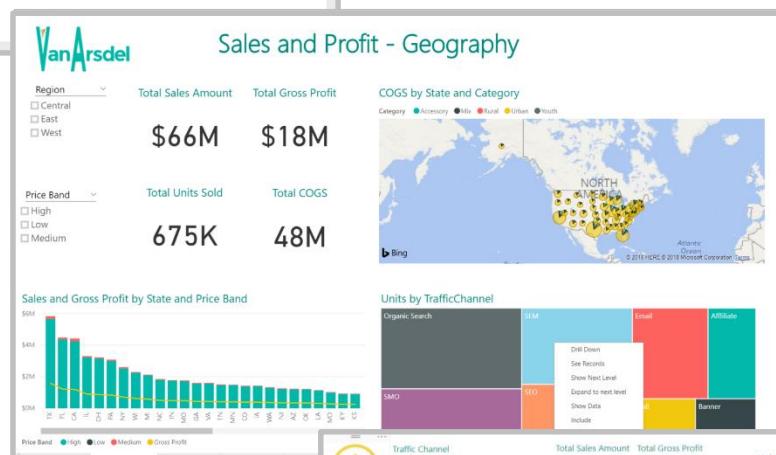
Dashboard to Report Transitions



Total Sales Amount

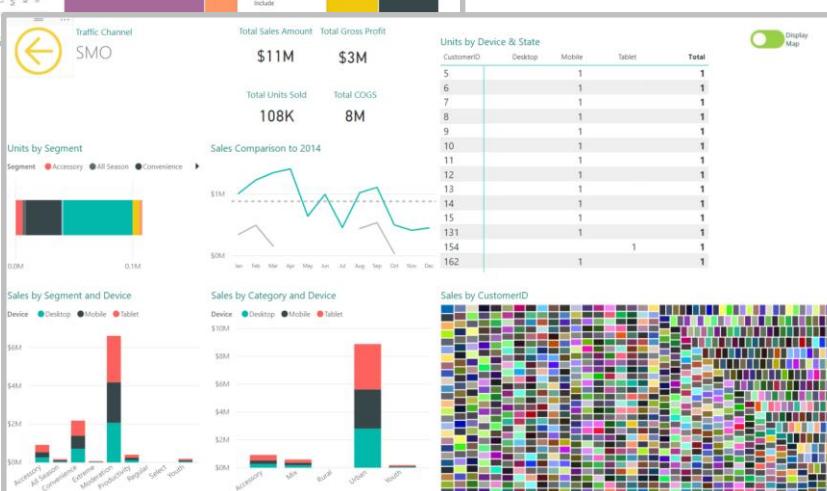
\$66M

Dashboard Tile (single KPI) Action Oriented – click thru to report



Report – tell Top level story of KPI

* Drill to another Report (Sliced to Specific details)



In Report can use “Back” to navigate back up

Layouts



Most people's
attention drawn here

2nd most important
area

Most people's
attention drawn here

3rd most important
area

Least important area

Dashboards

- Layout & Structure

Dashboard Layouts – Column Layout



Title <i>Area 1</i>	Title <i>Area 2</i>	Title <i>Area 3</i>
1 st KPI <i>Area 1</i>	1 st KPI <i>Area 2</i>	1 st KPI <i>Area 3</i>
2 nd KPI <i>Area 1</i>	2 nd KPI <i>Area 2</i>	2 nd KPI <i>Area 3</i>
Chart <i>Area 1</i>	Chart <i>Area 2</i>	Chart <i>Area 3</i>

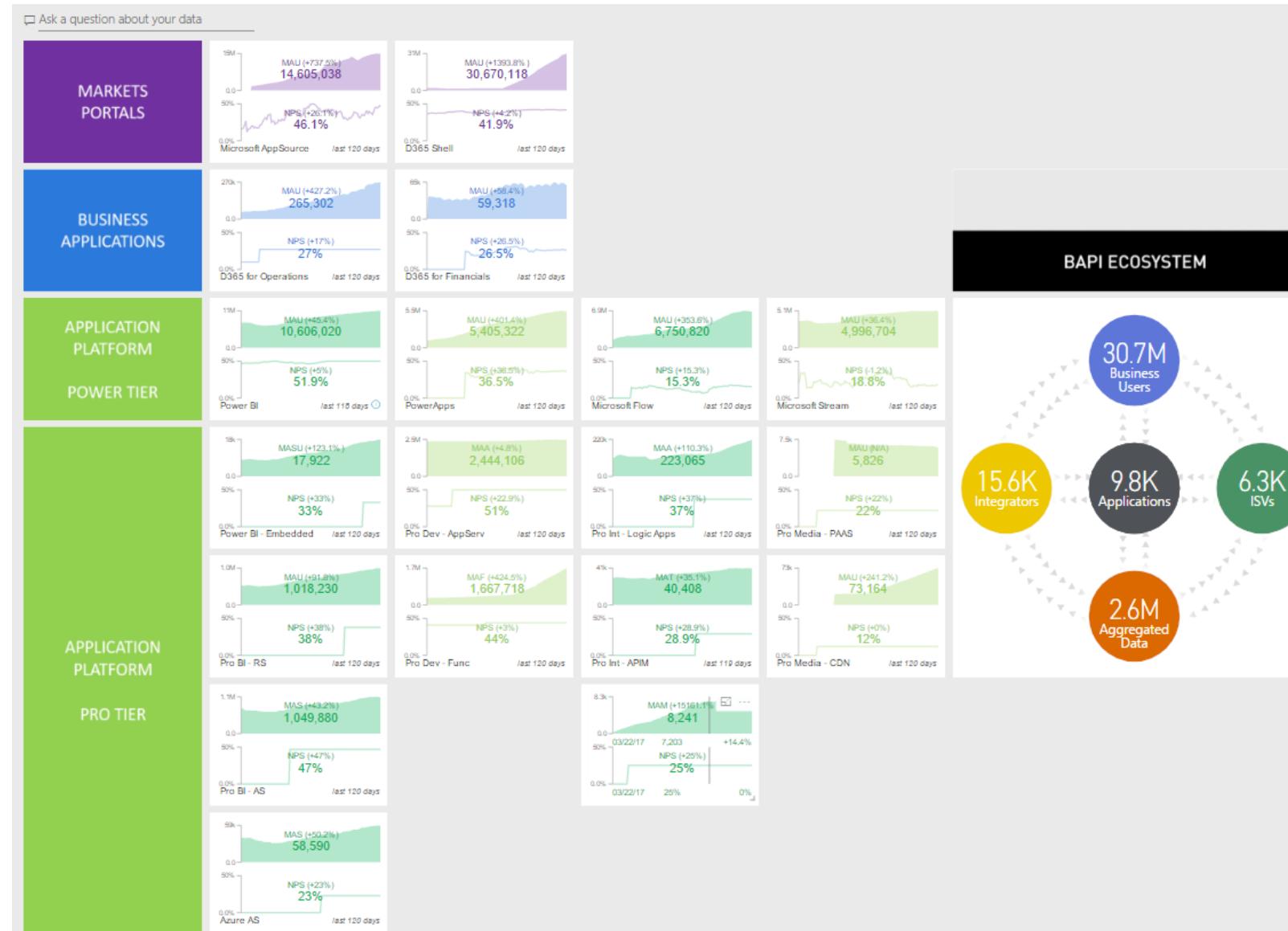
- This layout is most powerful for Executive Dashboard
- Line up each column for 1 area that an Exec manages (in decreasing order of importance)
- Ex. Marketing, Finance, Sales

Dashboard Layouts – Vertical Matrix Layout



- Layout is useful when
 - Each row has a story
 - Each column has similar KPIs
 - Usually helpful in Marketing, Supply Chain (think conversion funnels etc.)

Dashboard Layouts – Horizontal Matrix



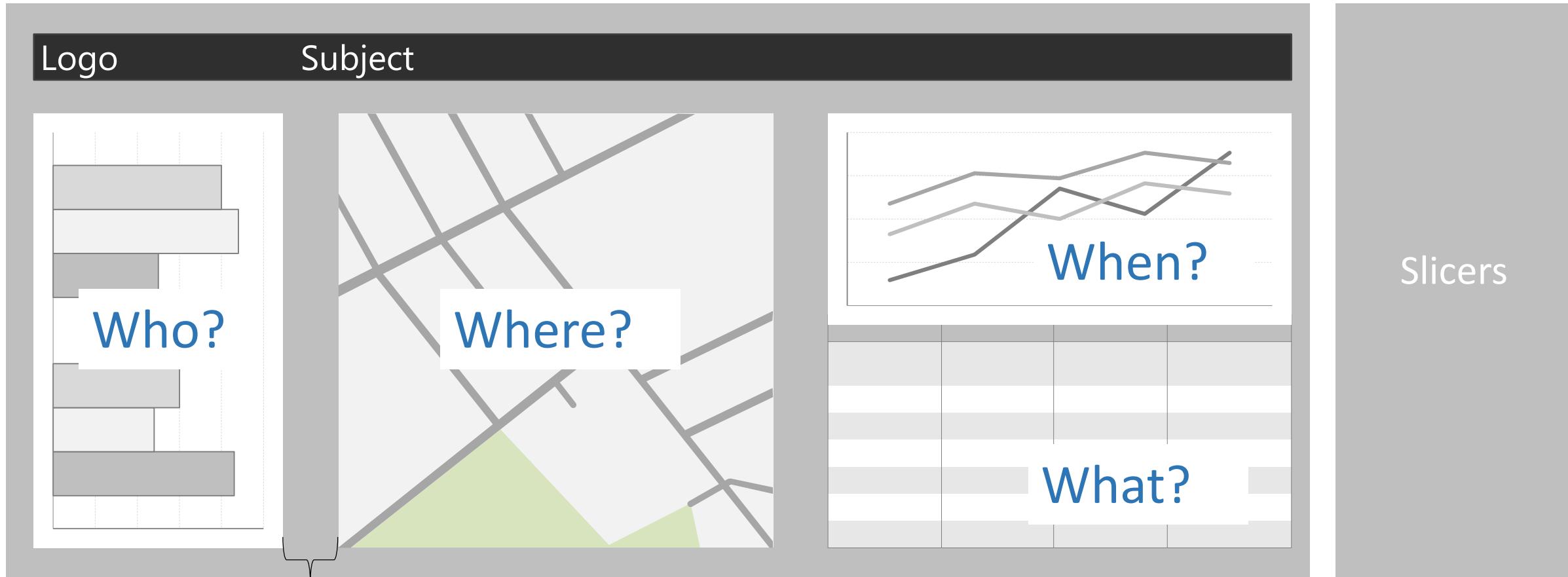
This Dashboard is currently in use by Microsoft to manage their cloud business.

<https://powerbi.microsoft.com/en-us/blog/how-microsoft-uses-power-bi-to-run-its-growing-cloud-business/>

Reports

- Layout & Structure

Use Storyboarding to Design Report Layout



Control this space. If all objects tell the same story, use the same gap space. If some objects tell a different story, make the gap bigger

Storyboarding Tools

The screenshot shows a Microsoft PowerPoint slide with a storyboard layout. The slide is titled "Logo" and "Subject". It contains four main sections: "Who?", "Where?", "When?", and "What?". A "Slicers" section is also present. The "Storyboarding" tab is selected in the ribbon, and a yellow arrow points from the ribbon to the "Storyboard Shapes" ribbon gallery. The gallery displays various shapes and icons for storyboarding, such as Bar Charts (horizontal and vertical), Images, Line Charts, Map Markers, Pie Charts, Play Controls, Position Control, and Street Maps. The "Icons" category is currently selected.

Install the Storyboarding Toolbar: <https://docs.microsoft.com/en-us/vsts/work/backlogs/office/storyboard-your-ideas-using-powerpoint>

Report Channel – Drill Through Filters

Sales and Profit - Geography

Region

- Central
- East
- West

Total Sales Amount **\$66M** Total Gross Profit **\$18M**

Price Band

- High
- Low
- Medium

Total Units Sold **675K** Total COGS **48M**

Sales and Gross Profit by State and Price Band

COGS by State and Category

Category: Accessory (Green), Mix (Black), Rural (Red), Urban (Yellow), Youth (Blue)

Map of North America showing COGS by state and category.

Units by TrafficChannel

- Organic Search
- SEM
- Email
- Affiliate
- SMO
- Traffic Channel

Drill Down, See Records, Show Next Level, Expand to next level, See Data, Include, Exclude, Drillthrough.

Legend: Price Band (High, Low, Medium, Gross Profit).

Filters

Page level filters: Drag data fields here.

Drillthrough filters: TrafficChannel is Organic Search.

Drill through allows you to create a page that provides details on a single ‘entity’ in your model:

- Allows quick navigation to a report page for more depth on that entity
- Can be accessed by almost any visual which contains that entity
- Quick “Back” button that is functional in Power BI Service as well

Traffic Channel: Organic Search

Total Sales Amount **\$14M** Total Gross Profit **\$4M**

Total Units Sold **145K** Total COGS **10M**

Units by Segment

Units by Category

Sales by Segment and Device

Sales by Category and Device

Sales by State and Device

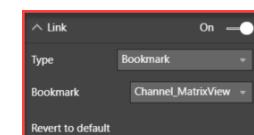
Map of North America showing units by state and device.

Report Channel – Bookmarks and Toggles



The screenshot shows a Power BI report channel interface. On the left is a dashboard with various visualizations: a traffic channel summary, a bar chart for 'Units by Segment', a line chart for 'Sales Comparison to 2014', a sparkline for 'Sales by Segment and Device', a stacked bar chart for 'Sales by Category and Device', and a matrix visualization for 'Sales by CustomerID'. On the right are two panes: 'SELECTION' and 'BOOKMARKS'. The 'SELECTION' pane lists items like 'btn_DisplayMap', 'btn_DisplayMatrix', 'Channel_MapView', and 'Channel_MatrixView'. The 'BOOKMARKS' pane shows a list of bookmarks with checkboxes for 'Add' and 'View'. A red arrow points from the 'VISIBLE' button in the 'BOOKMARKS' pane to the 'Visible' checkbox in the list.

1. Use **Selection** pane to choose visuals for bookmark
2. Manage Bookmarks on the **Bookmark** pane
 - **Add** creates bookmark
 - **Update** updates existing bookmark (...)
3. Assign bookmarks to images/shapes from the Format Pane – Link Section
 - Turn link ON
 - Type = Bookmark
 - Assign Bookmark name



Bookmarks let you save interesting states as part of your report. Once you have a list of bookmarks, you can use these in several ways including organizing and transitioning visuals:

- Includes the current page
- Any filters and slicers selected
- Sort Order
- Which visuals should appear on the report

The screenshot shows the same report channel with a bookmark applied. The 'Display Matrix' visualization in the top right corner now has a red border around its title and a red box highlighting the 'Visible' checkbox in the 'BOOKMARKS' pane. The visualization itself shows a world map with sales data for North America.

Create Custom Tooltip Report



The screenshot shows the Power BI desktop interface with a report titled "Tooltip Report". The main area displays a card for "Aaron Alexander" with fields: City (Aaronburg, PA), Sales (\$66M), Units (675K), and CustomerID (282597). Below this is a map of North America with a red dot indicating the location. On the left, there's a navigation bar with tabs: Traffic Channel, Customer-Drill, Customer-ToolTip (which is selected and highlighted in yellow), and a plus sign. A red arrow points from the text "You can Hide the tooltip (or any other) report!" to the "Customer-ToolTip" tab. The ribbon at the top has "VISUALIZATIONS" selected. The tooltip fields section in the ribbon is highlighted with a red box, showing "CustomerID".

- You can **Hide** the tooltip (or any other) report!
 - *Right click to hide*

Create a custom tooltip report for any **field** as a new page

1. Create the Tooltip Report

- **Page Information** – enable Tooltip
- **Page Size** – use **Tooltip** or set custom size
- **View Ribbon**, set **Page View** to **Actual Size**
- Place key **Field** in **Tooltip Field Well**
- Does not work with the Matrix or Table visual (*yet*)

2. Assign the Custom tooltip to each chart for which you want the tooltip to appear – the **field** must be visible on the chart

The screenshot shows a Power BI report with a card for "Alan Webster" and a bar chart titled "Sales by CustomerID". The card includes fields: City (Amherst, MA, USA), Sales (\$103), and Units (1). The bar chart has four bars with values: 233594 (blue), 233595 (orange), 233599 (green), and 233600 (grey). A red box highlights the "CustomerID" field in the tooltip for the blue bar. A red arrow points from the tooltip field in the ribbon to the "CustomerID" value in the tooltip for the bar chart. To the right, a "Settings in Master Report in which Tooltip is used" pane is open, showing various settings like "Report page" (set to "Customer-ToolTip") and "Page" (set to "Customer-ToolTip").



Slicers vs Filters

When to use a Slicer

- Display commonly-used or important filters on the report canvas for easier access.
- Make it easier to see the current filtered state without having to open a drop-down list.
- Filter by columns that are unneeded and hidden in the data tables.
- Create more focused reports by putting slicers next to important visuals.

