

Dashboards and

Data Discovery

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MICROSTRATEGY: DATA DRIVEN INTELLIGENCE

MicroStrategy provides analytics that empower and help enterprises unleash the full potential of their data. MicroStrategy's suite of capabilities includes powerful data discovery tools that let you explore data, answer pressing business questions, and easily share those insights. With an intuitive tool-set and built-in templates, MicroStrategy makes it easy to build compelling visualizations and interactive dashboards in a matter of minutes.

In this course, we will focus on MicroStrategy Web -- a browser-based client interface that enables IT to satisfy the diverse analytics needs of every enterprise user. Using virtually any browser, MicroStrategy Web users can access the full spectrum of MicroStrategy's analytics capabilities.

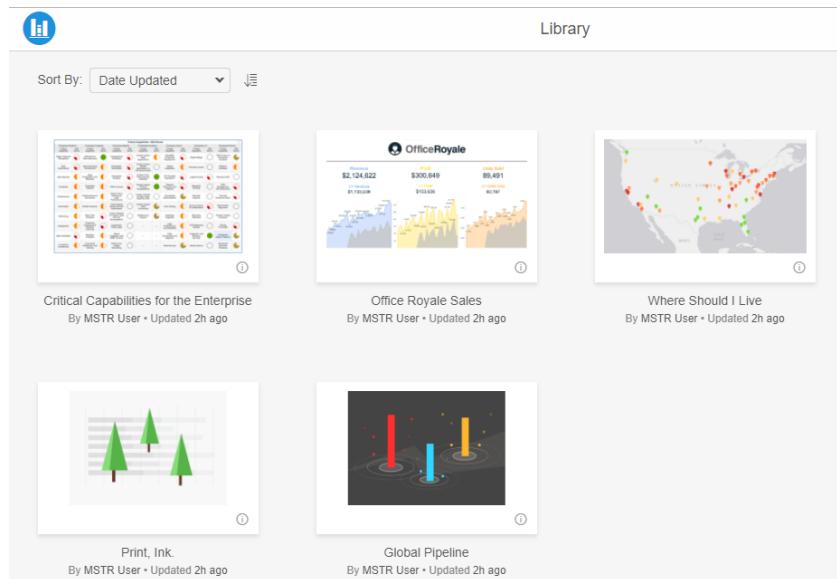
MicroStrategy also has a tool with the same core analytical features that does not require the MicroStrategy Enterprise, called Desktop. To learn more about MicroStrategy Desktop, take the *10.114 Visual Data Discovery - MicroStrategy Desktop* course.

Dossiers: Create an analytical book of business

With dossiers, MicroStrategy's next generation dashboarding interface, you can transform your data in minutes to create visually appealing dossiers that tell an analytical story with your business intelligence. You can drag and drop data to customize views, sort, pivot, drill, and use aggregations to apply statistical analysis. Quickly visualize data with out-of-the-box grids, graphs, charts, and maps to help you easily discover patterns, trends, and relationships. Dossiers are organized in pages and chapters, that make it easy to navigate and share the reports and visualizations



Easily collaborate and share dossiers using MicroStrategy Library. MicroStrategy Library provides a simple visual library to find the dossier content you and your colleagues need. With live collaboration, commenting, and notifications, your team can stay in sync. MicroStrategy Library makes sharing business intelligence simple.



Dashboarding foundations

MicroStrategy Web is designed for business users who need to visualize, analyze, and deliver data. Basic steps involved in creating a dossier are outlined below:

- Import and clean your dataset.
 - There are multiple options to import your data to MicroStrategy. The data can be imported from a file (such as an Excel spreadsheet), a database, a web page (Facebook, Twitter, Google, etc.), or by using the results of a custom database query.
- Use the dataset to create visualizations.
 - Attributes (business concepts) and metrics (business measures and key performance indicators) are the foundation of a MicroStrategy report -- they ultimately comprise the datasets used in MicroStrategy objects.
- Highlight particular business trends or focus on specific data points by applying options to the visualization.
- Customize the dossier's formatting for your business needs.
- Share the dossier and collaborate with relevant users in MicroStrategy Library.

Exercise 1.1: Explore a sample dossier

Let's view and interact with a sample dossier, Office Royale Sales, in MicroStrategy Library. The Office Royale sales team uses this dossier to understand key sales performance pipeline metrics. Chapters include an opportunity analysis, individual sales rep performance, and performance by product categories.

As a Regional Sales Manager, you will create a business plan for the year ahead using the dossier information.

Download and save external files

1 The Instructor will send you the following files:

- Office Royale Sales.mstr
- Airline Data.xlsx
- Article Database.xlsx
- Facebook data.csv
- NewCompanyData.xlsx
- NewCompanyDataAll.xlsx
- Supplier Report by Region.xlsx
- Worldwide Emissions 1990-2010.xlsx
- Campus Recruiting.mstr

2 Create a folder on your computer titled: Jump Start Exercise Files.

3 Download and save all of the exercise files to this folder. Make sure to store the folder in a convenient location as we will be accessing it regularly.

Access the MicroStrategy Cloud environment

Log in to MicroStrategy Cloud

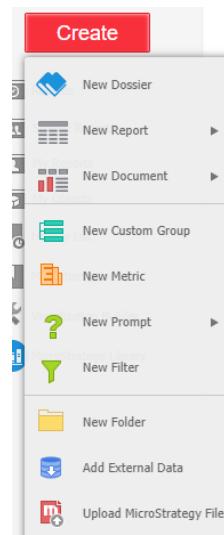
- 1** In the Welcome to MicroStrategy on AWS email, click **Access MicroStrategy**.
- 2** In the Login MicroStrategy web page, scroll down, and click **Credentials**.

The system displays the option to log in using Standard authentication.

- 3 In the **User Name** and **Password** boxes, type (or copy and paste) the login credentials provided in the MicroStrategy on AWS email.
- 4 Click **Login**. The MicroStrategy Cloud landing page displays in the Chrome browser window of your cloud environment.
- 5 On the landing page, hover over **MicroStrategy Web** and click **Launch**.
- 6 On the next page, click **Go to MicroStrategy Web**.

