

1.1. Exercise: Improving report cohesiveness

Introduction

By now, you should have a good understanding of color theory, the use of color in visual design, positioning, scale of information, and information density. These concepts form the basis of report cohesiveness in Microsoft Power BI. In this exercise, you will apply your knowledge in an end-to-end scenario by using Microsoft Power Query to create a report that connects to multiple data sources and has complex visualization elements. You'll improve its cohesiveness by considering color, scale, positioning, and information density.

Scenario

At Adventure Works, you have two main tables for the marketing budgets of the year 2023 for the quarters Q1 and Q2. They are *AdventureWorksMarketing2023-Q1.xlsx* and *AdventureWorksMarketing2023-Q2.xlsx*.

Your manager, Adio Quinn, assigns you the task of creating reports that show a detailed list of the quarterly budgets and the budgets per category in a pie chart. Your objective is to enhance the color scheme, positioning, scale, and overall cohesiveness of the report.

This exercise aims to assist you in understanding how to improve the color, position, scale, and cohesiveness of the report.

By the end of this exercise, you'll understand how to use table and pie chart visualization tools, use of colors, and positioning and scaling techniques to improve the cohesiveness of the report.

Open Power BI and follow the steps below to complete the exercise.

Step 1: Download files



1. Download the *ImprovingReportCohesiveness.pbix* file and open it by using File > Open report > Browse reports and find the .pbix file you just downloaded. The Power BI data model contains two tables, Marketing2023-Q1 and Marketing2023-Q2 representing the total amount and total budget allocated for each product category.
2. Download the *AdventureWorksLogo.jpg* file and store it for later use.

The screenshot shows the Power BI Desktop interface with a cluttered report layout. On the left, there are two tables: 'Marketing2023-Q1' and 'Marketing2023-Q2'. In the center, there are two charts: a donut chart titled 'Sum of Total Budget by Category' and a pie chart titled 'Sum of Target Amount by Category'. The right side of the screen is dominated by the 'Visualizations' pane, which lists various chart types and their corresponding visualizations. The 'Data' pane on the far right shows the data models 'Marketing2023-Q1' and 'Marketing2023-Q2' with their respective tables and measures selected. The overall layout is disorganized, with many elements overlapping and no clear visual hierarchy.

Step 2: Assess the current design

1. Identify the improper use of colors and elements that contribute to the cluttered and disorganized appearance of the report.
2. Analyze the information density and identify areas where it can be improved.
3. Note any inconsistencies in positioning, alignment, and visual hierarchy.
4. Place the tables and charts side by side using drag-and-drop.
5. Set the title text of the tables as Marketing Budget Detail Q1 and Marketing Budget Detail Q2.
6. Rename the chart titles as Marketing Budget 2023-Q1 and Marketing Budget 2023-Q2.

Step 3: Simplify the layout

1. Remove unnecessary elements and reduce visual clutter.
2. Use white space effectively to create sufficient space between different sections.
3. Ensure a consistent and balanced positioning of elements, aligning them properly.
4. Make sure that visual elements are vertically and horizontally aligned.
5. Leave an empty space between the vertical and horizontal visuals to make the elements more readable.
6. Move the charts slightly to the right to make room for expanding the tables and ensure all fields are visible.
7. Enlarge the charts to make them more prominent and attention-grabbing.

Step 4: Establish a clear visual hierarchy

1. Prioritize the most important information and make it visually prominent.
2. Use appropriate font sizes, styles, and colors to guide the viewer's attention.
3. Group related elements together to enhance organization and readability.
4. Add the *AdventureWorksLogo.jpg* file from the file location that you saved before.
5. Drag the image to position it at the top-left corner and resize it as well.
6. Increase the font size of the table and chart titles to 20, set them to Bold, and select the text color of Q1 as Orange, and Q2 as Green.

Step 5: Refine and iterate

- Review the redesigned page and make any necessary adjustments or improvements.

Tip: At this point in the design process, you would often seek feedback from colleagues or users to validate the effectiveness of the cohesive design. You might then also continuously refine and iterate the page based on feedback and evolving needs.

Conclusion

By following these steps, you can transform a poorly designed page into a cohesive and visually appealing one that effectively communicates information for Adventure Works. You have now successfully completed a cohesive report design by considering color, scale, positioning, and information density using Power BI.

Exemplar: Improving report cohesiveness

Overview

In the exercise *Improving report cohesiveness*, you put into practice your understanding of how to use color, scale, positioning, and information density in Power Query.

Your objective for this exercise was to complete the following tasks:

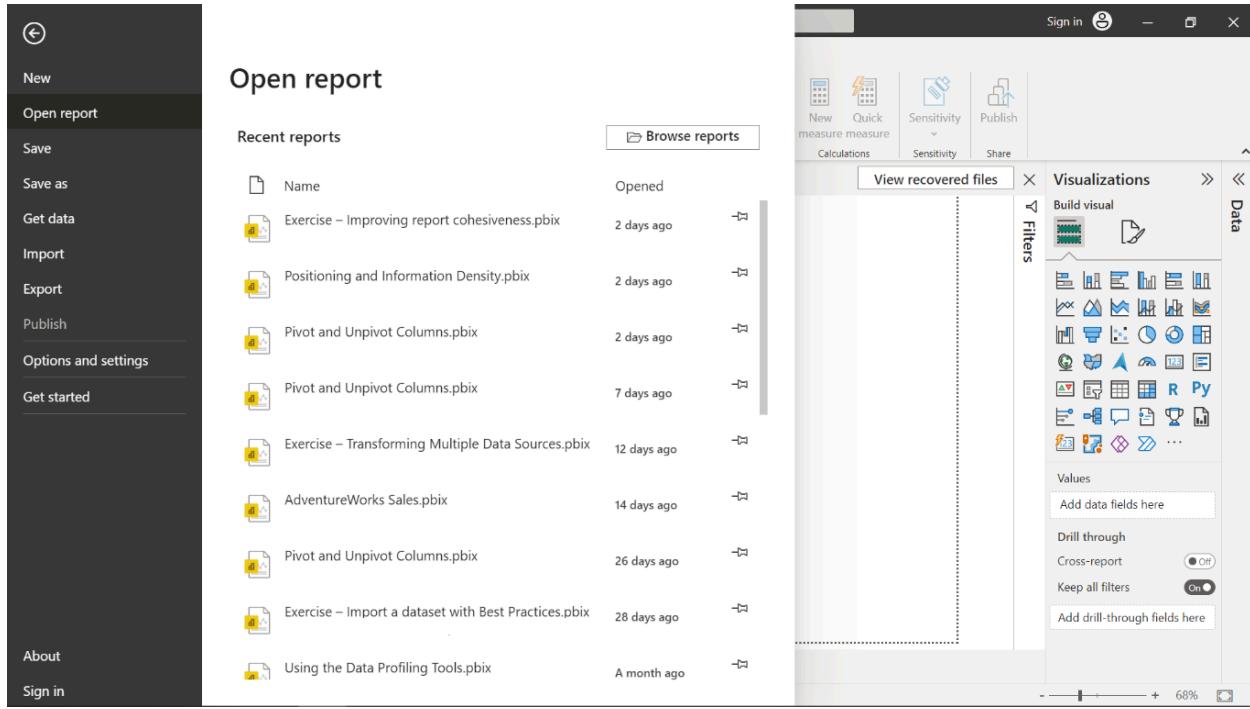
- Download a PowerBI report.
- Assess the current design.
- Simplify the layout.
- Establish a clear visual hierarchy.
- Refine and iterate.

This reading provides a step-by-step guide for completing these tasks, accompanied by screenshots for easy comparison with your own copy.



Step 1: Download files

1. Download the *ImprovingReportCohesiveness.pbix* file and open it by using File > Open report > Browse reports and find the .pbix file you just downloaded. You now have four visual elements that lack a defined purpose, with inconsistent positioning and alignment on the page.
2. Download the *AdventureWorksLogo.jpg* file and store it for later use.



Step 2: Assess the current design

1. Identify the elements that contribute to the cluttered and disorganized appearance. Specifically, these are the two pie charts at the bottom of the page.
2. Analyze the information density and identify areas where it can be improved.
3. Note any inconsistencies in positioning, alignment, and visual hierarchy. The two pie charts are located in the bottom left and right corners of the report, and are not the same size.
4. Place the tables and charts side by side by drag and drop. They are now aligned and resized with the corresponding tables.

1. Set title text to tables as Marketing Budget Detail Q1 and Marketing Budget

Detail Q2 respectively to differentiate from each other. To do this, select the first table and then navigate to Visualizations > Format visual > Visual > General. Change the text property by typing Marketing Budget Detail Q1. Repeat the same for the second table as well, naming it Marketing Budget Detail Q2.

1. Rename the chart titles as Marketing Budget 2023-Q1 and Marketing Budget 2023-Q2 respectively. To do this, select the first chart and then navigate to Visualizations > Format visual > Visual > General. Change the text property by typing Marketing Budget 2023-Q1. Repeat the same for the second chart as well.

Step 3: Simplify the layout

1. Remove unnecessary elements and reduce visual clutter.
2. Use white space effectively to create breathing room between different sections.
3. Ensure a consistent and balanced positioning of elements, aligning them properly.
4. Make sure that the visual elements are vertically and horizontally aligned.

The screenshot shows a Power BI report titled "Exercise - Improving report cohesiveness - Power BI Desktop". The report contains two main sections. The top section displays a pie chart titled "Marketing Budget 2023-Q1" with categories: Clothing (47.17%), Components (30.00%), and Accessories (22.83%). Below the chart is a table titled "Marketing Budget Detail Q1" with columns: Category, Sum of Target Amount, and Sum of Total Budget. The table shows data for Clothing, Components, and Accessories, with a total of 7800. The bottom section displays a pie chart titled "Marketing Budget 2023-Q2" with categories: Clothing (30.00%), Components (40.00%), and Accessories (30.00%). Below the chart is a table titled "Marketing Budget Detail Q2" with columns: Category, Sum of Target Amount, and Sum of Total Budget. The table shows data for Clothing, Components, and Accessories, with a total of 7150. The Power BI ribbon is visible at the top, showing tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. The right side of the screen features a sidebar with sections for Filters, Visualizations, and Data. The Filters section shows filters applied to the current visual, such as "Category is (All)" and "Sum of Total Budget is (All)". The Visualizations section lists various visualization types, and the Data section shows the data source hierarchy, including "Marketing2023-Q1" and "Marketing2023-Q2".

1. Leave an empty space between the vertically and horizontally to make the elements more readable.
2. Move the charts slightly to the right to make room for expanding the tables and ensure all fields are visible.
3. Enlarge the charts to make them more prominent and attention-grabbing. You can use the guide markers to resize it.

Step 4: Establish a clear visual hierarchy

1. Prioritize the most important information and make it visually prominent. This will specifically refer to the pie charts, which will capture the user's attention and draw their eyes to this information.
2. Use appropriate font sizes, styles, and colors to guide the viewer's attention.
3. Group related elements together to enhance organization and readability.
4. To add the company logo, on the Insert ribbon tab, inside the Elements group, select Image. Select the AdventureWorksLogo.jpg file from the file location that you saved before, and then select Open. This is done to improve branding and visual appeal.
5. Drag the image to position it at the top-left corner and drag the guide markers to resize it. This keeps the report clean, ensuring the logo does not impeded the information you want users to interact with.

The screenshot shows the Power BI Desktop interface with two reports on the page.

Left Report (Marketing Budget Detail Q1 and Q2):

- Marketing Budget Detail Q1:**

Category	Sum of Target Amount	Sum of Total Budget
Clothing	3200	8000000
Total	3200	8000000
- Marketing Budget 2023-Q1:**

Pie chart showing budget distribution by category. Legend: Bikes (blue), Clothing (orange), Components (red), Accessories (green).

Category	Value	Percentage
Bikes	2M	5.6%
Clothing	1M	2.4%
Components	10M	47.1%
Accessories	8M	37.7%
- Marketing Budget Detail Q2:**

Category	Sum of Target Amount	Sum of Total Budget
Accessories	1600	1000000
Bikes	750	750000
Clothing	3000	6000000
Components	1800	1600000
Total	7150	10700000
- Marketing Budget 2023-Q2:**

Pie chart showing budget distribution by category. Legend: Bikes (blue), Clothing (orange), Components (red), Accessories (green).

Category	Value	Percentage
Bikes	2M	5.6%
Clothing	1M	2.4%
Components	10M	47.1%
Accessories	8M	37.7%

Right Report (Marketing2023-Q1 and Q2):

- Marketing2023-Q1:**

Category	Sum of Target Amount	Sum of Total Budget
Clothing	3200	8000000
Total	3200	8000000
- Marketing2023-Q1:**

Pie chart showing budget distribution by category. Legend: Bikes (blue), Clothing (orange), Components (red), Accessories (green).

Category	Value	Percentage
Bikes	2M	5.6%
Clothing	1M	2.4%
Components	10M	47.1%
Accessories	8M	37.7%
- Marketing2023-Q2:**

Category	Sum of Target Amount	Sum of Total Budget
Accessories	1600	1000000
Bikes	750	750000
Clothing	3000	6000000
Components	1800	1600000
Total	7150	10700000
- Marketing2023-Q2:**

Pie chart showing budget distribution by category. Legend: Bikes (blue), Clothing (orange), Components (red), Accessories (green).

Category	Value	Percentage
Bikes	2M	5.6%
Clothing	1M	2.4%
Components	10M	47.1%
Accessories	8M	37.7%

1. Increase the font size of the table and chart titles to 20, set it to bold and select text color as orange. To do this, select the element and then navigate to Visualizations > Format visual > Visual > General. Select font size as 20 in the dropdown, select B as Bold, and choose the color. Repeat the same for the other elements as well.

The screenshot shows the Power BI Desktop interface with the same two reports as the previous screenshot, but with the following changes applied:

- Titles and subtitles (e.g., 'Marketing Budget Detail Q1', 'Marketing Budget 2023-Q1') are now bolded and orange.**
- Text in the tables (e.g., 'Category', 'Sum of Target Amount', 'Sum of Total Budget', numerical values) is now bolded and orange.**
- Legend text ('Category' and category names like 'Bikes', 'Clothing', 'Components', 'Accessories') is now bolded and orange.**
- Text in the pie charts (e.g., 'Value', 'Percentage') is now bolded and orange.**

Step 5: Refine and iterate

- Review the redesigned page and make any necessary adjustments or improvements.

Tip: Seek feedback from colleagues or users to validate the effectiveness of the cohesive design. Continuously refine and iterate the page based on feedback and evolving needs. By following these steps, you can transform a poorly designed page into a cohesive and visually appealing one that effectively communicates information for Adventure Works.

Conclusion

Your objective for this exercise was to complete an end-to-end scenario. In this context, you learned how to design a cohesive report by considering color, scale, positioning and information density using Power BI.

1.2. Exercise: Highlighting key information

Introduction

By now, you should have gained a solid grasp of essential concepts such as knowing the audience, age-related design, and prioritizing key information. These fundamental principles converge to establish the framework for formatting and creating impactful reports in Microsoft Power BI. This exercise gives you the opportunity to apply your knowledge in a Power BI end-to-end scenario using the techniques that you learned.

Scenario

You are working as a data analyst at Adventure Works. You have sales data that contains target versus sales by category in the file

AdventureWorksSalesvsTarget-Category.xlsx.

Your manager, Adio Quinn, has assigned you the task of creating a report that shows the detailed list of the yearly target versus sales by category and also puts the figures in a column chart report by emphasizing the top sales amounts. Your objective is to create the report in a good format and highlight the key data.

- This exercise aims to help you to format and highlight key data in a Power BI Report.
- By the end of this exercise, in a Power BI Report, you'll understand how to use table and column chart visualization tools, apply a theme, change the color of particular data points, add color to table rows, and apply conditional formatting to highlight key data.

Step 1: Download the Excel files

1. Create a new Power BI project called Exercise – Highlighting key information.pbix.
2. Download the AdventureWorksSalesTarget-Category.xlsx, and AdventureWorksLogo.png files, which you will use in this exercise. You can download the Adventure Works logo by selecting the logo and downloading it.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Category	2020 Target	2020 Sales	2021 Target	2021 Sales	2022 Target	2022 Sales										
2	Bikes	1800	2100	1900	2200	2000	1950										
3	Components	2000	1900	2200	2300	2500	2600										
4	Accessories	1000	1100	1200	1080	1400	1600										
5	Clothing	760	800	850	800	1000	1100										
6																	
7																	
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Step 2: Open the Power Query Editor

1. Choose Get Data in Power BI.
2. Select Load, and import your dataset, TargetvsSalesbyCategory.

Step 3: Design the Report Layout

1. Add a table that contains Category, 2020Target, 2020Sales, 2021Target, 2021Sales, 2022Target, and 2022Sales fields from the TargetvsSalesbyCategory table.
2. Add a column chart below the table, that consists of Category, 2022Target, and 2022Sales fields from the TargetvsSalesbyCategory table.
3. Align the table and column chart vertically.

4. Add the company logo, by selecting the AdventureWorksLogo.jpg file from its saved file location. Drag the logo to position it at the top-left corner, and also drag the guide markers to resize the logo to any size that fits well in the design.
5. Rename the report as Sales Target Report.
6. Now you have two visualization elements, table and chart, with a consistent positioning and alignment.

Step 4: Apply formatting styles

1. Set the title of the table as Sales vs. Target by Category Details.
2. Set the chart title as Sales vs. Target by Category Chart Report.
3. Remove the Sum of prefix from all the column names.
4. Apply a report theme and select Accessible City Park as the theme. In this way, all visuals in your report use the colors and formatting from this theme.

Step 5: Highlight key data with conditional formatting

- Highlight the top sales amounts by applying conditional formatting, and show the top sales amounts in the Sales 2022 column by setting font color to color code #f1c4cc for the minimum value and color code #6f3640 for the maximum value.

Step 6: Change the color of a single data point and all data points

You need to highlight the 2022 Sales values to show how well the sales are performing, by using color. To do that:

1. Expand the Columns card and turn on Show all to display the colors for each data element. You can now modify any of the data points.
2. Find 2022 Sales and apply color code #AD8F21.

Conclusion

By following these steps, you can improve your report design quality and keep a visual cohesiveness that effectively communicates information for Adventure Works.

You have now successfully completed a cohesive report design by formatting and highlighting key data in a Microsoft Power BI Report.

Exemplar: Highlighting key information

Introduction

In the exercise *Highlighting key information*, you put into practice your understanding of how to prioritize key information in Microsoft Power BI.

This exercise included tasks to:

- Apply formatting styles.
- Highlight key data with conditional formatting.
- Change the color of a single data point or all data points.

This reading provides a step-by-step guide to completing these tasks, accompanied by screenshots for easy comparison with your own work.

Step 1: Download the files



1. You created a new Power BI project called *Exercise – Highlighting key information.pbix*.
2. Then you downloaded the *AdventureWorksLogo.png* file and the *AdventureWorksSalesTarget-Category.xlsx* file, for use in the exercise.

The screenshot shows a Microsoft Excel spreadsheet titled "AdventureWorksSalesTarget-Category". The ribbon menu is visible at the top, and the "Home" tab is selected. The worksheet contains data from row 1 to 23, with columns A through P. Row 1 is a header row with column titles: Category, 2020 Target, 2020 Sales, 2021 Target, 2021 Sales, 2022 Target, and 2022 Sales. Rows 2 through 5 contain data for Bikes, Components, Accessories, and Clothing respectively. The "TargetvsSalesbyCategory" tab is selected in the bottom-left corner.

Category	2020 Target	2020 Sales	2021 Target	2021 Sales	2022 Target	2022 Sales
Bikes	1800	2100	1900	2200	2000	1950
Components	2000	1900	2200	2300	2500	2600
Accessories	1000	1100	1200	1080	1400	1600
Clothing	760	800	850	800	1000	1100

Step 2: Open the Power Query editor

1. You selected Get Data in Power BI.
2. Then selected Load, and imported your dataset, *TargetvsSalesbyCategory*.

The screenshot shows the Power BI desktop application. The left pane is the "Navigator" which lists the "TargetvsSalesbyCategory" dataset. The main area is the "Data" pane, which displays a preview of the "TargetvsSalesbyCategory" data. The data is presented in a table with columns: Category, 2020 Target, 2020 Sales, 2021 Target, 2021 Sales, and 2022. The preview shows the same data as the Excel sheet above. At the bottom right of the Power BI window, there are "Load", "Transform Data", and "Cancel" buttons.

Category	2020 Target	2020 Sales	2021 Target	2021 Sales	2022
Bikes	1800	2100	1900	2200	
Components	2000	1900	2200	2300	
Accessories	1000	1100	1200	1080	
Clothing	760	800	850	800	

Step 3: Design the report layout

1. You then added a table that contains the fields; Category, 2020 Target, 2020 Sales, 2021 Target, 2021 Sales, 2022 Target, and 2022 Sales from the TargetvsSalesbyCategory table.

The screenshot shows the Power BI desktop interface. On the left, there is a table visualization with the following data:

Category	Sum of 2020 Sales	Sum of 2020 Target	Sum of 2021 Sales	Sum of 2021 Target	Sum of 2022 Sales	Sum of 2022 Target
Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2000	1950	1950	2000
Clothing	800	780	800	800	1100	1000
Components	1800	2000	2200	2200	2000	2550
Total	5900	5560	6380	6150	7250	6900

To the right of the table, the Visualizations pane is open, showing various chart and report icons. Below the table, the Data pane displays the columns used: Category, Sum of 2020 Sales, Sum of 2020 Target, Sum of 2021 Sales, Sum of 2021 Target, Sum of 2022 Sales, and Sum of 2022 Target. A search bar and a list of available measures are also visible.

1. You added a column chart below the table, that had Category, 2022 Target, and 2022 Sales fields from the TargetvsSalesbyCategory table.
2. You vertically aligned the table and column chart.

Adventure Works • Last saved: Today at 7:14 PM

File Home Insert Modeling View Optimize Help

Clipboard Data Queries Insert Calculations

Transform Refresh data New visual Text box More visuals Quick measure measure Sensitivity Share

Get data from Excel workbook OneLake data hub SQL Server Enter data Recent sources

Transform Refresh data New visual Text box More visuals Quick measure measure Sensitivity Share

Category Sum of 2020 Sales Sum of 2020 Target Sum of 2021 Sales Sum of 2021 Target Sum of 2022 Sales Sum of 2022 Target

Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2200	1900	1950	2000
Clothing	800	760	800	850	1100	1000
Components	1900	2000	2300	2200	2600	2500
Total	5900	5560	6380	6150	7250	6900

Sum of 2022 Sales and Sum of 2022 Target by Category

● Sum of 2022 Sales ● Sum of 2022 Target

3K
2K
1K
0K

Category Components Bikes Accessories Clothing

Visualizations Data

Build visual

Filters

Search

TargetvsSalesbyCategory

- Σ 2020 Sales
- Σ 2020 Target
- Σ 2021 Sales
- Σ 2021 Target
- Σ 2022 Sales
- Σ 2022 Target
- Category

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Page 1 + 66%

1. You added the Adventure Works company logo, by selecting the *AdventureWorksLogo.png* file from its saved file location. You dragged the logo to its position at the top-left corner, and also resized the logo using the guide markers.
2. You changed the report's name to Sales Target Report.

Adventure Works • Last saved: Today at 7:14 PM

File Insert Modeling View Optimize Help

New page Visuals AI visuals Power Platform Elements Sparklines

New visual More visual visual Q&A Key influencers Decomposition tree Smart narrative Paginated report Power Apps Power Automate (preview) Text box Buttons Shapes Image Elements Add a sparkle Sparklines

Sales vs Target by Category

Category	2020 Sales	2020 Target	2021 Sales	2021 Target	2022 Sales	2022 Target
Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2200	1900	1950	2000
Clothing	800	760	800	850	1100	1000
Components	1900	2000	2300	2200	2600	2500
Total	5900	5560	6380	6150	7250	6900

Sales vs Target by Category Chart

● 2022 Sales ● 2022 Target

3K
2K
1K
0K

Category Components Bikes Accessories Clothing

Visualizations Data

Build visual

Filters

Search

TargetvsSalesbyCategory

- Σ 2020 Sales
- Σ 2020 Target
- Σ 2021 Sales
- Σ 2021 Target
- Σ 2022 Sales
- Σ 2022 Target
- Category

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Page 1 + 66%

At the end of this part of the exercise you had two visualization elements, a table and a chart, and had them in a consistent positioning and alignment.

Step 4: Apply formatting styles

1. You set the title of the table as Sales vs. Target by Category.
2. You set the chart title as Sales vs. Target by Category Chart.
3. You then removed the Sum of prefix from all the column names.
4. You also applied a report theme and selected Accessible City Park as the theme.

Now, all visuals in your report use the colors and formatting from this theme.

The screenshot shows a Power BI desktop interface with the following elements:

- Top Bar:** Includes File, Home (selected), Insert, Modeling, View, Optimize, Help, and Share buttons.
- Home Tab:** Contains icons for Paste, Cut, Copy, Format painter, Get data, Excel workbook, OneLake data hub, SQL Server, Enter data, Dataverse, Recent sources, Transform data, Refresh data, New visual, Text box, More visuals, Insert, Quick measure, Calculations, Sensitivity, and Publish.
- Visualizations Panel:** Shows a table titled "Sales vs Target by Category" and a bar chart titled "Sales vs Target by Category Chart".
- Data Panel:** Displays filters for "TargetvsSalesbyCategory" including columns for 2020 Sales, 2020 Target, 2021 Sales, 2021 Target, 2022 Sales, and 2022 Target, along with a "Values" section for adding data fields.
- Table Data:** Sales vs Target by Category

Category	2020 Sales	2020 Target	2021 Sales	2021 Target	2022 Sales	2022 Target
Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2200	1900	1950	2000
Clothing	800	760	800	850	1100	1000
Components	1900	2000	2300	2200	2600	2500
Total	5900	5560	6380	6150	7250	6900

- Bar Chart Data:** Sales vs Target by Category Chart

Category	2022 Sales	2022 Target
Components	2.5K	2.8K
Bikes	2K	2.2K
Accessories	1.8K	2K
Clothing	1.5K	1.8K

Step 5: Highlight key data with conditional formatting

1. You highlighted the top sales amounts by applying conditional formatting and displayed top sales amounts in the Sales 2022 column by setting the font color to a red theme color (theme color 4) for the minimum value and to a blue theme color (theme color 2) for the maximum value. To begin this process, you selected Conditional Formatting. To apply the conditional formatting, you selected the table and then navigated to Visualizations > Build visual > Columns.

The screenshot shows a Power BI desktop interface with a report titled "Sales vs Target by Category". The report contains two visualizations: a table and a bar chart. A context menu is open over the bar chart, specifically over the "2022 Sales" column header. The menu path "Conditional formatting" is highlighted. Other visible items in the menu include "Remove field", "Rename for this visual", "Move", "Add a sparkline", "Don't summarize", "Sum", "Average", "Minimum", "Maximum", "Count (Distinct)", "Count", "Standard deviation", "Variance", "Median", "Show value as", and "New quick measure".

You selected the down arrow near the 2022 Sales column and in the Conditional Formatting menu selected Font Color. Then you selected Gradient in the Format Style dropdown, and retained the other default values.

The screenshot shows the "Font color - 2022 Target" dialog box from the Power BI conditional formatting settings. The "Format style" dropdown is set to "Gradient". The "Apply to" dropdown is set to "Values only". The "What field should we base this on?" dropdown is set to "Sum of 2022 Target". The "Summarization" dropdown is set to "Sum". The "How should we format empty values?" dropdown is set to "As zero". Under "Minimum", the "Lowest value" dropdown is set to "Enter a value" and has a dark red color swatch. Under "Maximum", the "Highest value" dropdown is set to "Enter a value" and has a dark blue color swatch. There is an unchecked checkbox for "Add a middle color". A color gradient bar is shown below the input fields. At the bottom right are "OK" and "Cancel" buttons. On the right side of the dialog, there is a "Data" pane showing a list of fields: TargetvsSalesbyCategory, Σ 2020 Sales, Σ 2020 Target, Σ 2021 Sales, Σ 2021 Target, Σ 2022 Sales, Σ 2022 Target, and Category, all with checkmarks.

Step 6: Change the color of a single data point or all data points

1. You needed to highlight the 2022 Sales values to show how well the sales are performing, using color. To do that: you expanded the Columns card and enabled Show all to display the colors for each data element. You then modified the data points.
2. To adjust 2022 Sales, you navigated to Visualizations > Format visual > Visual > Columns, there you found 2022 Sales and applied the yellow theme color (theme color 3).

The screenshot shows the Power BI desktop interface. At the top, the ribbon includes Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The main area displays a bar chart titled "Sales vs Target by Category" comparing 2022 Sales and 2022 Target for four categories: Components, Bikes, Accessories, and Clothing. The chart uses green for 2022 Sales and blue for 2022 Target. Below the chart is a table titled "Sales vs Target by Category" with the following data:

Category	2020 Sales	2020 Target	2021 Sales	2021 Target	2022 Sales	2022 Target
Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2200	1900	1950	2000
Clothing	800	760	800	850	1100	1000
Components	1900	2000	2300	2200	2600	2500
Total	5900	5560	6380	6150	7250	6900

To the right, a color palette shows the theme colors, with yellow (#AD8F21) selected for the 2022 Sales column. The Power BI logo is visible in the bottom left corner of the interface.

Tip: You can experiment with your design by changing the color of a data point for one, several, or all data elements in the visualization. Try choosing the Adventure Works corporate colors of green, orange, and blue as seen in the logo of the *AdventureWorksLogo.png* file.

Sales vs Target by Category

Category	2020 Sales	2020 Target	2021 Sales	2021 Target	2022 Sales	2022 Target
Accessories	1100	1000	1080	1200	1600	1400
Bikes	2100	1800	2200	1900	1950	2000
Clothing	800	760	800	850	1100	1000
Components	1900	2000	2300	2200	2600	2500
Total	5900	5560	6380	6150	7250	6900

Sales vs Target by Category Chart

● 2022 Sales ● 2022 Target

Category	2022 Sales	2022 Target
Components	2.6K	2.5K
Bikes	2.0K	2.0K
Accessories	1.6K	1.4K
Clothing	1.1K	1.0K

Conclusion

When you finish creating a report, you will often continue the design process to refine and iterate the design. Steps to consider are:

- Review the redesigned page and make any necessary adjustments or improvements.
- Seek feedback from colleagues or users to validate the effectiveness of your design.
- Continuously refine and iterate the page based on feedback and evolving needs.

By following these steps, you can improve your report design quality and keep its visual cohesiveness that effectively communicates information for Adventure Works.

Your objective for this exercise was to complete an end-to-end scenario by prioritizing key information. In this context, you learned how to design a report by the formatting and highlighting of key data in Microsoft Power BI.

2.1. Exercise: Optimizing a report for mobile

Introduction

By now, you should have gained a solid understanding of the essential concepts of what visual clarity is and how to achieve it in reports. Appropriate chart selection, formatting visuals, accessibility considerations, and cellphone optimization are some of the ways you can create clutter-free, impactful reports in Microsoft Power BI.

In this exercise, you are asked to apply your knowledge to optimize a Power BI report for mobile devices.

Scenario

A senior Adventure Works marketing executive is traveling to Europe for business meetings. You must present a summary of the district sales report with a KPI that she can visualize on her way to the airport. A mobile-optimized version of the report is what is needed. As a report designer in Power BI, you can help by performing report optimization.

In this exercise, you will go through each step of optimizing an existing report for cellular devices.

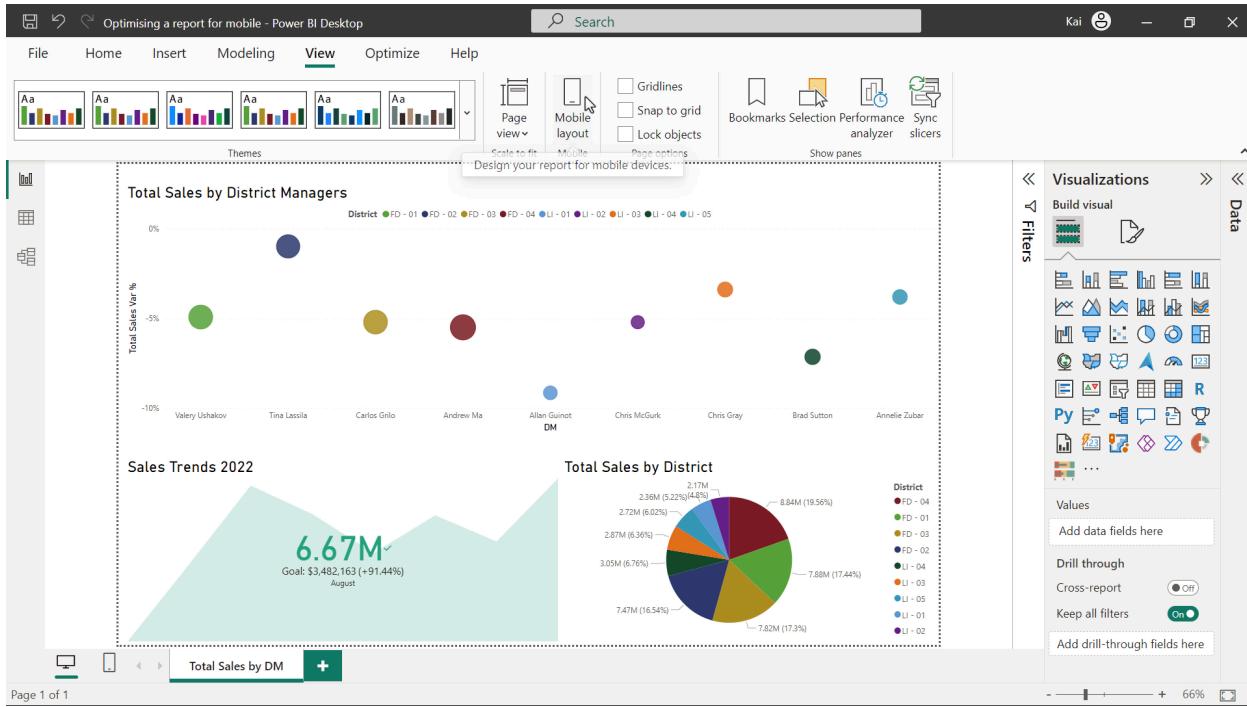
By completing this exercise, you will demonstrate your ability to:

- Review the layout and design of a report page.
- Optimize an existing report for mobile devices.
- Apply mobile-only formatting to the optimized report.

Follow the exercise steps to optimize the report for mobile layout and ensure the visual elements in the mobile canvas are properly positioned and scaled to eliminate any visual clutter.

Step 1: Download the Power Bi file

- Download the Optimizing a report for mobile.pbix file, which you will use in this exercise. The report contains three visuals: a pie chart, a bubble chart, and a KPI visual.



Step 2: Review the layout

- Start the task by reviewing the current layout and design and analyzing the sequence of visuals to be displayed on the mobile version of the report based on the importance of information.

Step 3: Move and format the KPI chart

- Move the KPI chart to the mobile canvas, position and rescale the chart appropriately to fill the mobile screen layout.
- Format the chart visual to have a mobile-friendly font size for the title, axis, values, and legend.

Tip: You can optimize the report by navigating to Mobile layout of the view ribbon in Power BI desktop.

Tip: You can navigate to the Visual and General tabs of Visualizations pane for formatting the chart.

Step 4: Move and format the bubble chart

- Move the bubble chart from the original report to the mobile canvas, position and rescale the chart appropriately to fit the mobile screen layout.

2. Format the visual with a mobile-friendly font size for title, axis, values, and legend. Confirm the changes are mobile-only and that they do not affect the desktop version of the report.

Tip: You can format any settings from the Visual and General tab of Visualization pane.

Step 5: Move and format the pie chart.

1. Move the pie chart from the original report to the mobile canvas, position and rescale the chart appropriately to fit the mobile screen layout.
2. Format the visual font size for a mobile-friendly title, axis, values, and legend. Confirm the changes are mobile-only, and that they are not affecting the desktop version of the report.

Tip: You can format any settings from the Visual and General tab of Visualization pane.

Step 6: Save the project

- Save your Power BI project to your local computer.

Conclusion

With these steps, you have successfully optimized a desktop Power BI report for cellular devices to meet the needs of managers and executives of Adventure Works.

Exemplar: Optimizing a report for mobile

Overview

In the exercise *Optimizing a report for mobile*, you put into practice your understanding of how to optimize a report for mobile in Power BI.

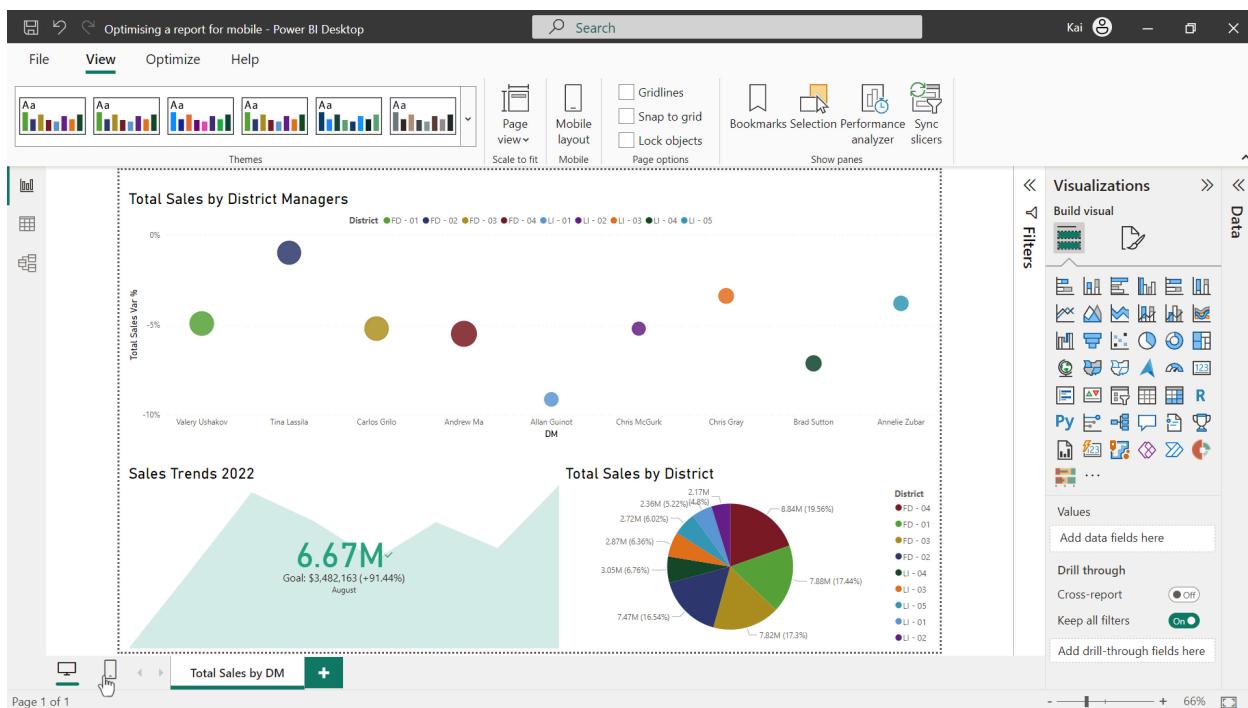
Your objective for this exercise was to complete the following tasks:

- Review the current layout and design of a report page.
- Optimize the report for mobile devices.
- Format the mobile properties of the visuals.

This reading provides a step-by-step guide for completing these tasks, accompanied by screenshots for easy comparison with your own copy. You can also review the video [Optimizing report layout for mobile](#).

Step 1: Download the Power BI File

Download the *Optimizing a report for mobile.pbix* file, which you will use in this exercise.



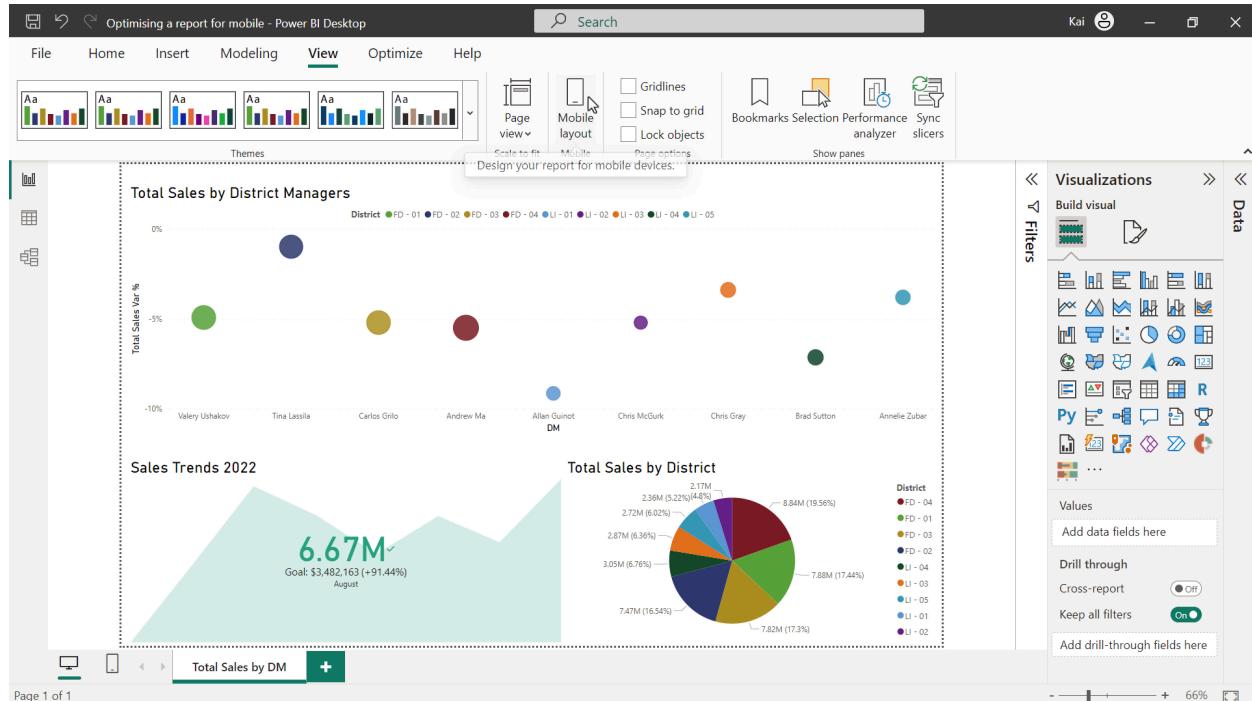
Step 2: Review the report layout

- The report contains three visuals. A pie chart representing the sales of various districts, a bubble chart showing the sales performance of district managers, and a Key Performance Indicator (KPI) displaying the sales vs. target values. Based

on the information presented, the KPI visual contains the most valuable information about sales progress followed by a bubble chart and finally a pie chart.

