

Data Visualization Techniques

- Story Telling With Data
- Visuals selections
- Layouts



Story Telling with Data

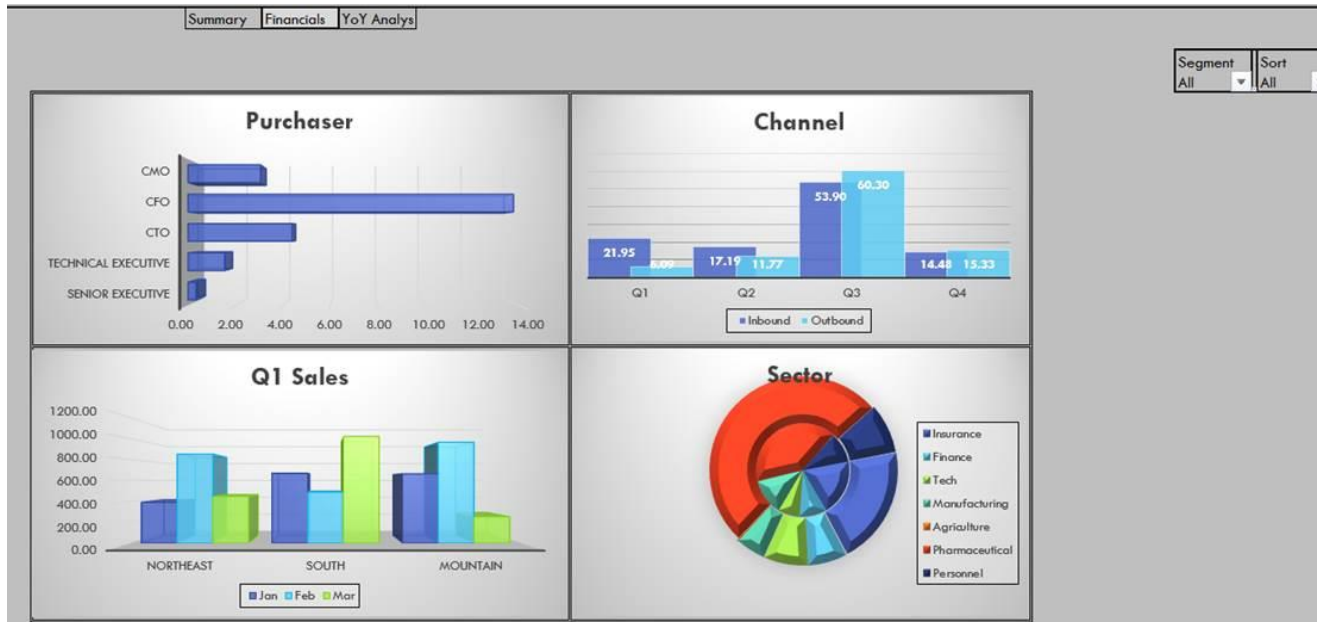


- Volume
- Velocity
- Variety



We are drowning in data!!

Science Behind Data Visualization



- 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

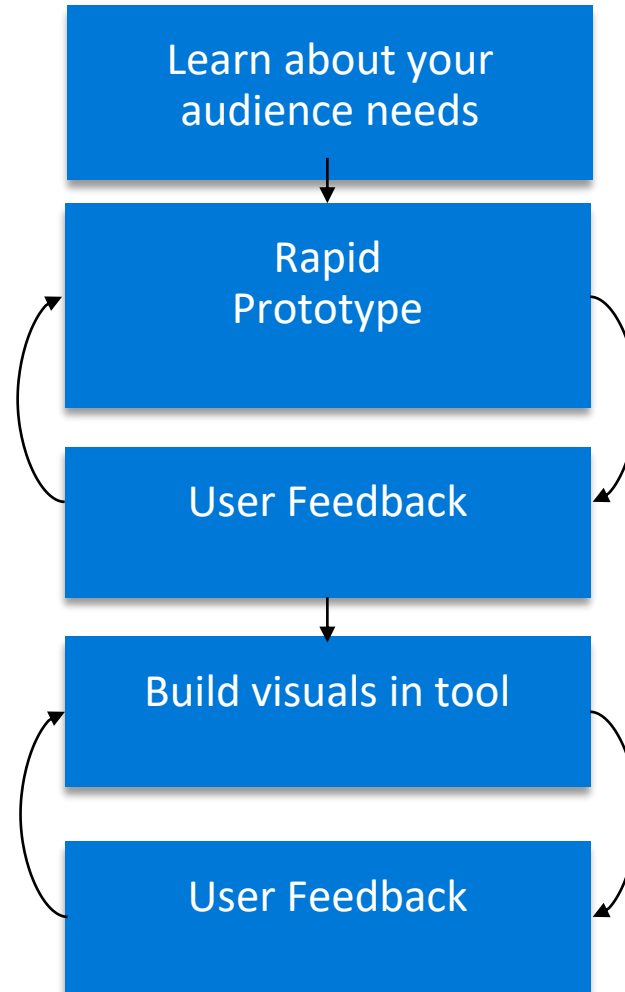
Process Behind Data Visualization



Top 5 Questions

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

Start Visuals with
Sample Data

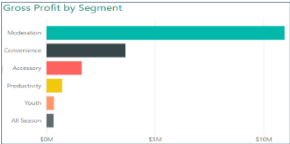


Use Whiteboard
or Storyboard
to plan POC

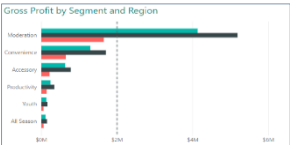
Choosing Right Charts



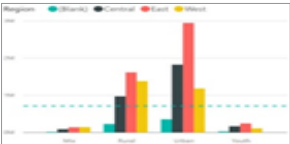
Comparison



Stacked Bar



Clustered Bar



Clustered Column

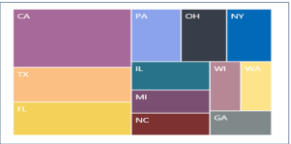
Segment	Region	Units	Gross Profit
Moderation	Central	137,999	
Convenience	Central	67,391	
Accessory	Central	15,028	
Productivity	Central	12,443	
All Season	Central	6,155	
Youth	Central	5,849	
Total		244,865	\$6,525,172

Table

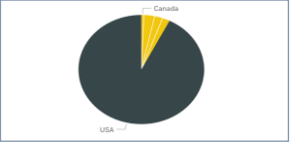
Region	Units	Gross Profit
TX	137,999	\$6,525,172
IL	67,391	
WI	15,028	
MO	12,443	
MN	6,155	
CO	5,849	
IA		
OK		
LA		
KS		
NE		

