User Group
Summit
NORTH AMERICA

Demystifying Visualizations and Enhancing Report Design

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HAVENS CONSULTING

Reid Havens

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MVP Microsoft® Most Valuable Professional

Demystifying Visualizations and Enhancing Report Design

- **Applying Report Design Principles**
  - Information Processing
  - Report Organization
  - S.C.R.A.P Methodology
  - Color Theory
  - Visual Cues
  - 8 Rules of Power BI Design
- **Designing Advanced Reports**
  - Conditional formatting
  - Drillthrough filters
  - Visual interactions
  - Sync slicers
  - Report tooltips
  - Bookmarks
  - Custom Visuals

Power BI Real-Time Demo Survey

Applying Report Design Principles

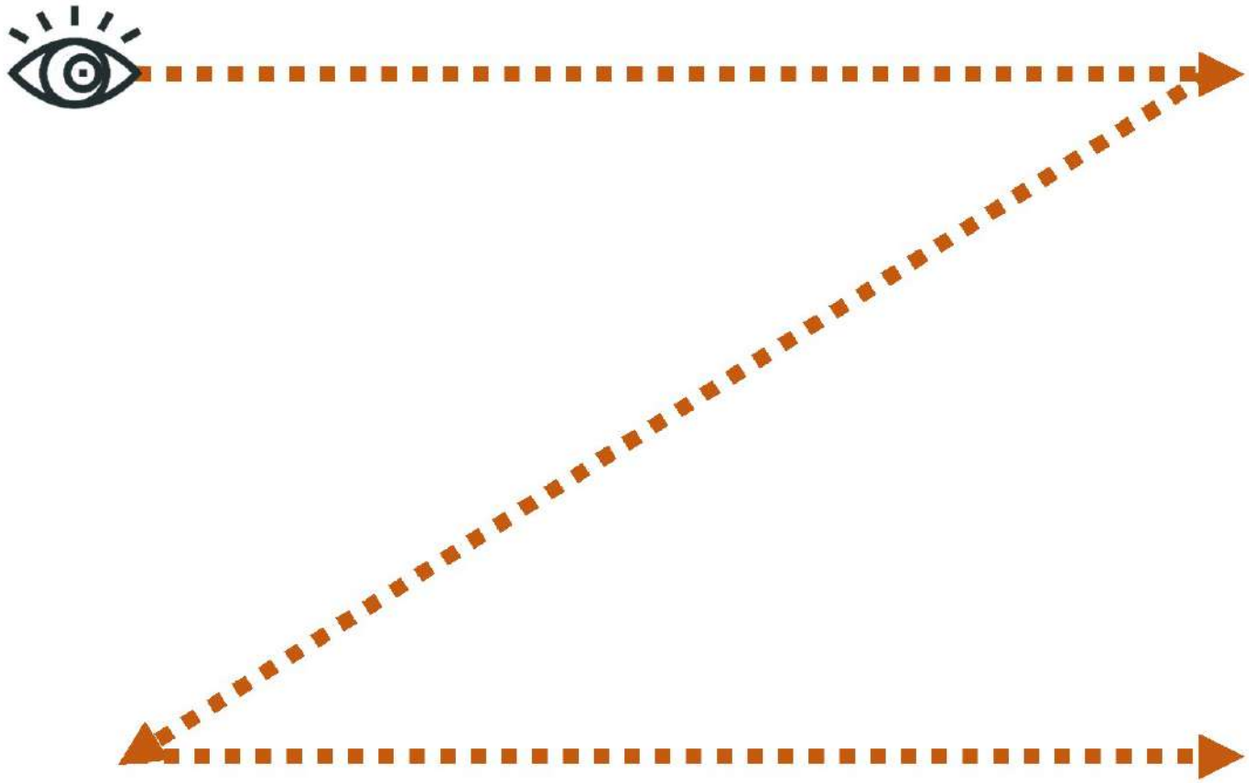
- Information Processing
- Report Organization
- S.C.R.A.P Methodology
- Color Theory
- Visual Cues
- 8 Rules of Power BI Design

Design Principles

Information Processing

How we process information

- **Information is read left to right**
  - Most people are accustomed to read in the direction of **left to right**.

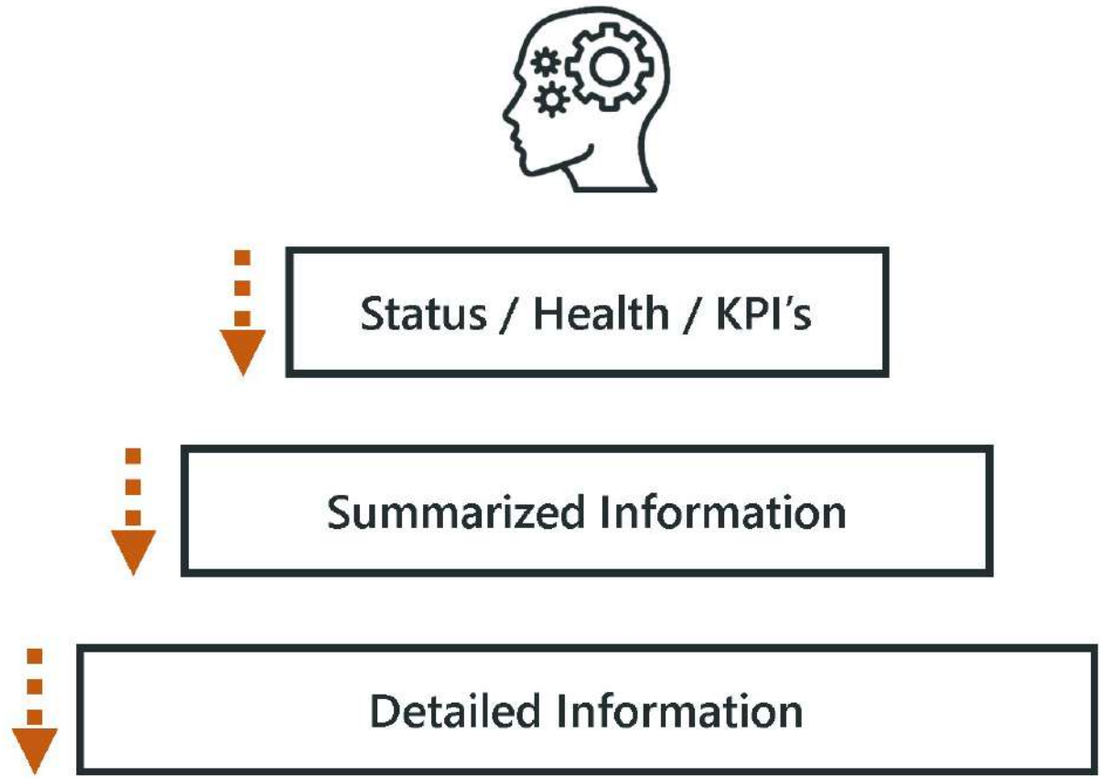


Design Principles

Information Processing

How we process information

- **Information is read left to right**
  - Most people are accustomed to read in the direction of **left to right**
- **Data is analyzed from the top down**
  - People typically look at summarized data **first**, before seeking further information
- **Application of Principles**
  - Leveraging these two principles in report design will create more **effective reports**

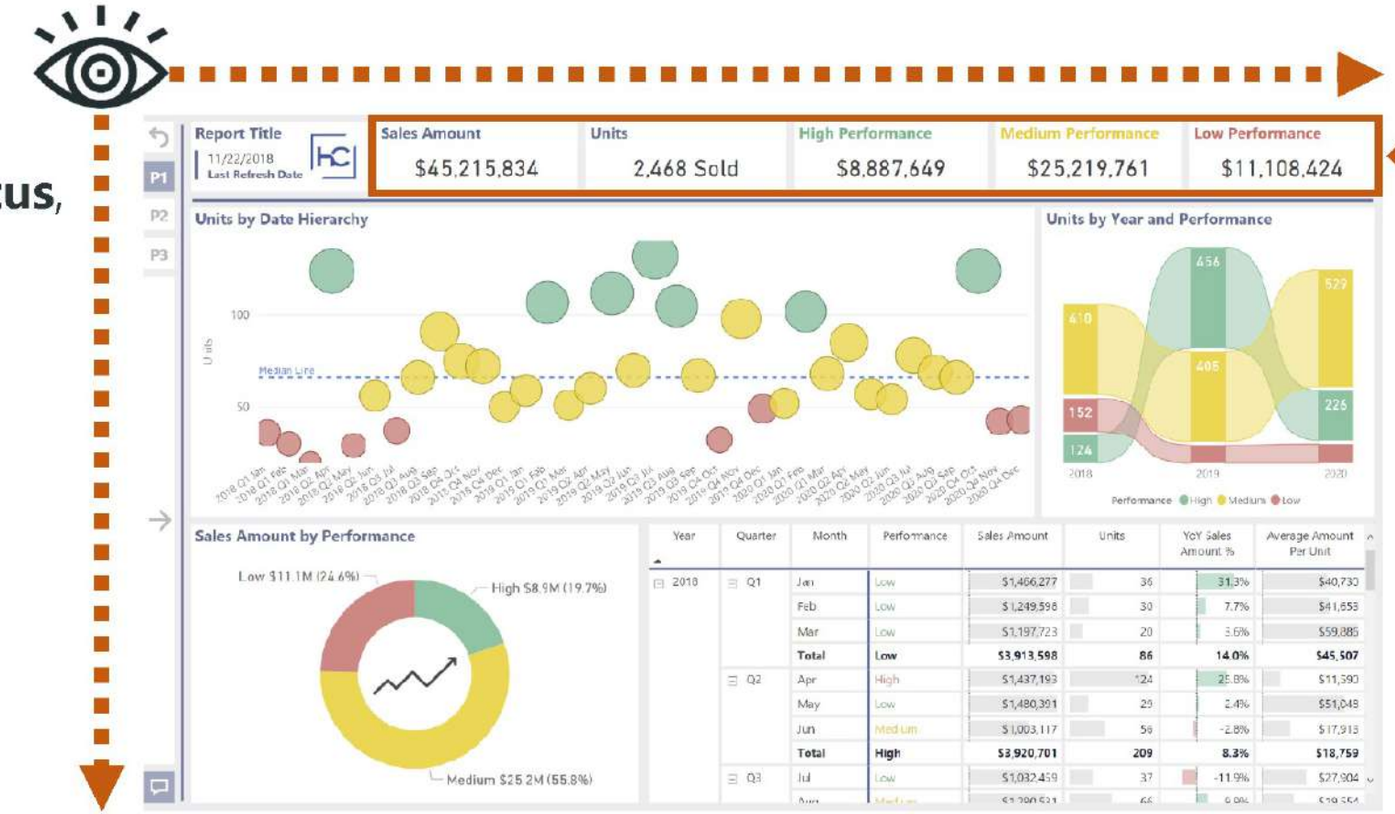


Design Principles

Information Processing ► Effective Report Organization

The data processing flow

1. **Key Performance Indicators (KPI's)**
   - Information pertaining to the **status**, **performance**, or **health** of the organization



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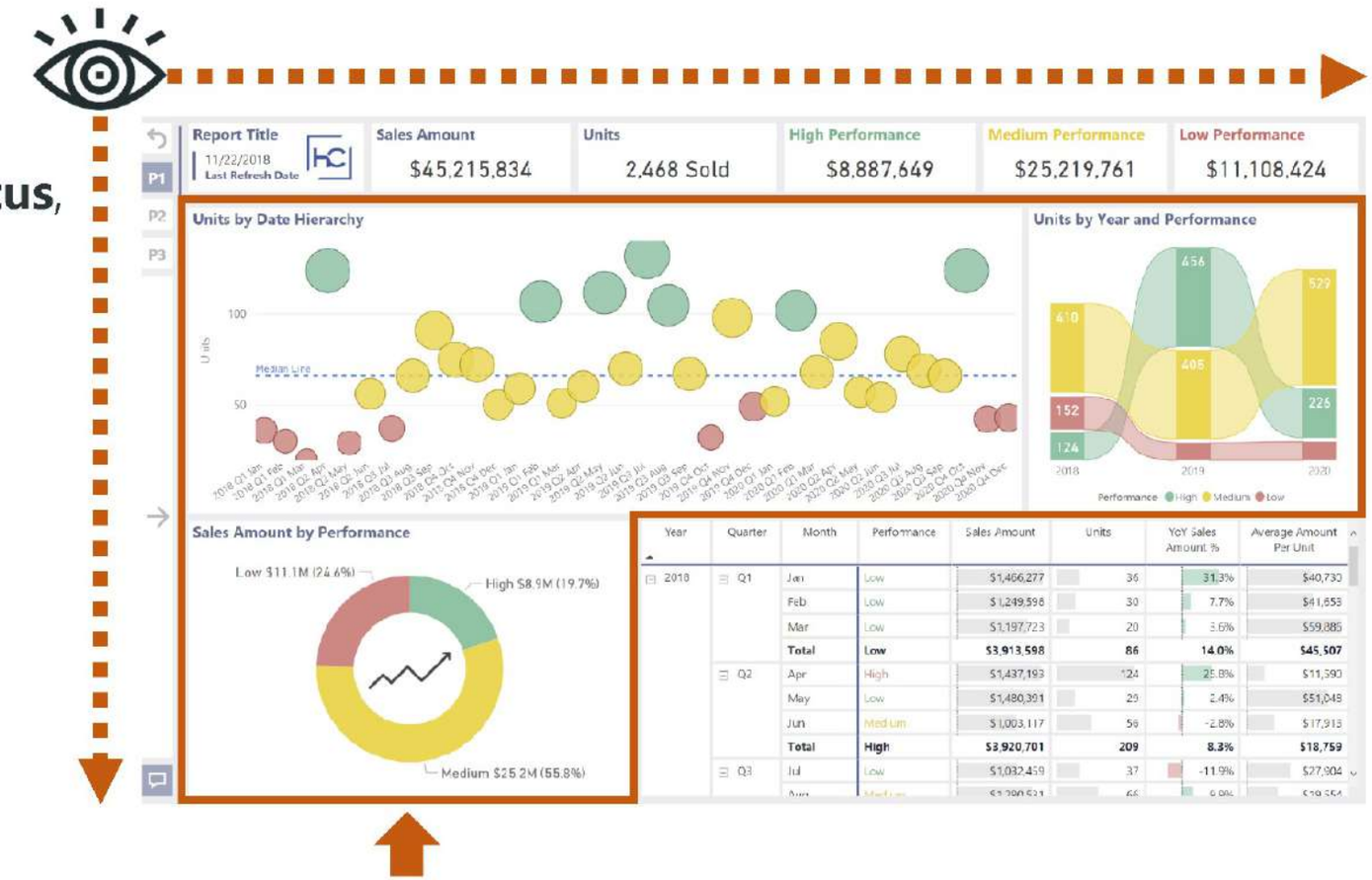
2. **Summarized Information**
   - Visuals displaying **patterns** or **trends** in the data. Allowing additional insights to the KPI's

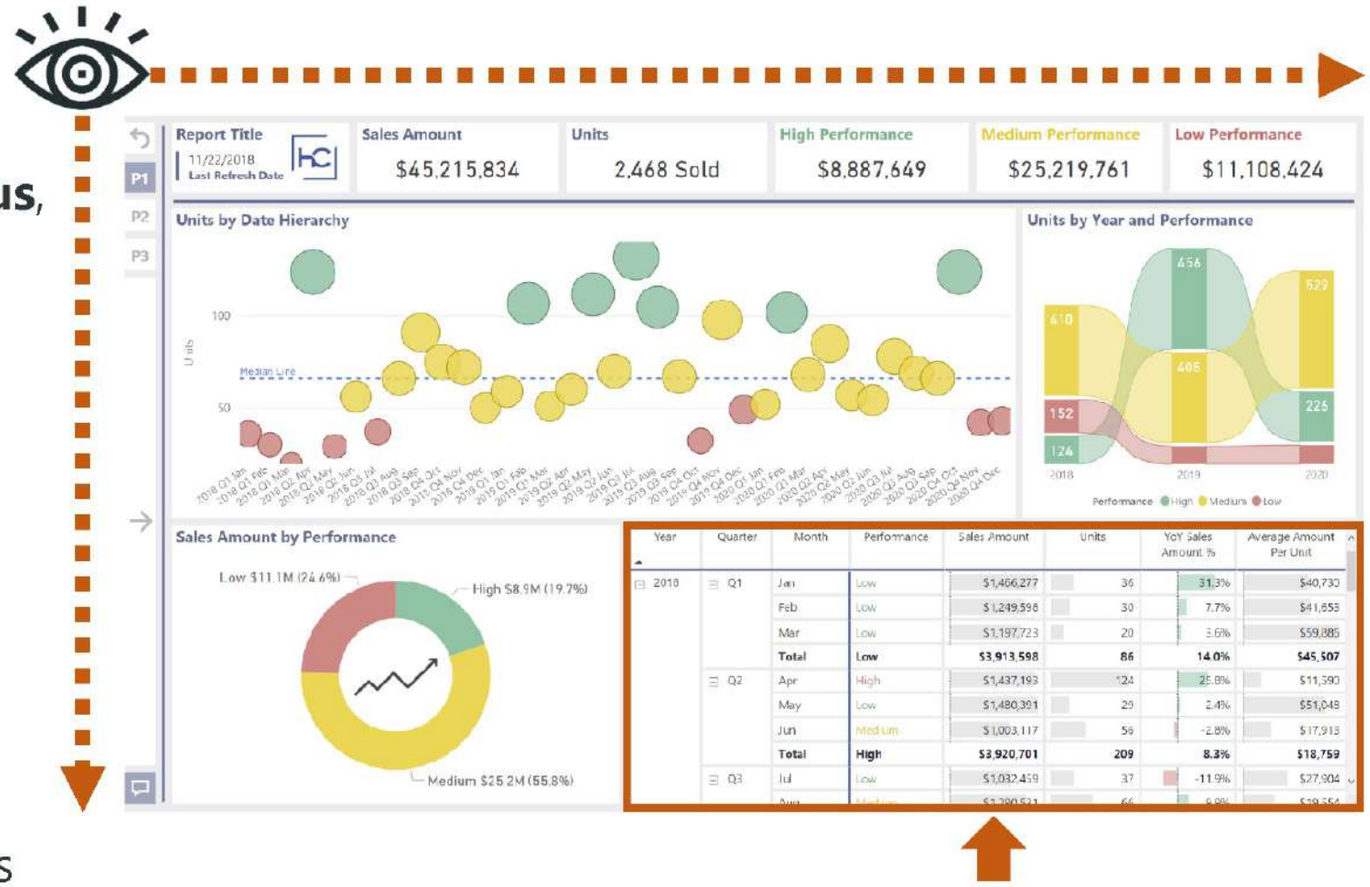


Design Principles

Information Processing ► Effective Report Organization

The data processing flow

1. **Key Performance Indicators (KPI's)**
   - Information pertaining to the **status**, **performance**, or **health** of the organization
2. **Summarized Information**
   - Visuals displaying **patterns** or **trends** in the data. Allowing additional insights to the KPI's
3. **Detailed Information**
   - Tables containing **specific detail** about the patterns or trends. Providing **explanation** to variances in the data



Design Principles

The S.C.R.A.P Methodology

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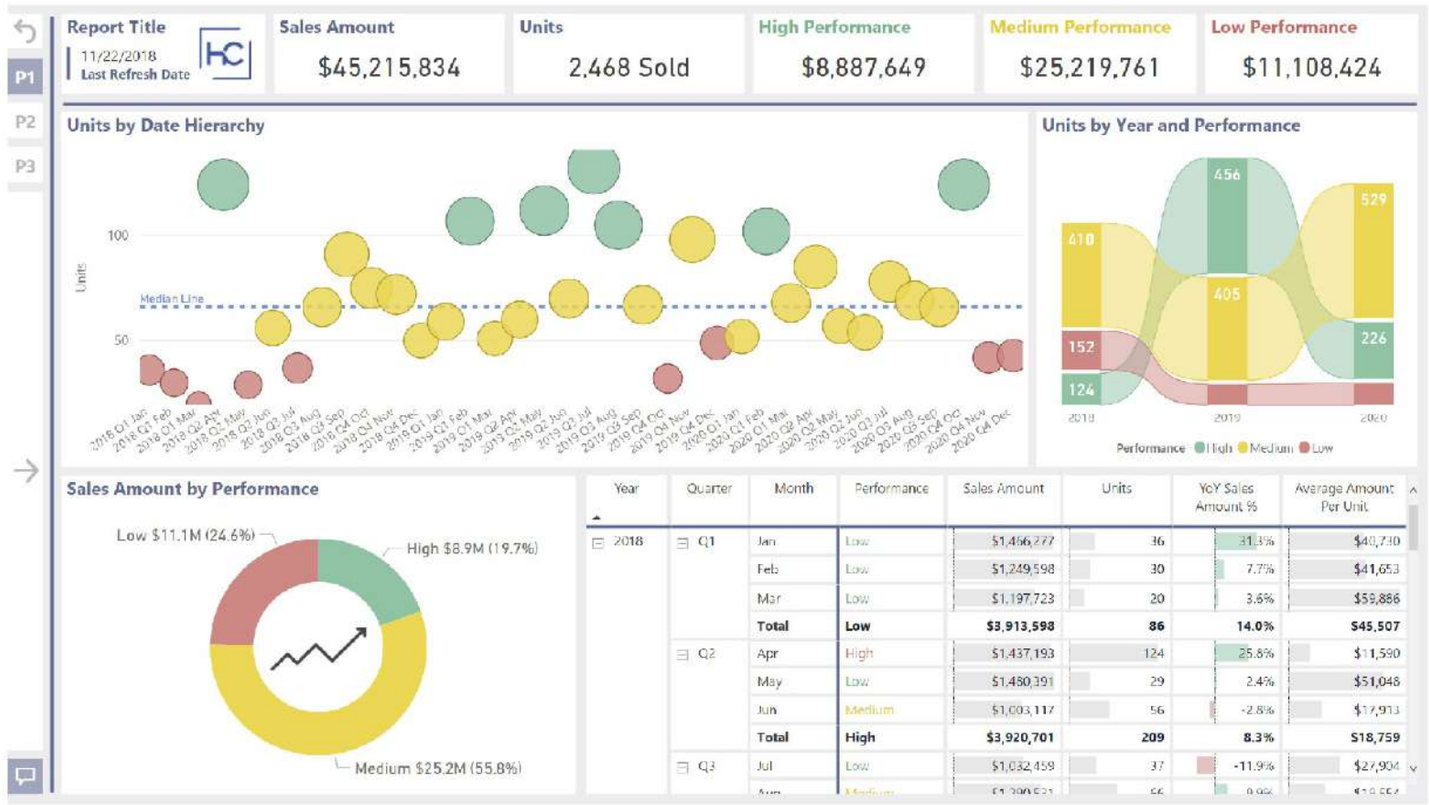
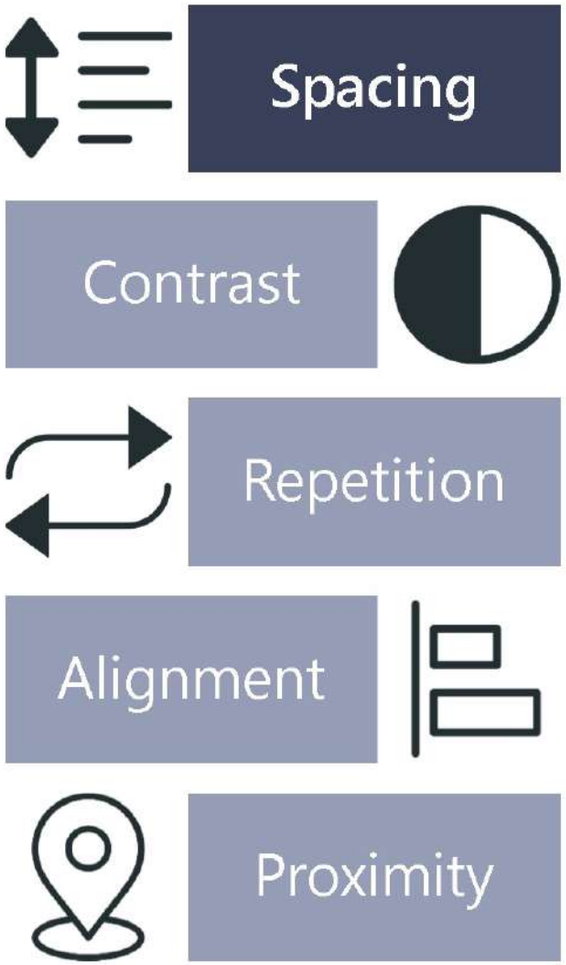
- Spacing
- Contrast
- Repetition
- Alignment
- Proximity