Slicer Limitations

- Slicers do not support input fields.
- Slicers cannot be pinned to a dashboard.
- Drilldown is not supported for slicers.
- Slicers do not support visual level filters.

When to use a Filter

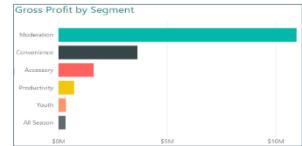
- There are too many items to display as a slicer
- When you need to take up as little space as possible. A slicer takes up too much room
- When running into performance issues, filters are less time consuming than slicers.

Chart Selection

Choosing the Right Charts for the Right Purpose



Comparison



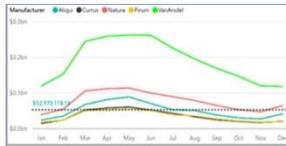
Stacked Bar

Composition



Tree

Trend



Line

Distribution



Scatter Plot

Status



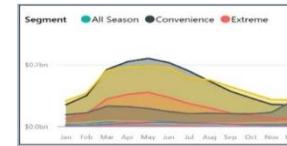
KPI

Geographic



Map

Relationships



Area

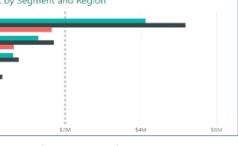
Slicing/Filtering

Date: 1/1/2011 - 12/31/2016

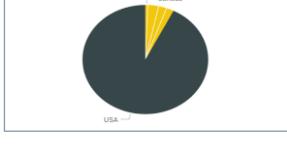
Region: Central, East, West

Segment: All

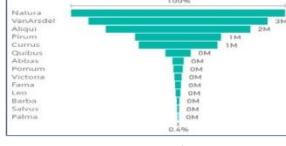
Product: Maximus RP-01, RP-02, RS-01, UC-00, UC-01, UC-02, UC-03, UC-04, UC-05, UC-06, UC-07, UC-08



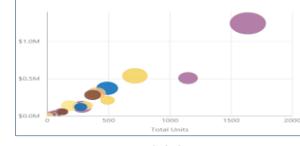
Clustered Bar



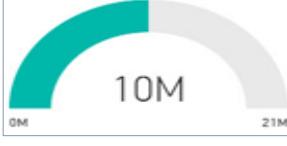
Pie



Funnel



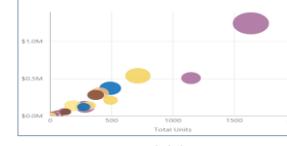
Bubble



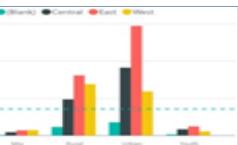
Gauge



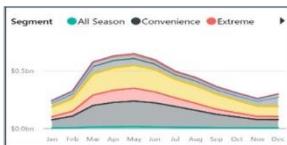
Filled Map



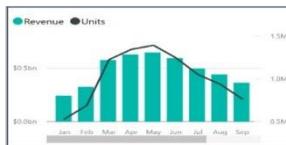
Bubble



Clustered Column



Stacked Area



Line and Stacked Column



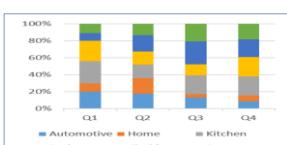
Map



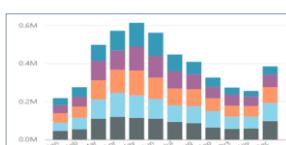
Multi-row Card

Segment	Region	Units	Gross Profit
Moderation	Central	137,999	\$6,525,172
Convenience	Central	67,391	
Accessory	Central	15,028	
Productivity	Central	12,443	
All Season	Central	6,155	
Youth	Central	5,849	
Total	Central	244,865	\$6,525,172

Table



100% Stacked Column



Stacked Column



Card

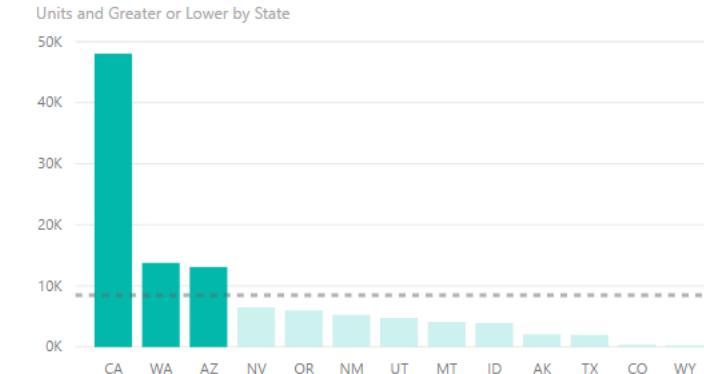
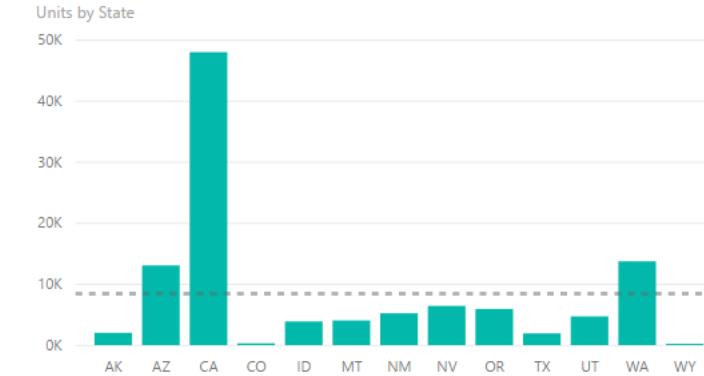
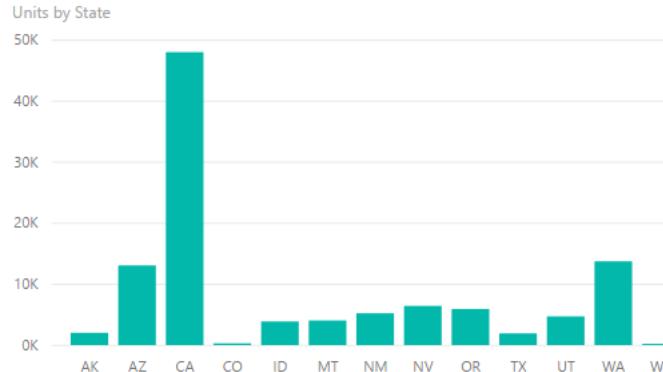
Category	Sub-Category	Product	Unit Sales	Gross Profit
Moderation	Home	123456789	123,456	\$6,252,854
Convenience	Home	123456789	123,456	\$6,252,854
Accessory	Home	123456789	123,456	\$6,252,854
Productivity	Home	123456789	123,456	\$6,252,854
All Season	Home	123456789	123,456	\$6,252,854
Youth	Home	123456789	123,456	\$6,252,854
Total	Home	493,824	493,824	\$24,964,270

Matrix



Water Fall

Column charts for Comparison

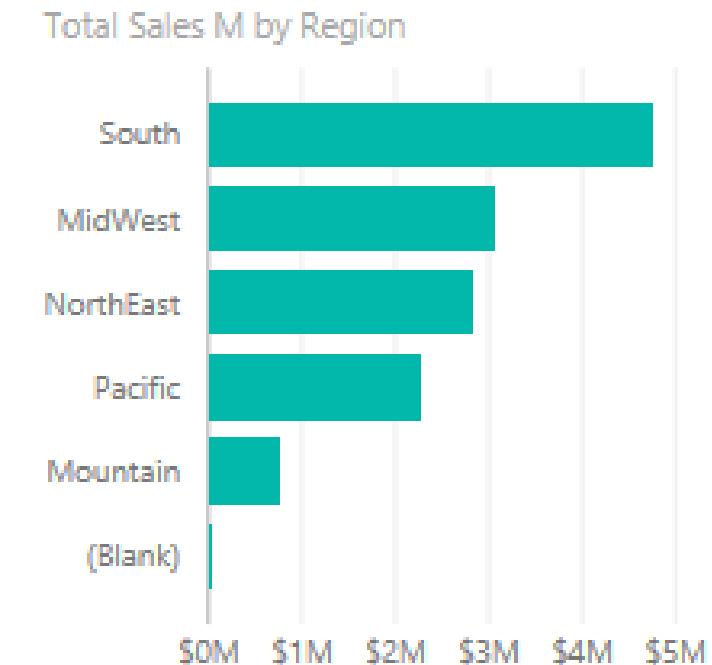
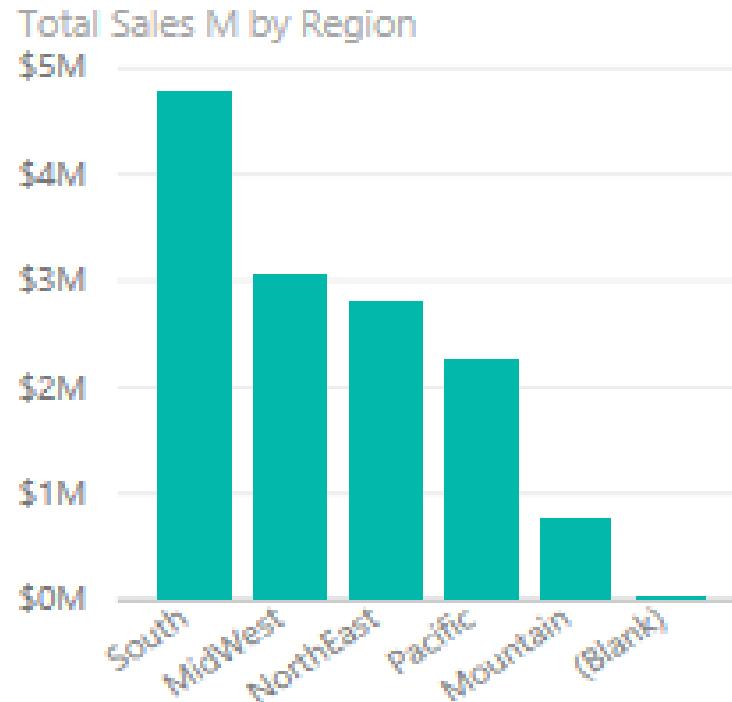


- Start Axis at 0

- Sort Chart

- Try to Have a Reference Line
- Use colors to draw attention

Column chart vs Bar Chart for Comparison

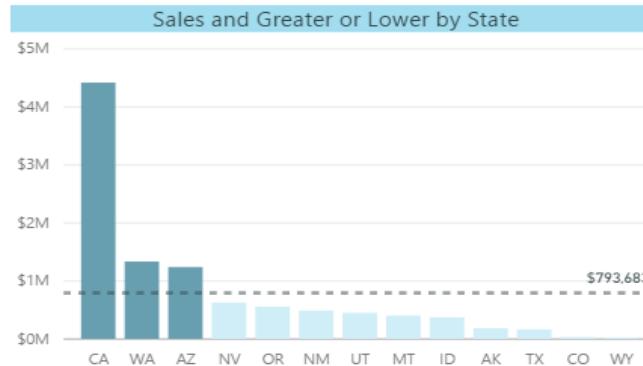
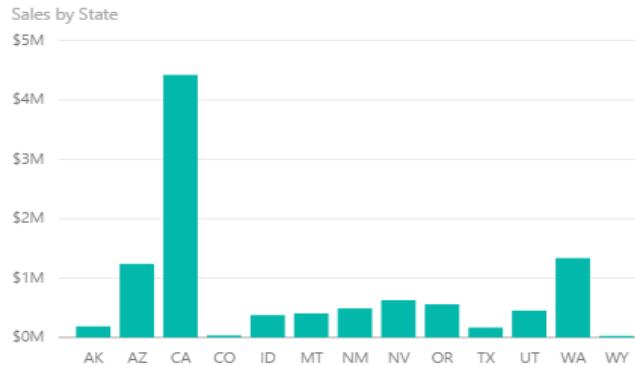


- When you have too many elements to display in a column, the bar chart can be easier to scroll.

Lab 1: Updated Column Chart



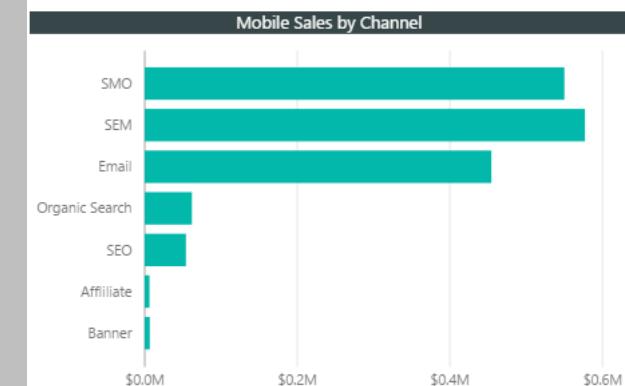
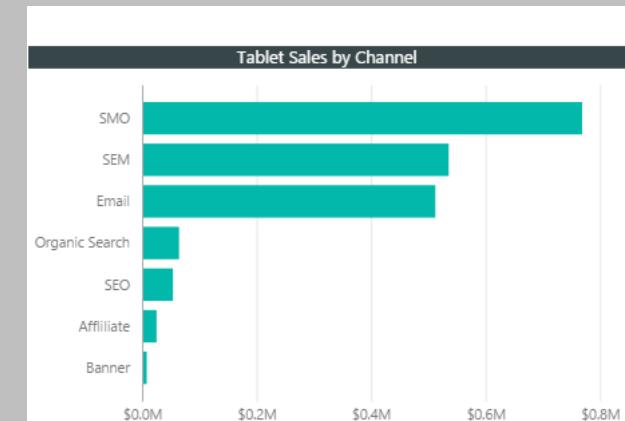
Column charts – PBIX Tab “Lab1”



- Update the chart on the left to the one on the right.

Note: For the gradient, there is a Measure called “Greater or Lower” which should be helpful

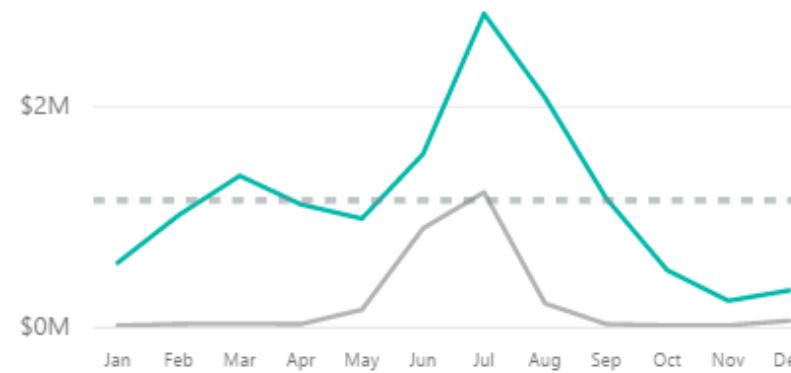
Challenge:
Create 2nd chart which sorts by first



Line Charts



Sales Comparison to 2014



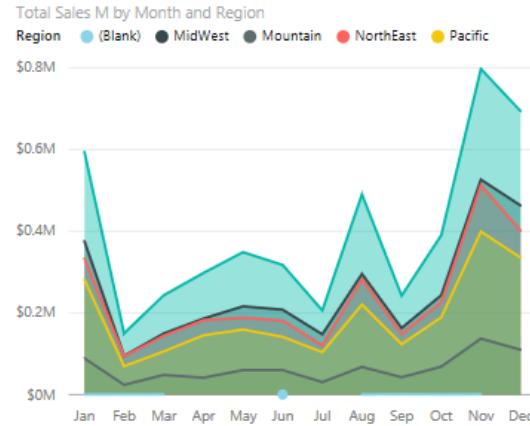
- Start Axis based on your “Business scenario”
 - Choose the right Aspect Ratio
 - Try to have a Reference Line
 - Use colors to draw attention strategically

Sales by Date

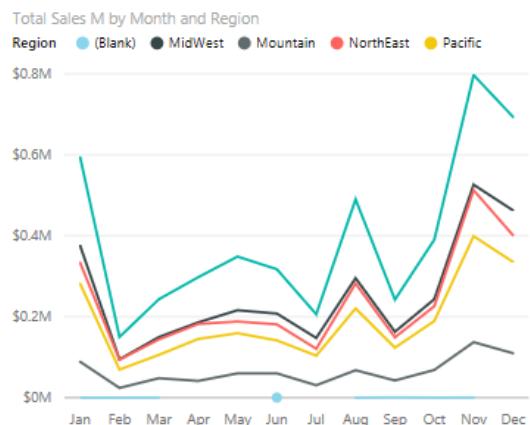


- Decide whether to “Show items with no data”
 - Data can be misleading if the breaks are connected
 - In the formatting pane, change the axis to categorical from continuous

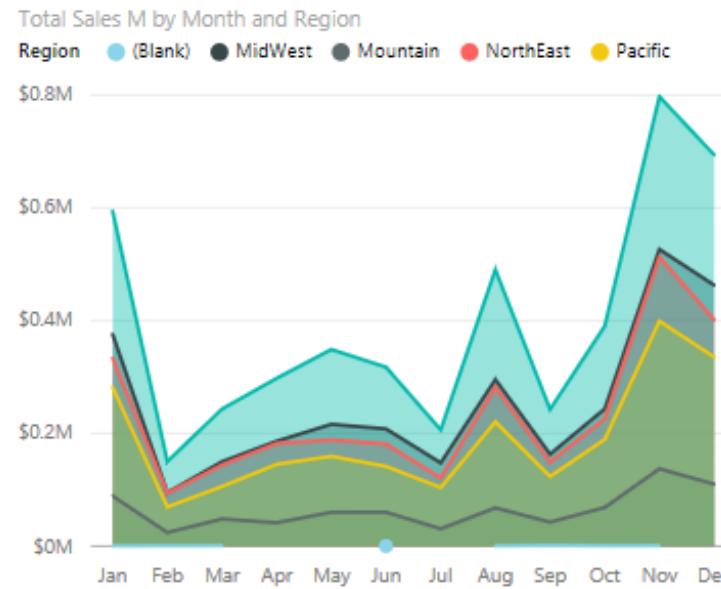
Area Chart vs Line Chart



- Choose Area Charts sparingly (when # of series < 5)
- Too many colors can be distracting
- Often Line charts are the better option
 - Would a Line Chart better portray my meaning?
 - Is the Area the meaningful thing I am measuring?

