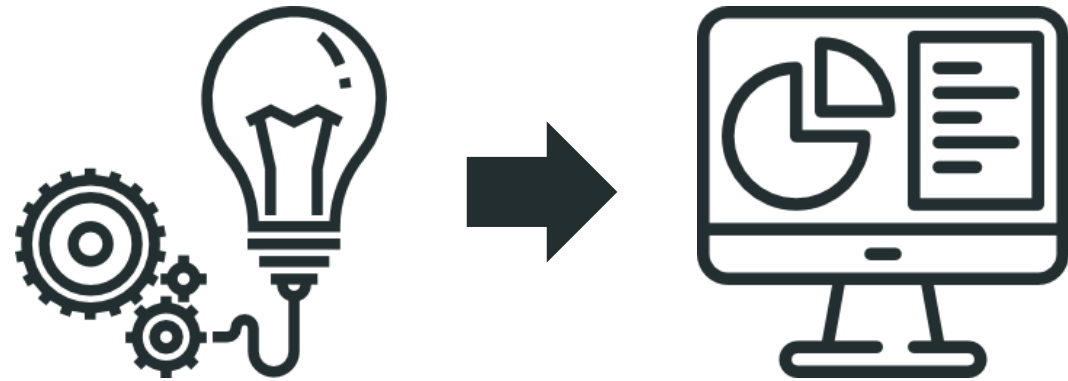


HAVENS

CONSULTING



Demystifying Chart Types and Design Principles in Power BI



Microsoft®
Most Valuable
Professional



HAVENS

CONSULTING



IntelliTect



HAVENS

CONSULTING



Session Agenda



Defining a Report

- Descriptions of report components and characteristics



Design Principles

- Practices for designing more effective reports



Data Visualizations

- Methodologies for creating impactful visualizations



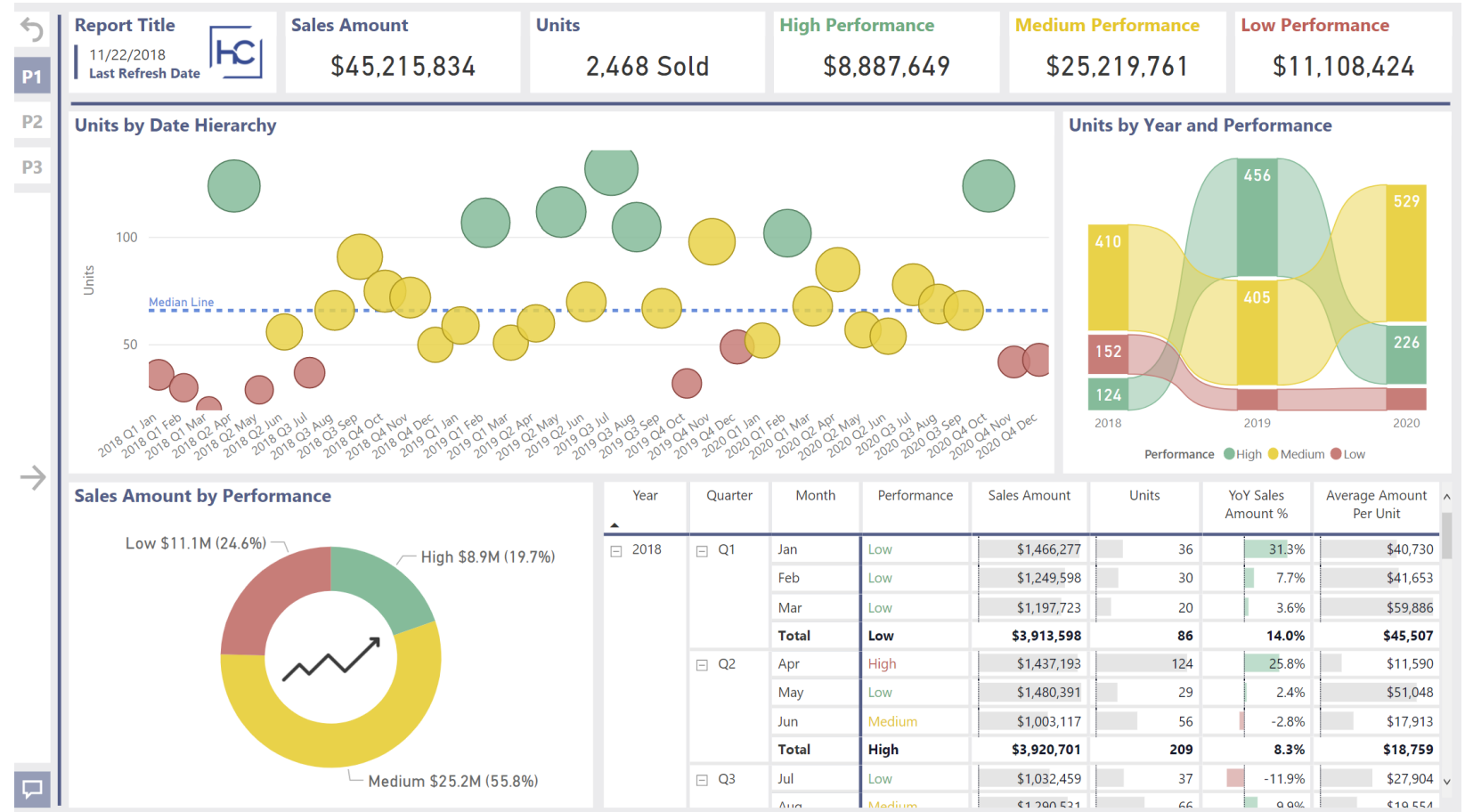
Defining a Report

- Descriptions of report components and characteristics

Defining a Report

The essence of a report

"A report is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged...so the information can be monitored at a glance."
~Stephen Few