Report with applied methodologies



Design Principles

The S.C.R.A.P Methodology ► Spacing



General concept

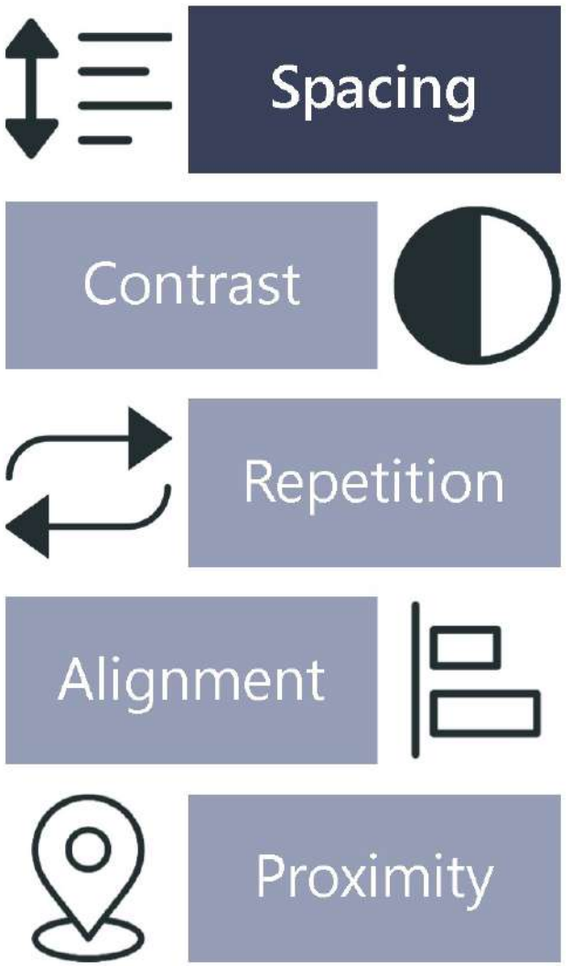
- **Space surrounding** or **between** the objects. Also known as **negative space**
- **Increases readability** by showing boundaries within objects

Spacing

No Spacing

Design Principles

The S.C.R.A.P Methodology ► Spacing



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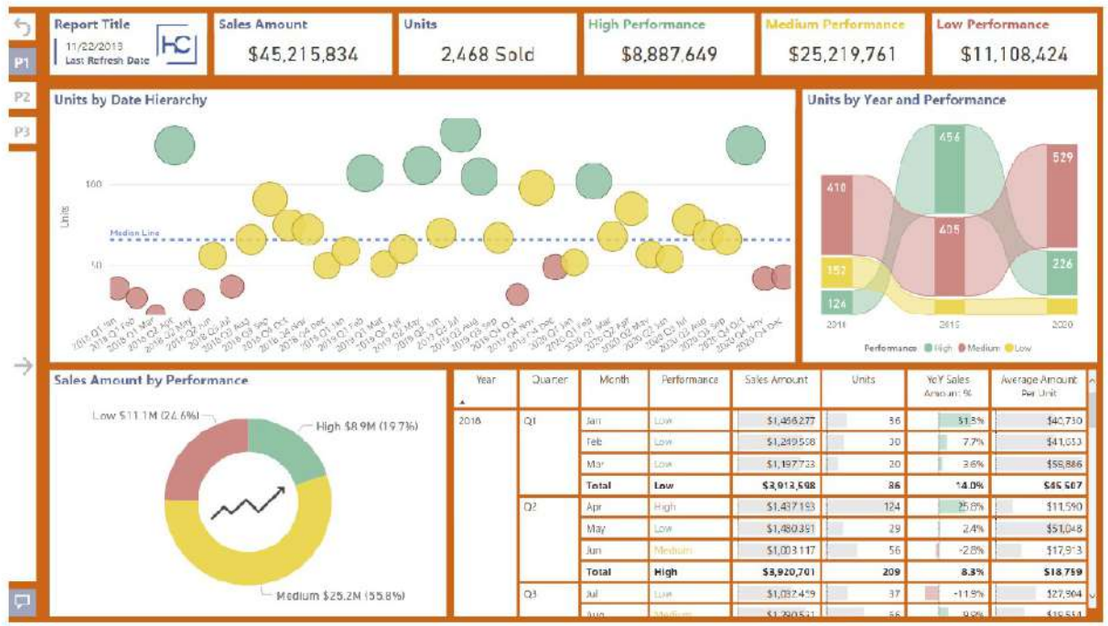
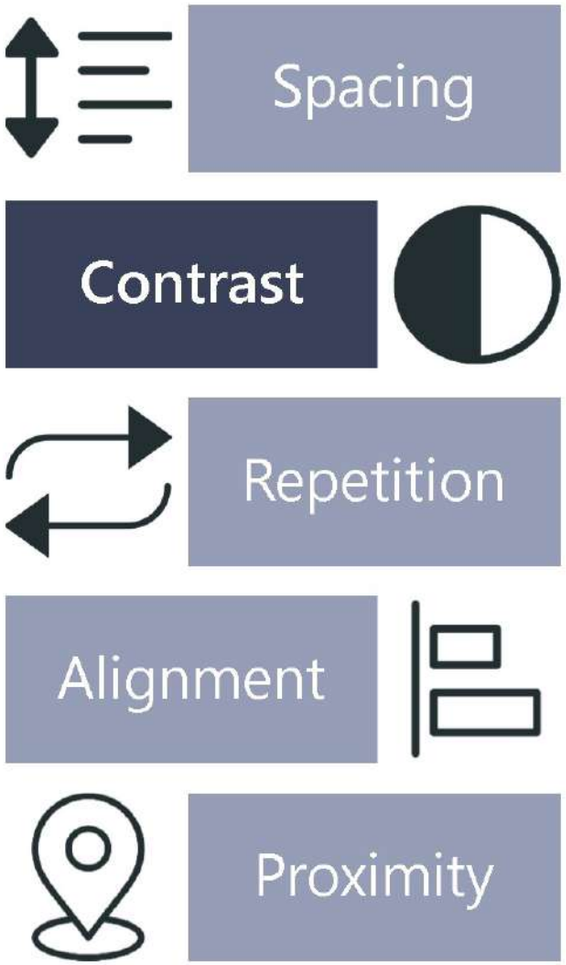
- Creates **clear boundaries** between objects



Design Principles

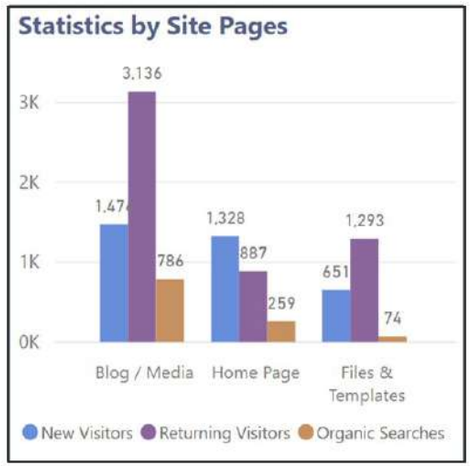
The S.C.R.A.P Methodology ► Contrast



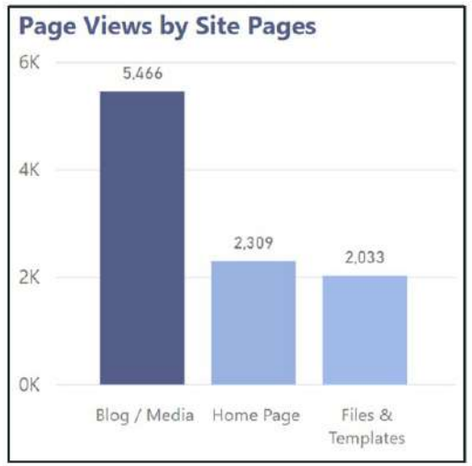
General concept

- Distinguishes elements to help **identify categories** or emphasize **key findings**

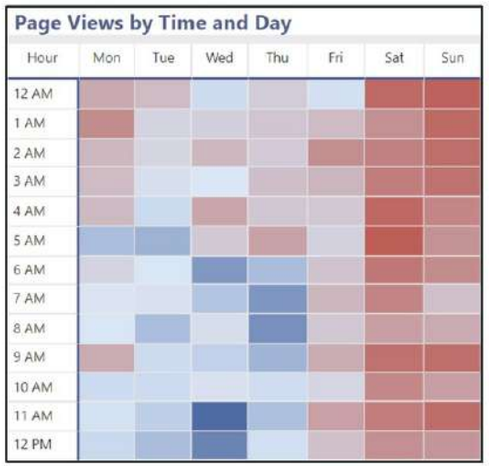
Categorical Colors



Sequential Colors

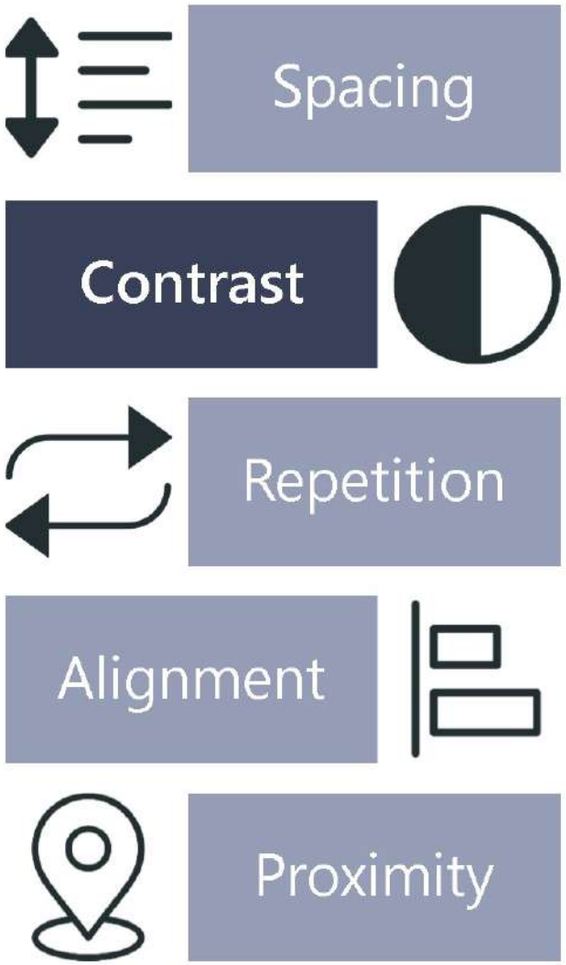


Diverging Colors



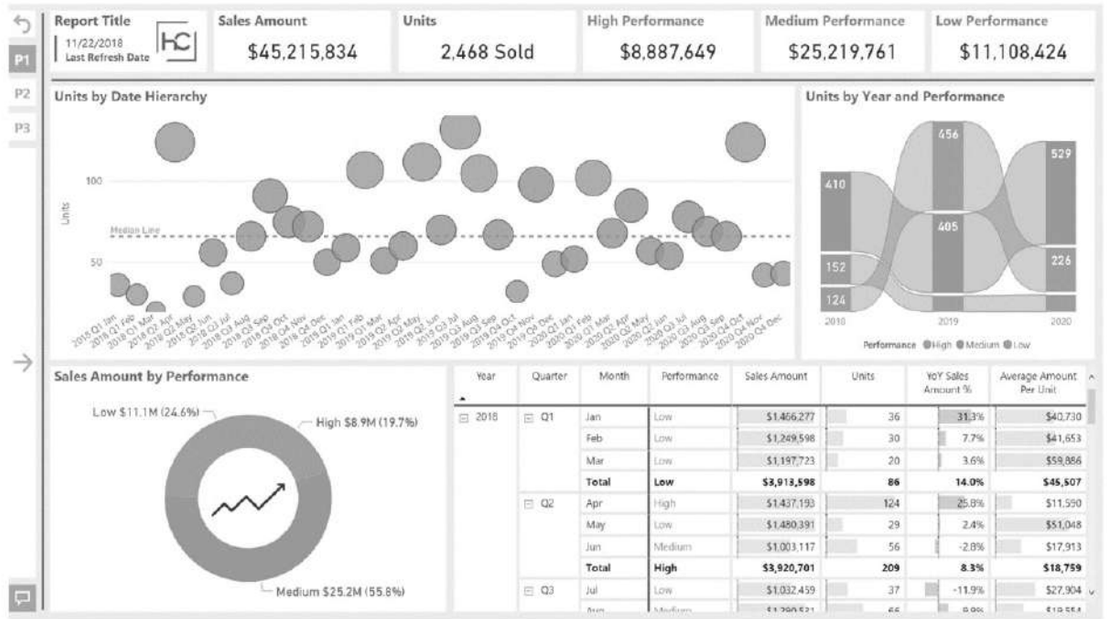
Design Principles

The S.C.R.A.P Methodology ► Contrast



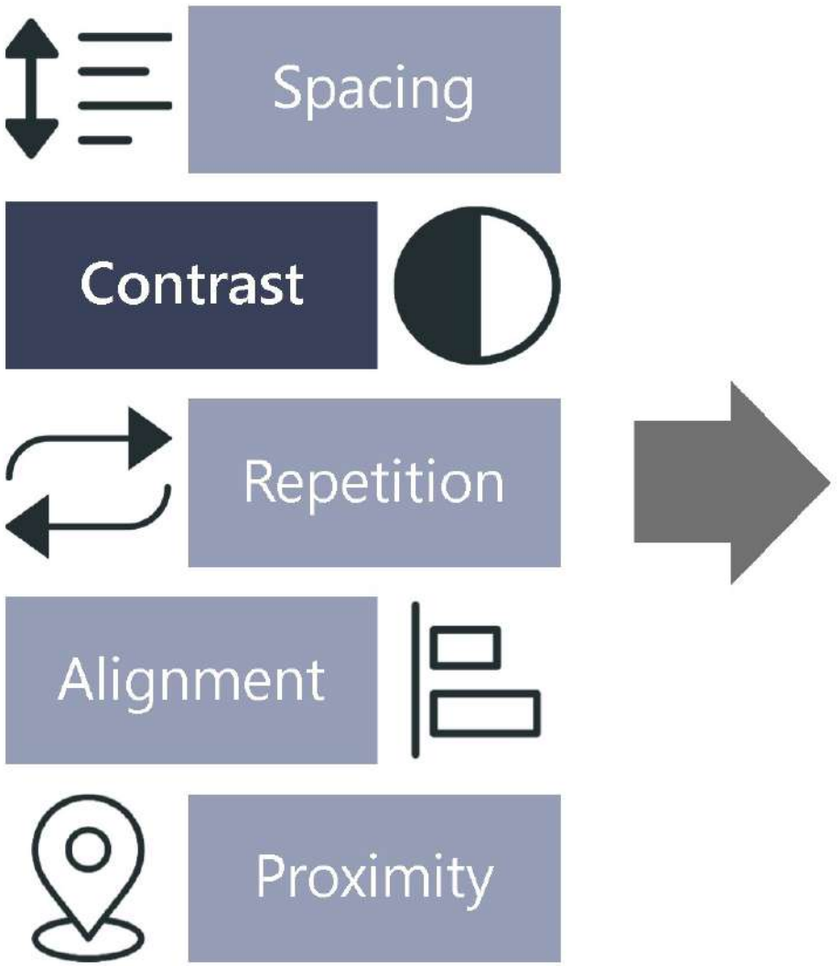
General concept

- Distinguishes elements to help **identify categories** or emphasize **key findings**
- **Color** is one of the most common forms of contrast



Design Principles

The S.C.R.A.P Methodology ► Contrast



General concept

- Distinguishes elements to help **identify categories** or emphasize **key findings**
- **Color** is one of the most common forms of contrast
- Contributes to the **squint test** requirements

Design Principles

The S.C.R.A.P Methodology ► Repetition

Spacing

Contrast

Repetition

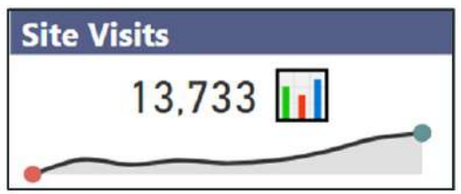
Alignment

Proximity

General concept

- Applying a **consistent pattern** or elements throughout the report design

Repetition

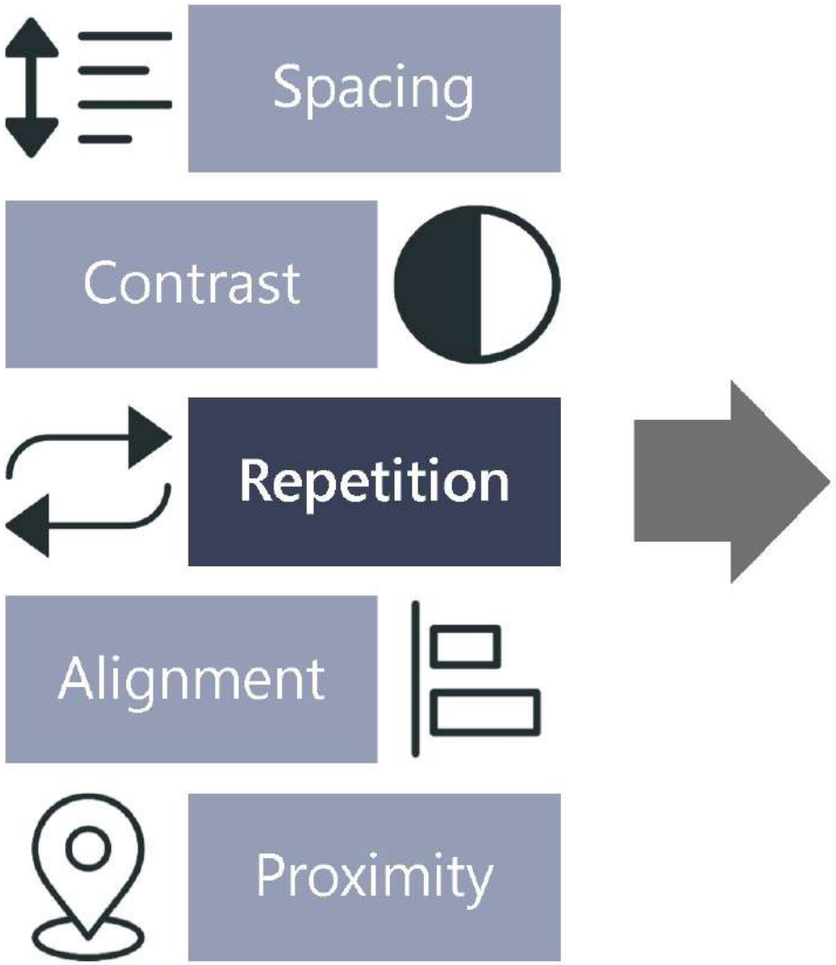


Repetition

No Repetition

Design Principles

The S.C.R.A.P Methodology ► Repetition



General concept

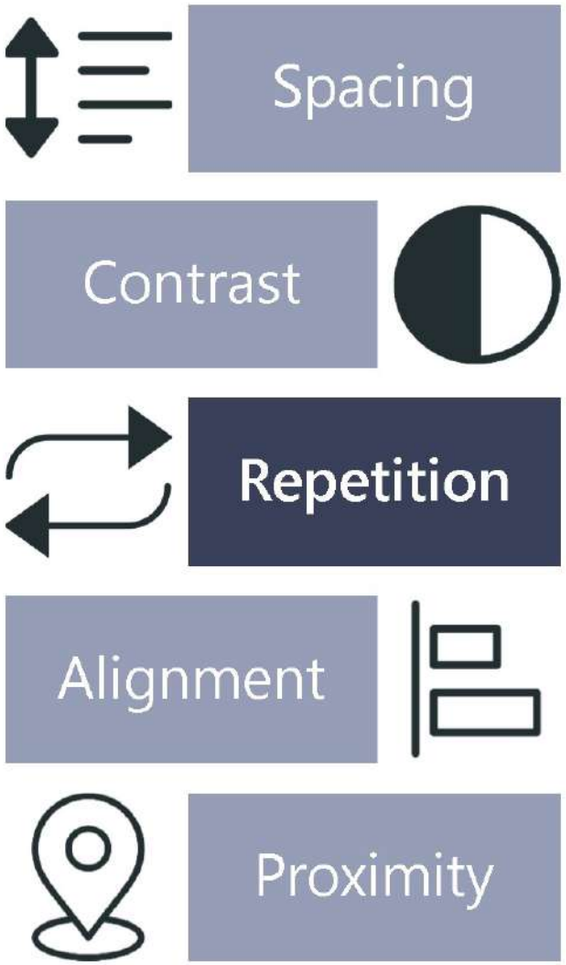
- Applying a **consistent pattern** or elements throughout the report design

No Repetition

Site Pages	Page Views	Unique Views	Searches	New Visitors	Returning Visitors
Blog / Media	5,466	4,550	786.0	1,476	3,136
Home Page	2,309	1,932	259.0	1,328	887
Files & Templates	2,033	1,644	74.0	651	1,293
Power BI Vs. Excel	1,658	1,535	1,123.0	1,193	434
About Us	786	673	324.0	358	404
What Is Power BI?	501	412	129.0	178	300
Consulting Services	313	267	10.0	25	275
Contact & Support	210	187	2.0	18	184
Online Courses	129	120	1.0	13	116
Total	**13,405**	**11,320**	**2,708.0**	**5,240**	**7,029**

Design Principles

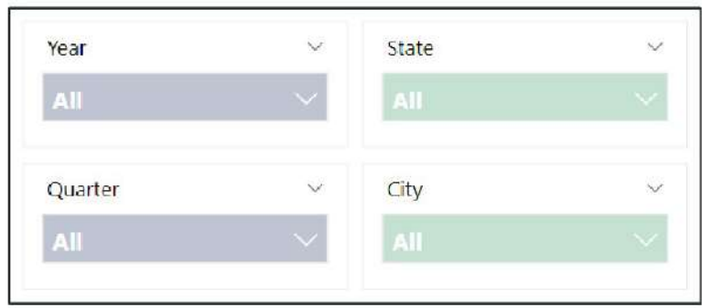
The S.C.R.A.P Methodology ► Repetition



General concept

- Applying a **consistent pattern** or elements throughout the report design
- Repetition can also **increase readability** by applying a specific pattern to groups, categories, or areas of a report