Matrix

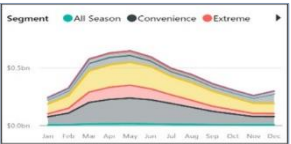
Composition



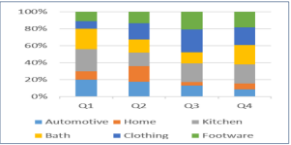
Tree



Pie



Stacked Area

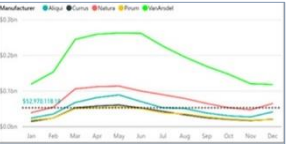


100% Stacked Column

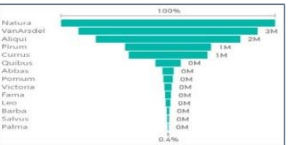


Water Fall

Trend



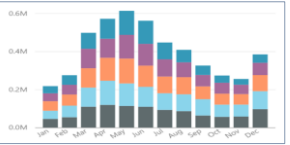
Line



Funnel

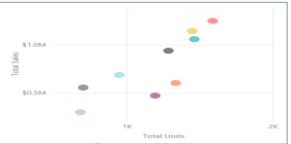


Line and Stacked Column

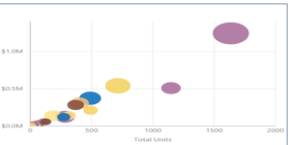


Stacked Column

Distribution



Scatter Plot



Bubble

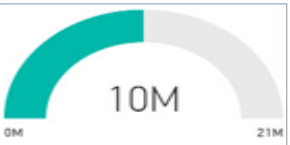


Map

Status



KPI



Gauge



Multi-row Card



Card

Geographic

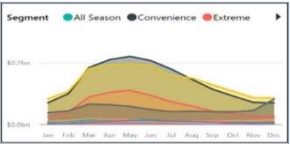


Map

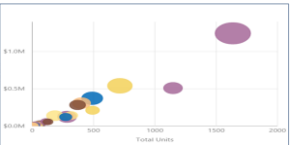


Filled Map

Relationships

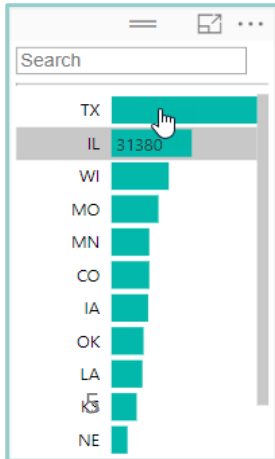
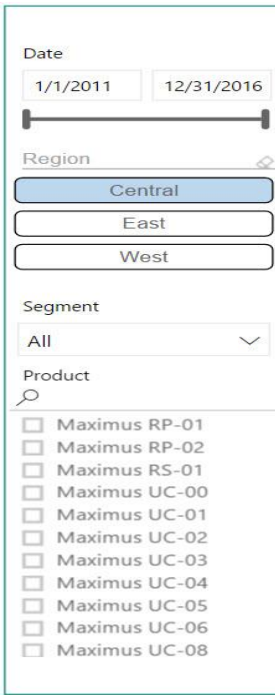


Area



Bubble

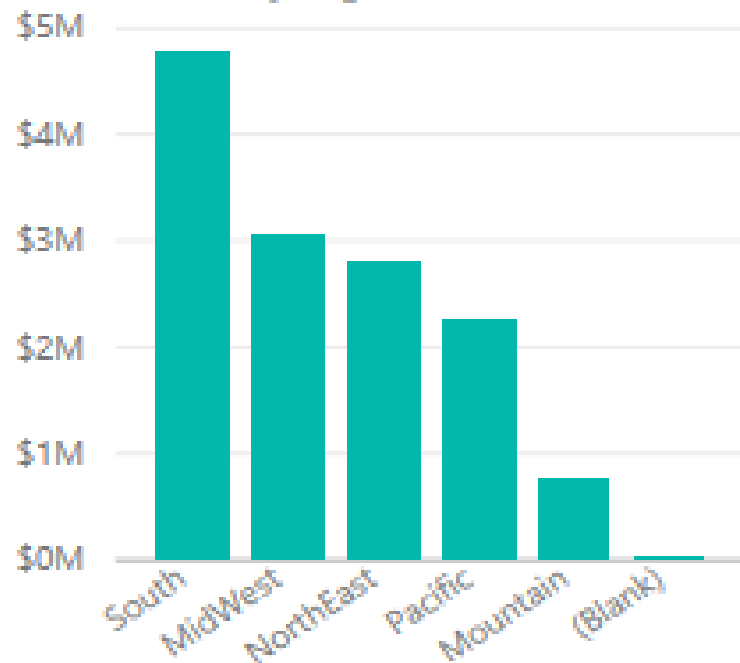
Slicing/Filtering



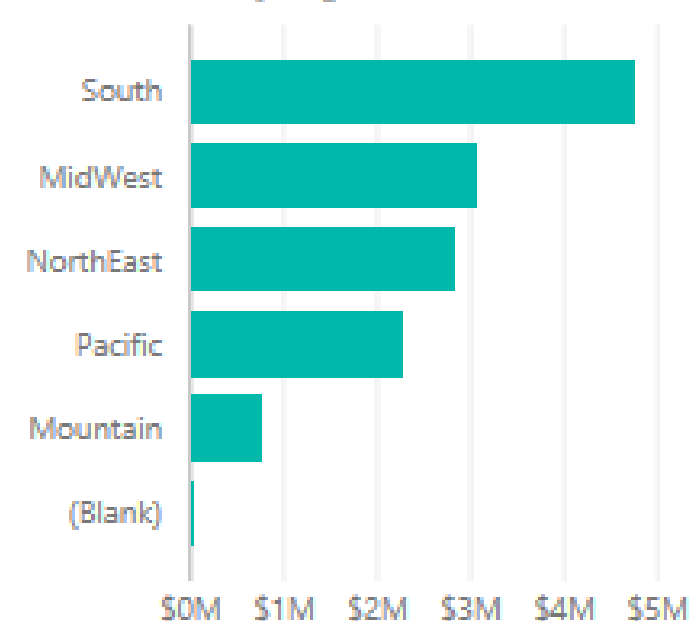
Column Chart and Bar Chart for Comparison