Add the Office Royale Sales dossier to MicroStrategy Web

- 7 You are now on the Shared Reports part inside the MicroStrategy Tutorial project. To add the dossier to your MicroStrategy Web environment, click **My Reports** on the menu on the left.
- 8 Click **Create**.



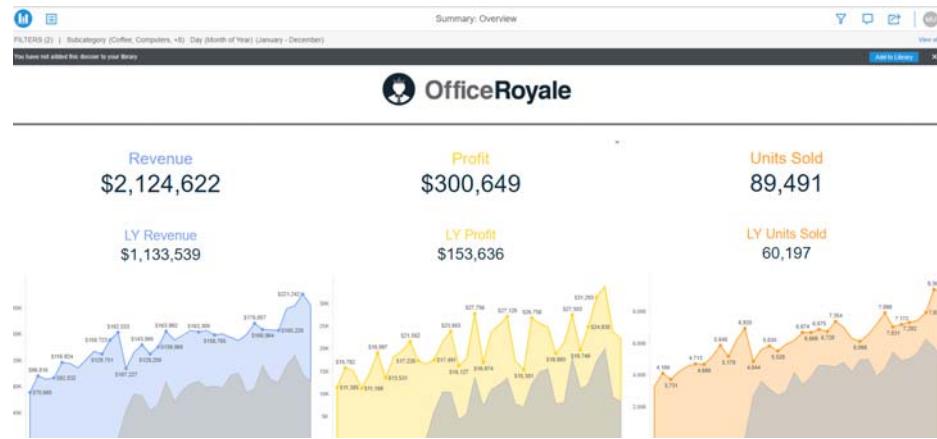
- 9 Select **Upload MicroStrategy File**.
- 10 Navigate to your Jump Start Exercises folder, then double-click the **Office Royale Sales.mstr** file.

Launch the dossier in MicroStrategy Library

- 1 On the Upload window, click **Share**.

- 2 From the Share: Office Royale Sales window click **Library Link**.
- 3 Select **Launch** under the URL to launch your Library.
- 4 Log in to MicroStrategy Library using your **User Name** and **Password** provided by your instructor.

You are now on the Summary chapter, Overview page of the dossier. This page outlines key performance indicators across the past calendar year for Office Royale.



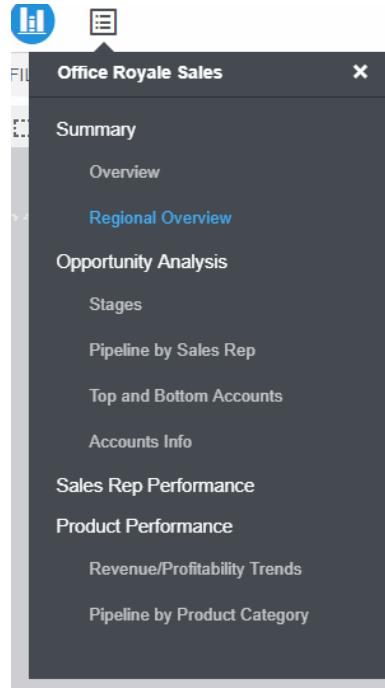
Add the dossier to your Library

When you add a dossier to Library, you will be able to directly access your content simply by logging into your Library. Whether you log in to your Library via Web or on a mobile device, you can quickly find the content you need.

- 5 Click **Add to Library** at the top of the page. You will now be able to access the dossier at any time via the Library home page.

Interact with the Office Royale Sales dossier

- Now that you've taken note of KPIs across the year, you would like to view information for your region, North America. Click the **Table of Contents** icon to view all chapters and pages in the dossier.

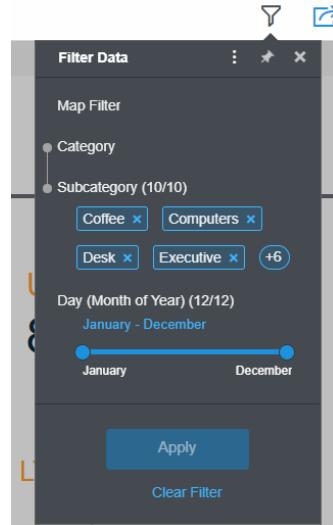


- Select the **Regional Overview** page, under the Summary chapter.



- Dossier authors can add innovating filtering options, so users can customize the data shown in each chapter when interacting with dossiers in Library. Click

the **Filter icon**  to view the filters the Office Royale dossier author added to the Summary chapter.



- 4 Visualizations, such as bar charts, can be added as interactive filters for each chapter. Visually presenting filters in the Filter Panel enables the user to make more informed selections and frees up page space to focus on the results. The Office Royale dossier author has chosen to add a map. From the **Filter Data** menu, click **Map Filter**.



The bubbles on the map represent Office Royale's office locations, sized and colored by revenue.

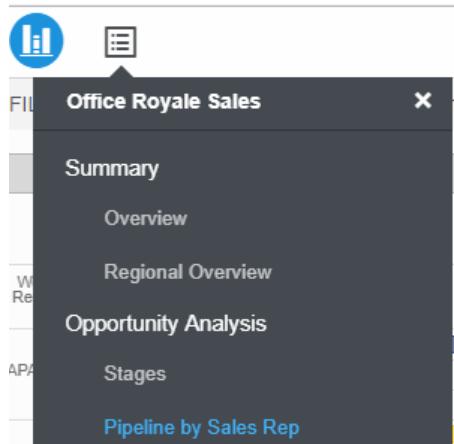
- 5 Your sales region includes Pennsylvania, and you would like to view more information for the city in your region with the highest revenue. Click the **dark**

blue bubble, then click **Apply** on the filter panel to narrow the data to show only information for Langhorne, PA.



The page now reflects data for Langhorne across the year.