Repetition



No Repetition

Design Principles

The S.C.R.A.P Methodology ► Alignment

Spacing

Contrast

Repetition

Alignment

Proximity

General concept

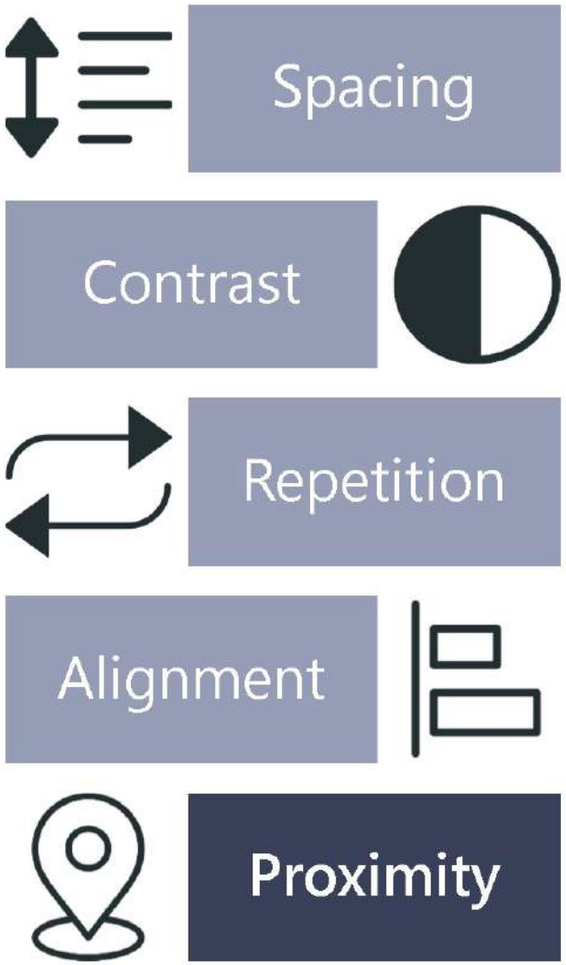
- **Edges of objects** are aligned with the edges of other objects
- Creates the perception that every object is **connected via an invisible line**, and that nothing is placed at random

Alignment

No Alignment

Design Principles

The S.C.R.A.P Methodology ► Proximity



General concept

- **Group related objects** together to show a relationship
- Applicable to **objects within a report**

Proximity

New Site Visitors	Returning Visitors	Total Visitors	Organic Searches
5,268	7,317	12,585	2,712

No Proximity

New Site Visitors	Returning Visitors	Organic Searches	Total Visitors
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Design Principles

The S.C.R.A.P Methodology ► Proximity

Spacing

Contrast

Repetition

Alignment

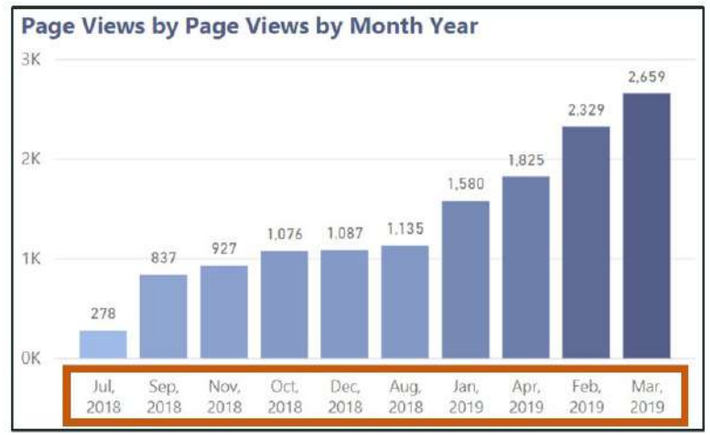
Proximity

General concept

- **Group related objects** together to show a relationship
- Applicable to **objects within a report**
- Applicable to **elements within an object**

Proximity

No Proximity



Design Principles

Color Theory

Color wheel definition

- Visual representation of **color hues** arranged according to their **chromatic relationship**

The color wheel

Design Principles

Color Theory

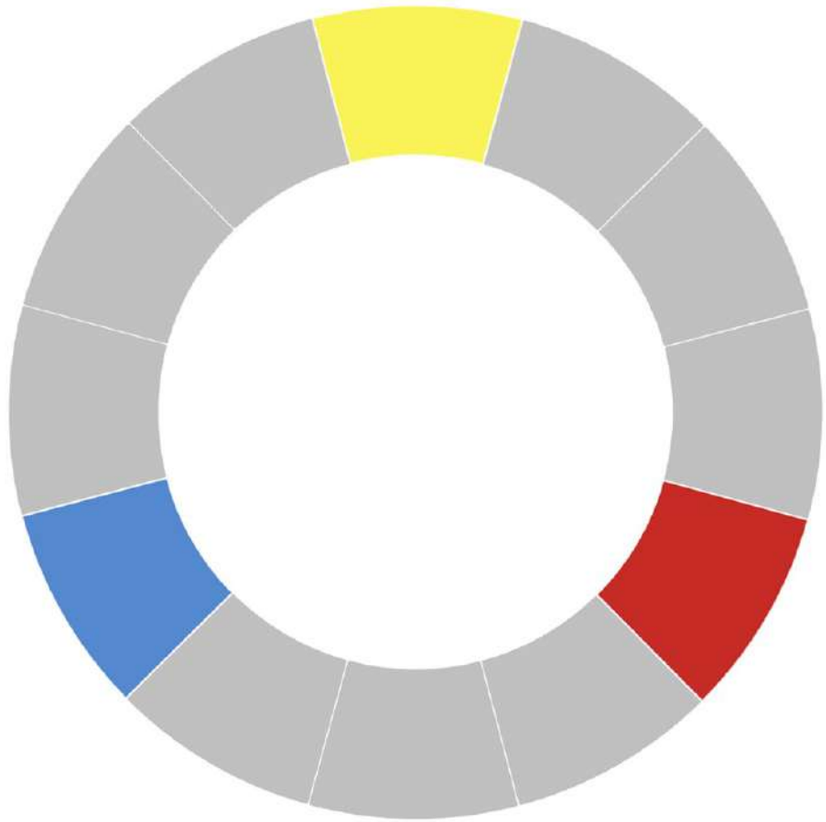
Color wheel definition

- Visual representation of **color hues** arranged according to their **chromatic relationship**

Primary vs. secondary colors

- Primary colors
  - **Cannot be created** by combining two or more colors together
  - All other colors are derived from these hues

The color wheel



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Primary vs. secondary colors

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  - **Cannot be created** by combining two or more colors together
  - All other colors are derived from these hues
- Secondary colors
  - Colors that are formed by **combining** the primary colors

The color wheel

Design Principles

Color Theory ► Color Harmony

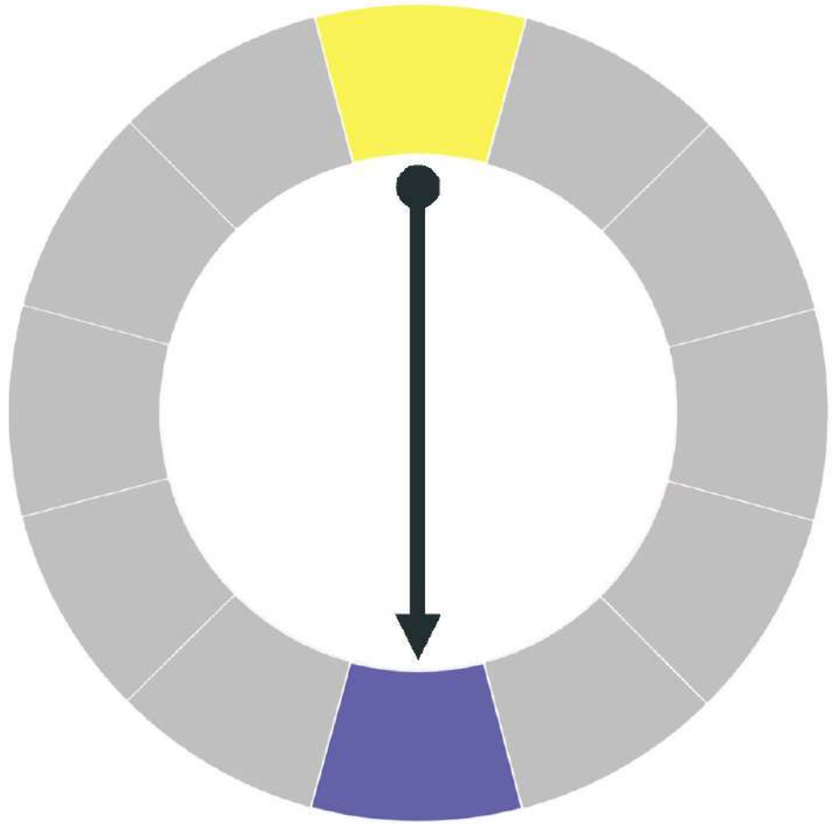
Color harmony definition

- Using a **combination of colors** that is **harmonious** to the human eye

Types of color harmony

- Complementary
  - Most basic type of harmony. It is the **opposite point** of the key color on the wheel.
  - Most other harmonies are **variations of this harmony** (apart from the analogous harmony)

The color wheel



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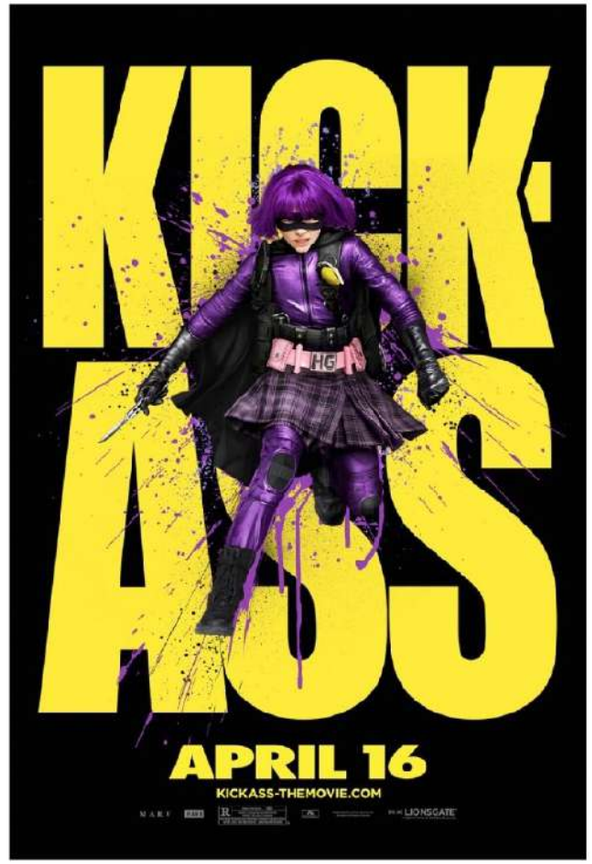


Design Principles

Color Theory ► Color Harmony

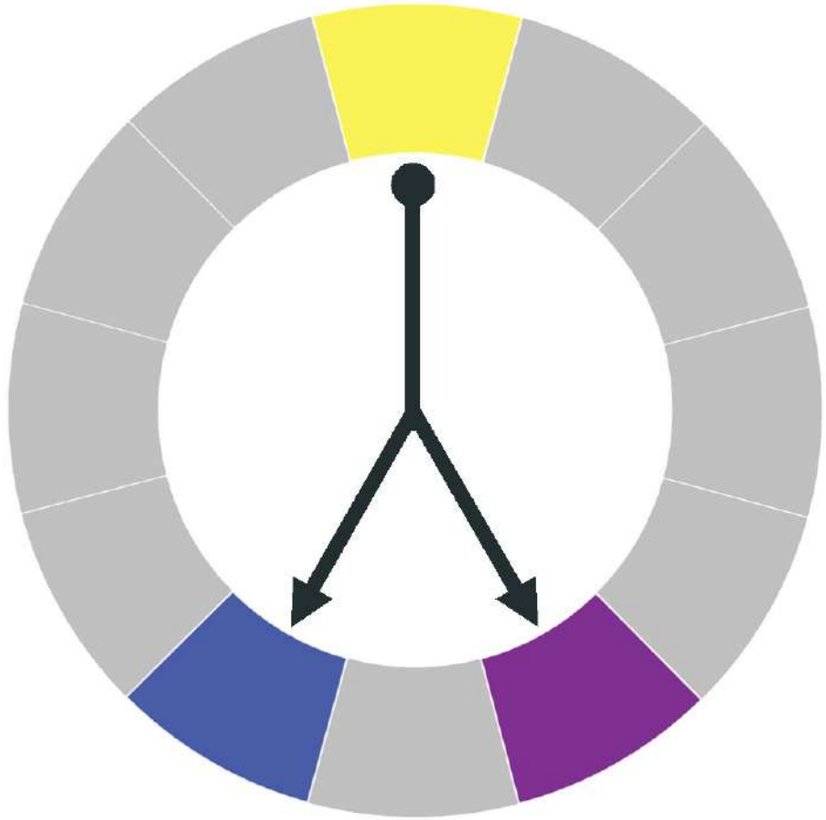
Color harmony definition

- Using a **combination of colors** that is **harmonious** to the human eye

Types of color harmony

- Split complementary
  - Uses the colors **one space away** from the key color.
  - Allows for a **broader range of colors**, while maintaining the basic harmony between the complementary colors

The color wheel



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Color Theory ► Color Harmony

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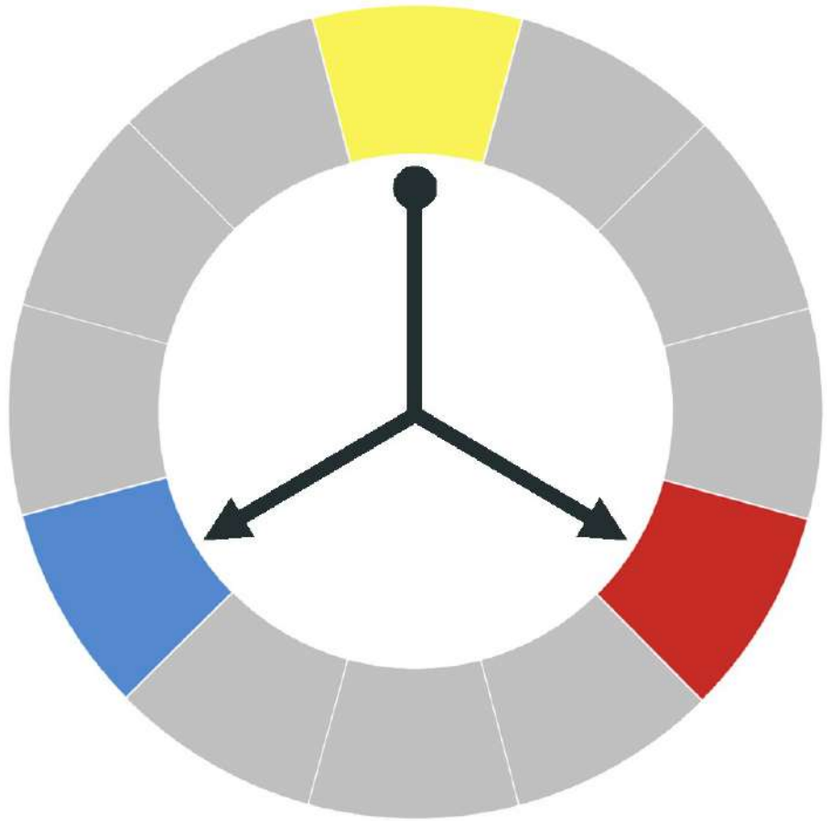
- Using a **combination of colors** that is **harmonious** to the human eye

Types of color harmony

- Triadic
  - Uses the colors **two spaces** away from the key color
  - Essentially allows the use of **three equidistant colors** on the wheel
  - Further apart, and therefore **less harmonious**

The color wheel



Design Principles

Color Theory ► Color Harmony

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Color Theory ► Color Harmony

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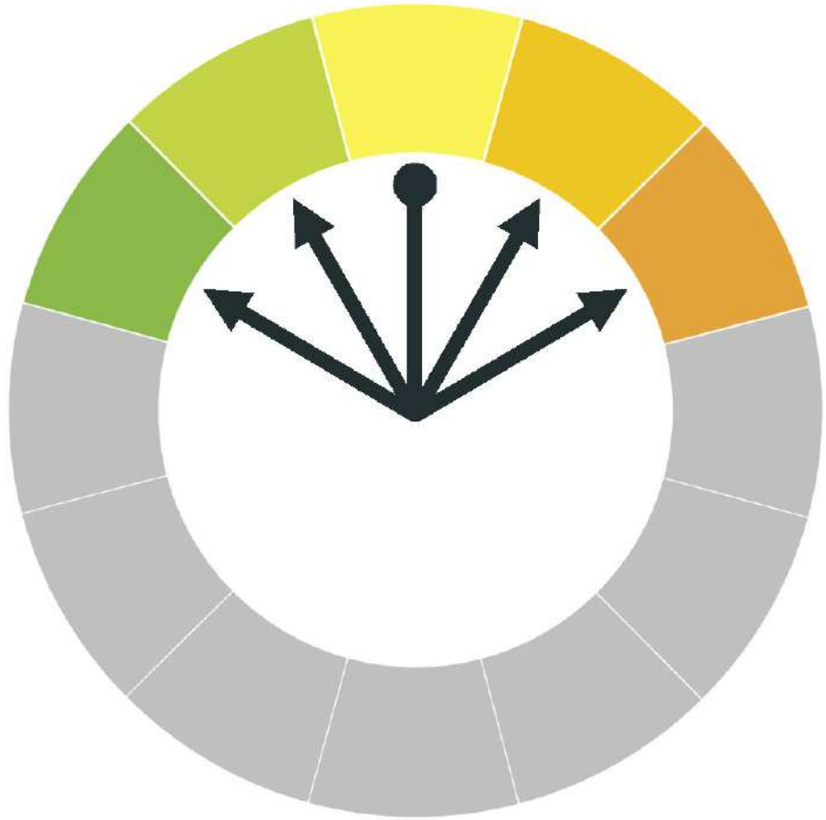
Types of color harmony

- Analogous
  - Colors that are **directly** to the **left or right** of the key color
  - Also known as **related colors**
  - Closest together, with the **least color variation**

The color wheel



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The color wheel

Design Principles

Color Theory ► Color Harmony

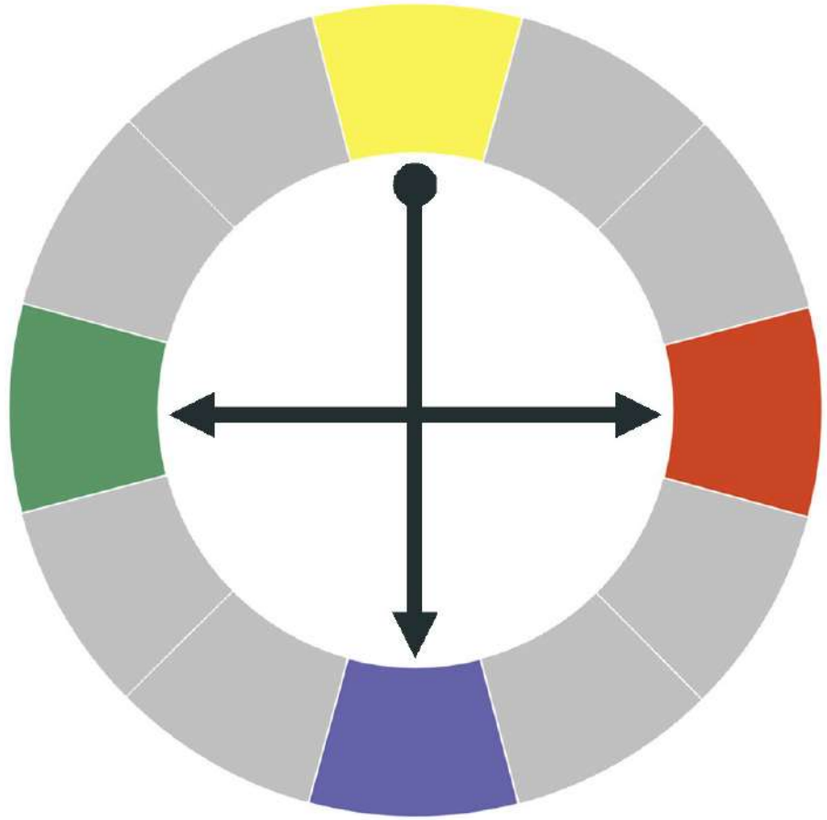
Color harmony definition

- Using a **combination of colors** that is **harmonious** to the human eye

Types of color harmony

- Tetradic
  - Similar to **triadic**, but with **four** colors all **equidistant** on the wheel
  - Essentially is using **two sets** of complementary colors
  - Greatest amount of **color variation**

The color wheel



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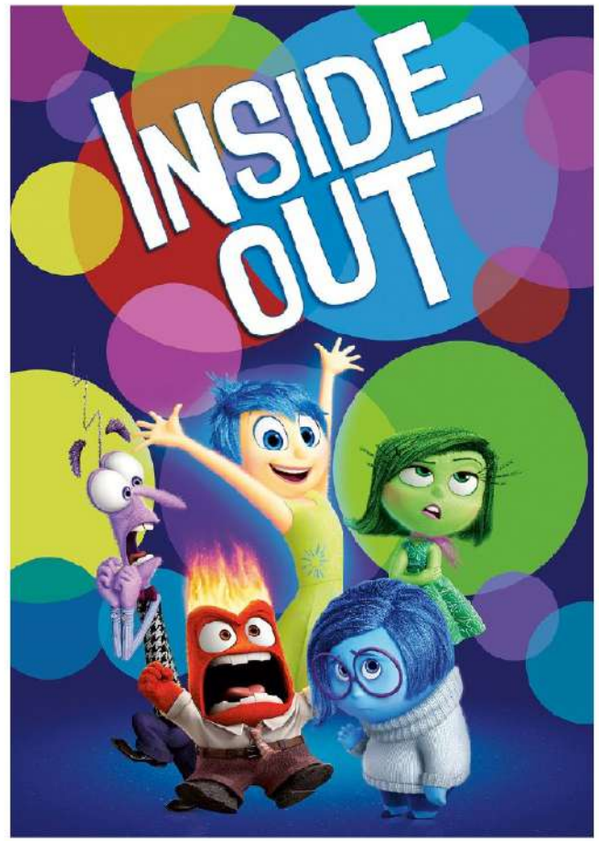


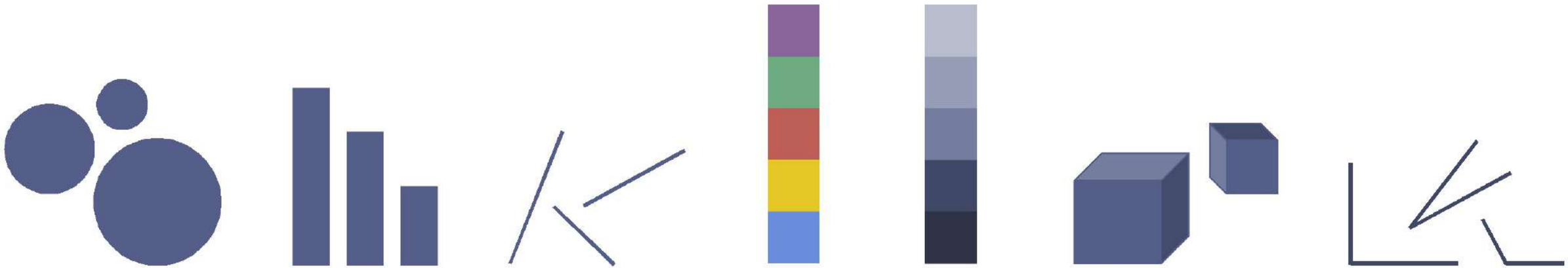
Design Principles

Visual Cues

General methodology

- Visualizations **translate** variances in data by utilizing different visual cues
- Each visual cue is **interpreted** differently by the human brain

Types of visual cues



VISUAL CUES ARE NOT CREATED EQUAL

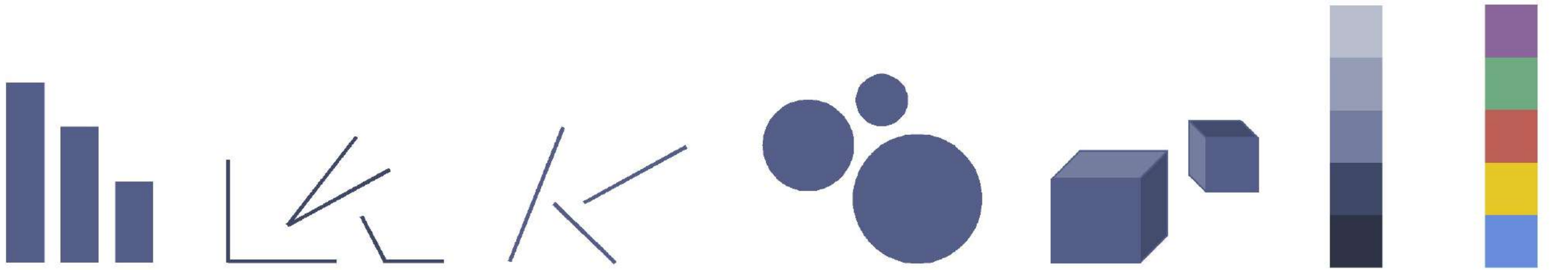
Design Principles

Visual Cues ► Ranked

General methodology

- Visualizations **translate** variances in data by utilizing different visual cues
- Each visual cue is **interpreted** differently by the human brain

Visual cues ranked by accuracy



Design Principles

Visual Cues ► Accuracy Influencers

What influences accuracy?