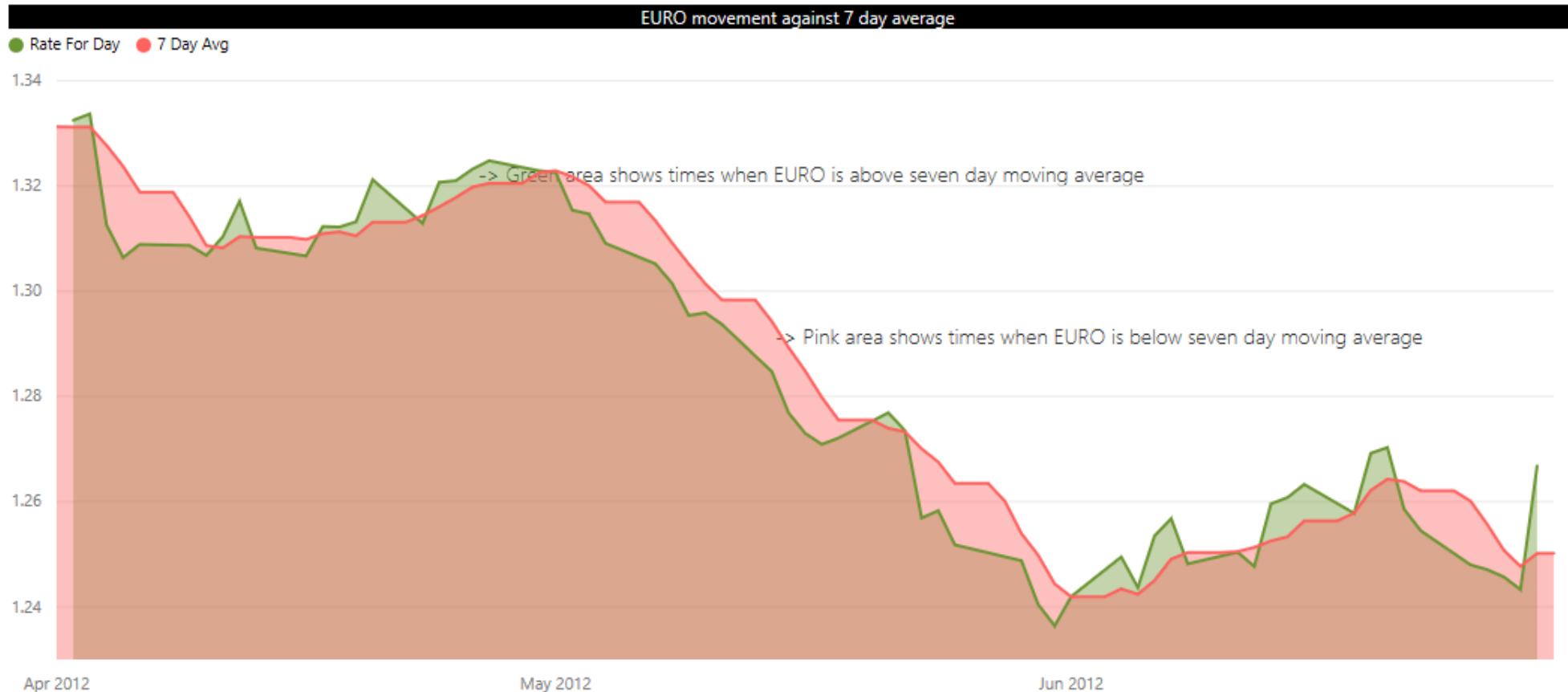


Stacked Area Charts



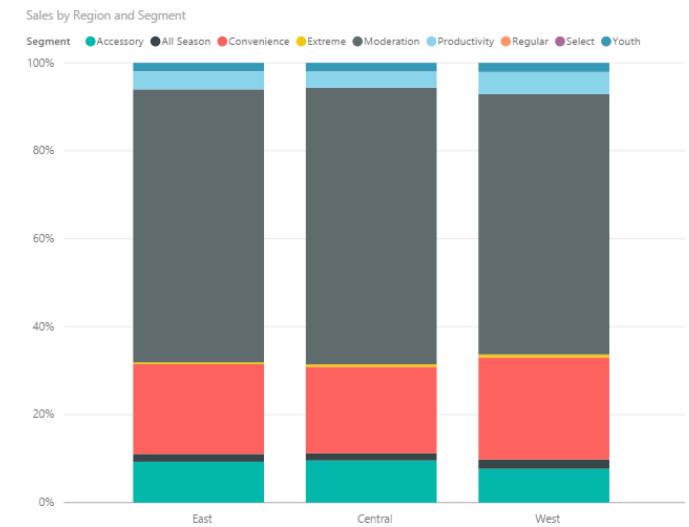
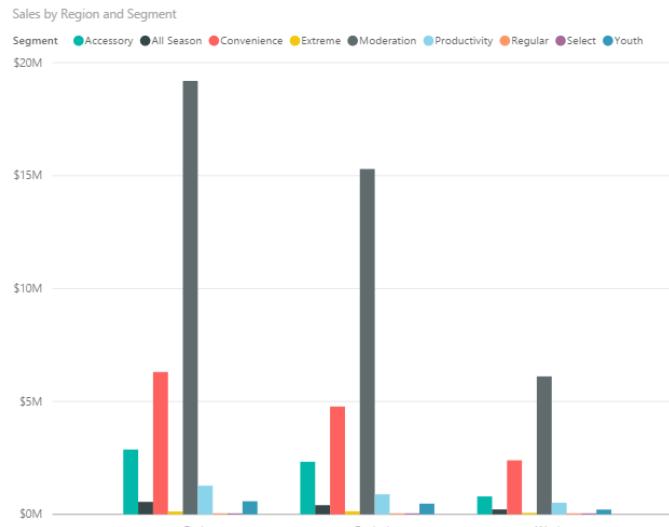
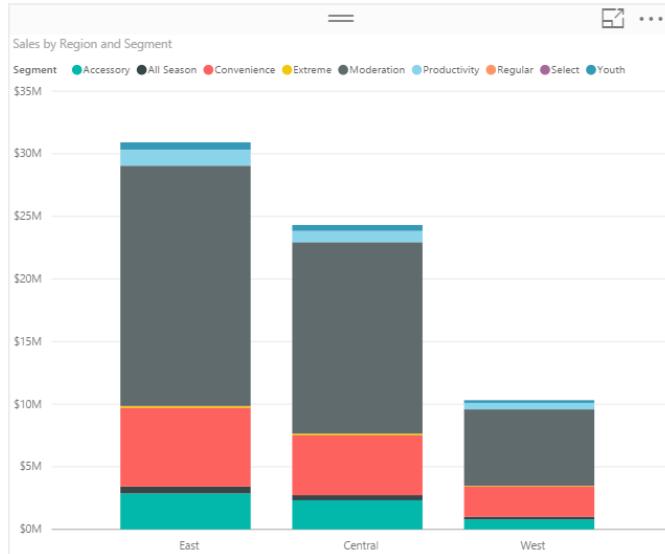
- Used to show how proportions and totals are changing
- Choose this chart wisely
- Can lead to misleading conclusions
- The eye tends to interpret the trends using the top lines of each shaded region rather than using the area of each region

One Use Case for Area Charts



- To see when a trend goes above or below a reference line

Stacked vs Clustered Column (Bar) Chart Types

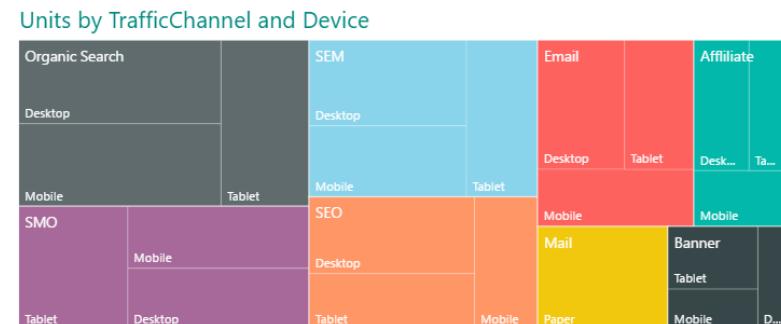


- Shows Totals
- Shows Part to whole relationship
- Inter-Category Comparison
- Intra-Category Comparison
- Shows Mix% change
- Ignore absolute numbers

Constructing Effective Tree Maps

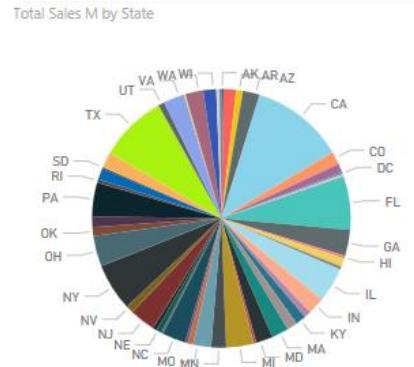


- Tree map is useful to visualize proportions
- Use Drill down to allow navigation to detail

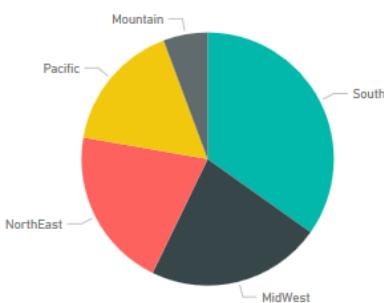




Constructing Effective Pie charts



Bad Pie chart



Good Pie chart

- Do not have more than 3-5 categories (if you have more then put a slicer and choose a default)
- Have data labels
- Choose right Sort Order
- Choose appropriate colors

Constructing Effective Tables



Region	Total Sal...	Sales...
South	\$1,788,579	14.2 %
Pacific	\$849,265	12.0 %
NorthEast	\$1,049,957	12.7 %
Mountain	\$271,125	-4.5 %
MidWest	\$1,133,694	14.2 %
	\$945	610.2 %

- Reduce precision
- Use muted background color
- Choose the right font size
- Use white space for columns instead of borders
- Highlight items using Symbols
- Sort Table based on Key KPIs

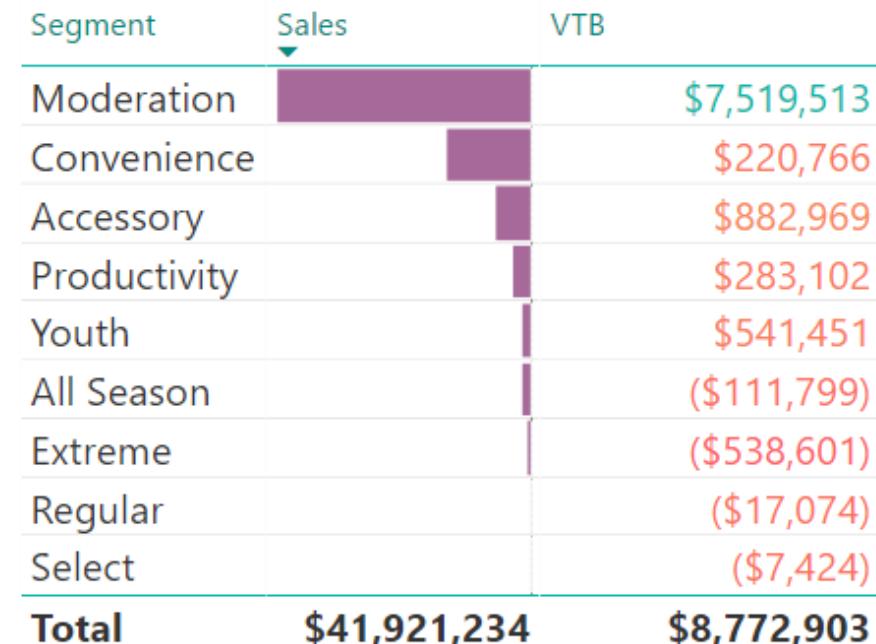


Region	Total Sales M	Sales YoY
South	\$1,788,579	14.18%
MidWest	\$1,133,694	14.23%
NorthEast	\$1,049,957	12.67%
Pacific	\$849,265	11.98%
Mountain	\$271,125	▼ -4.53%
	\$945	610.16%

Lab 2: Table



Segment	Sales	VTB
Accessory	\$3,566,905	882,969.17
All Season	\$768,092	-111,799.45
Convenience	\$8,613,502	220,765.90
Extreme	\$221,704	-538,600.51
Moderation	\$26,205,280	7,519,513.20
Productivity	\$1,722,832	283,102.11
Regular	\$12,930	-17,074.40
Select	\$4,265	-7,423.59
Youth	\$805,723	541,451.01
Total	\$41,921,234	8,772,903.43



Constructing Effective Cards



- 4%

MoM

Total Sales



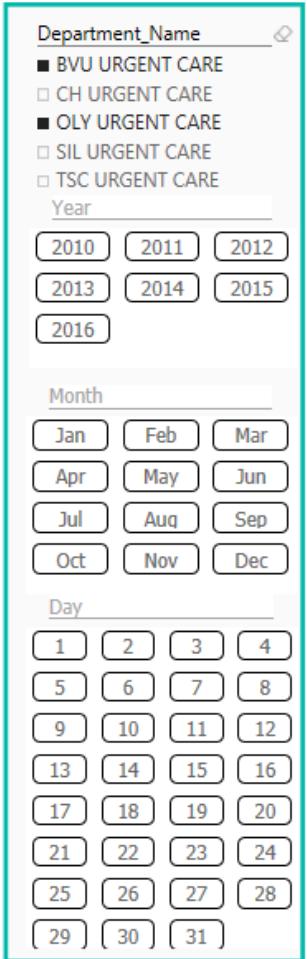
\$14M

- Category Labels can be renamed per each visual
- Choose right precision levels
- Use colors to draw attention to KPIs that matter most
- Use KPIs in conjunction with Symbols to draw attention

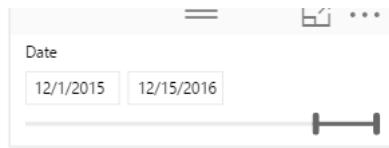
Constructing Effective Slicers



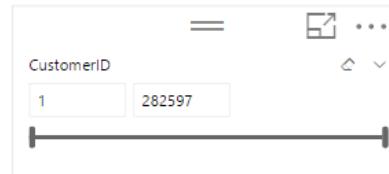
Slicer
as List



Date slicer



Numeric slicer



Year



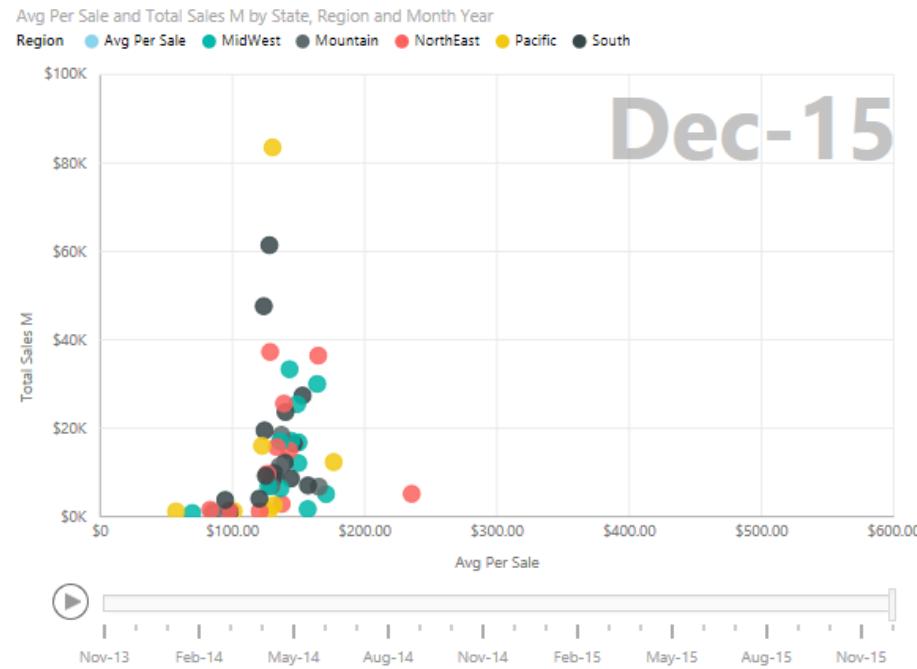
Segment



Slicers as
Dropdown

- Enclose Slicers using a subtle box
- Group Slicers together and keep them on right side of page
- Conserve space by using Dropdown Slicers
- Use “Chiclet Slicers” for a different look
- When Slicing Dates, use the Date Slicer