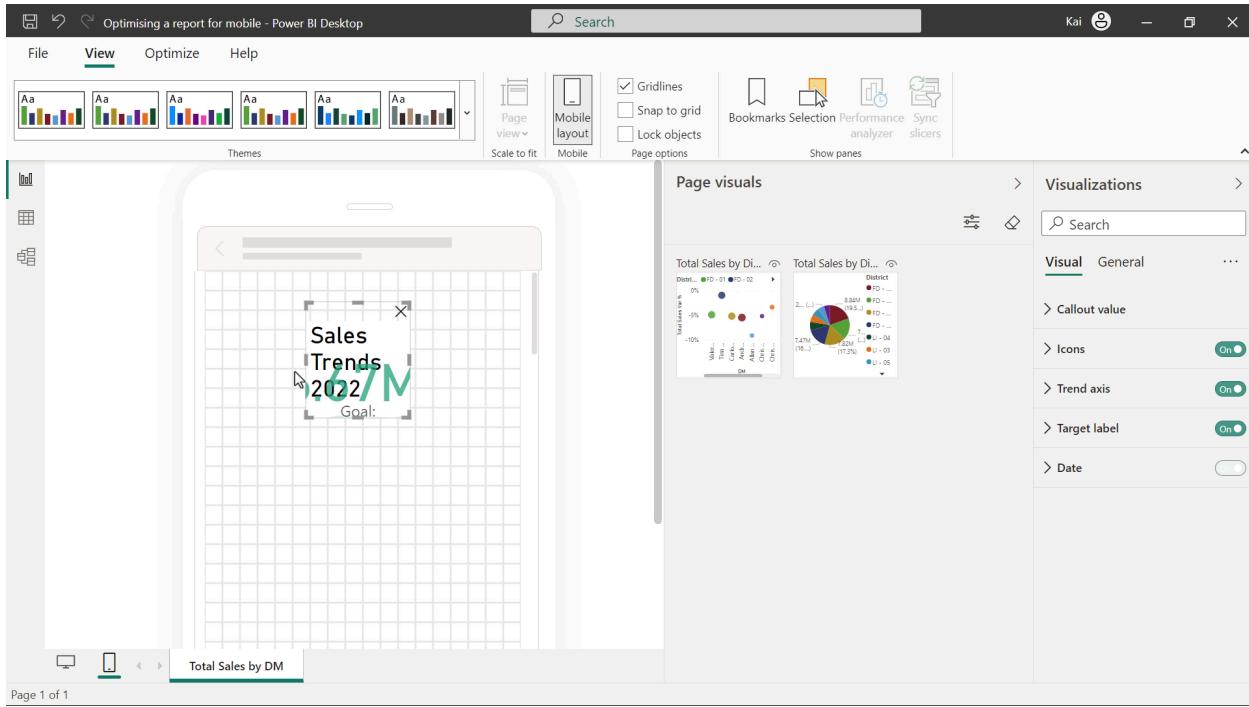
Step 3: Move and format the KPI chart

1. You need to navigate to Mobile layout in the view ribbon of Power BI which opens a mobile canvas.

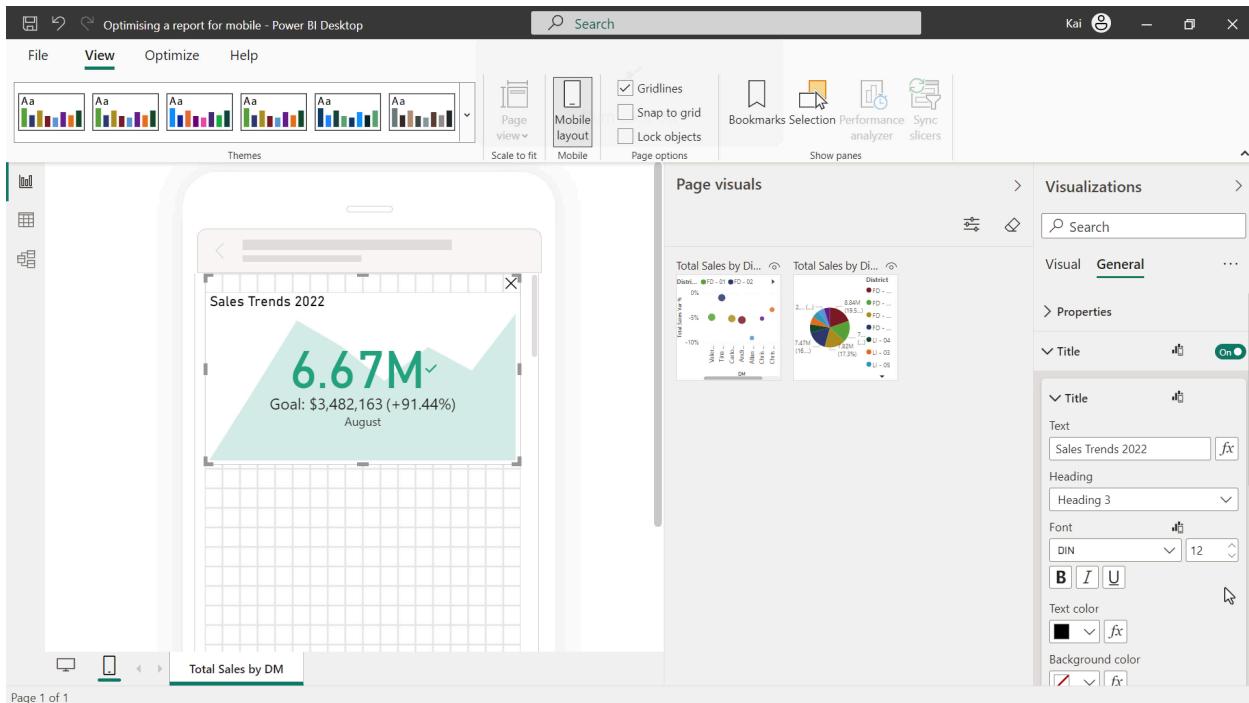


Next, you need to drag and drop the first chart (a KPI) from the Page visuals pane to the mobile layout canvas.

You can move the KPI chart at the top of the page and you need to re-scale and reposition the chart to fit the dimensions of the mobile screen.

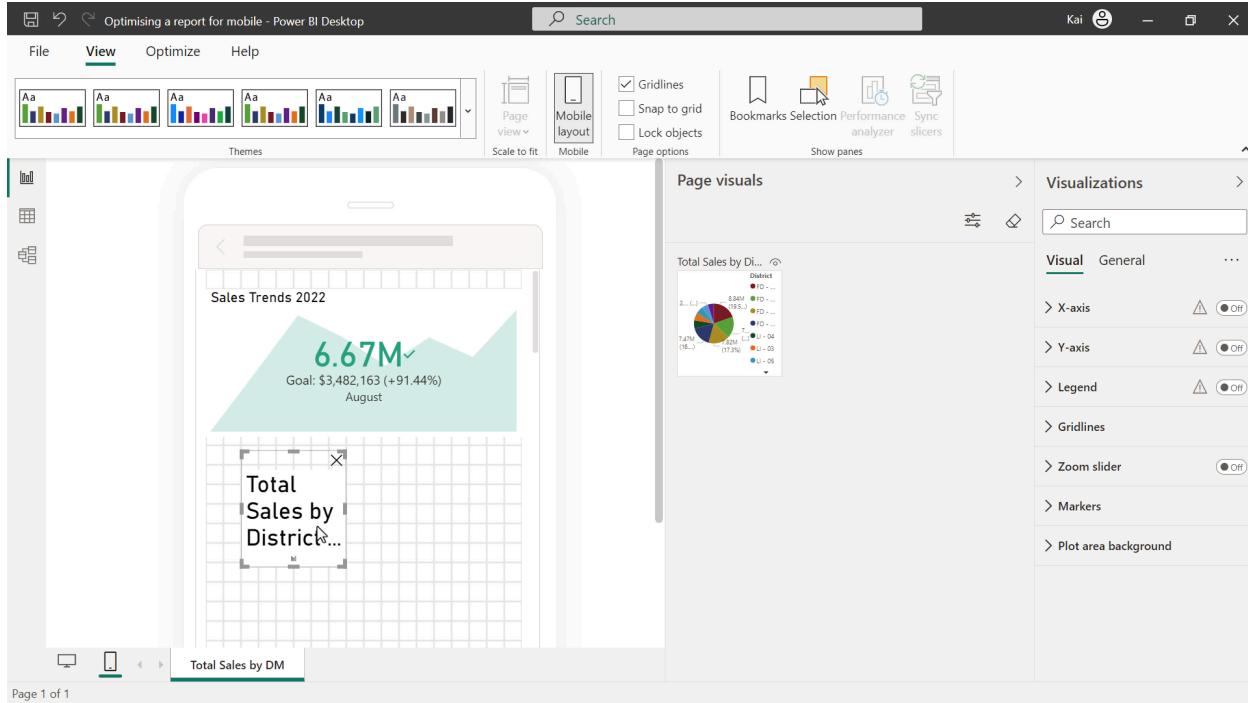


2. Once you move the KPI chart to mobile screen layout, both the chart title and values seem too big for a small screen. You need to navigate to Visualization > General and change the font size to 12. To format the value, go to Visualization > Visual, expand the callout value, and change the font size to 32. Scroll further down the callout value section, expand the target label, and reduce the target size to 10.



Step 4: Move and format the bubble chart

1. Next, drag and drop the bubble chart to the mobile layout pane of Power BI. You need to reposition and re-scale the visual below the KPI chart to fit the screen.



2. After moving to mobile canvas, the chart needs some formatting, the x-axis label, y-axis label font size, title font size all need adjustments. You need to adjust these font sizes to make the formatting consistent.

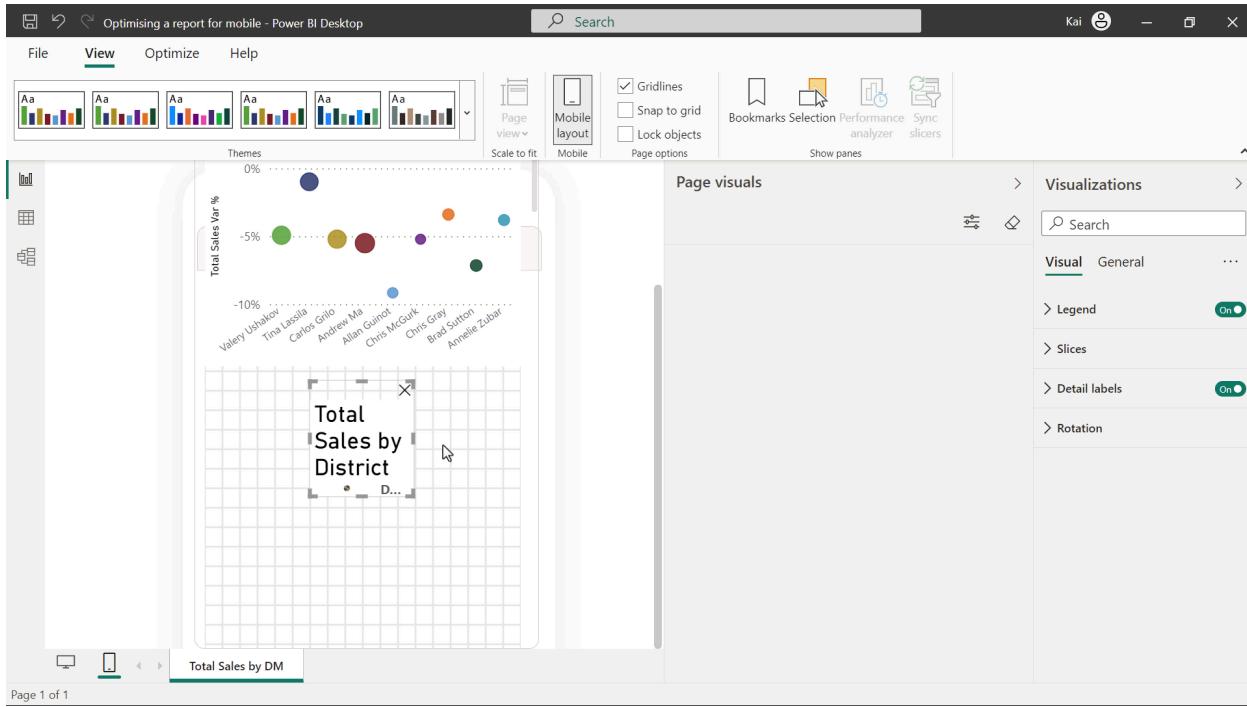
A screenshot of the Power BI Desktop application. The main area displays a mobile report titled "Sales Trends 2022". The report includes a large green callout with the text "6.67M" and "Goal: \$3,482,163 (+91.44%) August". Below this is a scatter plot titled "Total Sales by District Managers" showing sales variance for various district managers. To the right, the "Visualizations" pane shows a pie chart titled "Total Sales by District Manager" with data for FD-01 through FD-04 and LI-01. The "General" tab is selected in the visualization properties. The "Title" section is open, showing the current title "Total Sales by District Manager" and options to edit it.

You can also turn the legend title toggle button to the off position.

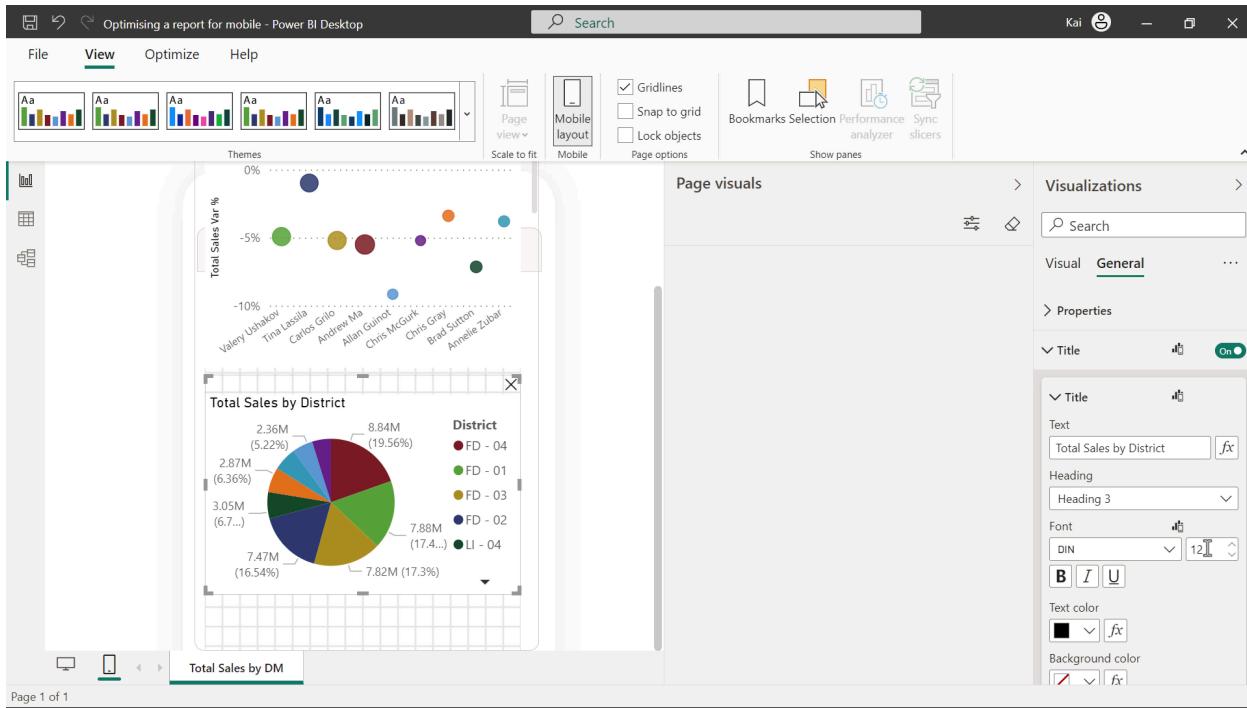
A screenshot of the Power BI Desktop application, identical to the one above but with a key difference. In the "General" tab of the visualization properties for the pie chart, the "Title" section has a "Title" toggle button that is now set to "Off". This results in the pie chart appearing without its title in the mobile report.

Step 5: Move and format the pie chart

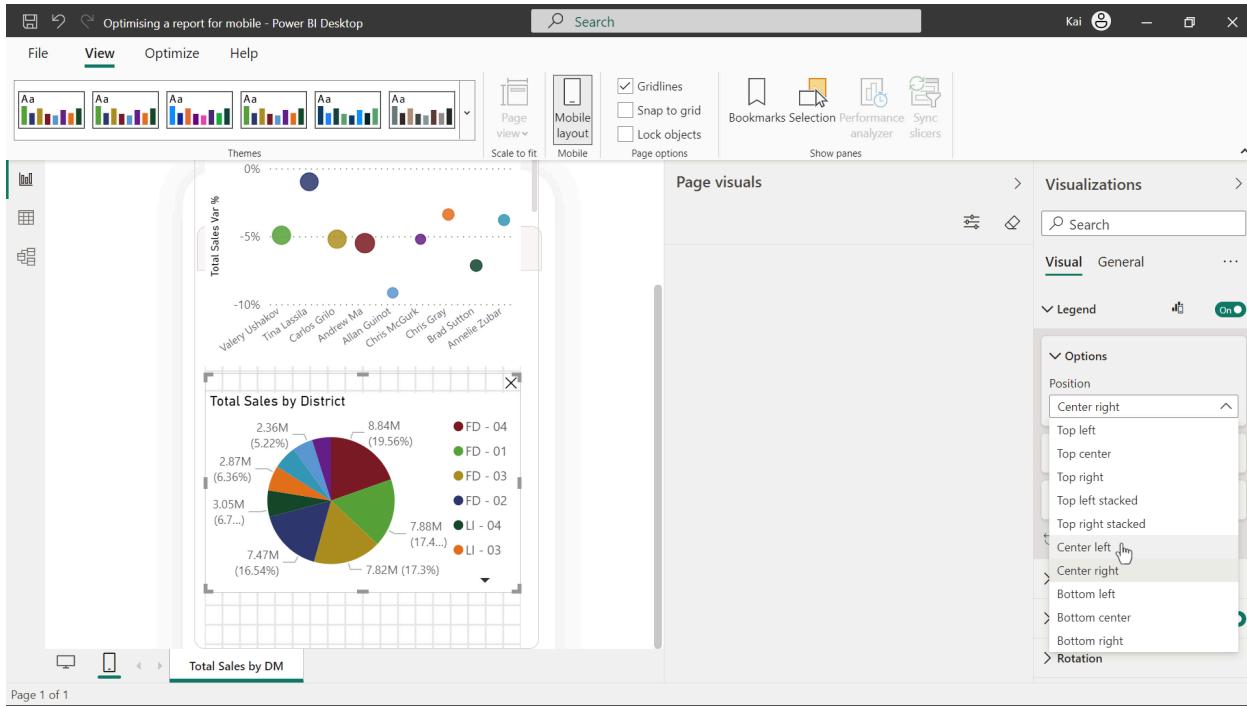
1. Lastly, drag and drop the pie chart to the mobile layout pane of Power BI.



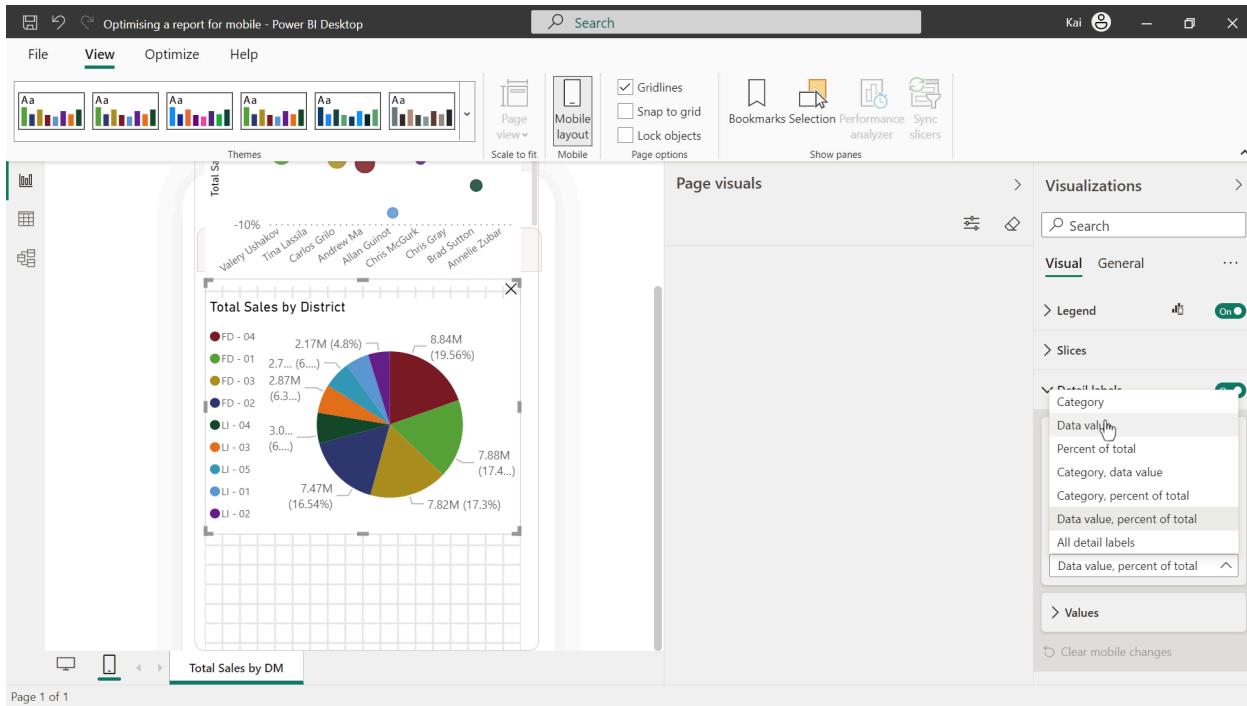
You need to reposition and re-scale the visual below the bubble chart to fill the screen.



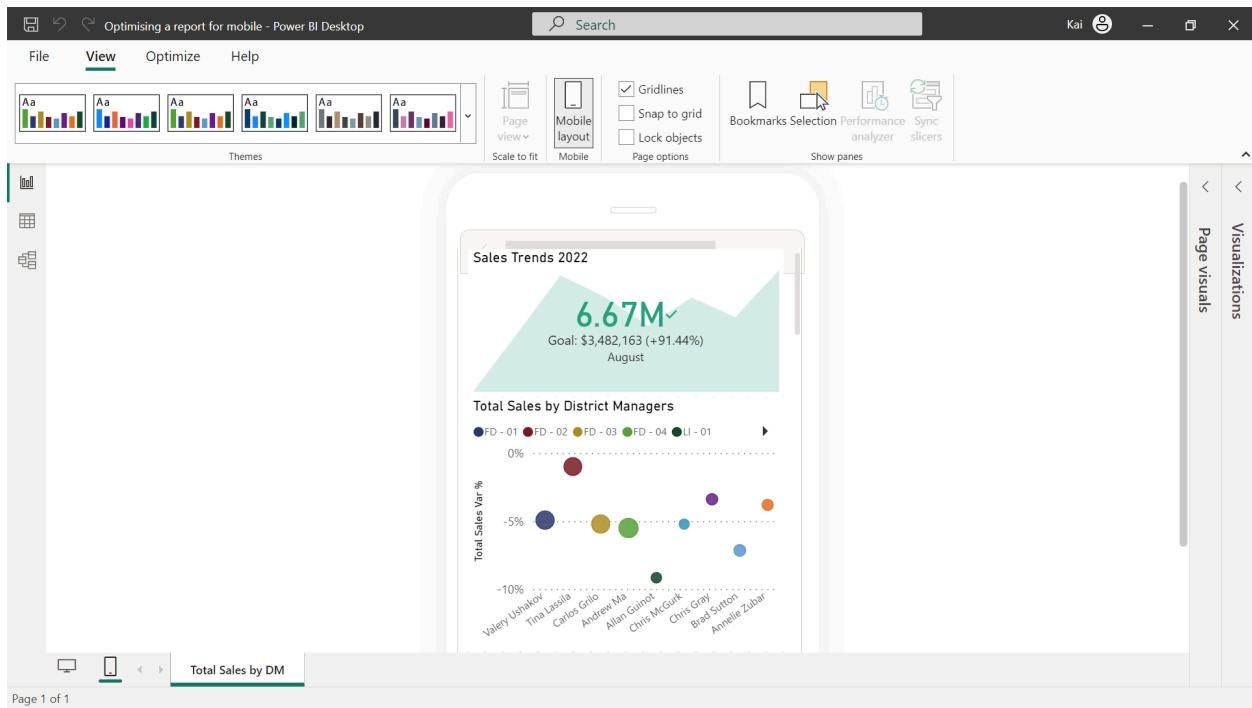
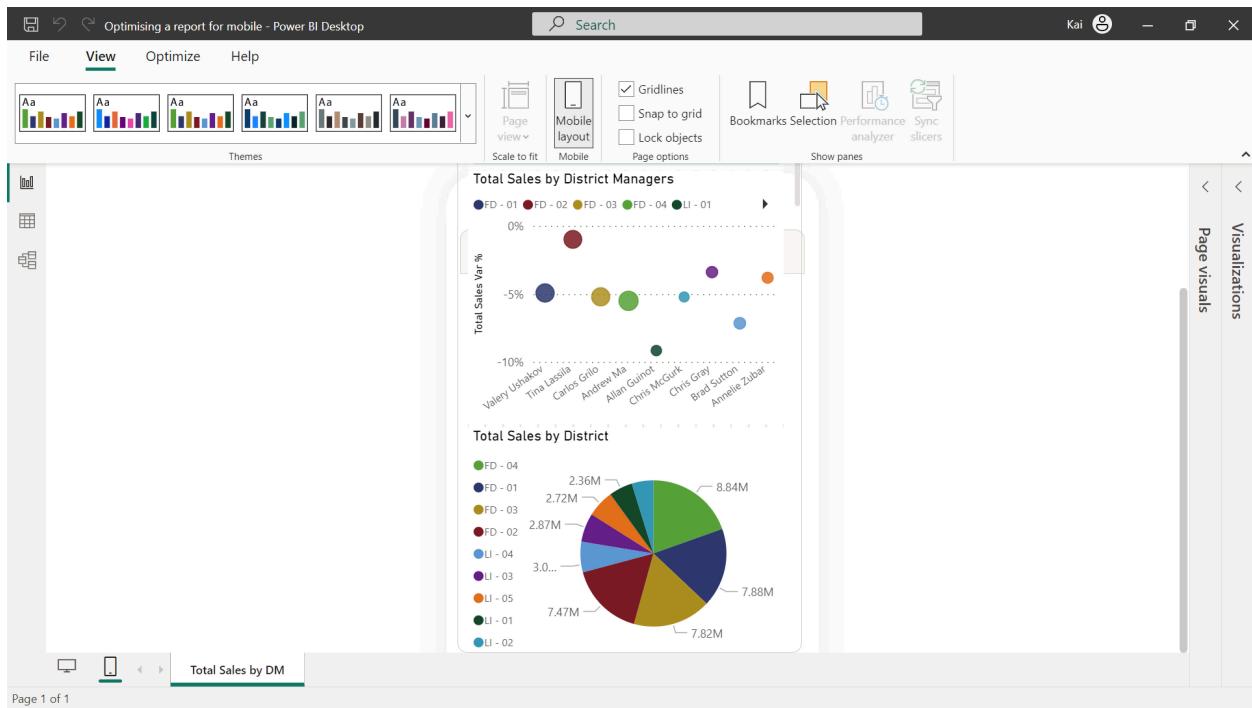
2. After moving to mobile canvas, the pie chart looks a bit cluttered and therefore needs some formatting adjustments. Reduce the chart title font size and set the legend title to the off position.



The data values on the pie chart slicers are not easily readable. Navigate to Visual, expand data labels and in the label content drop-down select Data value. This will remove the visual clutter from the pie chart slices.



After you make changes to the visuals, you can select the desktop icon from the bottom left corner of the Power BI interface to go back to the desktop view of the report and confirm that the changes you made for mobile did not affect the original report version. Your completed report should resemble the images below.



Step 6: Save the Power BI project

- Save your Power BI project to your local computer.

Make sure to provide an appropriate path to the file location.

Conclusion

With these steps, you have successfully optimized and formatted the Microsoft Power BI report for cellular devices.

2.2. Exercise: Visualizing data by geographical location

Introduction

By now, you have a deeper knowledge of how map visuals can be used effectively in Microsoft Power BI and how they add visual impact to reports. You have explored the essential concepts of map visuals such as Shape maps, Choropleth maps, Azure maps and Filled maps and experienced how they are used to generate regional insights and create geo hierarchies from your data.

In this exercise, you can apply this knowledge while creating an enhanced sales report for Adventure Works.

Scenario

Adventure Works sells its products globally, generating a large amount of sales data. As a result, it is important to create more focused summary reports to help regional managers understand the information and predict trends in their own geographical regions. Adio, one of the regional sales managers in the United States, has requested such a report. As a data analyst and experienced report designer, you know that while Power BI offers a range of map visualization options, the Shape map visual is the appropriate choice because you will be focusing on data from only one country.

By completing this exercise, you will demonstrate your ability to:

- Review and format the data to be used in the map visualization.
- Create a Shape map visual in the Power BI report to display the sales data for specific US states.
- Format and configure the map appropriately using color coding and design perspectives.

Instructions

Step 1: Download the Power BI project File

Download and open the Adventure Works Visualizing data by geographical location.pbix. This file contains a single data table Sales vs States which contains two data fields: Sales and States.

The screenshot shows the Power BI Desktop interface. The top navigation bar includes File, Home, Help, and a search bar. The ribbon has 'Table tools' selected. In the Data pane, there is a table named 'Sales vs States' with columns 'State' and 'Sales'. The table contains data for 50 US states. A tip at the bottom of the Data pane says 'Table: Sales vs States (50 rows)'. The right side of the screen shows a 'Data' pane with a search bar and a list of datasets, including 'Sales vs States'.

State	Sales
Alabama	320000
Alaska	110000
Arizona	250000
Arkansas	220000
California	210000
Colorado	100000
Connecticut	150000
Delaware	180000
Florida	170000
Georgia	260000
Hawaii	120000
Idaho	110000
Illinois	130000
Indiana	220000
Iowa	110000
Kansas	100000
Kentucky	400000
Louisiana	230000
Maine	90000
Maryland	100000
Massachusetts	110000
Michigan	120000
Minnesota	130000

Step 2: Review and format the data type

1. Review the data in the two data files. Assess the field categories and types and adjust the format where the data type is not appropriate for use in map visualization.

Tip: You review and change the data type from the Column Tools tab in Power BI desktop.

Step 3: Create a Shape map visual to present the sales data

1. Create a Shape map visual. In the Data pane select and add the appropriate data fields from the data pane to the map visual fields..
2. Resize the map visual to fill the report canvas.

Tip: The Visualization pane provides you with all the information you need to build the map visual.

Step 4: Format and configure the map visual

1. Apply the Accessible city park theme. Format the color scheme of the map to create a color coding that represents the sales trend across the states.
2. Configure and validate the zoom control of the map so the report users can manually select a specific region in the map.

3. Format the title and tooltip to create an easy-to-understand experience of the visualization.

Tip: You can access the formatting options in the Visual and General tabs of the Visualization pane.

Step 5: Save the Power BI project

1. Save the amended Power BI report locally on your computer.

Conclusion

The Shape map visualization that you have successfully created and configured, will display the sales data for the United States in a layered way. It will allow report users such as Adio to view overall sales information while also being able to drill-down to more focused regional analysis.

Exemplar: Visualizing data by geographical location

Introduction

In the exercise Visualizing data by geographical location, you were asked to create and format a map visual in Microsoft Power BI using Adventure Works sales data.

Your tasks in the exercise include:

- Review and format the data types and categories in the data to be used in the map visualization.
- Create a Shape map visual in Microsoft Power BI desktop to display the sales data for the United States.
- Configure and format the map visual to reflect the sales trend across the United States.

This reading provides you with a step-by-step guide for completing these tasks. It also includes screenshots that you can compare against your work.

You can also refer to the video *Shape map visuals*.

Step 1: Download the Power BI project file

Download and open the *Adventure Works Visualizing data by geographical location.pbix*.

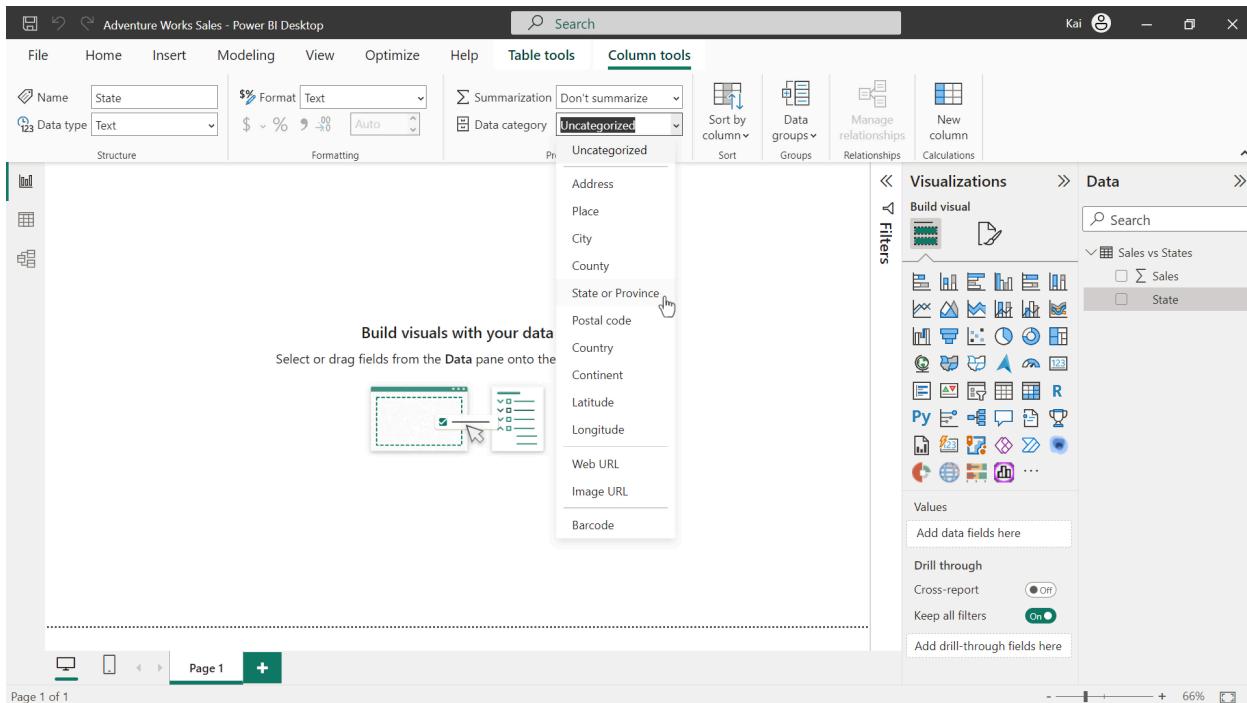
The data model in this file contains one table, which is called Sales vs States. This table contains two data fields titled Sales and State.

The screenshot shows the Power BI Desktop interface with the title bar "Adventure Works Sales - Power BI Desktop". The ribbon is visible with the "Table tools" tab selected. In the main area, there is a table titled "Sales vs States" with two columns: "State" and "Sales". The table contains 50 rows of data. The "Data" pane on the right shows the table name "Sales vs States".

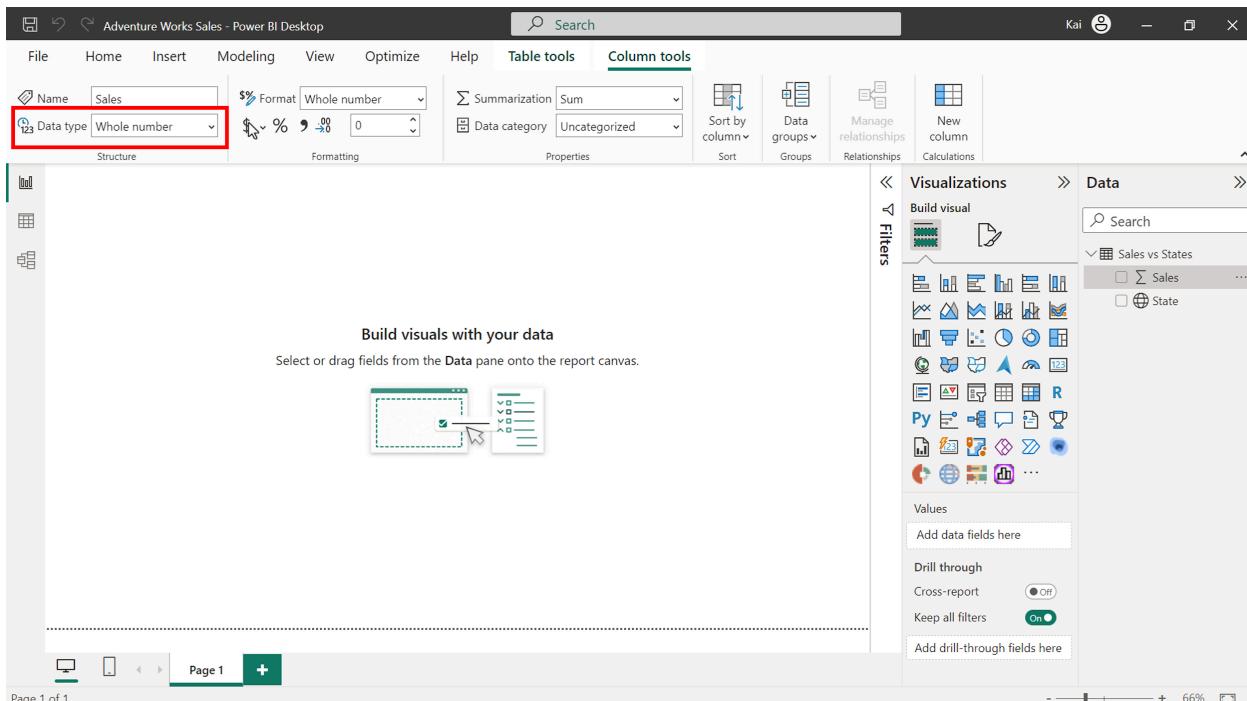
State	Sales
Alabama	320000
Alaska	110000
Arizona	250000
Arkansas	220000
California	210000
Colorado	100000
Connecticut	150000
Delaware	180000
Florida	170000
Georgia	260000
Hawaii	120000
Idaho	110000
Illinois	130000
Indiana	220000
Iowa	110000
Kansas	100000
Kentucky	400000
Louisiana	230000
Maine	90000
Maryland	100000
Massachusetts	110000
Michigan	120000
Minnesota	130000

Step 2: Review and format the data type and category

Both of the fields in the Sales vs States tables are in the wrong format. The State field is formatted as text with a data category of Uncategorized. When the data in a column is to be used in a map visualization, it is advisable to categorize the geographical data more appropriately as longitude, latitude, country, and so on. Change the category of the State field to State or Province.