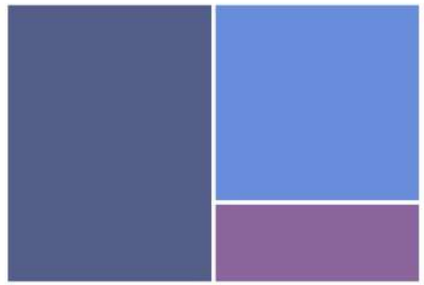
Alignment

- Objects on an **aligned scale** increase accuracy when comparing values
- Studies show length aligned on a single axis is the most accurate representation of data

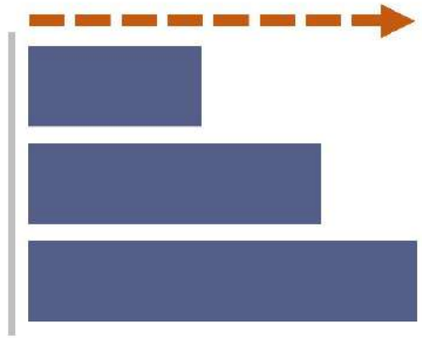
Direction

- Objects on an axis that follow a **single direction** also increase accuracy, when comparing values

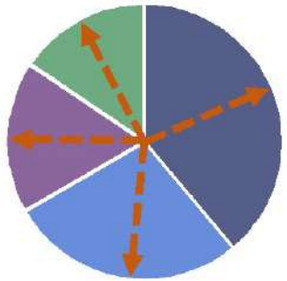
Length (Aligned)



Tree Map



Bar Chart



Pie Chart

Design Principles

Visual Categories

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sqlbi OKViz

THE VISUALS REFERENCE
— FOR MICROSOFT POWER BI —

SEP. 2018
http://sql.bi/visual-reference

PART-TO-WHOLE

Display the parts of a measure

DISTRIBUTION

Display the distribution of a measure

CORRELATION

Display relations between measures

SINGLE

Display single values

FILTER

Control report filters

NARRATIVE

Tell a story with data

MISCELLANEOUS

Recommended | There is a better alternative | Don't use in the category | Built-in visual | Certified visual | R required

Design Principles

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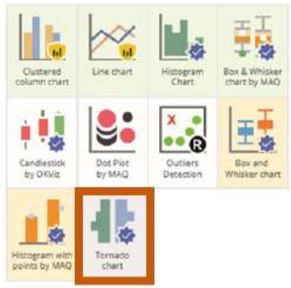

CORRELATION

Display relations between measures

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Display single values

FILTER

Control report filters

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Tell a story with data

MISCELLANEOUS

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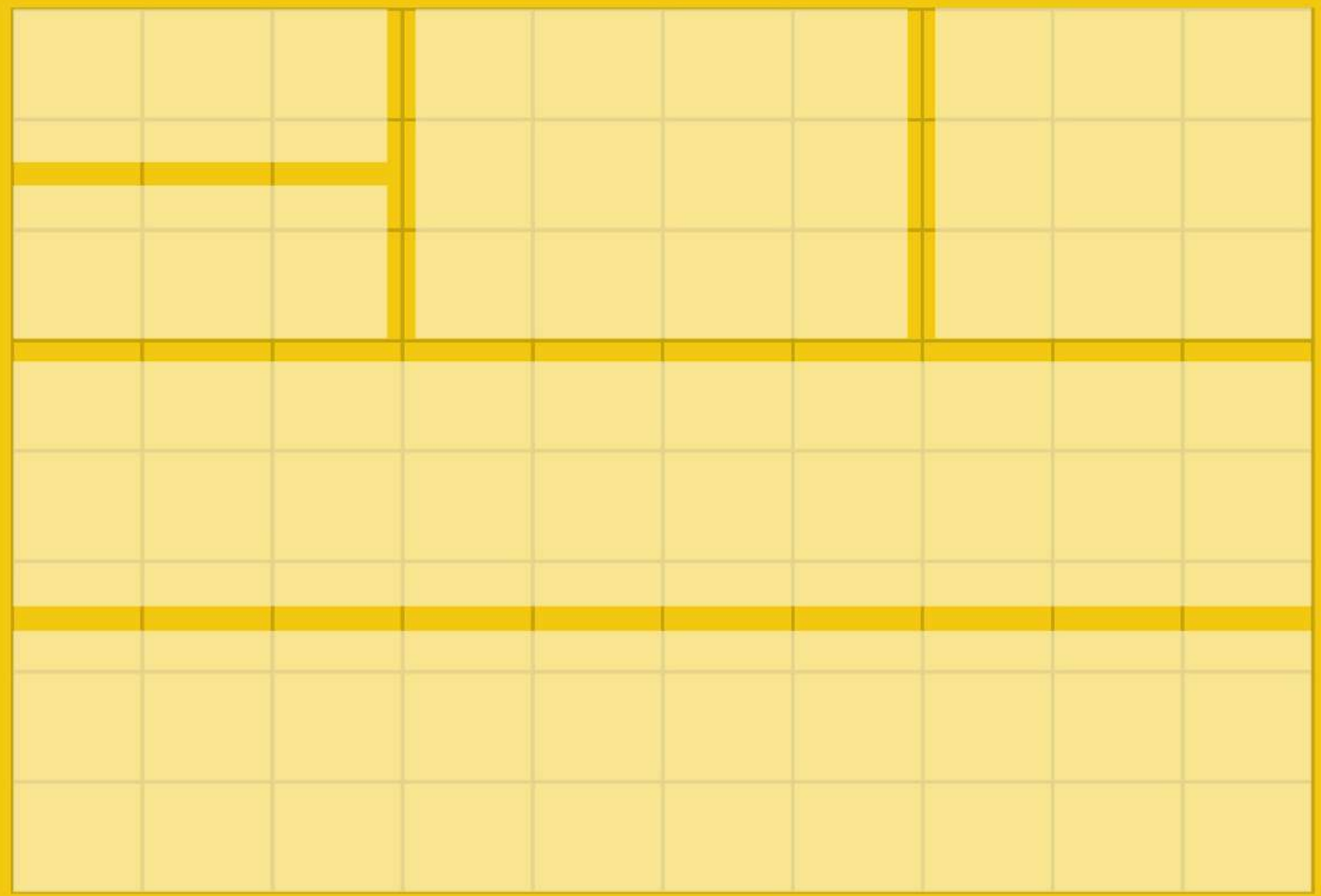
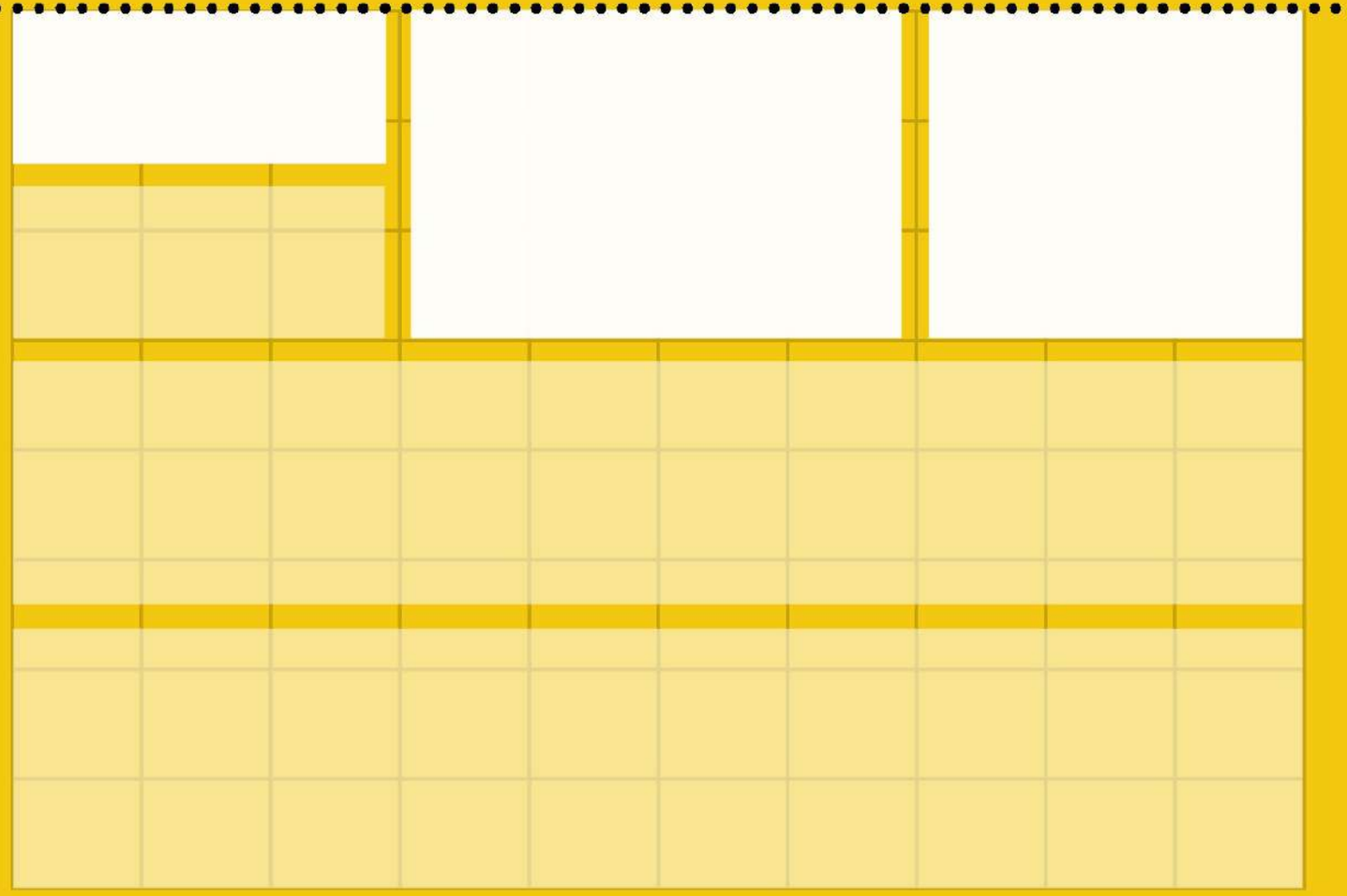
8 RULES

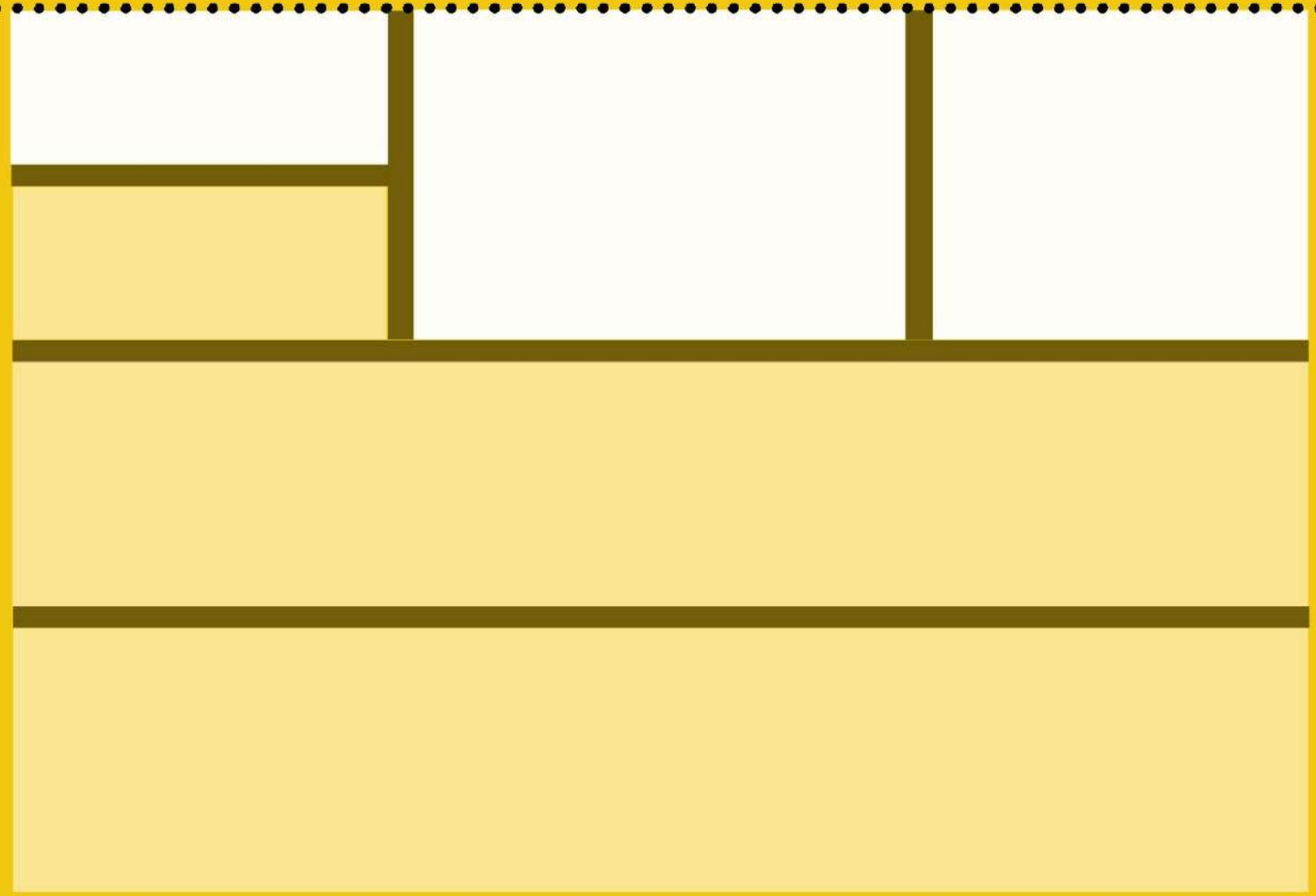
Designing reports and dashboards in Power BI



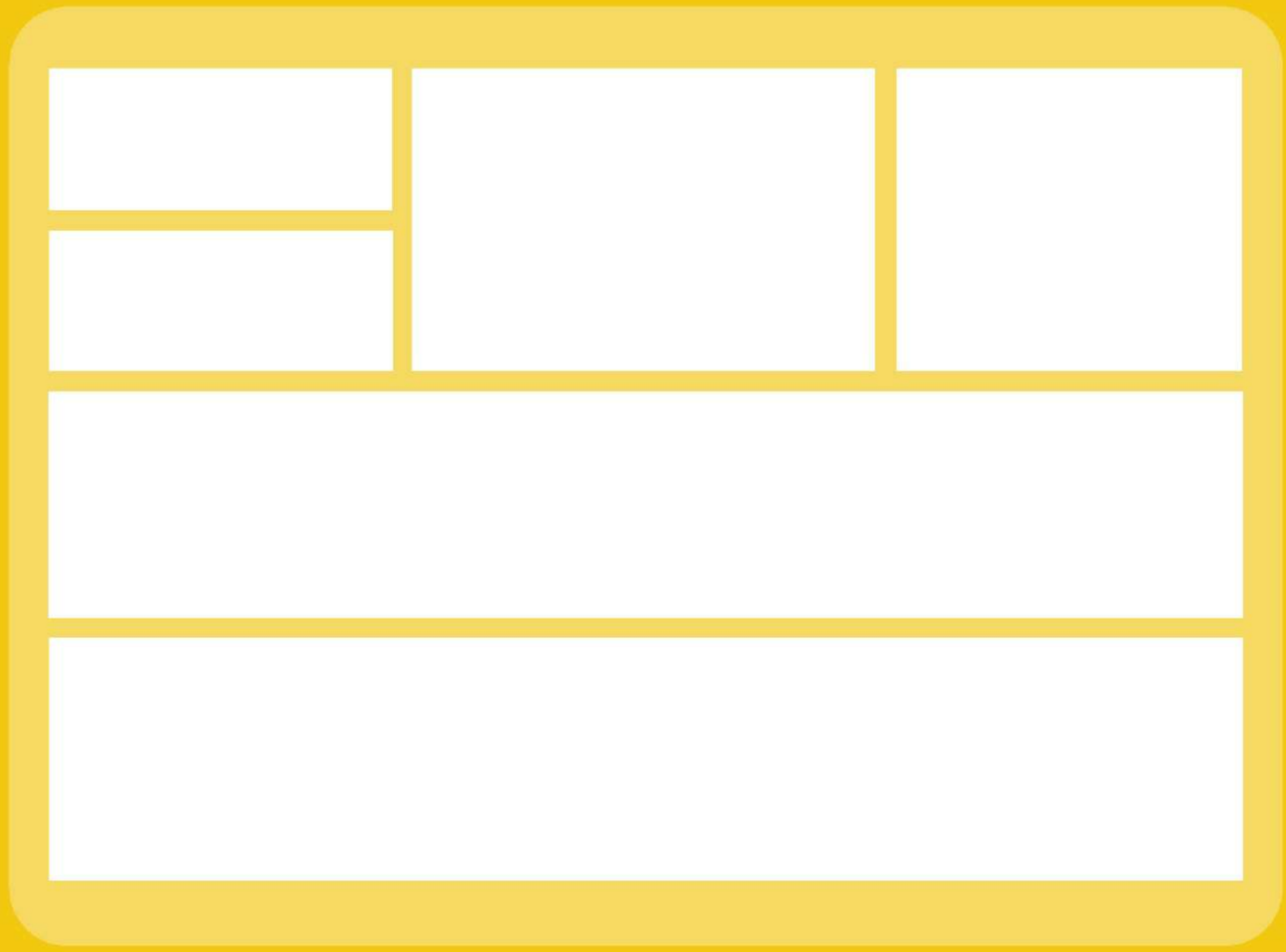
1.
Always use a Grid



2.
Use a correct Alignment



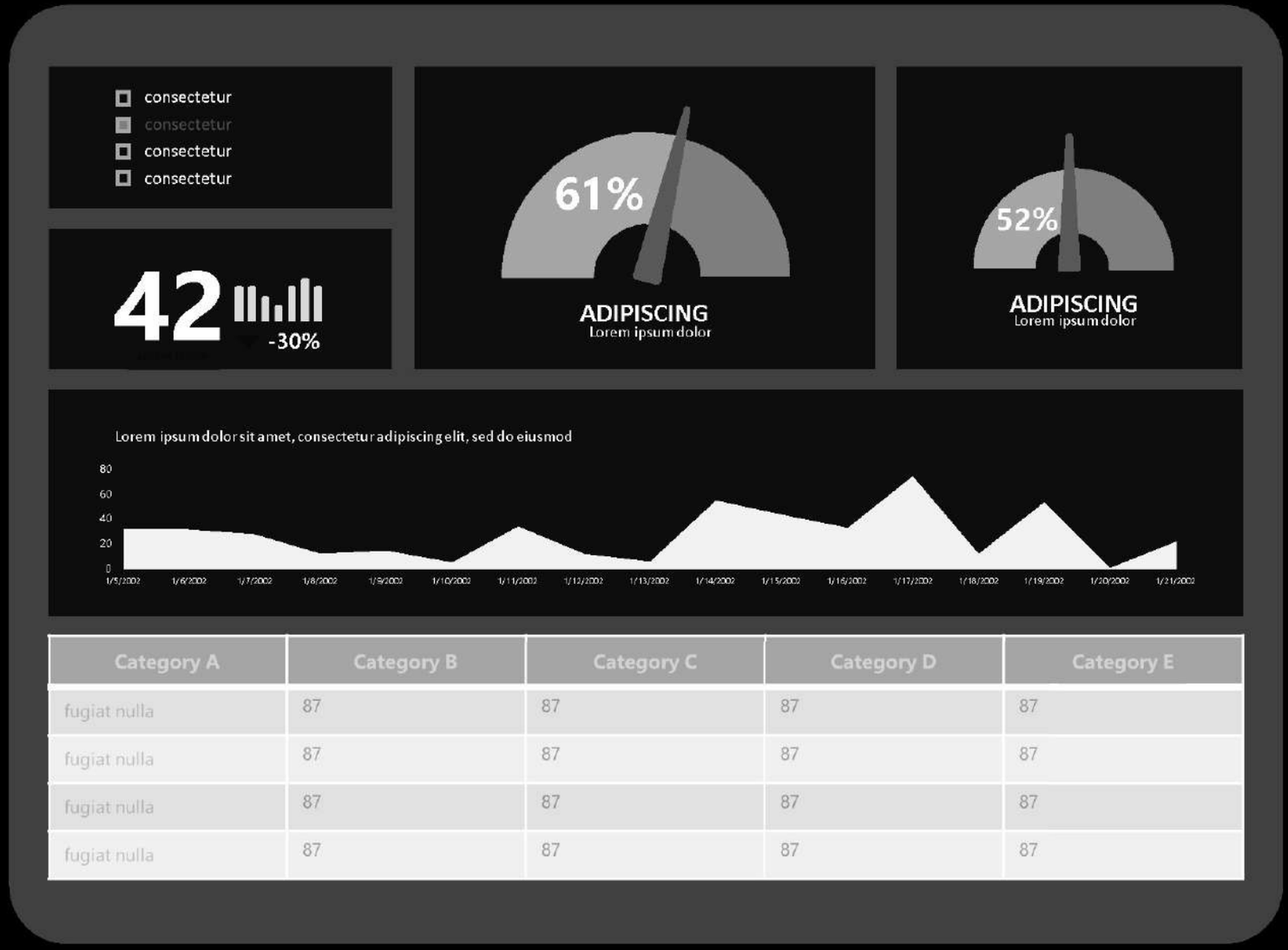
3.
Appropriate Spacing



4.
Select the right Background

Category A	Category B	Category C	Category D	Category E
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87

5.
Simpler
Is better!



Category A	Category B	Category C	Category D	Category E
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87

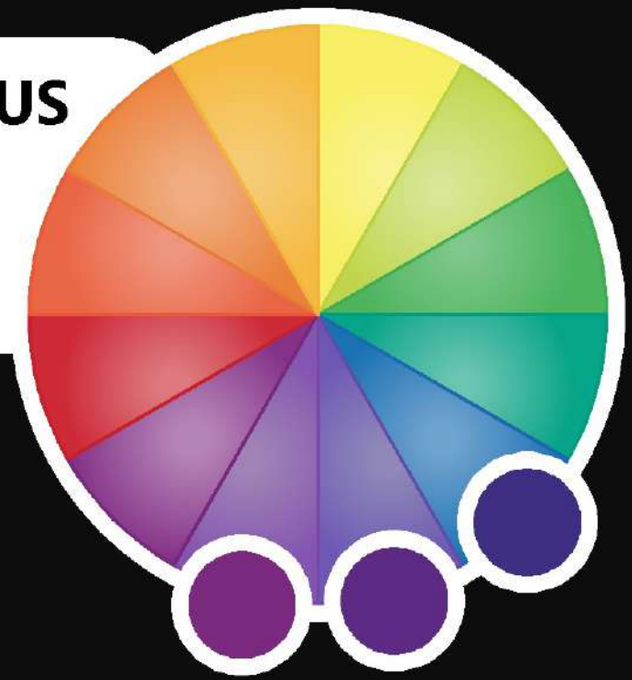
6.