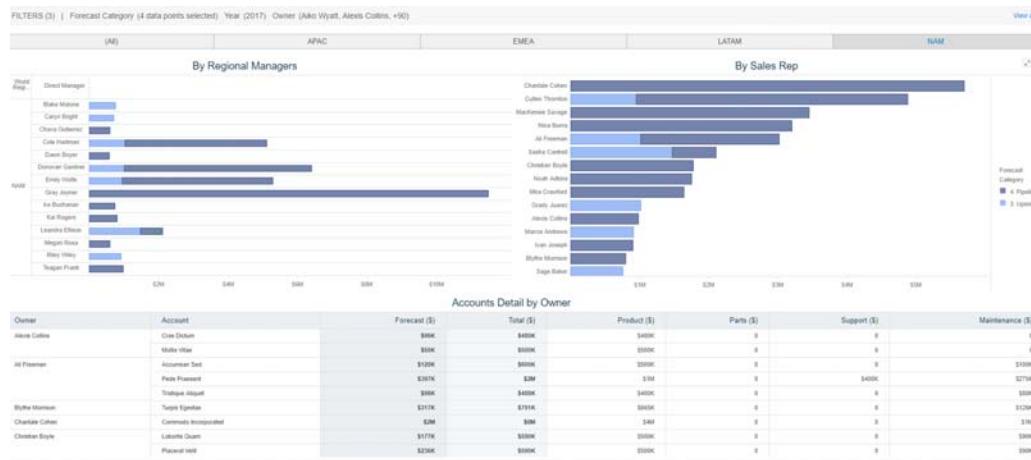
- 6 The Langhorne office had impressive growth last year and you would like to share this information with your counterpart. Click the **Comment** icon to add a comment.
- 7 In comments, you can tag users and add filtering states using the @ symbol. To tag a user, type @ then their username. To save your filtering state, type @filter. In the **Add Comment** box, type **@MSTR User, take a look at the Langhorne numbers: @filter**. Then click **Post**.
- 8 To utilize the comment filter, first clear your map filter. Click the **Filter** icon.
- 9 Click **Clear Filter**, then click **Apply**.
- 10 Click the **Comment** icon, then click **@filter**. The chapter will show only Langhorne data.
- 11 Now that you have a high-level view of KPIs across last year, you would like to analyze the opportunity for the year ahead. Click the **Table of Contents** icon, then click the **Pipeline by Sales Rep** page, under the Opportunity Analysis chapter.



This page shows opportunity by regional manager, sales rep, account owner, and region.

The map filter has not been applied here -- filters are on a chapter by chapter basis.

- 12** To view this page for your region (North America) only, click **NAM** at the top of the page.



- 13** Use the Table of Contents to navigate to different pages and chapters. What do you think of the Office Royale sales outlook for 2017?

Building your dossier: Import data

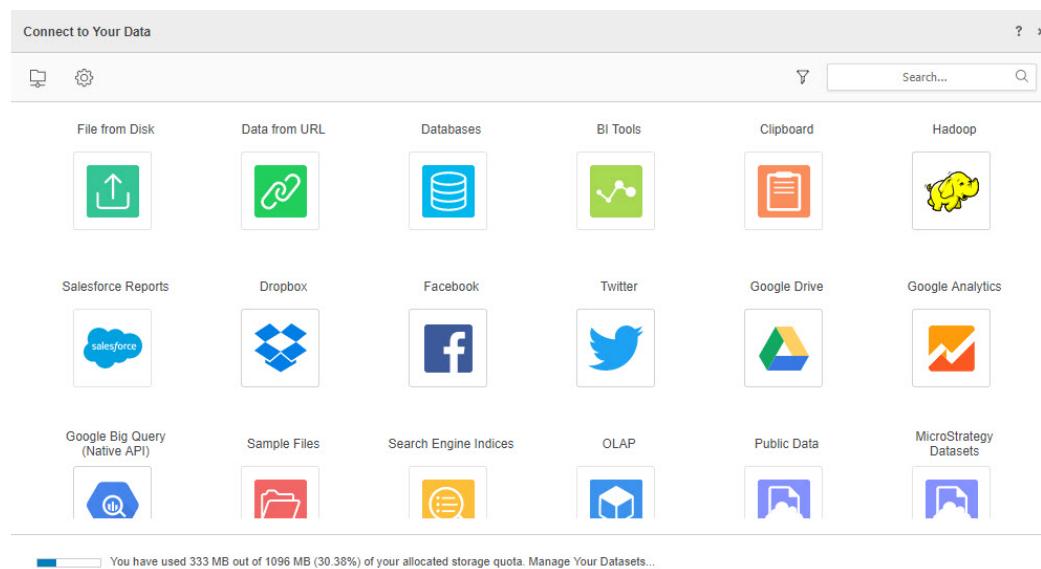
MicroStrategy makes it quick and easy to tap into, blend together, and visualize data of all kinds. From personal spreadsheets and cloud-based data sources like Facebook and Salesforce to big data sources like Hadoop, you can import over 70+ data sources into MicroStrategy Web. There are a variety of ways to import data into MicroStrategy Web to build reports and dossiers. This imported data serves as the dataset for the visualizations placed on the dossier.

Data can be imported from many different data sources such as:

- File sources
- Database sources
- Hadoop
- Salesforce report
- Google Analytics

- Google BigQuery
- Google drive
- Dropbox
- Reports and queries in BI tools
- Facebook
- Twitter

To begin the process, select the type of data source from the menu below.



Prepare data

Often, your data is not consistent within itself. For example, it may have City data that lists New York in some cells and NYC in other cells, and some cells might even be empty. To make sure your imported data is useful to you, you want to prepare or clean your data. This is known as data wrangling. You can do this within MicroStrategy Web without depending on other products such as exporting to Excel and re-importing.

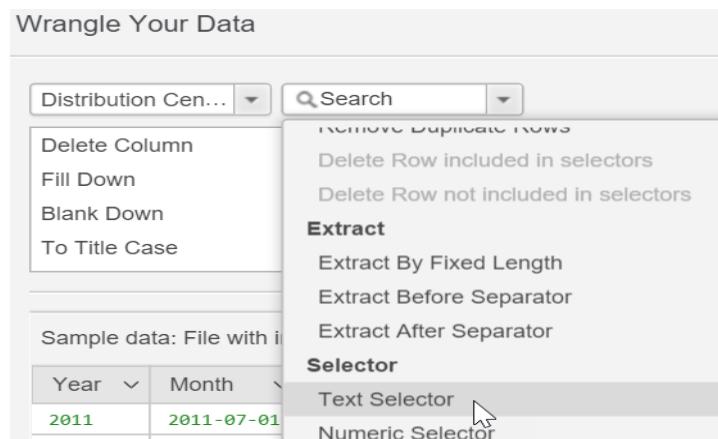
On the Data Wrangle page, you can explore your imported data to evaluate its quality and usability, then manipulate your data to fit your needs before using it in a dossier. You can also use the automatic recommendations MicroStrategy provides to make improvements simpler.