Defining a Report

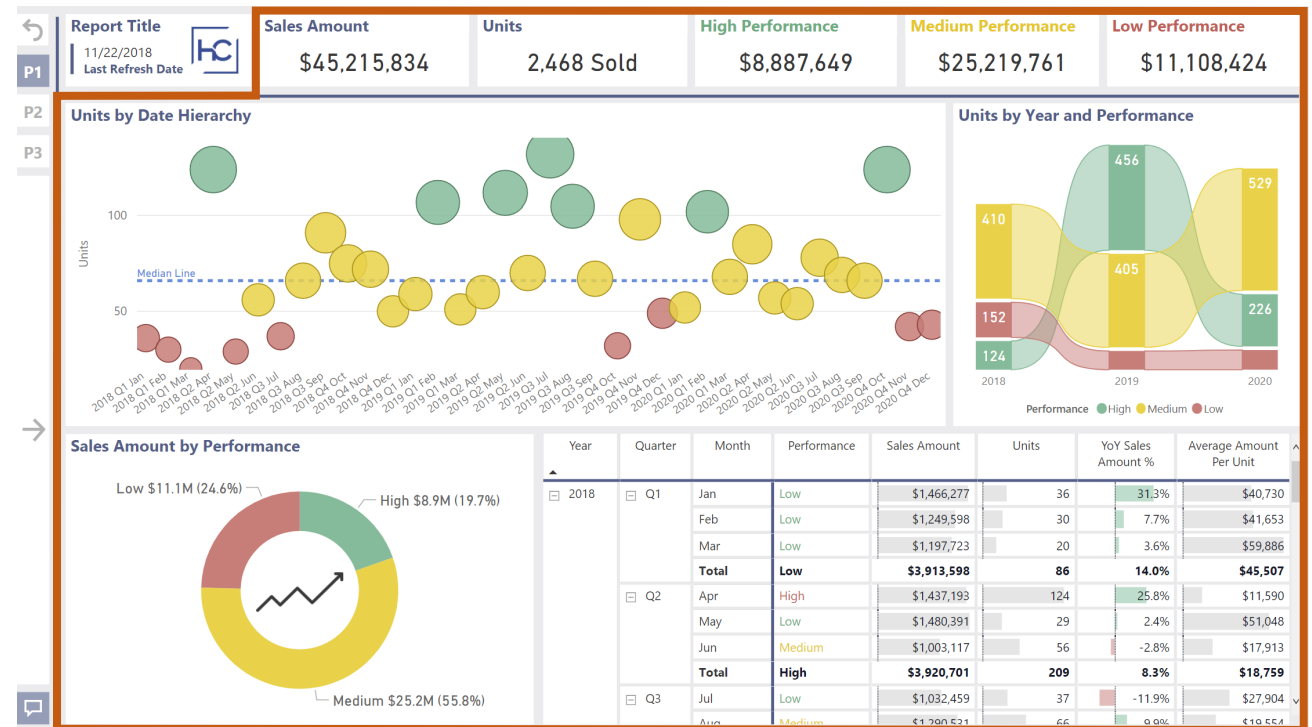
Essential report components

Three primary components of a report



Visualizations

- Displays patterns, trends, or outliers in the data



Defining a Report

Essential report components

Three primary components of a report



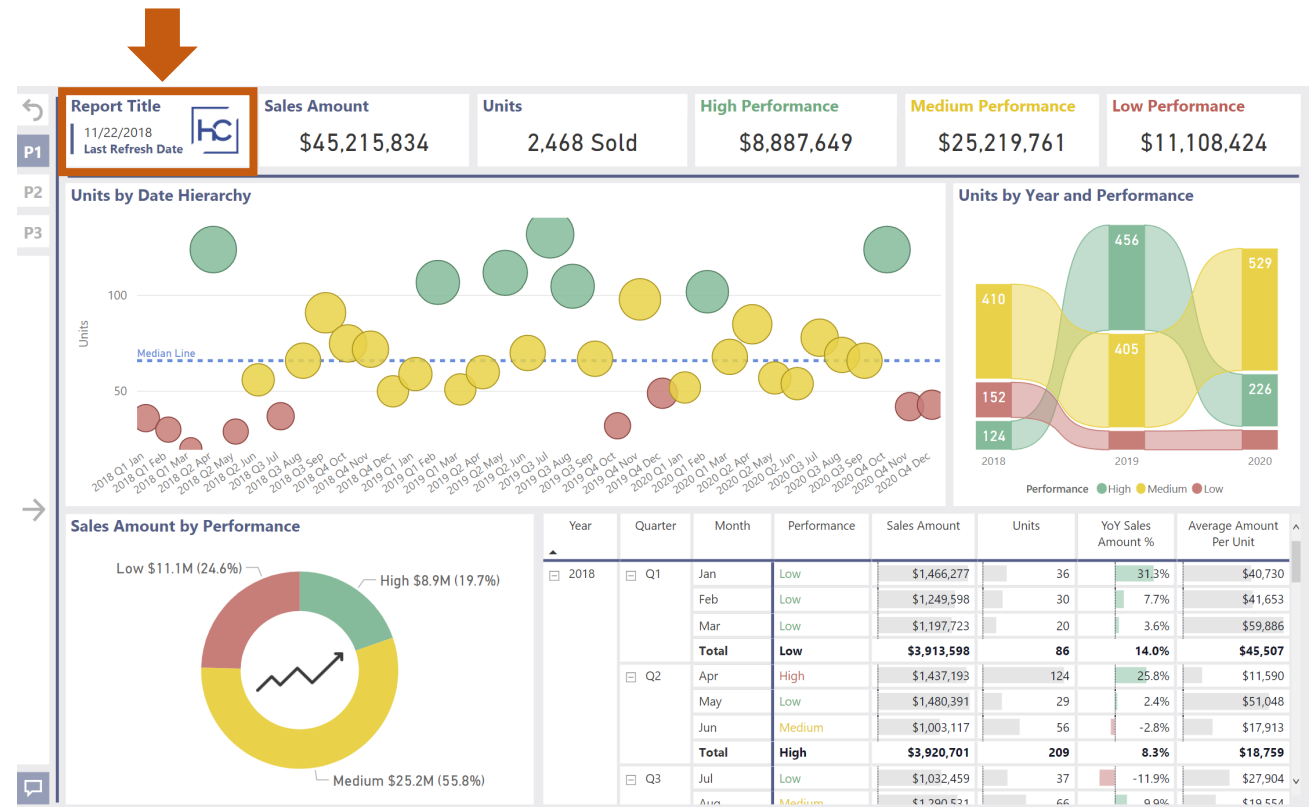
Visualizations

- Displays patterns, trends, or outliers in the data



Information

- Gives additional information about the data or report



Defining a Report

Essential report components

Three primary components of a report



Visualizations

- Displays patterns, trends, or outliers in the data



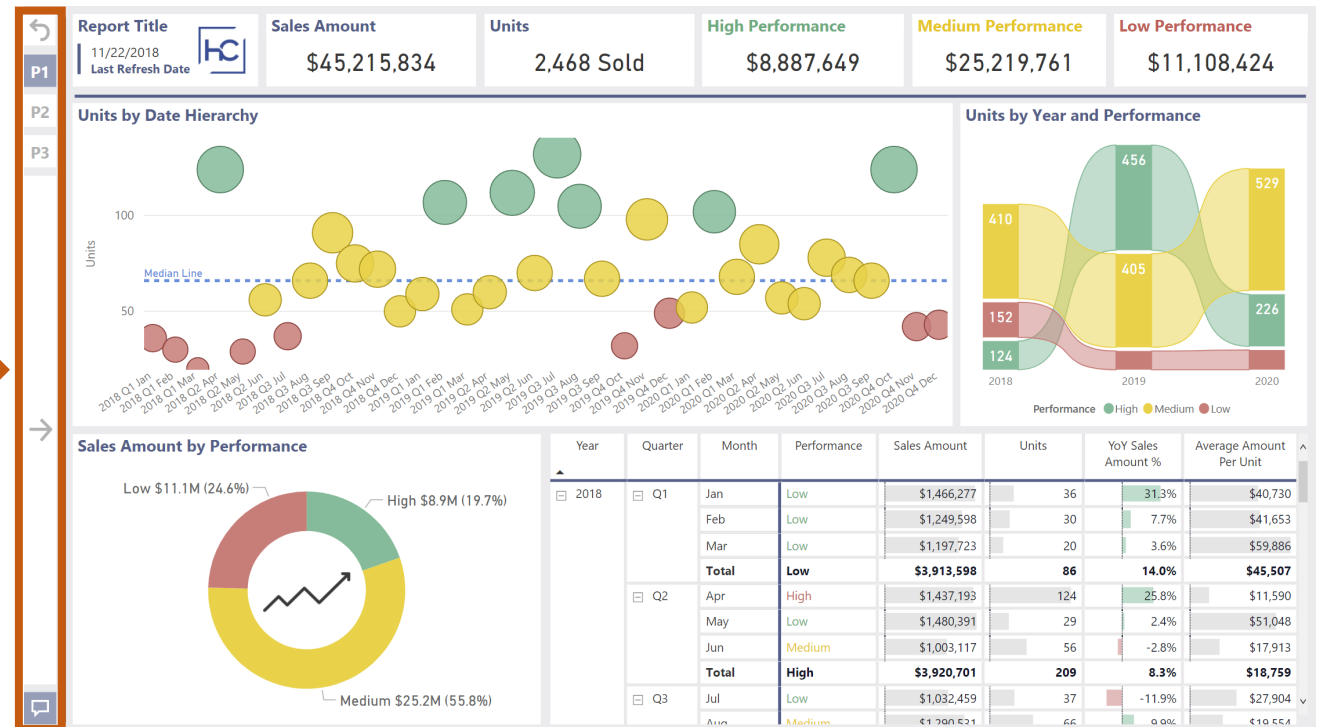
Information

- Gives additional information about the data or report



Filters / navigation

- Provides ways to interact with and drill into the data



ALL THREE ARE NEEDED TO CREATE AN EFFECTIVE REPORT

Defining a Report

Essential report components ► Characteristics of **visualizations**

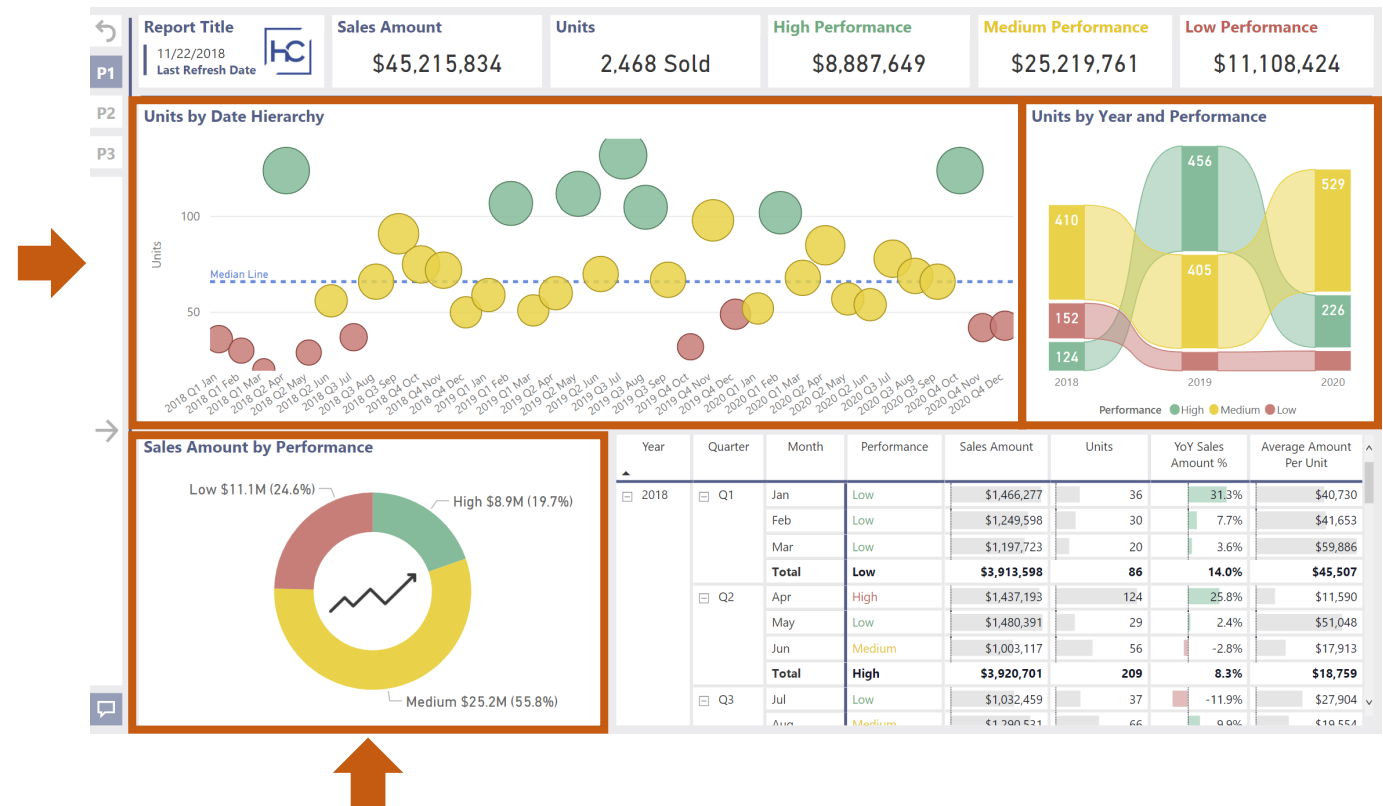
Defining visualizations

- Displays summarized data that has been categorized and sorted
- Tells a story about the data

Types of visuals



Charts / graphs



Defining a Report

Essential report components ► Characteristics of **visualizations**

Defining visualizations

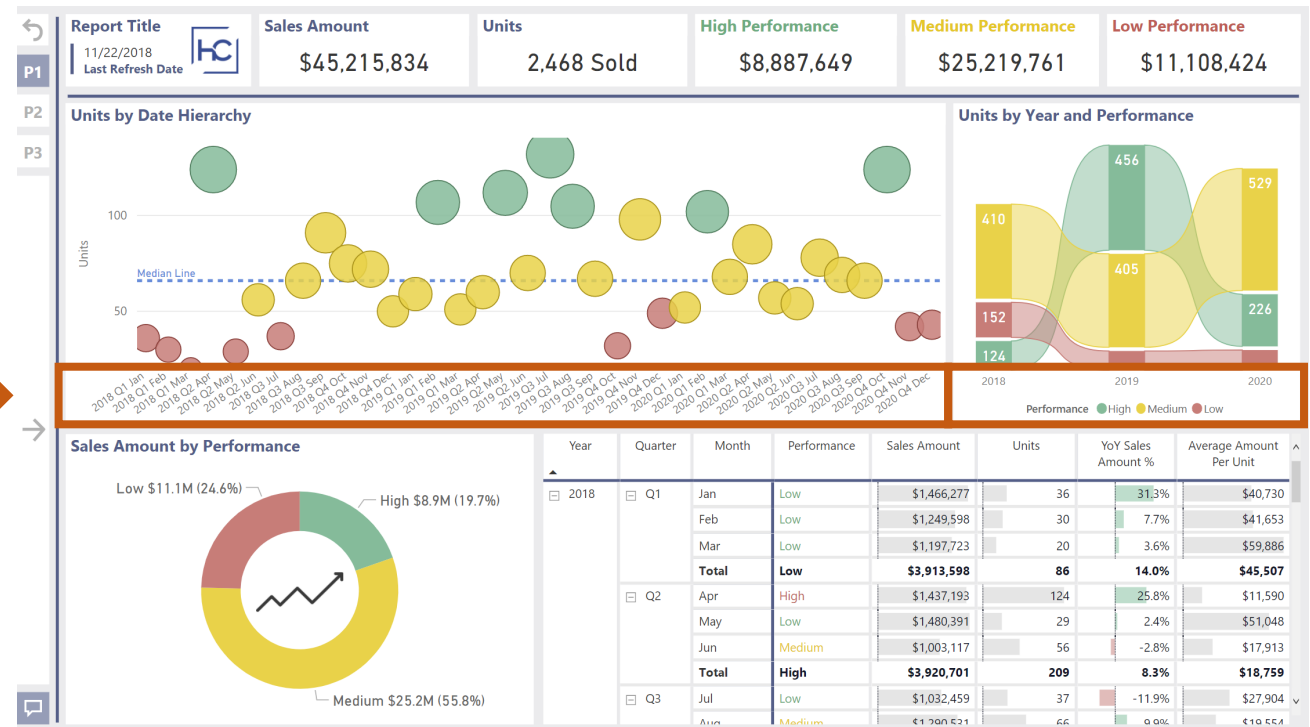
- Displays summarized data that has been categorized and sorted
- Tells a story about the data

Types of visuals



Charts / graphs

- Data represented graphically across time or categories



Defining a Report

Essential report components ► Characteristics of **visualizations**

Defining visualizations

- Displays summarized data that has been categorized and sorted
- Tells a story about the data

Types of visuals



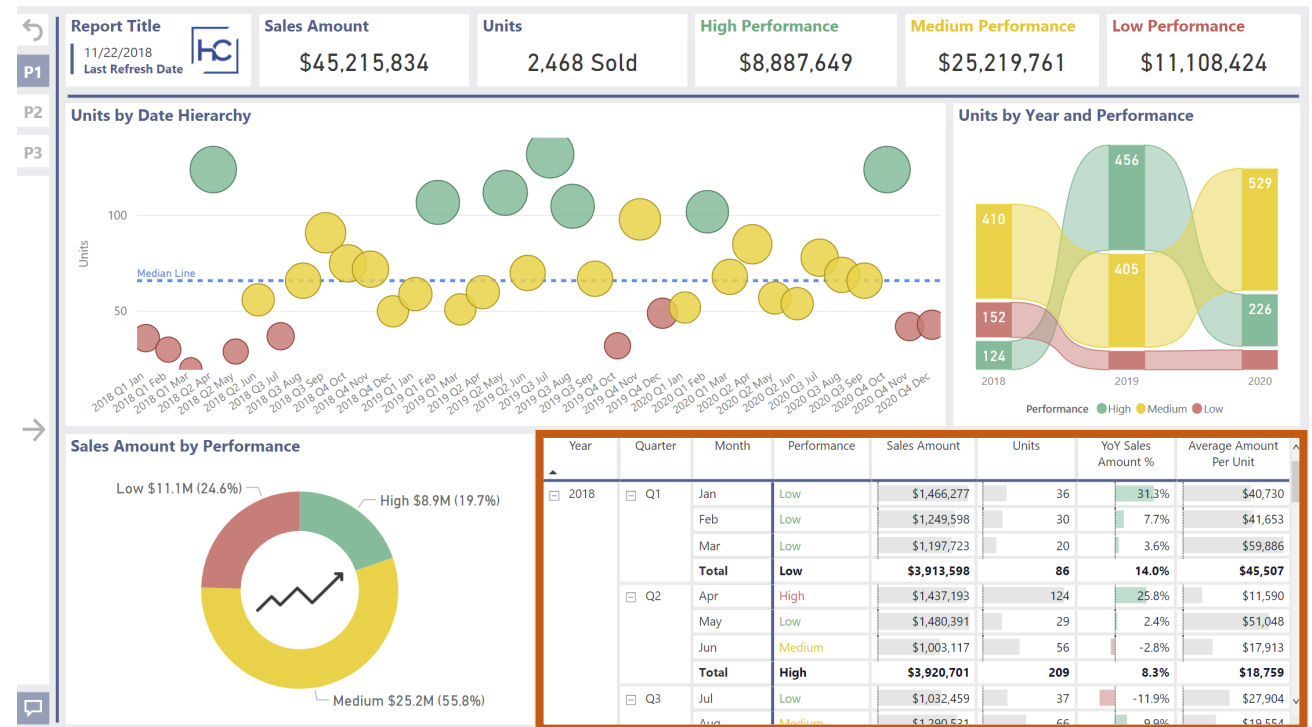
Charts / graphs

- Data represented graphically across time or categories



Tables

- Data displayed on columns and rows



Defining a Report

Essential report components ► Characteristics of **visualizations**

Defining visualizations

- Displays summarized data that has been categorized and sorted
- Tells a story about the data

Types of visuals



Charts / graphs

- Data represented graphically across time or categories



Tables

- Data displayed on columns and rows



Key performance indicators (KPI's)

- Quantifiable values used to measure performance



Defining a Report

Essential report components ► Characteristics of **visualizations**

Defining visualizations

- Displays summarized data that has been categorized and sorted
- Tells a story about the data

Types of visuals



Charts / graphs

- Data represented graphically across time or categories



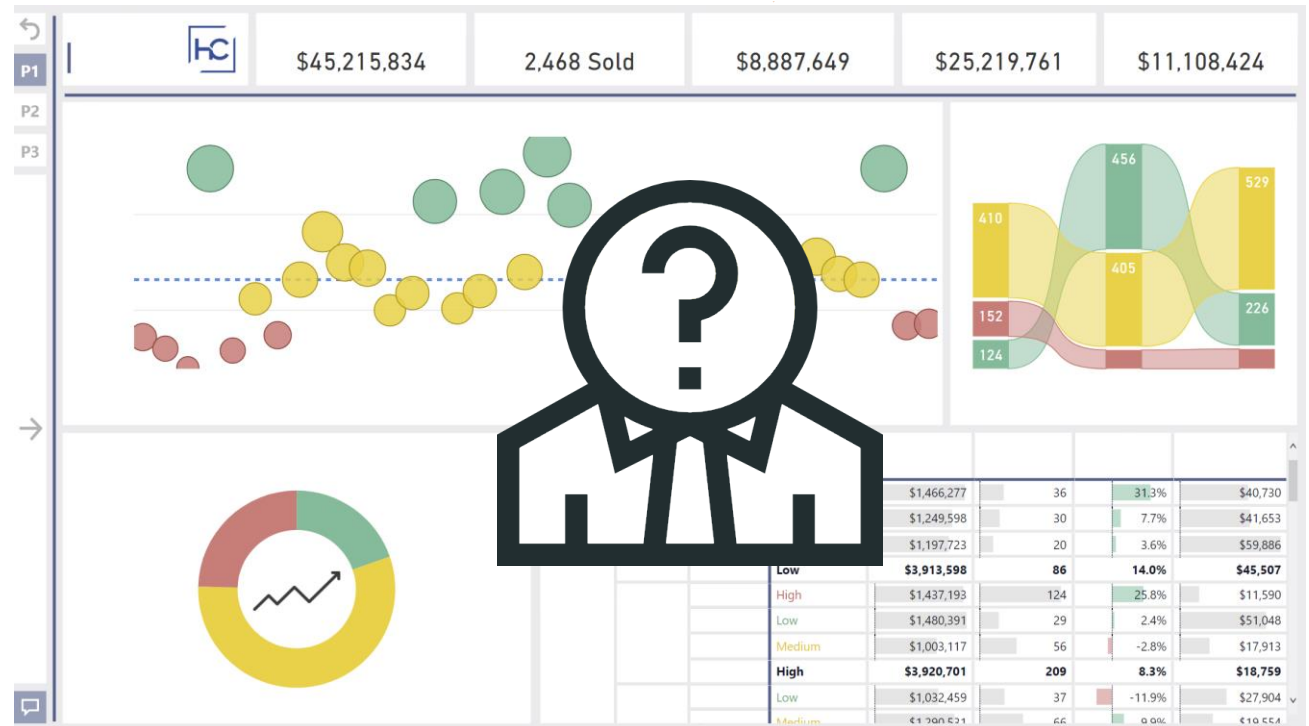
Tables

- Data displayed on columns and rows



Key performance indicators (KPI's)

- Quantifiable values used to measure performance



REPORTS NEED INFORMATION TO INTERPRET DATA

Defining a Report

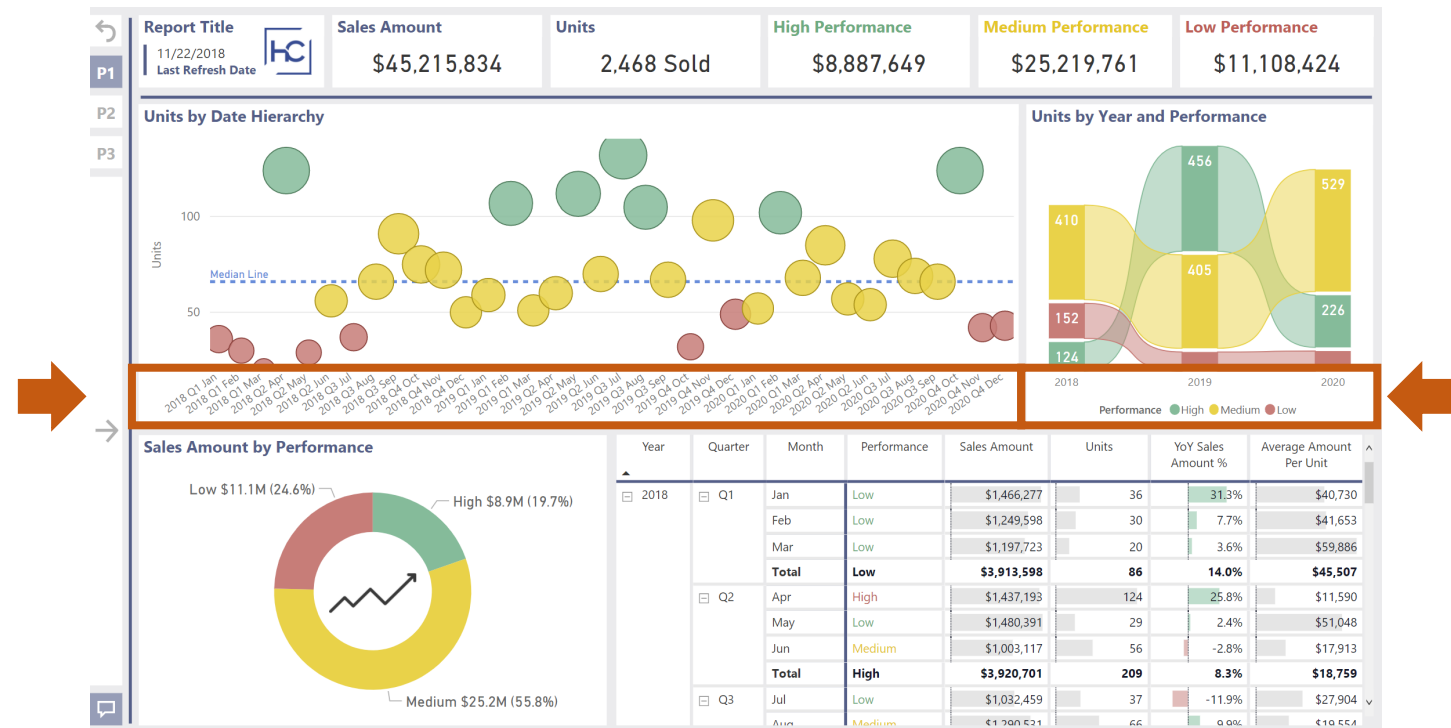
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis



Defining a Report

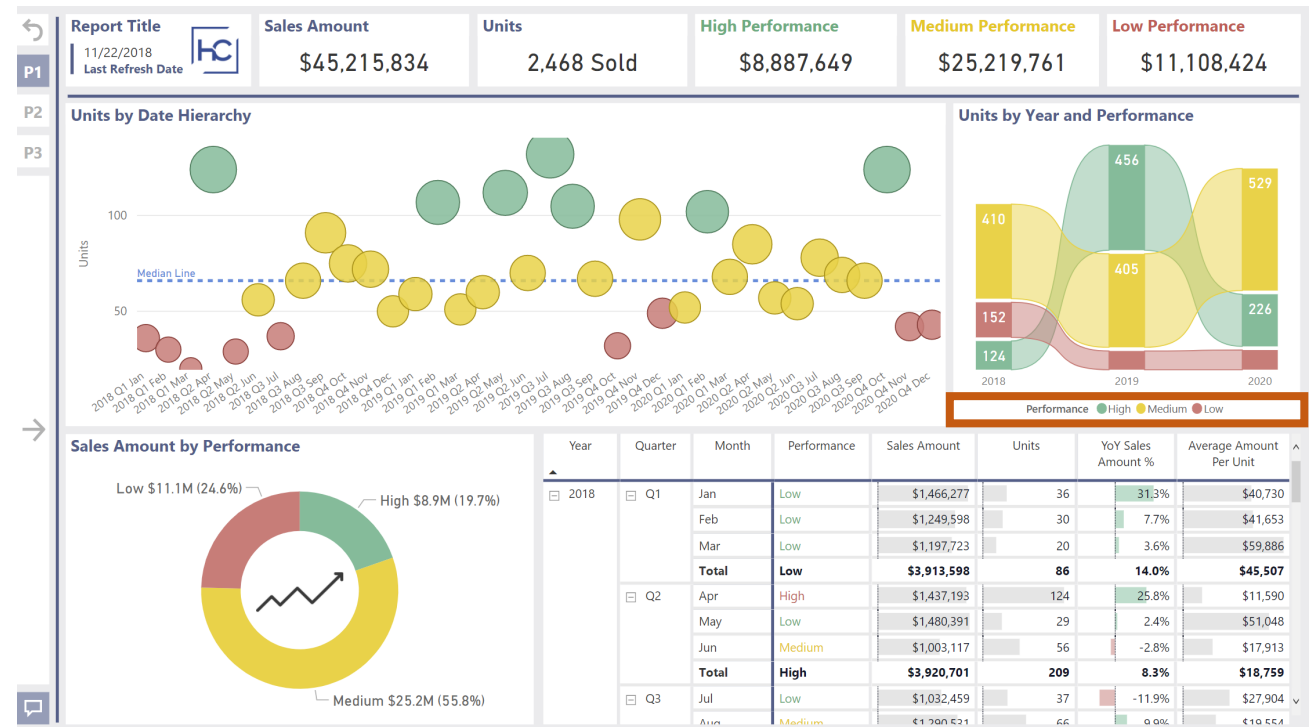
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis
 - Legend



Defining a Report

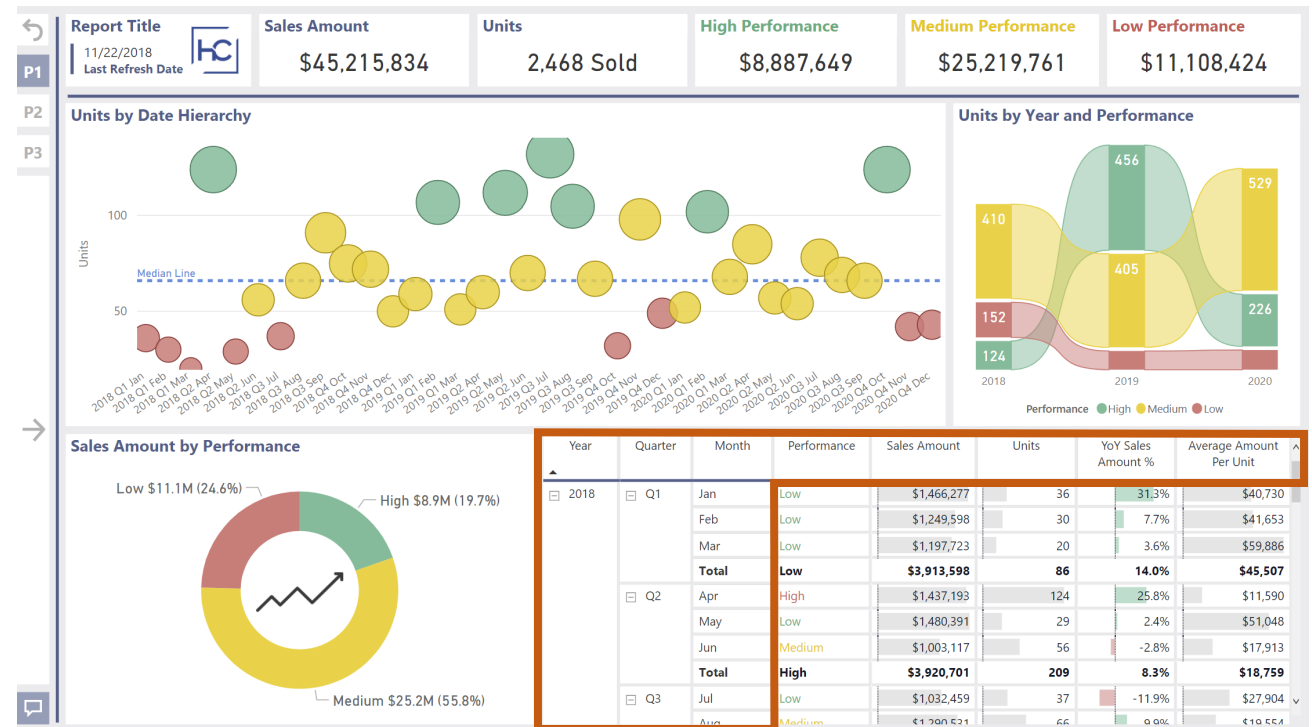
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis
 - Legend
 - Row / column headers



Defining a Report

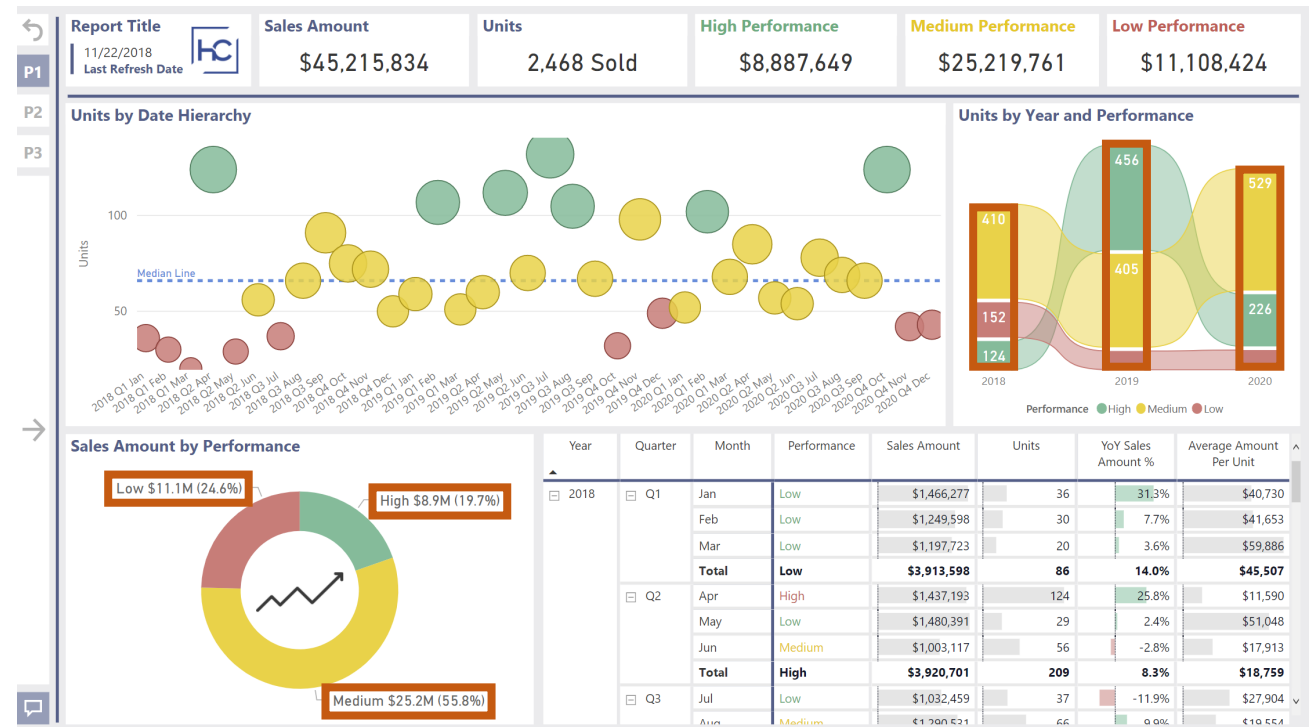
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis
 - Data labels
 - Legend
 - Row / column headers



Defining a Report

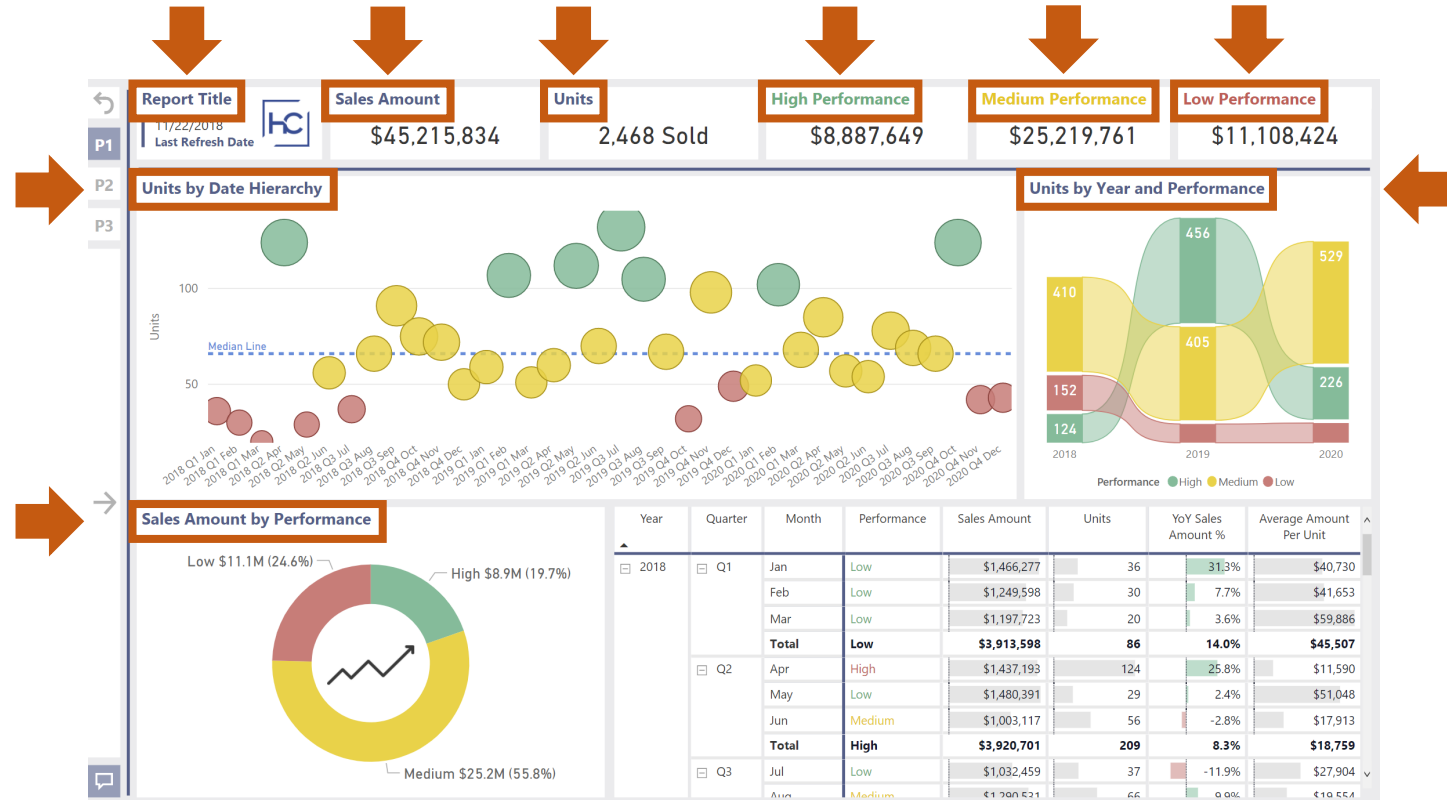
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis
 - Data labels
 - Legend
 - Title
 - Row / column headers



Defining a Report

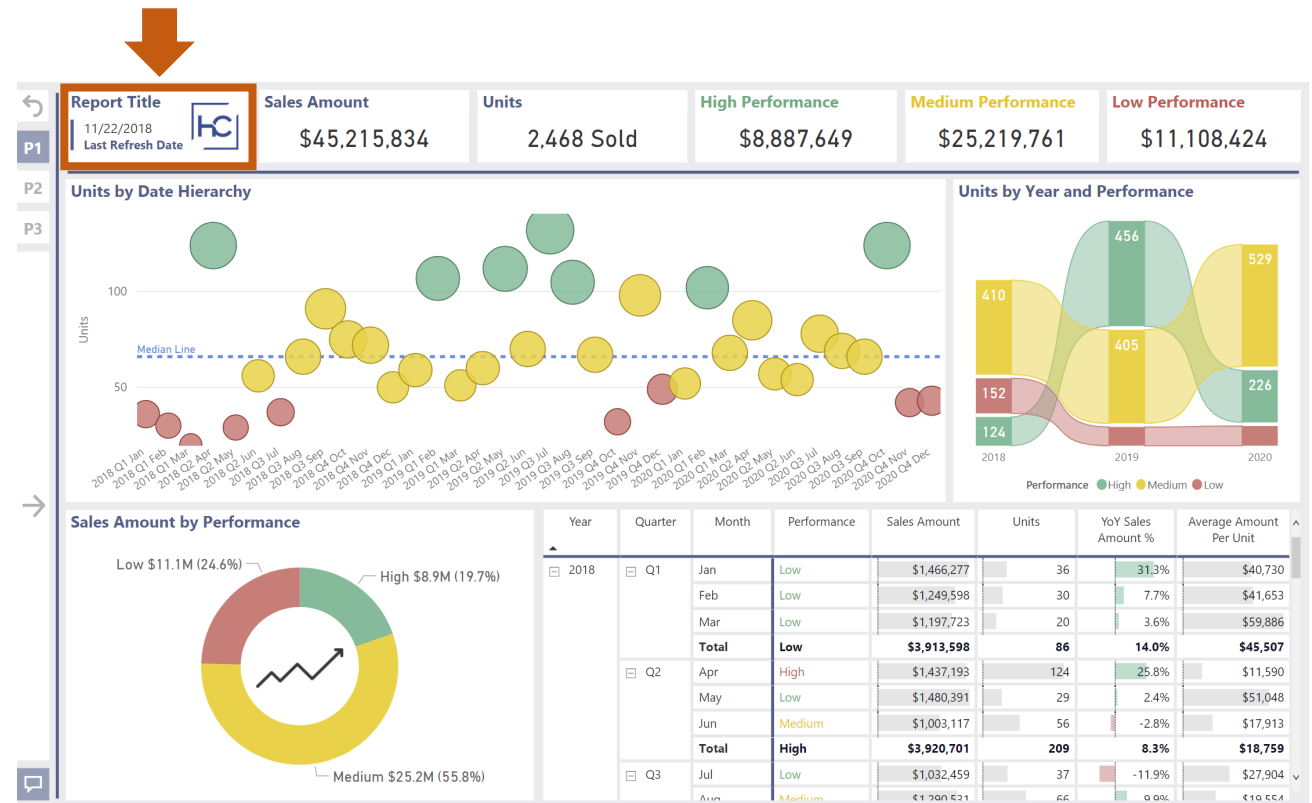
Essential report components ► Characteristics of **information**