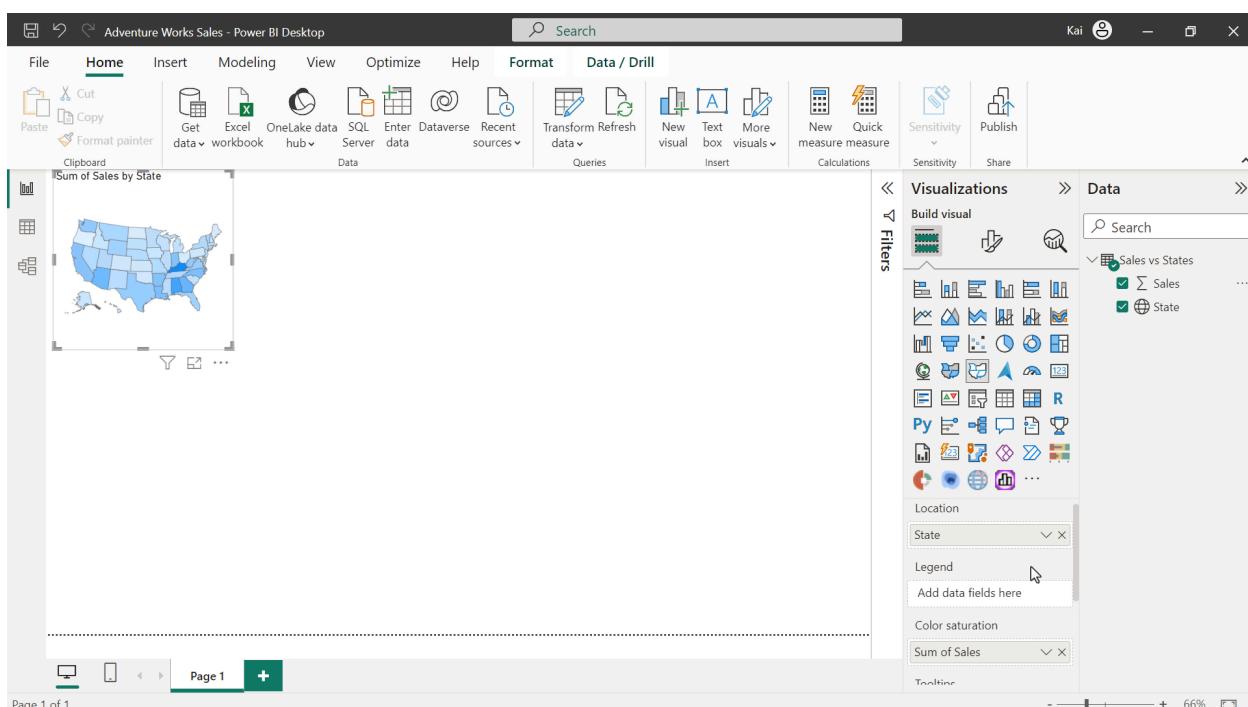
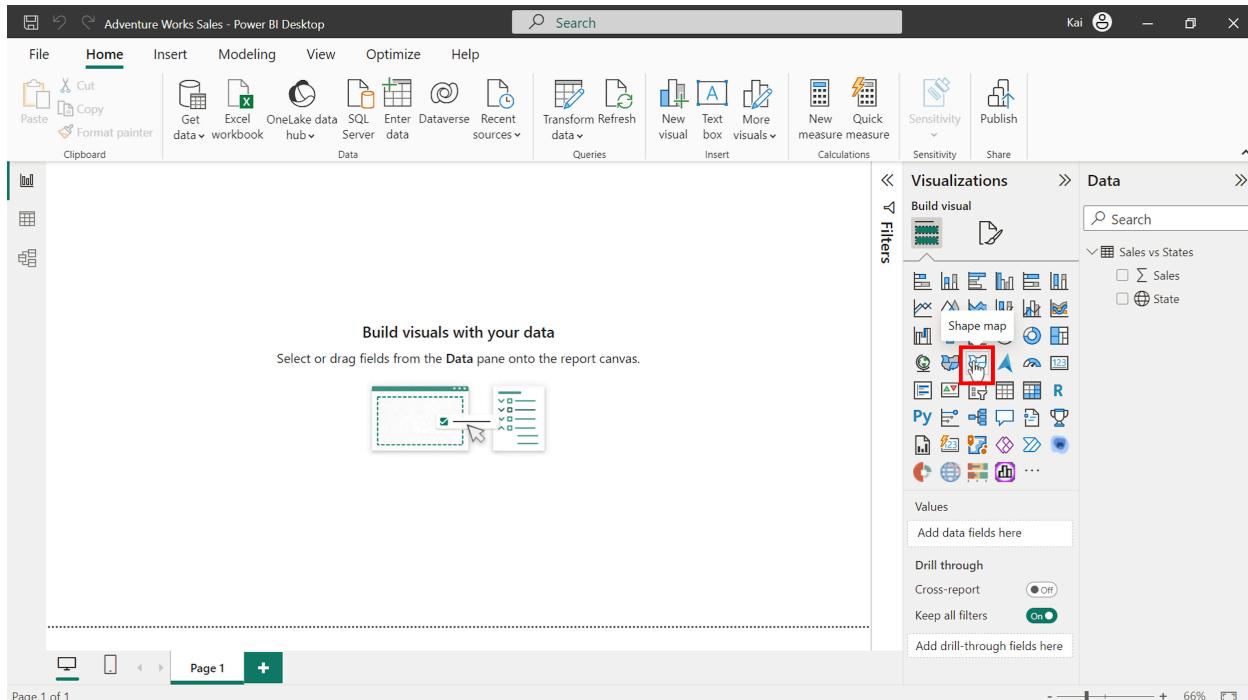


The data type of the Sales field is initially set to Whole number. As these figures represent sales, change the data type to Currency.



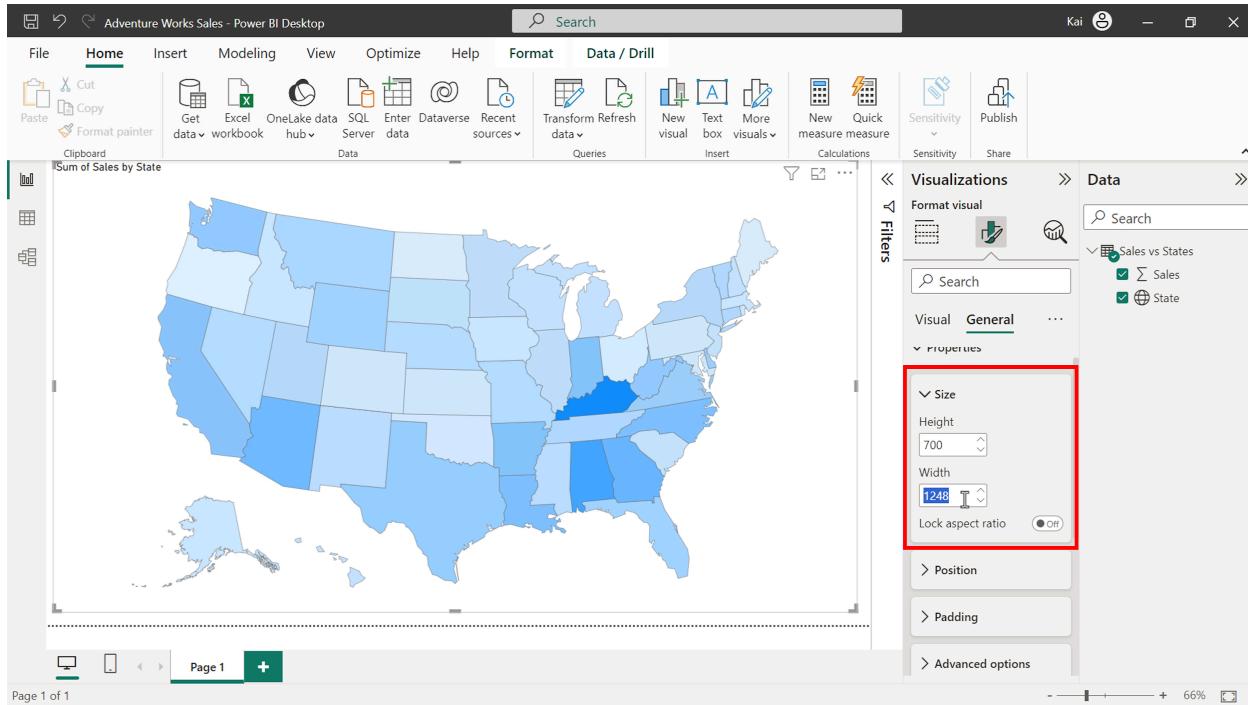
Step 3: Create a Shape map visual to present the sales data.

1. Select the Shape map visual in the Visualization pane to add it to the canvas.
Drag the State field to the Location well of the Shape map visual. Add the Sales field to the Color saturation well of the Shape map visual.



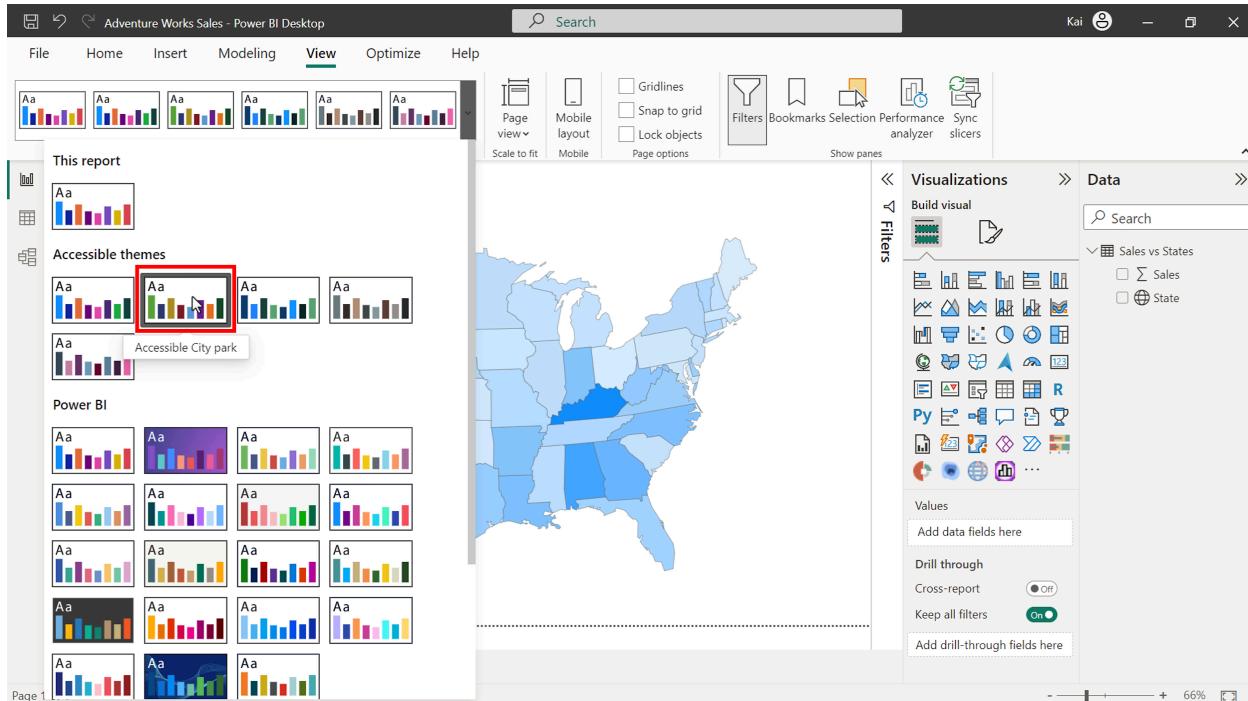
2. Resize the map visual to fill the report canvas by dragging any side of the image.
Alternatively, in the Format visual section of the Visualizations pane, you can select

General and then expand the Properties options. In this area, you can manually define the height and width of the visual.

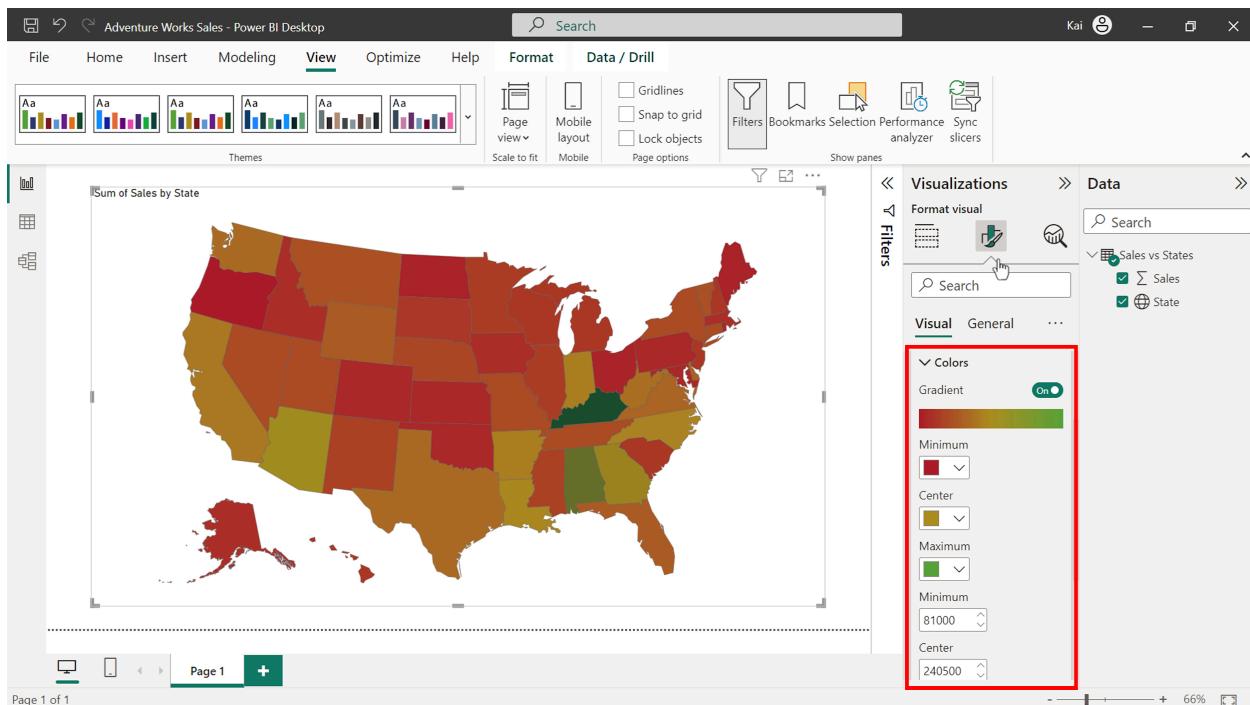


Step 4: Format and configure the map visual

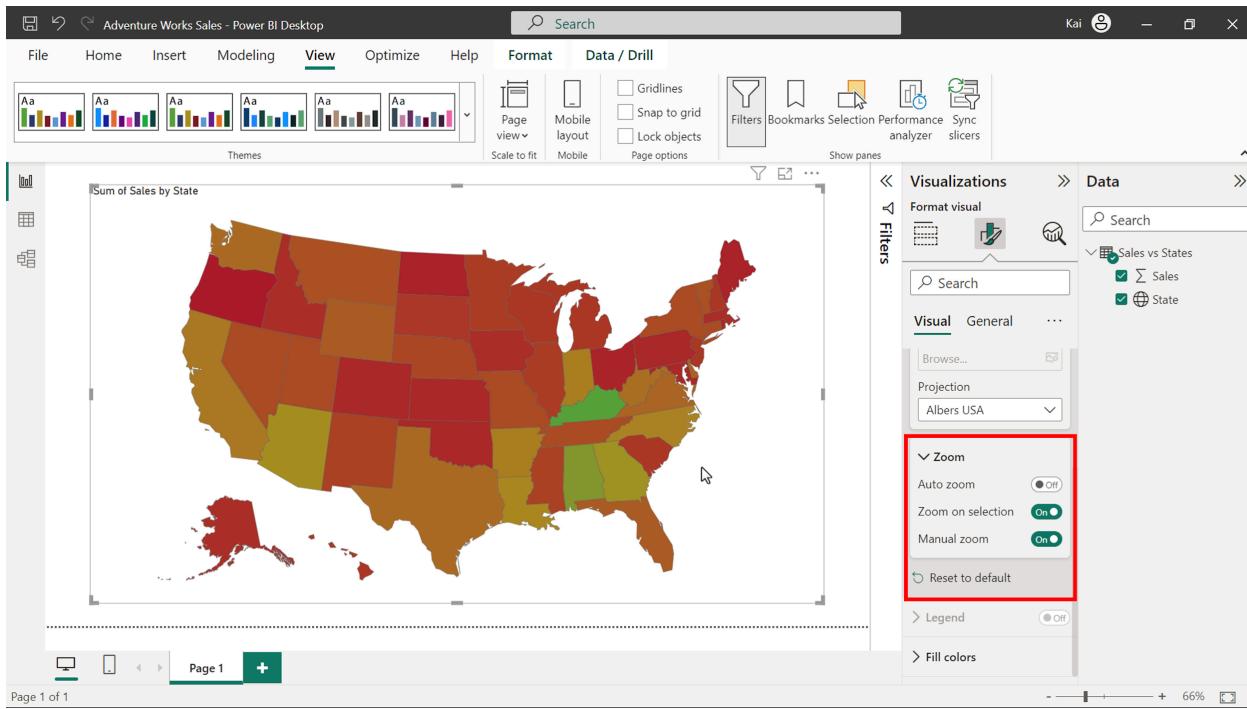
1. Apply the Accessible city park theme by selecting it from the View ribbon. This will improve the accessibility of the report.



You can customize the colors used in the visualization by going to the Fill colors option in the Format visual pane. There are currently, two choices of coloring for a Shape map visual. The first applies two colors for maximum and minimum values. The second option allows you to define a color for a center point and then provides gradient colors for the other values. You can use any of the three theme colors. You can also apply borders to create greater separation of the states.

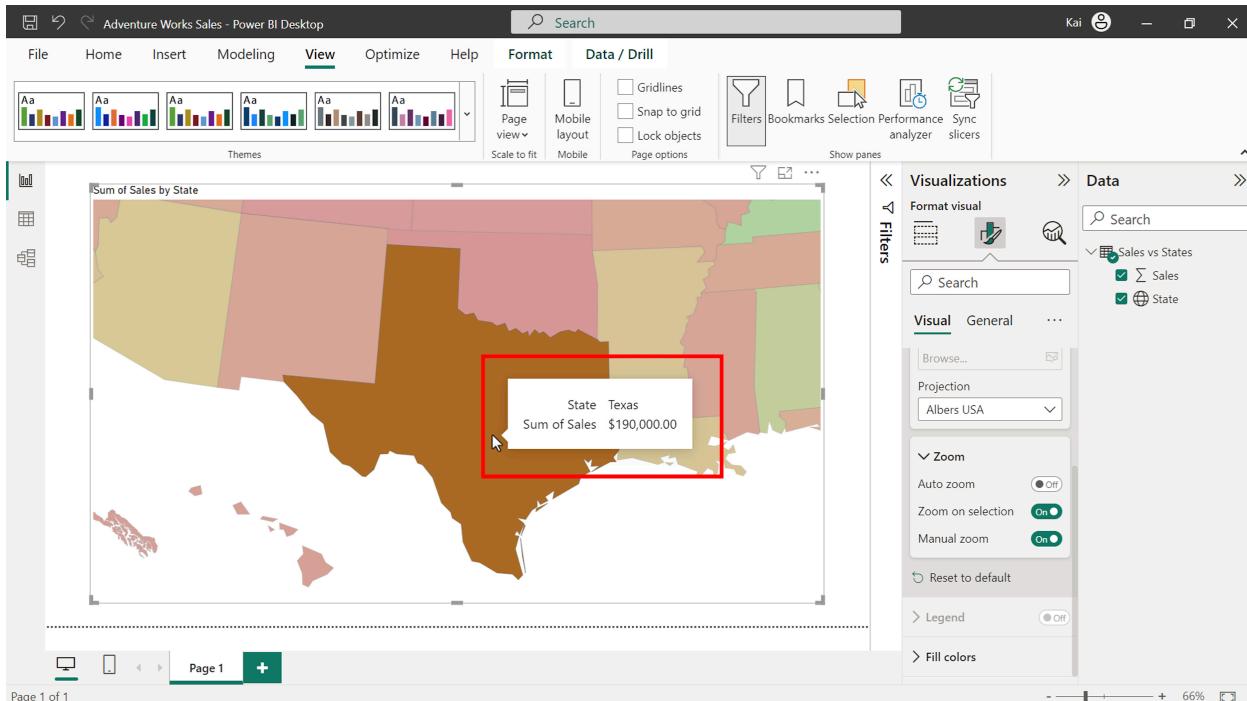


2. One of the benefits of the map is that users can manually select a specific region to view data relating to it. To configure this option, you need to set the zoom control on the map. Select Map settings and then expand the Zoom option. Three choices are available, Auto zoom, Zoom on selection, and Manual zoom. To correctly set the zoom for this map visual, move the toggle button for Zoom on selection and Manual zoom to the on position.

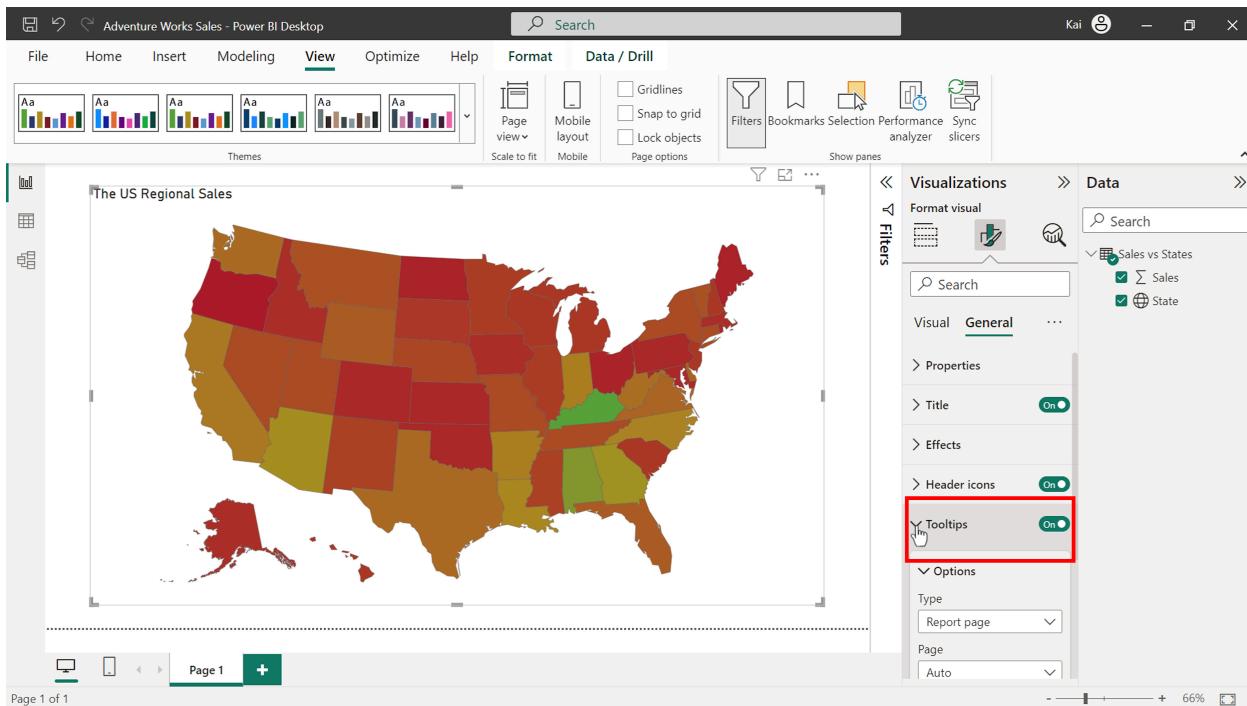
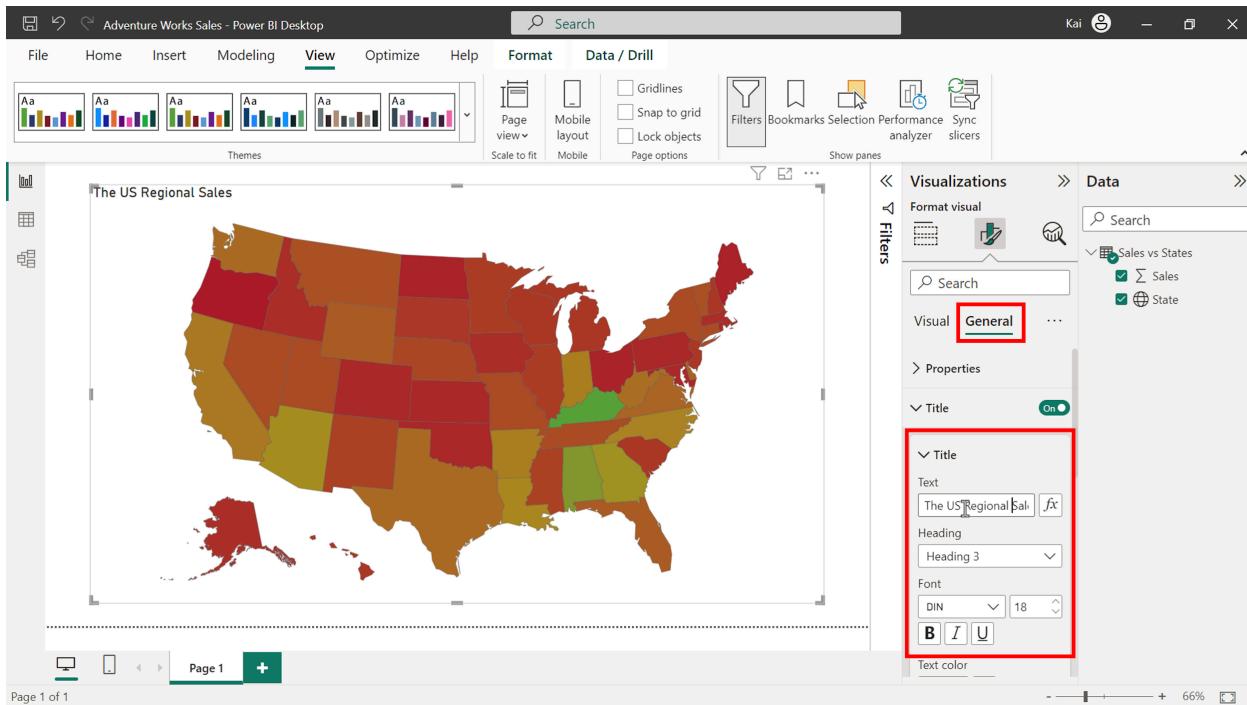


You can confirm that the zoom feature is functioning correctly by selecting any state.

This will make the visual zoom in on that area.

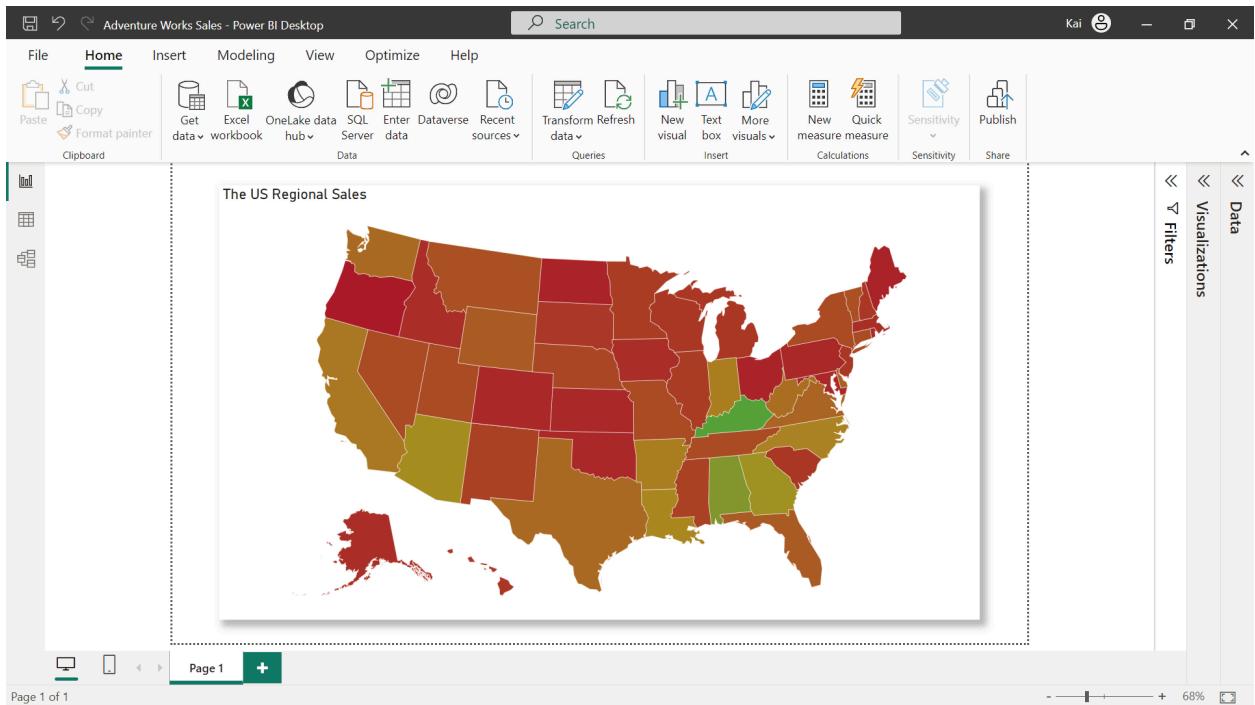


3. Change the wording and appearance of the title in the General tab of Visualizations pane. There is also a setting in this tab that allows you to change the text size, color, and background color of the tooltip so that it matches design or brand requirements.



Step 5: Save the Power BI project

To save the project, open the File menu, select Save As, and provide an appropriate name for the project along with a path to the folder on your computer.



Conclusion

With these steps, you have successfully created and formatted a shape map visual to display the Adventure Works' sales data for the United States. Regional managers in Adventure Works can now have better insight into patterns and trends in regional sales performance color coding in the map.

2.3. Activity: Installing custom visualizations from AppSource

Introduction

Microsoft Power BI contains a large selection of core visualizations but in your role as a data analyst, you may need to expand this choice by using custom visualizations.

Custom visualizations play a significant role in enhancing the capabilities and impact of Power BI reports and dashboards. With them, you can create bespoke and personalized visuals for your organization that address specific business requirements of the organization. This helps you to create reports that are more accurate and that have a greater impact on decision-makers.

You have already explored how to add custom visualizations using Python. Another important source of custom visuals is the Microsoft marketplace AppSource.

AppSource Visuals

AppSource offers a diverse collection of custom visualizations created by third-party developers and designers. By downloading these and integrating them into Power BI, analysts can expand the choice of visualization options beyond Power BI's core options. All the visuals in AppSource are tested and approved by Microsoft for functionality and quality.

Scenario

As a member of the Adventure Works data analytics team, you are helping to create Power BI reports and dashboards showing regional sales results and trends. You feel that some of the data collected would not be displayed to the best effect if you use only the Power BI core visualizations. You decide to explore the choice of visualizations offered in AppSource to find a more appropriate visual. Let's look at how you can import a custom visual from AppSource and how it can be used and formatted in your Power BI report.

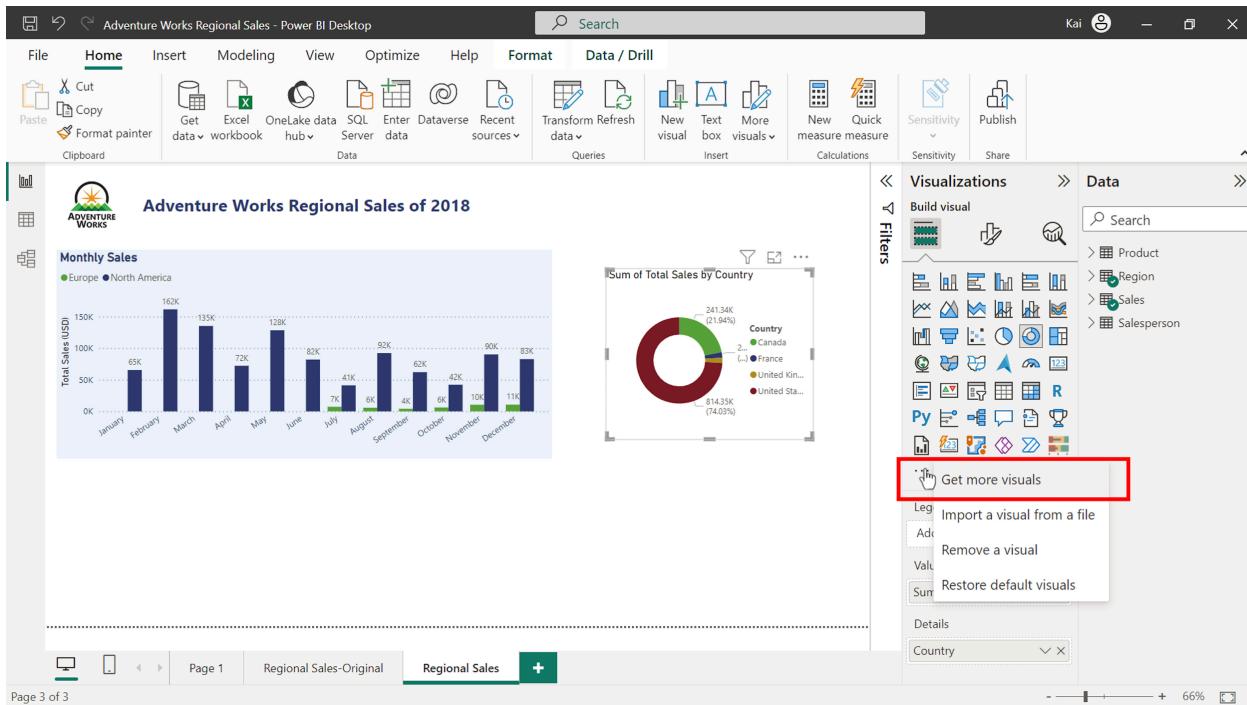
Step 1: Import the visual

1. Download the report Adventure Works Regional Sales.pbix and open it in Power BI desktop.
2. First, assess the current layout of the report by viewing it in Report view in Power BI. The report contains a donut chart which shows sales figures by country and a column chart showing the monthly regional sales.

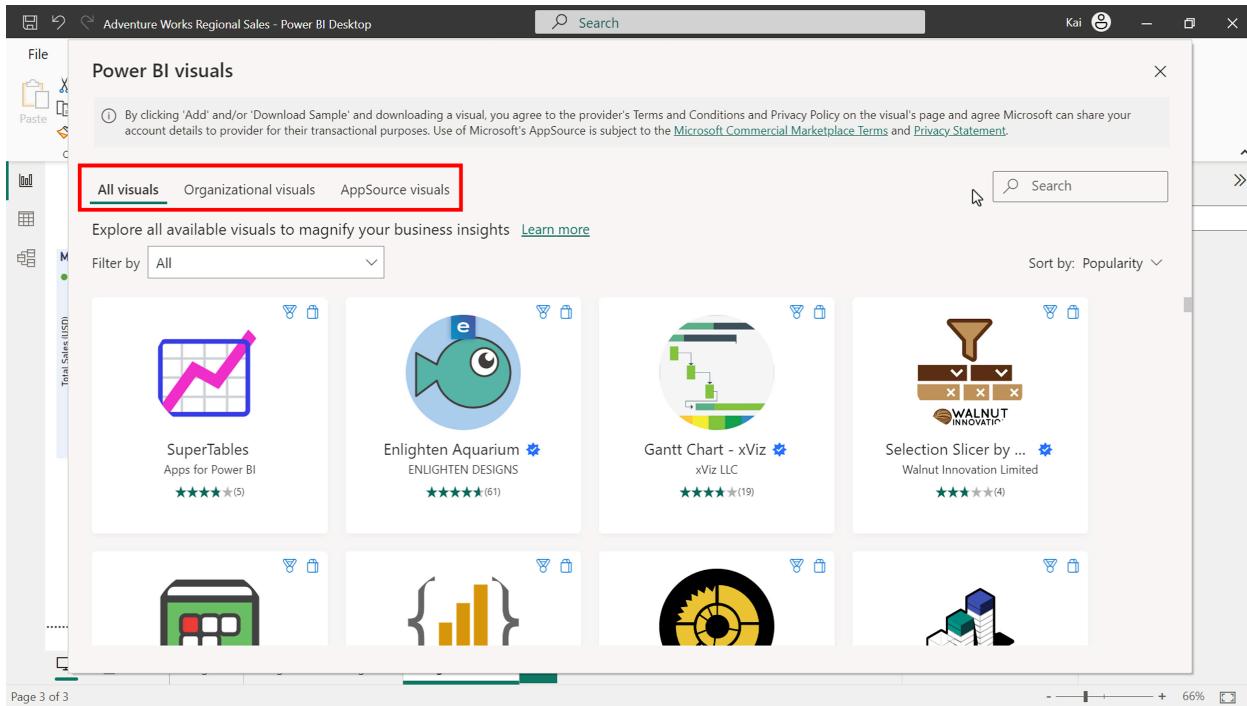
The screenshot shows the Power BI Desktop interface with a report titled "Adventure Works Regional Sales of 2018". The report includes a bar chart for monthly sales and a donut chart for total sales by country. The donut chart is highlighted with a red box. The visualization pane on the right displays various chart types and their descriptions.

3. Let's enhance the report by changing the donut chart to an Aster plot chart imported from AppSource. An Aster plot is a modified Donut chart representing the values by the depth of each section.
4. Open the Visualization pane and select the ellipses then choose Get more visuals from the drop-down. This opens a Power BI visuals window.

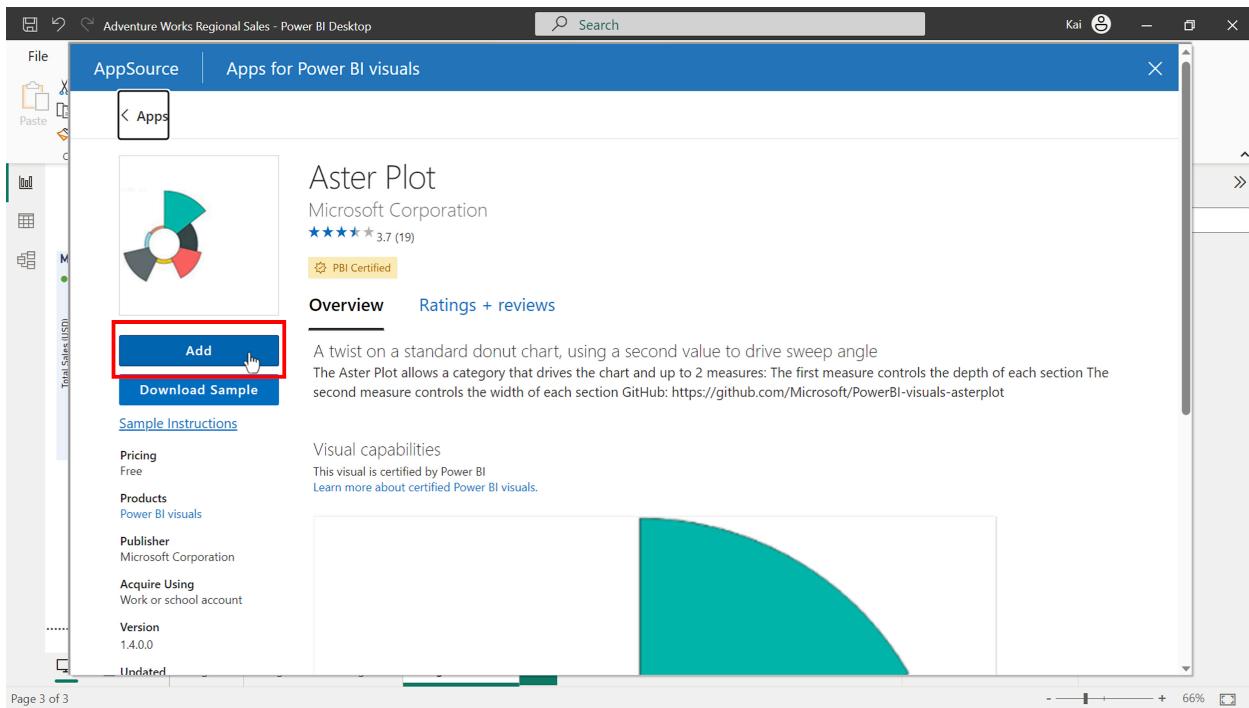
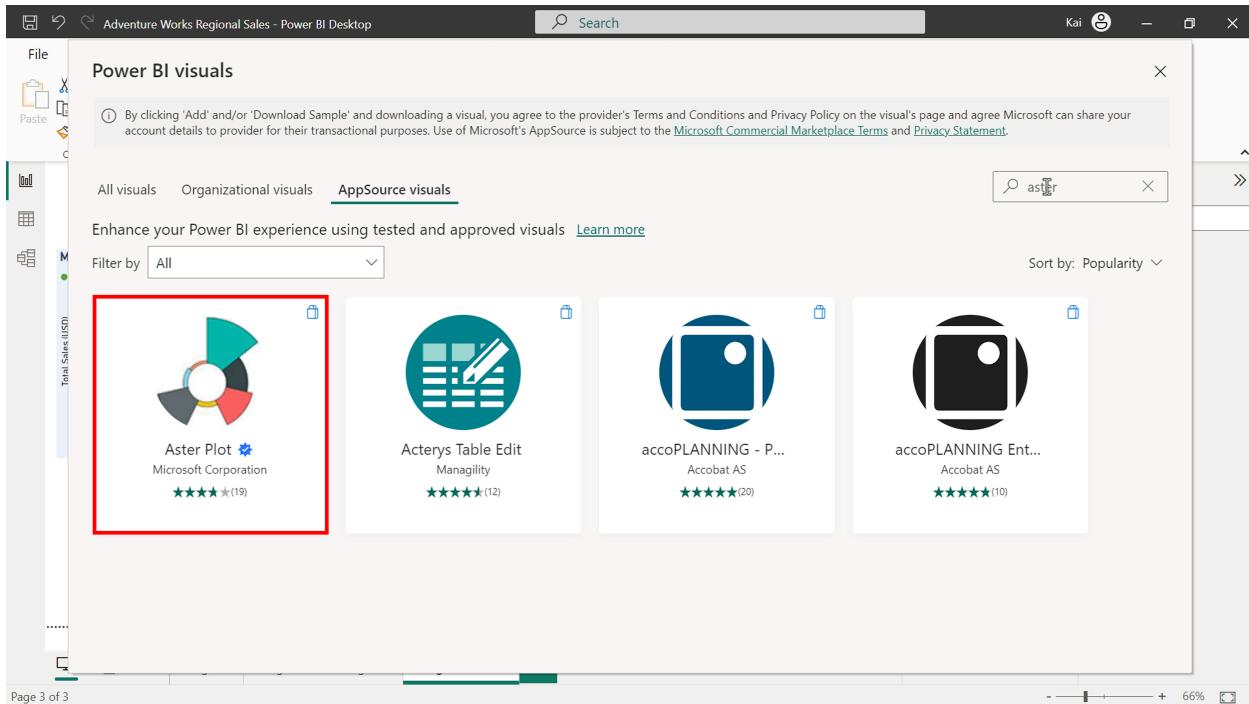
The screenshot shows the Power BI Desktop interface with the same report. The "Get more visuals" option in the visualization pane is highlighted with a red box, indicating the step to access additional chart types.