Constructing Scatter Charts



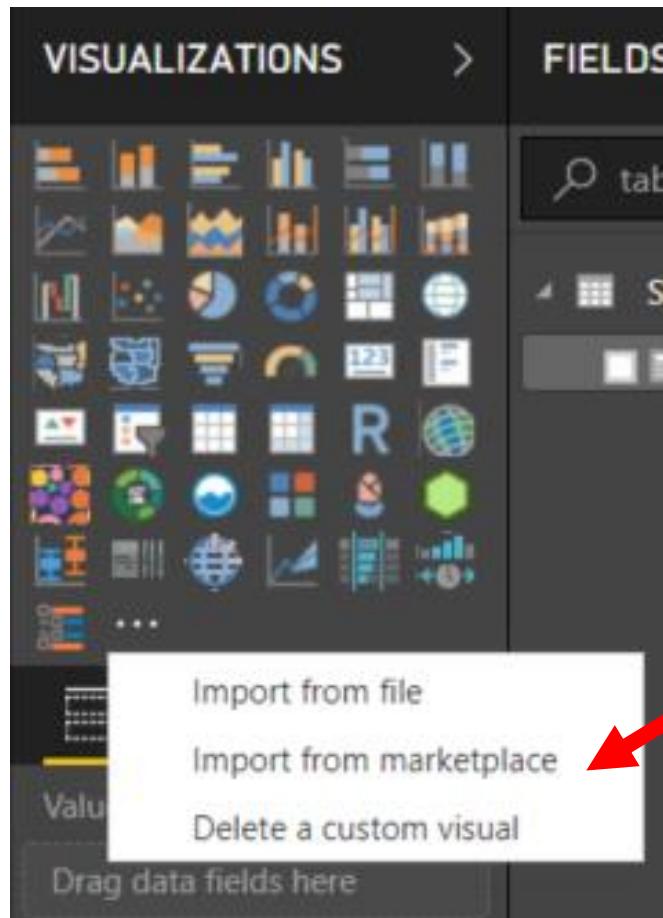
- Used to see distributions of 2 or more variables
- Use Hierarchies
- Helps to identify outliers
- Useful for categorization or clustering
- Time Axis used to show changes over time
- Choose colors wisely

Custom Visuals

Power BI Customizations



Import Custom Visual

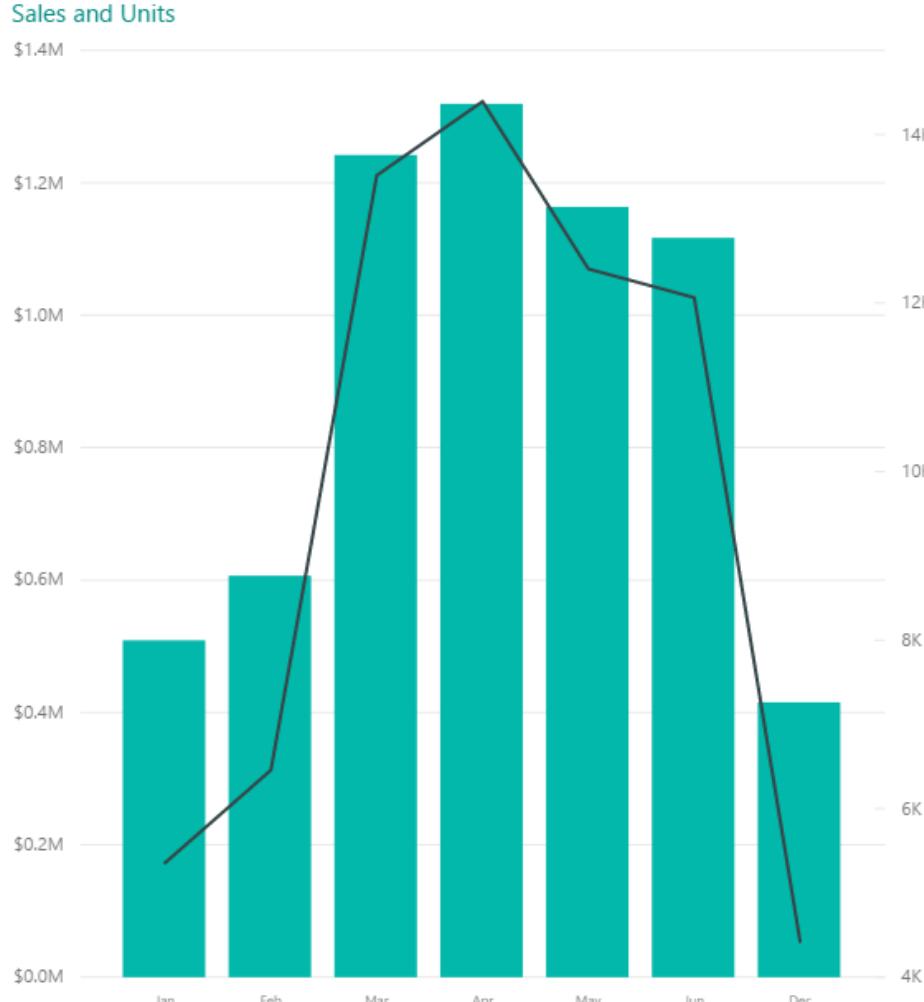


1. Click the ellipsis on the Visualization menu
2. Import from Marketplace
3. Select the visual to Download
4. Use the visual
5. If you decide you don't like it – delete it



Custom Slicers

Standard and Custom Slicers



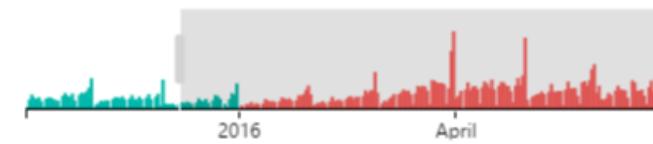
Standard Date Slicer (Range)

Year

Standard Date Slicer (Relative)

Date

TimeBrush



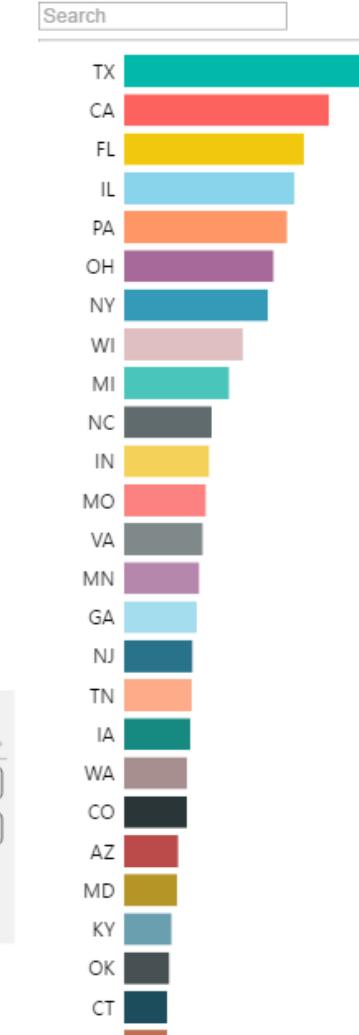
Hierarchy Slicer

- Category
- Accessory
 - Desktop
 - Mobile
 - Paper
 - Tablet
 - Mix
 - Rural
 - Urban
 - Youth

Chiclet Slicer

- Category
- | | |
|-----------|-------|
| Accessory | Urban |
| Mix | Youth |
| Rural | |