Some examples of data wrangling include:

- Deleting a column or row.
- Removing duplicate cells or rows.
- Extracting data to create a new column.
- Finding and replacing a cell or characters in cells.
- Changing the data type.
- Adding characters before or after the text in cells (padding). For example, if your Region column contains “South” and “North”, you can add “ern” using the Pad After option. The column then contains “Southern” and “Northern”.
- Grouping similar data into a cluster and editing the entire cluster at once.
- Concatenating or combining two columns into a new column.

You can refine the data from different sources to standardize the format across the board. Wrangling can also be used as a data discovery tool and to bypass some traditional extraction and transformation (ETL) -- avoiding the need for IT involvement or the use of third-party ETL tools.

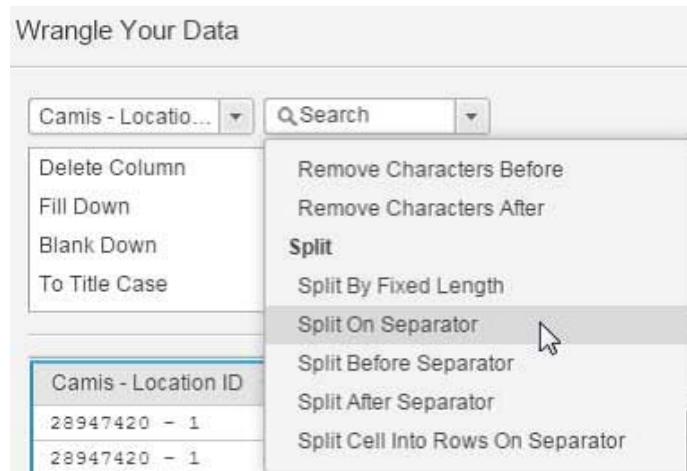
As an example, you can standardize naming conventions, such as Washington, DC versus D.C. From the **Data** menu, click **Text Selector** to easily search and edit the text in columns.



With the Text Selector you can easily edit all of your values at once.



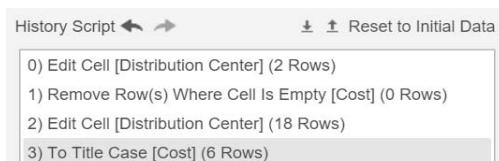
As another example, in this case you want to split the Camis and Location ID column into two columns.



In the Wrangle Your Data window you can choose to split the data and indicate the separator. The data is now split into two columns as seen in the image below:

Camis	Location ID
28947420	1
28947420	1
28947420	1
28947420	1
28947420	1
28947420	1

Finally, you can save time and effort with history scripts that keep track of data transformations so they can be reapplied to other analyses.



Refresh data

To make sure that the data in MicroStrategy Web is up to date when compared against your data sources, you can republish or refresh your datasets. Any new data can either replace or add to your existing data. If you make changes to your source file outside of MicroStrategy Web, you will need to republish/refresh your

data. When you republish imported data, MicroStrategy Web automatically updates the dataset.

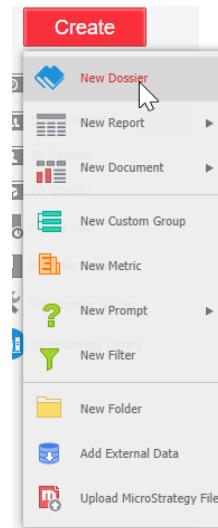
You also have the option to automatically refresh your data and to set the refresh frequency.

Exercise 1.2: Import data

You are a supply chain analyst for a large distribution company. You've been asked to put together a dossier detailing key performance indicators for regional suppliers. To get started, you will import a dataset into a new dossier.

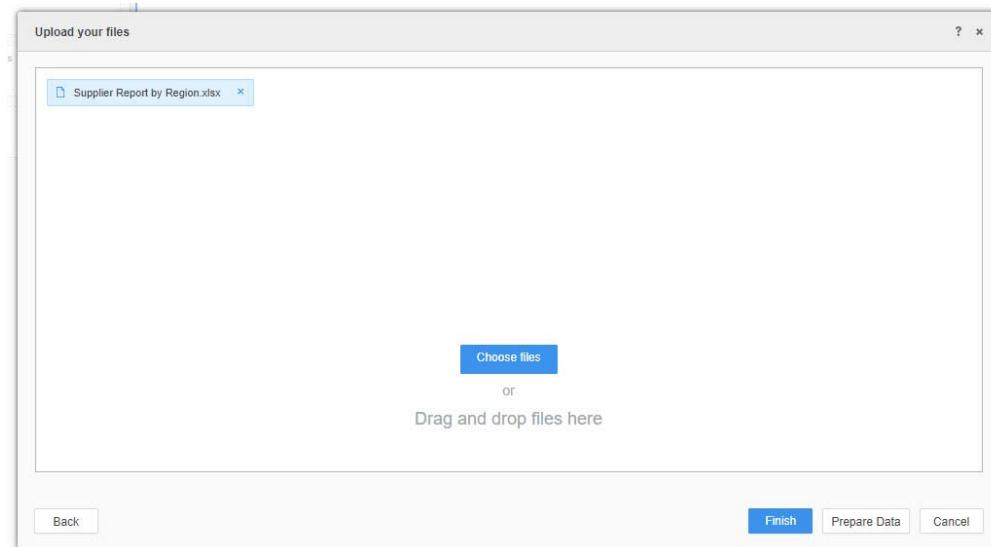
Open a new dossier and add data

- 1 From the Tutorial Homepage, click **Create**, then select **New Dossier**.



- 2 In the Dataset panel, under Add Data, click **New Data**.
- 3 In the Connect to Your Data window, click **File From Disk**.
- 4 Click **Choose files**.
- 5 Select the **Supplier Report by Region.xlsx** file, and click **Open**. *This file should be located in your Jump Start Exercise Files folder.*

- 6 To make sure the data imports properly, click **Prepare Data** in the Upload Your Files window.