Total Sales M by Region

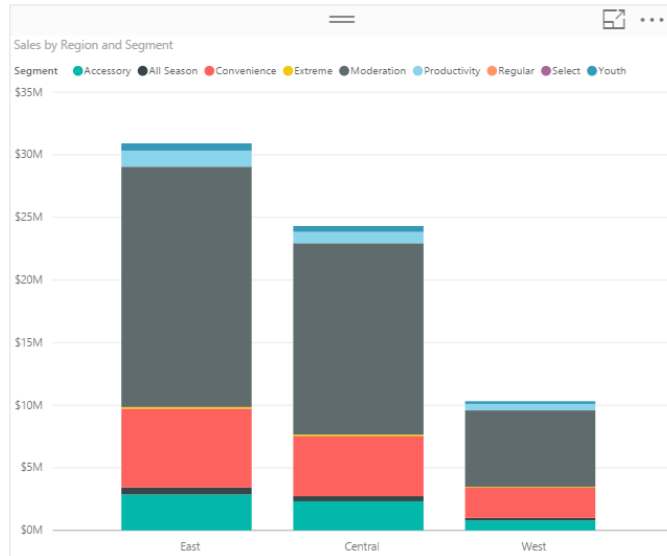


Total Sales M by Region

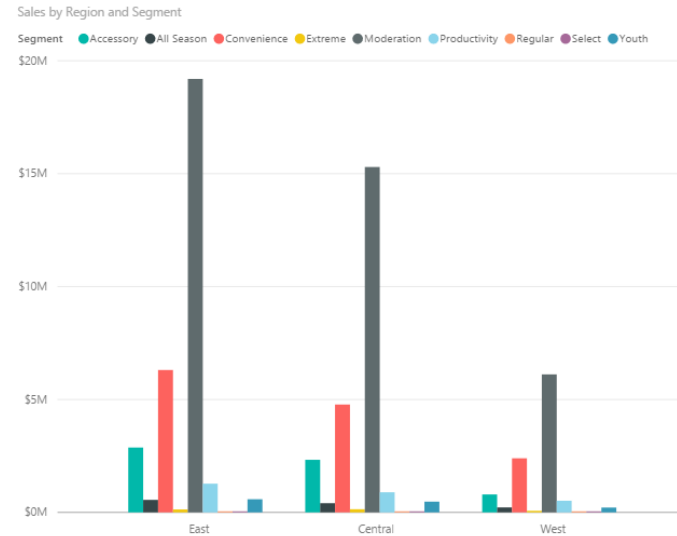


- When you have too many elements to display in a column, the bar chart can be easier to scroll.

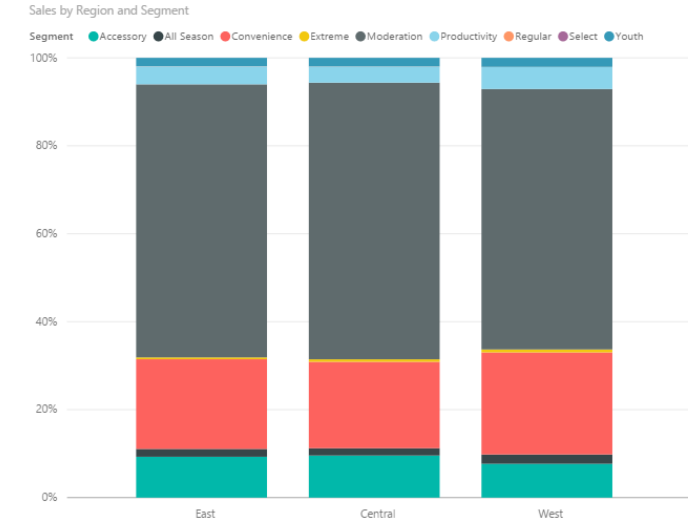
Stacked vs Clustered Column (Bar) Chart Types



- Shows Totals
- Shows Part to whole relationship



- Inter-Category Comparison
- Intra-Category Comparison

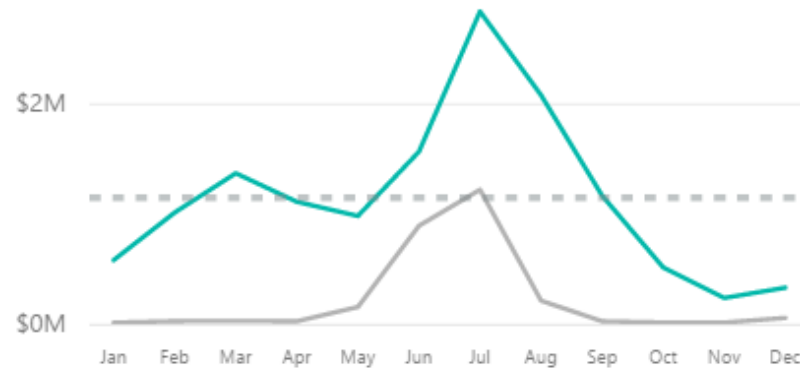


- Shows Mix% change
- Ignore absolute numbers

Line Charts



Sales Comparison to 2014



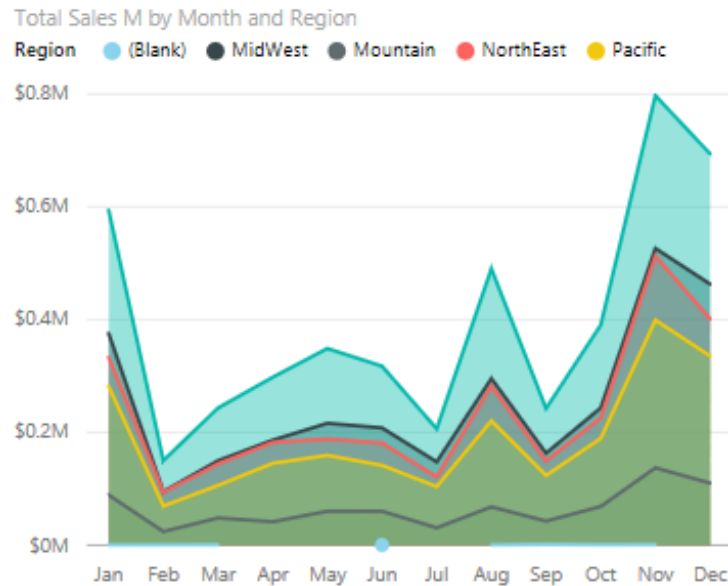
- Start Axis based on your “Business scenario”
 - Choose the right Aspect Ratio
 - Try to have a Reference Line
 - Use colors to draw attention strategically