Defining information

- Gives meaning to visualizations
- Provides context for the report

Types of information

- Visualization details
 - Axis
 - Data labels
 - Legend
 - Title
 - Row / column headers
- Report context
 - Report title
 - Refresh date(s)



VISUALS NEED INFO TO PROVIDE A COMPLETE STORY

Defining a Report

Essential report components ► Characteristics of **filters**

Defining filters

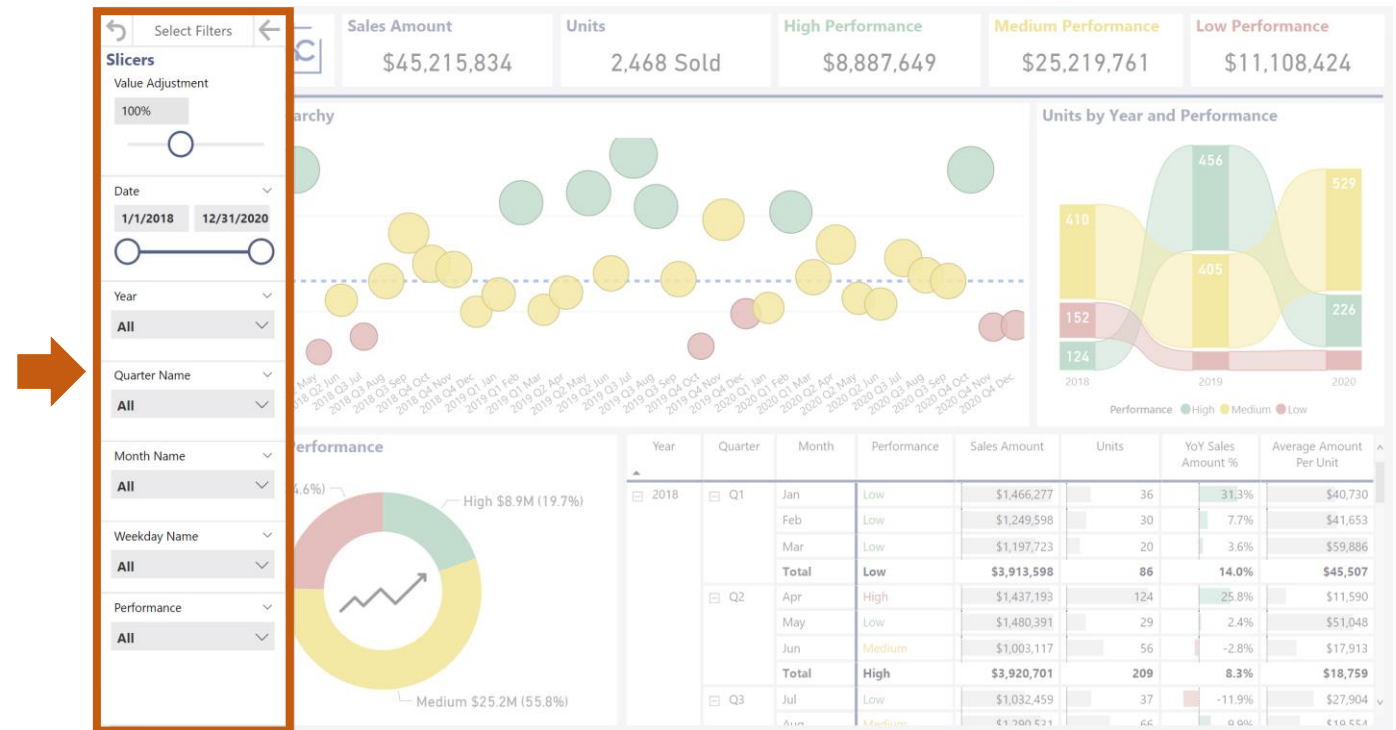
- Allow users to filter on different data perspectives
- Provide report interactions to derive insights from data

Types of filters



Report slicers

- Objects that can filter in various ways based on data type



Defining a Report

Essential report components ► Characteristics of **filters**

Defining filters

- Allow users to filter on different data perspectives
- Provide report interactions to derive insights from data

Types of filters



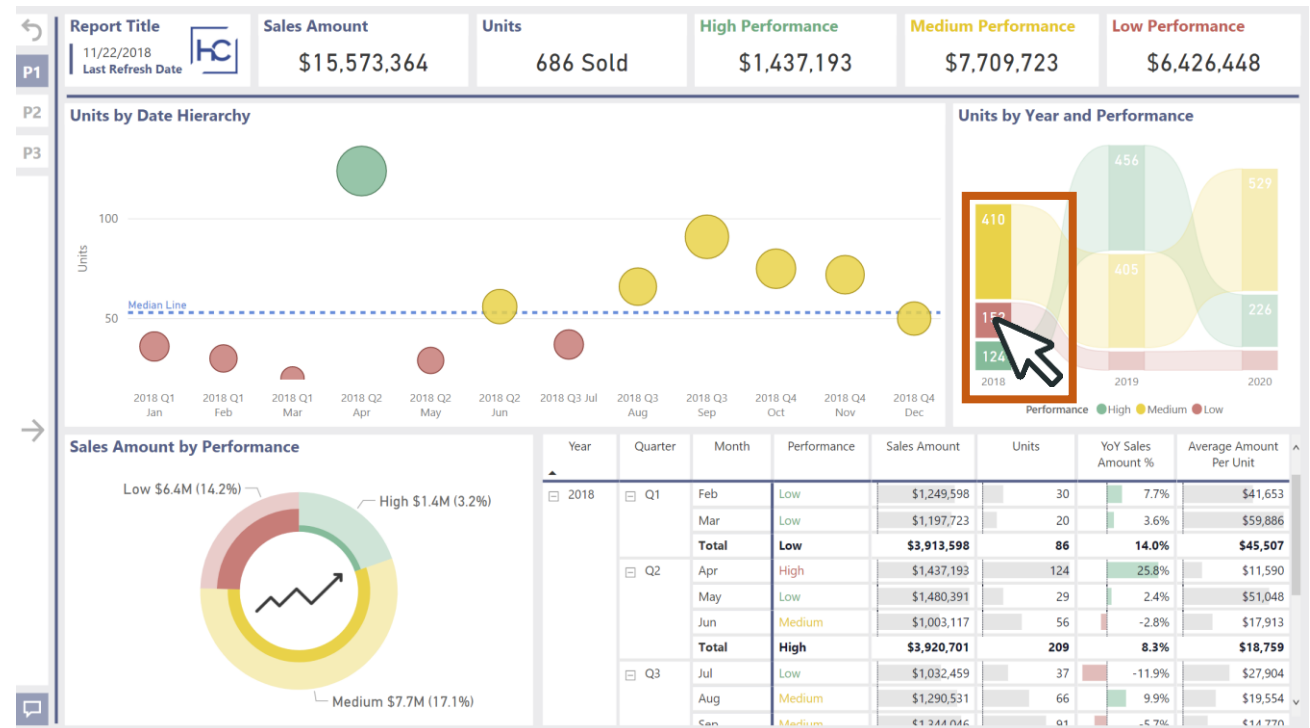
Report slicers

- Objects that can filter in various ways based on data type



Visual cross-filters

- Visual category selection that cross-filters other objects

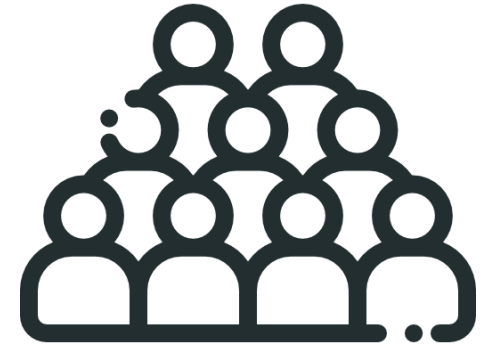


Defining a Report

Primary report types

Know your audience

- Audience determines the **type of report** to build, what to include, and what not to include
- There are different types of primary reports to build, and **levels of detail** to consider, depending on the audience



Types of reports



Operational

- Shows up-to-date metrics related to business process
- Notifies users when data deviates from acceptable standards



Strategic

- Shows key information to measure the health of the organization
- Helps identify areas for improvement or organizational changes



Analytical

- Provides data to identify patterns and trends across time or categories
- Contains larger datasets for discovery and analysis of the data

Less Detailed

More Detailed

Three Primary Components of a Report



**Knowledge
Check**



?

?



?