Use Negative Space wisely

7. Choose your Color palette

ANALOGOUS
Colors

<4

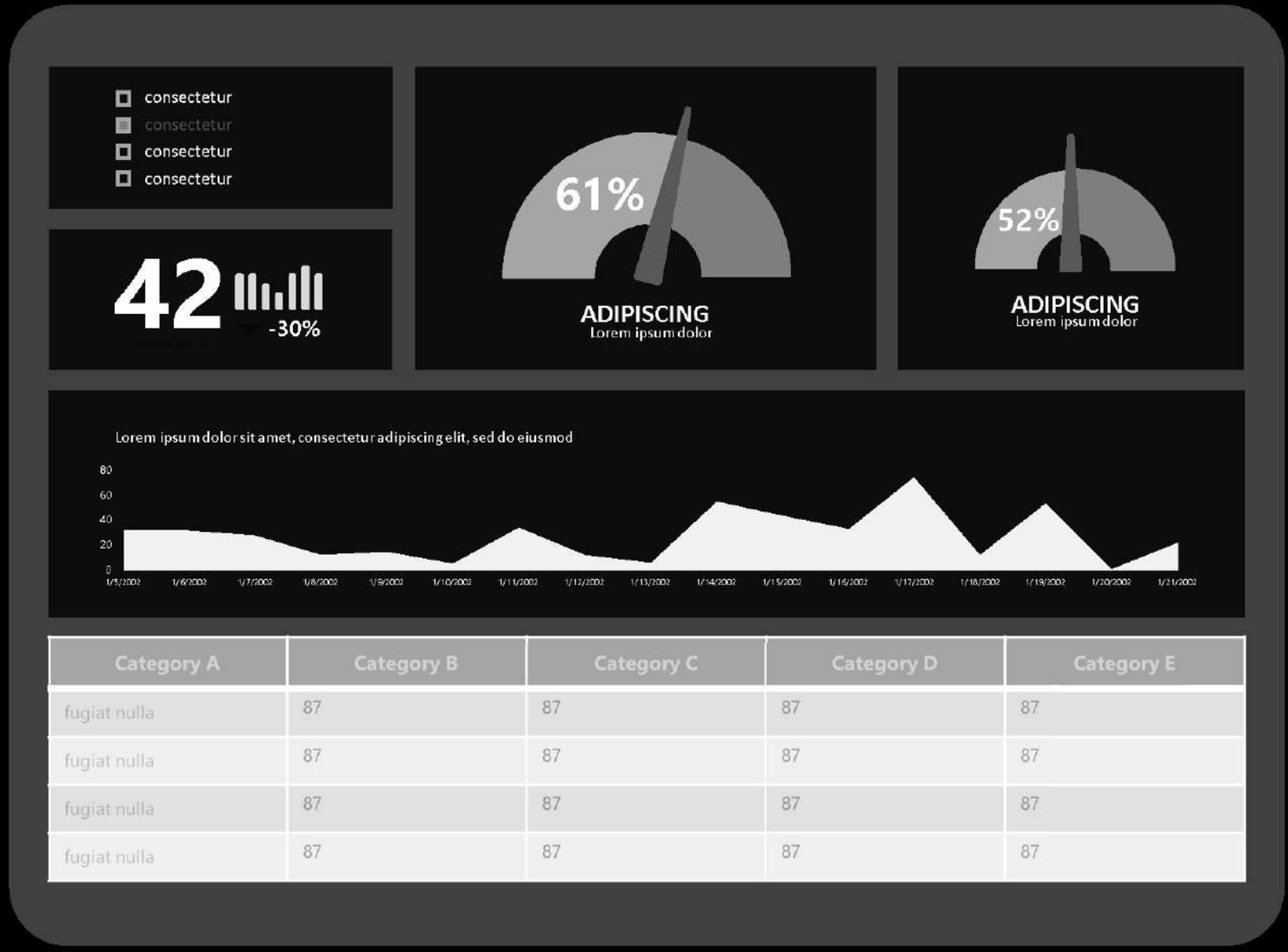


TRIADIC
Color

<4

MONOCHROMATIC
Color

<6

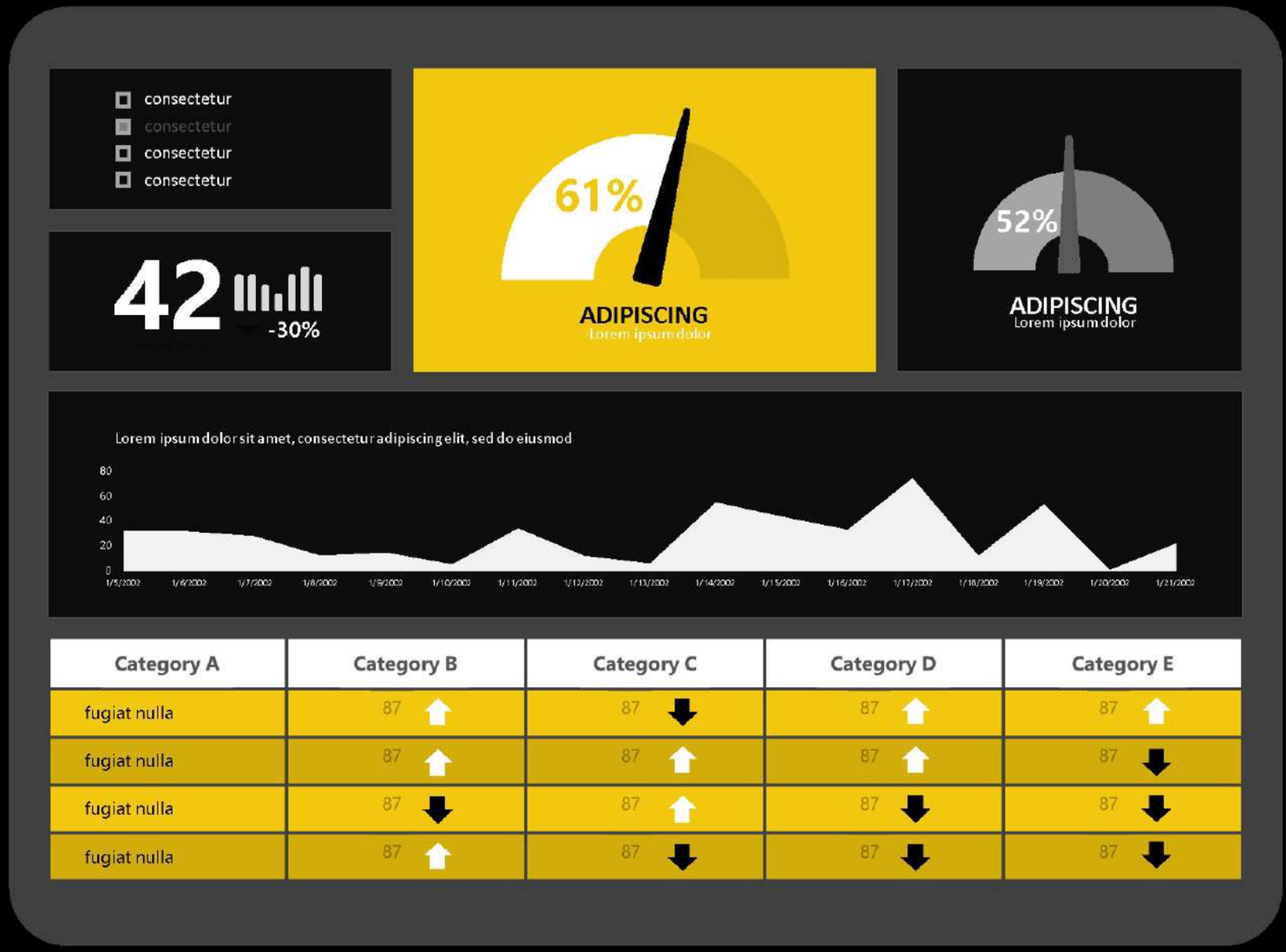


Category A	Category B	Category C	Category D	Category E
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87
fugiat nulla	87	87	87	87

8.

Enhance

the important parts of a page

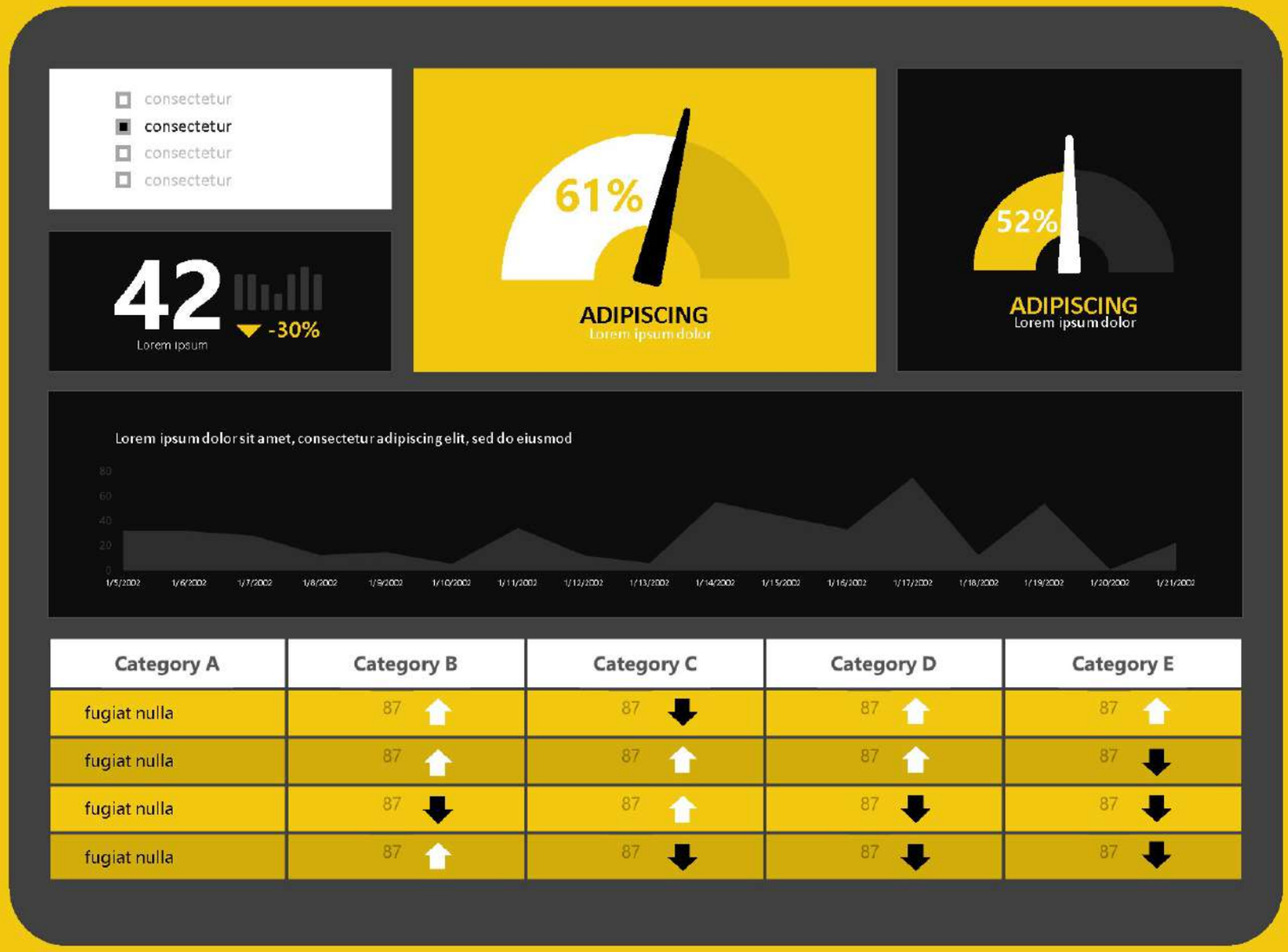


Category A	Category B	Category C	Category D	Category E
fugiat nulla	87 ↑	87 ↓	87 ↑	87 ↑
fugiat nulla	87 ↑	87 ↑	87 ↑	87 ↓
fugiat nulla	87 ↓	87 ↑	87 ↓	87 ↓
fugiat nulla	87 ↑	87 ↓	87 ↓	87 ↓

8.

Enhance

the important parts of a page



Category A	Category B	Category C	Category D	Category E
fugiat nulla	87 ↑	87 ↓	87 ↑	87 ↑
fugiat nulla	87 ↑	87 ↑	87 ↑	87 ↓
fugiat nulla	87 ↓	87 ↑	87 ↓	87 ↓
fugiat nulla	87 ↑	87 ↓	87 ↓	87 ↓

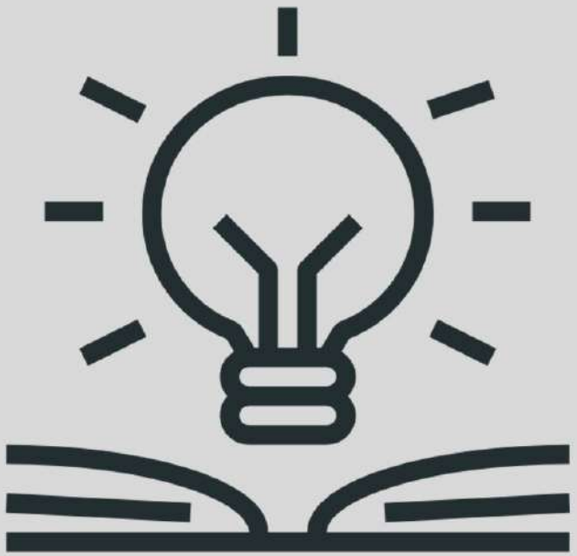
Success!!!

Thanks!

Slides

By Miguel Myers

Questions? @HavensBI



Knowledge Check

Design Principles

How do we **process information?**

Left to Right

Top to Bottom

What does **S.C.R.A.P** stand for?

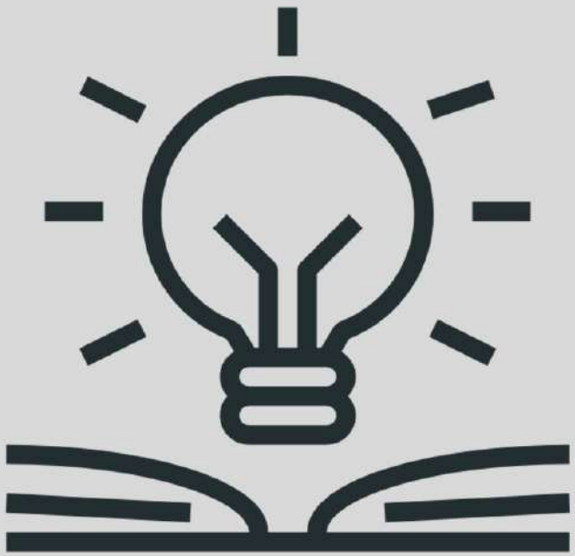
Spacing

Contrast

Repetition

Alignment

Proximity

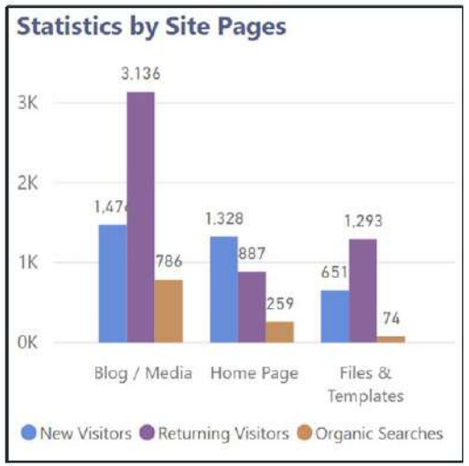


Knowledge Check

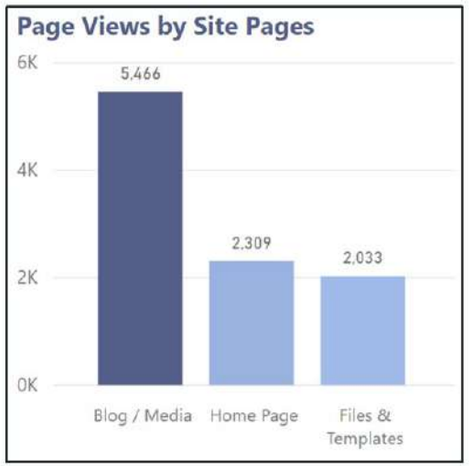
S.C.R.A.P Methodology

What are the **three types** of **color contrast** that can be used to distinguish elements?

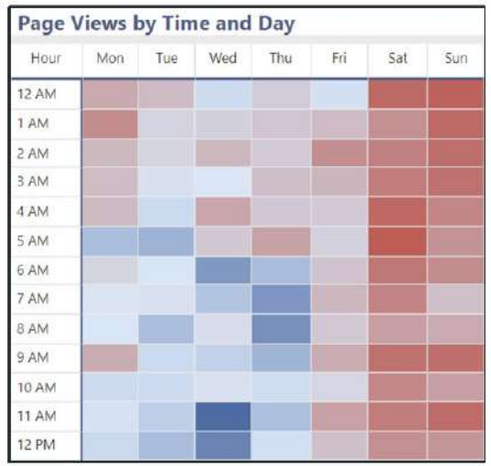
Categorical

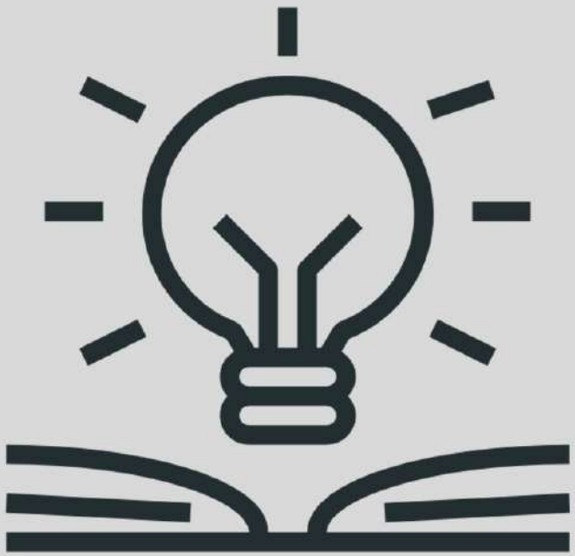


Sequential



Diverging



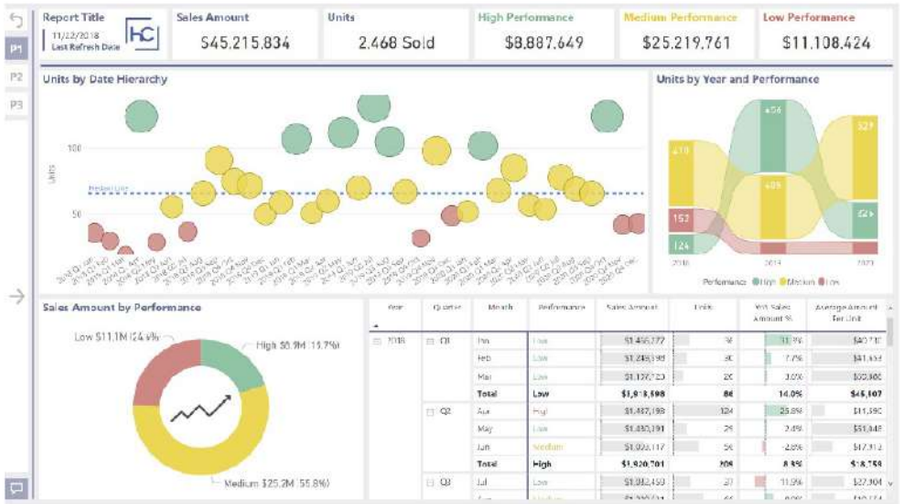


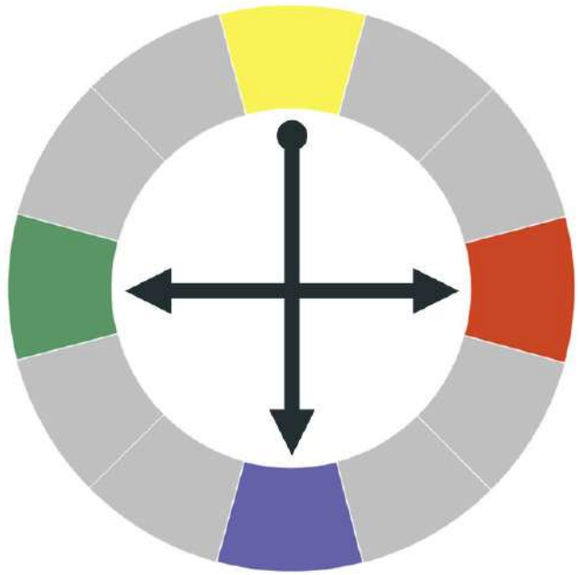
Knowledge Check

Design Principles

What type of **color harmony** is implemented in this report?

Tetratic

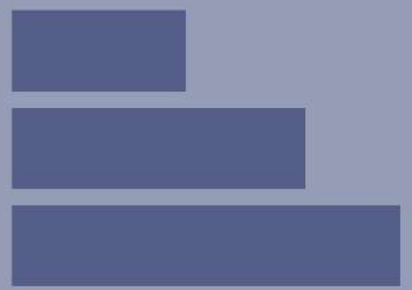




Knowledge Check

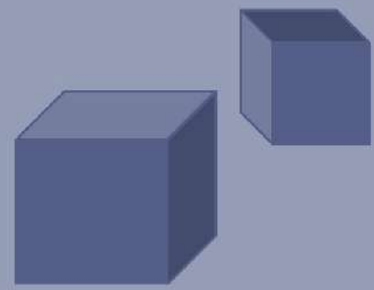
Visual Cues

Easiest visual cue to process?



Length (Aligned)

Hardest visual cue to process?