- 7 In the new window, select only the **Supplier Overview** worksheet and click **Select**.

When there are multiple worksheets in an imported file, you are prompted to select which worksheet you would like to add.

- 8 Verify that Region, Category, and Supplier are listed as attributes (data that reflects business concepts), and that Cost, Profit, and Profit Margin are listed as metrics (data that reflects business measurements).

Supplier Report by ...

Attributes

- Region
- Category
- Supplier

Metrics

- Cost
- Profit
- Profit Margin

- 9 Click **Finish**.

You have now successfully added a dataset to the dossier.

10 Save the dossier as **Supplier Dossier** in the My Reports folder.

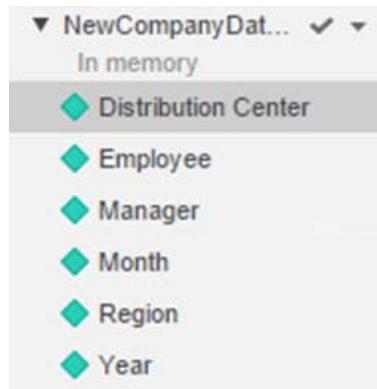
11 Click **Run newly saved dossier**.

Business concepts: Attributes

Attributes are the business concepts that are reflected in your data source. Attributes provide a context in which to report on and analyze business facts or calculations. An attribute on a dossier serves as a label for metrics. Examples of attributes may be Month, Year, Department, or Region. In the following example, Region and Distribution Center are the attributes:

Region	Distribution Center	Revenue	Cost
Central	Fargo	\$187,331	\$149,943
	Milwaukee	\$955,795	\$816,576
Mid-Atlantic	Charleston	\$287,174	\$245,795
	Washington, DC	\$649,390	\$555,149
Northeast	Boston	\$335,446	\$286,479
	New York	\$1,557,325	\$1,327,467
Northwest	San Francisco	\$160,948	\$141,463
	Seattle	\$158,216	\$133,763
South	Memphis	\$458,334	\$394,632
	New Orleans	\$732,924	\$626,649
Southeast	Atlanta	\$221,154	\$189,351
	Miami	\$243,245	\$209,007
Southwest	Salt Lake City	\$164,512	\$135,810
	San Diego	\$624,528	\$534,074
Web	Web	\$1,484,085	\$1,273,654

Attributes are comprised of attribute elements. An attribute element is the value of the attribute. In the example above, Central, Mid-Atlantic, Northeast, etc. are the attribute elements of the Region attribute. Attributes are automatically created by MicroStrategy when you import your data. Attributes are displayed with the following icon on the Dataset panel:



Business measures and KPIs: Metrics

Metrics represent business measures and key performance indicators. A metric on a dossier shows a list of values that are used for analytical calculations. Examples include Revenue, Cost, and Number of Clients. Metrics can be used to show sales trends, profit analysis, growth patterns, and more. In the following example, the metrics in the grid are Revenue and Cost.

Region	Distribution Center	Revenue	Cost
Central	Fargo	\$187,331	\$149,943
	Milwaukee	\$955,795	\$816,576
Mid-Atlantic	Charleston	\$287,174	\$245,795
	Washington, DC	\$649,390	\$555,149
Northeast	Boston	\$335,446	\$286,479
	New York	\$1,557,325	\$1,327,467
Northwest	San Francisco	\$160,948	\$141,463
	Seattle	\$158,216	\$133,763
South	Memphis	\$458,334	\$394,632
	New Orleans	\$732,924	\$626,649
Southeast	Atlanta	\$221,154	\$189,351
	Miami	\$243,245	\$209,007
Southwest	Salt Lake City	\$164,512	\$135,810
	San Diego	\$624,528	\$534,074
Web	Web	\$1,484,085	\$1,273,654

Similar to attributes, metrics are automatically created when you import your data. Metrics are displayed with the following icon in the Dataset panel:



Exercise 1.3: Create a grid visualization

In this exercise, we will use the dataset metrics and attributes to create a simple grid visualization on the Supplier Dossier. Data visualizations are grids, graphs, and other displays placed on dossiers that make your data interactive and easy to interpret. In the next chapter, we will review data visualizations in greater detail.

Create the grid visualization

- 1 If needed, reopen the **Supplier Dossier** from the **My Reports folder**.
- 2 A Grid is the default visualization for dossiers. To ensure you are using the correct visualization, click the **Grid** icon at the top of the Visualization Gallery at the far right.



- 3 To add data to the grid, double-click each **attribute** and each **metric** to populate the grid. Do not add Row Count.

Category	Region	Supplier	Cost	Profit	Profit Margin
Books	Central	Bantam Books	\$705	\$238	25.29%
		Bantam Books	\$129	\$42	24.33%
		Bantam Books	\$102	\$30	22.98%
		Bantam Books	\$249	\$70	22.09%
		Bantam Books	\$656	\$183	21.79%
		Bantam Books	\$129	\$42	24.33%
		Bantam Books	\$102	\$26	20.32%
		Bantam Books	\$335	\$87	20.72%
		Bantam Books	\$681	\$202	22.91%
		Bantam Books	\$187	\$54	22.54%
		Bantam Books	\$105	\$28	21.12%
		Bantam Books	\$503	\$137	21.44%
		Bantam Books	\$1,110	\$288	20.60%
		Bantam Books	\$187	\$54	22.54%
		Bantam Books	\$142	\$32	18.45%
		Bantam Books	\$394	\$107	21.33%
		Bantam Books	\$1,026	\$344	25.11%
		Bantam Books	\$302	\$97	24.33%
		Bantam Books	\$145	\$43	22.98%
		Bantam Books	\$431	\$142	24.72%
		Bantam Books	\$1,197	\$366	23.41%
		Bantam Books	\$259	\$72	21.72%
		Bantam Books	\$139	\$35	20.14%
		Bantam Books	\$347	\$110	24.13%
		Bantam Books	\$1,131	\$317	21.87%
		Bantam Books	\$216	\$62	22.25%

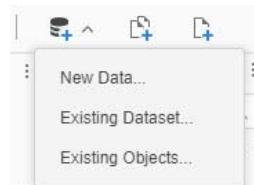
- 4 Save the dossier by clicking the **Save** icon .