Design Principles

- Practices for designing more effective reports

Design Principles

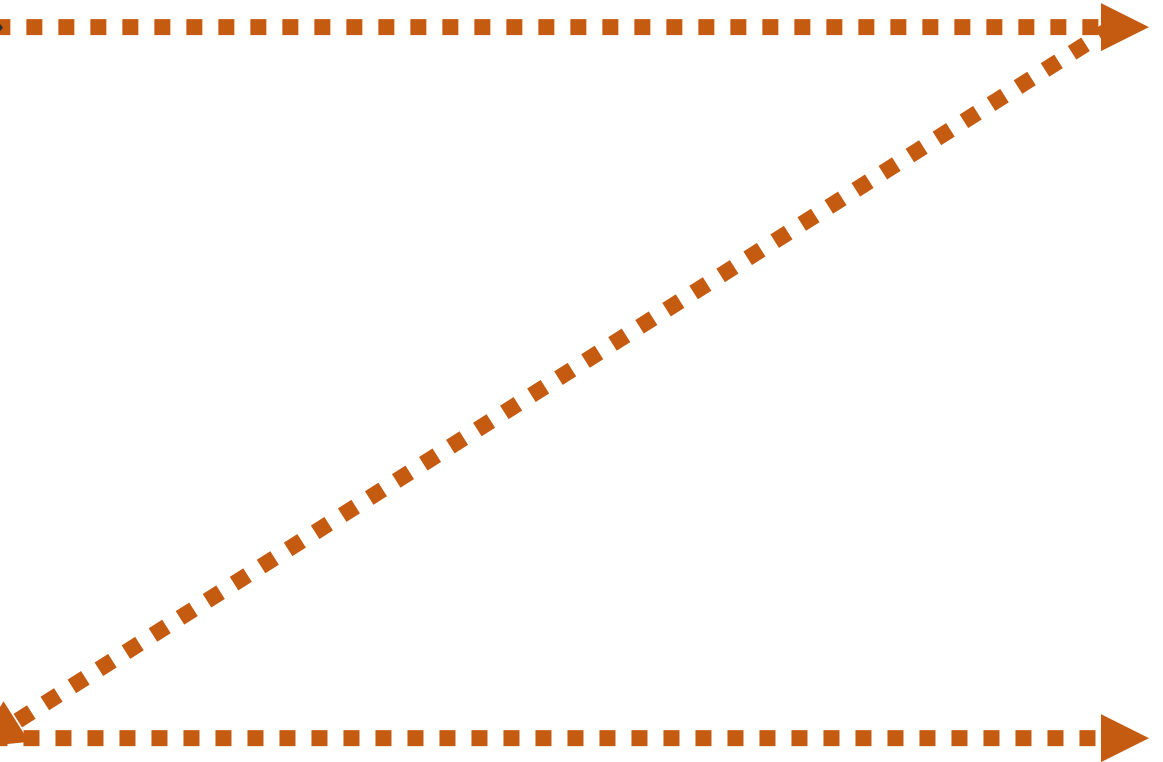
Information processing

How we process information



Information is read **left to right**

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

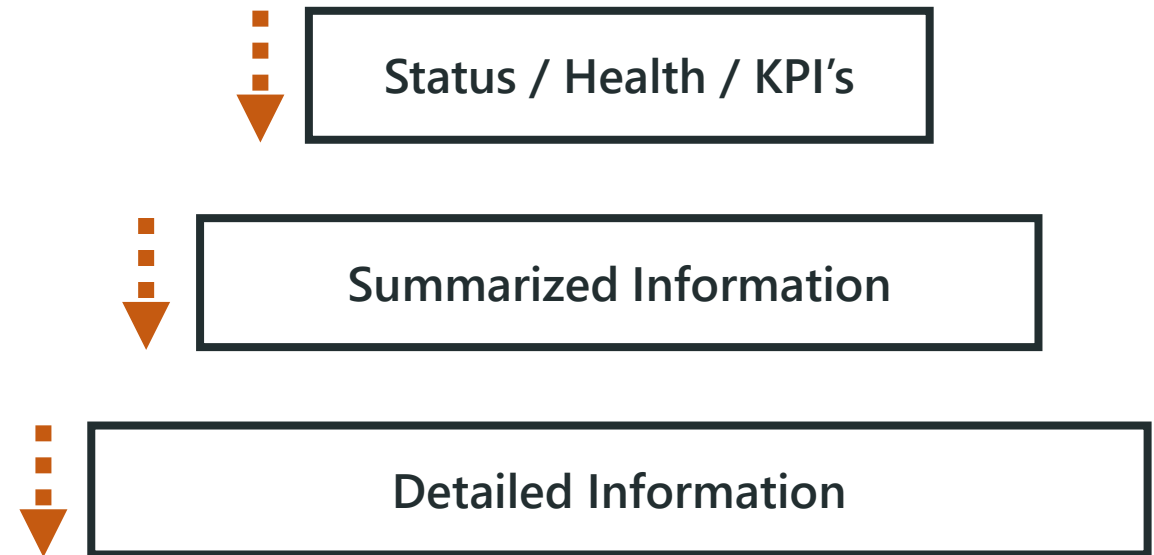


Design Principles

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**

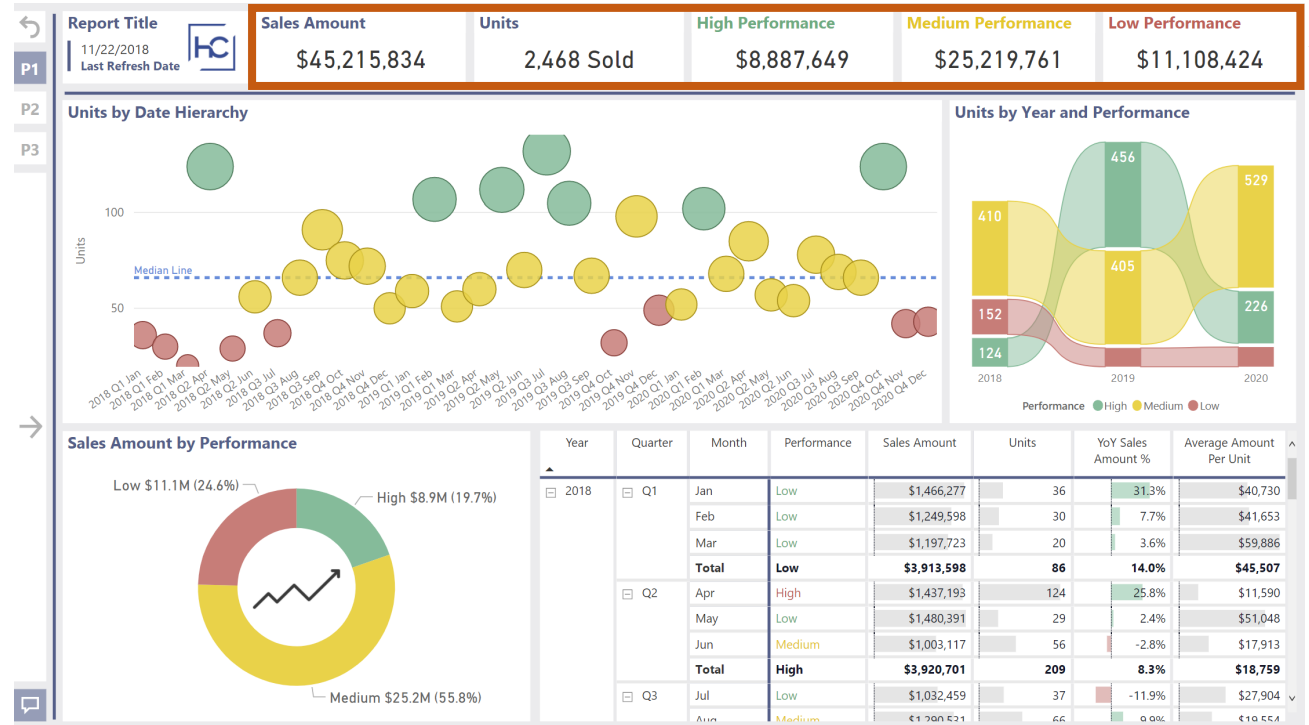


Design Principles

Effective report organization

The data processing flow

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

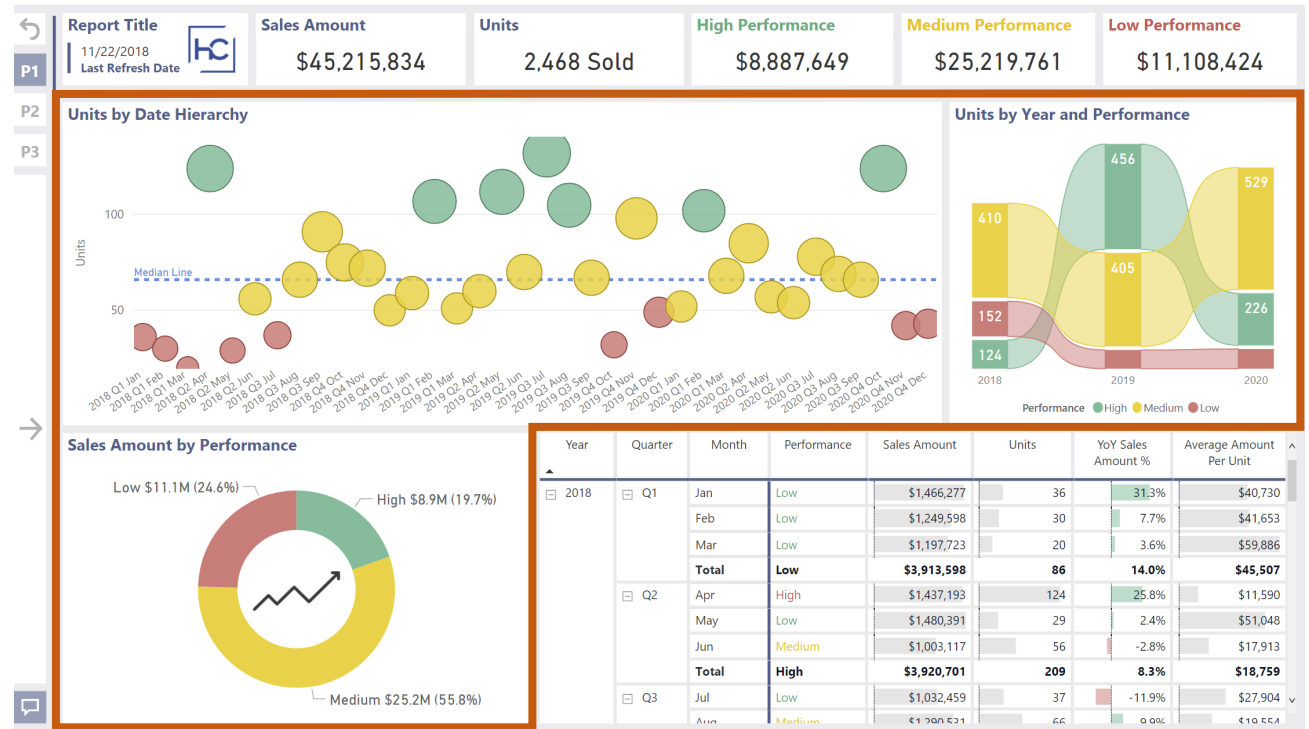


Design Principles

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

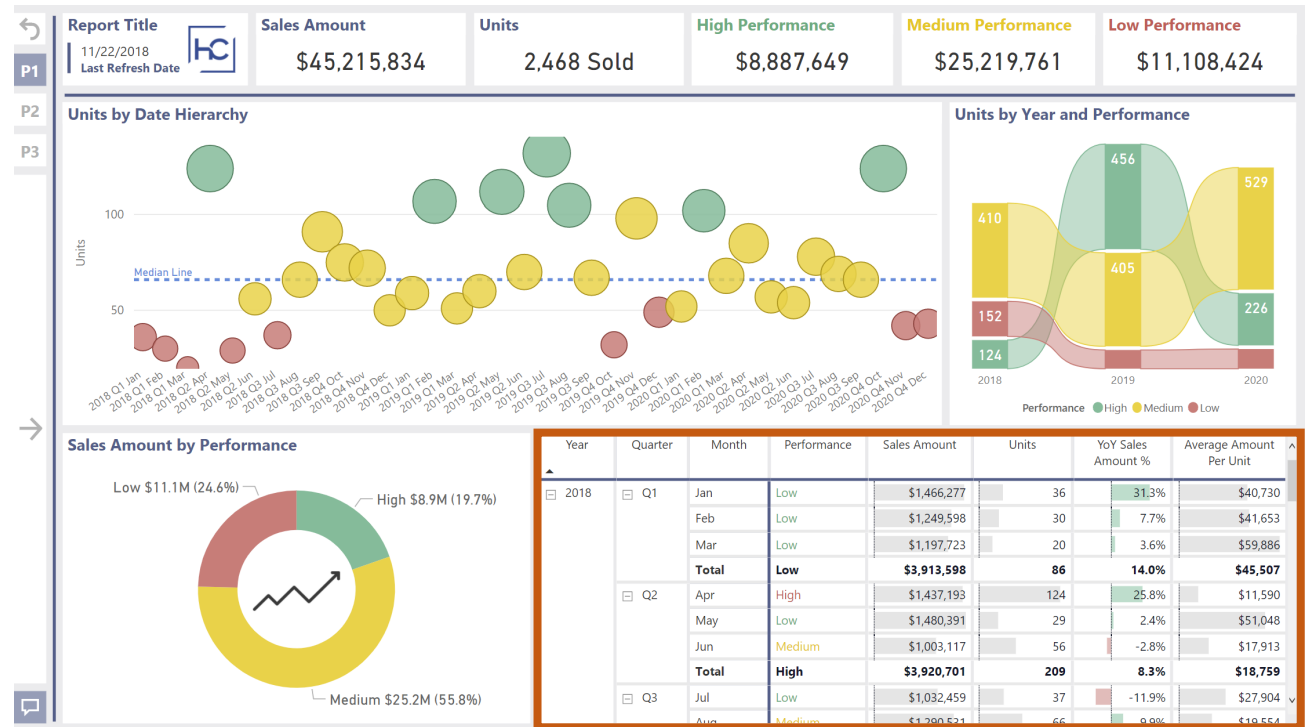


Design Principles

Effective report organization

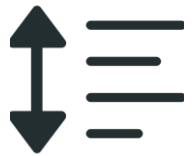
The data processing flow

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

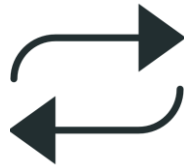


Spacing

Contrast



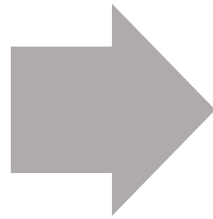
Repetition



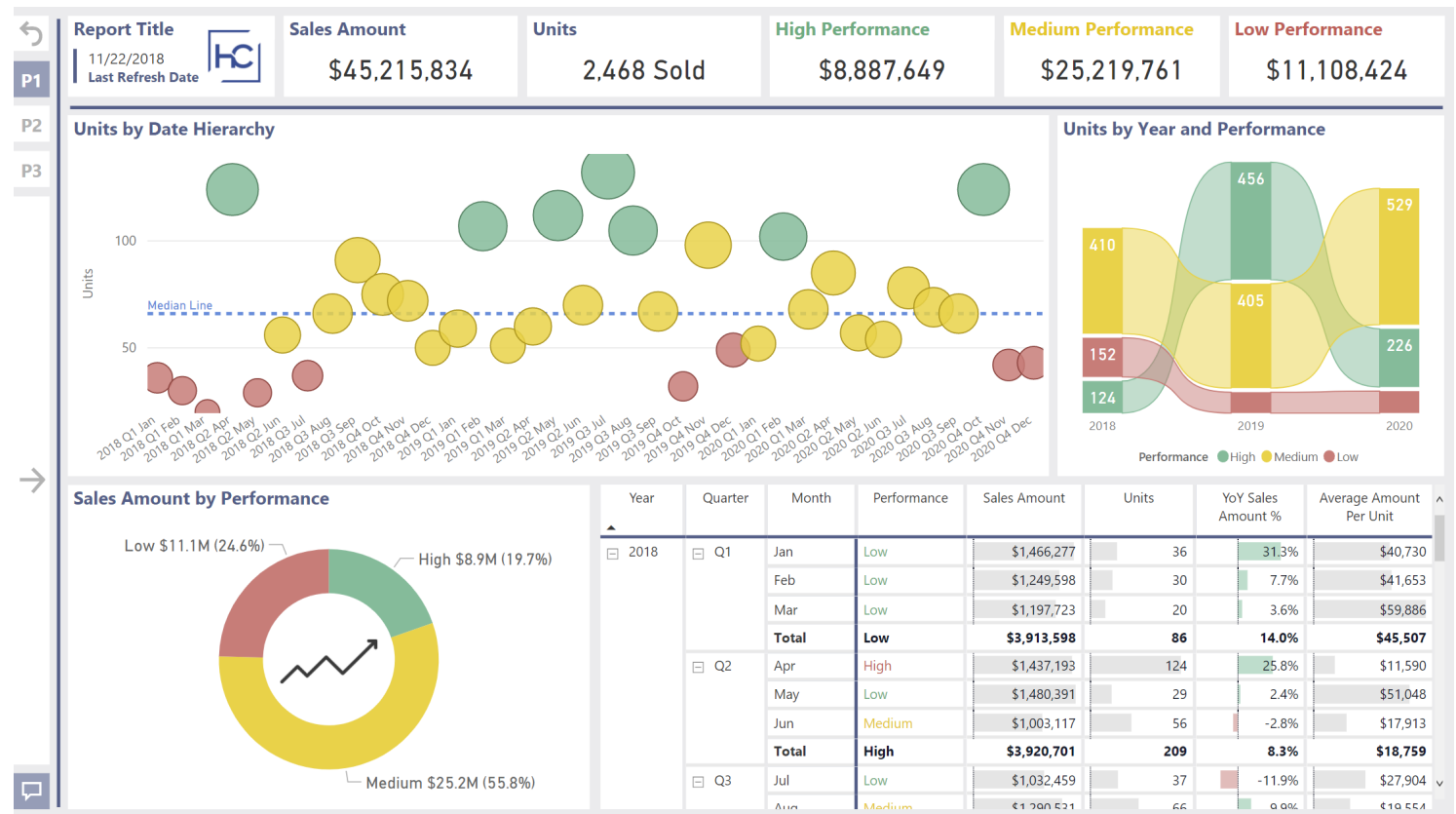
Alignment



Proximity

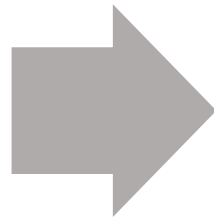
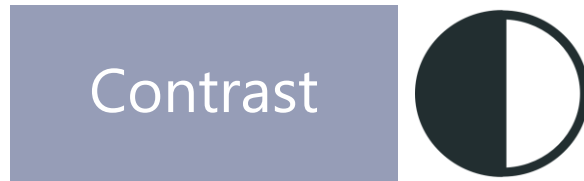


Report with applied methodologies



Design Principles

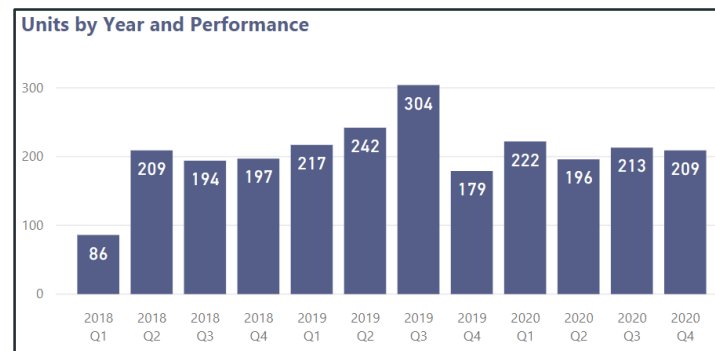
The S.C.R.A.P methodology ► Spacing



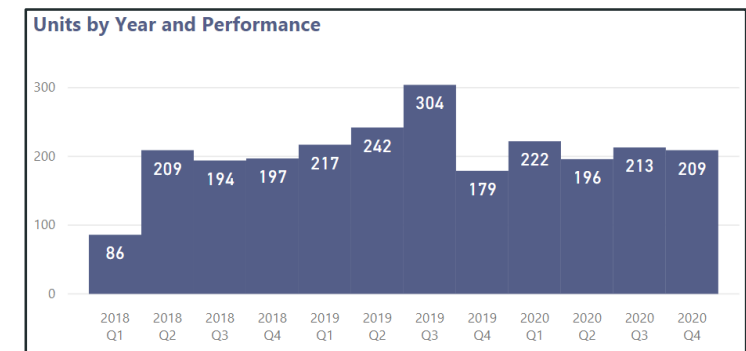
General concept

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

Spacing

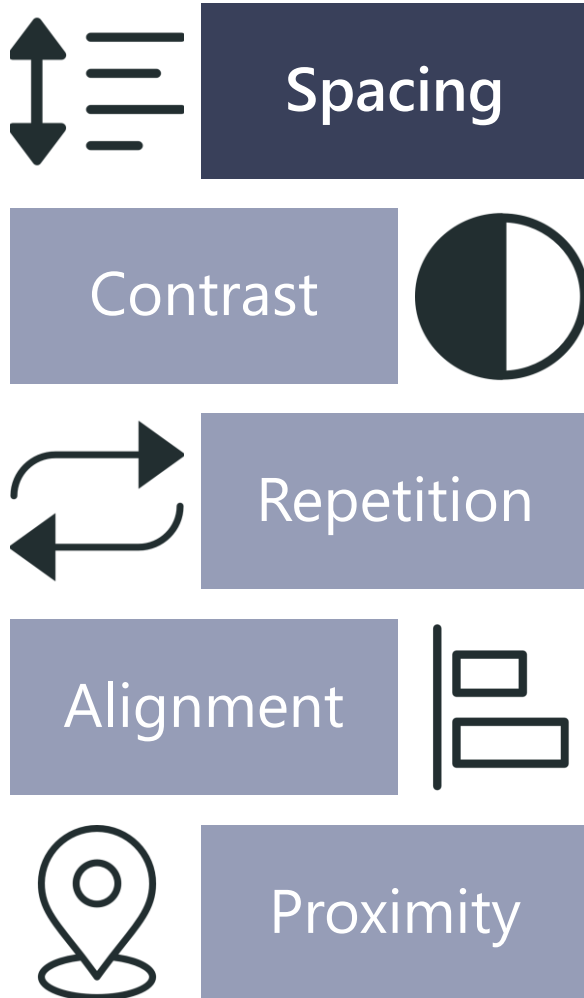


No Spacing



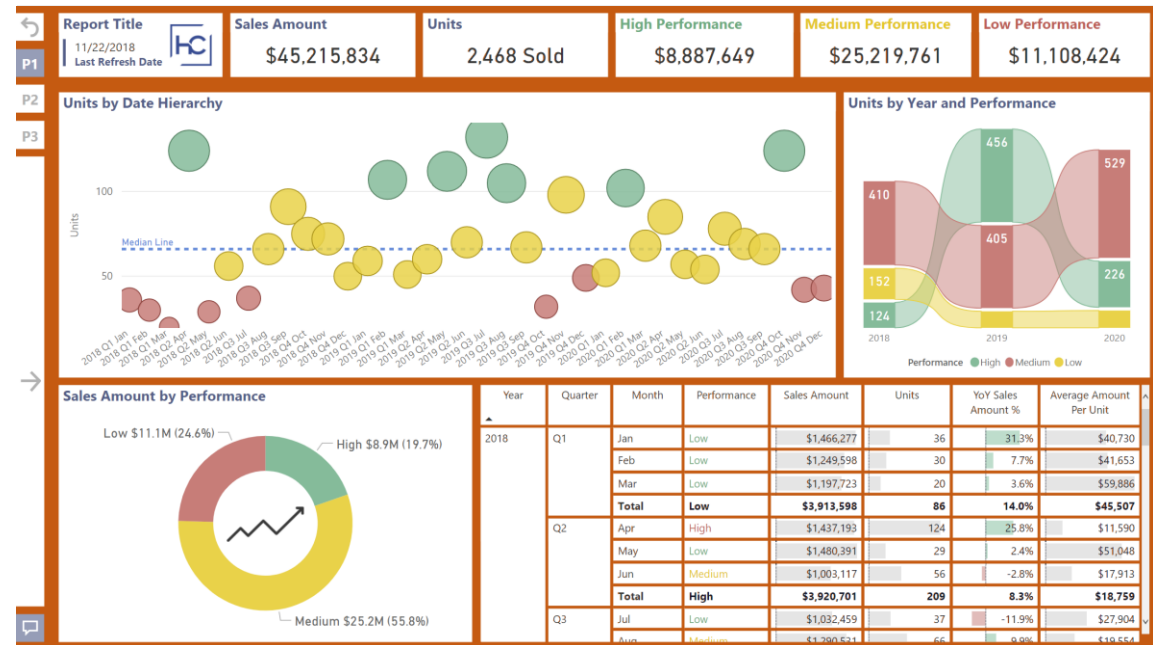
Design Principles

The S.C.R.A.P methodology ► Spacing



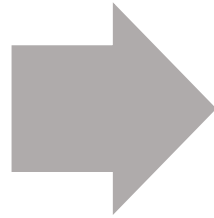
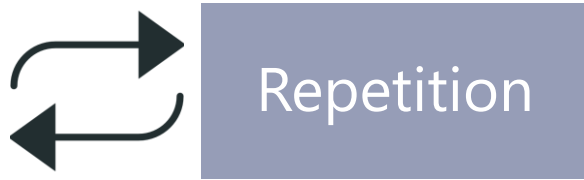
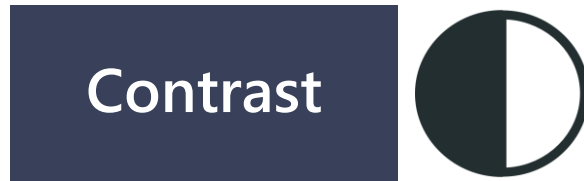
General concept