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

Stacked Area Charts

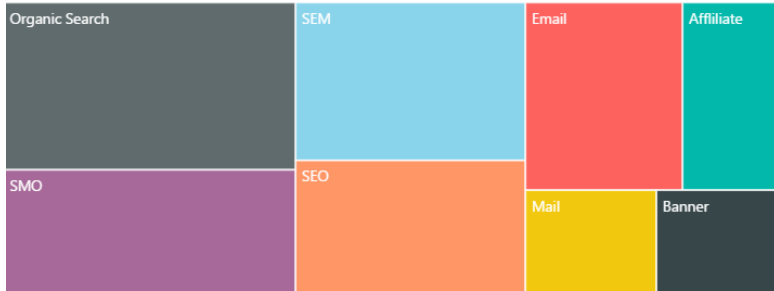


- Used to show how proportions and totals are changing
- Choose this chart wisely
- Can lead to misleading conclusions
- The eye tends to interpret the trends using the top lines of each shaded region rather than using the area of each region

Constructing Effective Tree Maps



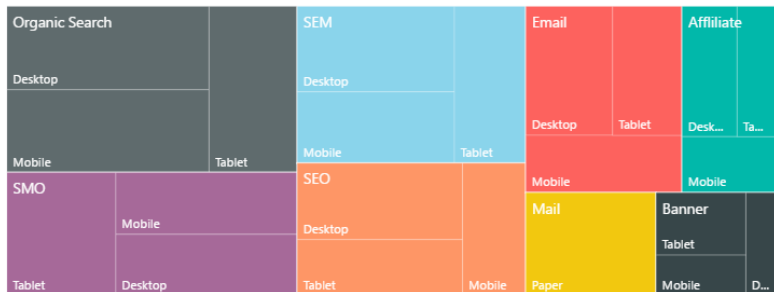
Units by TrafficChannel



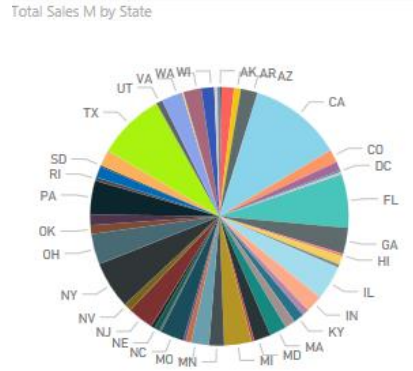
- Tree map is useful to visualize proportions
- Use Drill down to allow navigation to detail



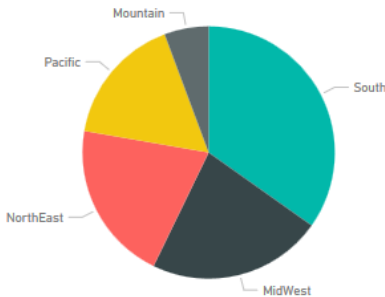
Units by TrafficChannel and Device



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 %



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%

- 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

Constructing Effective Slicers



Slicer
as List

Chiclet
slicer

Chiclet
slicer

Date slicer

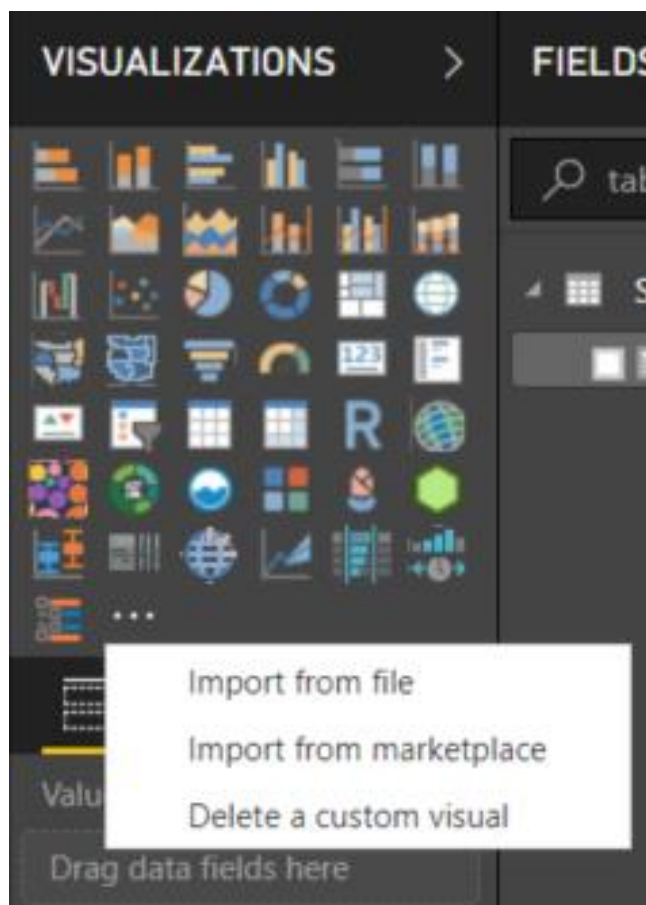
Numeric slicer

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

Custom Visuals

Import Custom Visual

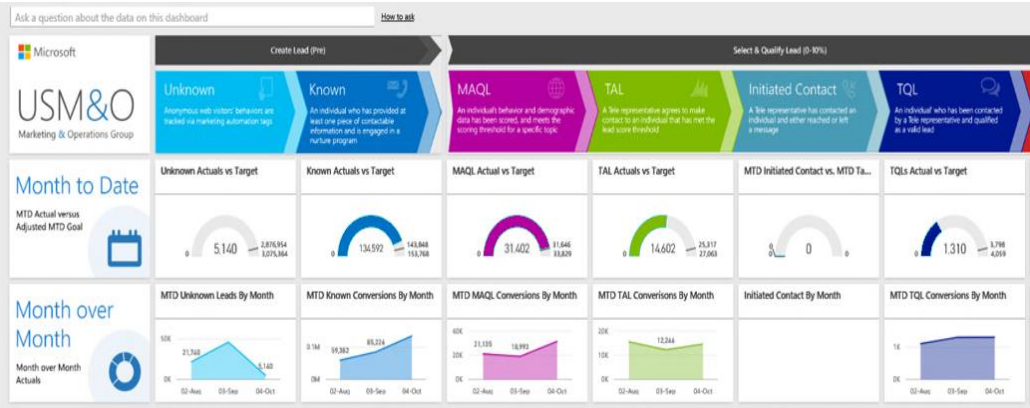


1. Click the ellipsis on the Visualization menu
2. Import from Marketplace
3. Select the visual to Download
4. Use the visual
5. If you decide you don't like it – delete it