5. The window contains three tabs titled All visuals, Organizational visuals and AppSource visuals. The visuals in AppSource have been tested and approved by Microsoft so the new visual will be downloaded from there. Select the AppSource visuals tab.



6. In the search bar type Aster Plot and when the search results appear select Aster Plot. The details page for the Aster Plot visual appears. Select Add. This imports the visual and adds it to the Visualization pane in Power BI where it can be selected and added to the report.



7. Once import is complete, a dialog box appears on screen showing the message Import successful. The Astor Plot visual is now a choice under the Visualization pane. Right click on it and select the pin to visualization pane option. This adds the imported visual to the main Visualization pane for future use.

The screenshot shows the Power BI Desktop interface. In the center, there is a bar chart titled "Adventure Works Regional Sales of 2018". The chart displays monthly sales for Europe and North America from January to September. A red box highlights a "Import successful" dialog box that appears over the chart, stating "The visual was successfully imported into this report." with an "OK" button. The ribbon at the top shows the "Home" tab is selected. The right side of the screen features the "Visualizations" pane, which lists various chart types like Bar, Line, and Map, and the "Data" pane, which shows a hierarchy of data sources including Product, Region, Sales, and Salesperson.

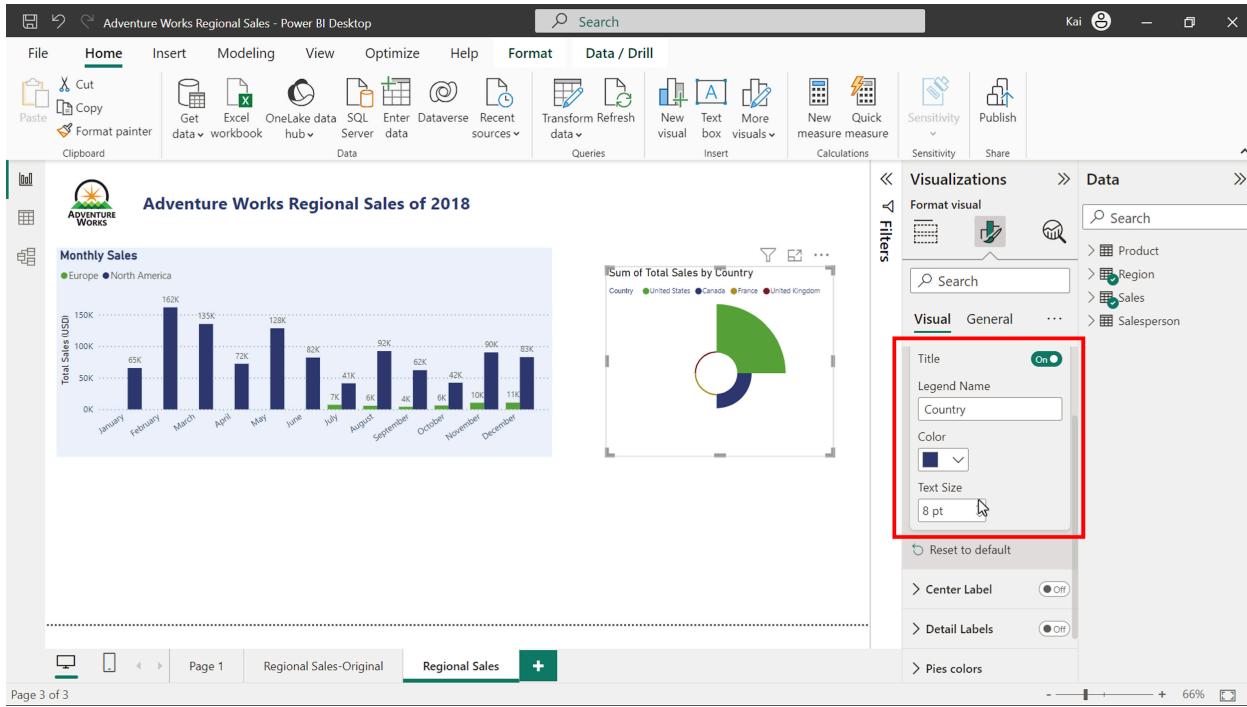
This screenshot shows the same Power BI Desktop environment after the import. It includes the bar chart from the previous step and a new donut chart titled "Sum of Total Sales by Country" to the right. A context menu is open over the donut chart, with the "Pin to visualizations pane" option highlighted by a red box. The menu also includes other options like "About" and "Add data fields here". The ribbon and Visualizations/Data panes are visible on the top and right sides respectively.

Step 2: Use and format visual in your report

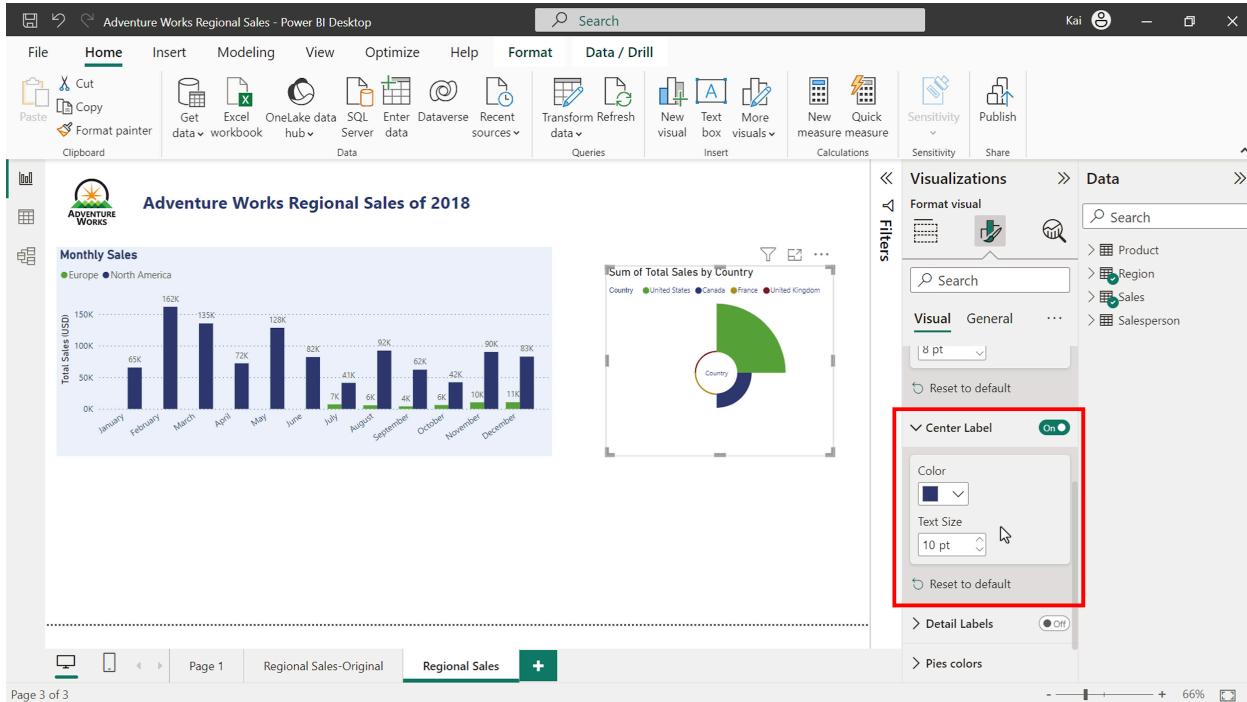
1. Select the donut chart, which represents the sales by country figures, and then select the Astor plot icon. The Sales by county visualization instantly changes from Donut chart to Aster plot and it can now be formatted to meet the design and analytical requirements.

The screenshot shows the Power BI Desktop interface with a report titled "Adventure Works Regional Sales of 2018". The report includes a bar chart for monthly sales and a donut chart for total sales by country. The donut chart is selected, as indicated by a red box around the "Aster Plot 1.4.0" item in the Visualization pane. The Visualization pane also lists other visualizations such as Line, Bar, and Map.

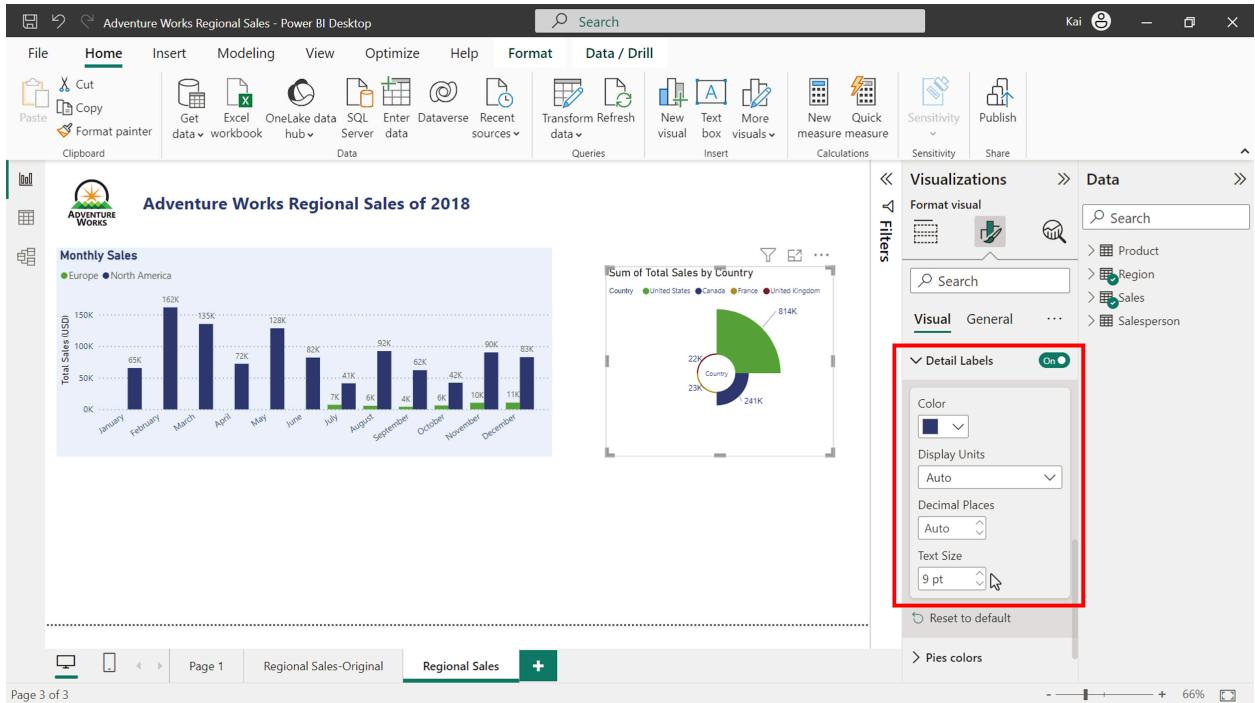
2. Select the Astor plot visual. In the Visualization pane select the Format Visual tab and then Visual. In the Legend section make the following series of choices. Turn on the Legend by moving the toggle button to the on position. Change the Legend position to the left. Switch off the Legend title by moving the toggle to the off position. Change the color to blue to match the color palette used in the report.



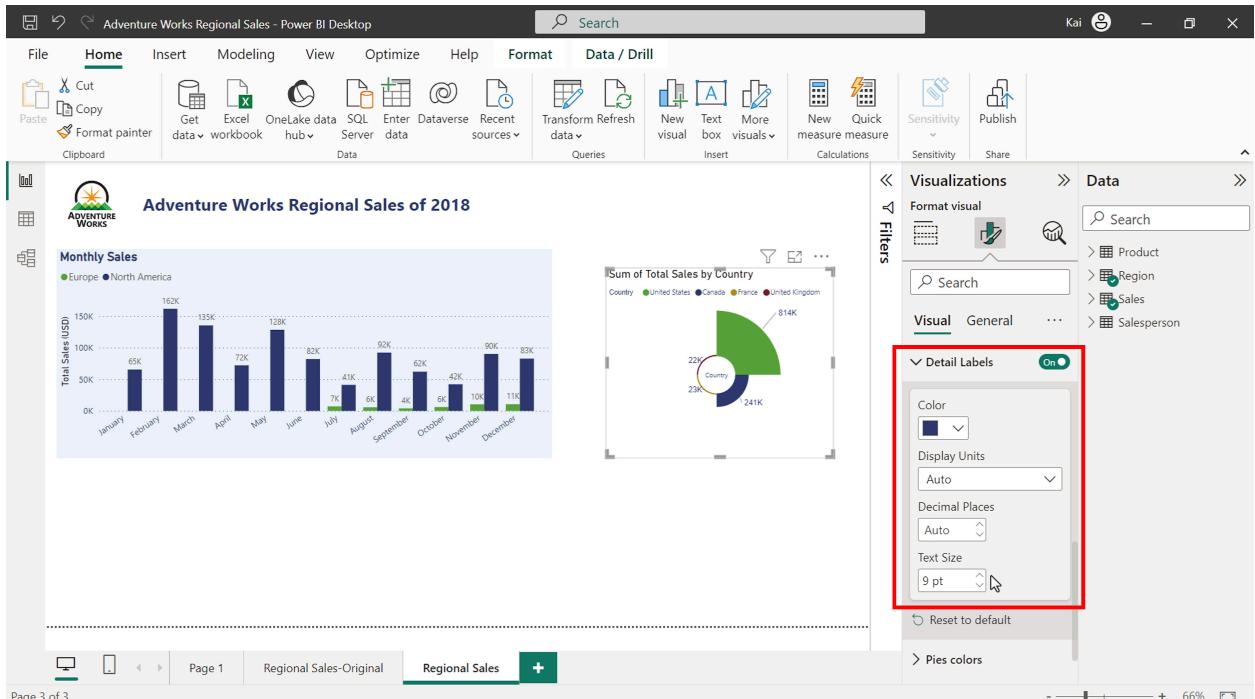
3. In the Center label section, Center label, toggle the button to the on position, change the color to blue to match with the entire report.



4. In the Detail labels section toggle the button to the on position. Enter 2 in the Decimal places section, and again change the color to blue.



5. Keep the Pies color default settings because these are consistent with the report theme.



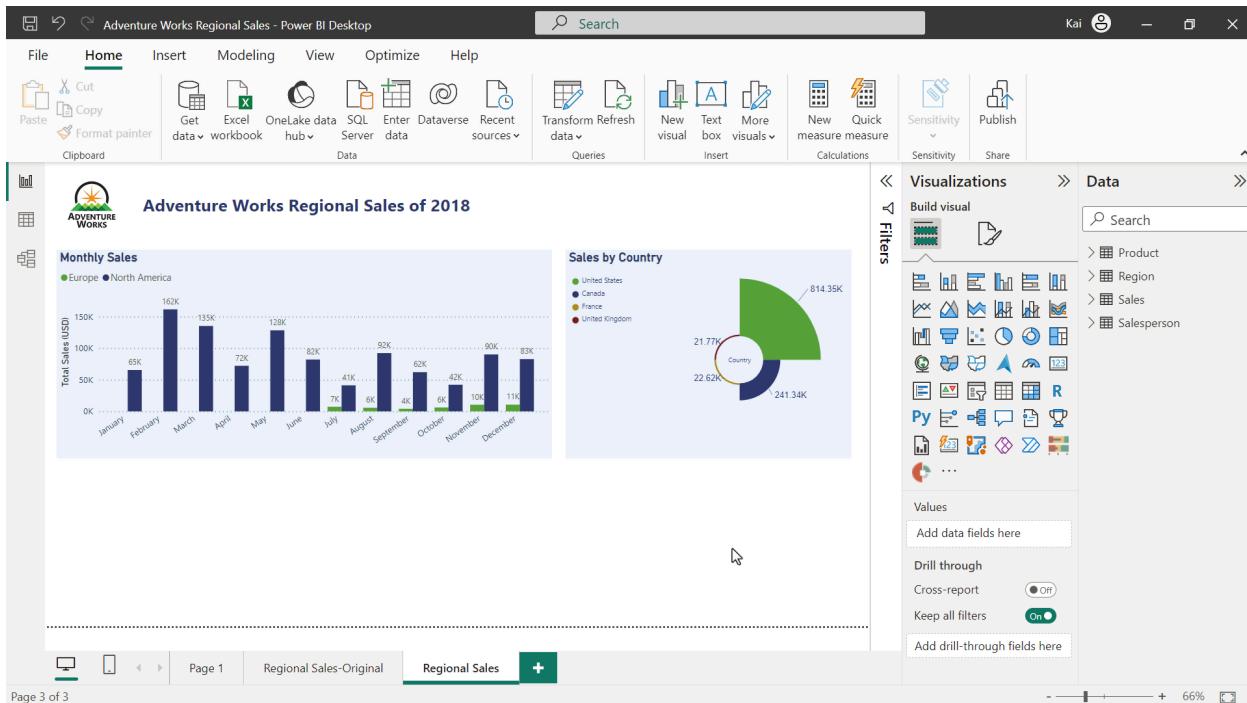
6. Now change the title of the visual to Sales by Country and format the text to match the settings already used in the report. For this, Go to Visualization > Format Visual > General > Title. Change and format the title text.

The screenshot shows the Power BI Desktop interface with the 'Adventure Works Regional Sales' report open. In the 'Visualizations' pane, a donut chart titled 'Sales by Country' is displayed. The chart shows sales distribution across four countries: United States (814K), Canada (241K), France (22K), and United Kingdom (23K). The 'General' format settings for this visual are being edited, with the 'Title' section highlighted by a red box. The title is set to 'Sales by Country' with a font of DIN 14pt.

7. As the column chart has a light blue background, so you need to make the report cohesive. Go to Visualization > Format Visual > General > Effects > Background. Change the color to light blue and set the transparency value at 70%.

The screenshot shows the Power BI Desktop interface with the same report. The 'Visualizations' pane now shows the donut chart with its background effects applied. The 'Effects' section for the chart is highlighted by a red box, specifically the 'Background' section where the transparency is set to 70%.

8. Finally, drag the visual to adjust its position in the report and enlarge it so that the entire report looks like a unified design.



Conclusion

AppSource visuals are a valuable resource for creating custom visualizations to address specific needs of businesses. They also enhance data presentation and contribute to the overall effectiveness of Power BI as a business information tool. Moreover, the visuals available in AppSource are tested and validated for their functionality and quality for creating reports and dashboards in Power BI.

2.4. Activity Adding a chart using Python (Optional)

Introduction

You now have a deeper understanding of custom visualizations, and you are familiar with several ways to create them within Microsoft Power BI desktop, including the use of Python. Python is a powerful data analytics language that is supported by Power BI. Python, along with its collection of libraries can be used to build and deploy custom visualizations to meet specific design and analytical requirements.

Scenario

The size of the sales dataset for Adventure Works is significant because it is a large company operating in a multinational environment. It needs an extensive range of visualizations to correctly reflect these sales results and market trends in its reports. In some situations, Power BI core visualizations are too limited to do this. In this activity, you'll use Python scripts and libraries to generate the analysis and visualization for a new custom visual in Power BI.

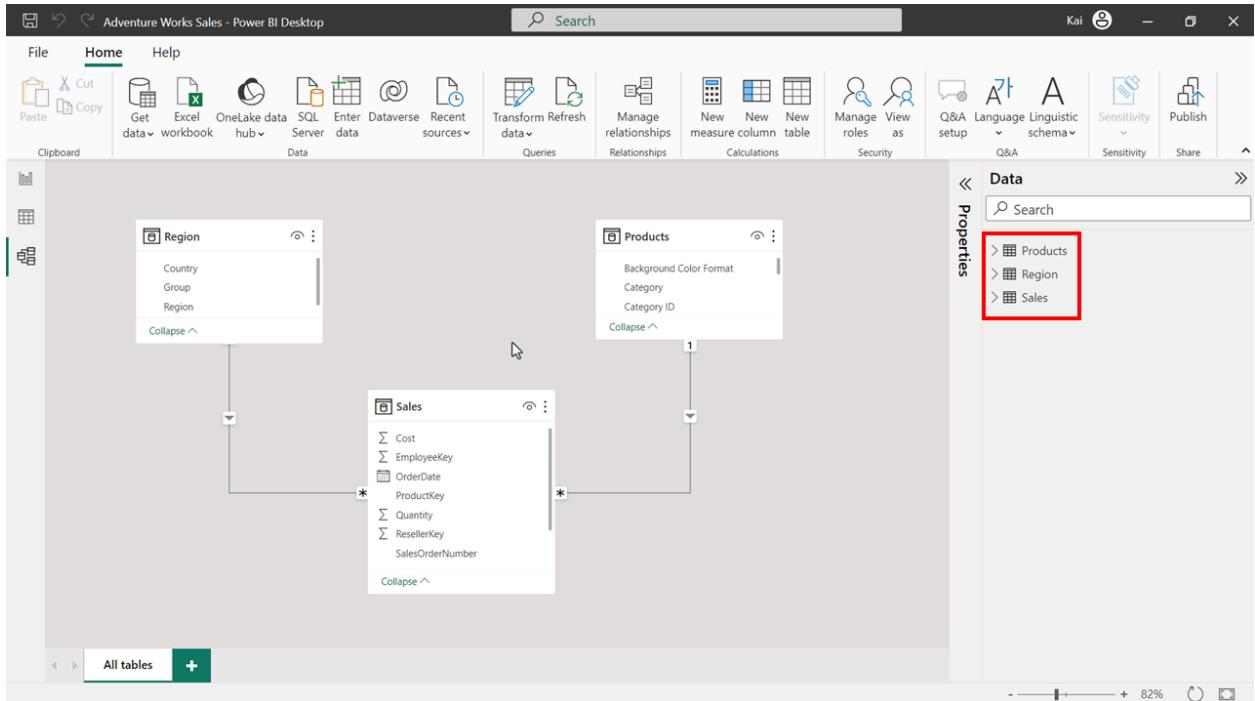
The specific tasks in the activity are to:

- Enable Python scripting if necessary.
- Ensure that Power BI detects the Python home directory path.
- Use Python to create a Bar chart representing the total monthly sales of Adventure Works.
- Confirm that the Python chart is interactive by placing another Power BI core visual element on the report page.

This reading provides you with a step-by-step guide for completing the tasks along with screenshots of each step.

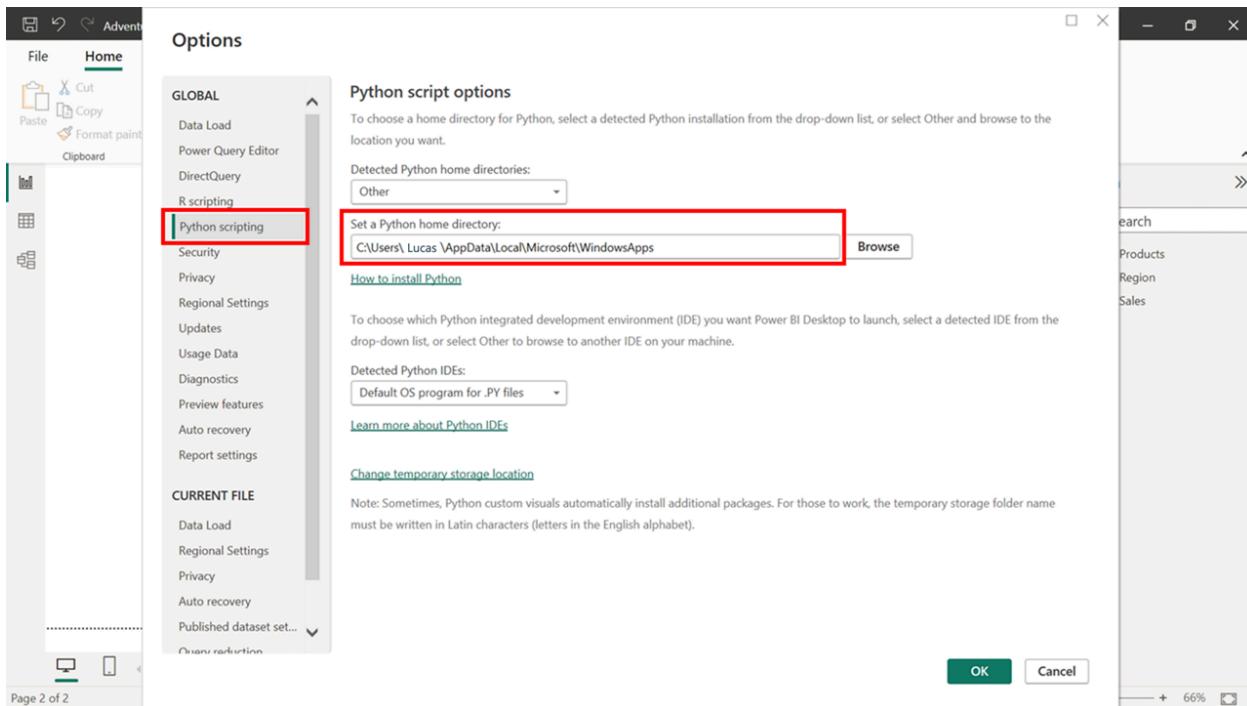
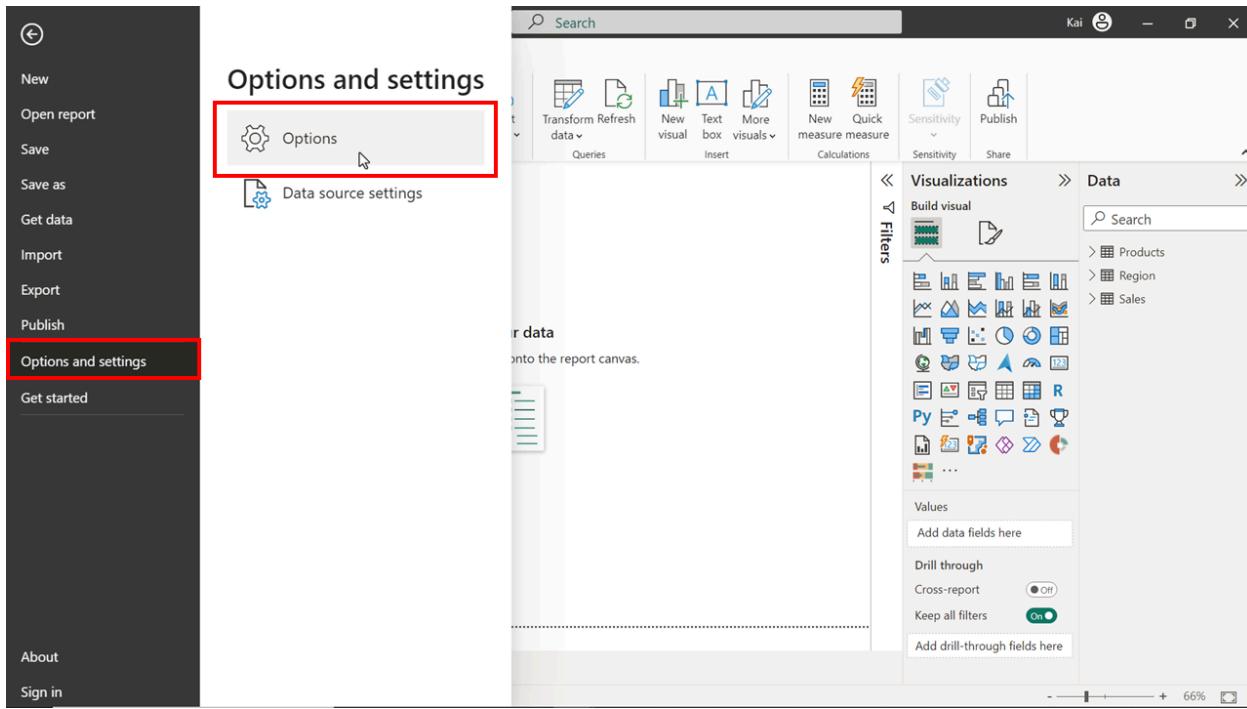
Step 1: Download the Adventure Works Power BI project

1. First download and save the Microsoft Power BI project *Adventure Works Sales.pbix* to your local computer. Confirm that the data model contains three data tables called Sales, Regions, and Products.



Step 2: Prepare Power BI to use the Python visualization

1. To enable Python scripting on your Power BI desktop, select File and then select Options and Settings then Options. In Options, select Python Scripting in the bar on the left of the window.
2. Check that the path of the Python home directory is automatically detected. If the path is not correctly configured, you will get an error message when importing data or creating a custom visual in Power BI.

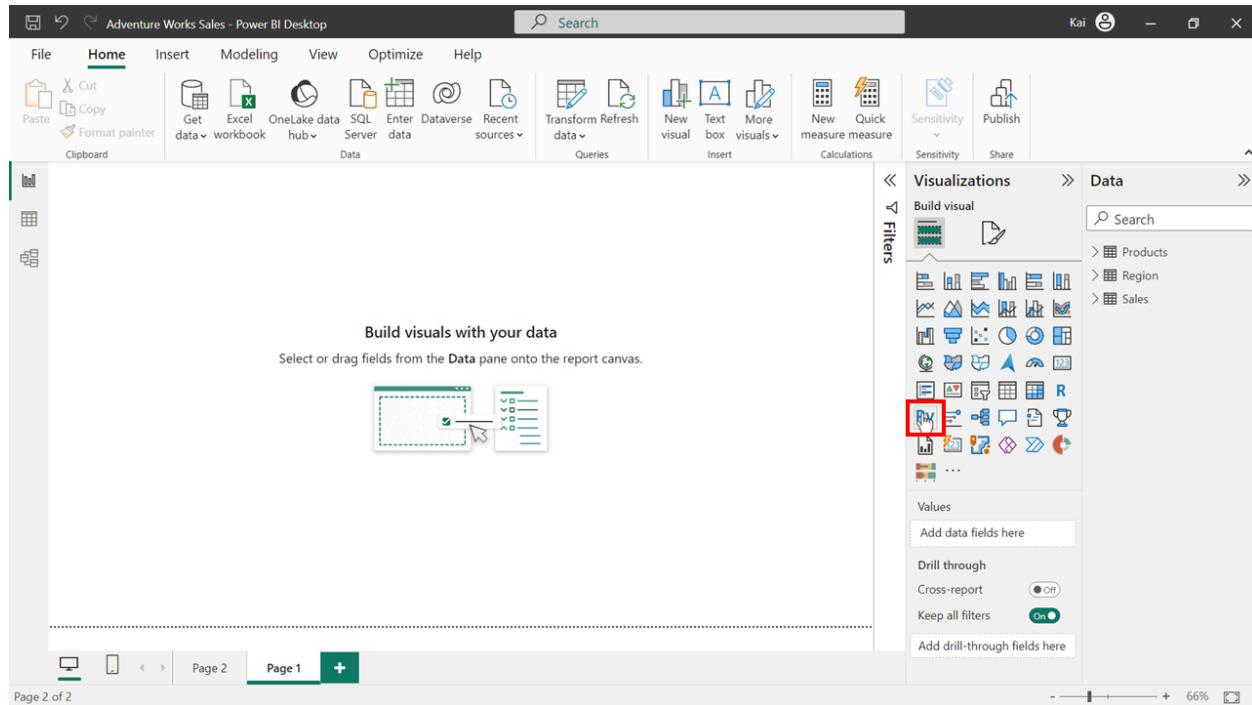


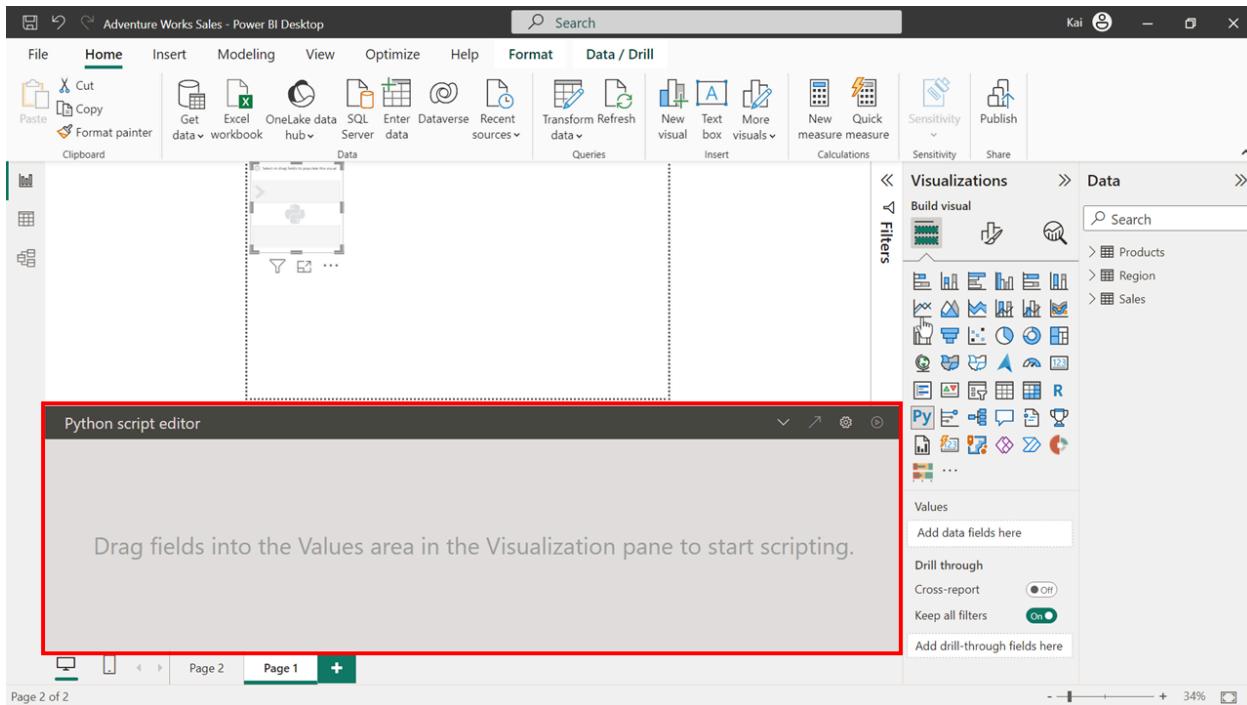
Step 3: Create Python chart visual

1. The Python visualization uses only the fields that are brought to the Values section of the Python visual to create a dataframe. It is important to remember that if you are using fields from different tables of your data model, you need to

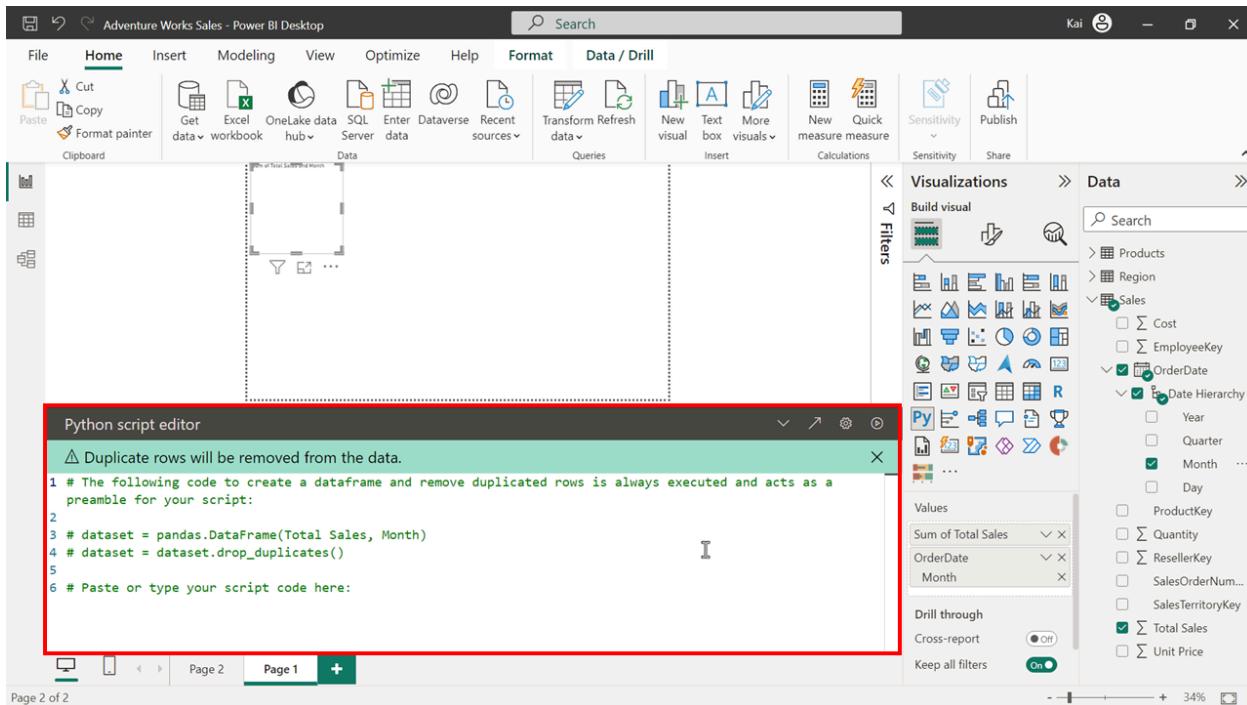
make sure that the tables are related using appropriate relationships and cross-filter direction to achieve accurate results in the final visual.

2. Select the Python visual icon from the Visualization pane. Once you select the Python icon from the visualization pane of Power BI, a message appears saying: "Enable script visuals, select enable". Select Enable to open the Python script editor (it will also add a Python visual placeholder image to the report canvas.)





Drag the Total sales field and the Month column from the OrderDate hierarchy from the Sales table to the Values section of the Python visual. You can expand the OrderDate column to see the Month field in the hierarchy if it is not already visible.

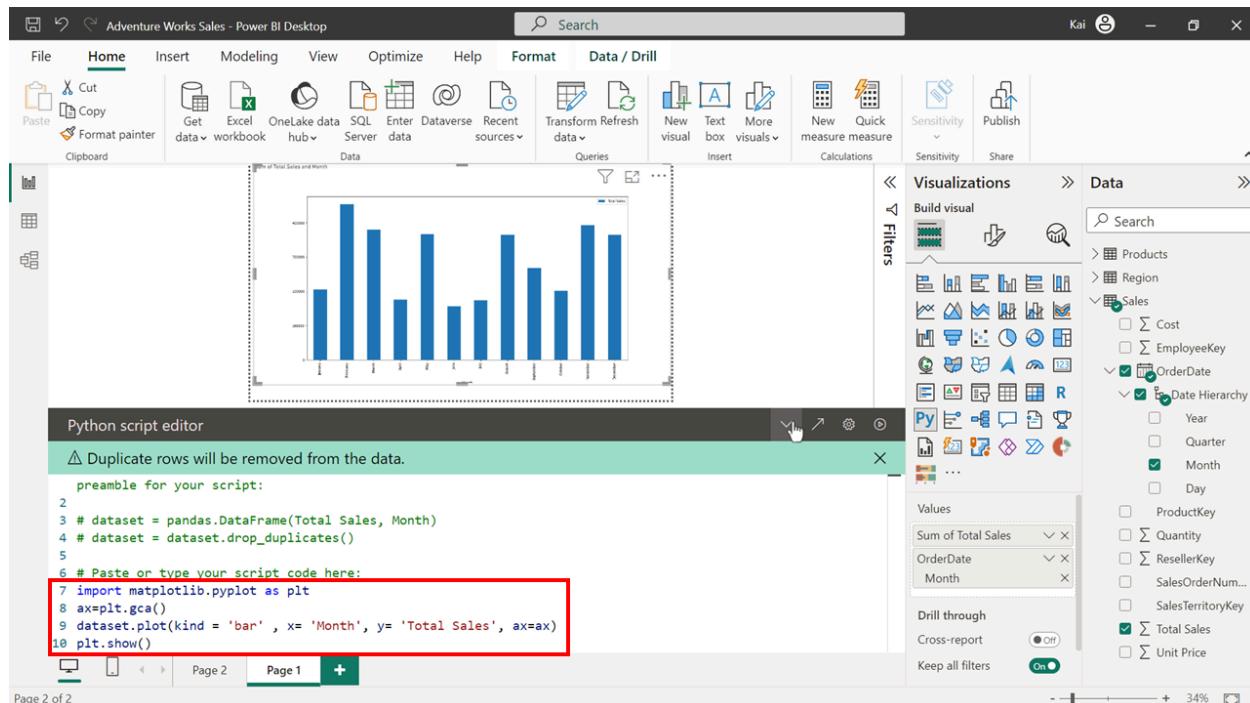


3. Write the following Python script in the Python script editor window and then execute the code to generate a Bar chart showing the Total sales by month.

```
import matplotlib.pyplot as plt
ax = plt.gca()
dataset.plot(kind='bar', x='Month', y='Total Sales', ax=ax)
plt.show()
```

These code operations are:

- Importing the matplotlib library which creates the bar chart.
- Defining the specifications of the chart such as the X and Y-axis values, and the formatting to be added.
- Commanding the output in the last line of code.