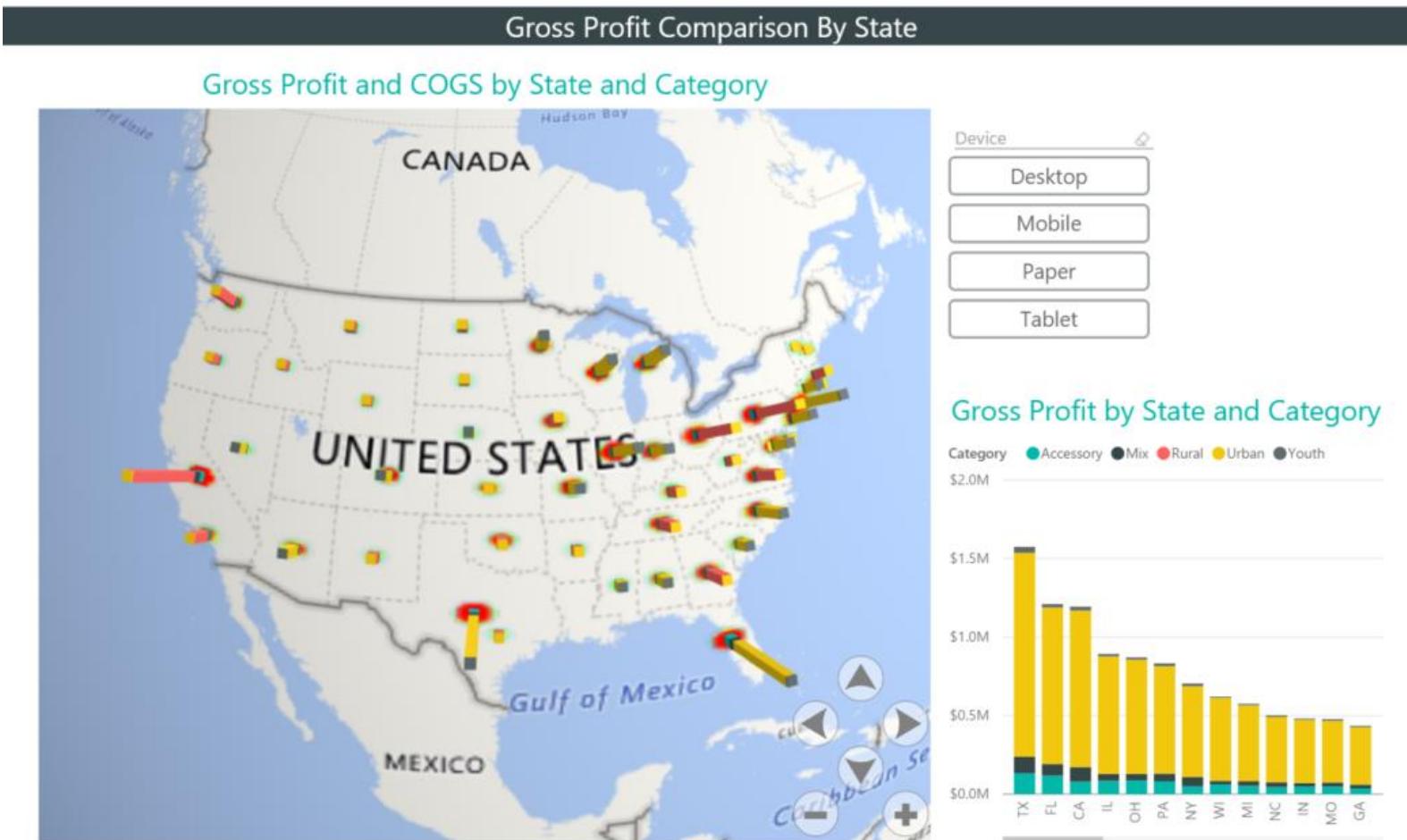
Attribute Slicer



Power BI Customizations



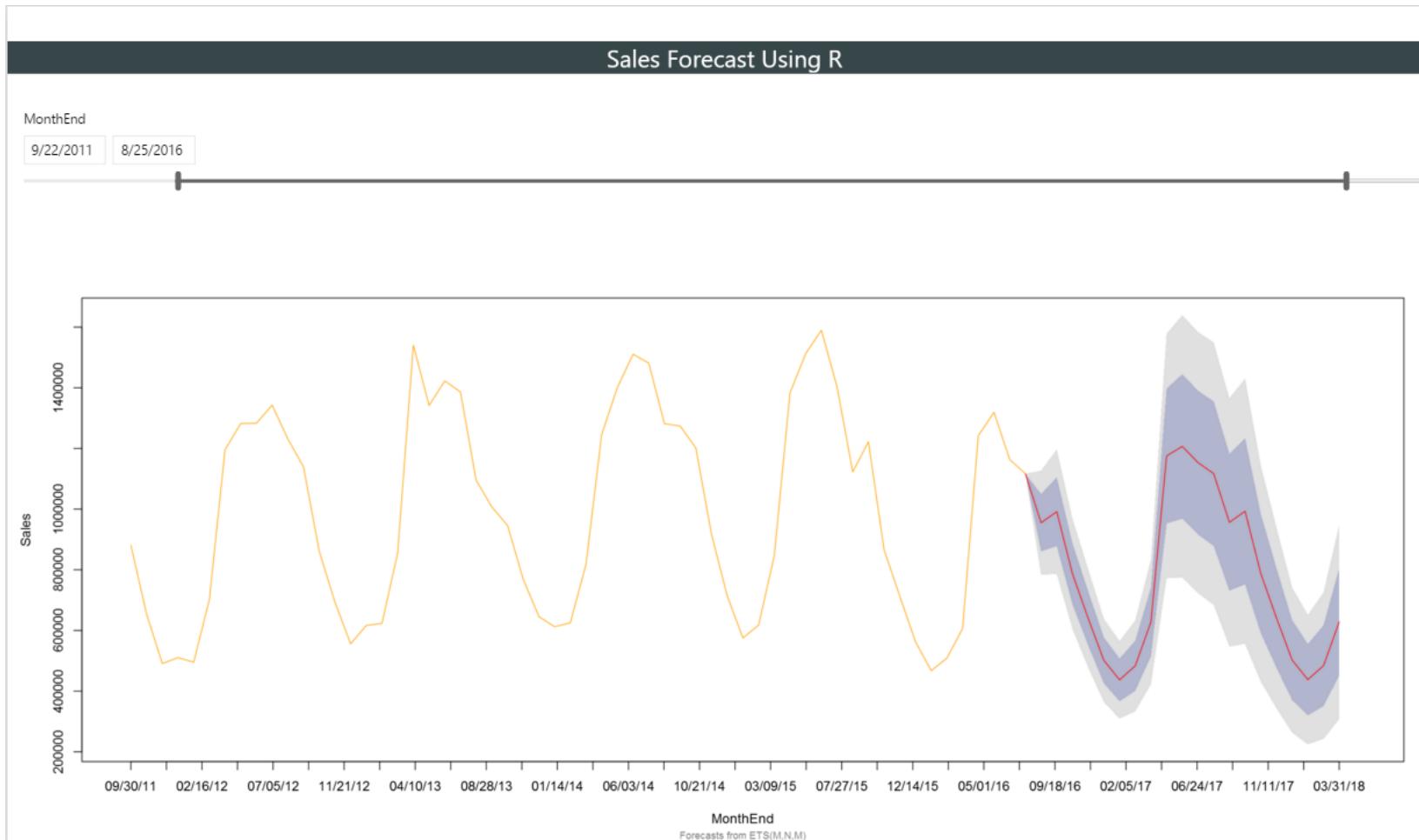
Create Custom Visual



Power BI Customizations



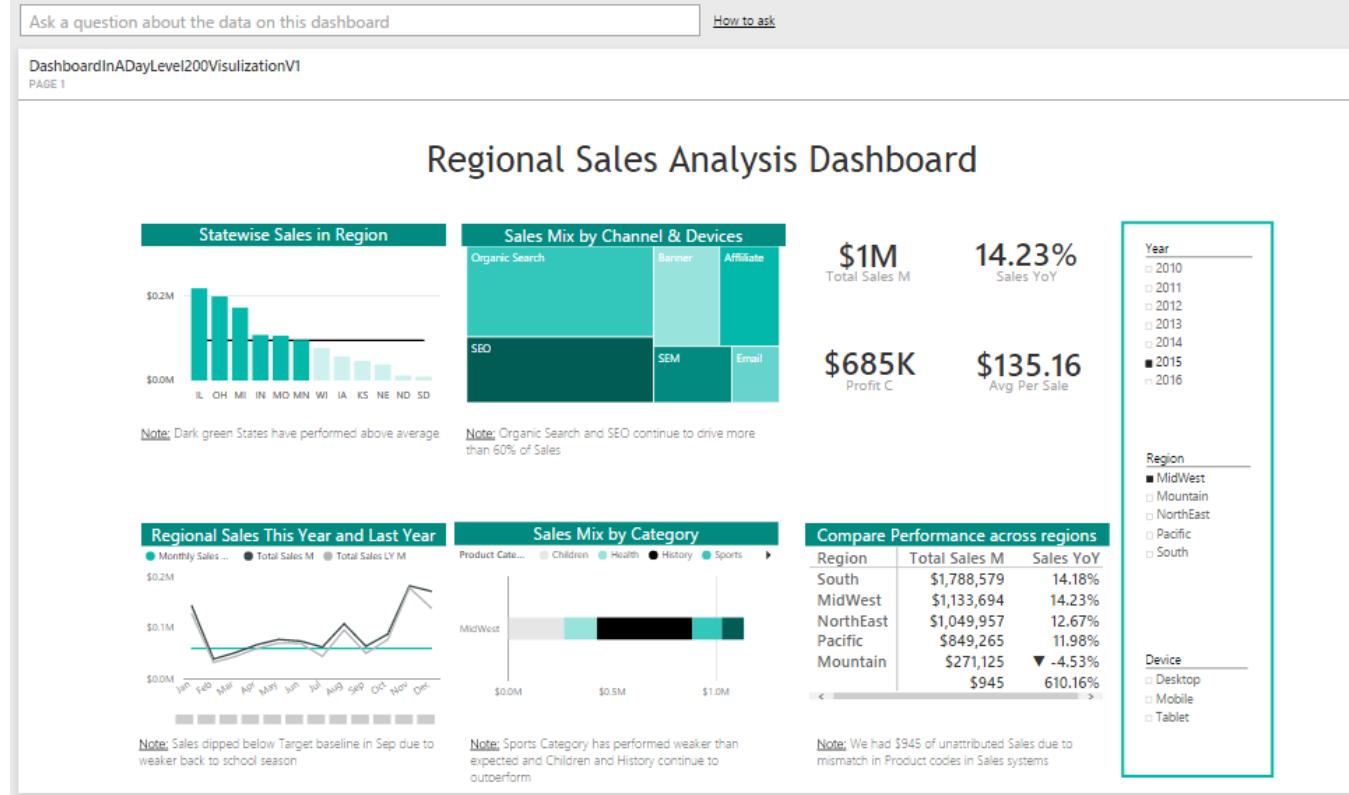
Create Custom Visual Using R Visual



Pin a Live Report Page as a Dashboard

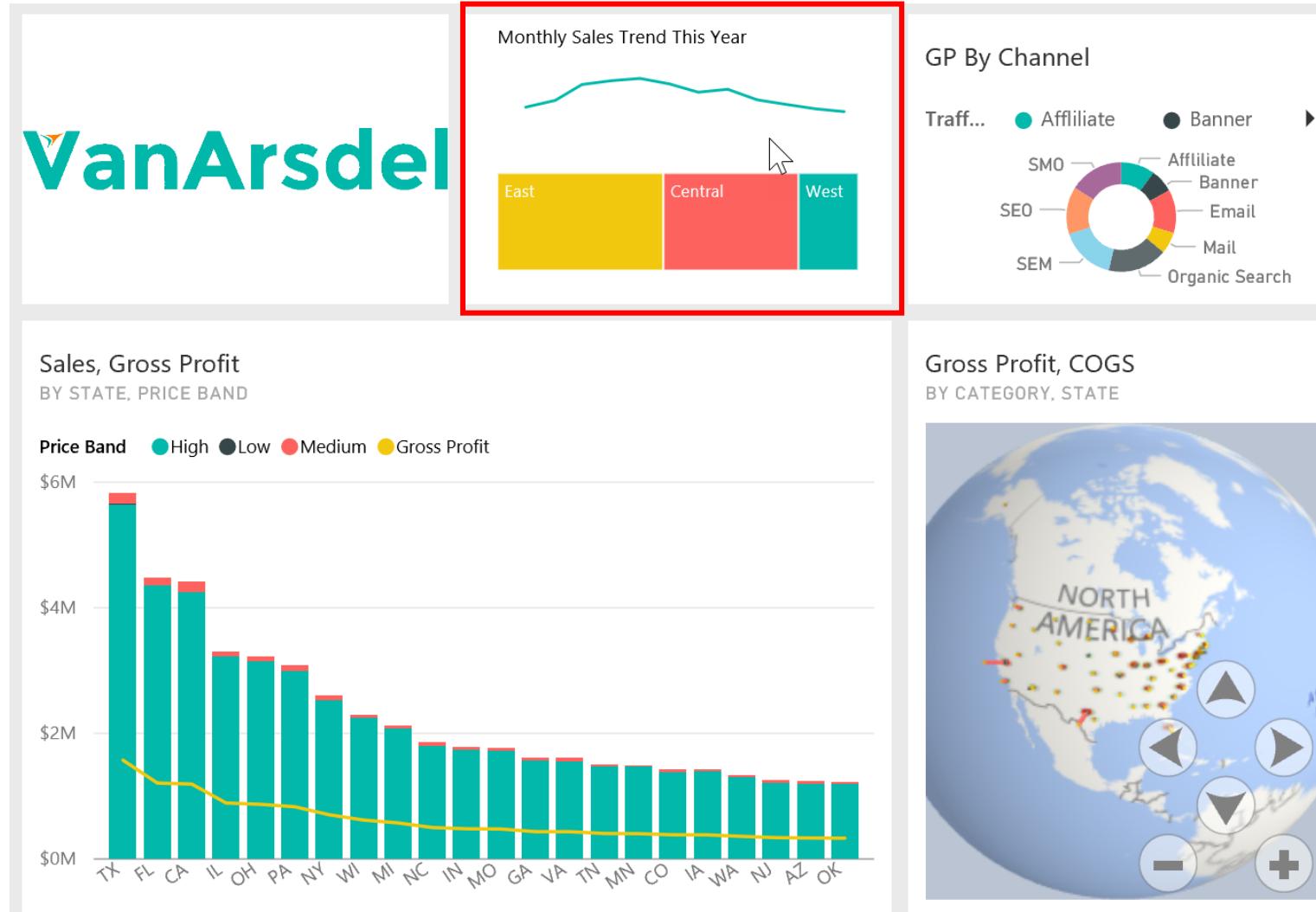


DEMODOASHBOARD



- Useful when you don't want to be constrained by Grids
- All slicers work in Dashboard view

Pin a Live Report Page as a Dashboard Tile



Useful when:

- The visual you need is constructed of multiple parts
- You want very specific formatting on tile
- Manually update the URL to an appropriate URL

Polishing and Formatting



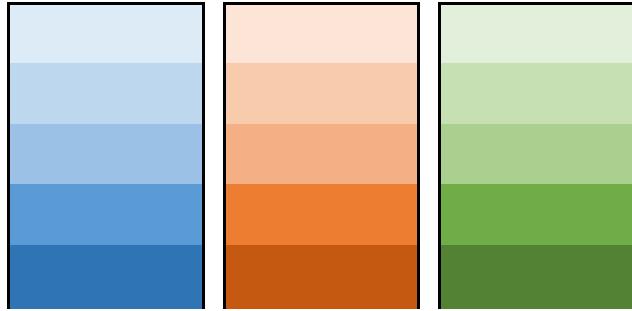
How do you pick a color scheme?

- Check with your Marketing team for Color/Style Guides
- Use Cynthia Brewer's [Color Brewer](#) or other sites to choose Color Blind friendly colors
- Use the [Adobe Color Wheel](#) to get custom complementary colors
- [Paletton.com](#) is the color scheme generator that the Power BI product team uses
- Color Blind Sensitive: **Contrast Analyzer** is a tool you can use that creates a “lens” to see how people with visual disabilities would view your reports:
<https://developer.paciellogroup.com/resources/contrastanalyser/>
- Use Power BI's default color scheme

Pro Tip: Use [Pixie](#) or a similar tool to pick colors from Internet and other places

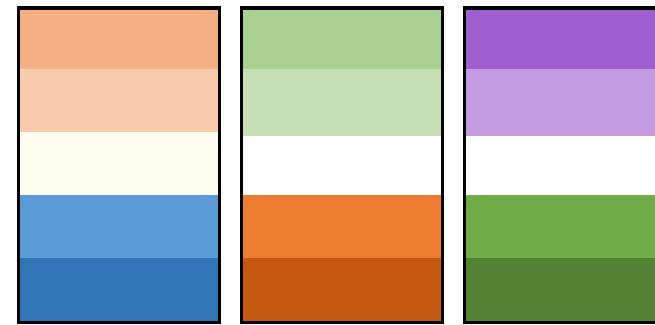


Types of Colors



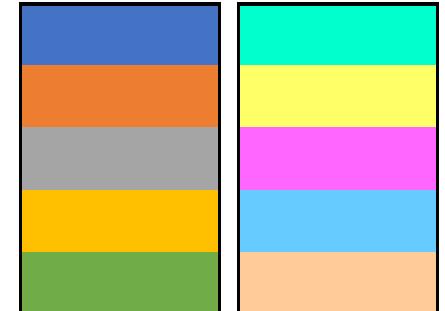
Sequential

When you have to imply an increasing or decreasing scale



Divergent

When there are two divergent set of values with a middle ground



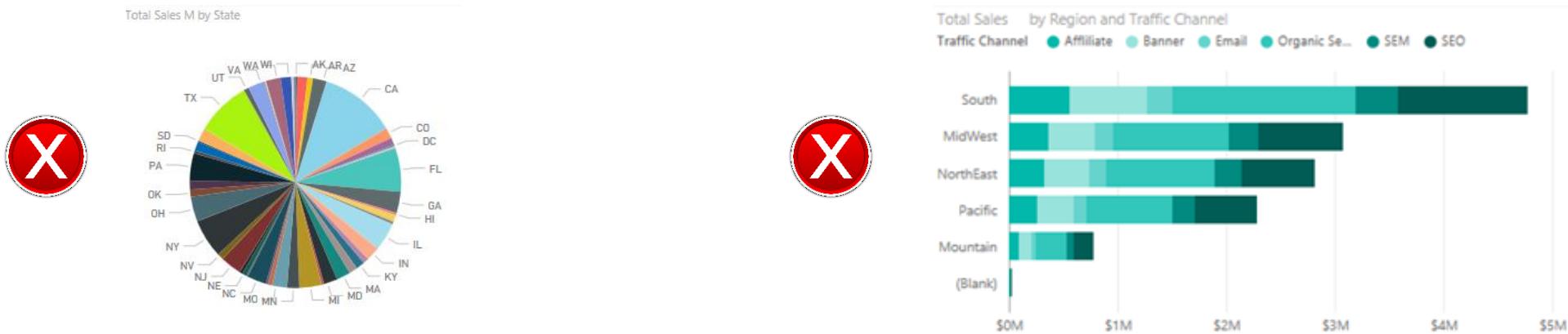
Qualitative

When the values don't have any logical ordering

Things to remember when using colors



- Do not have more than 3-5 colors display on a single visual (think of Short Term memory)
- The eye cannot differentiate more than 5 colors of same hue
- Try to have a semantic meaning for your colors (Red = Bad, Green = Good)



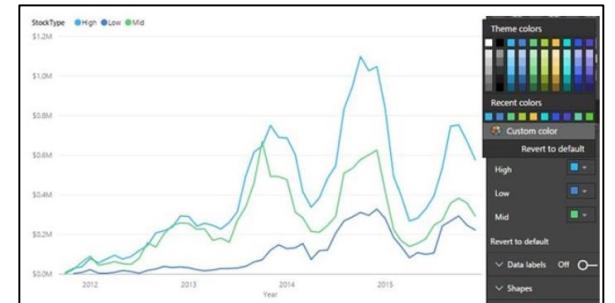
Make your own Theme



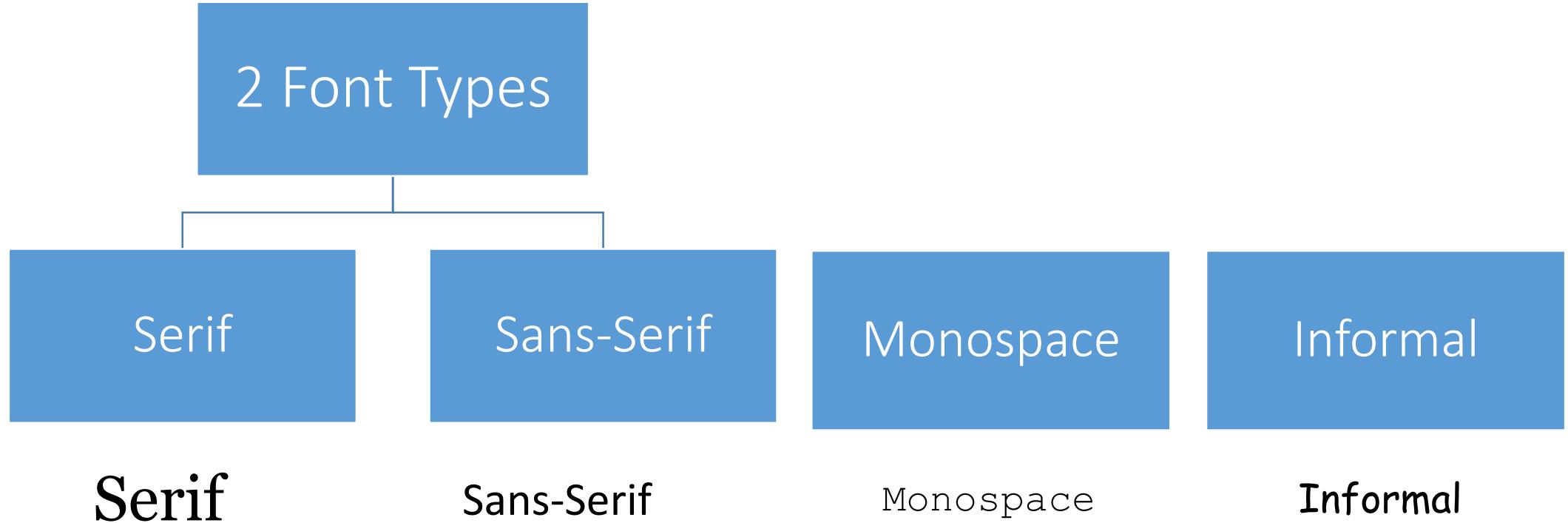
Theme files are simple JSON files

- Import the theme into your PBIX to update styles in your report
 - Color palette
 - Font
 - Visual Formatting (and more...)
- Check out pre-made themes in the [Power BI Theme Gallery](#)
- Blog post on how to apply themes:
<https://powerbi.microsoft.com/en-us/blog/power-bi-community-report-theme-gallery/>
- Theme Generator: <https://powerbi.tips/tools/report-theme-generator-v3/>

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



WELCOME TO THE REPORT THEME GALLERY
A showcase for stunning report themes.