Volume

What influences **accuracy?**

Alignment

What influences **accuracy?**

Direction

Demonstration

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Applying Report Design Principles

- Exercise 1 – Background Color
- Exercise 2 – Alignment and Spacing
- Exercise 3 – Removing Object Elements
- Exercise 4 – Selecting Visual Types

Recommended Practices

- **Design principle practices:**
  - Commonly, people look at the *upper-left of report* pages first – consider carefully what to place there as that is the first thing users will see
  - Develop reports from a *blank canvas perspective* – start with nothing and add one element at a time until requirements are met
    - This will help minimize unnecessary elements and prevent the report from becoming "noisy"
  - Consider using a *light page background* and *white backgrounds for objects* – this creates soft borders between page elements
  - Choose carefully the type of color contrast *(categorical, sequential, diverging)* applied to visuals – as each one tells a different story with the data
  - Repetition *(e.g. font, color, location, naming, etc.)* can be used to indicate relationships or *lack thereof* – so choose carefully when to apply

Recommended Practices

- **Design principle practices:**
  - Apply alignment to *every object* – no exceptions
    - Borders between objects should be able to follow a *natural line* throughout the report page
    - Enable *gridlines* and *snap-to-grid* on the view tab to assist with alignment and spacing
  - Have feedback sessions with users to determine *logical proximity* of report objects and the "flow" of the report page
  - Reports should be built to *minimize eye and mouse travel* on the screen

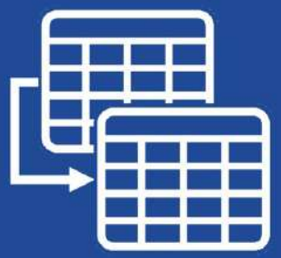
Recommended Practices

- **Data visualization practices:**
  - Have feedback sessions with users to determine what type of story needs to be told for each visualization – and make a visual type selection based on this
    - E.g. Part-to-whole, correlation, distribution, etc.
  - *Forced variation* between visual types does not always add value – choose carefully the type of visual if *data accuracy* is important

References

- Power BI Visualization Best Practices
  - https://docs.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-best-practices
- Design Concepts for Better Power BI Reports
  - https://datasavvy.me/design-concepts-for-better-power-bi-reports
- Adobe Color Wheel
  - https://color.adobe.com
- Color Blindness Resources
  - https://www.color-blindness.com/
- Visuals Reference
  - https://www.sqlbi.com/ref/power-bi-visuals-reference

Questions?

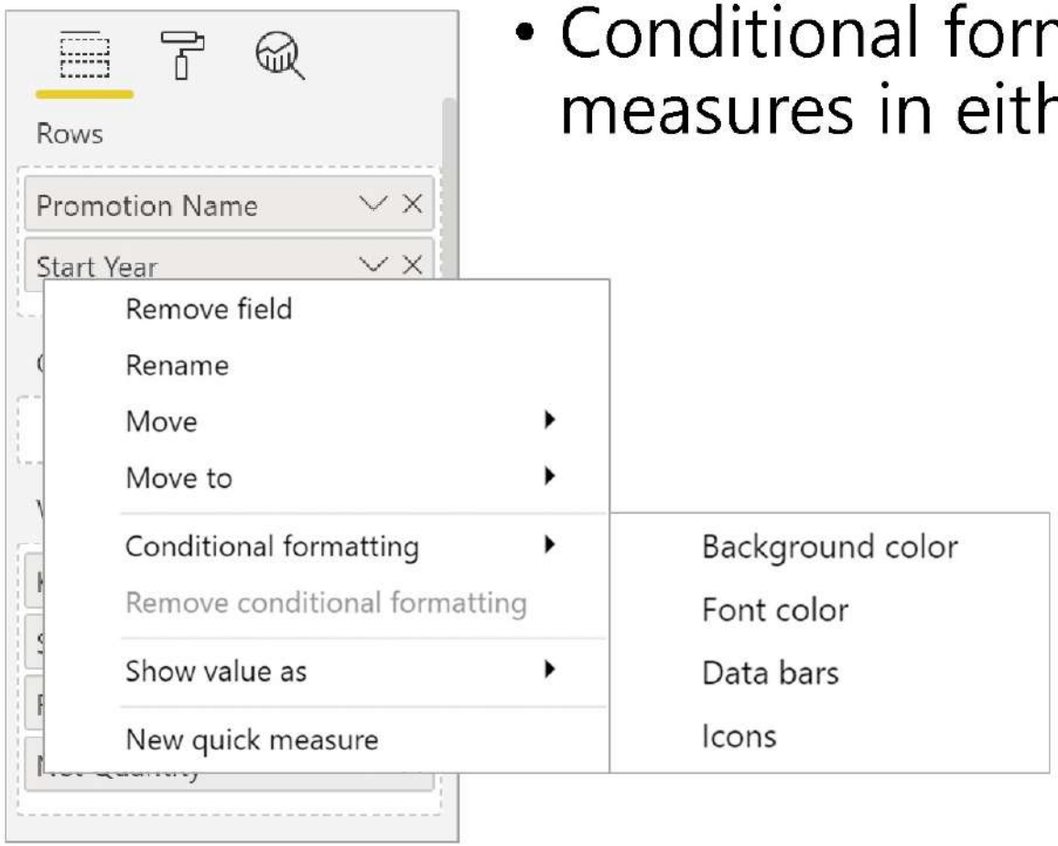


Designing Advanced Reports

- Conditional formatting
- Drillthrough filters
- Visual interactions
- Sync slicers
- Report tooltips
- Bookmarks
- Custom Visuals
- Recommended Practices

Designing Advanced Reports

Conditional Formatting

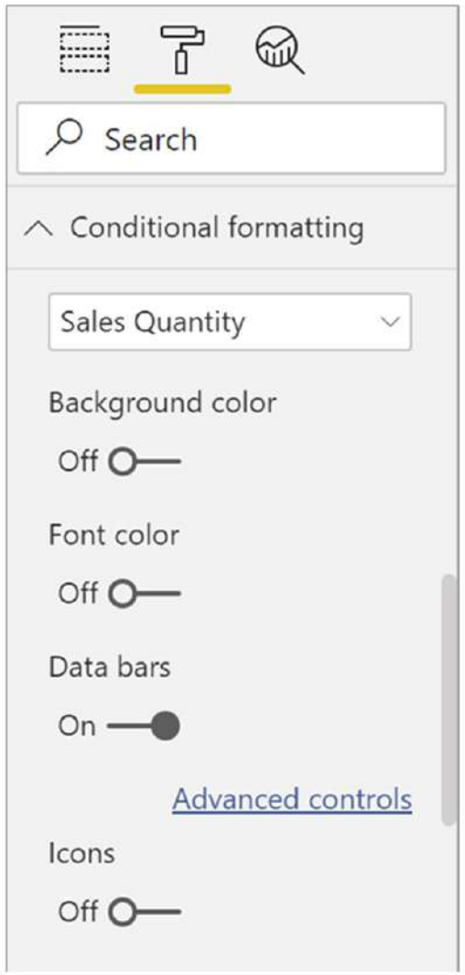


- Conditional formatting can be applied to calculated measures in either the *table* or *matrix* visuals

Page Title & Geo	Page Views	Unique Views	Searches	Bounce Rate
Havens Consulting	4,326	3,587	546	47.6%
Files & Templates — Hav...	4,270	3,424	225	72.8%
Blog / Media — Havens ...	3,464	2,921	35	73.2%
Blog Posts — Havens Co...	2,695	2,050	33	63.6%
Power BI Vs. Excel — Hav...	2,367	2,202	1,540	91.2%
Havens Consulting — Se...	1,403	1,034	0	37.9%
About Us — Havens Con...	1,226	1,049	455	47.1%
What Is Power BI? — Hav...	855	723	241	57.5%
Creating a Slicer Pop-Out...	800	679	9	80.1%
Google Analytics Report	786	710	20	80.8%
Total	**29,936**	**24,836**	**4,512**	**70.0%**

Designing Advanced Reports

Conditional Formatting

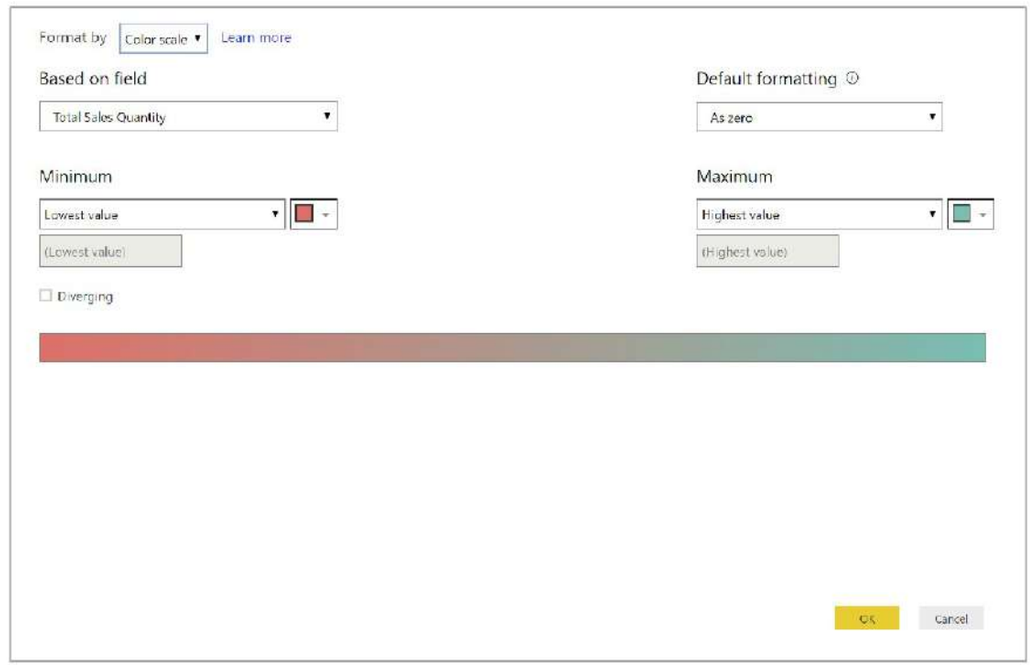


- Conditional formatting can be applied to calculated measures in either the *table* or *matrix* visuals
- Settings can be accessed:
  - In the **Fields** well of the **Visualizations** pane[1]
  - From the sub-menu under the Formatting pane

Designing Advanced Reports

Conditional Formatting ► Background and Font Colors

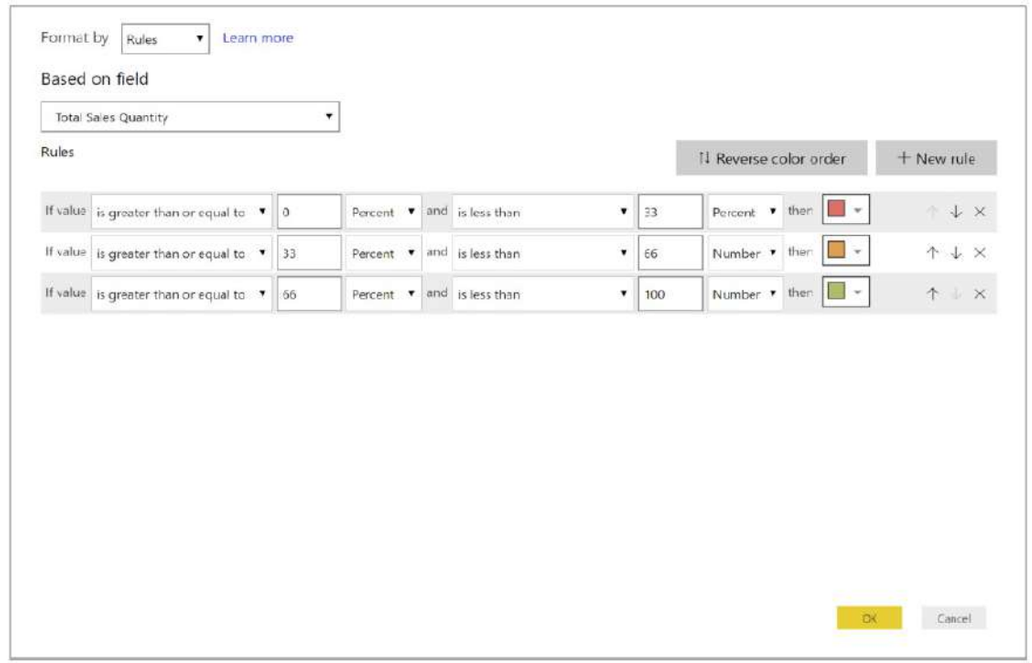
- **Background** and **font color** share the same *format by* settings
- Formatting logic can be based on:
  - **Color scale**
    - Applies a gradient between *min* and *max*
    - Min/Max can be set to *lowest value* or *fixed absolute* value
    - *Diverging* enables a third middle color



Designing Advanced Reports

Conditional Formatting ► Background and Font Colors

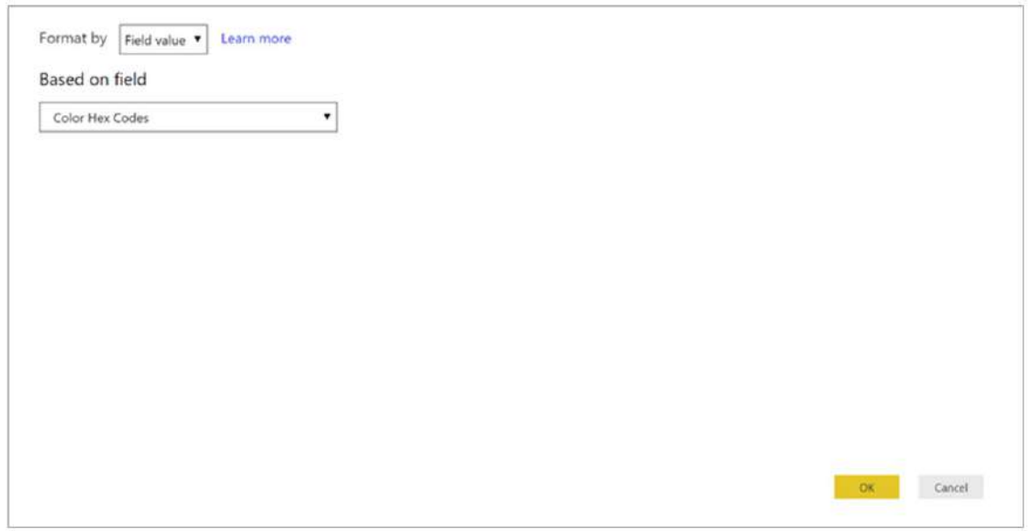
- **Background** and **font color** share the same *format by* settings
- Formatting logic can be based on:
  - **Rules**
    - Applies colors based on one or more value ranges, each with a set color
    - Each value range starts with:
      - An **If** value condition
      - An **and** value condition
      - And a **color**



Designing Advanced Reports

Conditional Formatting ► Background and Font Colors

- **Background** and **font color** share the same *format by* settings
- Formatting logic can be based on:
  - **Field value**
    - Applies colors by using a *calculated measure* or a *column* that specifics a color – either using a *text value* or a *hex code*
    - Custom logic can be created inside a calculated measure to apply the desired color

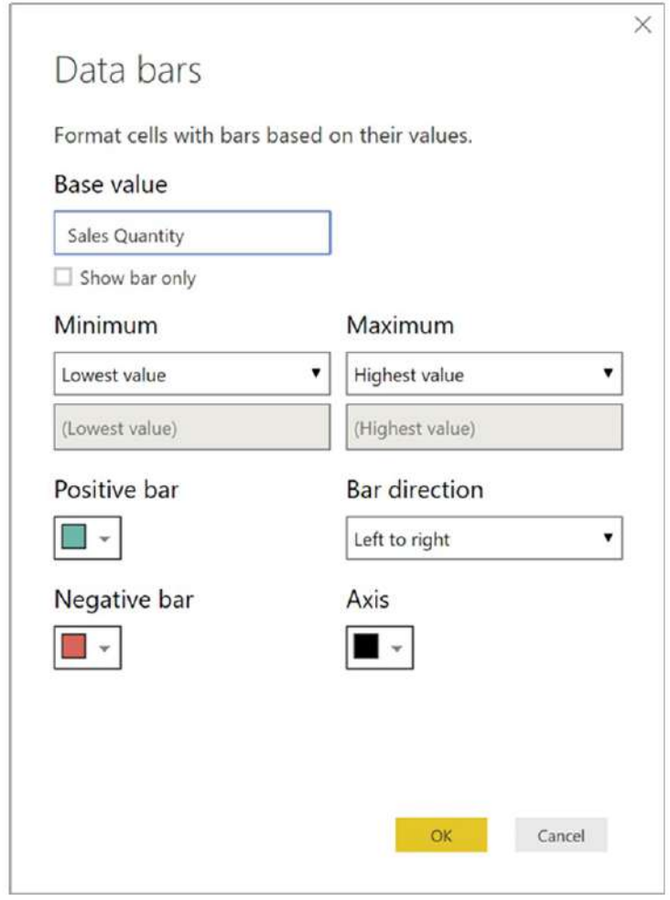


Field value formatting will be outside the scope of this pre-con

Designing Advanced Reports

Conditional Formatting ► Data Bars

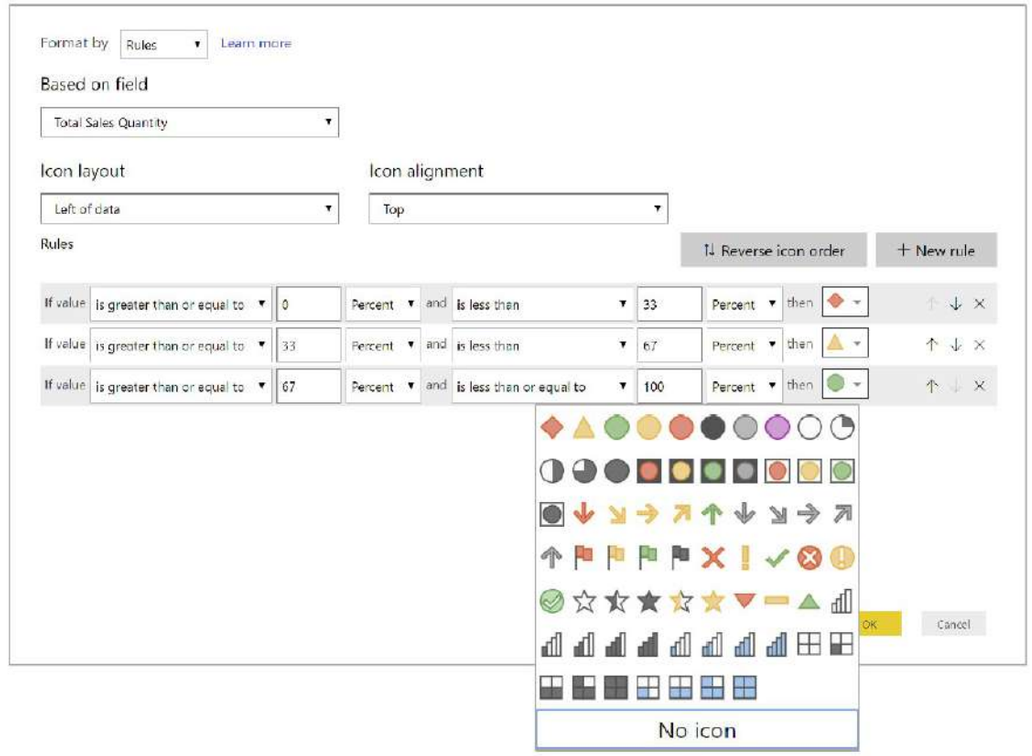
- **Data bars** can be set to *lowest value* or *fixed absolute value*
- **Other data Bar properties:**
  - Positive/negative bar (*color*)
  - Axis (*color*)
  - Bar direction
  - Show bar only – *hides the value*



Designing Advanced Reports

Conditional Formatting ► Icons

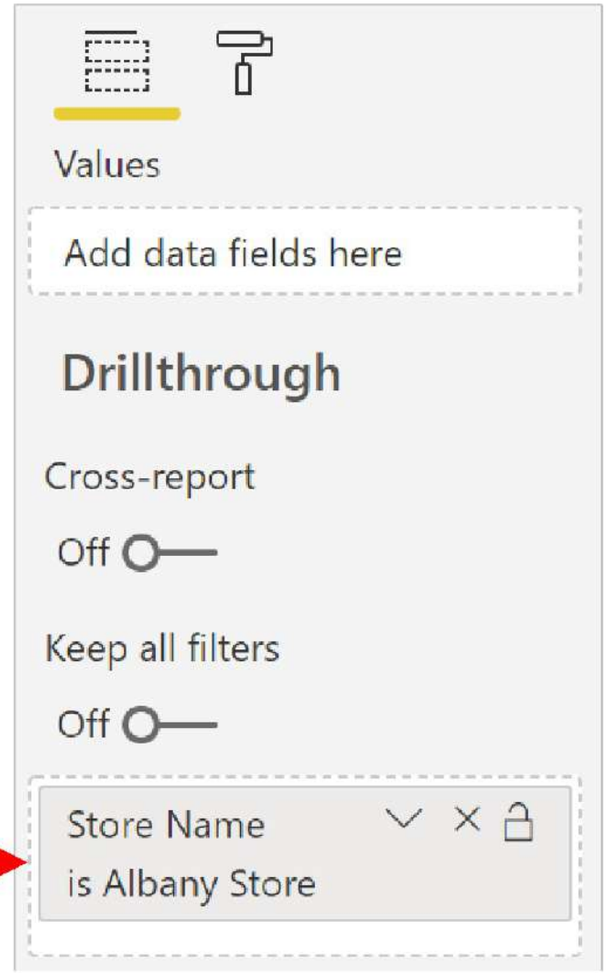
- **Icon sets** in Power BI are *very similar* to the ones found in *Excel*
- Formatting logic can be based on **Rules** or **Field Value**
- By default, icon rules will apply:
  - Red diamond to the *lower 33%*
  - Yellow triangle to the *middle 33%*
  - Green circle to the *upper 33%*
- *Custom* icon sets can be imported using Power BI Desktop



Designing Advanced Reports

Drillthrough Filters

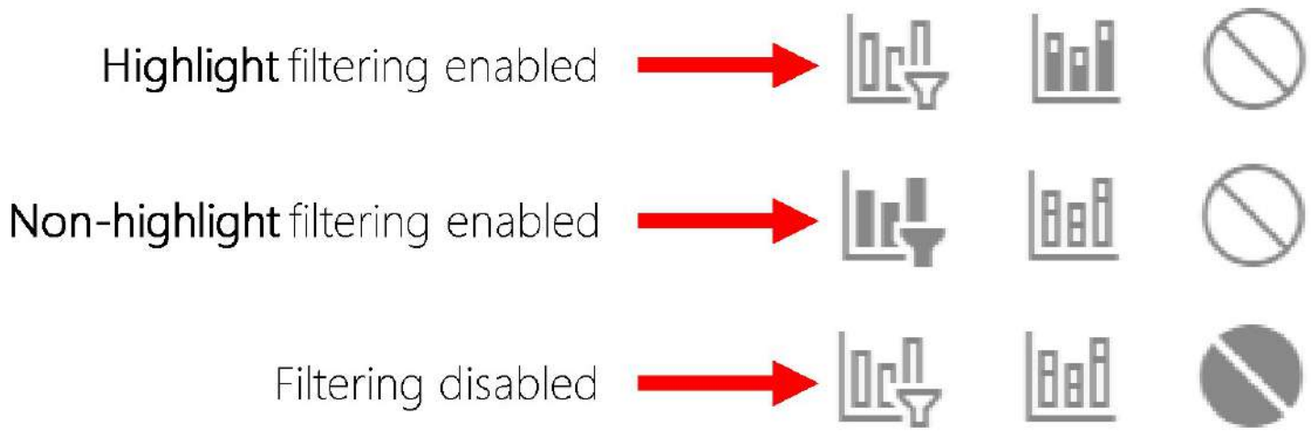
- Pages with a **drillthrough filter** can be used as the *navigation target* of a visual drillthrough from a *different page*
  - User's right-click an data category of a visual – and a *context menu* appears offering drillthrough options
- A *back button* is automatically added to the drillthrough page
- **Cross-report** allows filters to be passed between reports in the same workspace or app
- **Keep all filters** passes all applied filters from a visual to the drillthrough page