You cannot format this visual in Power BI as you typically do with Power BI core visuals. To format a Python visual, you need to modify the code for specific formatting. For example, the bars in the chart can be changed to a red color by amending the third line of the script as follows:

```
dataset.plot(kind='bar', x='Month', y='Total Sales', color =
'red', ax=ax)
```

The screenshot shows the Power BI Desktop interface. A bar chart titled "Total Sales and Month" is displayed on the left. On the right, the "Visualizations" pane shows a "Build visual" section with various chart icons. The "Data" pane lists fields under "Sales": "Sum of Total Sales", "OrderDate", and "Month". Below the Data pane, there are sections for "Drill through", "Cross-report", and "Keep all filters". A Python script editor window is open at the bottom-left, containing the following code:

```

preamble for your script:
2
3 # dataset = pandas.DataFrame(Total Sales, Month)
4 # dataset = dataset.drop_duplicates()
5
6 # Paste or type your script code here:
7 import matplotlib.pyplot as plt
8 ax=plt.gca()
9 dataset.plot(kind = 'bar' , x= 'Month', y= 'Total Sales', color ='red', ax=ax)
10 plt.show()

```

The script editor has tabs for "Page 2" and "Page 1", with "Page 1" selected.

This screenshot shows the final report page in Power BI Desktop. The "Total Sales and Month" bar chart is now part of a larger report layout. The "Visualizations" pane and "Data" pane are visible on the right, showing the same setup as the previous screenshot. The Python script editor is no longer present.

Step 4: Check the interactivity of the Python visual.

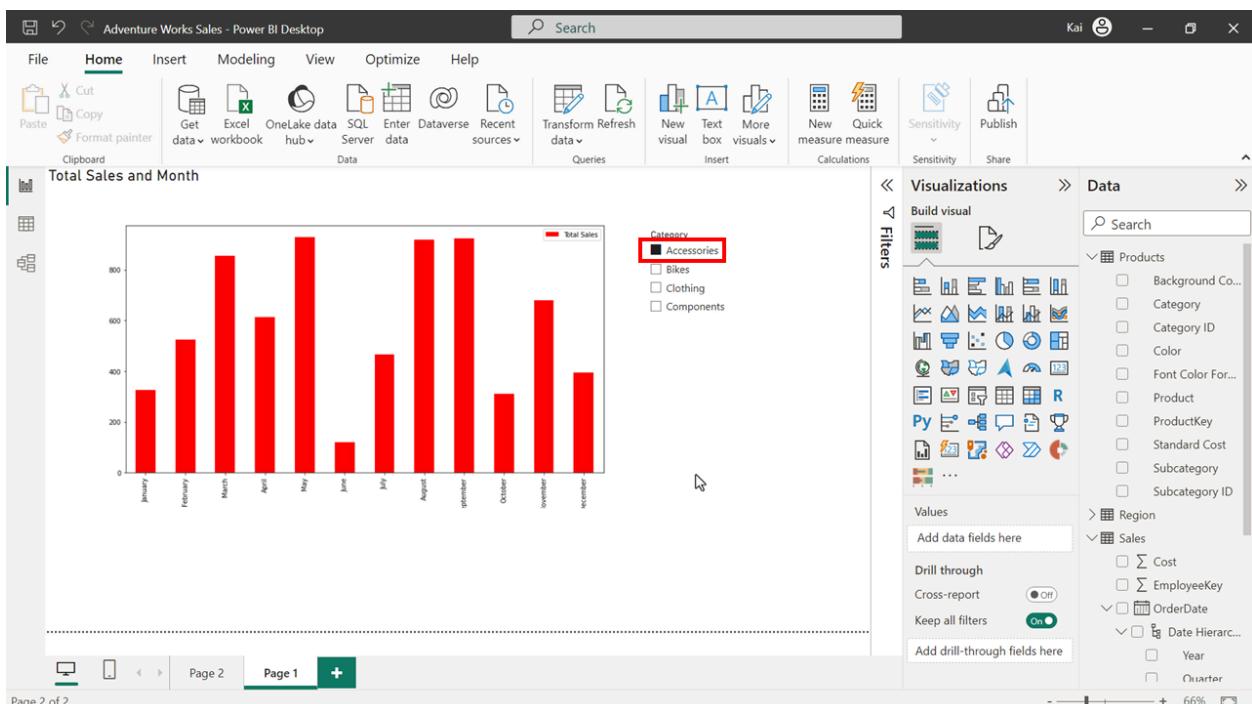
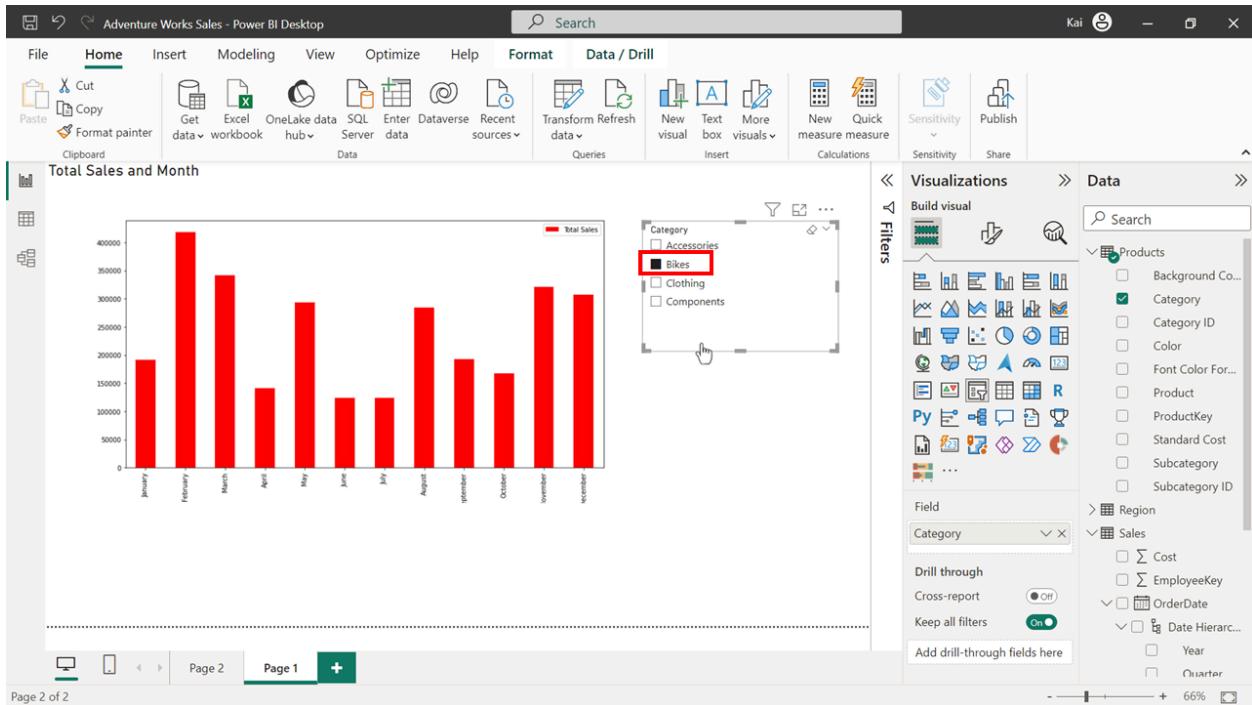
1. You can confirm that the Python visual is interactive and displaying the data results correctly by creating a Category slicer in the report page of Power BI. Drag

the Category field from the Product table to the report canvas. Convert the visual to a slicer by selecting the Slicer icon in the Visualization pane. You can use the Slicer options to format the Slicer as tile or dropdown.

The screenshot shows the Power BI Desktop interface. On the left, there is a bar chart titled "Total Sales and Month" showing monthly sales. The x-axis lists months from January to December. The y-axis shows sales values ranging from approximately 15,000 to 45,000. On the right, the "Data" pane is open, displaying the schema of the "Products" table. The "Category" column is selected, indicated by a red box around its entry in the "Columns" list. Other columns listed include Background Co..., Category ID, Color, Font Color For..., Product, ProductKey, Standard Cost, Subcategory, and Subcategory ID.

This screenshot is similar to the previous one, showing the same bar chart and Data pane. However, the "Sensitivity" icon in the Visualizations pane is highlighted with a red box. This icon is used to convert a selected visual into a slicer.

2. Select each of the categories in the slicer in turn to confirm that the sales values in the Python bar chart automatically adjust to reflect the sales values for that category.



Step 5: Save the Power BI project

1. Save your Power BI project to your local computer.

Conclusion

With these steps, you can successfully create a bar chart using Python in Power BI. You can use Python's potential to create custom visualizations in situations where Power BI core visualizations are not sufficient or powerful enough to build the required visualization.

3.1. Exercise: Optimizing a dashboard

Introduction

So far, you have gained a thorough understanding about dashboard design and the significance of data mobility and accessibility. Microsoft Power BI is a complete business intelligence ecosystem that provides the tools and techniques to design user-centric dashboards and how to optimize them to join the digitalization wave and keep informed on real-time.

In this exercise, you will be reviewing, publishing, creating, and optimizing a Power BI dashboard of Adventure Works products for mobile devices. Adventure Works has a diverse portfolio of its products, and the inventory management team needs to have a dashboard showing the sale of product categories, subcategories, and top and least selling products to manage the regional inventory levels.

Scenario

Adventure Works has an extensive product catalog spanning thousands of items across various product categories and subcategories. Adventure Works' chief product officer (CPO) is keen to optimize product dashboards to drive important strategic decisions about least selling products, enhance customer experience, and boost sales across various regions. The CPO needs a unified view of the product data that is accessible anytime, anywhere, and on various devices. To complete this task, you will need to go through each step of creating and optimizing a dashboard for cellular devices. By completing this exercise, you will demonstrate your ability to:

- Review existing reports on Power BI desktop and publish them to Power BI service.
- Create a product dashboard in Power BI service and optimize for mobile devices.
- Rearrange and resize the tiles for phone screen and unpin any unnecessary tiles.

Follow the exercise steps to optimize the report for mobile layout and ensure the visual elements in the mobile canvas are properly positioned and scaled to eliminate any visual clutter.

Step 1: Download the Power BI project file.

- Download and save the Power BI project *Adventure Works Optimizing a dashboard.pbix*. The report contains two report pages; Products and Categories.

Step 2: Review the report pages of the project.

- Next in this task is to review the current layout and design. This includes analyzing the sequence of visuals to be displayed on the dashboard and mobile version based on the importance of information. Identify the visual element that is not suitable for mobile devices.

Step 3: Publish the report to Power BI service and create a dashboard.

1. Publish your report on the Power BI service.
2. Log in to the Power BI service on your web browser.
3. Create a new dashboard named Product Sales in the workspace.
4. Pin all tiles from the product page of the Power BI report to the dashboard.
5. Pin all tiles from the categories page of the Power BI report to the Product Sales dashboard.

Tip: You can publish your report by selecting the Publish button from the Home tab of Power BI.

Tip: To create a new dashboard, you can select New from the My workspace interface in Power BI service.

Step 4 :Optimize the dashboard for mobile devices.

1. Optimize the Product Sales dashboard for mobile devices.
2. Arrange the tiles in a logical sequence on the edit mobile layout pane of Power BI service.
3. Resize and reposition the visuals to create a coherent visual story.

Tip: You can unpin all visuals to start optimizing the mobile screen.

Tip: You can also use Reset Tiles to revert to the original state of dashboard.

Step 5: Save the Power BI project.

- Save your updated Power BI project to your local computer.

Tip: Make sure you select an appropriate project name and folder path for your project.

Conclusion

With these steps, you have successfully published a Microsoft Power BI report for Power BI service. You have created and optimized a dashboard for cellular devices to meet the needs of Adventure Works CPO.

Exemplar: Optimizing a dashboard

Overview

In the exercise *Optimizing a dashboard*, you put into practice your understanding of how to create and optimize a dashboard for a mobile device in Microsoft Power BI.

Your objective for this exercise was to complete the following tasks:

- Review the current layout and design of report pages.
- Publish the report to Power BI service and create a dashboard.
- Optimize the dashboard for mobile screen by resizing and repositioning tiles.

This reading provides a step-by-step guide for completing these tasks, accompanied by screenshots for easy comparison with your own copy.

You can also review the video [Optimizing a dashboard for mobile phones](#).

Step 1: Download the Power BI project file.

- Download and save the Power BI project *Adventure Works Optimizing a dashboard.pbix*

Step 2: Review the report pages of the project.

- The Power BI project file contains two report pages, Products and Categories. The product page contains four card visuals representing snapshots of valuable information about sales, units sold and so on, a donut chart displaying the sales of various products based on colors, and a column chart showing the top 5 products sold.

Adventure Works Products

Units Sold 6560 **Revenue** 3.51M **Profit** 45.81K **Revenue Growth** 20.73%

Top 5 Products

Product	Total Sales (USD)
Mountain-200 Black, 48	150K
Mountain-100 Black, 42	111K
Mountain-100 Black, 44	105K
Mountain-100 Black, 48	101K
Mountain-200 Black, 42	100K

Products **Categories** **+ [New]**

The Categories page has three visual elements; a combo chart displaying total sales and profit by product category, a bar chart representing sales by subcategories, and a table visual showing sales and units sold for each product. The entirety of information on both pages relates to products.

Product **Units sold** 6560 **Total Sales** 3,505,340.43

Product	Units sold	Total Sales
AWC Logo Cap	117	612.03
Bike Wash - Dissolver	12	572.4
Cable Lock	12	180.00
Chain	22	267.08
Classic Vest, L	2	76.20
Classic Vest, M	14	533.40
Classic Vest, S	29	1,104.90
Front Brakes	30	1,917.00
Total	6560	3,505,340.43

Total Sales and Profit by Category

Total Sales by Subcategory

Subcategory	Total Sales
Mountain Bikes	1308.8K
Road Bikes	1200.01K
Touring Bikes	399.8K
Road Frames	223.8K
Mountain Frames	203.65K
Touring Frames	67.21K
Wheels	32.11K
Shorts	9.62K
Handlebars	8.28K
Jerseys	7.49K
Pedals	5.82K
Gloves	4.48K
Cranksets	3.64K
Tights	3.49K
Forks	3.33K
Helims	3.17K
Brakes	3.13K
Bib-Shorts	3.08K
Bike Racks	3.02K
Saddles	2.07K
Derrailleurs	2.01K
Vests	1.71K
Bottom Brackets	1.61K
Headsets	1.33K
Socks	0.96K
Caps	0.81K
Hydration Packs	0.44K
Chains	0.27K

Products **Categories** **+ [New]**

The card visuals contain the most valuable information, and the top 5 products provide insight into the top performing products of Adventure Works. You need to keep this in mind while designing a dashboard in Power BI service.

The table visual contains information about sales of each product in all regions and for the entire period of the current dataset. This is not a suitable visual element for mobile devices because users cannot scroll down the table to visualize the sales values of all products.

Step 3: Publish the report to Power BI service and create a dashboard.

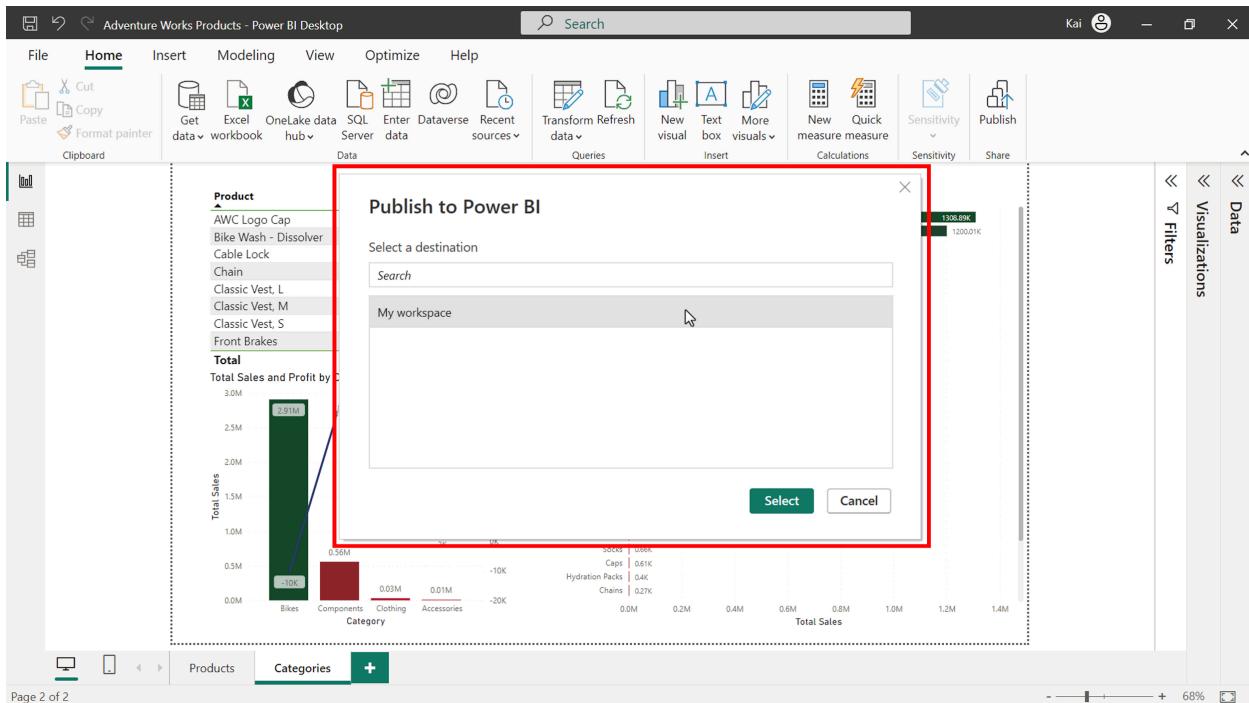
- Having reviewed your report, you need to navigate to the Home tab of Power BI desktop and select Publish to publish to Power BI service. You need to make sure the project is saved on your computer and all changes are saved before publishing.

The screenshot shows the Power BI Desktop interface with a report titled "Adventure Works Products - Power BI Desktop". The ribbon is visible at the top with tabs like File, Home, Insert, Modeling, View, Optimize, and Help. The Home tab is selected. On the right side, there's a "Visualizations" pane with a "Filters" section. The main area displays three visualizations:

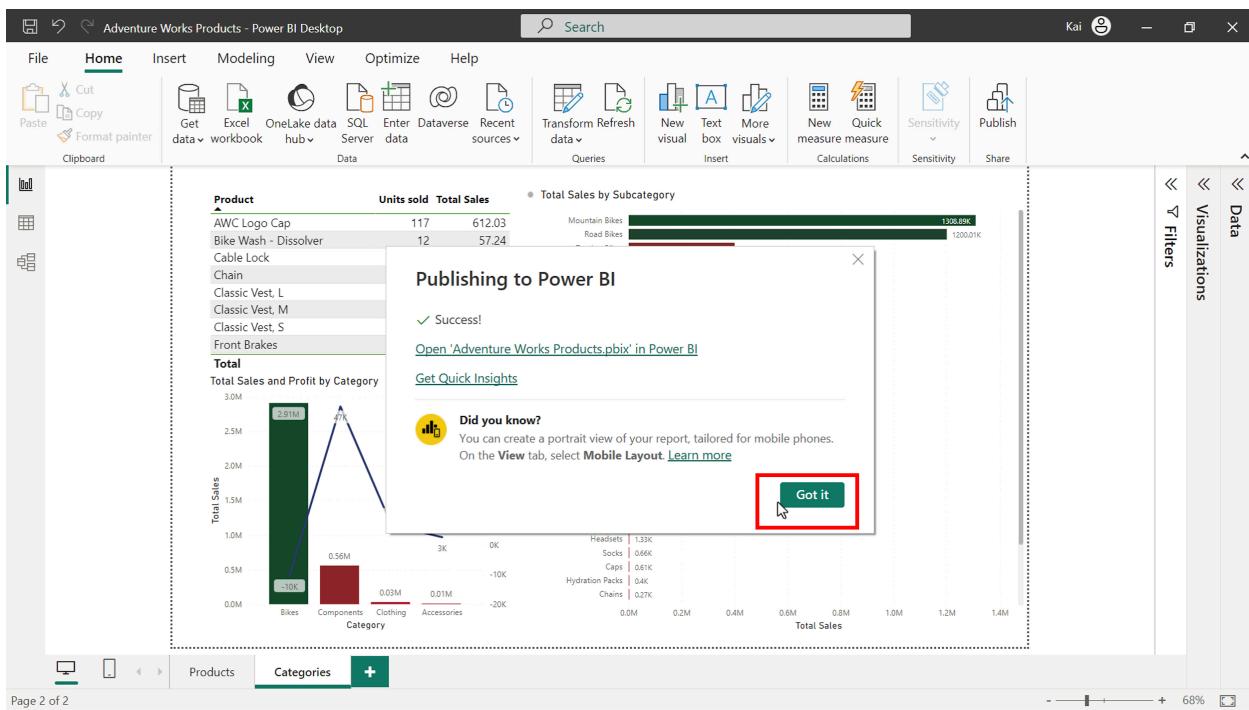
- A table titled "Product" showing sales data with columns for Product, Units sold, and Total Sales. The total sales are 3,505,340.43.
- A bar chart titled "Total Sales by Subcategory" showing sales for various bike categories like Mountain Bikes, Road Bikes, Touring Bikes, etc.
- A line chart titled "Total Sales and Profit by Category" showing sales and profit for categories like Bikes, Components, Clothing, and Accessories.

The "Publish" button on the ribbon is highlighted with a red box. The status bar at the bottom indicates "Page 2 of 2" and "68%".

Once you select Publish, the Publish to Power BI dialog appears on screen where you need to select the workspace where you want to publish your report. Select My workspace and choose Select.



The dialog changes, and a Success message appears. Select Got it.



1. Open a browser and log in to your Power BI account. In Power BI service navigate to My workspace from the left bar of the interface. You can see Adventure Works Products report is published and appears in the list.

The screenshot shows the Power BI Home interface. On the left sidebar, under the 'Workspaces' section, the 'My workspace' icon is highlighted with a red box. The main area displays a 'Recommended' section with four cards: 'You frequently open this' (My workspace), 'Popular in your org' (Adventure Works), 'You frequently open this' (Sales Summary), and 'Popular in your org' (Adventure Works Sales). Below this, there are navigation buttons for 'Recent', 'Favorites', and 'My apps', and a search bar labeled 'Filter by keyword'.

1. You need to create a new dashboard by selecting New from the My workspace interface and name it Product Sales.

The screenshot shows the 'My workspace' page. On the left sidebar, the 'My workspace' icon is highlighted with a red box. The main area features a 'New' button with dropdown menus for 'Report', 'Paginated report', 'Scorecard', and 'Dashboard'. The 'Dashboard' option is also highlighted with a red box. A tooltip 'Build a single-page data story.' appears over the 'Dashboard' button. To the right is a table listing various items: Report (Adventure Works Products), Dataset (Adventure Works Sales), Report (AdventureWorks Sales), and Dataset (AdventureWorks Sales). The table includes columns for Type, Owner, Refreshed, Next refresh, and Endorsement.

A screenshot of the Power BI workspace interface. On the left, there's a sidebar with icons for Home, Create, Browse, Workspaces, My workspace, Adventure Works, Sales Summary, and Power BI. The main area shows a list of workspaces under 'My workspace'. A modal window titled 'Create dashboard' is open in the center, prompting for a 'Dashboard name' (set to 'Product Sales') and providing 'Create' and 'Cancel' buttons. The background list includes entries like 'Adventure Works' (Report, Kai), 'Adventure Works Sales' (Dataset, Kai), and 'AdventureWorks Sales' (Report, Kai).

1. You need to pin all tiles from the product page of the Power BI report to the dashboard. To do this, go back to your report and select the Product page from the left pane. This opens the product report page.

A screenshot of the Power BI workspace interface, similar to the previous one but with a different selection in the sidebar. The 'Product Sales' icon is now highlighted. The main list shows 'Adventure Works' (Report, Kai) and 'Adventure Works Products' (Report, Kai). The 'Adventure Works Products' row is selected, indicated by a gray background. The URL at the bottom of the browser window is <app.powerbi.com/groups/me/reports/f52351e2-b7ae-4b43-9ca9-ac84356bf...>.

Hover the cursor on the first card visual and select the pin icon to pin the visual to the dashboard. A pin to dashboard dialog appears where you need to select the dashboard

from the drop-down list where you want to pin the visual. You need to select Product Sales and select Pin. Repeat the process for all other visuals in the report page.

The screenshot shows two instances of a Power BI report titled "Adventure Works Products".

Top Screenshot: A context menu is open over a green tile labeled "Units Sold 6560". The menu item "Pin visual" is highlighted with a red box. The report interface includes a left sidebar with navigation links like Home, Workspaces, My workspace, Adventure Works..., Product Sales, Adventure Works, Sales Summary, and Power BI. The main area displays a donut chart titled "Units sold by product color" and a bar chart titled "Top 5 Products".

Bottom Screenshot: A "Pin to dashboard" dialog box is displayed. It contains a preview of the "Top 5 Products" bar chart and settings for "Tile Theming" (radio buttons for "Use destination theme" and "Keep current theme"). A red box highlights the "Select existing dashboard" dropdown menu, which lists "Product Sales", "Product Sales", and "Sales Summary". The "Existing dashboard" option is selected.

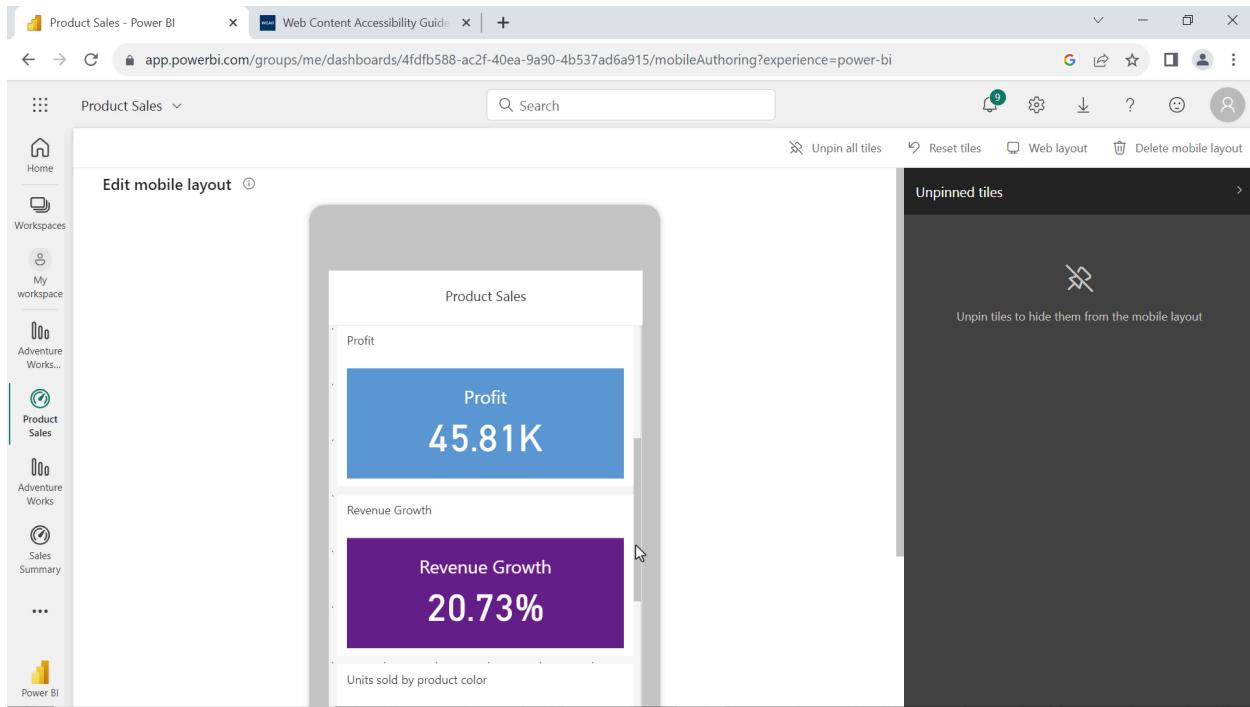
1. Pin all tiles from the categories page of the Power BI report to the Product Sales dashboard.

Step 4: Optimize the dashboard for mobile devices.

1. You need to open the Product Sales dashboard and navigate to edit the menu, select Mobile layout from the drop-down list of options. An edit mobile layout screen opens with unpinned visuals pane on the right side.

The screenshot shows the 'Product Sales - Power BI' dashboard in a web browser. The dashboard includes a table of product sales, a bar chart of total sales by subcategory, and a line chart of total sales by category. On the right side, there is an 'Edit' button with a dropdown menu open, showing 'Mobile layout' as the selected option. The URL in the browser is <https://app.powerbi.com/groups/me/dashboards/4fdfb588-ac2f-40ea-9a90-4b537ad6a915/mobileAuthoring?experience=power-bi>.

1. All the tiles from the dashboard automatically appear in mobile layout. The visual elements are not in the correct order. You can drag and reposition each tile individually to meet your needs.

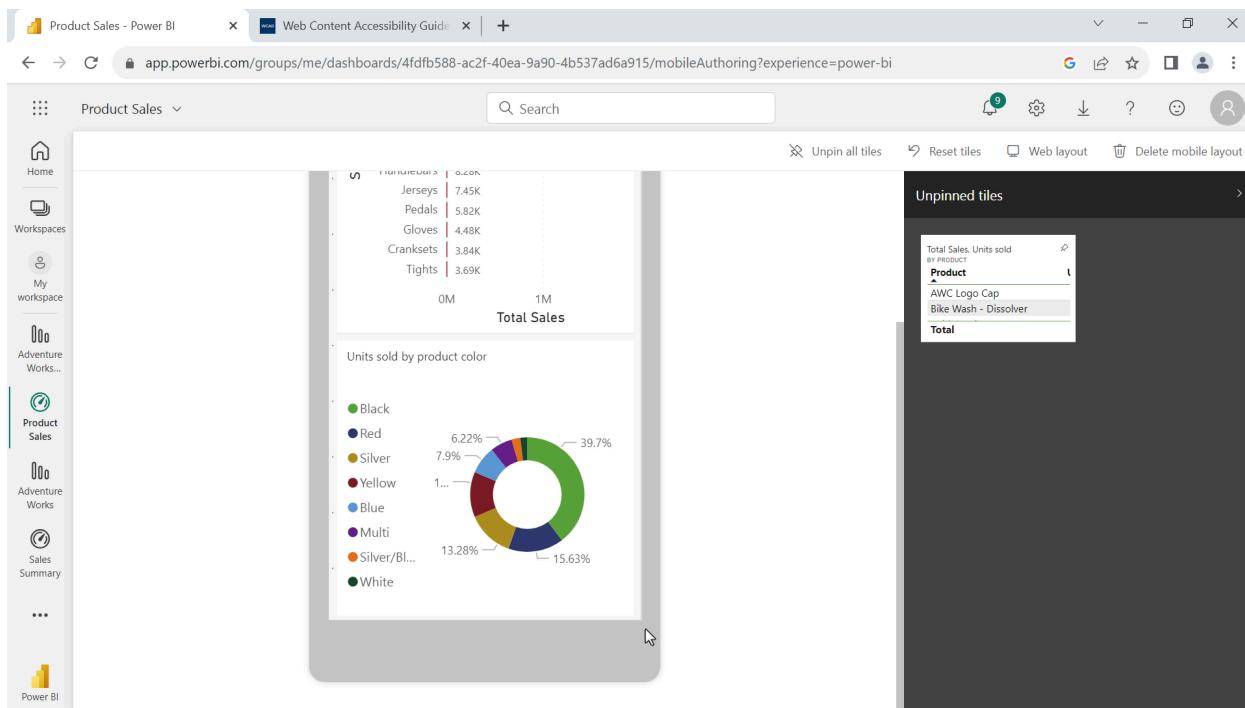
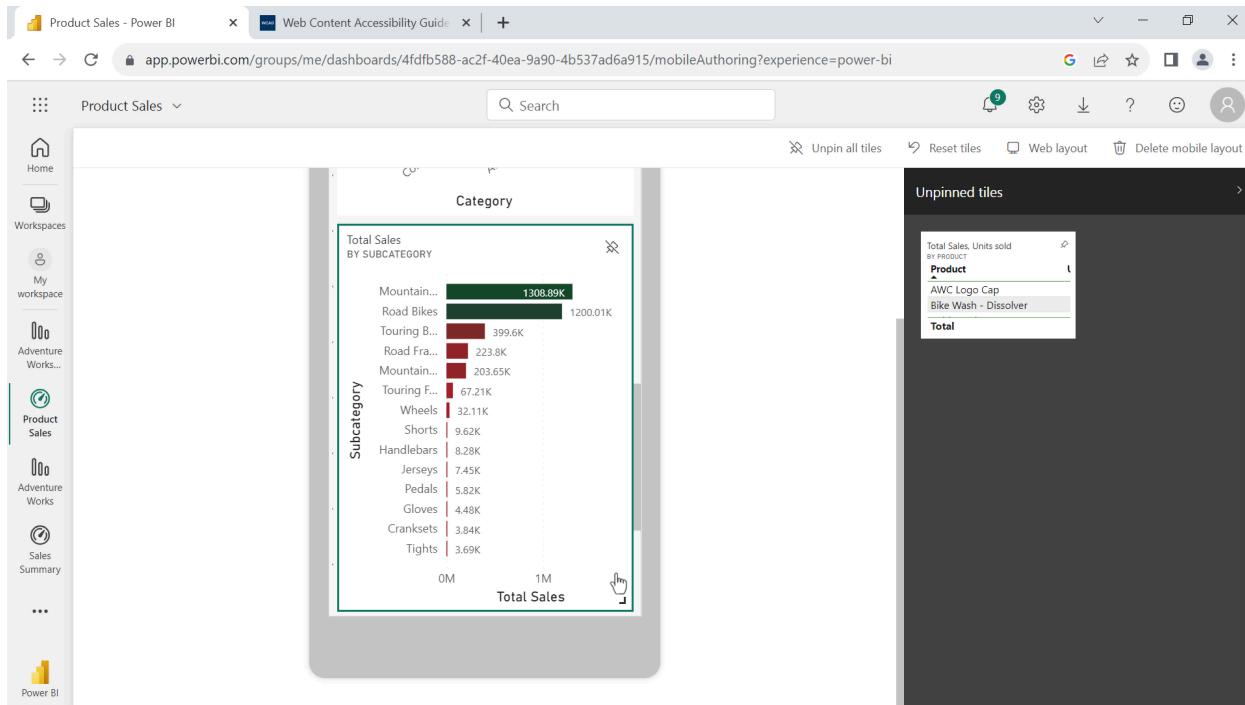


Alternatively, you can clean the entire mobile screen by selecting unpin all tiles from the top menu and then pin individual tiles in a sequence to tell a story.

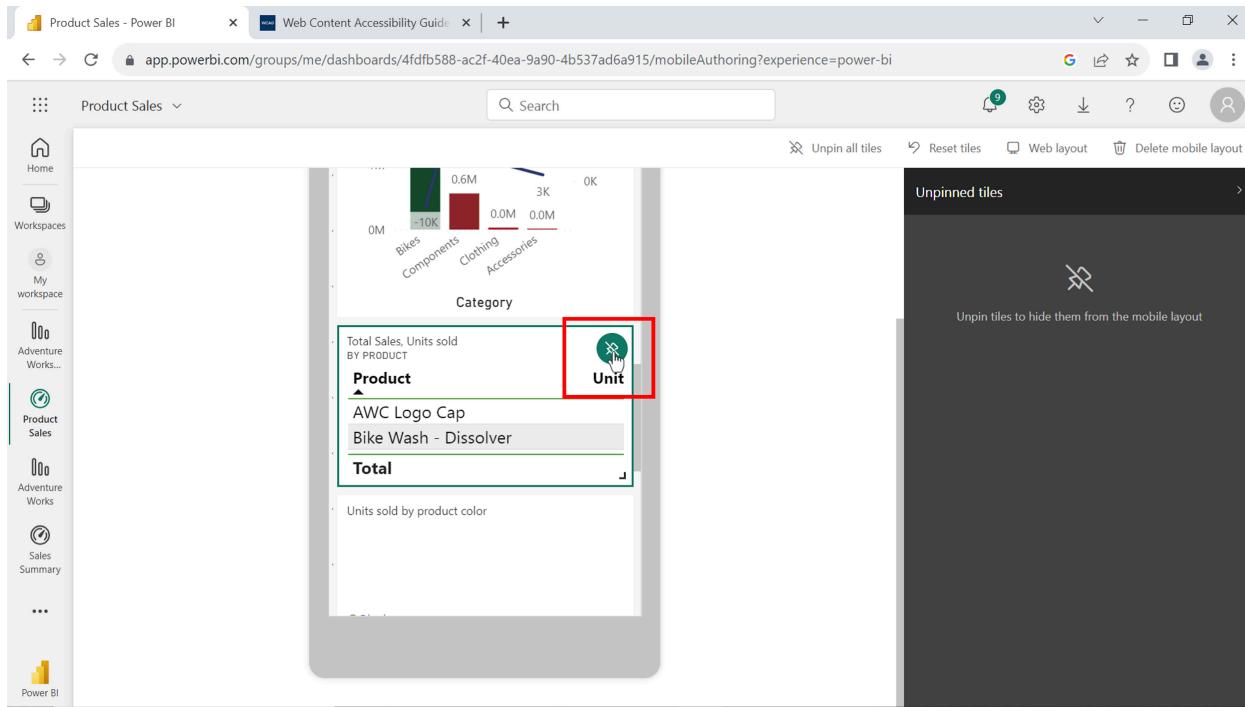
1. Once you have pinned all tiles you can further reduce or enlarge the tile size and rearrange the tiles according to the narrative of the data you are presenting. For example, card visuals with snapshots of essential information should come at the top followed by the chart showing information about the top 5 products.

The screenshot shows a Power BI dashboard titled "Product Sales". The dashboard features several tiles: "Units Sold" (6560), "Revenue" (3.51M), "Profit" (45.8...), and "Revenue Growth" (20.7...). Below these is a chart titled "Top 5 Products" showing sales in USD for five categories: Mountain-200 Bla..., Mountain-100 Bla..., Mountain-100 Bla..., Mountain-100 Bla..., and Mountain-200 Bla... with values 150K, 111K, 105K, 101K, and 100K respectively. To the right, there is an "Unpinned tiles" pane listing "Total Sales, Units sold BY PRODUCT" with items like "Product", "AWC Logo Cap", "Bike Wash - Dissolver", and "Total".

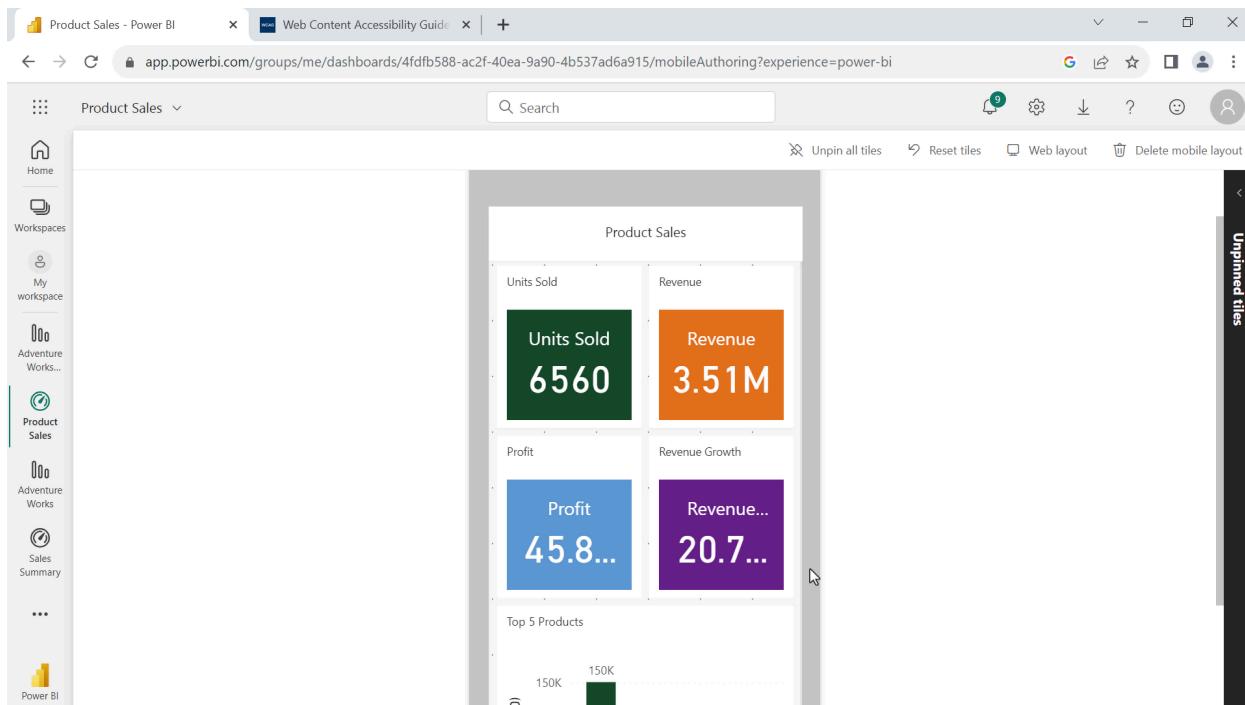
You can arrange the remaining tiles showing sales of categories, subcategories, and colors at the end of the dashboard.



You can unpin the table visual because this information is needed for detailed reports and not a suitable visual for mobile devices.



Once done, you can select the web layout from the top menu to go back to the desktop version of the dashboard. Power BI automatically saves the mobile version. You can access the mobile version of the dashboard from your cellphone. You need to download and install the Power BI mobile app and log in to access your workspace and all reports, datasets, and dashboards.



Step 5: Save the Power BI project.