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



Design Principles

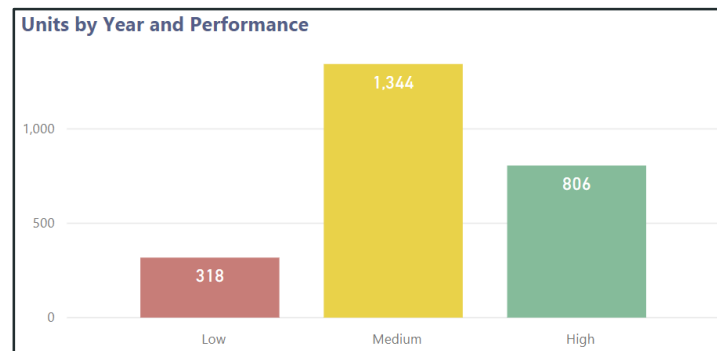
The S.C.R.A.P methodology ► Contrast



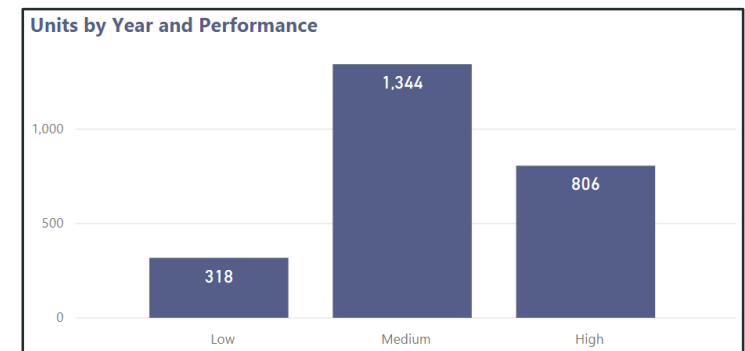
General concept

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

Contrast

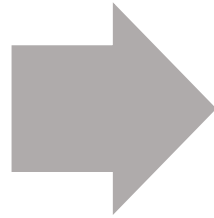
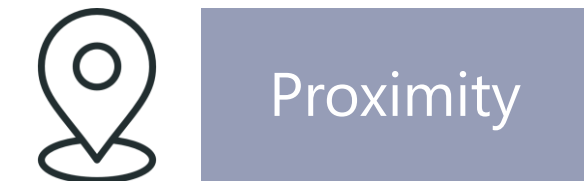
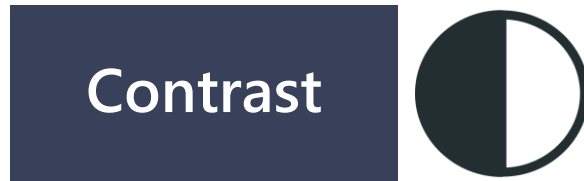


No Contrast



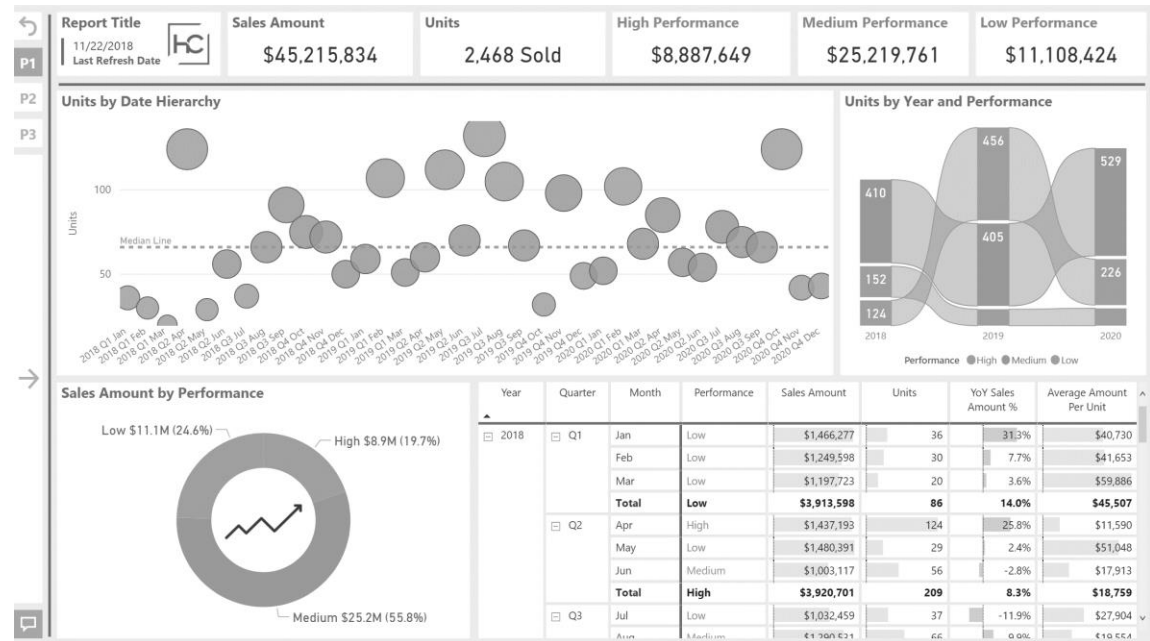
Design Principles

The S.C.R.A.P methodology ► Contrast



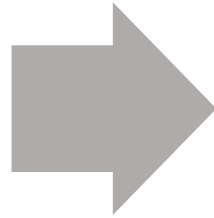
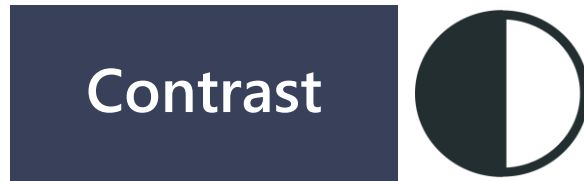
General concept

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



Design Principles

The S.C.R.A.P methodology ► Contrast



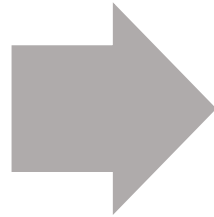
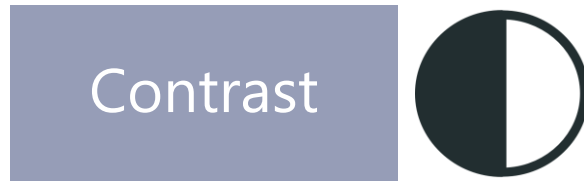
General concept

- 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

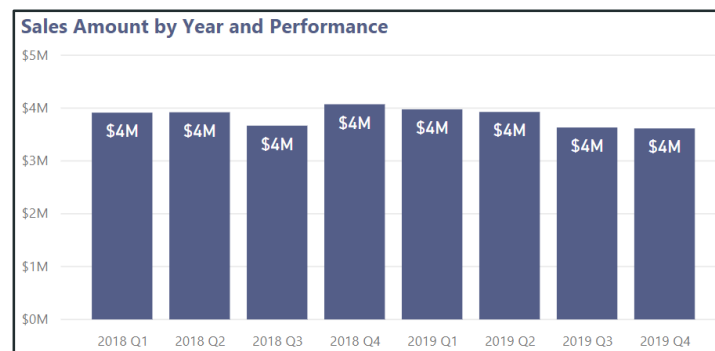
The S.C.R.A.P methodology ► Repetition



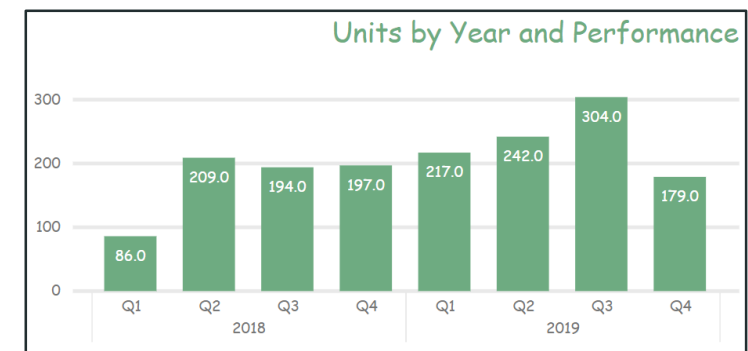
General concept

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

Repetition

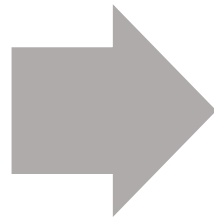
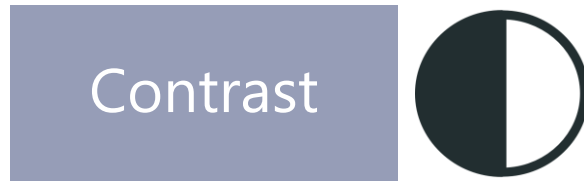


No Repetition



Design Principles

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



General concept

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

Repetition

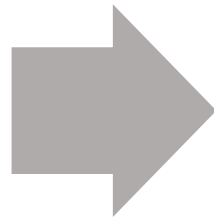
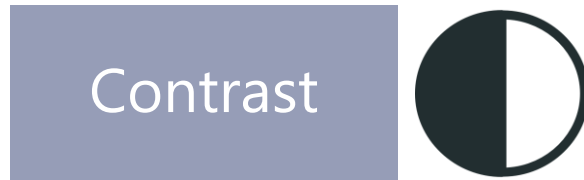
Year All	State All
Quarter All	City All

No Repetition

Year All	State All
Quarter All	City All

Design Principles

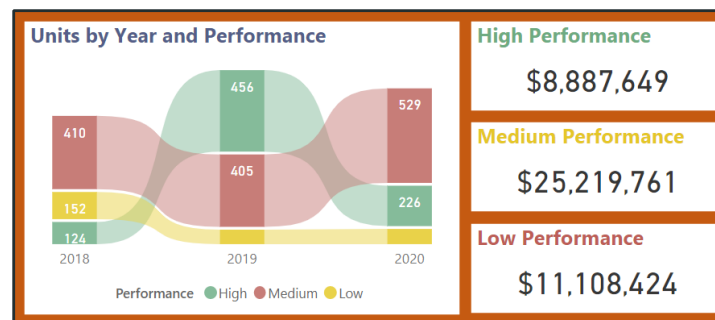
The S.C.R.A.P methodology ► Alignment



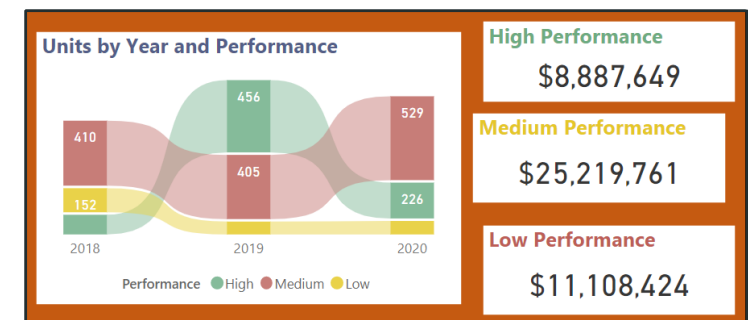
General concept

- **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

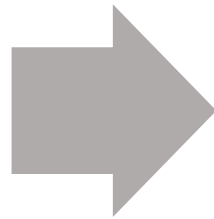
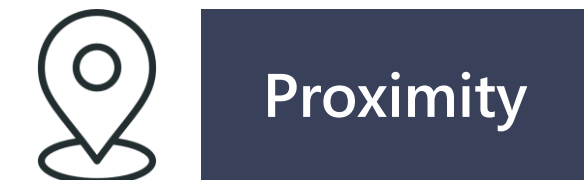
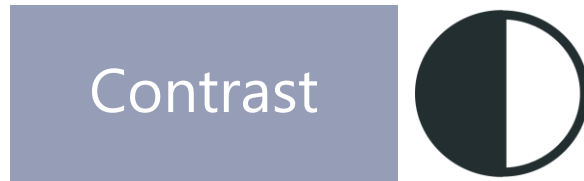


No Alignment



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




Sales Amount
\$45,215,834
High Performance
\$8,887,649
Medium Performance
\$25,219,761
Low Performance
\$11,108,424

No Proximity

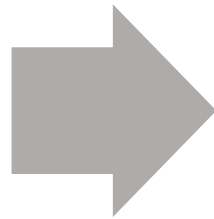
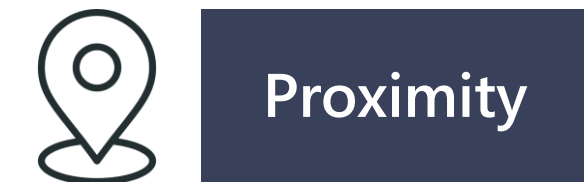
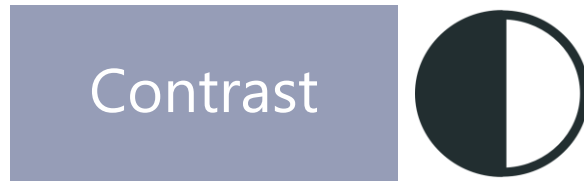


High Performance
\$8,887,649
Sales Amount
\$45,215,834
Medium Performance
\$25,219,761
Low Performance
\$11,108,424