Layouts: Dashboard vs Report



Dashboard Layout

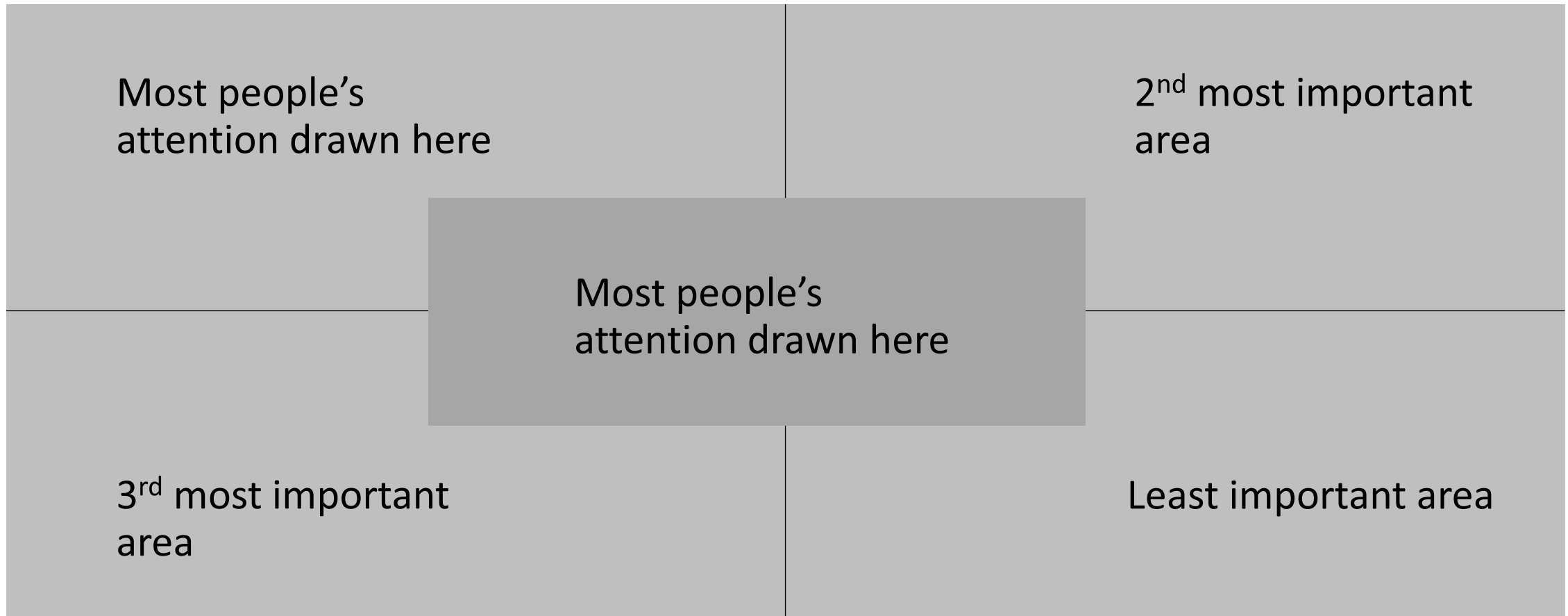


Typically provides snapshot of Business overview and may contain data from multiple reports