- Sans-Serif fonts most suited for Digital Media in a Professional Setting
- Ex. Segoe, Calibri, Trebuchet



Changing font weight using three techniques

- Change font size
 - Hi Power BI - Segoe UI Light 28
 - Hi Power BI - Segoe UI Light 24
- Choose different font with greater weight from same family
 - Hi Power BI - Segoe UI (Body) 24
 - Hi Power BI - Segoe UI Light 24
- Bold an existing font
 - Hi Power BI - Segoe UI Light 24 (Bolded)
 - Hi Power BI - Segoe UI Light 24 (Non-Bolded)

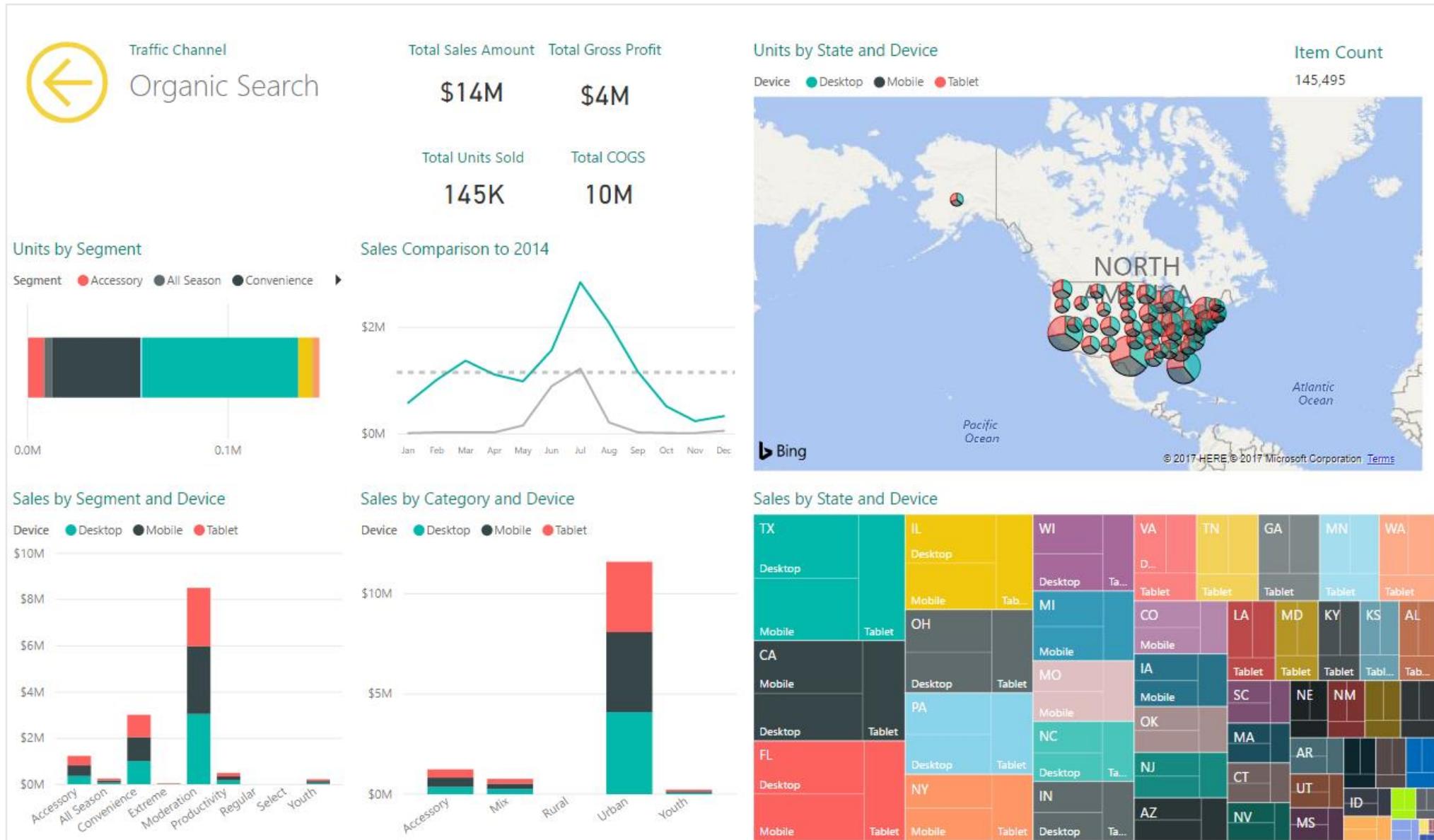
Try all three techniques to see which one looks the best



Font Recommendations

- Choose at the most 2-3 font types/sizes on a report page/dashboard
- Choose a lighter weight font Ex. “Segoe UI Light” for
 - Axis
 - Non important Data Labels
 - Text box
 - Non Titles
- Use a higher weight font from same family for Titles rather than (bold) Ex. Segoe UI Bold

Use of Fonts



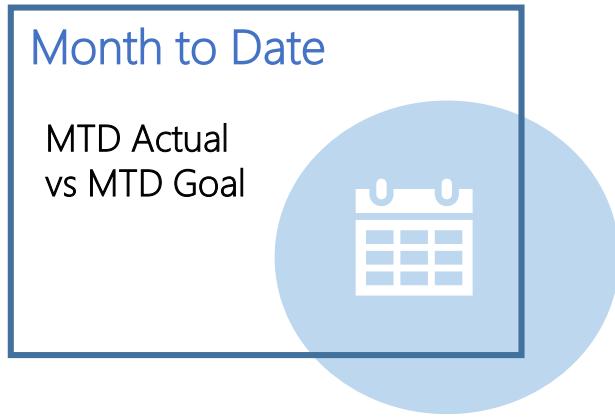


Icons

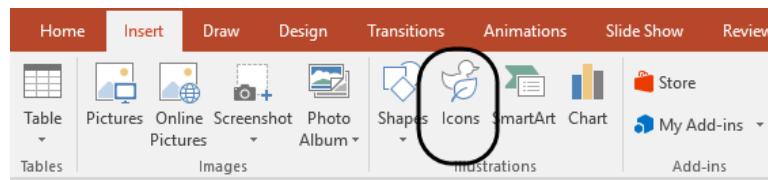


- Effective use of icons can add to perceptual depth of a report
- Don't over use icons or misuse icons

Dashboard Tile Art



- Rectangle image size 1.81" by 2.66"
- Add header text
- Add subtitle text
- Add circle shape for icon emphasis
- Add icon from native **Office 2016 Icon library**
- Change color of icon graphic
- Snip out the box and save as PNG



Proportional Sizes for Custom Dashboard Tiles



Rule of Thumb Formula:

- 1 x 1 Tile – 266:181 pixels
- 2 x 1 Tile – 540:181 pixels
- 3 x 1 Tile – 816:181 pixels

- Images Width = $266 * (\text{Number of Tiles Wide}) + 8(\text{Number of Tiles Wide} - 1)$
- Image Height = $181 * (\text{Number of Tiles High}) + 8(\text{Number of Tiles High} - 1)$

Pro Tip: Tile sizes don't have to be exact, just proportional (i.e. 2.66" by 1.81")

Symbols



Different Ways to Use Symbols

- Unicode Symbols - You can find Unicode symbols at [Unicode-table.com](http://unicode-table.com) or [Unicode.org](http://unicode.org) (need to convert hex to dec)

(rendered in Black/White)

- Locate the web page for the desired symbol
- Scroll down to see the “Your Browser” section
- Highlight the symbol and copy (Ctrl+C)
- Paste (Ctrl+V) into the formula bar of your DAX



Your browser



Arial



Times New Roman



Different Ways to Obtain/Use KPIs

- Use the KPI visualization in Power BI Desktop
- If you *import* an Excel data model with KPIs into Power BI Desktop, the KPIs will be maintained and render in color
- If you *connect* Power BI Desktop to either SSAS Multi-Dimensional or Tabular Model which contains KPIs, the KPIs will render in color in your visualizations
- In the Table Visual, use conditional formatting to set colors in a column then set the column width very small to only display the colors

Report Layout "Hacks"



Can this be done in Power BI?

Performance Comparison Across Segments					
Segment	Sales	Monthly V T B	Daily Ave Sales	VTB	VTB %
Accessory	\$1,067,508			173,908.60	19.46%
Convenience	\$2,554,423			-260,215.44	▼ -9.25%
Moderation	\$7,533,866			1,201,974.45	18.98%
Total	\$11,155,796			1,115,667.61	11.11%

Bar charts as KPIs



You can do the same with Pie Charts

Spark Lines



Spark line with Min, Max



YoY growth with +/-



Win loss charts

How do you create these with Power BI?



Hyperlinks and Images

Table with URL



Type	Link
file	
ftp	
http	
https	
mailto	
news	
telnet	

- Full path of the URL in a field
- Modify the **Data Category** (modeling ribbon)
 - ImageURL – to see image
 - WebURL – to see Link Symbol
- Supports all link types displayed at left.

How do you create these with Power BI?



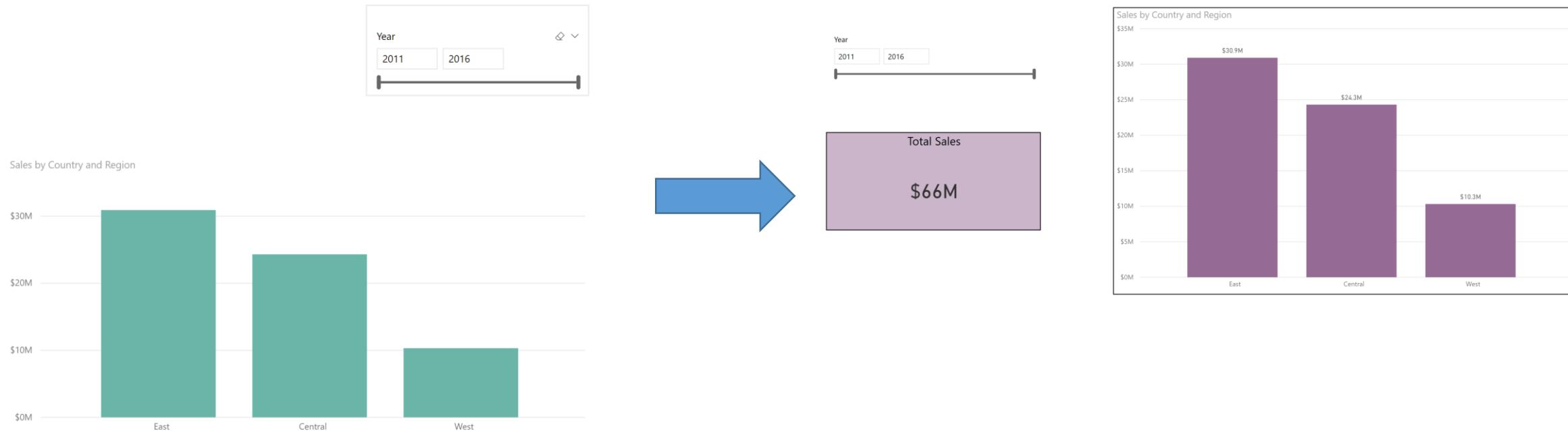
Report Accessibility

- For Line, Area, and Combo visuals, as well as for Scatter and Bubble visuals, turn markers on, and use a different Marker shape for each line
- Don't rely on color to convey information. In addition to using shapes on line and scatter charts, don't rely on conditional formatting to provide insights in tables and matrices.
- Pick an intentional sort order for each visual on your report. When screen reader users navigate the data behind the chart, it picks up the same sort order as the visual.
- Select a theme that is high contrast and color blind friendly from the theme gallery, and import it using the [Theming preview feature](#).
- Make sure your reports have sufficient contrast between text and any background colors.
- Use text sizes and fonts that are easily readable.
- Include a title, axis labels, and data labels in all visuals.
- Use meaningful titles for all report pages.

Lab 3



What is the Sales for a selected Year and level of Geography hierarchy ?

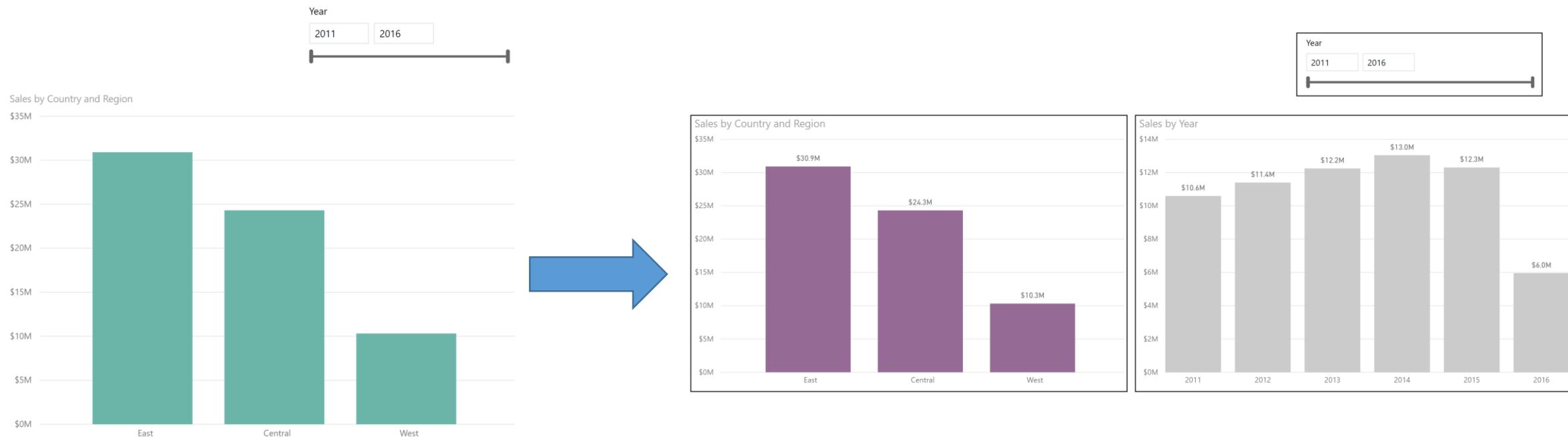


- Update the chart on the left to the one on the right.

Lab 4



How is my Sales doing Year over Year by Geography ?

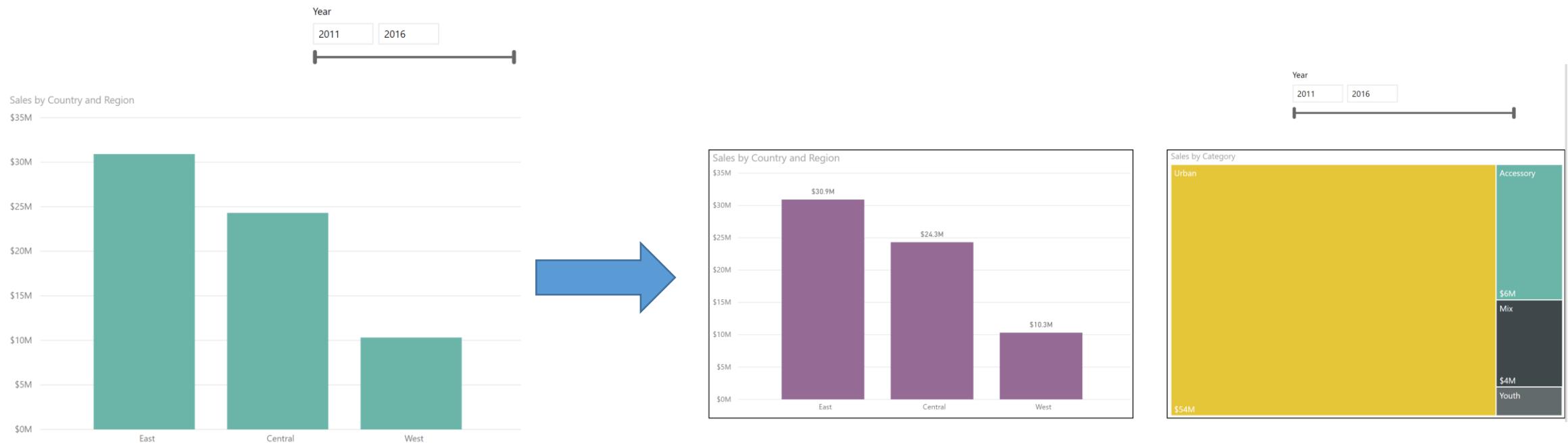


- Update the chart on the left to the one on the right.

Lab 5



How is Product Sales by Geography ?



- Update the chart on the left to the one on the right.

Lab 6



I want to view transaction details -> Sales by Product, by date, by geography.