Design Principles

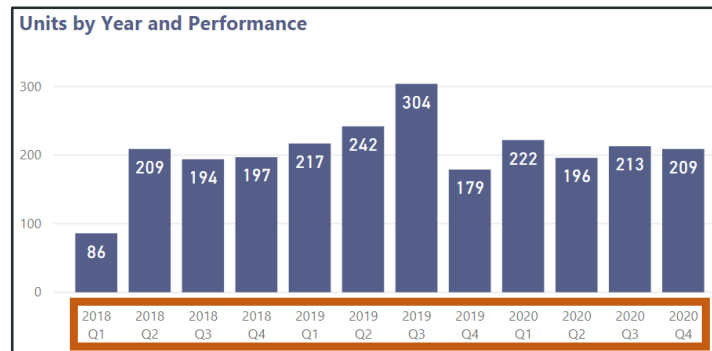
The S.C.R.A.P methodology ► Proximity



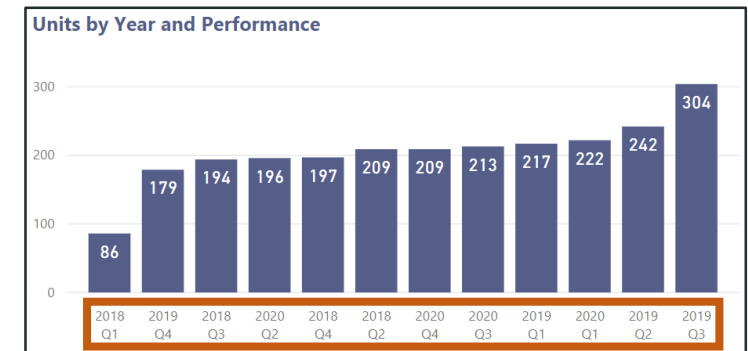
General concept

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

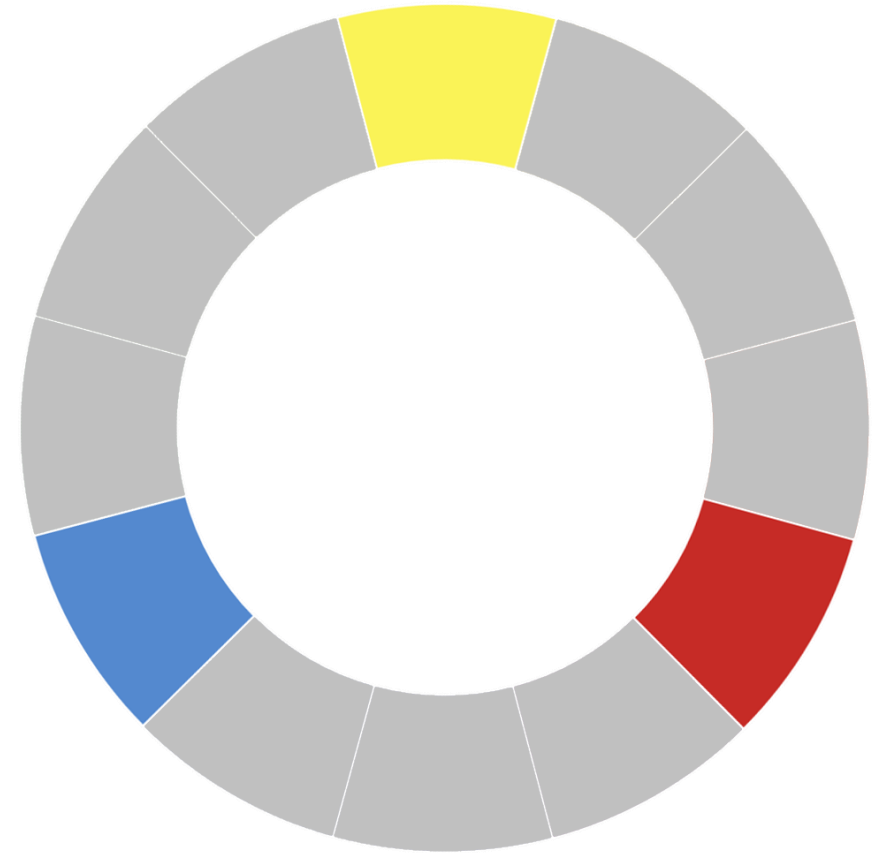
Color wheel definition

- 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



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
- Secondary colors
 - Colors that are formed by **combining** the primary colors

The color wheel



Design Principles

Color theory ► Color harmony

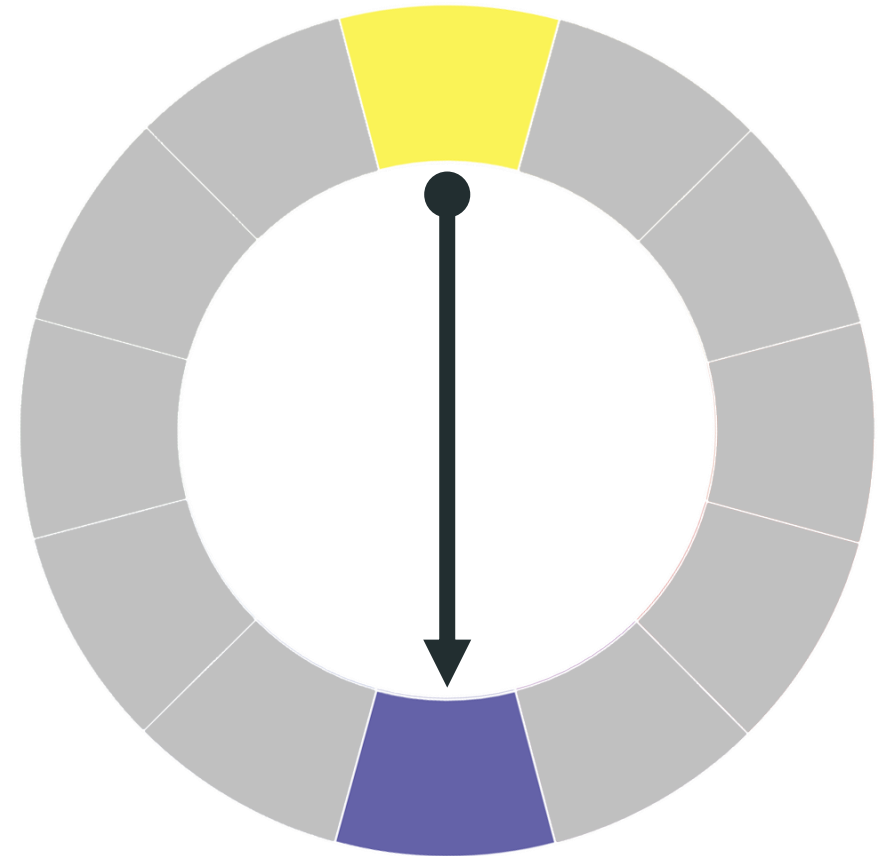
Color harmony definition

- 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



Design Principles

Color theory ► Color harmony

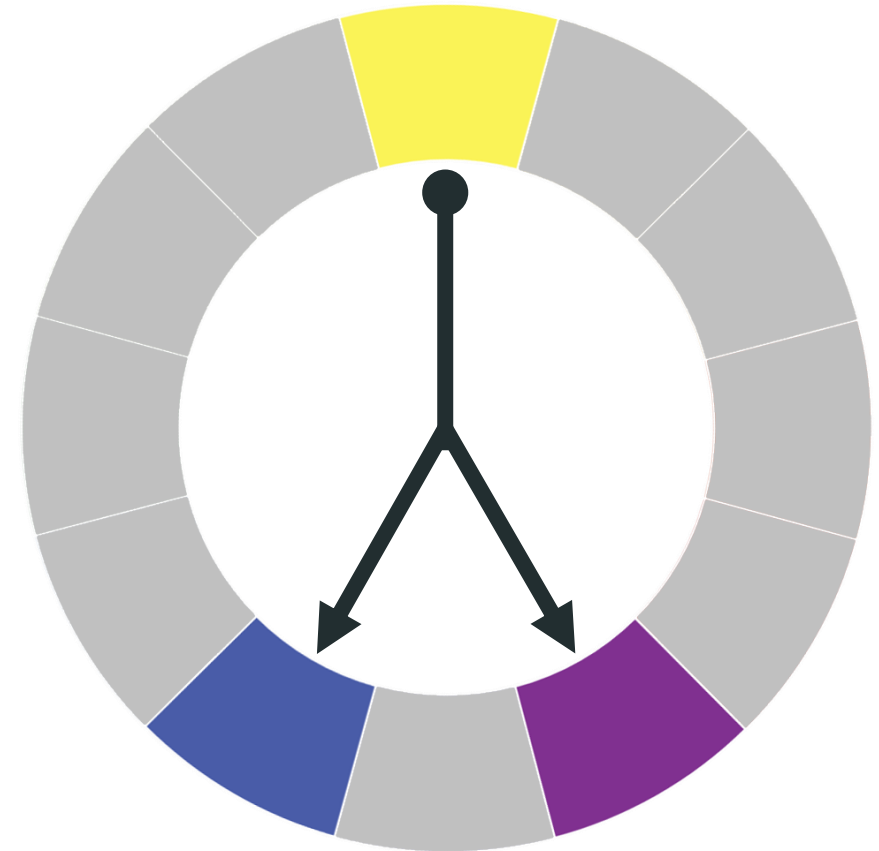
Color harmony definition

- 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



Design Principles

Color theory ► Color harmony

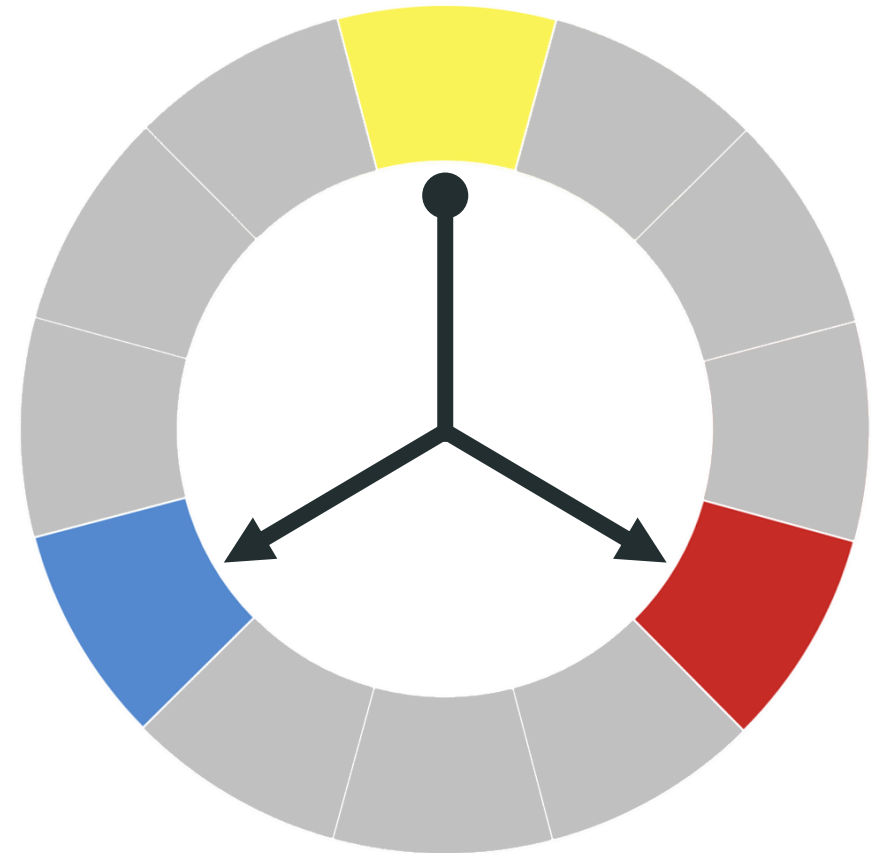
Color harmony definition

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

Types of color harmony

- 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

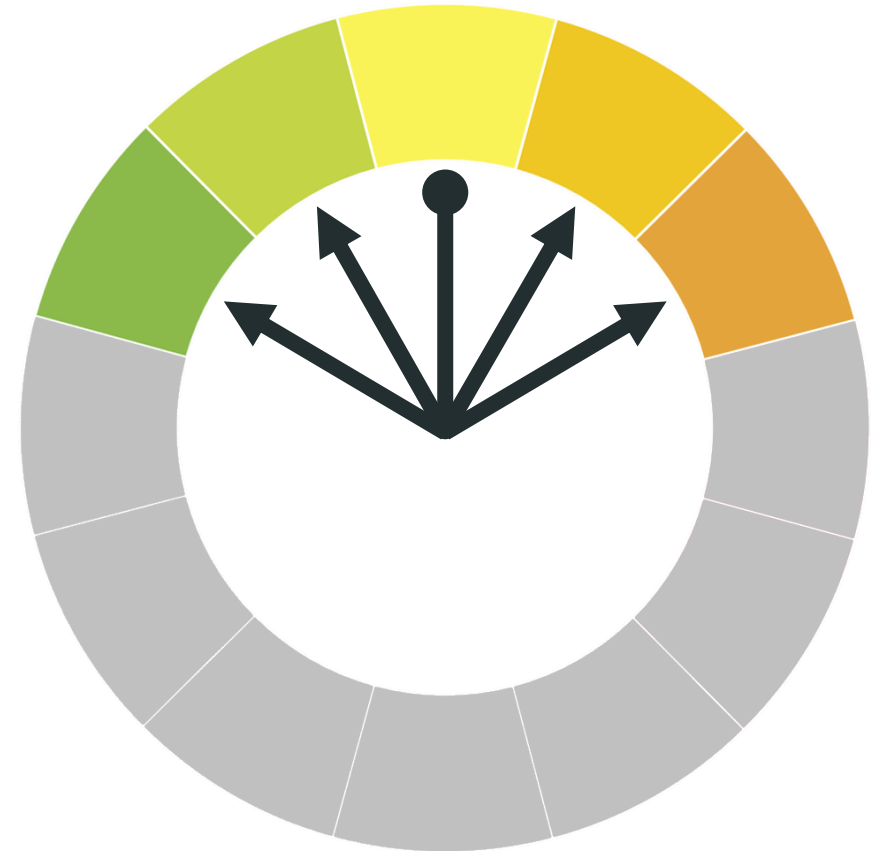
Color harmony definition

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

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



Design Principles

Color harmony ► Color harmony

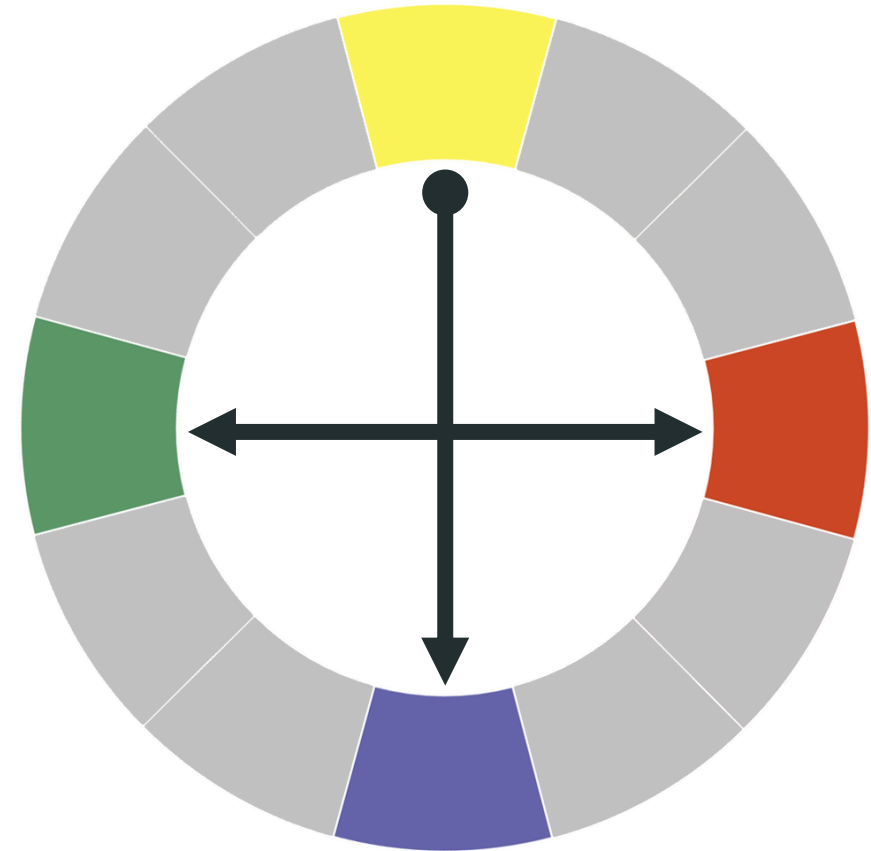
Color harmony definition

- 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

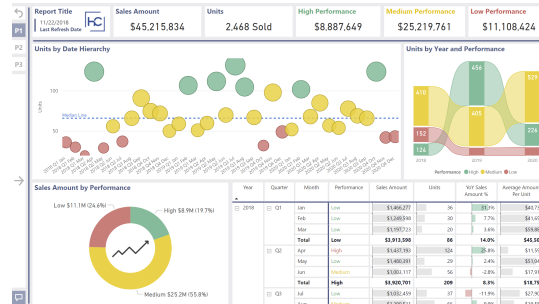


Design Principles

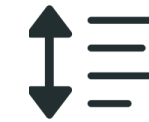
How do we **process** information?