Exercise 1.4: Import another dataset

The data science team has prepared another set of useful data for you with additional information on the company's suppliers. In this exercise, you will insert that dataset into the Supplier dossier. Then, you will prepare and wrangle the data before adding it to the dossier to verify accuracy.

Import and wrangle data

- 1 On the toolbar, click **Add Data** and select **New Data**.



- 2 Click **File From Disk**.

- 3 Click **Choose files** and select the **Supplier Report by Region.xlsx** file, then click **Open**.
- 4 In the Upload Your Files window, click **Prepare Data**.
- 5 Clear the **Supplier Overview** check box and only select the **Supplier Report** check box.
- 6 Click **Select**.

There are two issues with this data:

- Order Count and Units Sold should be metrics, not attributes
- Some of the Subcategory fields are missing

Year	Quarter	Subcategory	Supplier	Supplier Latitude	Supplier Longitude	Order Count	Unit Cost	Units Sold
2012	2012 Q1	Art & Architecture	Bantam Books	33.921623	-88.023941	54	112	56
2012	2012 Q1		John Wiley & Sons	40.587107	-79.561629	70	114	79
2012	2012 Q1		Scholten	33.173172	-89.251841	31	115	32
2012	2012 Q1		Simon & Schuster	34.818926	-120.623955	38	111	39

- 7 To convert the Order Count and Units Sold objects to metrics, click and drag the objects to the Metrics area of the table. The table should now resemble the following:

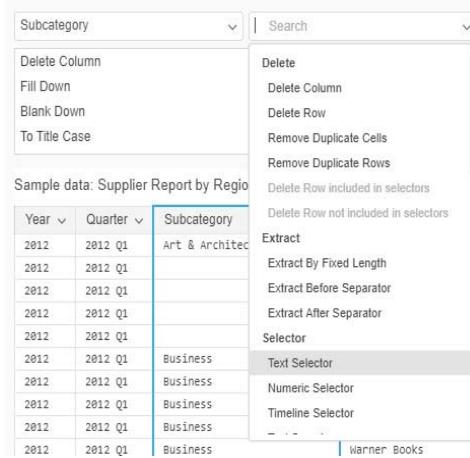
Supplier Report by ...	
Attributes	
◆	Year
◆	Quarter
◆	Subcategory
◆	Supplier
📍	Supplier Latitude
📍	Supplier Longitude
Metrics	
📋	Order Count
📋	Unit Cost
📋	Units Sold
📋	Unit Profit
📋	Revenue

- 8 To fix the missing Subcategory data, click **Wrangle** at the top right of the Preview window. Notice the empty spaces -- these should all be filled with the Art & Architecture subcategory.

Sample data: Supplier Report by Region.xlsx

Year	Quarter	Subcategory	Supplier
2012	2012 Q1	Art & Architecture	Bantam Books
2012	2012 Q1		John Wiley & Sons
2012	2012 Q1		Scribner
2012	2012 Q1		Simon & Schuster
2012	2012 Q1		Warner Books
2012	2012 Q1	Business	Bantam Books

- 9 In the Wrangle Your Data window, select the **Subcategory** column and from the **Function Selector** drop-down list, choose **Text Selector**.

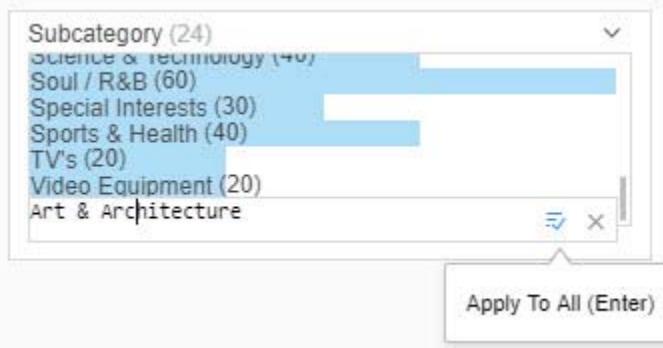


- 10 In the bottom panel, scroll to the bottom of the Subcategory menu, hover your cursor over the **(blank)(4)** option and click **Edit**.



- 11 From the menu, click **Art & Architecture**.

- 12 You will see Art & Architecture replace the blank field. Click **Apply To All** icon.



13 Notice that now the first 5 rows all have Art & Architecture listed as the subcategory. The data is now ready to be imported. Click **Apply**.

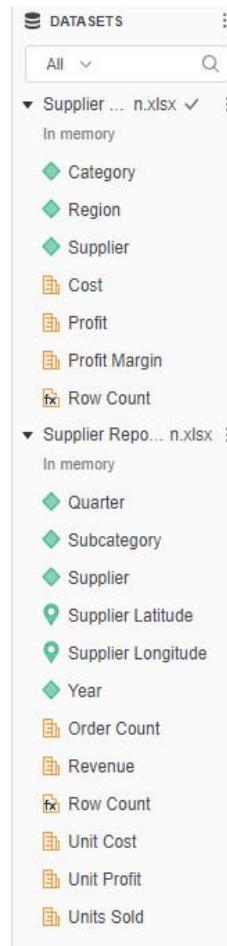
Year ▾	Quarter ▾	Subcategory ▾	Supplier ▾
2012	2012 Q1	Art & Architecture	Bantam Books
2012	2012 Q1	Art & Architecture	John Wiley & Sons
2012	2012 Q1	Art & Architecture	Scribner
2012	2012 Q1	Art & Architecture	Simon & Schuster
2012	2012 Q1	Art & Architecture	Warner Books
2012	2012 Q1	Business	Bantam Books

14 In the Preview window, click **Finish**.

15 Click **Save**.

Now that you've verified and cleaned the data, the dataset is ready to use to build the dossier. With the metrics and attributes, you can create data visualizations that help answer business questions such as which suppliers had the highest cost per unit and which region had the highest profit.

The Dataset panel should match the image below:



CREATE A FIRST CLASS DOSSIER

Once you have imported a dataset into the dossier, you can showcase and explore your business intelligence through visualizations. Visualizations are grids, graphs, and other displays placed on the dossier that make your data interactive and easy to interpret. You can customize the look and feel of the visualizations as well as the data that is displayed. Add multiple visualizations to create an interactive display of key data.