Designing Advanced Reports

Visual Interactions

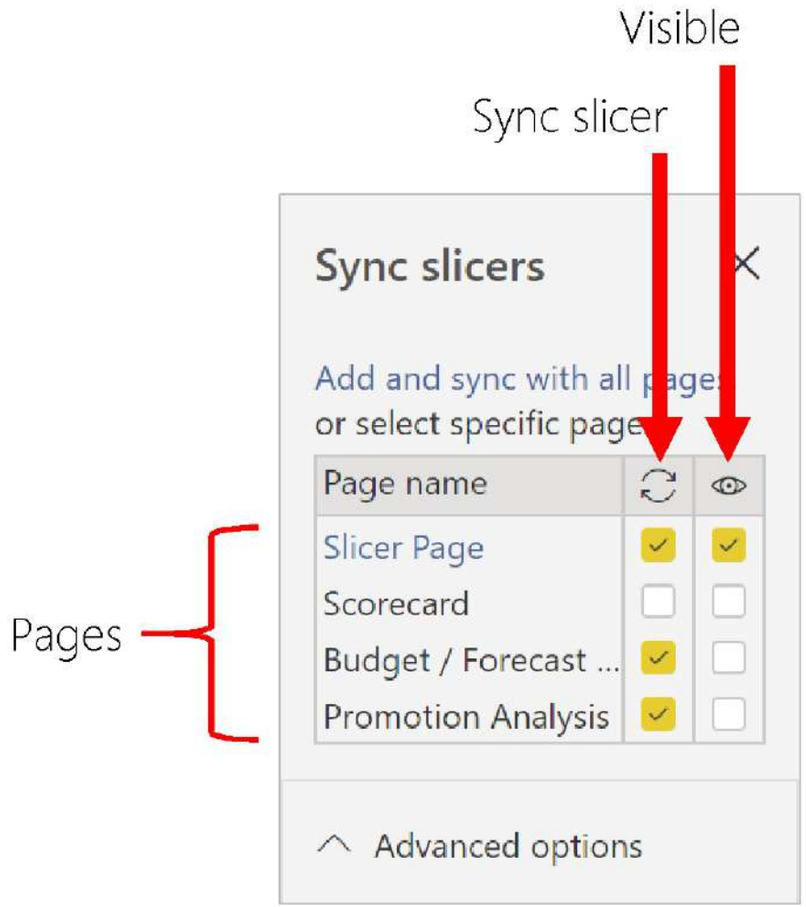
- By default, *slicer* and *visual cross-filtering* is active for all page visuals
- Use **Editing Interactions** to disable/re-enable filtering for a specific pair of visuals
  - Select the source visual
  - Configure settings for target visual(s)



Designing Advanced Reports

Sync Slicers

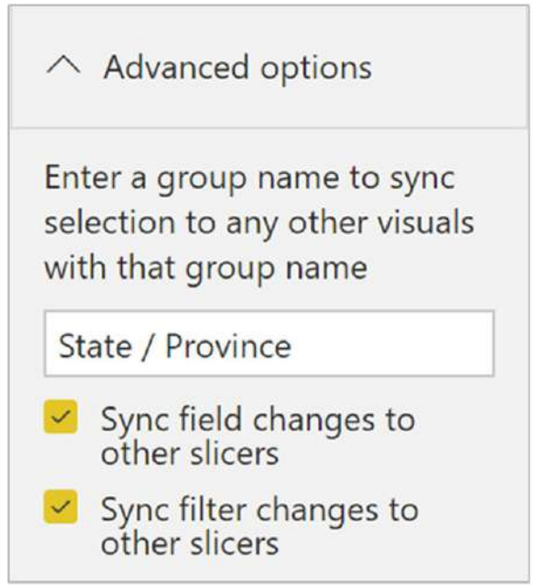
- Use the **Sync Slicers** pane to configure the following for a *selected slicer*:
  - Which pages to sync
  - Whether to display the slicer
- All slicer interactions are synced – to provide *synced filtering across pages*
- Syncing a slicer can pass additional filter context to a *drillthrough page*



Designing Advanced Reports

Sync Slicers ► Advanced Options

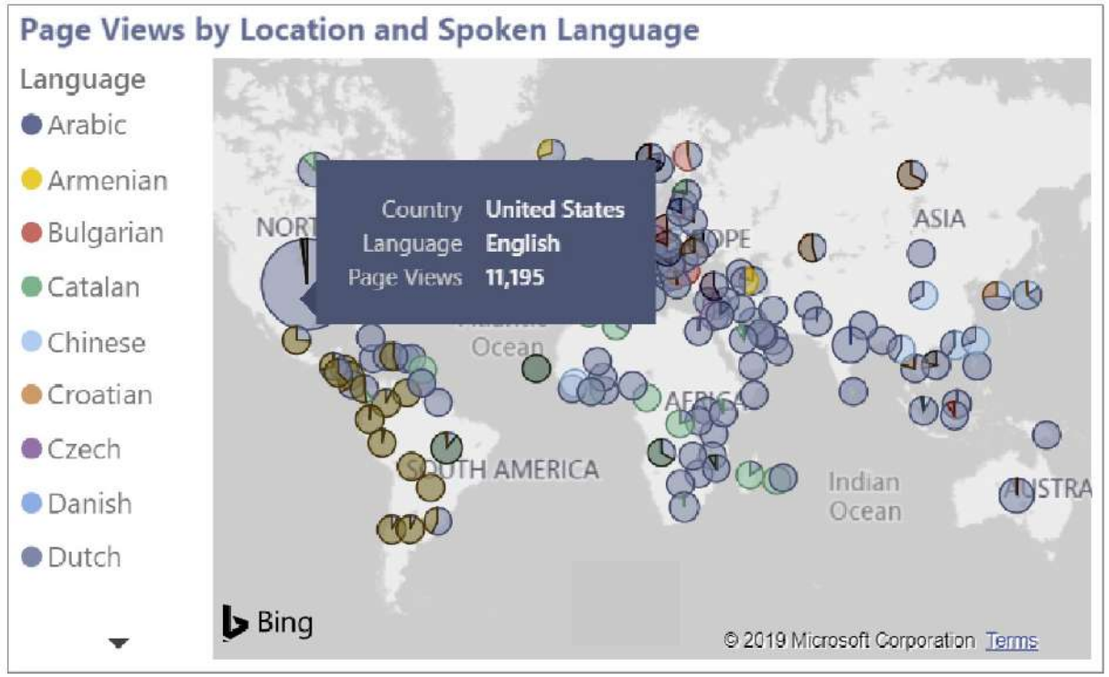
- **Advanced Options** lets you create a *custom group* of slicers to provide *additional synchronization* flexibility
- A default name is provided – but *any name* can be used
- You can sync slicers that use the same field, or put slicers that use different fields into the same group
- Within custom groups slicers can:
  - **Sync field changes**
    - Updates slicer field if another synced slicer field is changed
  - **Sync filter changes**
    - Updates slicer filter if filters from the fields pane are applied



Designing Advanced Reports

Tooltips

- Tooltips can be configured by adding fields to the **Tooltips** well of most visuals
- Fields added to this well display filtered data when hovering over any data points on the visual

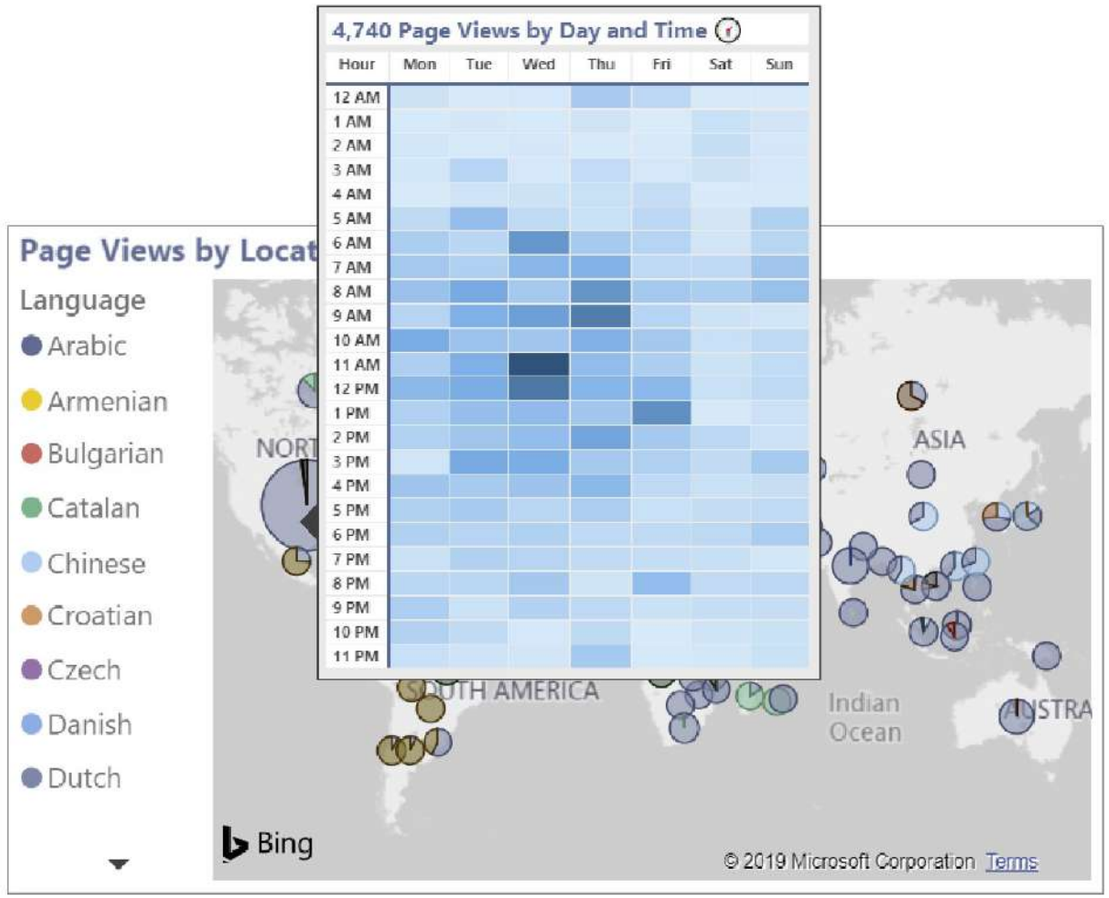


Tooltips can also be disabled for specific visuals

Designing Advanced Reports

Tooltips ► Report Tooltips

- Additionally, **report tooltip pages** can be created to display visuals as a tooltip
- Tooltip pages:
  - Can be set to any height or width
  - Can include any visual or object
  - Cannot be interacted with inside the tooltip[1]

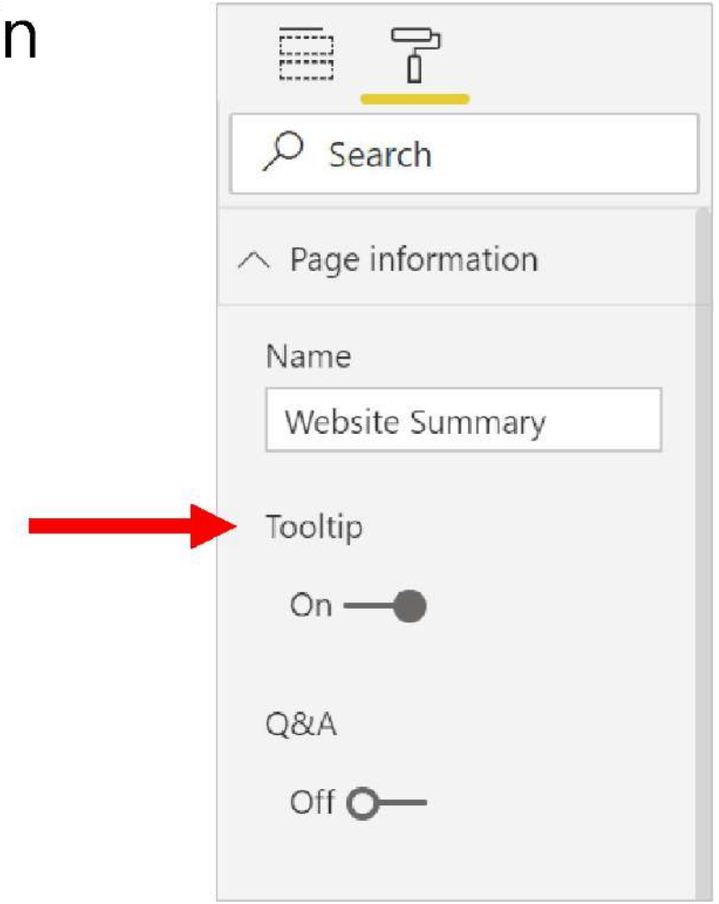


1: Elements such as slicers, hierarchy controls, drillthrough, etc. cannot be clicked

Designing Advanced Reports

Tooltips ► Report Tooltips ► Configuration

- Configurations for report tooltips are accessed in the *format pane* for the *report page*[1]
- **Report tooltip settings:**
  - Tooltip (*toggle*) – enables this page to be used as a tooltip by other page visuals

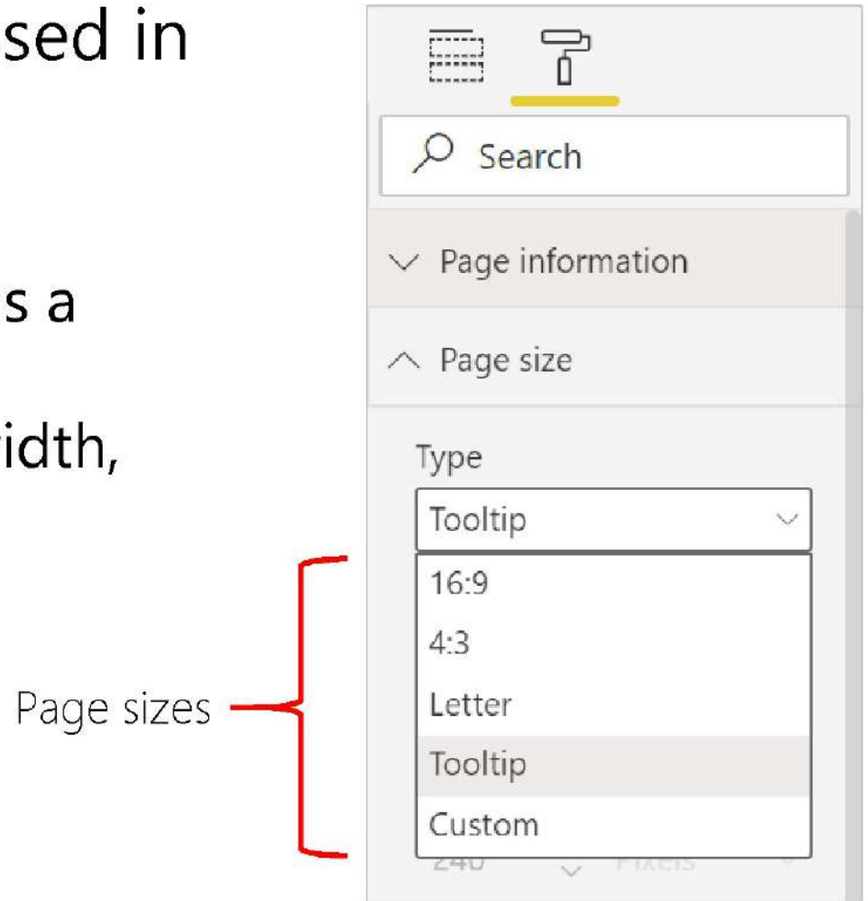


1: page formatting is only accessible if there is not an active page visual selected

Designing Advanced Reports

Tooltips ► Report Tooltips ► Configuration

- Configurations for report tooltips are accessed in the *format pane* for the *report page*[1]
- **Report tooltip settings:**
  - **Tooltip** (*toggle*) – enables this page to be used as a tooltip by other page visuals
  - **Page size** – configuration of the pixel size and width, common configurations include:
    - *Tooltip* – 320 x 240 pixels
    - *Custom* – User defined pixel width and height

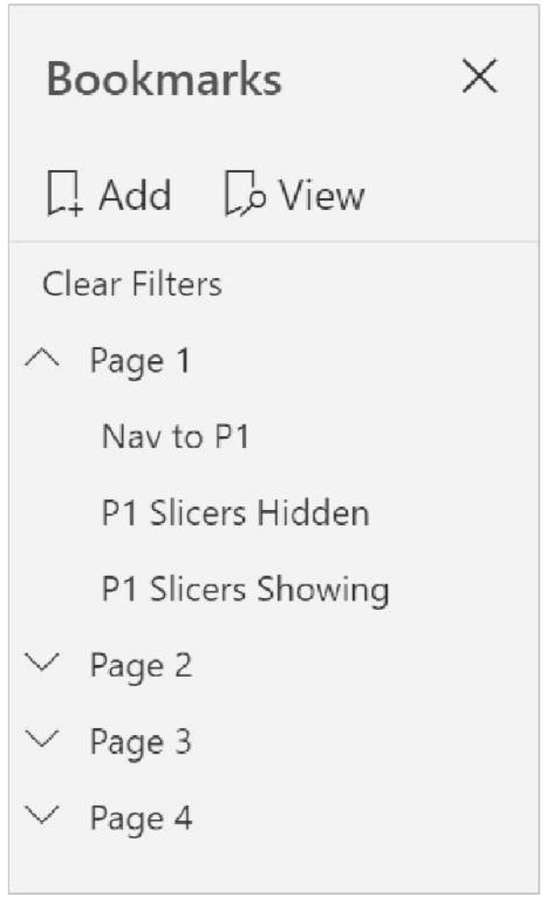


1: page formatting is only accessible if there is not an active page visual selected

Designing Advanced Reports

Bookmarks

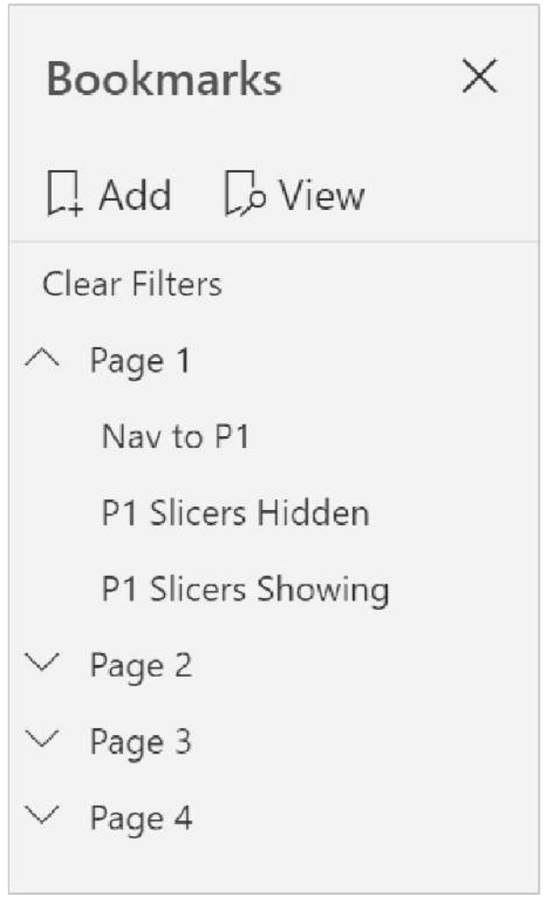
- The **Bookmarks** pane captures the *currently configured view* of a report page at *design-time*
- **Common uses:**
  - Create an ordered list of bookmarks, then click **View** to replay them as a story
  - Create advanced report interaction by assigning bookmarks to buttons and/or images
  - Select a bookmark to return to a previously captured state
- Report users can open the pane at view-time



Designing Advanced Reports

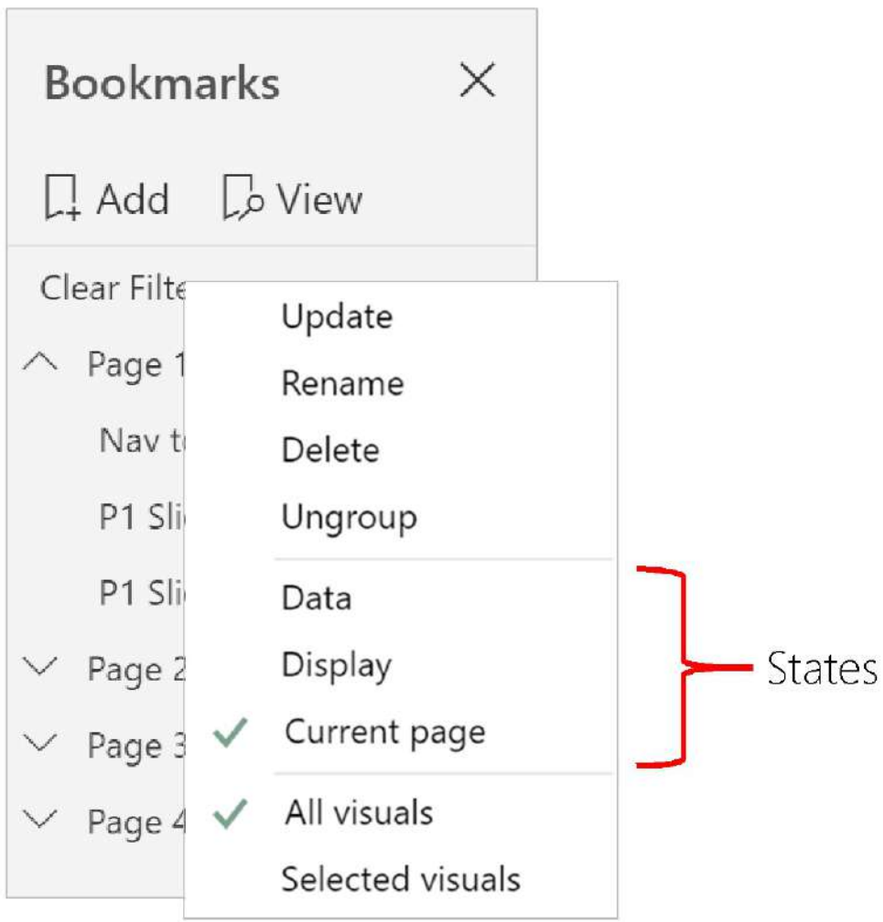
Bookmarks ► Capture States

- Bookmarks can save the *following states*:
  - Current page
  - Filters and slicers
  - Sort order
  - Drill mode
  - Drill location
  - Visibility of objects (as configured in the **Selections** pane)
  - Spotlight set on an object
  - Focus set on an object
- Bookmarks do not capture cross-highlight state