Report Layout

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

Typically answers 1 Business Question

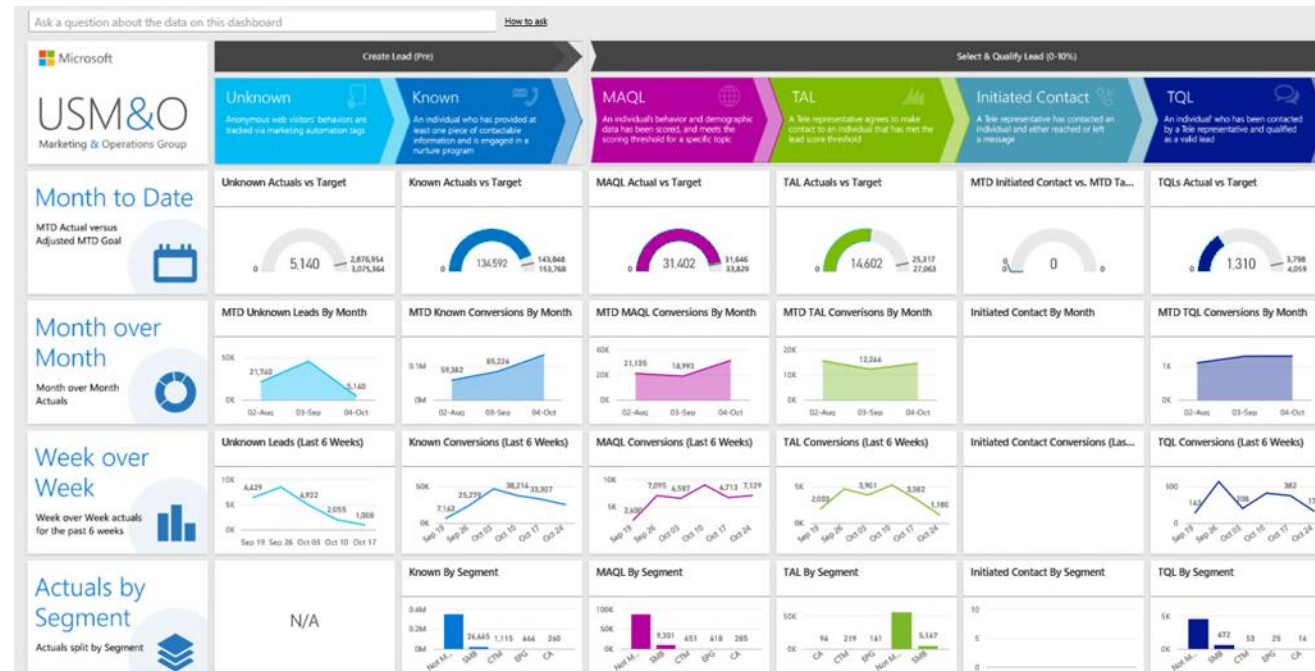


Dashboard Layouts – Column Layout



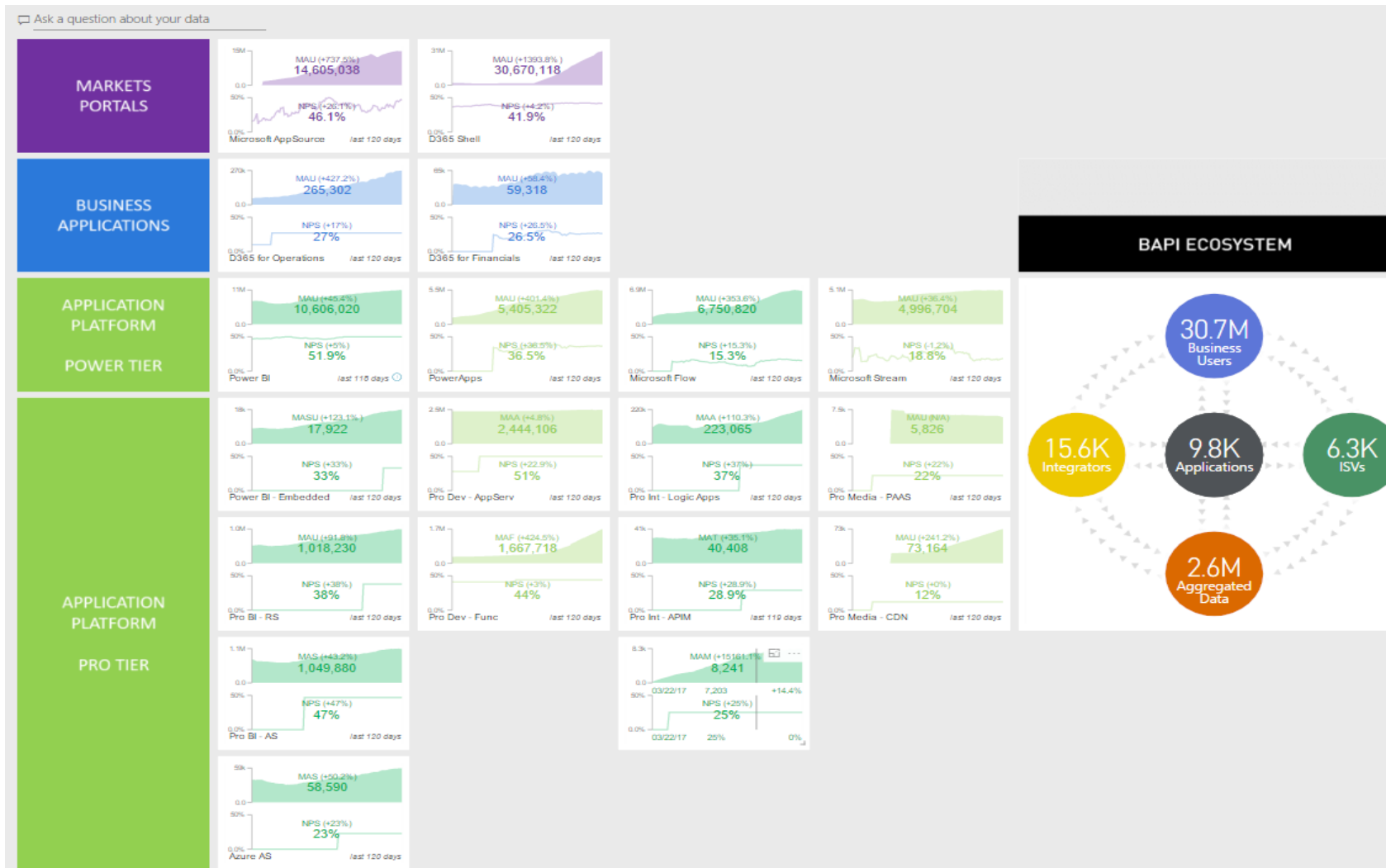
- This layout is most powerful for Executive Dashboard
- Line up each column for 1 area that an Exec manages (in decreasing order of importance)
- Ex. Marketing, Finance, Sales

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.

Polishing and Formatting

- Formatting a visual in Power-BI
- Colors
- Fonts
- Icons



Formatting a visual in Power-BI



Changing Visuals Dynamically

Change your visuals
Dynamically by just clicking.

- Select the desired visual.
- Go to Visualization tab.
- Choose Desired visual.