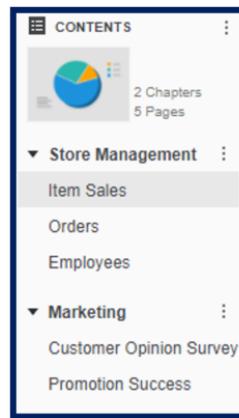
In this chapter we will explore the dossier interface and some of the available visualizations.

Building your dossier

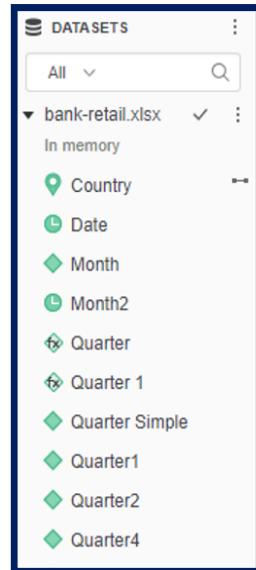
The dossier interface has an intuitive, simple drag and drop design. Panels and tool bars help authors easily design their dossiers.

- Contents panel
 - This panel displays the dossier table of contents showing the chapters and pages of your dossier. Edit, add, and remove pages and chapters in the table of contents. You can also add a thumbnail image for the dossier on this panel. This helps to identify dossiers once added to Library. For

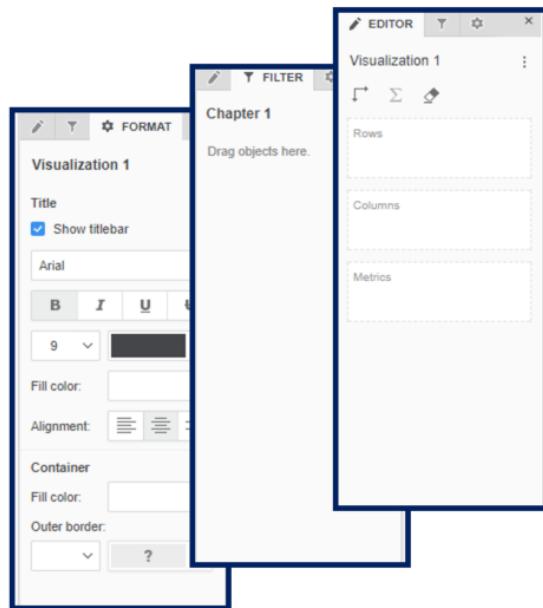
example, you might add an image of a map for a dossier analyzing geographical performance.



- Datasets panel
 - The Datasets panel shows the dataset objects from each dataset in the dossier, organized by the dataset that they belong to. You can also add new datasets through this panel, or click Add Data  from the toolbar.

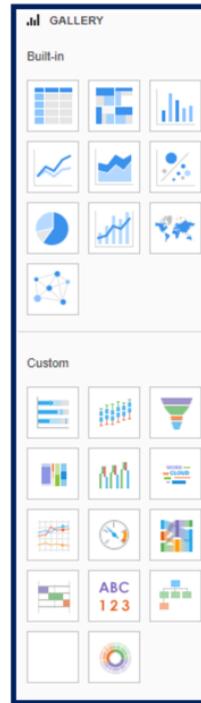


The Format, Filter, and Editor panels are stacked next to the Dataset panel. Flip between these three panels to customize your visualizations and chapters.

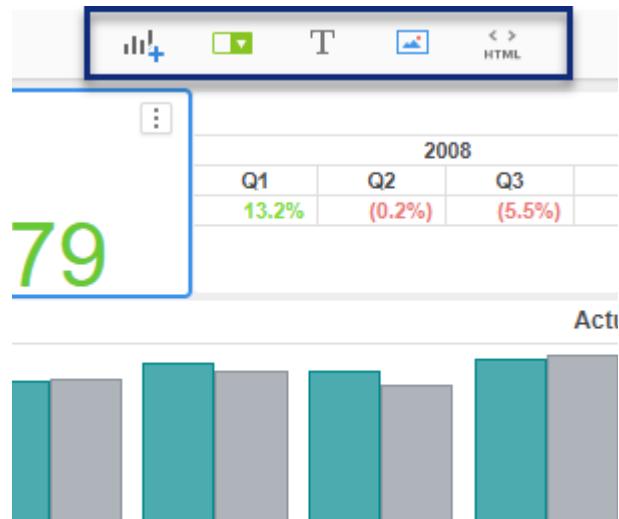


- Format panel
 - To customize your visualizations, use this panel to change your visualization's font and the visualization container to fit your dossier needs. You can also customize visualizations by adding a legend, reference line, changing the shape of a graph, and so on.
- Filter panel
 - To apply filters to limit and specify the data visible on the dossier chapter, use the filter panel. You can use metrics, attributes, or visualizations to filter the data.
- Editor panel
 - To create your visualizations by adding data, use the Editor panel. Drag and drop attributes and metrics into the Rows, Columns, and Metrics boxes to see them appear in the visualization. Options in this panel depend on the selected visualization.

- Visualization Gallery
 - Available visualizations are listed here. Hover over an icon to see the visualization name and data requirements.

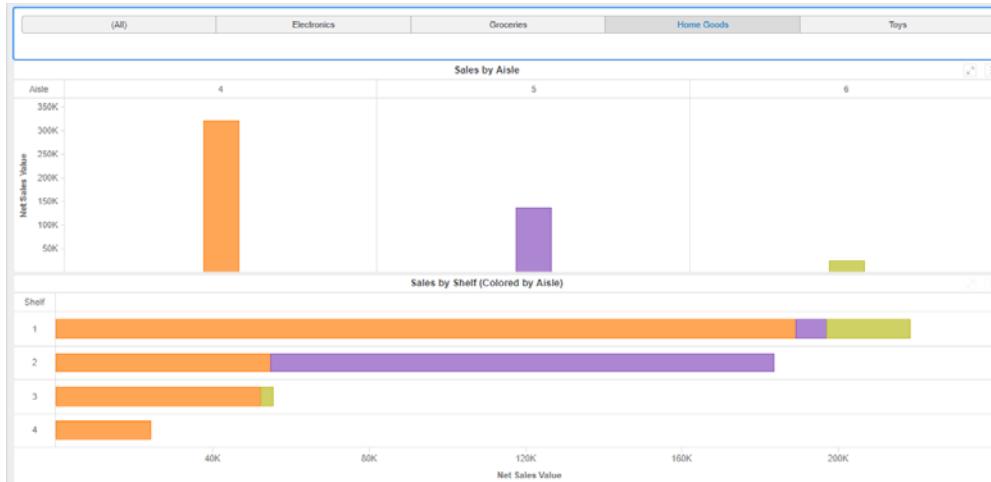


- The toolbar above the dossier page gives you several options to add items to the page.