I want to easily navigate to this data from Lab 5 page

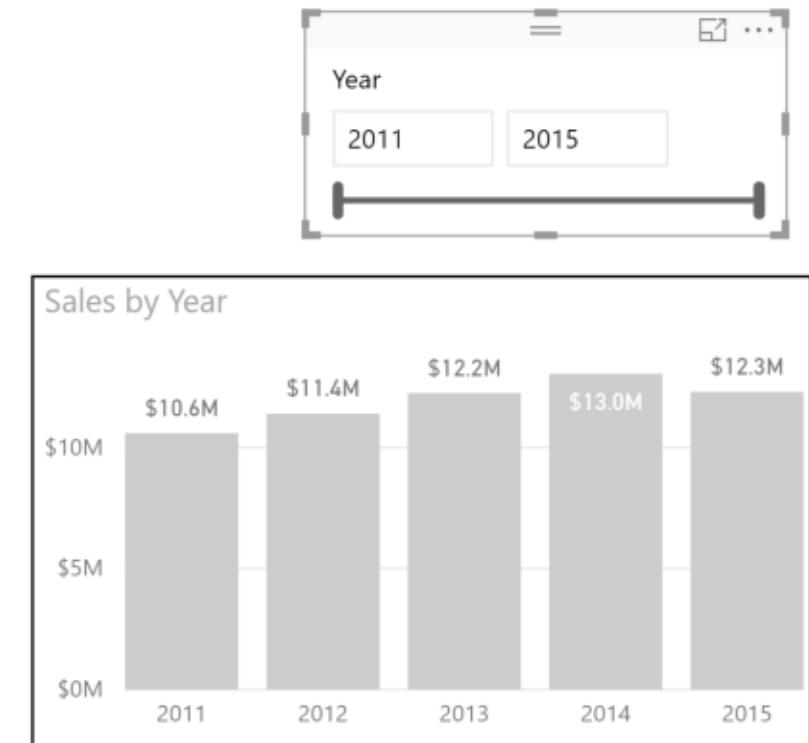
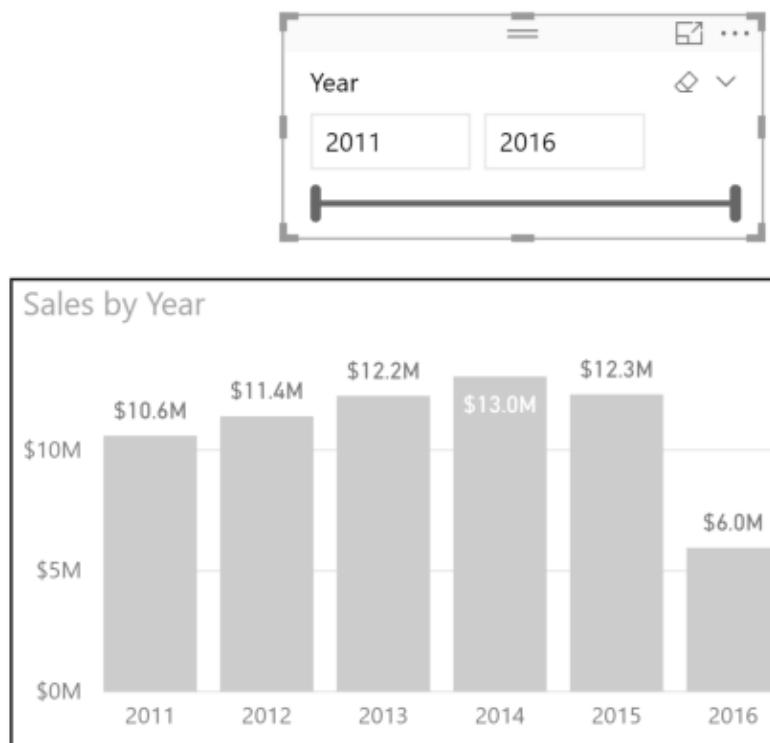
Date	Category	Segment	Product	Device	TrafficChannel	State	Region	Country	Sales
1/1/11	Urban	Convenience	Maximus UC-01	Tablet	SEO	CT	East	USA	\$88
1/1/11	Mix	Productivity	Maximus UC-21	Mobile	Affiliate	FL	East	USA	\$86
1/1/11	Urban	Convenience	Maximus UC-55	Mobile	Affiliate	PA	East	USA	\$37
1/1/11	Urban	Moderation	Maximus UM-11	Mobile	Affiliate	MI	East	USA	\$124
1/2/11	Urban	Convenience	Maximus UC-01	Tablet	SEO	NC	East	USA	\$88
1/2/11	Urban	Convenience	Maximus UC-01	Tablet	SEO	NJ	East	USA	\$88
1/2/11	Mix	All Season	Maximus UC-13	Tablet	SEO	VA	East	USA	\$52
1/2/11	Urban	Convenience	Maximus UC-15	Tablet	SEO	NC	East	USA	\$50
1/2/11	Urban	Convenience	Maximus UC-24	Desktop	SEM	VA	East	USA	\$147
1/2/11	Mix	Productivity	Maximus UC-24	Tablet	Affiliate	MD	East	USA	\$63
1/2/11	Youth	Youth	Maximus UC-32	Mobile	Affiliate	MI	East	USA	\$77
1/2/11	Urban	Convenience	Maximus UC-39	Tablet	Banner	NC	East	USA	\$205
1/2/11	Urban	Convenience	Maximus UC-41	Tablet	SEO	FL	East	USA	\$76
1/2/11	Urban	Convenience	Maximus UC-41	Tablet	SEO	GA	East	USA	\$76
1/2/11	Urban	Convenience	Maximus UC-41	Tablet	SEO	MI	East	USA	\$76
1/2/11	Urban	Convenience	Maximus UC-43	Mobile	Affiliate	GA	East	USA	\$157
1/2/11	Urban	Convenience	Maximus UC-69	Desktop	SEM	PA	East	USA	\$51
1/2/11	Urban	Convenience	Maximus UC-70	Mobile	Affiliate	FL	East	USA	\$42
1/2/11	Urban	Convenience	Maximus UC-74	Tablet	Banner	DE	East	USA	\$84
1/2/11	Urban	Extreme	Maximus UE-04	Tablet	SEO	VA	East	USA	\$52
1/2/11	Urban	Extreme	Maximus UE-23	Tablet	SEO	KY	East	USA	\$54
Total									
\$30,914,539									

- Use drill through feature

Lab 7



1. We do not have full year sales for 2016. I do not want 2016 data to show in this report page. How would I achieve this ?
2. I want 2016 data to be filtered out of the entire report. How would I achieve this ?



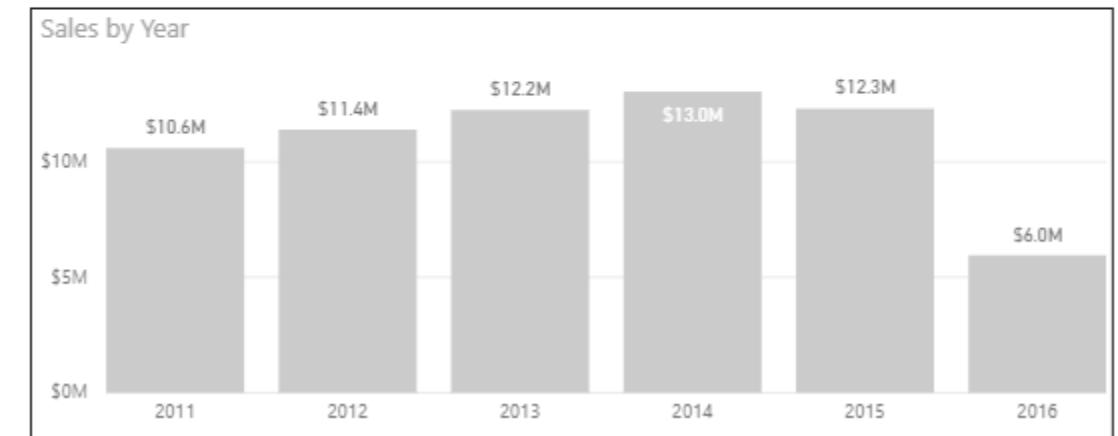
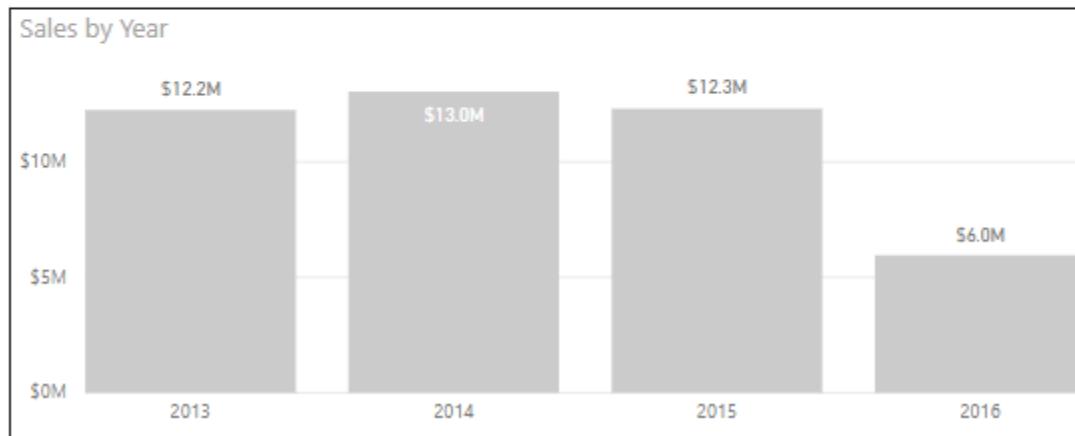
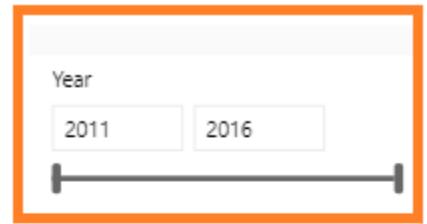
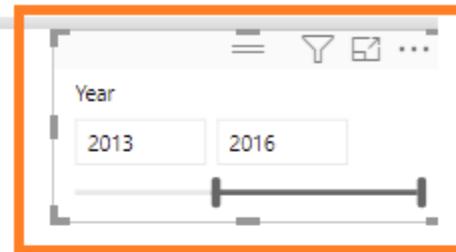
Lab 8



Filter Year slicer to 2013 to 2016.

Navigate to Lab 7 page. Notice data is not filtered by year here.

I want all Year slicers to be synced.



Lab 9



Notice there is a steady increase in Sales from 2011 through 2014. In 2015 there is a decrease.

1. Is this consistent across all Regions ?
2. Is there a difference in Sales by Product Segment in 2014 compared to 2015 ?
3. Use Bookmarks to capture your story.

Bookmarks X

□ Add □ View

Channel_MapView

Channel_MatrixView

East Region

West Region

East Region 2014

East Region 2015

West Region 2014

West Region 2015

Sample Report Authoring Process

Original Report



MAIN KPIs

KPIs DETAILS

INDICATORS

PROPORTIONS

SSA TIER 2

Chart Selection



<<<College Logo>>

Key Funding Values - College Overview

£4.4M

TotalValue

TotalValue by ProvSpecMon_C



123K

Learn Ref Numbers

Count of learnrefnumber by ProvSpecMon_C



£3,083,448.4

ProgCashValue

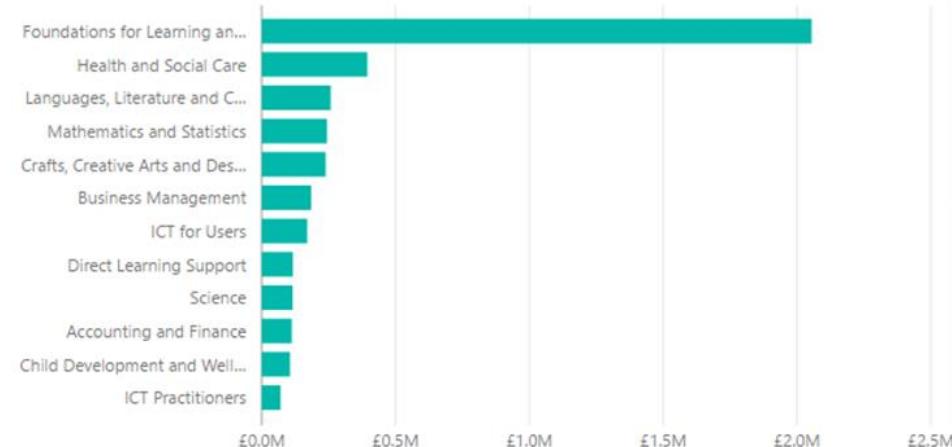
£498,118.0

AimAchValue

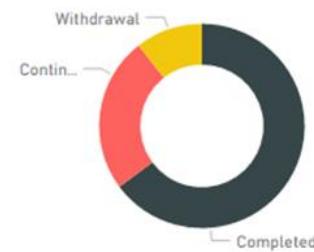
£516,150.0

LearningSupportValue

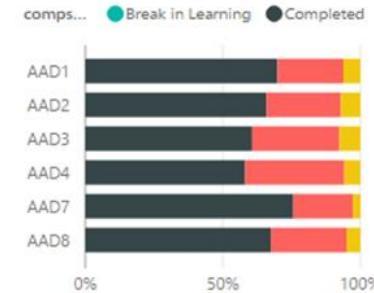
TotalValue by SectorSubjectAreaTier2Desc



Count of learnrefnumber by compstatus



Count of learnrefnumber by ProvSpecMon_...



SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Administration	£22.8	£607.6	300	£0.0
Business Management	£192.7	£4,592.6	198	£0.0
Child Development and We...	£65.4	£829.0	120	£0.0
Crafts, Creative Arts and De...	£12.1	£4,592.6	2371	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Foundations for Learning a...	£36.9	£5,264.3	1956	£0.0
Health and Social Care	£64.1	£4,592.6	613	£0.0
History, Philosophy and The...	£281.7	£4,343.1	19	£246.2
Total	£35.4	£5,264.3	8607	£0.0

Report Alignment

SSA TIER 2



<<<College Logo>>

Key Funding Values - College Overview

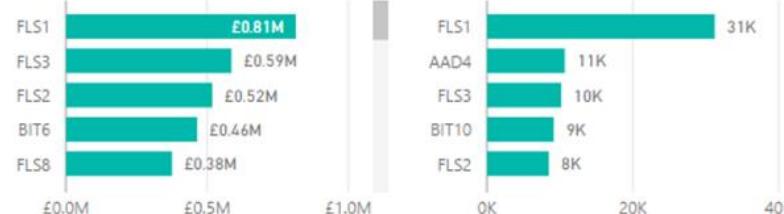
MAIN KPIs

£4.4M
Total Value

123K
Learn Reference Numbers

KPIs DETAILS

Provider Monitoring Field/School/Dept Learn references



INDICATORS

£498,118.0

AltValue

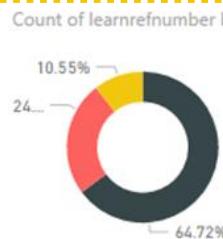
£3,083,448.4

ProgCashValue

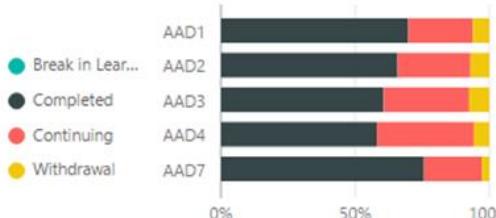
£516,150.0

LearningSupportValue

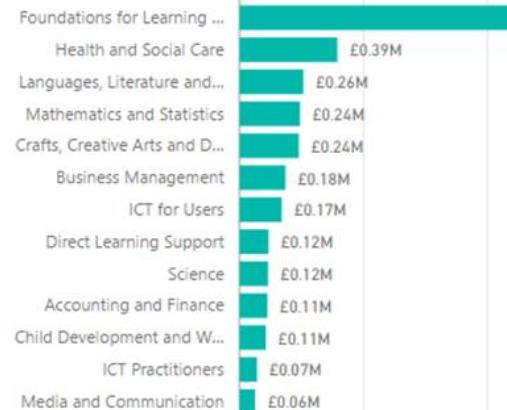
PROPORTIONS



Proportion by Completion Status



TotalValue by SectorSubjectAreaTier2Desc



SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Total	£35.4	£5,264.3	8607	£0.0

Branding/Targeting



FLEXIBLE LOGO



INFO ASSET
MANAGEMENT

The screenshot shows a web browser displaying the website infoassetmanagement.com/products.html. The page features a large, bold 'IAM' logo at the top left, followed by the text 'INFO ASSET MANAGEMENT'. A horizontal navigation bar includes links for HOME, ABOUT US, CONTACT US, PRODUCTS, SERVICES, and PRIVACY. Below the navigation, there's a sidebar with social media icons for Facebook, Twitter, LinkedIn, Email, and a plus sign. The main content area contains a paragraph about the challenges of managing information in colleges and introduces 'College Information Asset Manager' (CIAM). To the right, there's a section with a laptop displaying a dashboard interface, and a 'Try CIAM' button. The bottom of the page is divided into four sections: 'IT Professionals', 'Finance Professionals', 'Quality Professionals', and 'Marketing and Student Services Professionals', each with a brief description and a bullet point. A blue arrow points from the 'MAIN COLOR' text below to the blue sidebar on the left.

College Information Asset Manager

The amount of information within colleges is constantly expanding, and to stay competitive, your data-insight strategy has to keep pace with business change. With multiple sources of data, it can be difficult for your users to get access to the information they need, when they need it. College Information Asset Manager (CIAM) is not just a dashboard but your strategic information asset manager to help you address these challenges here.

Try CIAM

IT Professionals
Because we know as a Technology manager you are busy. CIAM also tracks technical updates for you.

•Use CIAM to understand the technology of your

Finance Professionals
There is a lot of pressure balance the books and as a Finance Director you have a key priority to balance requirements and ensure sustainability. CIAM also tracks technical updates for you

•Use CIAM to understand the trends in

Quality Professionals
Because we know the importance of teaching, learning and outcomes we have developed models to ensure these are triangulated to inform practice

•Use CIAM to understand the trends in

Marketing and Student Services Professionals
CIAM will ensure that you are not just aware of your applications and conversion rates but also aware of other strategic information sets to help with recruitment. Why don't you find more about your tweets...