- Save your Power BI project to your local computer.

Tip: Make sure you select an appropriate project name and folder path for your project.

Conclusion

You have successfully published a report on Power BI service, created and optimized a dashboard for mobile accessibility. Optimizing a dashboard for mobile devices is not just a matter of adapting to smaller screens, it is about ensuring that your data-driven insights are accessible anywhere and anytime in a user-friendly and mobile friendly environment.

3.2. Activity: Creating a QR code

Introduction

You have discovered the significance of media elements in dashboard design and how to incorporate images, videos, text boxes, QR codes, and live-streaming data. In this exercise, you will apply your QR code knowledge in Microsoft Power BI service to generate codes for a dashboard tile and an entire report.

Scenario

Adventure Works has sales operations in global regions. Each region is managed by a country sales manager. Jamie, the CEO, wants to have a sales report that is easy to distribute and easy for all managers to access. In addition, she wants to target each country's manager with sales data insights from the dashboard that are relevant to their own region. The most convenient way to accomplish both tasks is to generate QR codes for the Adventure Works sales report and the sales by country visual from the dashboard. Those QR codes can then be used as an e-mail attachment to distribute the report and dashboard. As an Adventure Works Power BI report designer, you can help Jamie achieve these goals.

Using an Adventure Works dashboard and report as examples, follow the steps in Power BI service to create QR codes.

Generate a QR code for a dashboard tile

Step 1: Log into your Power BI service account and access My workspace

1. Open app.powerbi.com in a browser and log into your account.
2. In Power BI service, open My workspace from the left navigation pane of the Home screen. My workspace lists all the assets you created or published from Power BI desktop. That includes datasets, reports, and dashboards.

The screenshot shows the Power BI Home page. On the left, there's a sidebar with icons for Home, Create, Browse, OneLake data hub, Apps, Metrics, Workspaces, and a 'My workspace' link, which is highlighted with a red box. The main area displays a 'Recommended' section with four cards: 'You frequently open this' (My workspace), 'Popular in your org' (Sales Summary), 'You frequently open this' (Adventure Works), and 'Popular in your org' (Adventure Works Sales). Below this, there are buttons for 'Recent', 'Favorites', and 'My apps', and a search bar labeled 'Filter by keyword'. At the bottom, there are filters for 'Name', 'Type', 'Opened', 'Location', 'Endorsement', and 'Sensitivity'.

Step 2: Open a dashboard and create a QR code

1. From the list of assets in My workspace, open the *Sales Summary* dashboard.

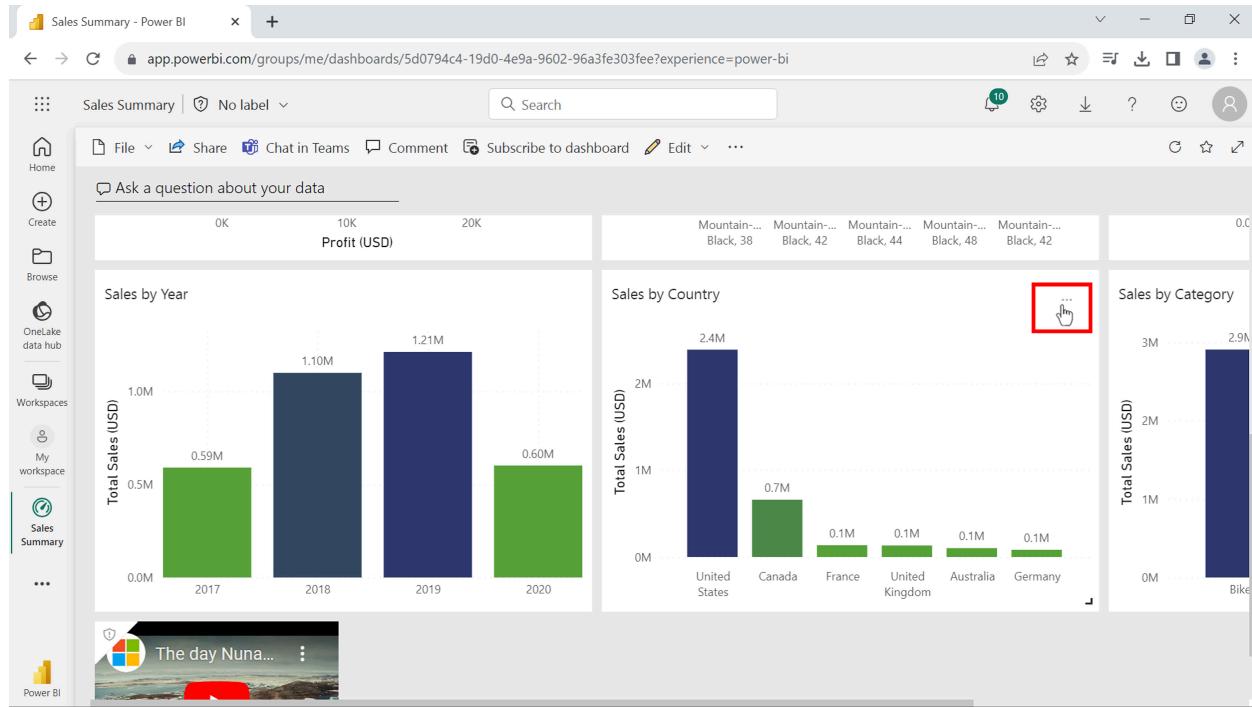
You created this dashboard in the previous lesson, *Optimizing a dashboard for mobile phones*.

The screenshot shows the 'My workspace' page. The sidebar has a 'My workspace' link highlighted with a red box. The main area shows a table of assets with columns for Name, Type, Owner, Refreshed, Next refresh, and Endorsement. The 'Sales Summary' dashboard is selected, indicated by a cursor icon over its name. Other items listed include Product Performance, Product Sales, Sales Report (Report), Sales Report (Dataset), SalesOrderDetail (Workbook), Untitled Scorecard (Scorecard), and Untitled Scorecard (Dataset).

Name	Type	Owner	Refreshed	Next refresh	Endorsement
Product Performance	Dashboard	Kai	—	—	—
Product Sales	Dashboard	Kai	—	—	—
Sales Report	Report	Kai	5/14/23, 1:16:12 AM	—	—
Sales Report	Dataset	Kai	5/14/23, 1:16:12 AM	N/A	—
Sales Summary	Dashboard	Kai	—	—	—
SalesOrderDetail	Workbook	My workspace	4/23/23, 2:52:11 PM	—	—
Untitled Scorecard	Scorecard	Kai	9/12/23, 9:47:16 PM	—	—
Untitled Scorecard	Dataset	Kai	9/12/23, 9:47:16 PM	N/A	—

2. In the dashboard, locate the tile called Sales by country and select More options.

Tip: You can locate More options by selecting three dots on the top right corner of the tile.



3. From the More options drop-down, select Open in focus mode. The visual displays full-screen in Power BI service.

The screenshot shows a Power BI dashboard titled "Sales Summary". On the left, there's a sidebar with options like Home, Create, Browse, OneLake data hub, Workspaces, My workspace, and Sales Summary. The main area has three visualizations: "Sales by Year" (a bar chart showing sales from 2017 to 2020), "Sales by Country" (a bar chart showing sales by country), and "Sales by Category" (a bar chart showing sales by category). A context menu is open over the "Sales by Country" chart, specifically over the United States bar. The menu items include "Add a comment", "Chat in Teams", "Copy visual as image", "Go to report", "Open in focus mode" (which is highlighted with a red box), "Export to .csv", "Edit details", "View insights", "Pin tile", and "Delete tile".

4. In the full-screen display of the Sales by Country visual, from the top right corner of its toolbar, select More options, and choose Generate QR code from the drop-down.

This screenshot shows the "Sales by Country" visualization in full-screen mode. The toolbar at the top right features a "Generate QR Code" button, which is highlighted with a red box. Below the toolbar, there are buttons for "Exit Focus mode" and "Sales by Country". The chart displays total sales for six countries: United States (2.39M), Canada (0.66M), France (0.14M), United Kingdom (0.13M), Australia (0.10M), and Germany (0.08M). The chart has a green color scheme. On the right side, there are filters for "Country" (set to "is (All)") and "Total Sales (USD)" (set to "is (All)").

5. A dialog with the QR code appears. From here you can scan the code with your mobile device or download it to your local computer as a JPG file. The JPG file can be

used for distribution as an email attachment or can be printed for physical display purposes.

The screenshot shows a Power BI dashboard titled "Sales Summary". A modal window titled "Your QR code is ready" is displayed over the main content. The modal contains a QR code labeled "Sales by Country", a note explaining it can be scanned from a mobile device, and two buttons: "Download" and "Close". The main dashboard features a bar chart titled "Sales by Country" showing total sales in USD for various countries. The United States is the top performer at 2.39M. Other visible data points include Canada at 0.66M, France at 0.14M, United Kingdom at 0.13M, Australia at 0.10M, and Germany at 0.08M. The dashboard also includes a sidebar with filters for "Country" and "Total Sales (USD)".

6. From the top left corner of the visual's toolbar bar select Exit focus mode, to go back to the dashboard.

This screenshot shows the same Power BI dashboard as the previous one, but with a red box highlighting the "Exit Focus mode" button located in the top-left corner of the visual's toolbar. The main content of the dashboard is visible, showing the "Sales by Country" bar chart with the United States leading at 2.39M.

Step 3: Open a report and create a QR code

- From the My workspace list of assets, open the Adventure Works sales report.

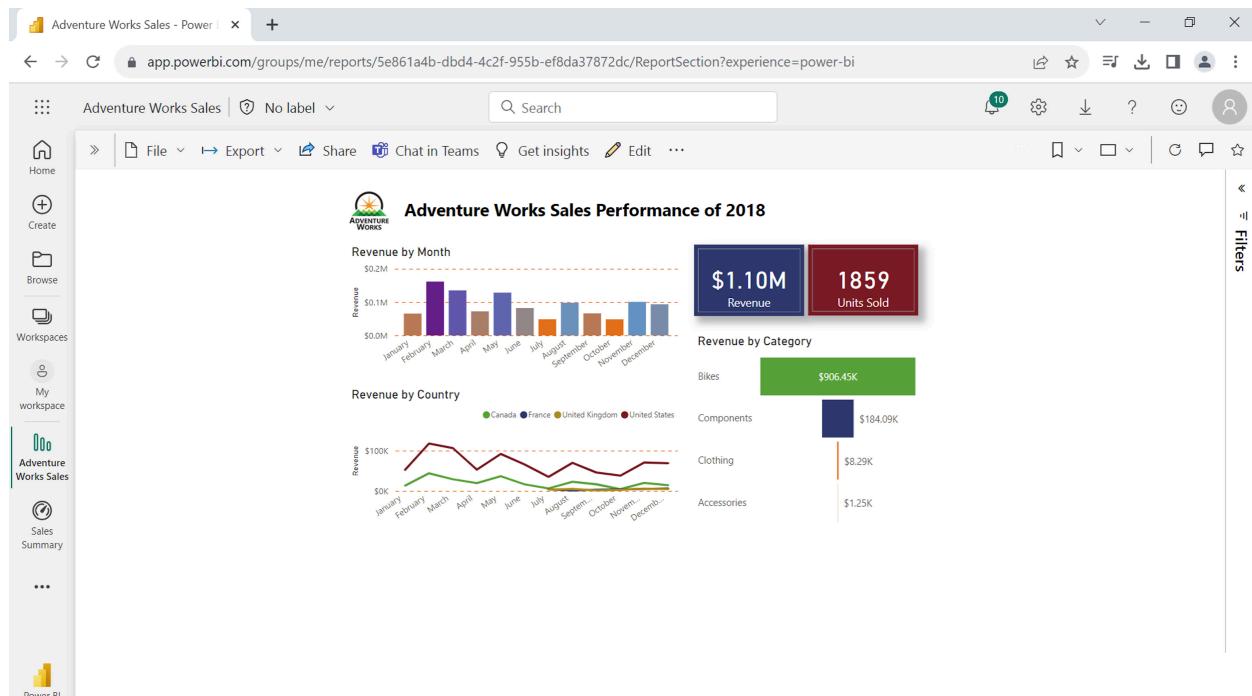
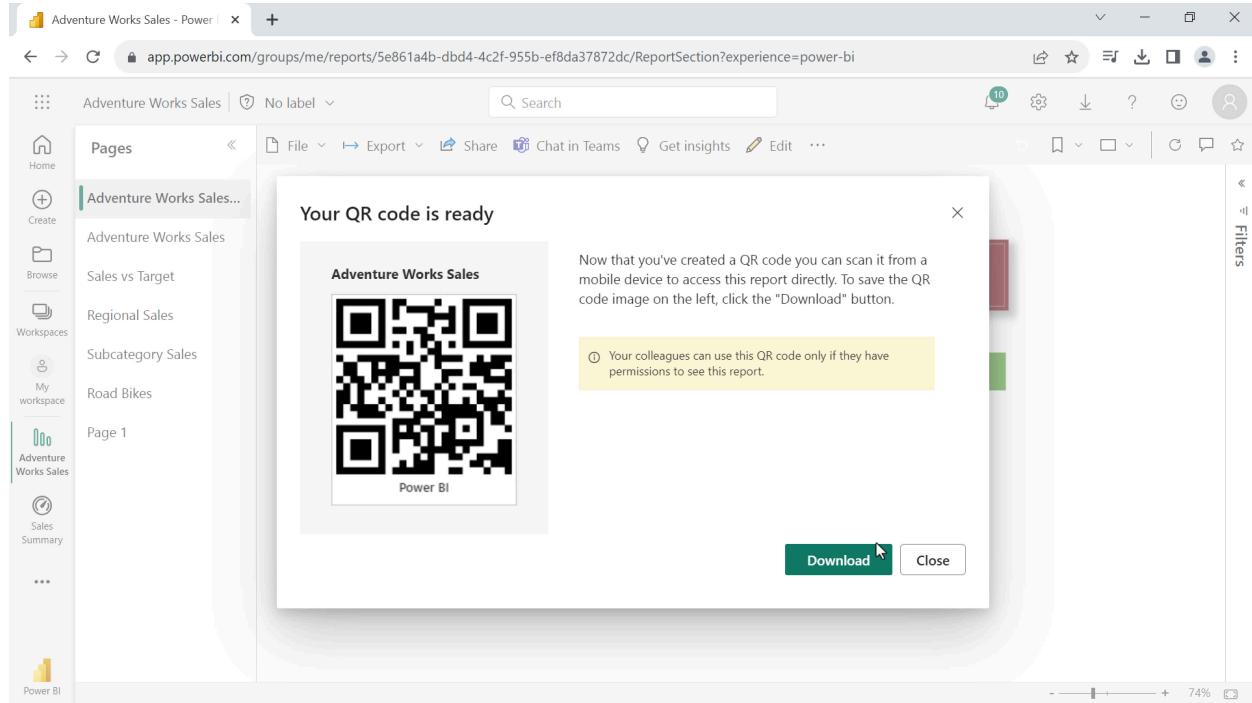
The screenshot shows the Power BI 'My workspace' interface. On the left is a sidebar with icons for Home, Create, Browse, OneLake data hub, Workspaces, My workspace (which is selected), Sales Summary, and Power BI. The main area displays a table of assets:

Name	Type	Owner	Refreshed	Next refresh	Endorsements
Adventure Works Products	Dataset	Kai	9/14/23, 9:31:18 PM	N/A	—
<u>Adventure Works Sales</u>	Report	Kai	9/20/23, 7:15:08 PM	—	—
Adventure Works Sales	Dataset	Kai	9/20/23, 7:15:08 PM	N/A	—
AdventureWorks Sales	Report	Kai	4/21/23, 5:54:16 PM	—	—
AdventureWorks Sales	Dataset	Kai	4/21/23, 5:54:16 PM	N/A	—
Product Performance	Dashboard	Kai	—	—	—
Product Sales	Dashboard	Kai	—	—	—
Sales Report	Report	Kai	5/14/23, 1:16:12 AM	—	—

- Select File, then select Generate QR code.

The screenshot shows the 'Adventure Works Sales' report page in Power BI. The left sidebar lists pages: Adventure Works Sales (selected), Sales vs Target, Regional Sales, Subcategory Sales, Road Bikes, and Page 1. The top navigation bar includes File, Export, Share, Chat in Teams, Get insights, Edit, and more. A context menu is open over the report title, with 'Generate a QR code' highlighted by a red box. The main content area displays the 'Adventure Works Sales Performance of 2018' dashboard, featuring a bar chart for Revenue by Month, a card for total Revenue (\$1.10M) and Units Sold (1859), a map for Revenue by Category (Bikes, Components, Clothing, Accessories), and a line chart for Revenue by Country (Canada, France, United Kingdom, United States).

3. A dialog with the QR code appears. From here, you can scan the QR code and distribute it using your mobile device. You can also download the QR code as a JPG file for later use. Select Close to finish.



Conclusion

In this exercise, you generated QR codes that Jamie, the Adventure Works CEO, can now distribute to the sales managers in each region. These QR codes are to monitor sales data, but QR codes can be used to address a diverse range of applications. For instance, conducting surveys, collecting feedback, and providing additional context about the presented data.

3.3. Exercise: The elements of a data story

Introduction

You have gained a thorough understanding of data storytelling, its components and how to craft a compelling story from your raw data. You have learned how a strong narrative drives the storyline while effective visualizations and appropriate charts are at the heart of story presentations and grab the audience's attention.

In this exercise, you are asked to review the dataset provided, create a narrative story, and present it in the form of a report in Microsoft Power BI. This exercise helps you develop your storytelling skills, which are essential to convey insights effectively.

Scenario

Adventure Works, a multinational bicycle manufacturer, has sales operations across the globe. The company's CEO wants to look at the growth of the company in terms of revenue and profit to devise its strategic directions for future years. That is your narrative.

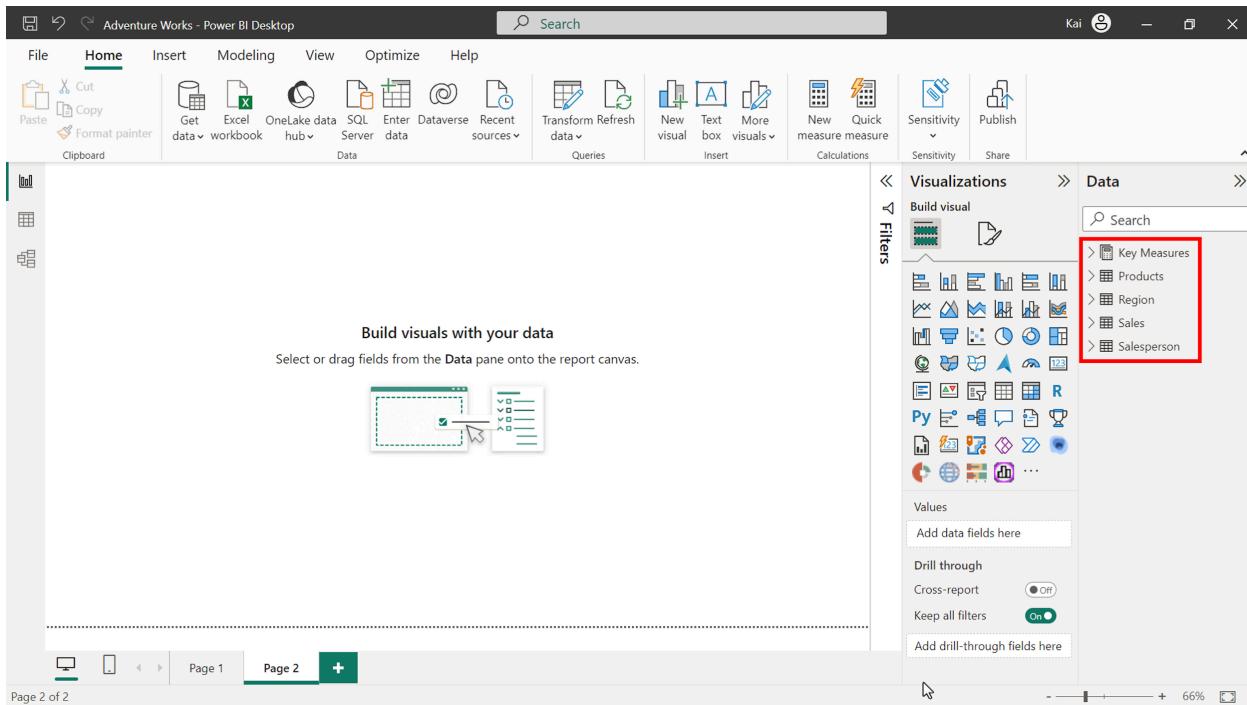
Follow these exercise steps to craft a compelling data story about the growth of the company.

By completing this exercise, you will demonstrate your ability to:

- Review the dataset and identify the measures needed to support your story.
- Create a multi-page report in Power BI desktop and include appropriate charts that clearly present your data story.
- Identify insights you can convey to the CEO and other stakeholders in your story.

Step 1: Download the Power BI project file.

1. Download and save the Power BI project *Adventure Works data story.pbix*.
2. Open the file in Power BI desktop. Notice that the dataset includes five tables; Key measures, Products, Sales, Region, and Salesperson.



Step 2: Explore the data and identify which elements you need to visualize.

1. Explore the dataset tables and measures. Identify which fields and measures you need to include to support your story of growth and which of them you can use to create visualizations in the report canvas.
2. Identify the items from the Key measures table that will be the key highlights and the most valuable information for the CEO.

Tip: You need to remember the narrative of the story while exploring the data. For example, you can consider yearly sales and previous year sales to indicate the difference.

Tip: You can also consider the total revenue and profit as the most valuable information and as key highlights of the presentation.

Step 3: Create a report in Power BI desktop to present your story.

1. Create a chart showing revenue and revenue from the previous year. Take time to consider the most appropriate chart type for this data before adding it to the canvas.
2. Create another chart showing Revenue YoY% which shows the company's growth over the years in terms of sales.

3. Create visuals to present key information such as profit, revenue, and growth.

Again, take time to consider which Power BI visuals you are selecting and why they are the most appropriate.

Tip: You can use the Accessible city park theme to create consistency in colors.

Tip: A bar or column chart are appropriate chart types for revenue and growth analysis.

Tip: You can use card visuals to display the key metrics.

Step 4: Format your visualization and craft the story.

1. Format the charts for consistent font style, color schemes, and scaling.
2. Organize your findings and highlights on the canvas to structure a coherent narrative.
3. Add a title as the beginning of the story before concluding your story by providing a conclusion or recommendation.

Tip: You can add an additional text box at the end of the report to contain the conclusion.

Tip: It is good practice to create and format one card visual and then copy and paste it to create others. This ensures a consistent appearance for all the cards.

Step 5: Provide insights from your data story.

- Add the insights and takeaways that are evident from your story about Adventure Works growth to the report.

Tip: You can write your insights on the same or separate report page.

Step 6: Save your project.

- Save your Power BI project to your computer.

Tip: Make sure you provide an appropriate path for your project.

Conclusion

With these steps you have successfully created a cohesive and informative narrative for the CEO. You identified the most important measures to use as the basis for the visualizations in your report. You then presented these using the most appropriate chart types to display the information. Finally, you were able to present important insights that will assist the CEO in planning for the future.

Exemplar: The elements of a data story

Introduction

In the exercise *Elements of a data story*, you put into practice your understanding of how to create a data story using Adventure Works' data in Microsoft Power BI.

Your objective for this exercise was to complete the following tasks:

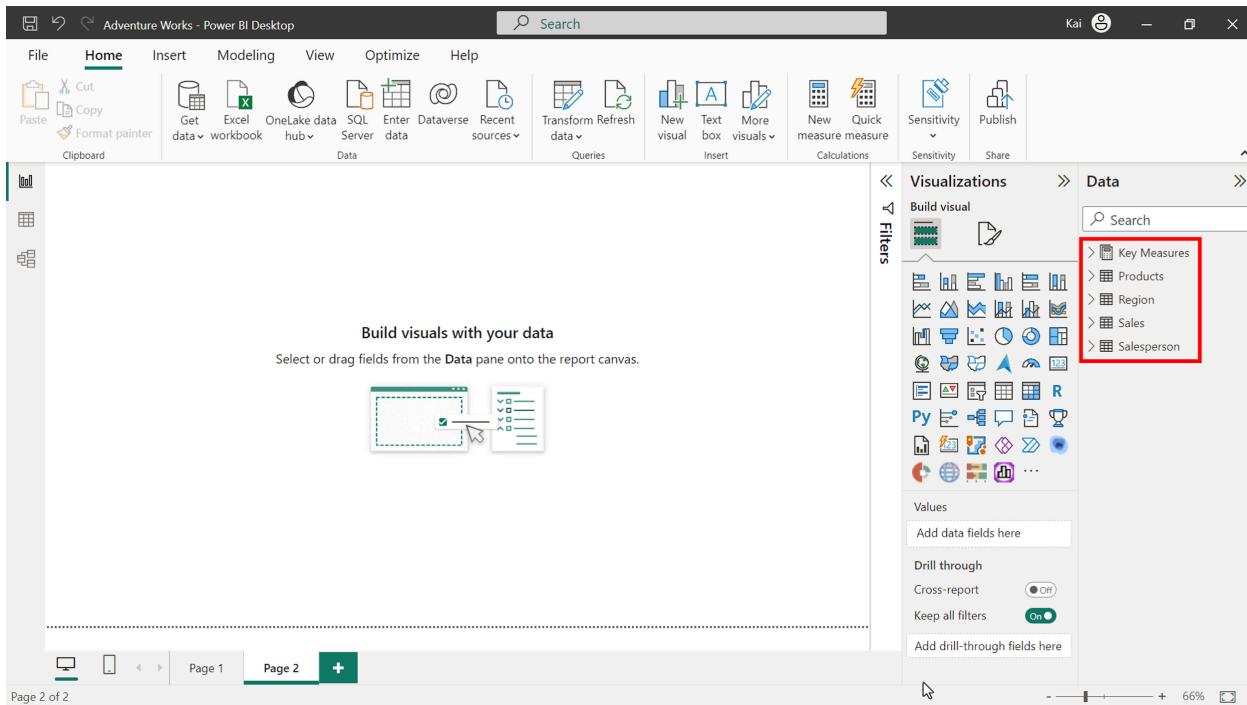
- Review the dataset and identify the measures needed to support your story.
- Create a multi-page report in Power BI desktop and include appropriate charts that clearly present your story.
- Identify and display insights that you can convey to the CEO and other stakeholders in your story.

This reading provides a step-by-step guide for completing these tasks, accompanied by screenshots for easy comparison with your own copy. You can also review the video [Storytelling process](#) and [Story elements](#).

Step 1: Download the Power BI project file.

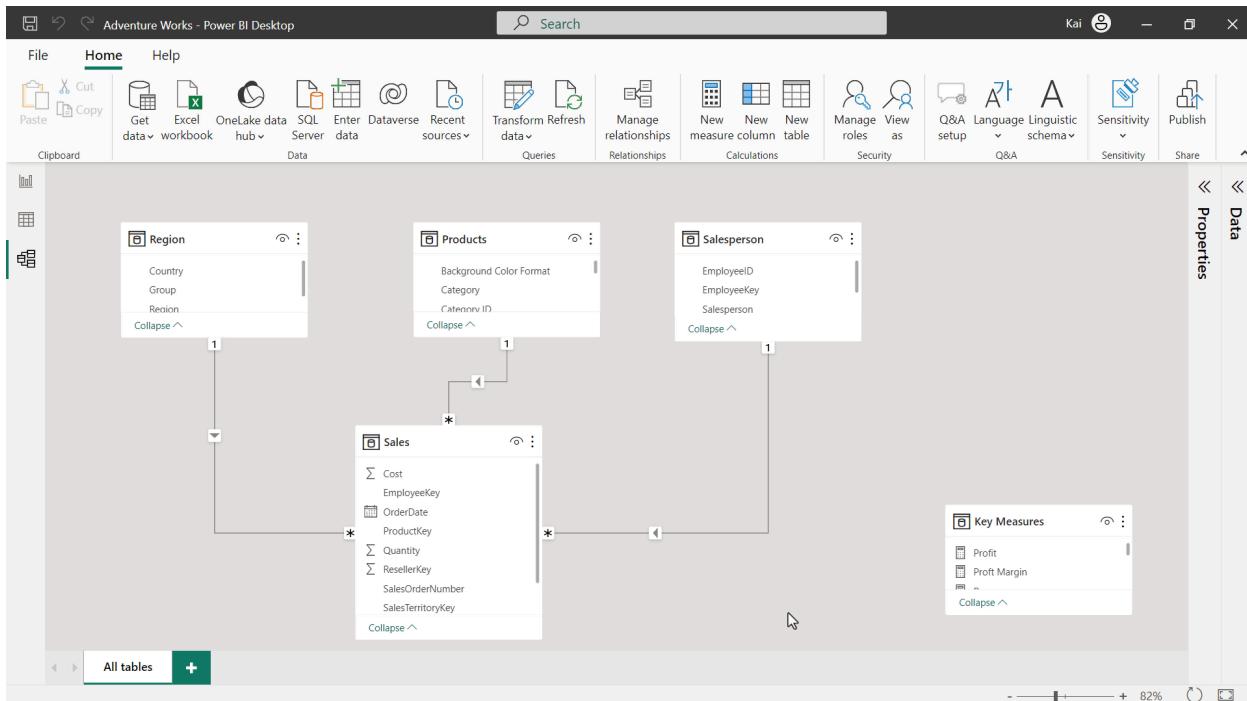
1. Download and save the Power BI project *Adventure Works data story.pbix*.
2. Open this file in Power BI desktop.

The dataset includes 5 tables: Key measures, Products, Sales, Region, and Salesperson. The Key measures table is not part of the data model. But it does contain the measures for specific business metrics.



Next, you need to explore the dataset tables and measures and identify which fields and measures you need to include that support your story of growth and create visualizations in the report canvas.

The dataset includes four data tables and one measure table. Based on the story narrative, you need to present only the information relevant to company growth in terms of sales and profit. Therefore, plotting yearly sales and the previous year's sales adequately shows the yearly sales data. In addition, you also need to display the year-over-year growth to support your story.



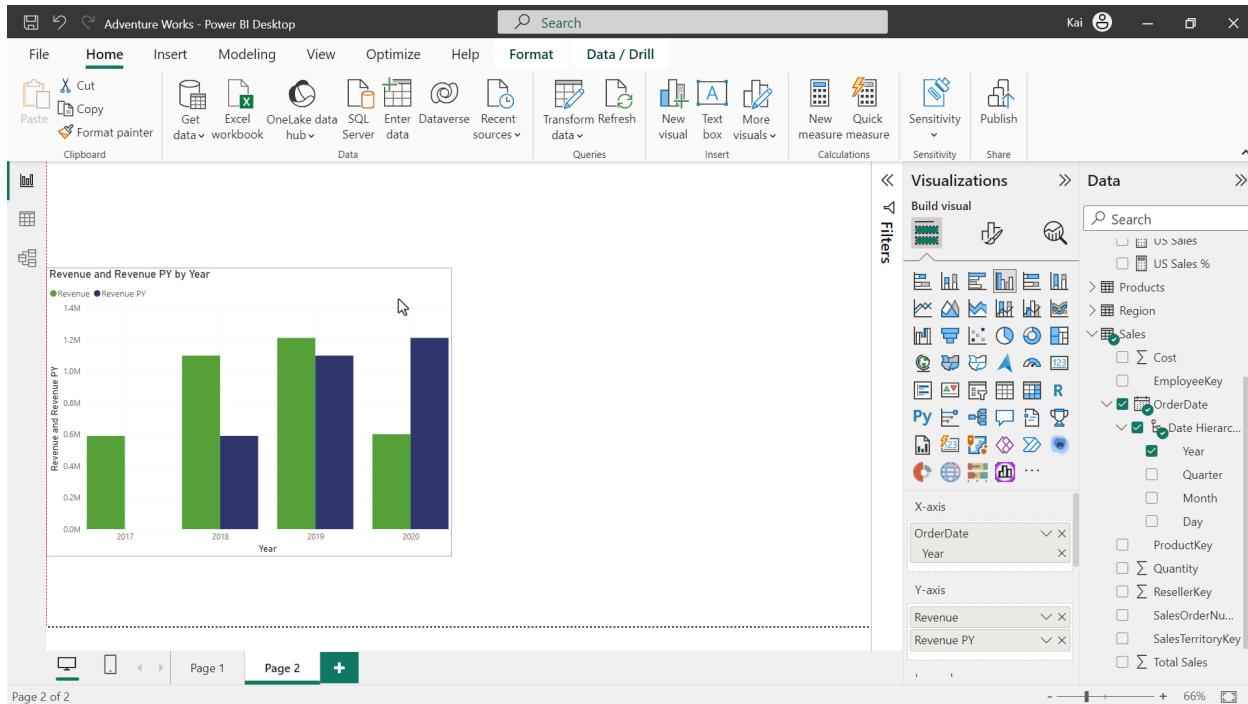
You also need to identify some key highlights from the Key measures table as the most valuable information for the CEO.

Four measures from the key measures table are relevant to the growth story you are going to present. They are Revenue, Revenue YoY%, Profit, and Profit margin.

The screenshot shows the Power BI Desktop interface with the 'Home' tab selected. The report canvas is visible, and the Data pane on the right is open, showing the 'Key Measures' table. Four items from this table are selected and highlighted with a red box: Profit, Profit Margin, Revenue, and Revenue YoY %.

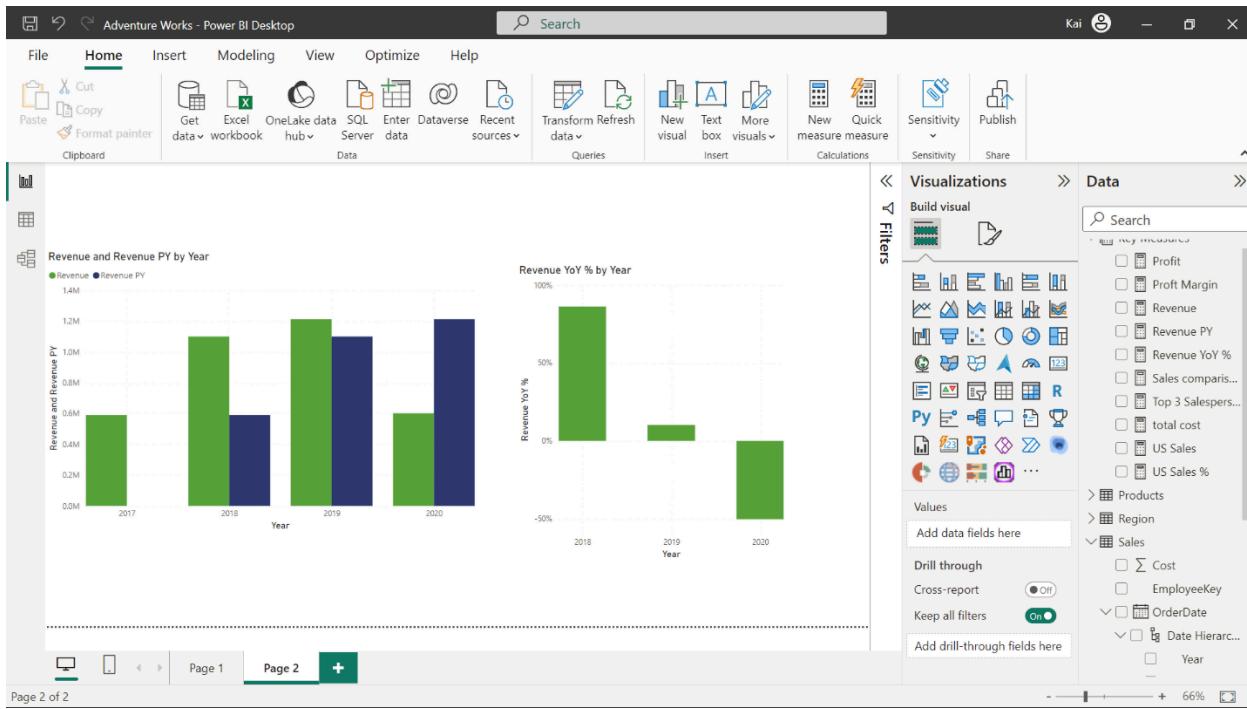
Step 3: Create a report in Power BI desktop to present your story.

1. Add a bar or column chart to the canvas to illustrate the comparison of sales for the current year with the previous year. This is the best choice of chart to display the side-by-side comparison.



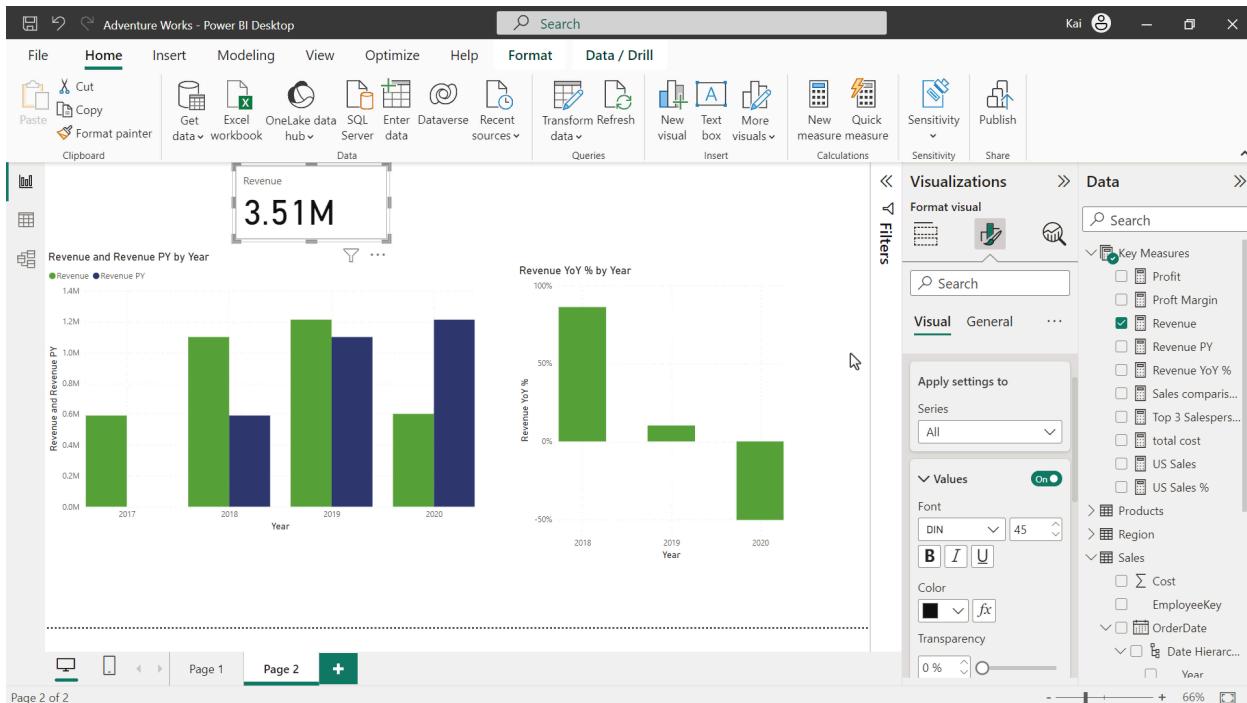
Before adding further visuals, apply a theme to create consistency in colors and formatting. To match the screenshots used in this reading, select the Accessible city park theme, and customize it to display text in a black color.

2. Create another chart showing the company's sales growth over the years. You can use the same chart type you used in the previous step. It is an appropriate chart type to represent the date-related data and helps to create a consistent look in the report.



3. You now need to create visuals to present the key information such as profit, revenue, and growth.

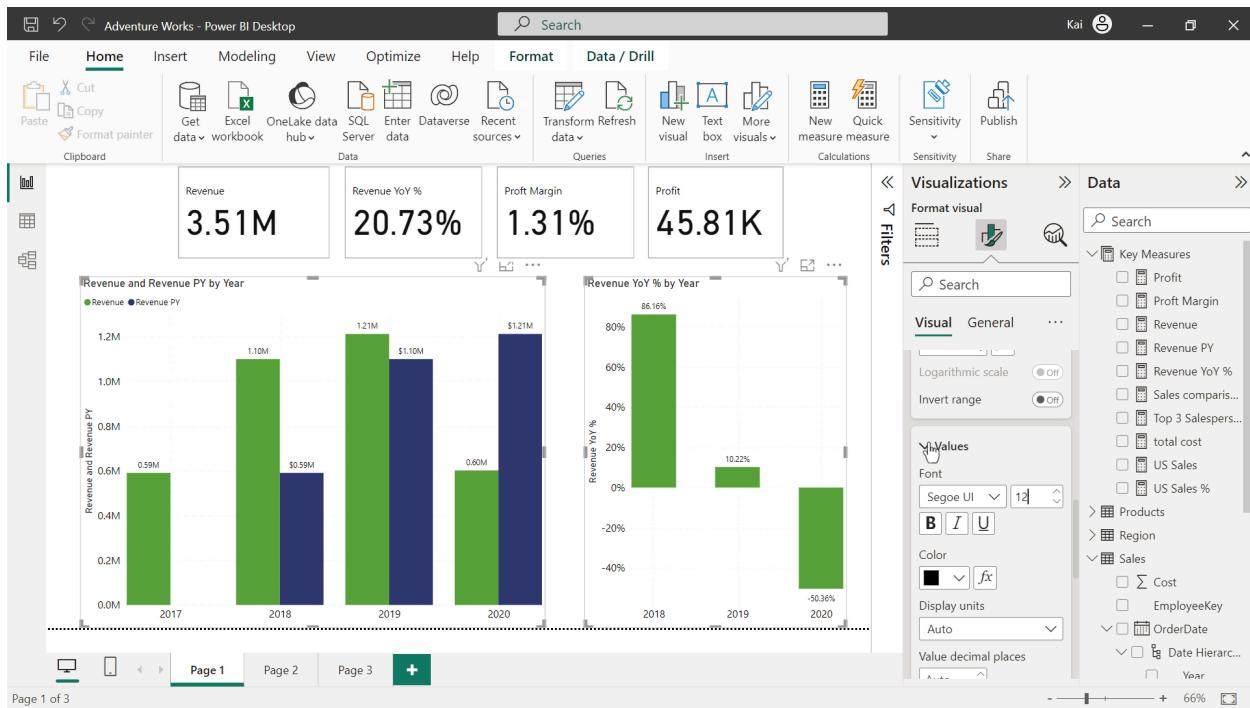
The most appropriate visual to show the single data point as valuable information is the card visual. The Power BI core Visualization pane offers two types of card visuals that you can use to display this information.