Visualizations

Filters

Axis

Rolling Period

Legend

Region

Value

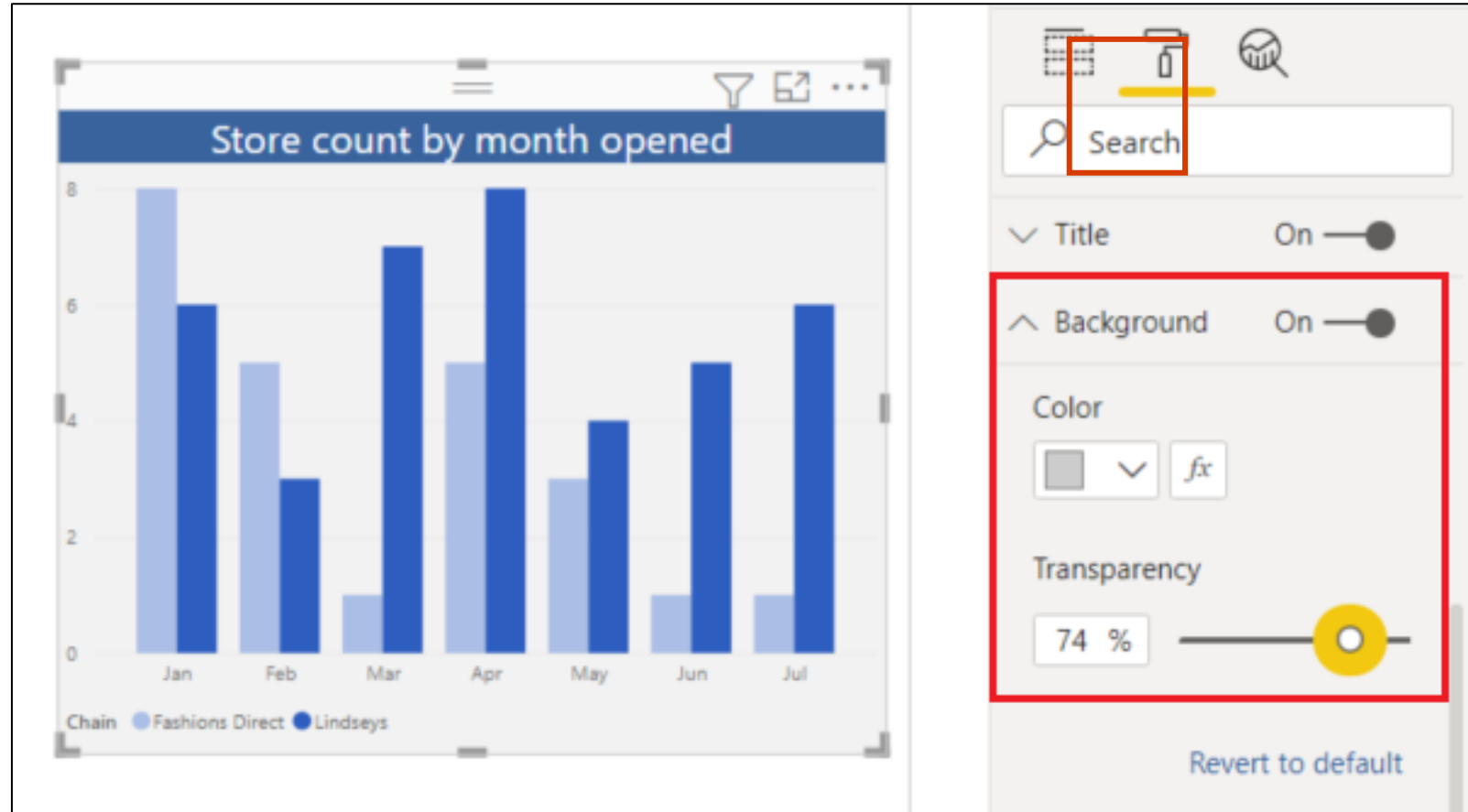
% Unit Market Share YOY

Formatting a visual in Power-BI



Customize your visuals Dynamically by just clicking.

- Choose Desired visual.
- Go to Visualization tab.
- Select “Format your Report Page” option.
- Formatting can be done with “Visual” and “General” tabs where various options are given.

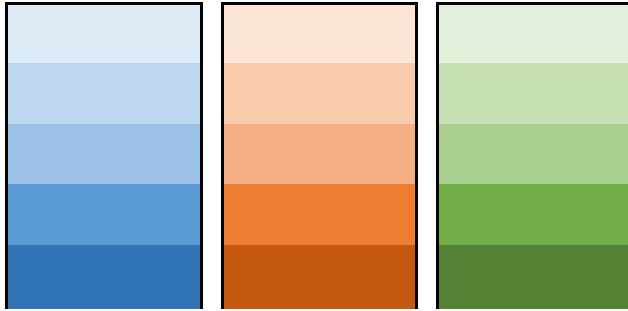


How do you pick a color scheme?

- 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

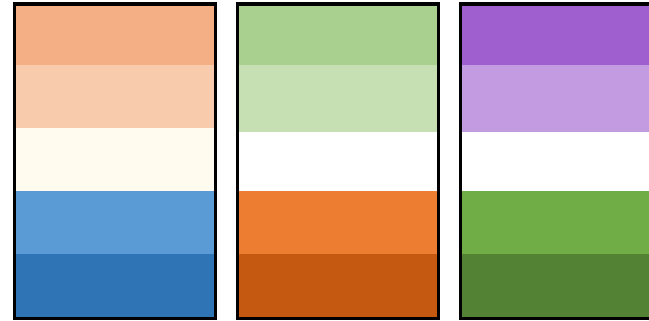
Pro Tip: Use [Pixie](#) or a similar tool to pick colors from Internet and other places

Types of Colors



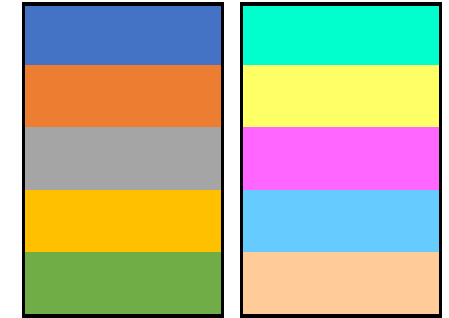
Sequential

When you have to imply an increasing or decreasing scale



Divergent

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



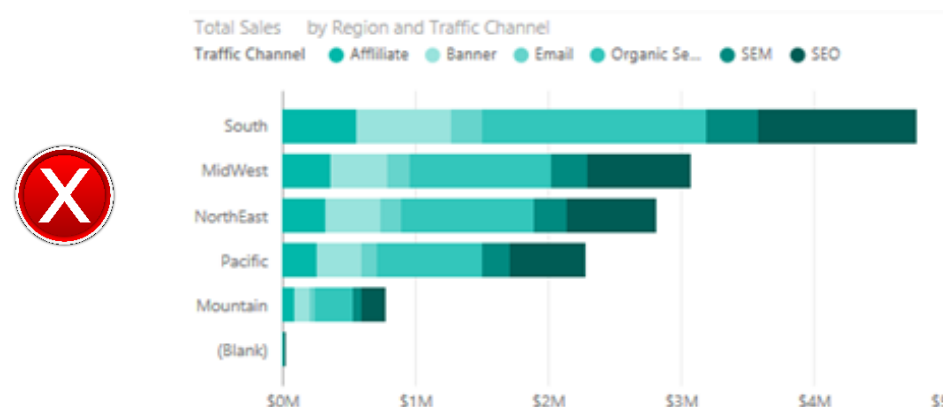
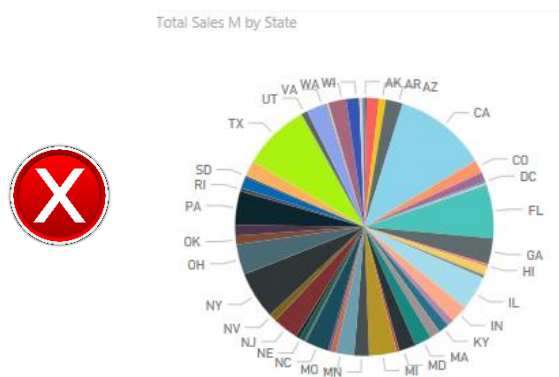
Qualitative