MAIN COLOR

Color Selection



INFO ASSET MANAGEMENT

Key Funding Values
College Overview

£4.4M
Total Value

123K
Learn Reference Numbers

Provider Monitoring Field/School/Dept

Field/School/Dept	Total Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M

Learn references

Reference	Count
FLS1	31K
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0
AimAchValue

£3,083,448.4
ProgCashValue

£516,150.0
LearningSupportValue

Proportion by Completion Status

Completion Status	Proportion
Completed	64.72%
Continuing	24.24%
Break in Lear...	10.55%
Withdrawal	0.49%

SSA Tier 2 Funding Distribution

Sector	Subject Area	Tier 2 Desc	Total Value
Foundations for Learning ...			£2.05M
Health and Social Care			£0.39M
Languages, Literature and...			£0.26M
Mathematics and Statistics			£0.24M
Crafts, Creative Arts and D...			£0.24M
Business Management			£0.18M
ICT for Users			£0.17M
Direct Learning Support			£0.12M
Science			£0.12M
Accounting and Finance			£0.11M
Child Development and W...			£0.11M
ICT Practitioners			£0.07M
Media and Communication			£0.06M
Other Languages, Literatu...			£0.06M

Sector	Subject Area	Tier 2 Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners			£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology			£281.7	£4,343.1	19	£246.2
Service Enterprises			£239.1	£749.3	12	£299.7
Business Management			£192.7	£4,592.6	198	£0.0
Accounting and Finance			£71.4	£1,336.0	132	£0.0
Mathematics and Statistics			£71.3	£894.9	186	£0.0
Direct Learning Support			£70.4	£571.3	118	£58.7
Child Development and Well Being			£65.4	£829.0	120	£0.0
Languages, Literature and Culture of...			£65.1	£4,592.6	203	£72.7
Health and Social Care			£64.1	£4,592.6	613	£0.0
Science			£62.1	£3,757.6	156	£43.7
Total			£35.4	£5,264.3	8607	£0.0

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Background Color



INFO ASSET MANAGEMENT

Key Funding Values
College Overview

KEY METRICS

£4.4M
Total Value

123K
Learn Reference Numbers

Provider Monitoring Field/School/Dept

Field/School/Dept	Total Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M

Learn references

Reference Type	Count
FLS1	31K
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0
AimAchValue

£3,083,448.4
ProgCashValue

£516,150.0
LearningSupportValue

Proportion by Completion Status

Completion Status	Percentage
Completed	64.72%
Continuing	24.24%
Break in Lear...	10.55%
Withdrawal	0.0%

SSA Tier 2 Funding Distribution

Subject Area	Funding Value
Foundations for Learning ...	£2.05M
Health and Social Care	£0.39M
Languages, Literature and...	£0.26M
Mathematics and Statistics	£0.24M
Crafts, Creative Arts and D...	£0.24M
Business Management	£0.18M
ICT for Users	£0.17M
Direct Learning Support	£0.12M
Science	£0.12M
Accounting and Finance	£0.11M
Child Development and W...	£0.11M
ICT Practitioners	£0.07M
Media and Communication	£0.06M
Other Languages, Literatu...	£0.06M

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
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Total	£35.4	£5,264.3	8607	£0.0

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Text Selection

Font

Segoe UI

8



9



14



30



Types

Normal

Bold

INFO ASSET MANAGEMENT

Key Funding Values

College Overview

KEY METRICS

£4.4M Total Value

123K Learn Reference Numbers

Provider Monitoring Field/School/Dept

Learn references

Category	Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
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FLS8	£0.38M
BIT1	£0.28M
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0 AimAchValue

£3,083,448.4 ProgCashValue

£516,150.0 LearningSupportValue

Proportion by Completion Status

Completion Status	Percentage
Completed	64.72%
Continuing	24.24%
Withdrawal	10.55%

SSA Tier 2 Funding Distribution

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
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Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
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Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0

Final Report



INFO ASSET MANAGEMENT

Key Funding Values
College Overview

KEY METRICS

£4.4M Total Value	123K Learn Reference Numbers
-----------------------------	--

Provider Monitoring Field/School/Dept

Field	Total Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M

Learn references

Reference	Count
FLS1	31K
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

AimAchValue: £498,118.0

ProgCashValue: £3,083,448.4

LearningSupportValue: £516,150.0

Proportion by Completion Status

Status	Percentage
Completed	64.72%
Continuing	24.72%
Break in Lear...	10.55%
Withdrawal	0.0%

SSA Tier 2 Funding Distribution

Subject Area	Total Value
Foundations for Learning ...	£2.05M
Health and Social Care	£0.39M
Languages, Literature and...	£0.26M
Mathematics and Statistics	£0.24M
Crafts, Creative Arts and D...	£0.24M
Business Management	£0.18M
ICT for Users	£0.17M
Direct Learning Support	£0.12M
Science	£0.12M
Accounting and Finance	£0.11M
Child Development and W...	£0.11M
ICT Practitioners	£0.07M
Media and Communication	£0.06M
Other Languages, Literatu...	£0.06M

Sector Subject Area Tier 2 Desc

Sector	Subject Area	Tier 2 Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners			£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology			£281.7	£4,343.1	19	£246.2
Service Enterprises			£239.1	£749.3	12	£299.7
Business Management			£192.7	£4,592.6	198	£0.0
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Science			£62.1	£3,757.6	156	£43.7
Total			£35.4	£5,264.3	8607	£0.0

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Follow best practices to improve presentation of report page.

Assets available:

1. Multiple report layout options.
2. VanArsdel logo

Report Authoring – Best Practices

Report Optimization/High Level



- Visuals generate queries against source data
- Minimum of 1 query per visual
- Queries are sent in parallel
- Inappropriate use of visuals/slicers can generate very large amount of queries and slow things down

Goals

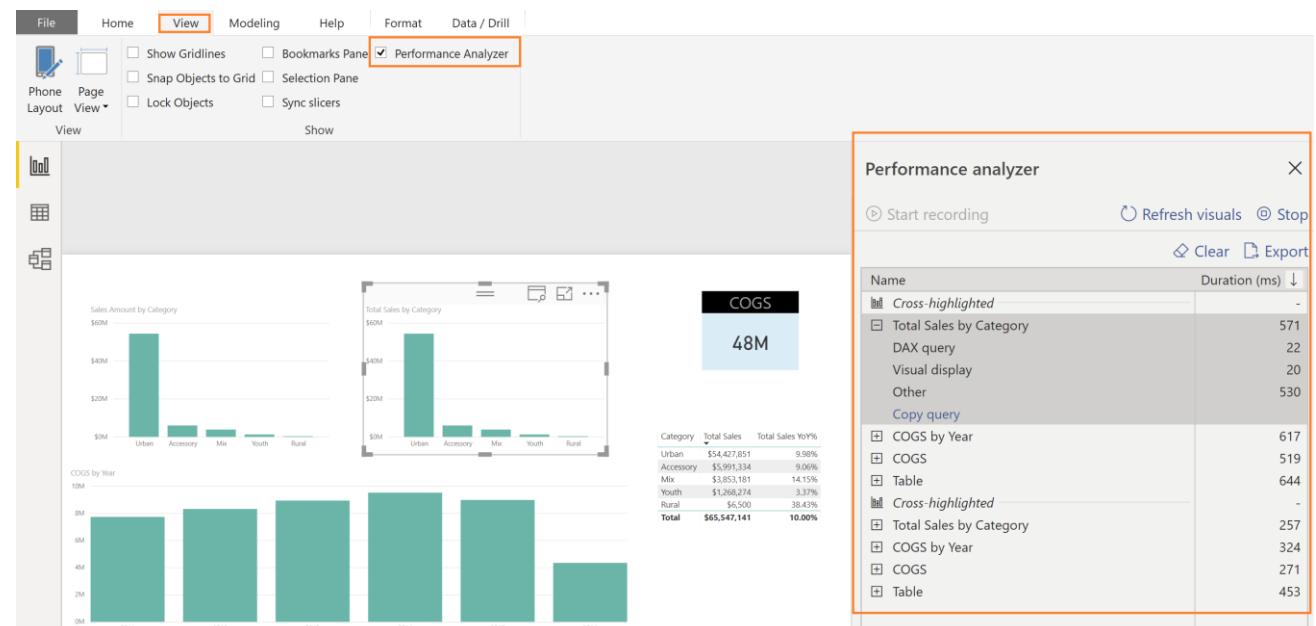
- Reduce number and complexity of queries
- Reduce amount of data being returned to report



Performance Analyzer

Using Performance Analyzer:

- You will know how each of your report elements, such as visuals and DAX formulas, are performing
- You can see and record logs that measure how each of your report elements performs when users interact with them, and which aspects of their performance are most (or least) resource intensive



Be Careful with Custom Visuals, Test performance



Scenario

- Custom visuals can be poorly optimized

Why is it undesired?

- Can be the slowest visuals, dragging down the user experience

Proposed solutions

- Replace with built in visuals, or use certified custom visuals
- Test custom visual performance in isolation then compare



Filters vs Slicers

Scenario

- Slicers in report contain thousands of values

Why is it undesired?

- High memory load, especially with multiple interacting slicers.
- Slicers issue two queries (populate, fetch selection details)

Proposed solutions

- Use filter instead of slicer, or to force context and limit values
- Restructure to provide drillthrough to detail



Use Slicer selection defaults

Scenario

- Unfiltered visuals containing high number of values

Why is it undesired?

- High memory load, more data to fetch and process

Proposed solutions

- Set default value and set and single/multi-select property
- Restructure to provide drillthrough to detail



Use Synced Slicers with Care

Scenario

- Report with many pages, many visuals and synced slicers

Why is it undesired?

- Higher memory load and more queries

Proposed solutions

- Use filter instead of slicer, or to force context and limit values
- Restructure to provide drillthrough to detail

Use Query Reduction features



Scenario

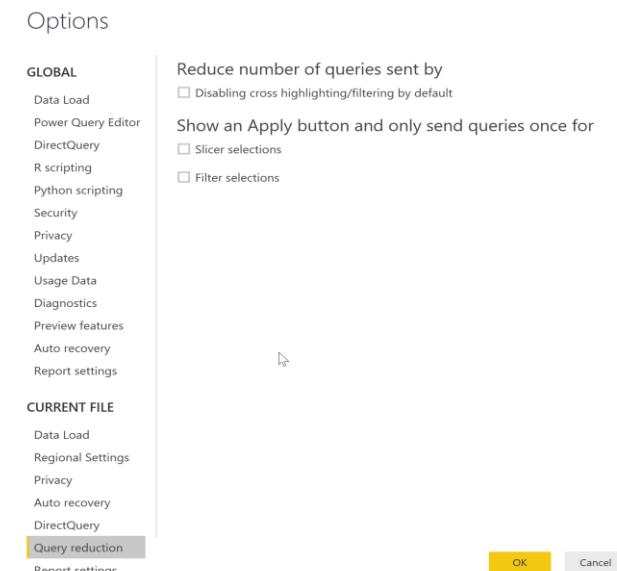
- Previously discussed high no. of visuals/slicers

Why is it desired?

- Lower memory load, less data to fetch and process

Proposed solutions

- Consider no cross-highlighting and adding Apply buttons to slicers and filers



Avoid intensive data export



Scenario

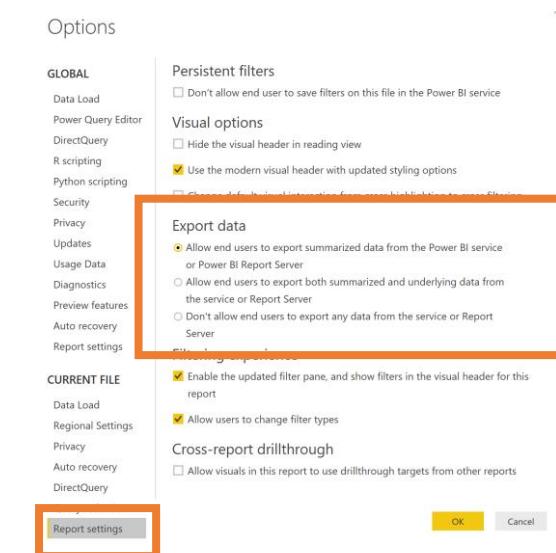
- Table visual containing many fields and complex measures
- Users export detail data

Why is it undesired?

- Leaf level queries are expensive and can consume a lot of memory, especially for large models

Proposed solution

- Limit export at design time



Dashboard Design

Dashboard Optimization: High Level



- Dashboards were designed to provide a fast summary view with drill to report if desired
- Some configurations reduce speed and usefulness

Goals

- Use Power BI dashboard tile cache wherever possible
- Employ a “launch pad” design principle



Tip: Avoid single-visual Report Tiles

Scenario

- Pinning a report that contains only 1 tile

Why is it undesired?

- Executed on demand, not cached so could be slower

Proposed solutions

- Pin the visual instead of the page



Tip: Avoid very busy live Report Tiles

Scenario

- Pinning a live report tile with high number of visuals

Why is it undesired?

- Executed on demand, not cached so could be slower
- Negatively impacts perceived dashboard load experience

Proposed solutions

- Pin individual visuals instead of the report page
- Design metrics/dashboards to truly meet users' information needs.
Usually requires more iterations

Tip: Manage Dashboard Cache refresh



Scenario

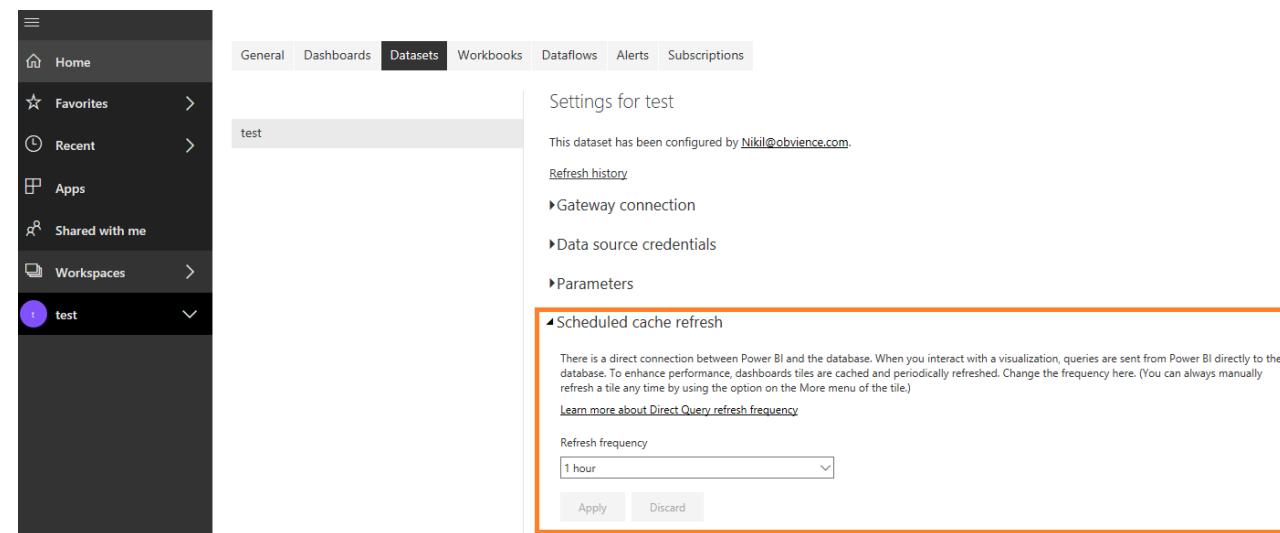
- Many dashboards hitting source, which may have many unique RLS contexts

Why is it undesired?

- By default, tiles from in-memory sources will refresh after a scheduled data refresh
- By default, tiles from DQ sources will refresh cache every hour. May overload source

Proposed solution

- Reduce Cache Refresh frequency
- External DW's often refreshed only daily, so align schedules



Final Thoughts



Sample Business Questions for Agile Process

1. What is my Total Sales for a Selected Year and Region?
2. How is my Total Sales doing Year Over Year?
3. How is Gross Profit for various States in my region?
4. How is my Sales doing by Channel, Device, Category for selected Year?
5. How is my Total Sales and YoY Growth for the region doing compared to other regions?
6. What is my Total Sales for selected Year, Month across Categories?
7. How are my Product Sales by Geography?
8. How is VTB, YoY, MoM for various categories which ones are doing good and bad?
9. How is my 12 month VTB trend for my categories?
10. How is my 1 month Avg Per Sale trend for my categories? What is the Min and Max Avg Per Sale?

Power BI Support Resources



Contact Support

Report Errors, Issues – Support.PowerBI.com

Resources

- Community.PowerBI.com – Community Forum
- [Report Theme Gallery](#) – A showcase for stunning report themes
- [Data Stories Gallery](#) – Get inspired with Data Stories by other Power BI users
- [R-Visuals Gallery](#) – Get inspired by others use of R for analyzing their data
- [Store.office.com](#) – Custom PBI visuals and R visuals you can download and use in your story

- [Power BI Blog](#) - weekly updates
- [User Voice for Power BI](#) – Vote on (or submit) your favorite new ideas for Power BI
- [Issues.PowerBI.Com](#) – log issues with the community
- [Whitepaper](#) - Creating an Enterprise Class Dashboard Solution with Power BI
- [Guided Learning](#) Self Service Power BI training

- [DAX Formula Language](#) – syntax for DAX
- [DAX Patterns](#) – Great website to learn new patterns for the DAX Language
- [Power Query Formula Language](#) – syntax for the “Query” language
- [Paletton.com](#) – a color scheme generator
- <https://unicode-table.com/en/> – Unicode Character Table
- [Theme Generator](#)
- [Contrast Analyzer](#): a tool that creates a “lens” to show how people with different visual disabilities might see your reports
- [Charticulator](#): a tool that helps to build custom visuals

Instructors:

Questions?