Step 4: Format your visualization and craft the story.

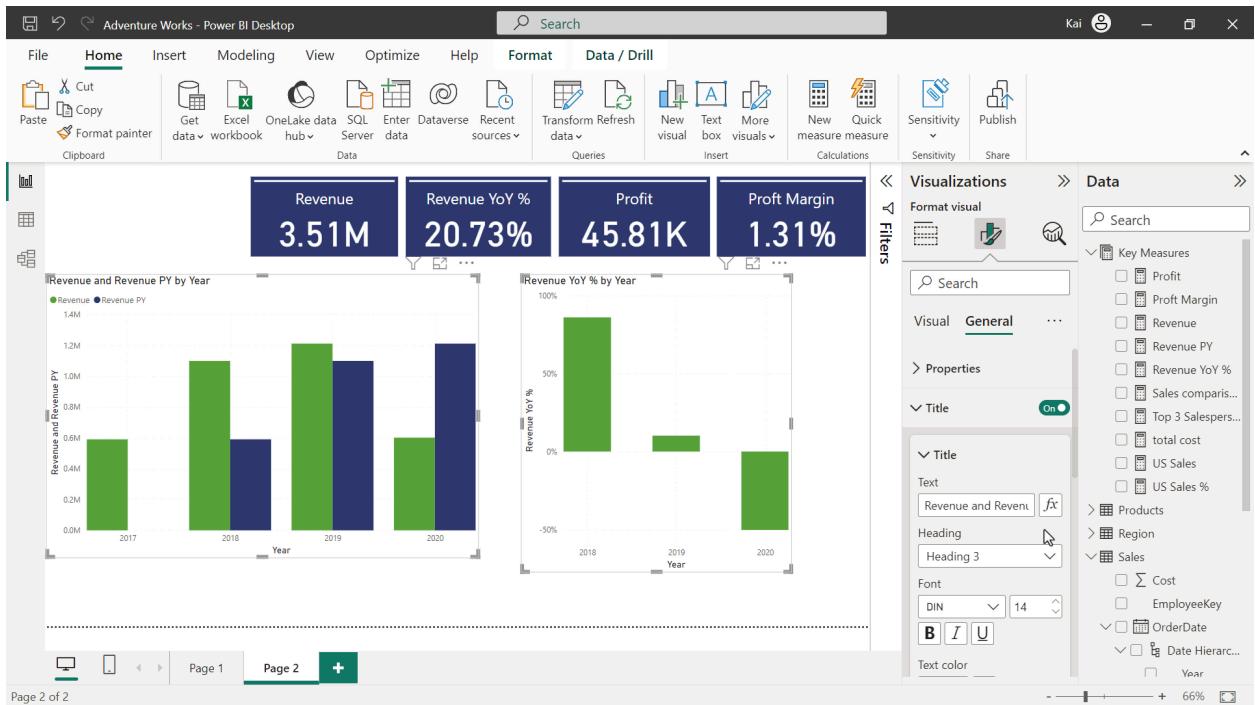
1. Format the charts for consistent font style, color schemes, and scaling.

Make sure the axis title, values, and data labels are of the same size and color. A font size of 12 points would be appropriate.



Adjust the titles of the charts if necessary and increase the font size to create a font hierarchy.

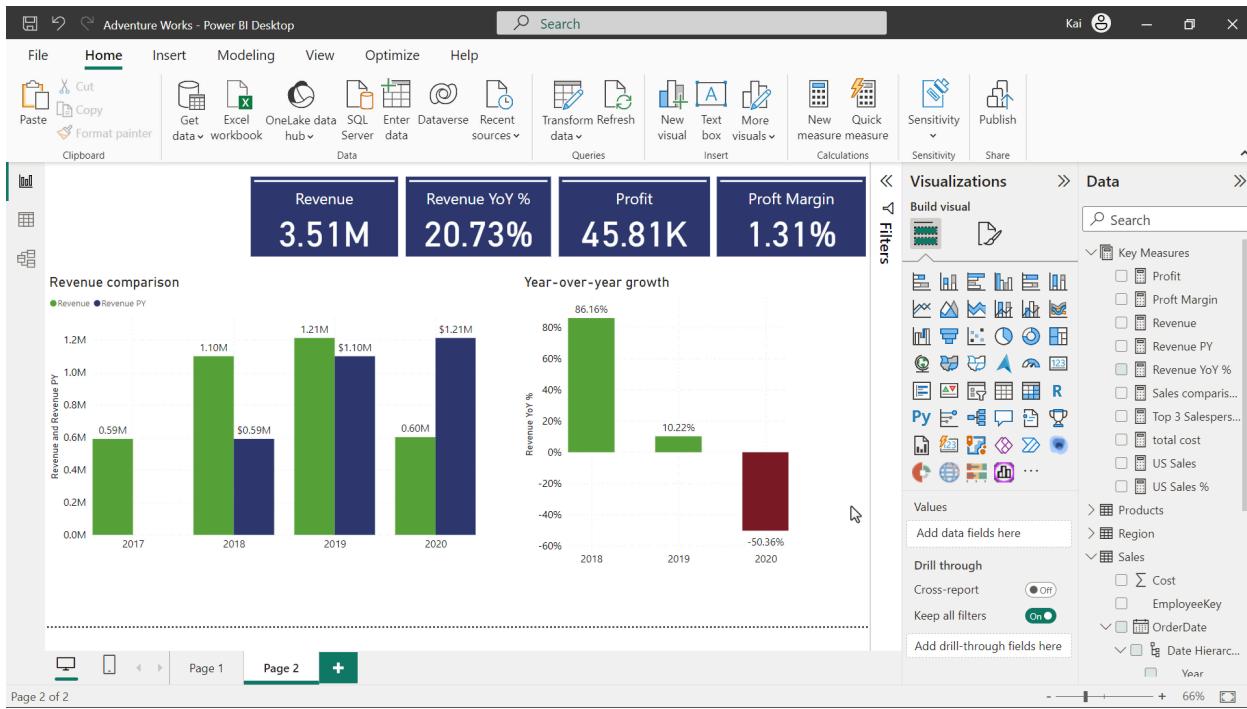
Format the card visuals. Resize them to the same size and increase the category font size. You can also create a somewhat more appealing design by changing the background color of the card visuals.



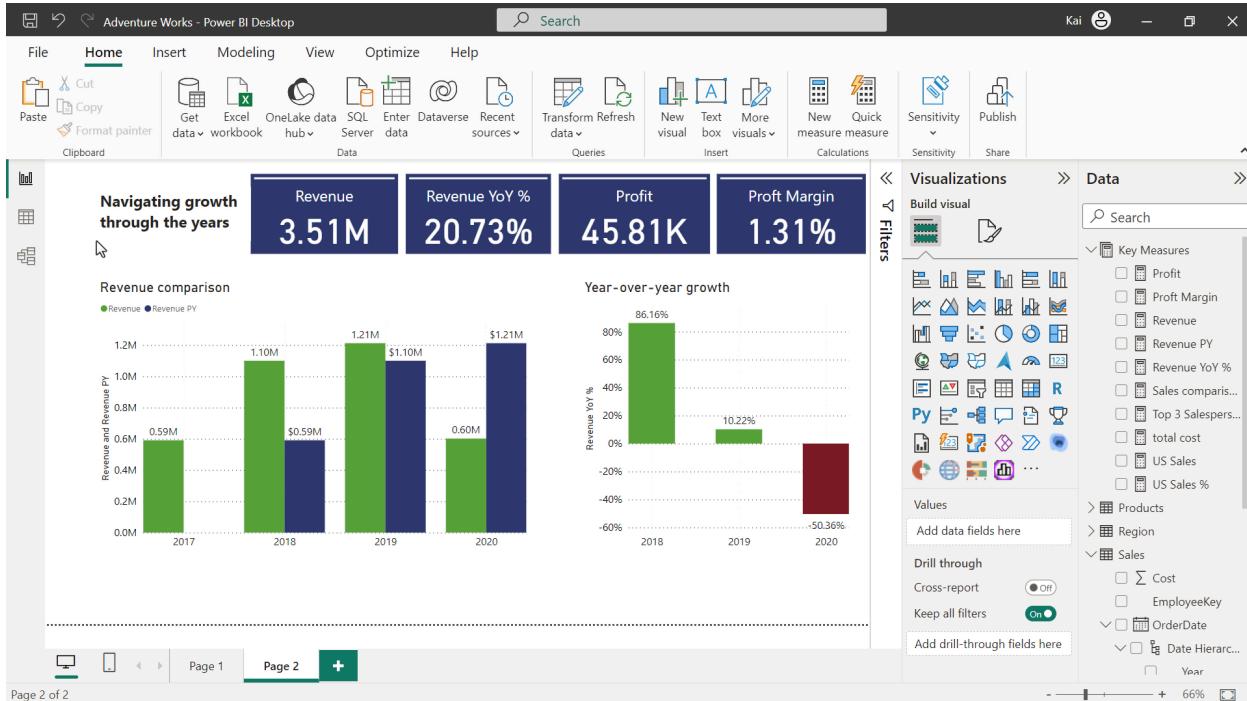
2. Organize your findings and highlights on the canvas to structure a coherent narrative.

Once you format the visual elements of your story, you need to arrange them in a logical sequence on the report canvas, so that the visuals tell the growth story of Adventure Works.

Card visuals represent the key metrics of the company, which you bring on the top of the canvas, followed by the column chart side by side below the card visuals.



3. Add a title that emphasizes the narrative. You can add a text box and write a title - for example, **Navigating growth through the years** - and reposition on the top left of the canvas.



Step 5: Provide insights from your data story.

Now you can add a visual to include the insights and takeaways that are evident from your story about Adventure Works' growth.

Add another text box at the bottom of the report canvas to hold your findings.

The screenshot shows a Power BI desktop interface with a dashboard titled "Navigating growth through the years". The dashboard features four main KPI cards:

- Revenue: 3.51M
- Revenue YoY %: 20.73%
- Profit: 45.81K
- Profit Margin: 1.31%

Below these cards are two bar charts:

- "Revenue comparison" chart showing revenue for the years 2017, 2018, 2019, and 2020. The values are 0.59M, 1.10M, 1.21M, and \$1.10M respectively.
- "Year-over-year growth" chart showing the percentage change from 2018 to 2020. The changes are 86.16%, 10.22%, and -50.36% respectively.

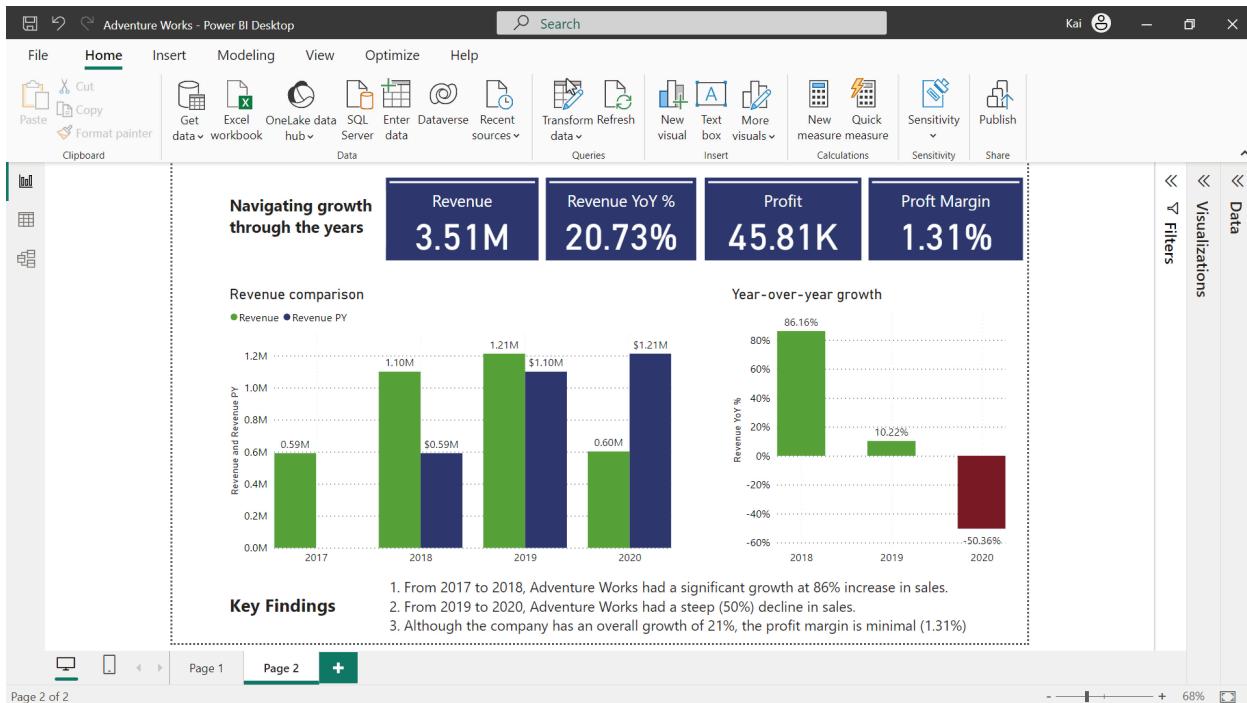
A callout box at the bottom of the dashboard lists three findings:

- From 2017 to 2019, Adventure Works had a significant growth at 86% increase in sales.
- From 2019 to 2020, Adventure Works had a steep (50%) decline in sales.
- Although the company has an overall growth of 21%, the profit margin is minimal (1.31%)

The Power BI ribbon is visible at the top, and the data browser on the right side shows various measures and dimensions available for the report.

Based on the storyline presented in your report, the key findings that the CEO should now be aware of are:

1. From 2017 to 2019, Adventure Works had a significant growth at 86% increase in sales.
2. From 2019 to 2020, Adventure Works had a steep (50%) decline in sales.
3. Although the company has an overall growth of 21%, the profit margin is minimal (1.31%)



Step 6: Save your project

- Save your Power BI project to your computer.

Tip: Make sure you provide an appropriate path for your project.

Conclusion

You have successfully crafted a data story for Adventure Works' CEO that is easy to understand and has a clear narrative to show the company's growth over the years. The appropriate identification of relevant data out of a huge data set, a precise selection of chart type, and a logical arrangement of visual elements on the report canvas help you convey the message via data storytelling to your stakeholders.

4. FINAL COURSE PROJECT: Exercise Adventure Works quarterly report

Introduction

In this module, you have learned about the creative processes involved in creating engaging dashboards and reports using Microsoft Power BI.

Throughout these weeks, you learned about visualization and design best practices, designing powerful report pages, and the process of data storytelling.

To create effective and engaging visualizations in Power BI desktop and service, you learned about the criteria of chart selection. This helped build towards creating an effective data story.

In a data story, the narrative created, the data selected to present this story, and the visualizations used are the key components of an effective data story.

In this exercise, you will create a story about the quarterly sales of Adventure Works in the form of a dashboard and report. This exercise will test your data visualization and storytelling skills, which are essential to convey insights effectively.

Scenario

Adventure Works, a multinational bicycle manufacturer, has multiple sales operations across the globe. The company's executive board and sales management team require quarterly sales information to assess their performance for the previous quarter. This analysis should provide them with the insights they need to make strategic decisions for their upcoming quarter.

As a data storyteller, the specific tasks you should perform in this exercise are:

1. Create a data story through a dashboard, providing an overview of quarterly sales performance for the executive board of Adventure Works.
2. Create a granular report with interactivity about the same sales period for the sales management team.
3. Highlight any trends identified, such as higher/lower sales by region, category, and salespersons.
4. Provide a conclusion summarizing the key takeaways for both the board of directors and sales management team.

By completing this exercise, you will demonstrate your ability to:

- Review the dataset and identify the measures and fields needed to support your story.
- Create a report in Power BI desktop by appropriate selection of chart which shows clarity to present your story.
- Publish your report on the Power BI service and create a dashboard for the executive board.
- Drive a few insights from your story that you can convey to stakeholders.

Step 1: Download the Power BI project file

1. Download the Power BI project file *Adventure Works Quarterly Report.pbix* by selecting the file below, and inspect the data tables and fields.
2. Download the Adventure Works logo file. You can do so by selecting the logo below and downloading it.



Step 2: Identify the relevant data fields and create visualizations

1. Identify the relevant data fields and measures that support the data story you are going to present to the sales team as well as the executive board.
2. Create visualizations by appropriate selection of charts for each data type you are presenting. For example, here is a list of chart types that you could use for different types of data:
 - a. A column/bar chart to display sales on a time scale.
 - b. A donut chart or funnel chart can show sales by category.
 - c. A map visual, a pie chart, or bar chart can be used to display sales by country.
 - d. A bar chart can be used to show the sales performance of salespeople.
 - e. A treemap can be used to visualize units sold for each category.

- f. As the objective of the story is to show the quarterly sales performance you can add slicers for the year and quarters to interactively explore the data.
 - g. You can also add top selling products, top performing regions, and salesperson to your report to support your story. Card visuals highlight key metrics for the executive board such as profit, revenue, profit margin and so on.
3. Format your visualizations to create a consistent look in terms of font size, style, and color. You need to use and customize the Accessible City Park theme to create a consistent look for the reports.

Step 3: Craft a data story for the sales team.

1. Add a descriptive title to your story and mention the timescale that your visualization covers. For example, what are you showing the sales team?
2. Arrange the visual elements you created in step 2 that are relevant to your story presenting to the sales management team in a logical sequence. Make sure to include the most valuable information at the top of the canvas and follow along accordingly.
3. Add an Adventure Works logo to your report.

Step 4: Craft a data story for the executive board.

1. Publish your report to My workspace in Power BI service. You need to make sure you apply all changes made and your report is saved to your local computer before publishing.
2. Log in to your Power BI service account and create a dashboard to tell a story about the quarterly sales performance to the executive board. Remember, you only need to pin the visuals from your report that are relevant to the executive board and support your story.
3. Add the Adventure Works logo to the dashboard.
4. Provide key takeaways from the story. You can add a text box to describe the key insights.
5. Optimize the dashboard for mobile devices.

Conclusion

With these steps, you have created a data story for the sales team and the executive board. You identified the data fields and measures relevant to each story and created visuals in Microsoft Power BI desktop. You then presented the visuals in the form of a Microsoft Power BI report and a dashboard in Power BI service to communicate valuable metrics of the business.

Exemplar: Adventure Works Quarterly Report

Overview

In the exercise *Adventure Works quarterly report*, you put into practice your understanding of how to craft a data story and create and optimize a dashboard for it.

Your objective for this exercise was to complete the following tasks:

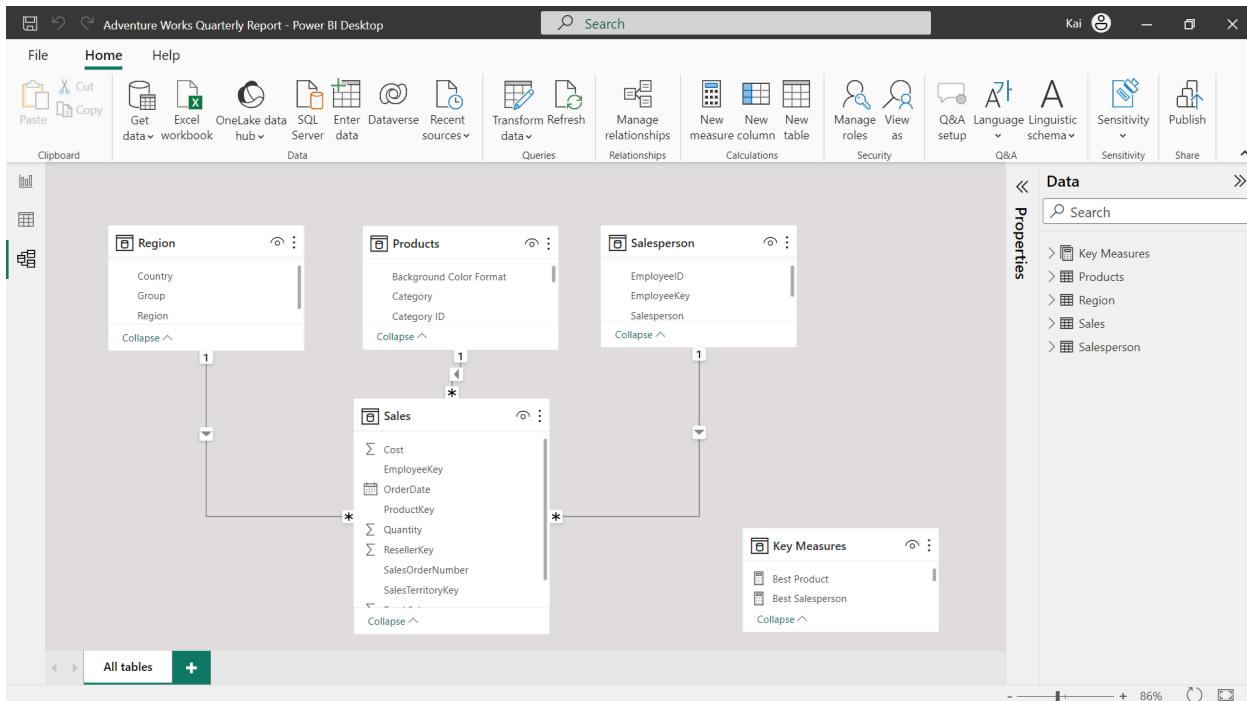
- Review the dataset and identify the measures and fields needed to support your story.
- Create a report in Power BI desktop by appropriate selection of chart which shows clarity to present your story.
- Publish your report on the Power BI service and create a dashboard for the executive board.
- Drive insights from your story that you can convey to stakeholders.

This reading provides a step-by-step guide for completing these tasks, accompanied by screenshots for easy comparison with your own copy.

Step 1: Download the Power BI project file

Download the Power BI project file *Adventure Works Quarterly Report.pbix* and inspect the data tables and fields.

1. The Power BI data model contains a Sales fact table and three dimension tables; Region, Products, and Salesperson. A Key Measures table is also present, unrelated to the model and only contains some key measures.



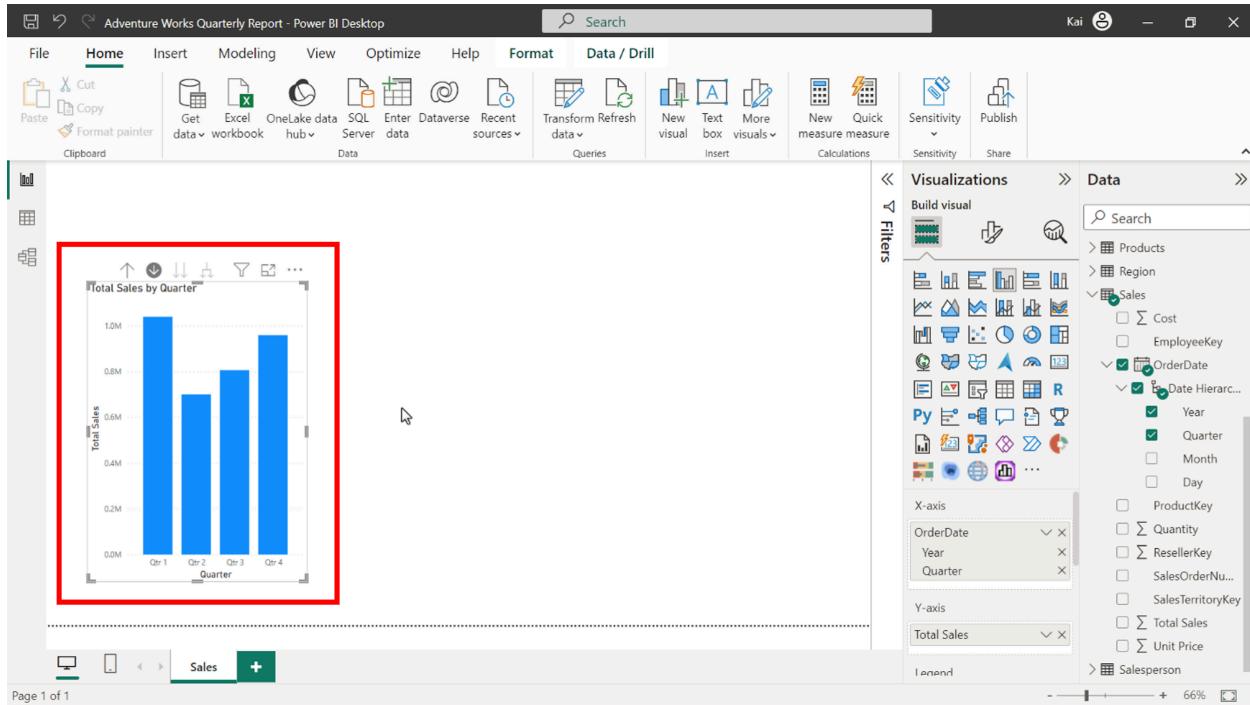
Step 2: Identify the relevant data fields and create visualizations

Identify the relevant data fields and measures that support the data story you are going to present to the sales team as well as the executive board.

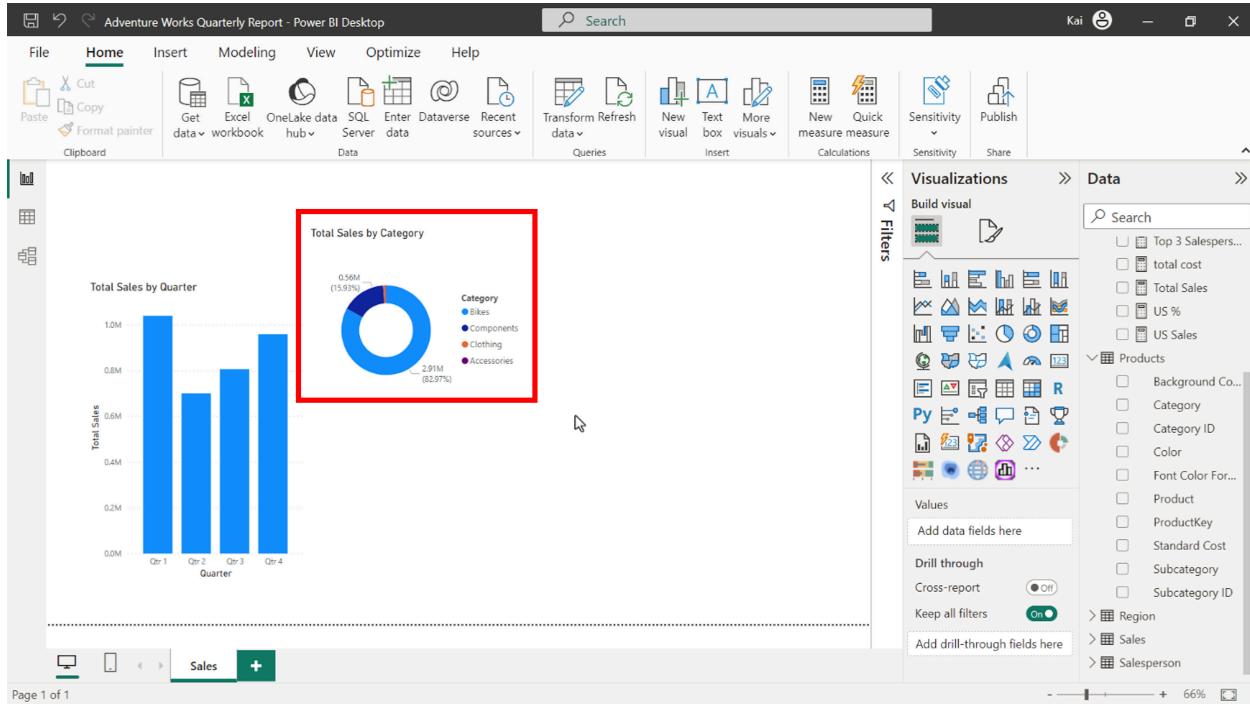
The sales team might require more granular data with interactivity to drill down to a detailed level of analysis, but the Executive board only needs an overview of the sales information. Therefore, you can create a Power BI report for the sales team and a dashboard in Power BI service for the executive board.

1. You can visualize the sales by category, country, and salesperson and introduce year and quarter slicer for interactive visualization of quarterly or yearly sales values. On the other hand, you need to consider adding snapshots of valuable information in the form of card visuals for the executive board.
2. Create visualizations by appropriate selection of charts for each data type you are presenting.
 - A column or bar chart is the best option to visualize time related data. You can create a date hierarchy based on your analytical needs. In this case, you need to

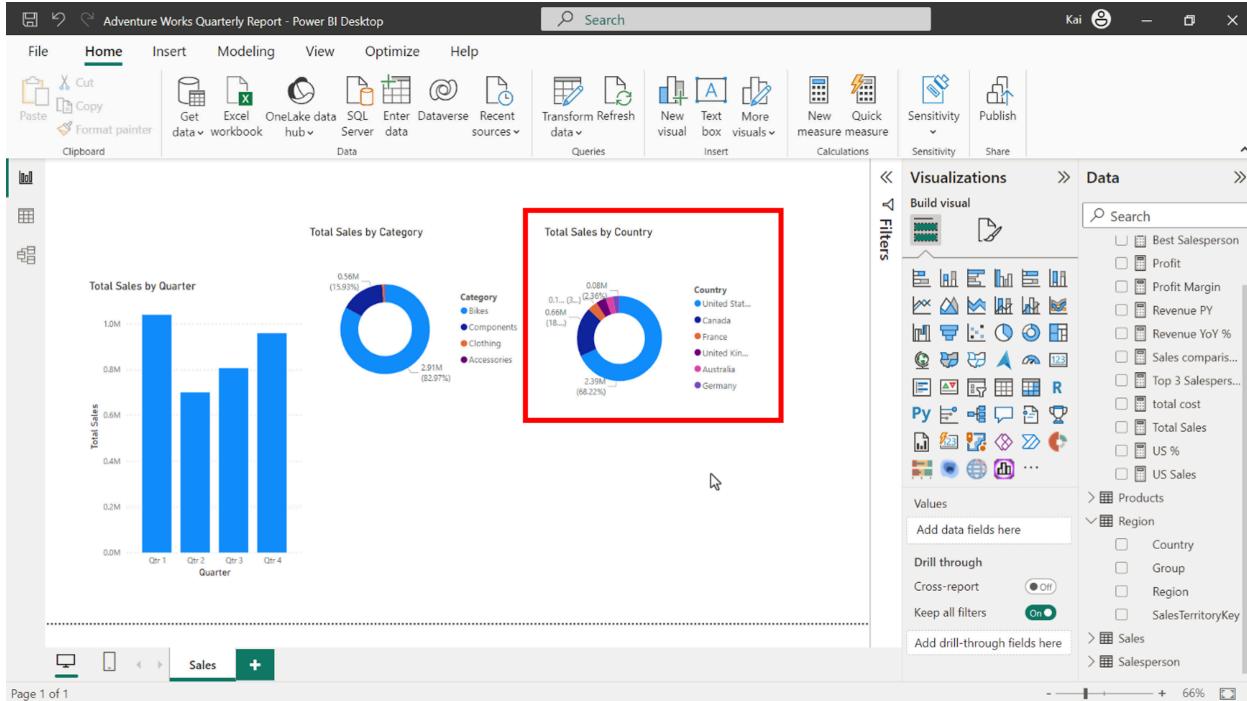
bring year and quarter fields from the sales table date field to the column chart x-axis and total sales measure on y-axis.



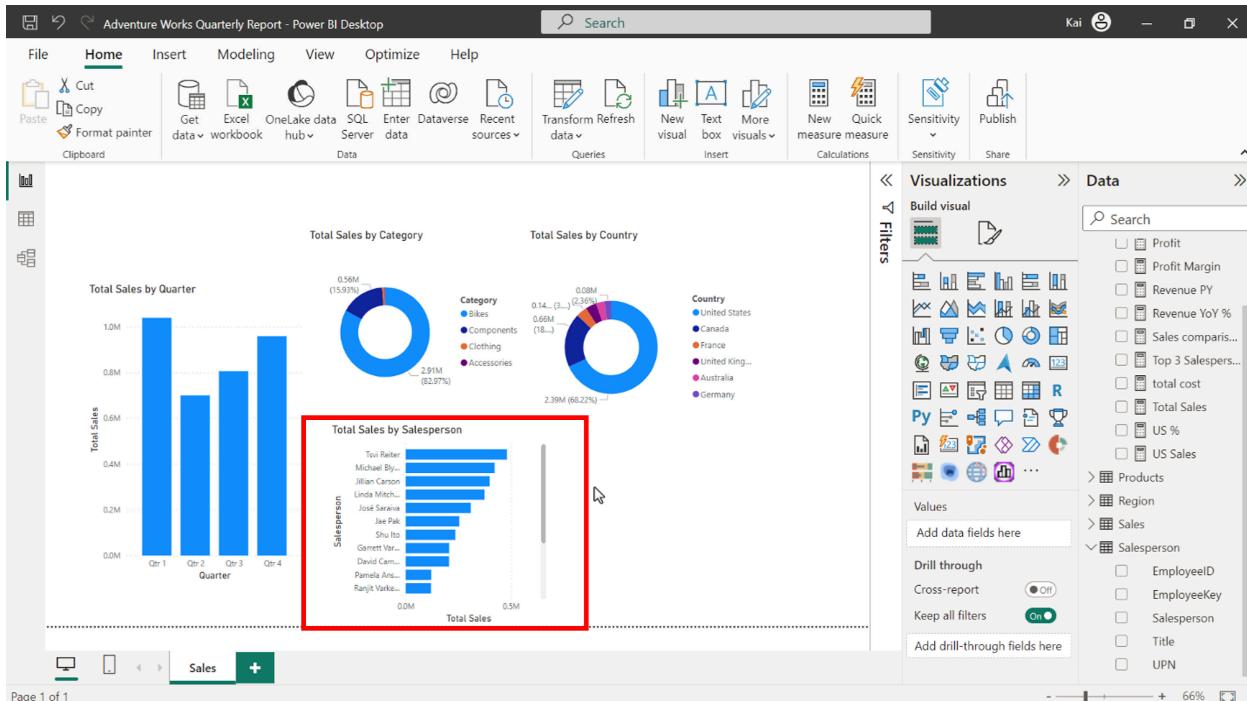
- As Adventure Works has only four product categories, you can use a donut chart to display the sales by category.



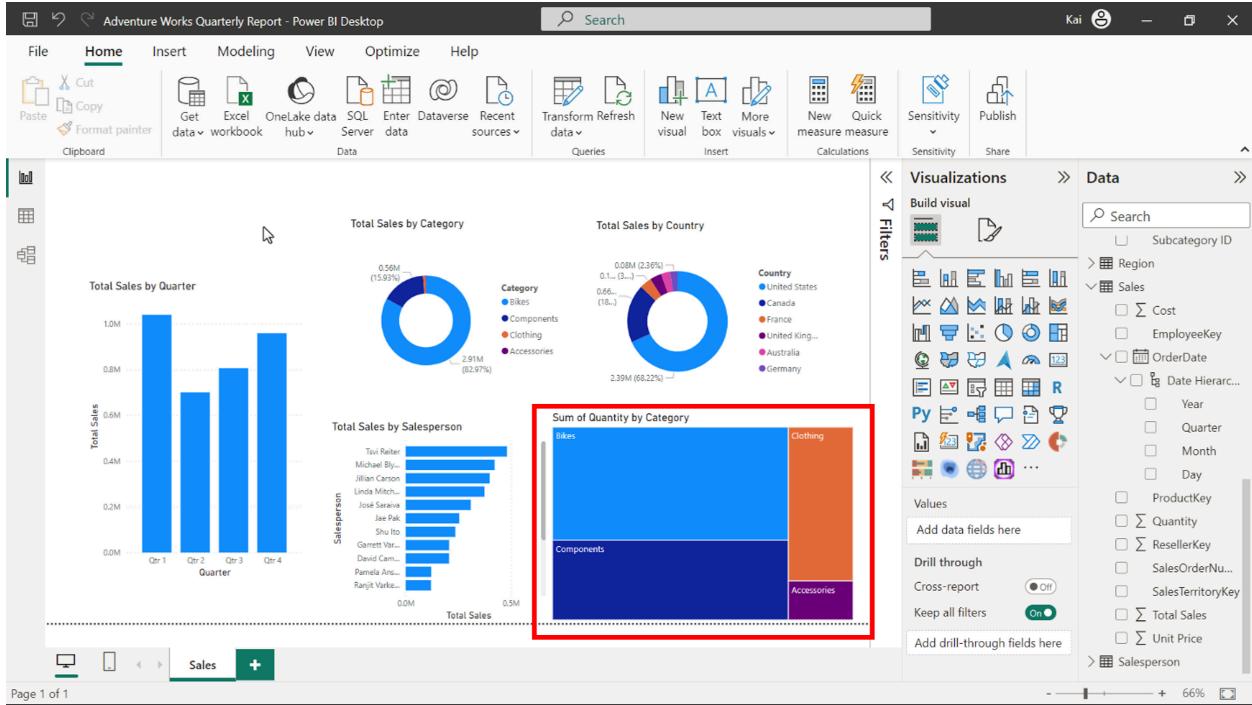
- Although you can use any map visual to display sales values by each country, to create a consistent design look, it is good to use the donut chart as there are only 6 countries worth of data available.



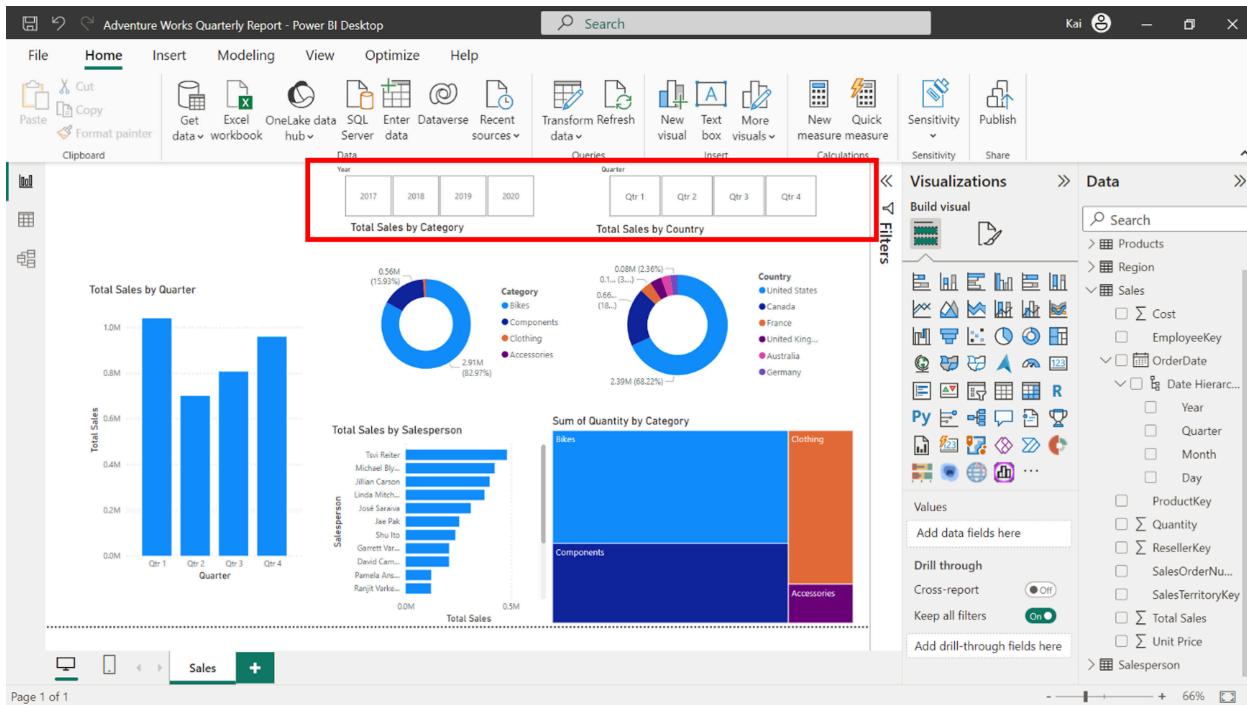
- You can use a bar chart to show the sales performance by salespersons.