Left to Right

Top to Bottom

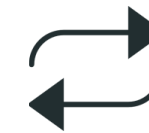


What does **S.C.R.A.P** stand for?



Spacing

Contrast



Repetition

Alignment



Proximity



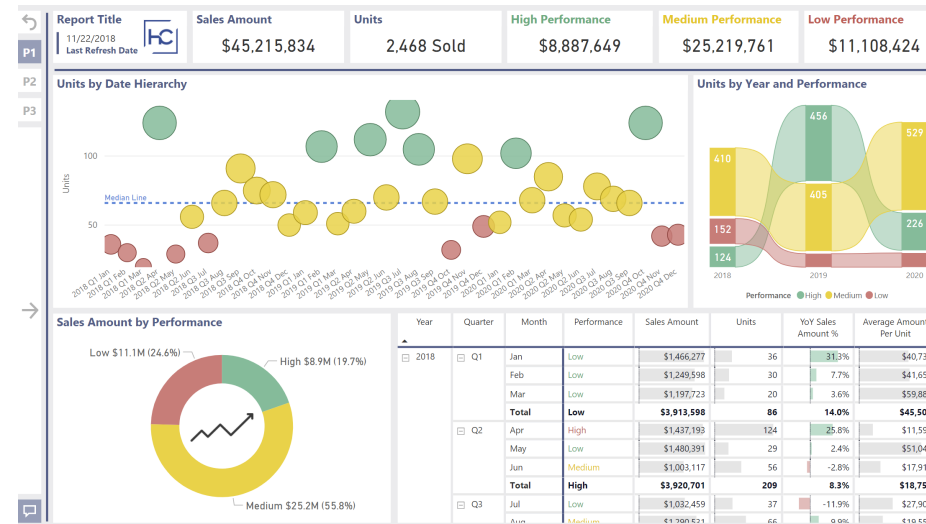
Knowledge Check

Design Principles

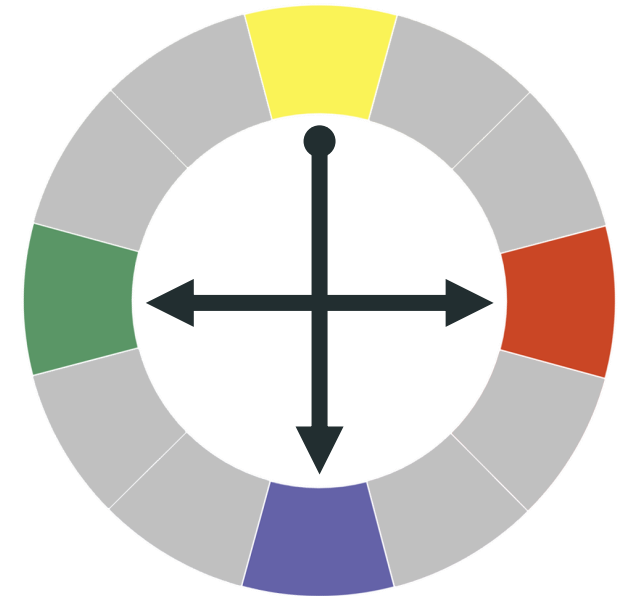
What type of **color harmony** is implemented in this report?



Knowledge Check



Tetratic





Data Visualization

- Methodologies for creating impactful visualizations

Data Visualization

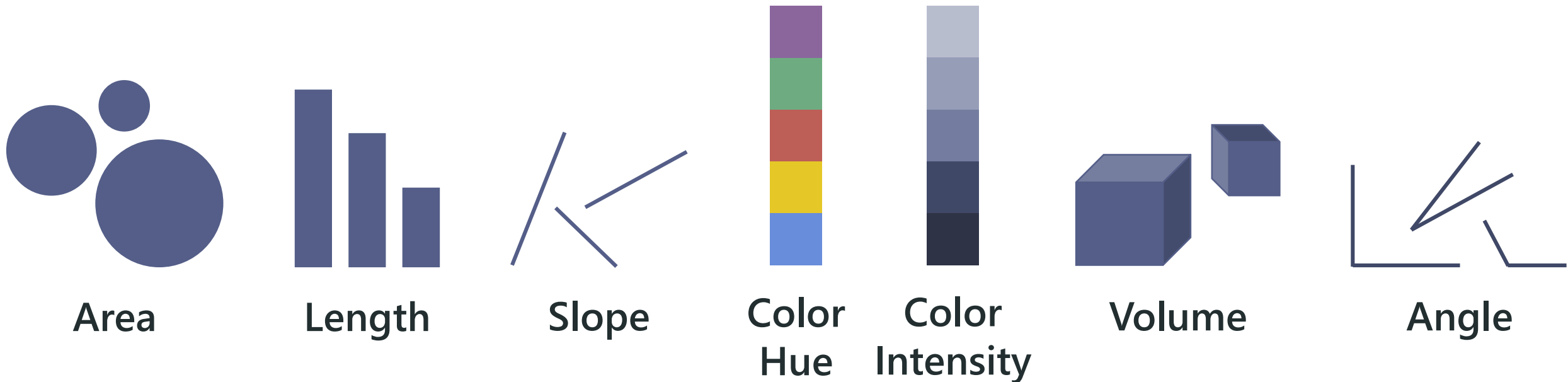
Concept of visual cues

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 ALL CREATED EQUAL

Data Visualization

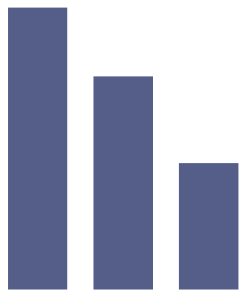
Concept of visual cues ► Visual cues ranked

General methodology

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



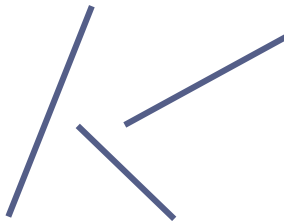
Visual cues ranked by accuracy



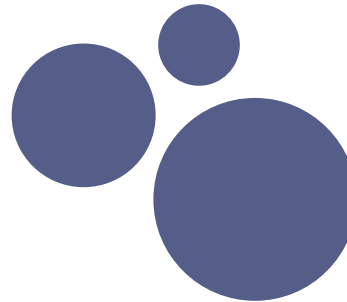
Length



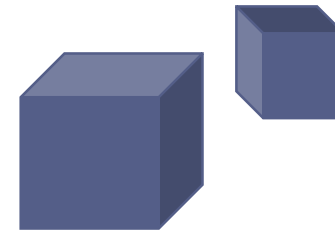
Angle



Slope



Area



Volume



Color
Intensity



Color
Hue

More Accurate

Less Accurate

Data Visualization

Concept of visual cues ► Visual cues explained

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



Length
(Aligned)

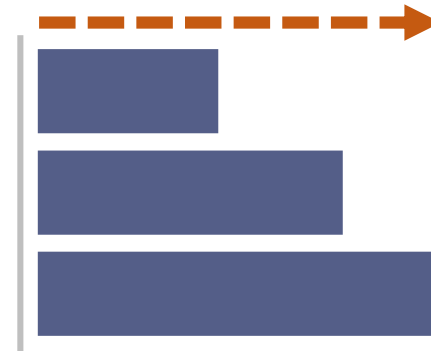


Tree Map

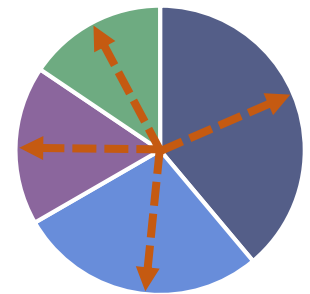


Direction

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



Bar
Chart



Pie
Chart

Data Visualization

Visualization categories



THE VISUALS REFERENCE

— FOR MICROSOFT POWER BI —

SEP. 2018

<http://sqlbi.com/visual-reference>

PART-TO-WHOLE

Display the parts of a measure



DISTRIBUTION

Display the distribution of a measure



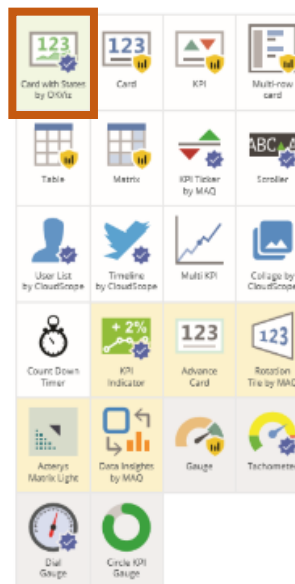
CORRELATION

Display relations between measures



SINGLE

Display single values



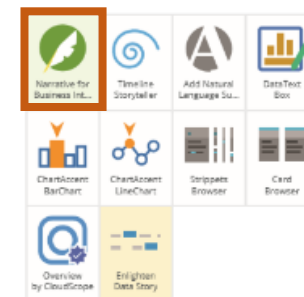
FILTER

Control report filters

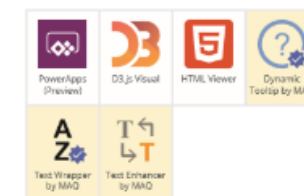


NARRATIVE

Tell a story with data



MISCELLANEOUS



There is a better alternative

Don't use in the category

Built-in visual

Certified visual

R required



Data Visualization

Visualization categories



THE VISUALS REFERENCE

— FOR MICROSOFT POWER BI —

SEP. 2018
<http://sqlbi.com/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

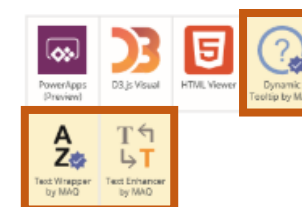


NARRATIVE

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



Data Visualization

Visualization categories



THE VISUALS REFERENCE

— FOR MICROSOFT POWER BI —

SEP. 2018

<http://sqlbi.com/visual-reference>

PART-TO-WHOLE

Display the parts of a measure



DISTRIBUTION

Display the distribution of a measure



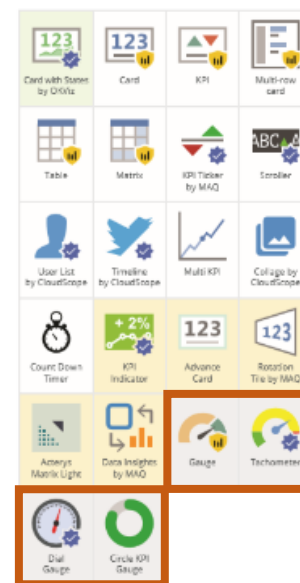
CORRELATION

Display relations between measures



SINGLE

Display single values



FILTER

Control report filters

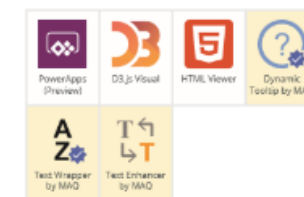


NARRATIVE

Tell a story with data



MISCELLANEOUS



Recommended

There is a better alternative

Don't use in the category

Built-in visual

Certified visual

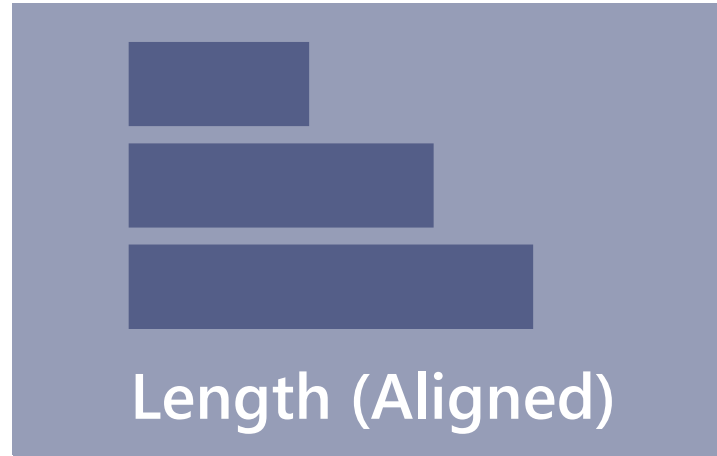
R required

Visual Cues

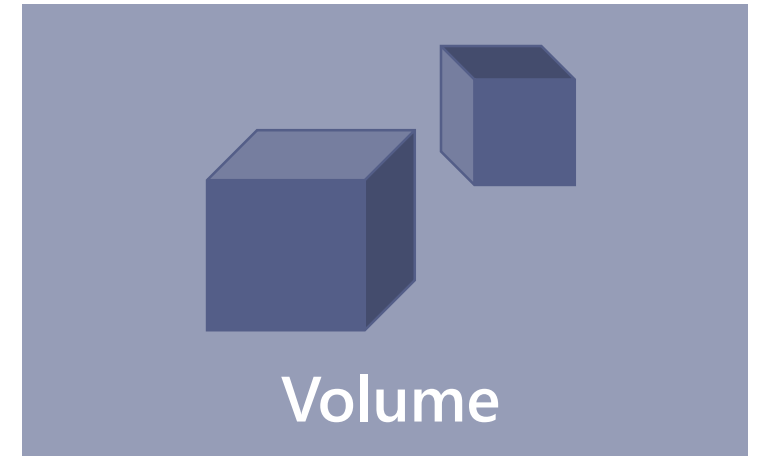


Knowledge Check

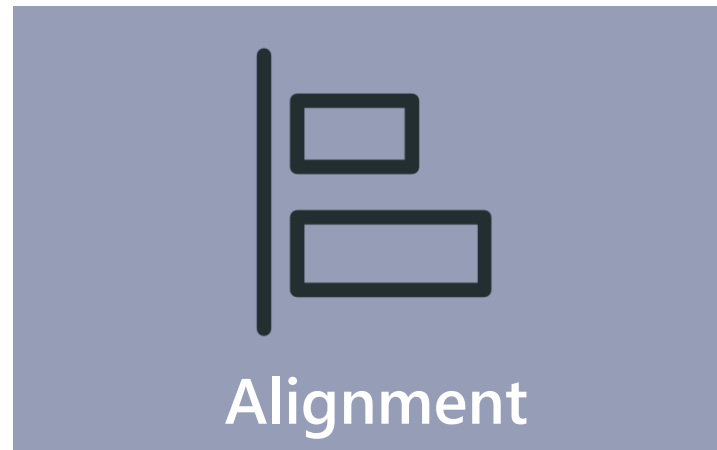
Easiest visual cue to process?



Hardest visual cue to process?



What influences **accuracy**?



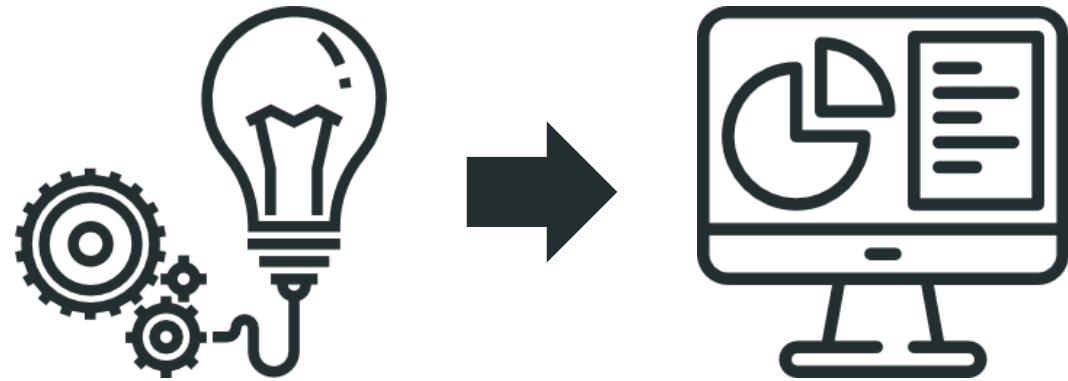
What influences **accuracy**?





HAVENS

CONSULTING



Thanks for Participating!





HAVENS

CONSULTING

Online Resources



Consulting Services

- <http://www.havensconsulting.net/consulting-services>



Files & Templates

- <http://www.havensconsulting.net/files-and-templates>



YouTube Channel

- <https://www.youtube.com/c/HavensConsulting>



LinkedIn Page

- <https://www.linkedin.com/in/reidhavens>

Evaluation Link



<http://www.sqlsaturday.com/822/Sessions/SessionEvaluation.aspx>