Designing Advanced Reports

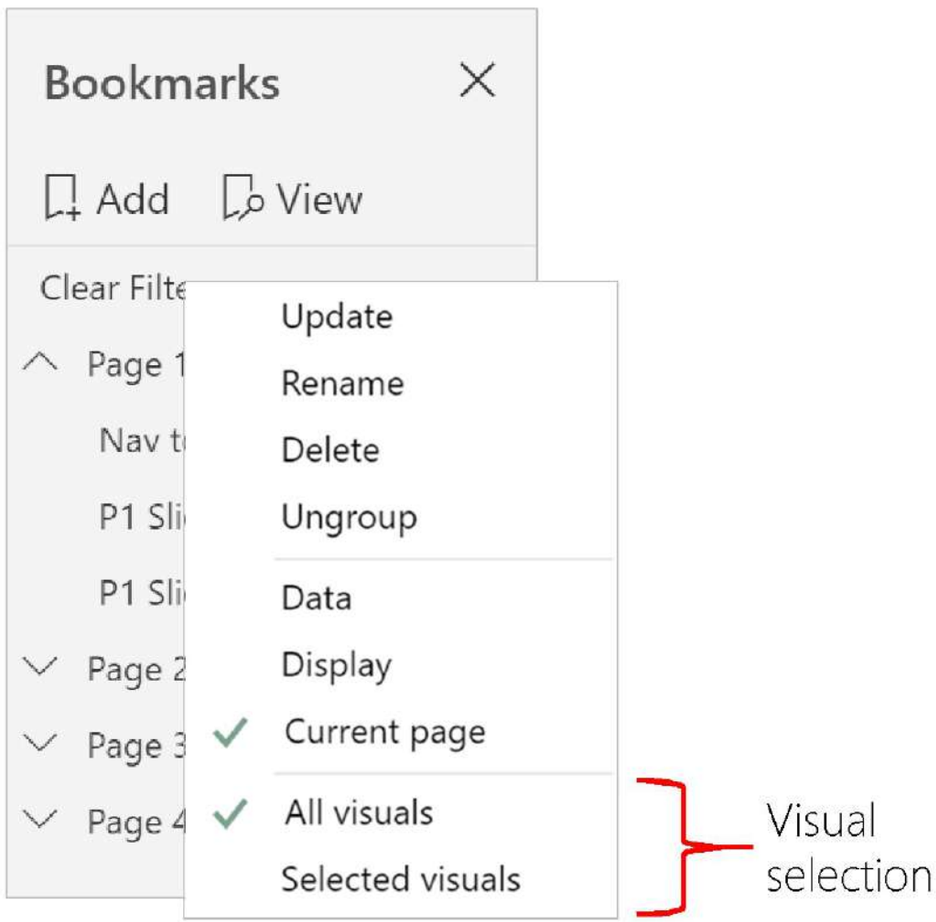
Bookmarks ► Settings



- State capture can *include/exclude*:
  - **Data**: Filter state
  - **Display**: Object visibility state
  - **Current page**: Current page

Designing Advanced Reports

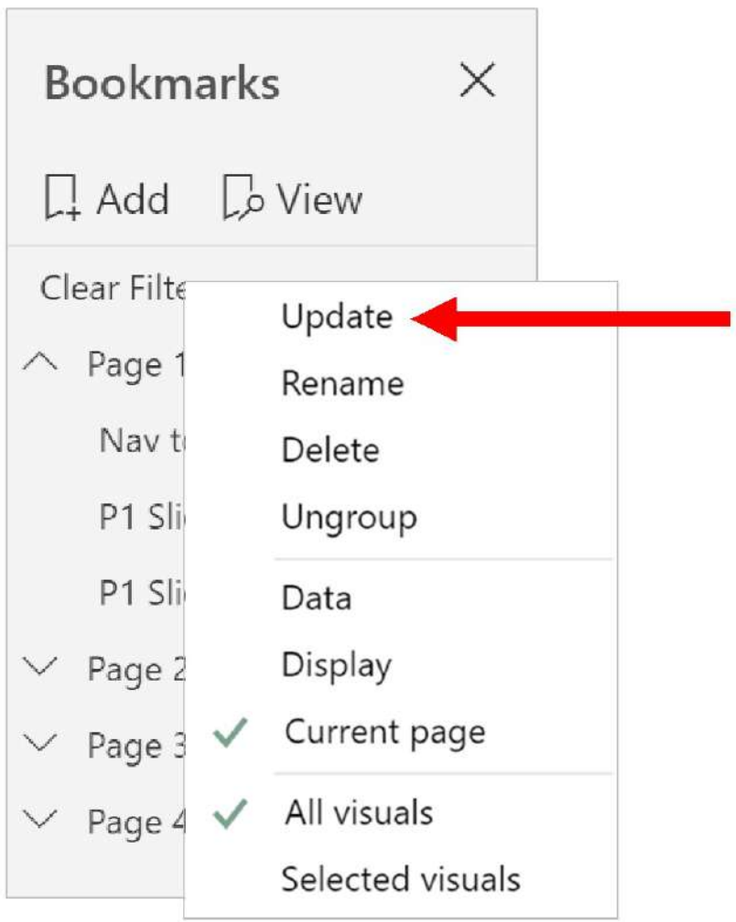
Bookmarks ► Settings



- State capture can *include/exclude*:
  - **Data**: Filter state
  - **Display**: Object visibility state
  - **Current page**: Current page
- State capture can apply to:
  - All visuals
  - Selected visuals

Designing Advanced Reports

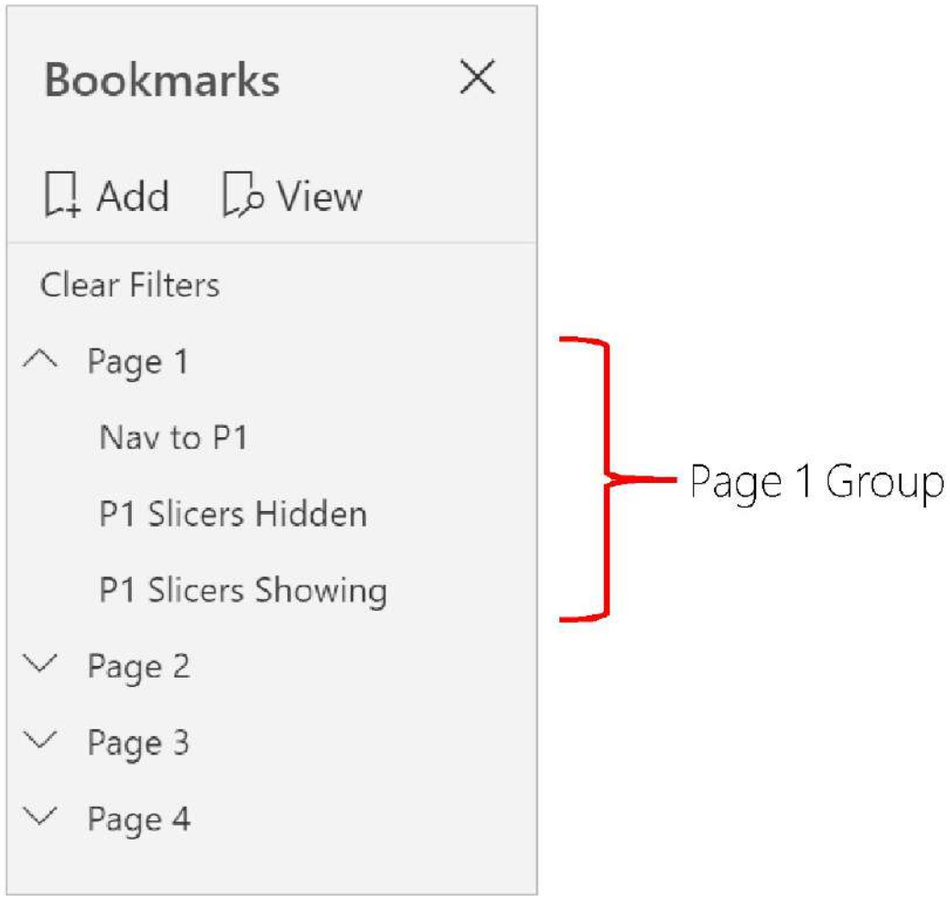
Bookmarks ► Settings



- State capture can *include/exclude*:
  - **Data**: Filter state
  - **Display**: Object visibility state
  - **Current page**: Current page
- State capture can apply to:
  - All visuals
  - Selected visuals
- Select **Update** to re-capture state

Designing Advanced Reports

Bookmarks ► Settings

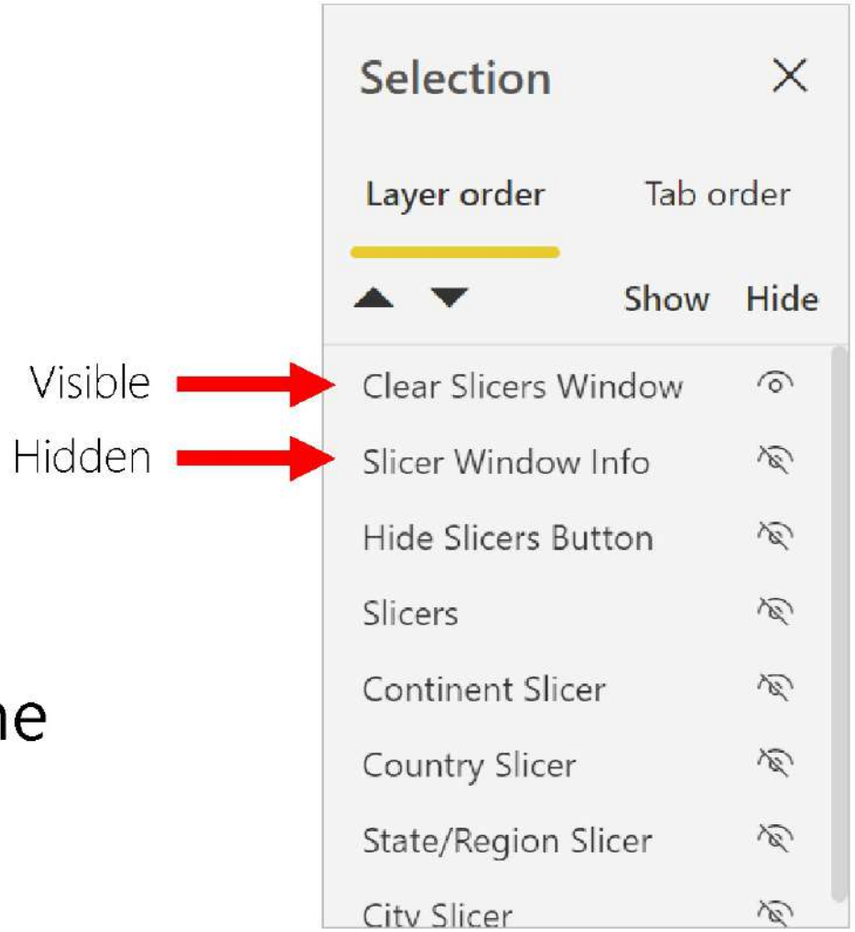


- State capture can *include/exclude*:
  - **Data**: Filter state
  - **Display**: Object visibility state
  - **Current page**: Current page
- State capture can apply to:
  - All visuals
  - Selected visuals
- Select **Update** to re-capture state
- Bookmarks can also be organized by named **Groups**

Designing Advanced Reports

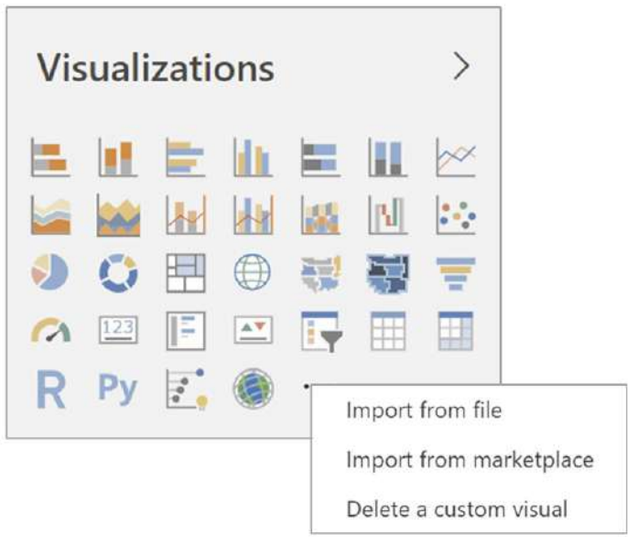
Bookmarks ► Selection Pane

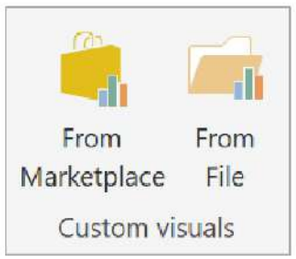
- Use the **Selection** pane at design-time to:
  - Order overlapping report objects
  - Toggle visibility state of report objects
- **Common uses:**
  - Appropriately order visuals so *visual headers* and other *visual pop-ups* don't display behind other visuals
  - Hide/display objects when updating a bookmark
- Report users can open the pane at view-time
- It is a recommended practice to give each object a unique name



Designing Advanced Reports

Custom Visuals



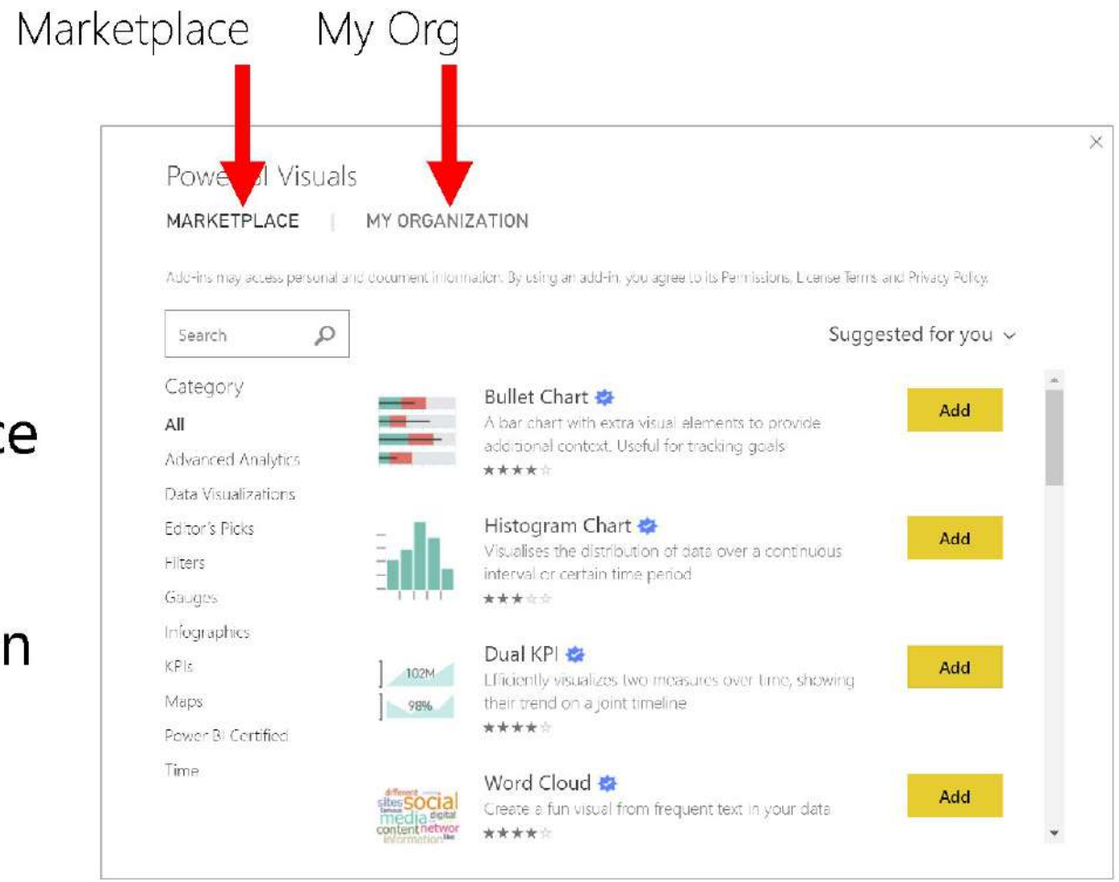


- Microsoft *open sourced* the code for visuals – allowing report developers to create custom visuals that can be used by report authors
- A custom visuals **Marketplace** exists that contains custom visuals that have been tested and certified
- Custom visuals can be added either through the marketplace or from a file:
  - By selecting the *ellipses* in the Visualizations pane
  - By selecting these commands on the Home ribbon:
    - *From Marketplace*
    - *From File*

Designing Advanced Reports

Custom Visuals ► Marketplace

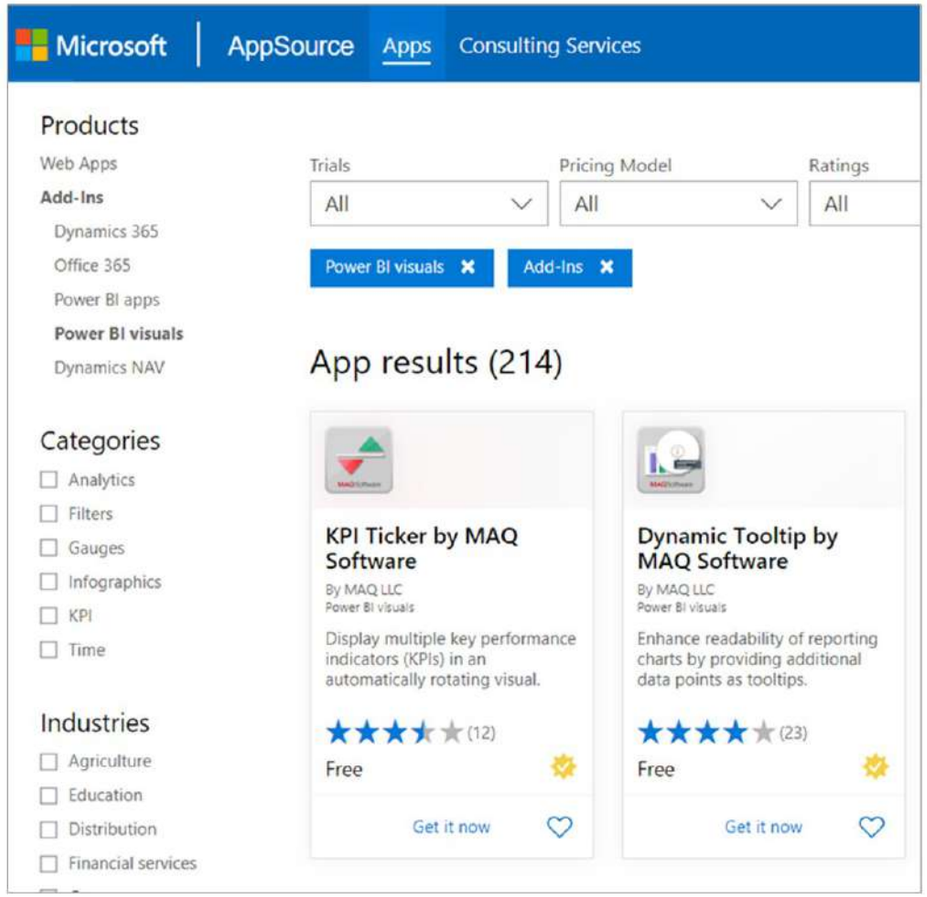
- The marketplace lets report authors *search for* and *add* visuals directly from within the Power BI report
- Authors can choose visuals from:
  - **Marketplace** – Contains all marketplace custom visuals
  - **My Organization** – Contains custom visuals *approved* within the organization



Designing Advanced Reports

Custom Visuals ► File

- Authors can also download custom visual files (**PBVIZ**) and import them into the Power BI report
- Commonly, custom visual files can be downloaded from the **Microsoft AppSource** store under Power BI visuals
- Microsoft certified custom visual partners also provide (PBVIZ) files for purchase and download directly from their websites



Demonstration

Four

User Group Summit NORTH AMERICA

Designing Advanced Reports

- Exercise 1 – Developing a Drillthrough Page
- Exercise 2 – Configuring Visual Interactions
- Exercise 3 – Configuring Sync Slicers
- Exercise 4 – Customizing Tooltips
- Exercise 5 – Applying Conditional Formatting
- Exercise 6 – Utilizing Bookmark Features
- Exercise 8 – Adding a Custom Visual

Recommended Practices

- Consider the *audience* and their *needs*
- Just because a *feature exists* does not mean it has to be used in a report
- Use *conditional formatting* to draw attention to *important data*
- *Leverage tooltips* to provide additional relevant information to visuals
- Configure *drillthrough* and *bookmarks* to reduce the number of mouse clicks and mouse travel for users – enabling a more intuitive report experience

References

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  - https://docs.microsoft.com/power-bi/service-reports
- Power BI service features by license type
  - https://docs.microsoft.com/en-us/power-bi/service-features-license-type
- Power BI performance best practices
  - https://docs.microsoft.com/power-bi/power-bi-reports-performance
- Show Visualization Categories with No Data in Power BI
  - HC Video – https://youtu.be/Js5z_JrWS4A
- Naming Objects in the Power BI Selection Pane
  - HC Video – https://youtu.be/SSdD0bGF48o

References

- Guide Users With Power BI Bookmark Button Tooltips
  - HC Video – https://youtu.be/dZ2cdWpAsi4
- Customizing the Hierarchy Controls and Visual Header
  - HC Video – https://youtu.be/_zqztkG-wS4-
- SVG Image Sparklines on Rows in Power BI Tables
  - HC Video – https://youtu.be/xLD8HKwPWHE
- SVG and GIF KPI's on Rows in Power BI Tables
  - HC Video – https://youtu.be/zDpD016Eebg
- Changing Font Size with Bookmark Buttons in Power BI
  - HC Video – https://youtu.be/w94s6LSuv6M

References

- Creating Report Tooltips in Power BI
  - HC Video – https://youtu.be/epDb9ruV0bU
- Creating a Pareto Chart Using DAX and Native Visuals in Power BI
  - HC Video – https://youtu.be/bzF5kN2BQ60
- Creating a Dynamic Chart Title with Whatlf Parameters in Power BI
  - HC Video – https://youtu.be/ZoPZjtNnriU
- Custom KPI Card With Sparklines in Power BI
  - HC Video – https://youtu.be/3lja_5afjBA
- Creating Table Heatmap in Power BI
  - HC Video – https://youtu.be/aCq9Nz8K_Cs

References

- Creating a Stacked Column Chart with Grand Total Data Label
  - HC Video – https://youtu.be/B_pv0HmBi8o
- Creating a Slicer Pop Out Window with Bookmark Buttons in Power BI
  - HC Video – https://youtu.be/5TaZQFc-t58
- Creating Dynamic Titles for Report Tooltips in Power BI
  - HC Video – https://youtu.be/SrKSZNzqrNk
- Dynamic URL's for Images and Bookmark Buttons in Power BI
  - HC Video – https://youtu.be/4WOuLNvldSg
- Visual Header Tooltips in Power BI
  - HC Video – https://youtu.be/mtt8fR54Agg

References

- Native and Custom KPI Icons in Power BI
  - HC Video – https://youtu.be/NzUVUaev8lA
- Applying Field Based Conditional Formatting as a Best Practice
  - HC Video – https://youtu.be/xsHnz1mc9mw
- Conditional Formatting for Single Value Cards
  - HC Video – https://youtu.be/74vPHPEb7OY
- Conditional Formatting for Line Values in Power BI
  - HC Video – https://youtu.be/2_2rGxA6PKQ

Questions?

Online Resources

- **Presentation PDF**
  - http://www.havensconsulting.net/speaking-events
- **Consulting Services**
  - http://www.havensconsulting.net/consulting-services
- **Files & Templates**
  - http://www.havensconsulting.net/files-and-templates
- **30% Discount Code**
  - PUG_SUMMIT_OCT_2019
- **YouTube Channel**
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