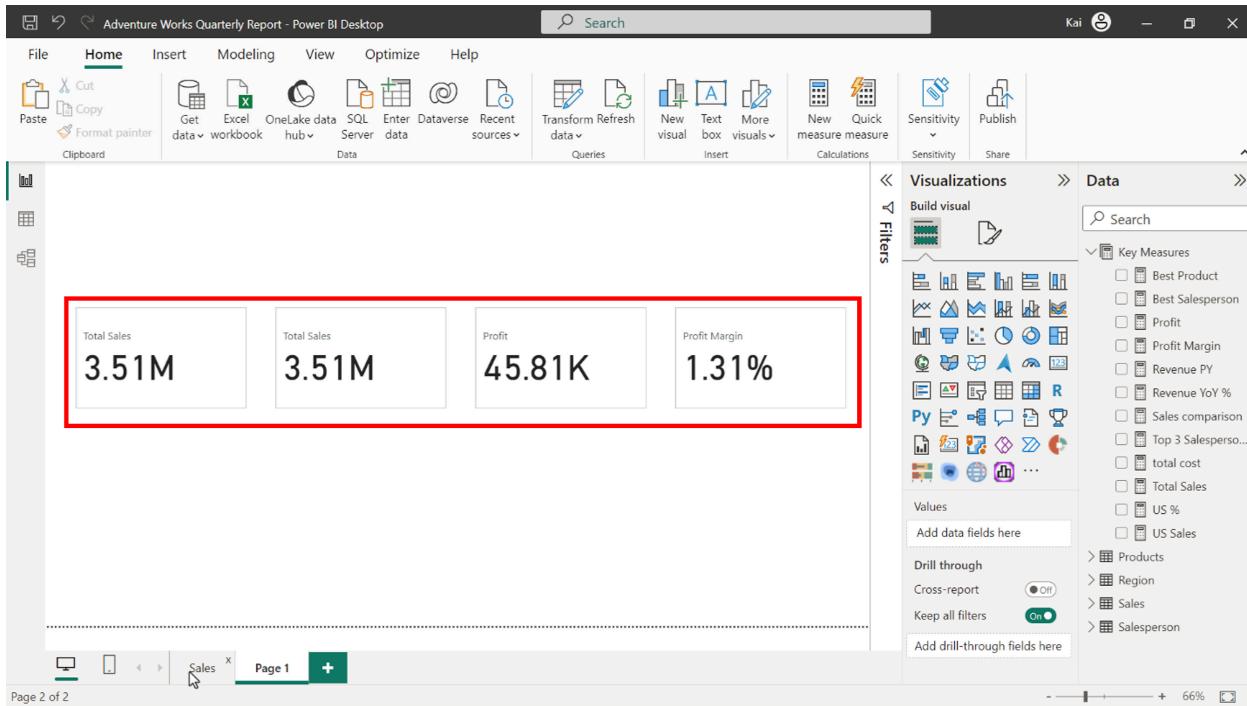
- You can use a treemap to visualize units sold for each category. The size of each rectangle proportionally represents the number of units sold per category.



- As the objective of your data story is to show quarterly sales performance, you can add slicers for the years and yearly quarters so users can interactively explore the data. You need to create a slicer for each year and quarter respectively. You can use the tile style of slicer because there are only 4 years of data available in the report.



- You need to create card visuals to highlight key metrics for the executive board such as profit, revenue, profit margin and so on. Typically, the executive board needs to look at the key metrics available, therefore adding card visuals or KPIs (Key Performance Indicators) is recommended.

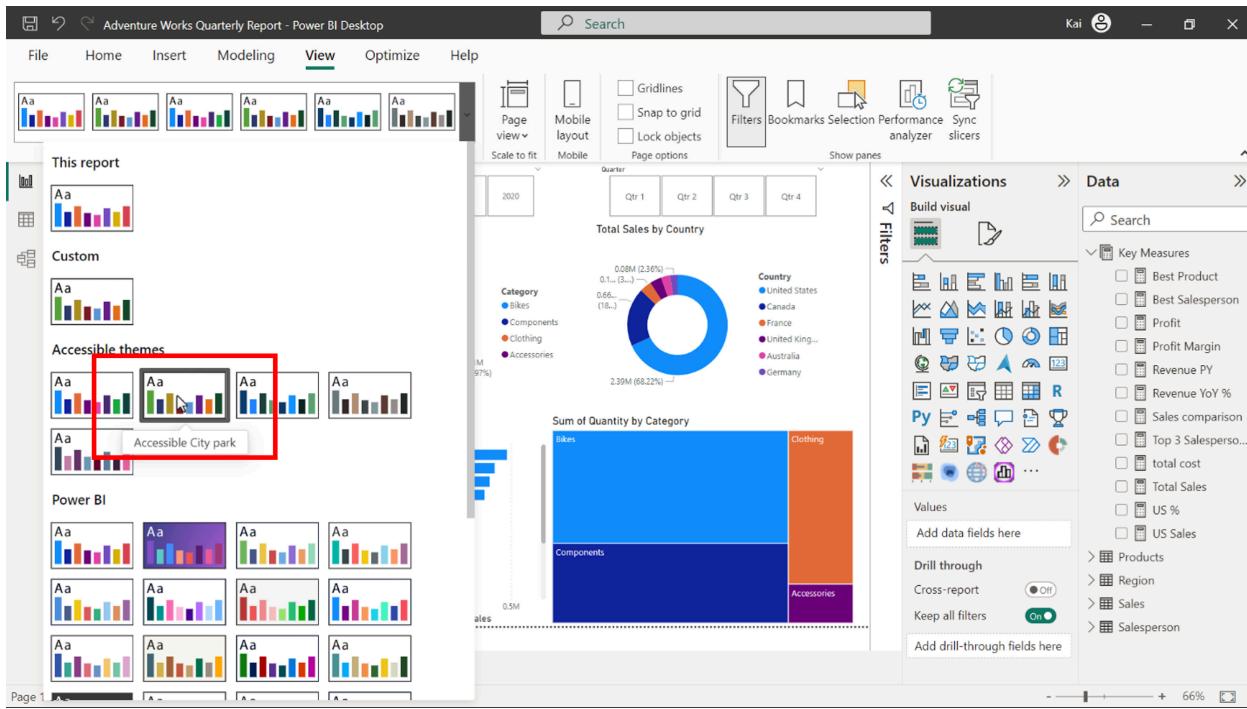


- You can add a new page to your report to create card visuals. You need to copy and paste the slicers to the new page to apply the filters to the card visuals which only displays the relevant data.

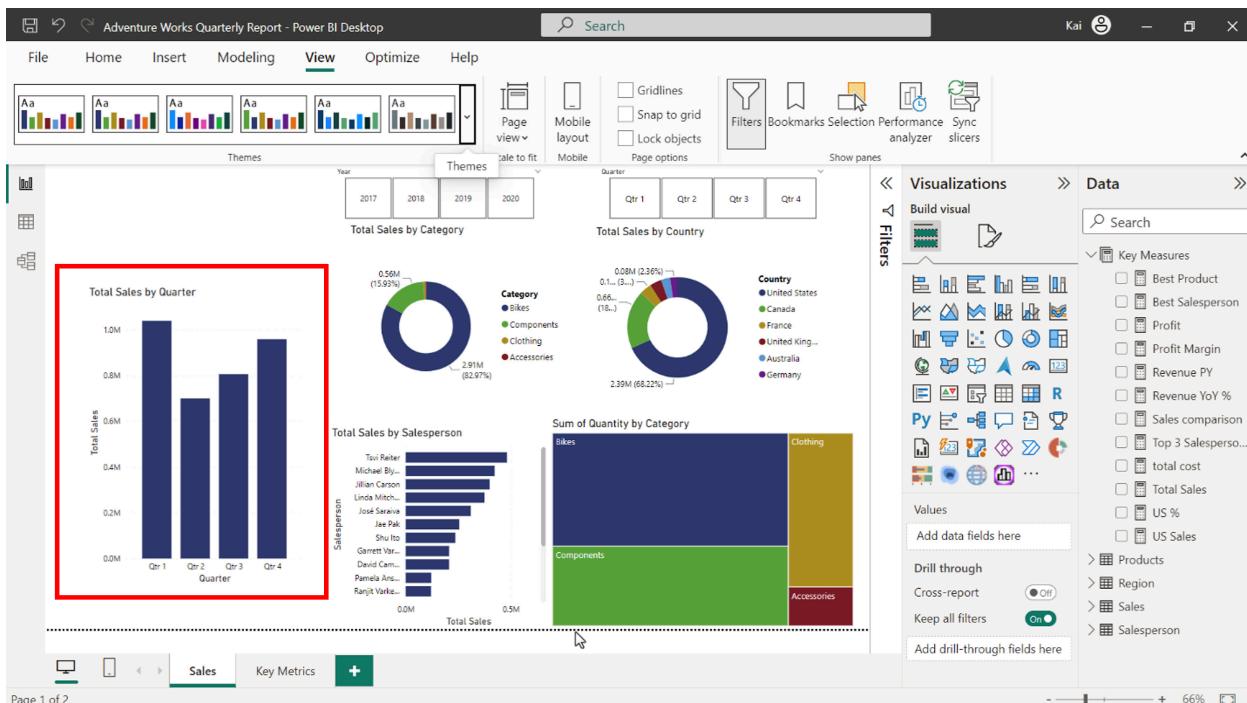
The screenshot shows the Power BI Desktop interface with the following details:

- Top Bar:** Adventure Works Quarterly Report - Power BI Desktop. Includes File, Home, Insert, Modeling, View, Optimize, Help, and a Search bar.
- Clipboard:** Shows options like Cut, Copy, Paste, and Format painter.
- Data Sources:** Get data from Excel, OneLake data hub, SQL Server, Enter Data, Refresh data, New visual, Text box, More visuals, Quick measure, and New measure.
- Sensitivity:** Buttons for Sensitivity and Publish.
- Visualizations:** A list of available visual types including Bar, Line, Map, Gauge, and Radar.
- Data:** A search bar and a list of key measures such as Best Product, Profit, Profit Margin, Revenue PY, Revenue YoY %, Sales comparison, Top 3 Salesperso..., total cost, Total Sales, US %, US Sales, Products, Region, Sales, and Salesperson.
- Report Content:**
 - A date slicer with years 2017, 2018, 2019, 2020 and quarters Qtr 1, Qtr 2, Qtr 3, Qtr 4.
 - Four card visualizations:
 - 1st Quarter Sales: 3.51M
 - Same Period Last Year: 3.51M
 - Profit: 45.81K
 - Profit Margin: 1.31%
- Page Navigation:** Sales tab selected, Key Metrics tab, and a plus sign for adding new pages.
- Page Footer:** Page 2 of 2.

1. You first need to activate and customize the Accessible City Park theme from the View tab of Power BI desktop. You need to adjust the color to black in the second and fourth level elements. This will automatically convert all axis and legend text to black color, so you do not have to change each chart individually.



After you have activated the theme, the colors of the charts change according to the theme color palette. You need to adjust the color of individual charts if needed. For example, in the Total Sales by Quarter column chart all columns are blue, so you can change them to distinct colors. You can also apply conditional formatting to the bars if needed.



Once the visual elements are created, you need to format them to create a consistent and coherent look. In Visualizations > Format visual, there are two tabs for visual formatting; Visual and General. You need to adjust the font size of axis title and values to 12, chart title to 16, and legend to 12. You also need to make sure the text color is black throughout your report.

In the slicers, you can either set a background color or create a border to differentiate the slicers from the rest of the report.

The screenshot shows a Power BI desktop interface with a dashboard containing several visualizations:

- Sales by Quarter:** A bar chart showing total sales by quarter (Qtr 1, Qtr 2, Qtr 3, Qtr 4) with values 1.04M, 0.70M, 0.81M, and 0.96M respectively.
- Total Sales by Salesperson:** A horizontal bar chart showing total sales for various salespeople.
- Sales by Category:** A donut chart showing sales distribution across categories like Bikes, Components, Clothing, and Accessories.
- Units sold by Category:** A stacked bar chart showing units sold for Bikes, Components, Clothing, and Accessories.
- Sales by Country:** A donut chart showing sales distribution across countries like United States, Canada, France, United Kingdom, and Australia.

The top ribbon is visible with tabs like File, Home, Insert, Modeling, View, Optimize, and Help. The View tab is selected. The ribbon also includes themes, page view options, filters, and bookmarks.

For card visuals, you can either create a colored background or use other design elements to make them stand out. Power BI has two card visuals; Card and Card (New). You can use Card (New) as this provides more design options.

The screenshot shows a Power BI desktop interface with a dashboard containing four cards. The cards are arranged horizontally and provide key performance metrics. The first card displays '1st Quarter Sales' at \$3.51M. The second card shows 'Same Period Last Year' sales at \$2.90M. The third card shows 'Profit' at 45.81K. The fourth card shows 'Profit Margin' at 1.31%. The 'Key Metrics' tab is currently selected in the ribbon. A red box highlights the first two cards.

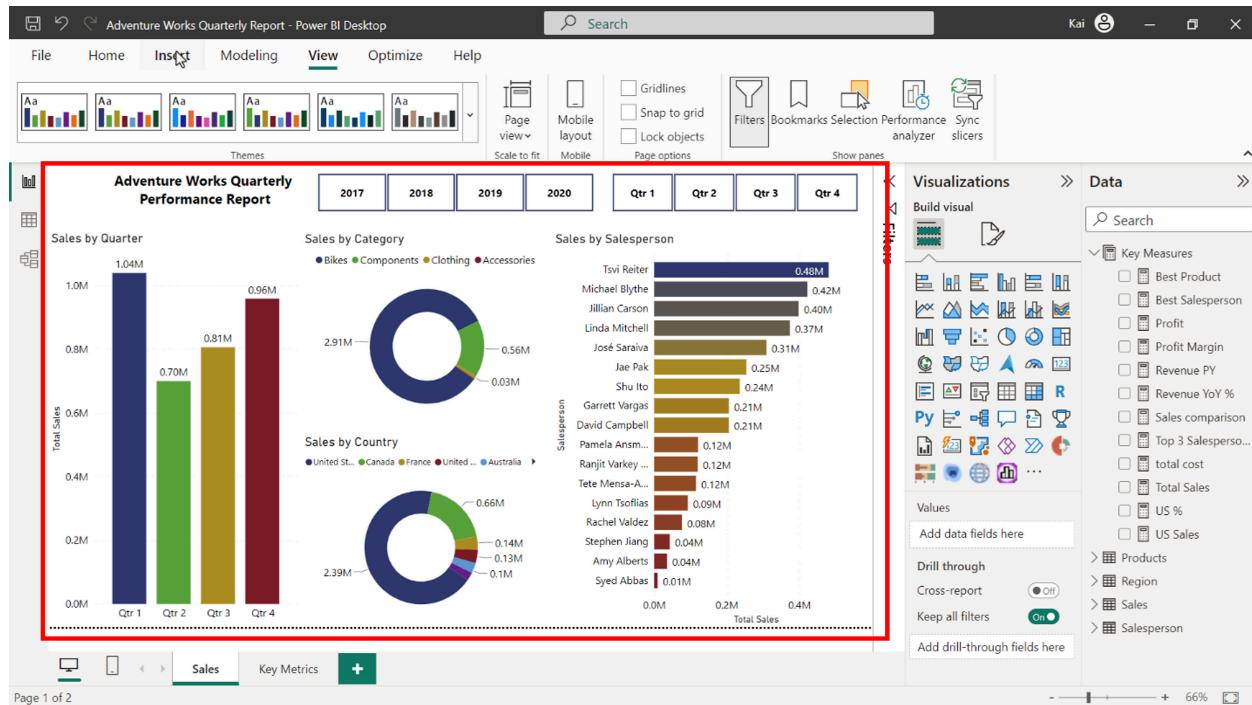
Step 3: Craft a data story for the sales team.

1. You need to add a descriptive title to your story and mention the period of time your visualization covers. For example, you can add “Adventure Works quarterly performance report” for the sales team. Add a text box from the Insert tab of Power BI desktop, where you can write and format the text.

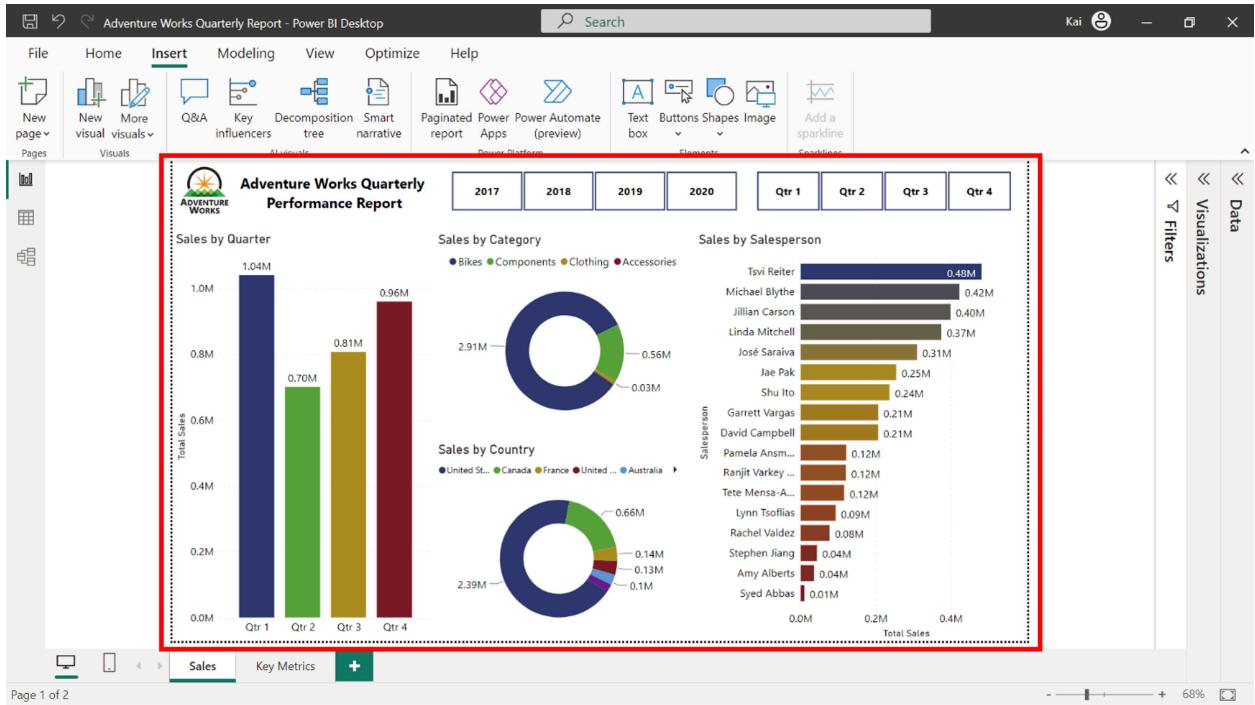
The screenshot shows a Power BI desktop interface with a dashboard. The main title 'Adventure Works Quarterly Performance Report' is highlighted with a red box. Below the title, there are several visualizations: a bar chart titled 'Sales by Quarter' showing total sales for each quarter; a donut chart titled 'Sales by Category' showing the distribution of sales by category; another donut chart titled 'Sales by Country' showing the distribution of sales by country; a bar chart titled 'Total Sales by Salesperson' showing total sales for each salesperson; and a stacked bar chart titled 'Units sold by Category' showing the breakdown of units sold by category. The 'Sales' tab is selected in the ribbon. The dashboard also includes a navigation bar with tabs like 'Key Metrics' and a search bar.

Arrange the visual elements created in step 2 that are relevant to your story in a logical sequence.

- For the sales team report, you can use a column chart showing Sales by Quarter, two donut charts visualizing Sales by Country and Category, and a bar chart showing Sales by Salesperson. The treemap seems unrelated to the entire sales story so you can move this chart to the second page of your report which you may use for other visualizations. Additionally, you need to add two slicers which enable the users to interact with the report and compare the data between the quarters and years.



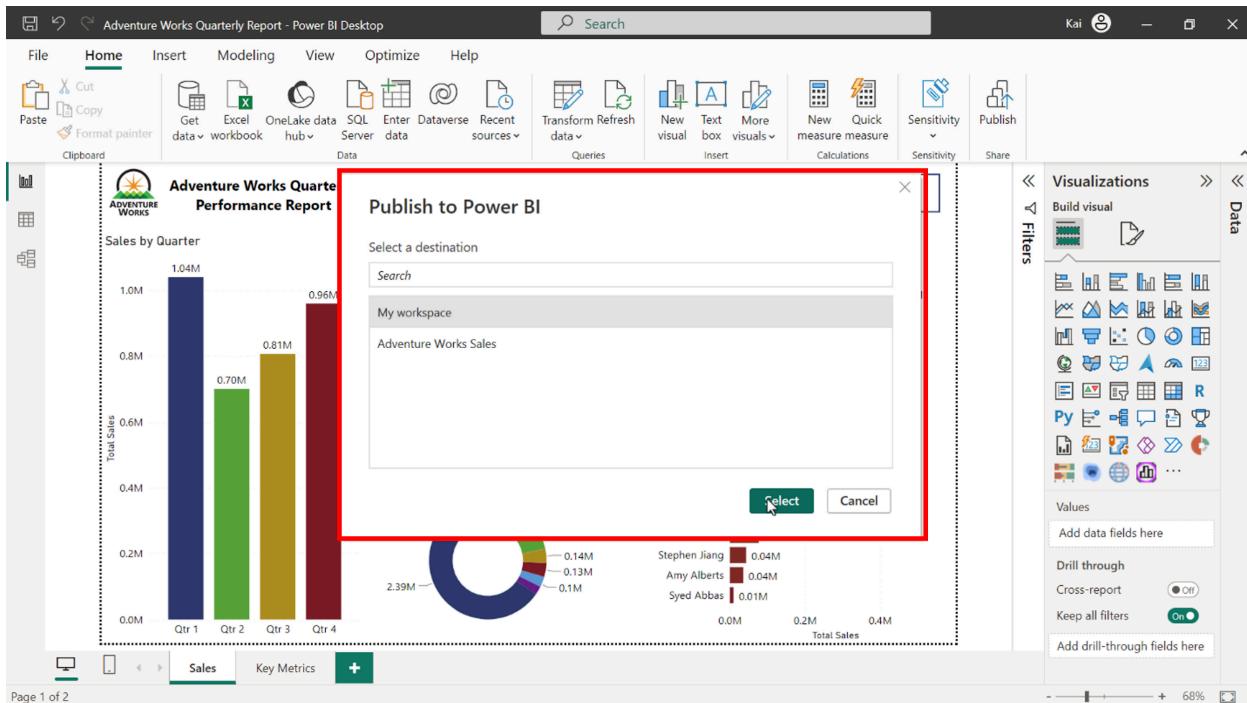
- Add the Adventure Works logo to your report. From the Insert tab on the ribbon, select Image and navigate to the folder where you saved the Adventure Works logo file. Adjust the position and scaling of the logo to the top left of the report canvas.



Step 4: Craft a data story for the executive board.

To create a dashboard for the executive board, you must publish your report to My workspace in Power BI service. You need to make sure you apply all changes made and your report is saved to your local computer before publishing.

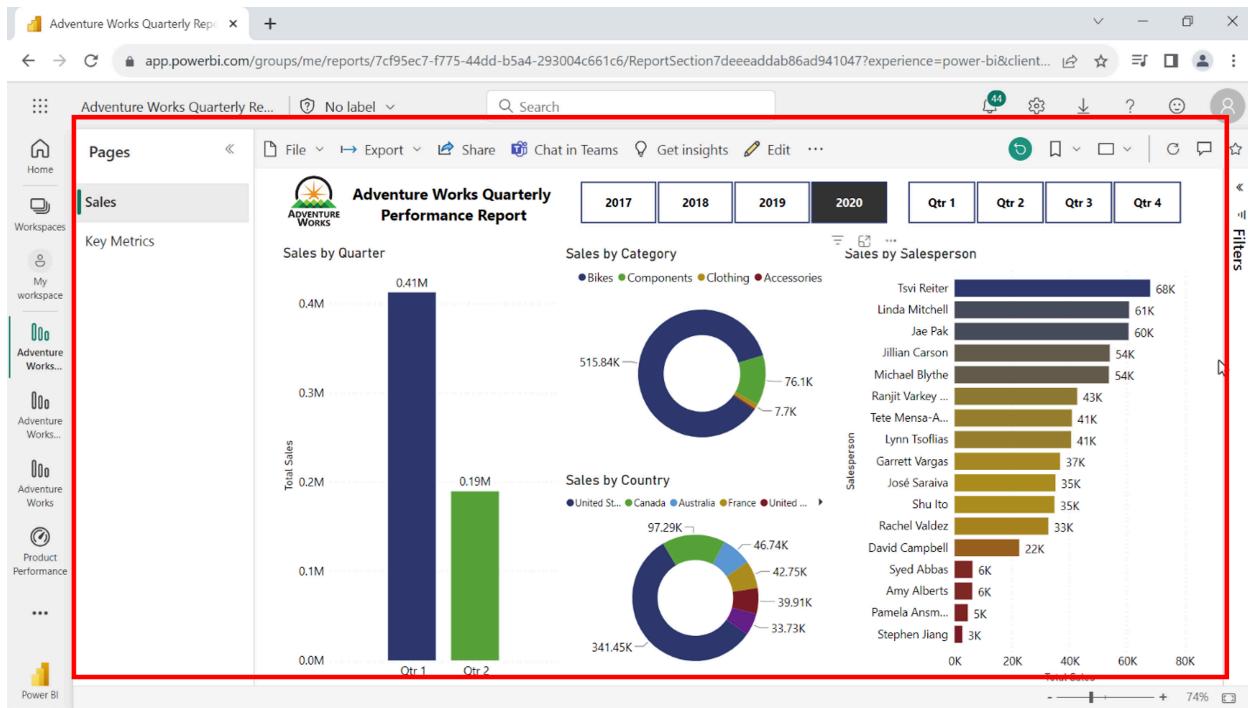
1. Select Publish from the Home tab on the ribbon and select My workspace to publish your report.



1. Log in to your Power BI service account and create a dashboard to tell a story to the executive board. From My workspace, open the report you published. Select Pin visual icon represented by a pin from any chart and select New dashboard from the Pin to dashboard box. Provide an appropriate name to the dashboard and select Pin.

Name	Type	Owner	Refreshed	Next refresh	Endorsements
Adventure Works 2	Dataset	Kai	9/24/23, 1:35:17 AM	N/A	—
Adventure Works Exercise	Report	Kai	10/9/23, 5:59:48 PM	—	—
Adventure Works Exercise	Dataset	Kai	10/9/23, 5:59:48 PM	N/A	—
Adventure Works Products	Report	Kai	9/14/23, 9:31:18 PM	—	—
Adventure Works Products	Dataset	Kai	9/14/23, 9:31:18 PM	N/A	—
Adventure Works Quarterly Report	Report	Kai	10/9/23, 8:40:15 PM	—	—
Adventure Works Quarterly Report	Dataset	Kai	10/9/23, 8:40:15 PM	N/A	—
Adventure Works Sales	Report	Kai	9/20/23, 7:15:08 PM	—	—

Before you pin any visual element to the dashboard, you need to apply filters to the report for the first two quarters of 2020. For column and donut charts, by selecting 2020 from the year slicer will display the data only relevant to the first two quarters of the year. Now you can pin these visuals to the dashboard.



For card visuals, you need to apply both year and quarter filters to display only the values for the first quarter of the year, then you need to pin to the dashboard.

Adventure Works Quarterly Report

Pages: Sales, Key Metrics

2017, 2018, 2019, 2020 (highlighted)

Qtr 1, Qtr 2, Qtr 3, Qtr 4 (highlighted)

1st Quarter Sales: 412.37K

Same Period Last Year: \$265.12K

Profit: 261.72

Profit Margin: 0.06%

Units sold by Category:

Category	Value
Bikes	423
Components	185
Accessories	149
Clothing	74%

Make sure to rename the visuals according to the filters applied.

Adventure Works Quarterly Performance

File, Share, Chat in Teams, Comment, Subscribe to dashboard, Edit

Ask a question about your data

Quarter Sales: 2.37K

Same Period Last Year: \$265.12K

Profit: 261.72

Profit Margin: 0.06%

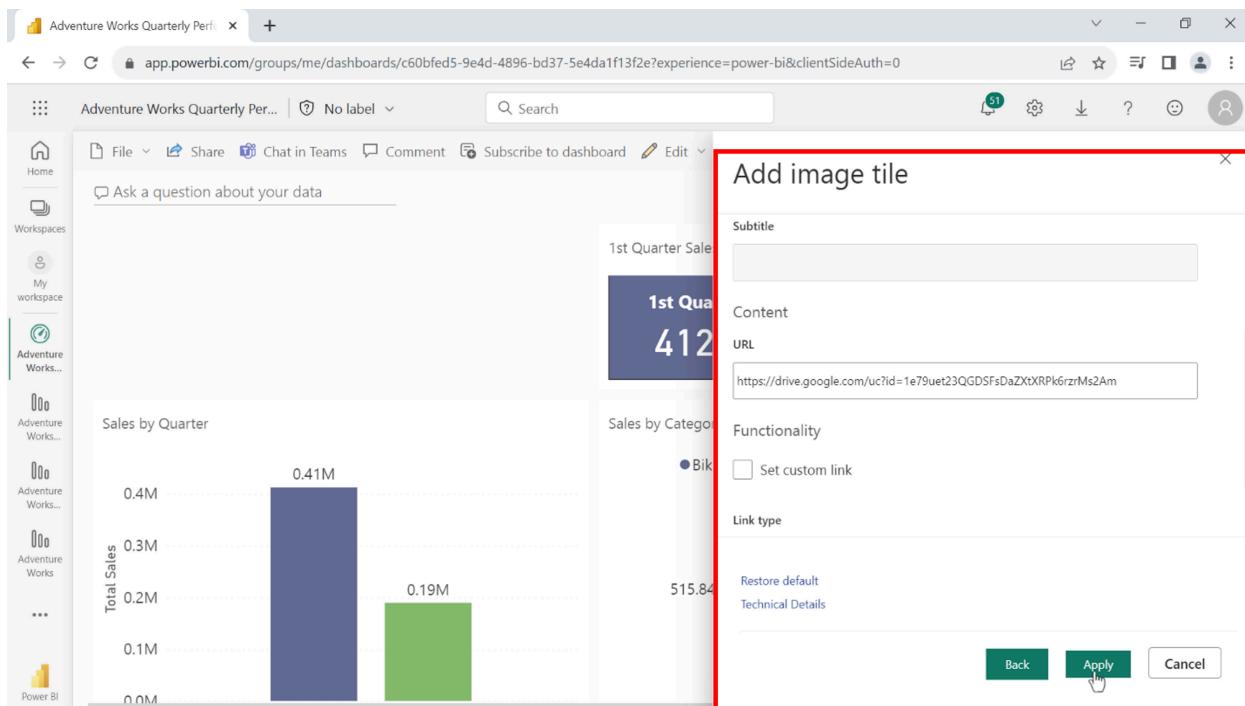
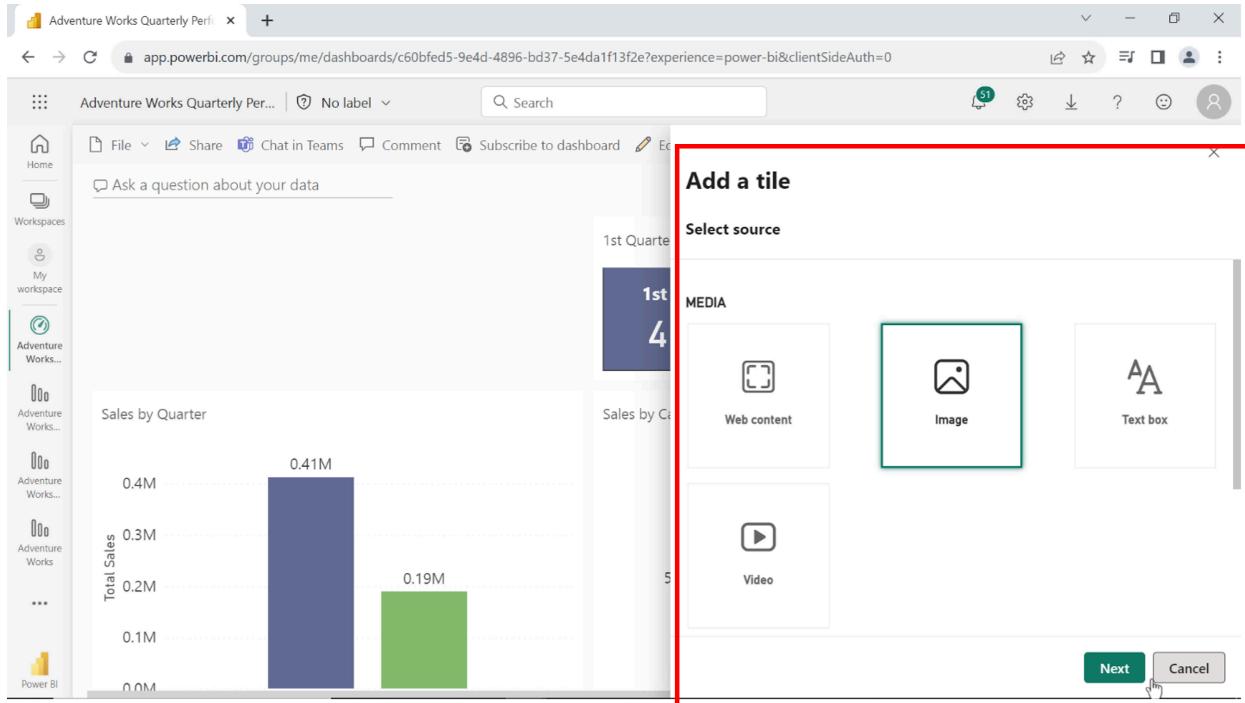
Sales by Category:

- Bikes: 515.84K
- Components: 76.1K
- Clothing: 7.7K
- Accessories: 341.45K

Sales by Country:

- United States: 97.29K
- Canada: 46.74K
- Australia: 42.75K
- France: 39.91K
- United Kingdom: 33.73K
- Germany: 0.00K

1. Add the Adventure Works logo to the dashboard. Publish the logo file that you have downloaded online without applying any security credentials and add it to the dashboard. You need to adjust the size and position of the logo to the dashboard.



1. Provide a title and key takeaways from the story. You can add a text box to each to add a title and to describe the key insights.

The screenshot shows a Power BI dashboard titled "Adventure Works Quarterly Perf...". The dashboard includes a logo for "ADVENTURE WORKS", a bar chart for "Sales by Quarter" comparing Qtr 1 (0.41M) and Qtr 2 (0.19M), and a card for "1st Qua" showing the value 412. A modal window titled "Add textbox tile" is open, prompting the user to enter a title, subtitle, and content. The content area contains the text "Sales performance for the 1st quarter of 2020".

Quarter	Total Sales
Qtr 1	0.41M
Qtr 2	0.19M

Sales by Quarter

Sales by Category

1st Qua 412

Add textbox tile

Title:

Subtitle:

Content:
Fill in the details.

Bik

Sales performance for the 1st quarter of 2020

Technical Details

Back Apply Cancel

The screenshot shows a Power BI dashboard titled "Adventure Works Quarterly Perf...". The dashboard features a donut chart with four segments: Bikes (blue), Components (green), Clothing (yellow), and Accessories (red). The blue segment is labeled "515.84K", the green segment is "76.1K", the yellow segment is "7.7K", and the red segment is partially visible. Below the chart, three bullet points are displayed: "the same period last year.", "arter despite increase in sales.", and "underperforming salespersons." A red box highlights a tooltip titled "Tile details" that contains three numbered statements: "1. The sale for the 1st quarter is higher than the same period last year.", "2. The profit margin is negligible for the quarter despite increase in sales.", and "3. Stephen, Amy, and Syed are consistently underperforming salespersons." At the bottom right of the tooltip, there are "Apply" and "Cancel" buttons.

1. You need to optimize the dashboard for cellular devices. In Power BI service, open the dashboard you have created and from the Edit drop down select Mobile layout. Adjust the tiles scales and position to fit the mobile screen.

Adventure Works Quarterly Perf... +

app.powerbi.com/groups/me/dashboards/c60bfed5-9e4d-4896-bd37-5e4da1f13f2e?experience=power-bi&clientSideAuth=0

Adventure Works Quarterly Per... | No label

Search

File Share Chat in Teams Comment Subscribe to dashboard

Ask a question about your data

Home Workspaces My workspace Adventure Works... Adventure Works... Adventure Works... Adventure Works... Adventure Works... Power BI

Adventure Works Sales performance for the 1st quarter of 2020

1st Quarter Sales 412.37K Same Period Last Year \$265.12K Profit 261.1

Sales by Quarter

Total Sales

0.4M 0.3M 0.2M 0.19M 0.41M

Sales by Country

United States Canada Australia France United Kingdom Germany

23.74K 27.64K 30.66K 69.22K 239.46K

Sales by Category

Bikes

Adventure Works Quarterly Performance Dashboard

The dashboard displays sales performance for the 1st quarter of 2020. Key metrics include 1st Quarter Sales at 412.37K, Same Period Last Year at \$265.12K, and Profit at 261.1. It includes three main visualizations: a bar chart showing Sales by Quarter (Qtr 1: 0.41M, Qtr 2: 0.19M), a donut chart showing Sales by Country (United States: 23.74K, Canada: 27.64K, Australia: 30.66K, France: 69.22K, United Kingdom: 239.46K, Germany: 0), and a bar chart showing Sales by Category (Bikes).

Adventure Works Quarterly Perf... +

app.powerbi.com/groups/me/dashboards/c60bfed5-9e4d-4896-bd37-5e4da1f13f2e/mobileAuthoring?experience=power-bi&clientSideAuth=0

Adventure Works Quarterly Per... | No label

Search

Unpin all tiles Reset tiles Web layout Delete mobile layout

Home Workspaces My workspace Adventure Works... Adventure Works... Adventure Works... Adventure Works... Adventure Works... Power BI

Sales by Quarter

Total Sales

0.3M 0.2M 0.1M 0.0M 0.19M 0.41M

Sales by Country

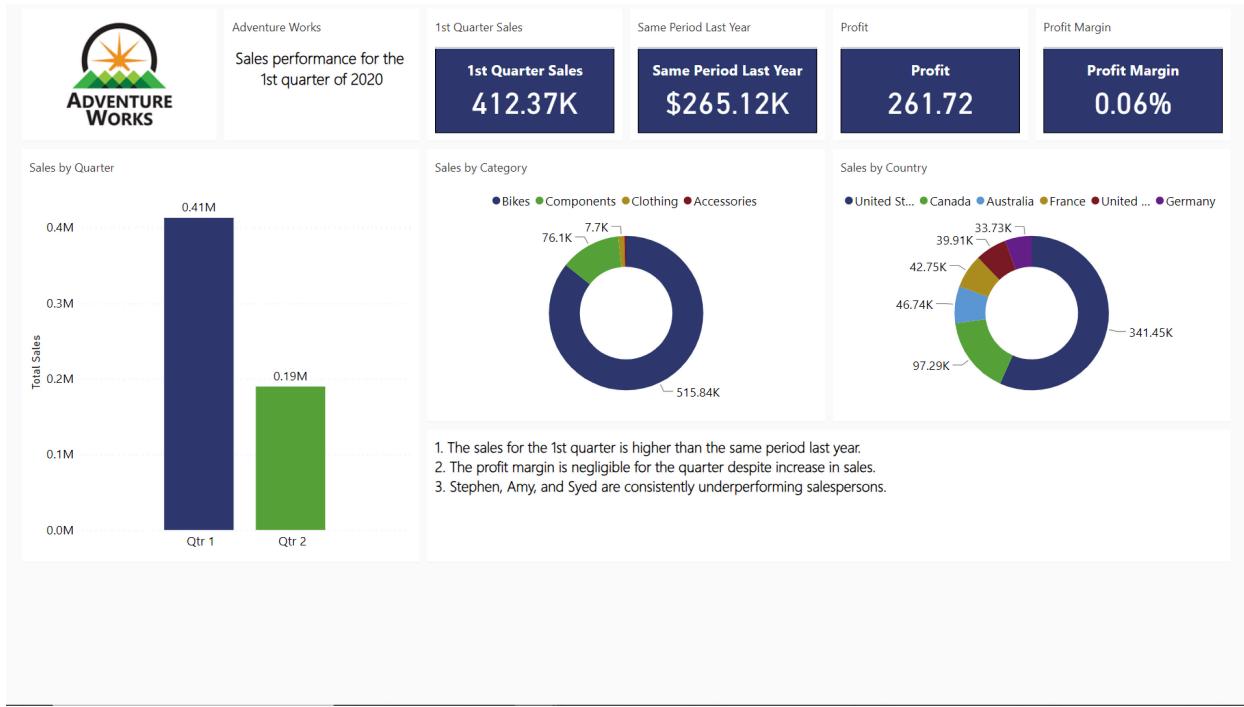
United States Canada Australia France

23.74K 27.64K 30.66K 69.22K 239.46K

Unpinned tiles

Adventure Works Quarterly Performance Dashboard

The dashboard displays sales performance for the 1st quarter of 2020. Key metrics include 1st Quarter Sales at 412.37K, Same Period Last Year at \$265.12K, and Profit at 261.1. It includes three main visualizations: a bar chart showing Sales by Quarter (Qtr 1: 0.41M, Qtr 2: 0.19M), a donut chart showing Sales by Country (United States: 23.74K, Canada: 27.64K, Australia: 30.66K, France: 69.22K, United Kingdom: 239.46K, Germany: 0), and a bar chart showing Sales by Category (Bikes).



Conclusion

Your objective for this exercise was to complete the following tasks:

- Review the dataset and identify the measures and fields needed to support your story.
- Create a report in Power BI desktop by appropriate selection of chart which shows clarity to present your story.
- Publish your report on the Power BI service and create a dashboard for the executive board.
- Drive insights from your story that you can convey to stakeholders.

With these steps, you have successfully crafted a story as a Power BI report for the sales team. The report contains slicer and filter functionality which will enable users to interactively navigate the report to compare the sales value between quarters. Similarly, you also published the report to design and optimize the dashboard for the executive board. Use of slicers and filters sometimes, eliminating the need to write DAX logic to answer specific business questions.