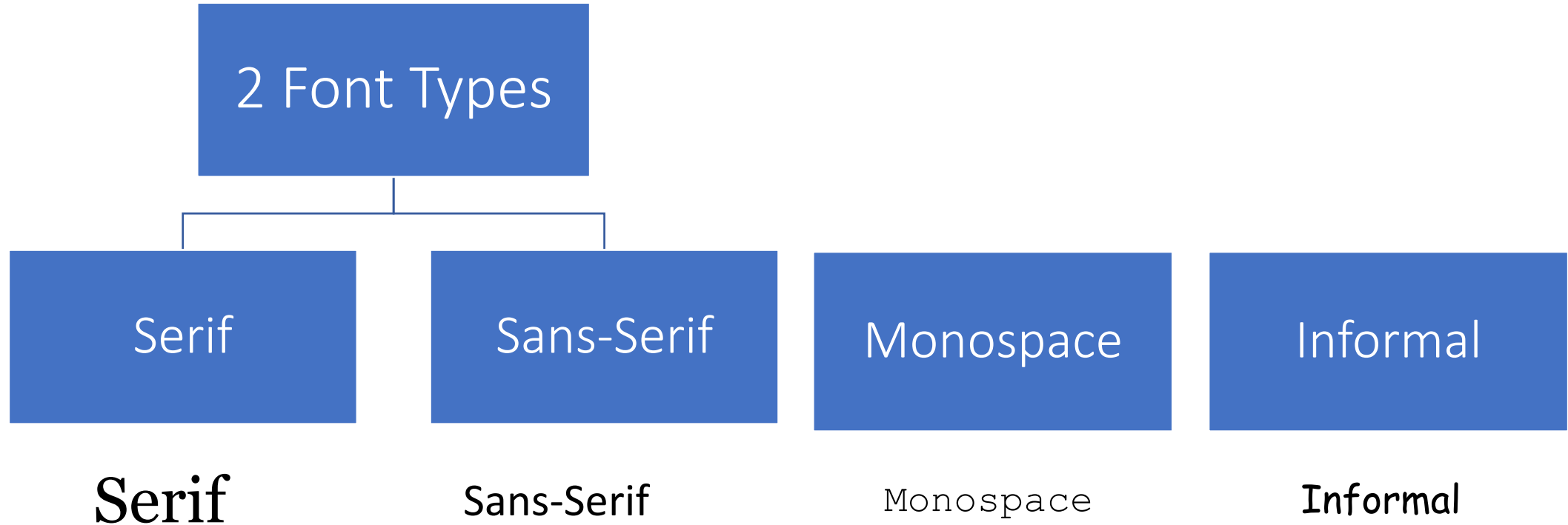
When the values don't have any logical ordering

Things to remember when using colors



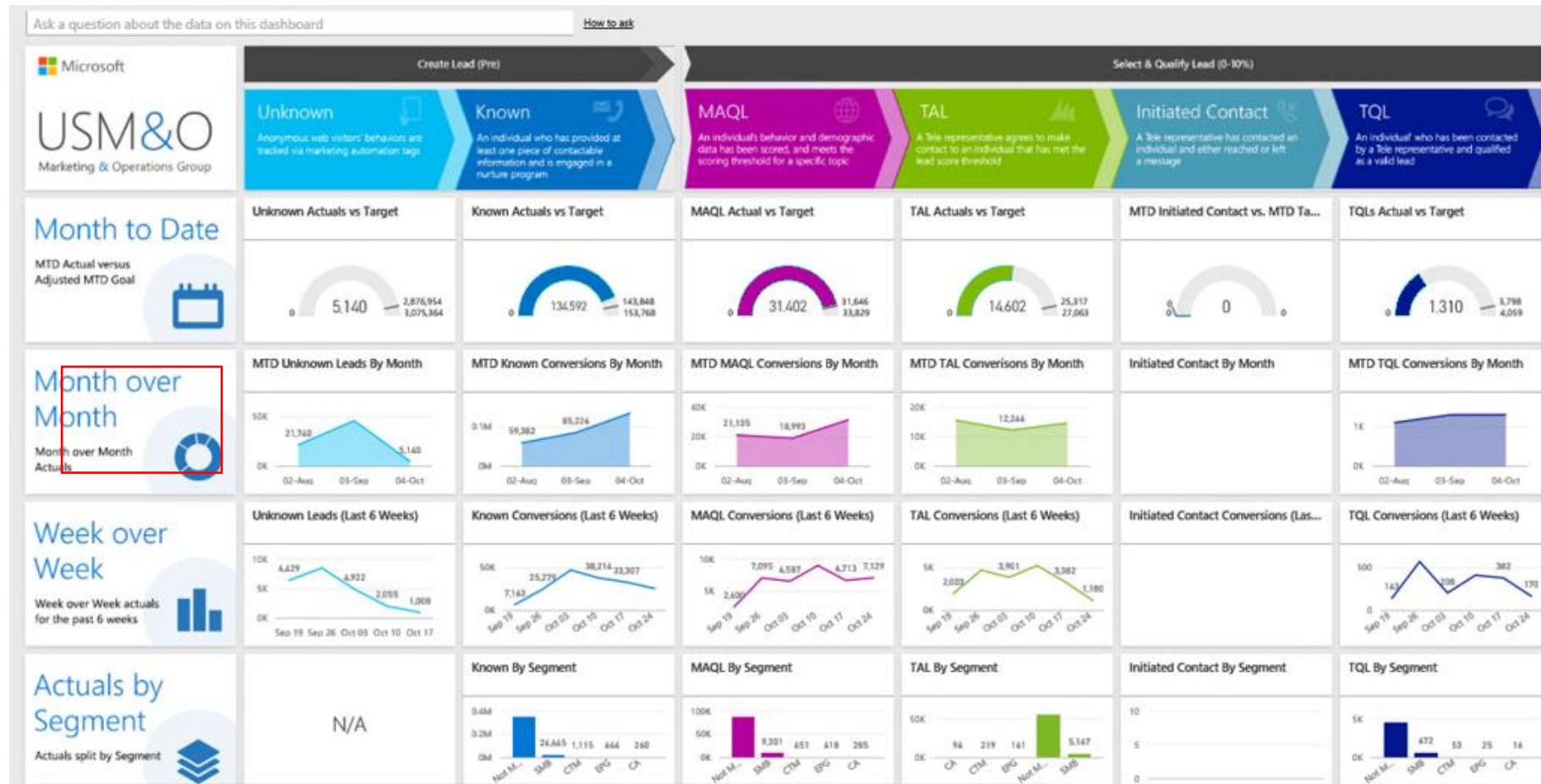
- Do not have more than 3-5 colors display on a single visual (think of Short Term memory)
- The eye cannot differentiate more than 5 colors of same hue
- Try to have a semantic meaning for your colors (Red = Bad, Green = Good)





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

Icons



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