- Add a visualization.

-  Add a filter to the page to target visualizations. In the example below, users can click the buttons listing each department to filter the visualizations below it to see data for only that department.



-  Add text.
-  Add an image.
-  Add HTML.

Format your dossier for a visually appealing design

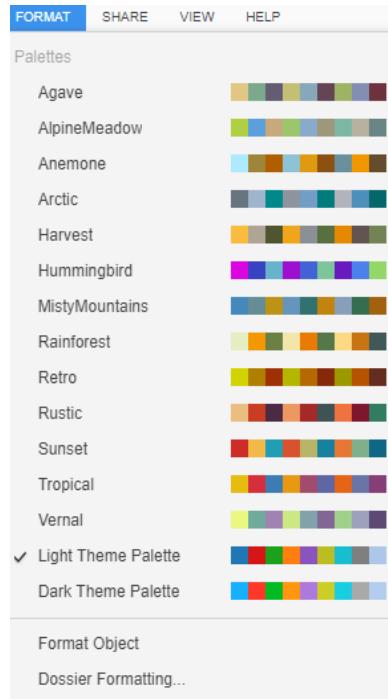
The use and selection of color when designing dossiers can improve the readability of charts, drawing the users' attention to important changes, trends, and measures. You can format font and colors for your dossier that are applied to each page, or format specific visualizations.

From the **Format Menu**, you can choose from a list of predefined color palettes or create your own. These color palettes apply to the entire dossier, however you can select specific objects within the page and use the **Format panel** to change a visualization's formatting.

Custom color palettes

MicroStrategy provides built-in color palettes inspired by nature to help build visually appealing dossiers. Color palettes are applied to all chapters and pages in

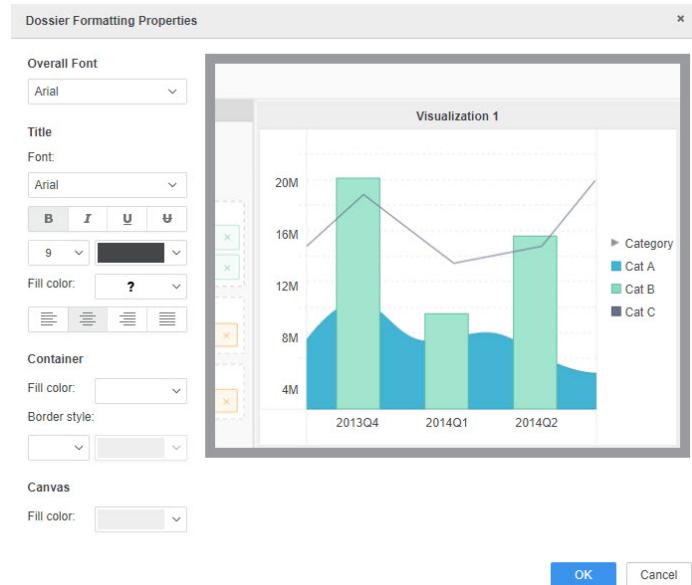
the dossier. To select a new color palette, select the **Format** menu from the toolbar.



Dossier formatting

There may be instances where you want to customize the overall formatting properties, such as text size and visualization border size, to create a uniform dossier feel. From the **Format** menu, select **Dossier Formatting** to customize

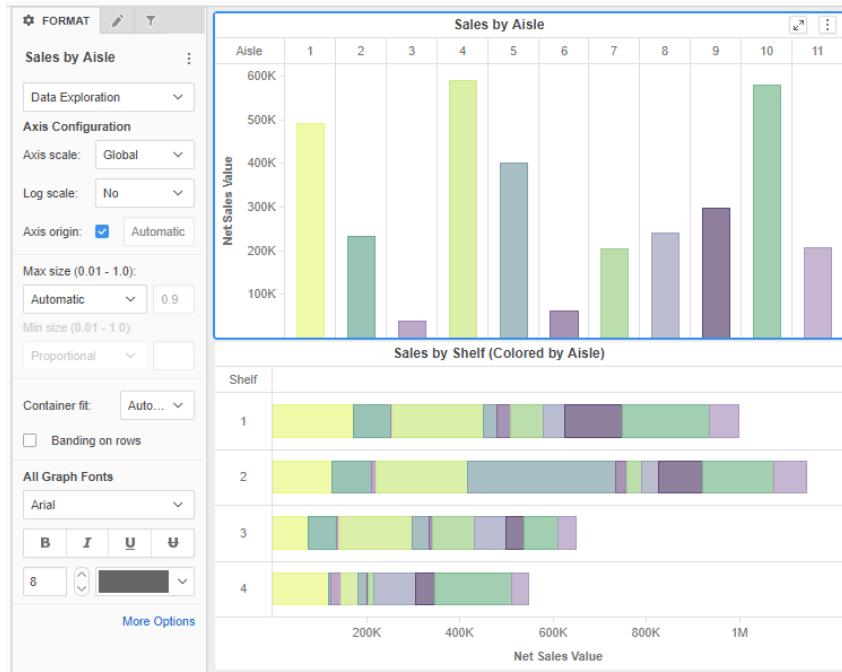
those formatting properties. All selections from this menu are applied to all objects in the dossier, such as visualization titles and text.



Format specific objects

In addition to customizing the entire dossier, you can also format a specific object, such as a visualization or a text box. For example, when formatting a bar graph displaying revenue by item, you can highlight a specific item by changing the color of one bar, remove data labels, and add a reference line that displays the average revenue across items.

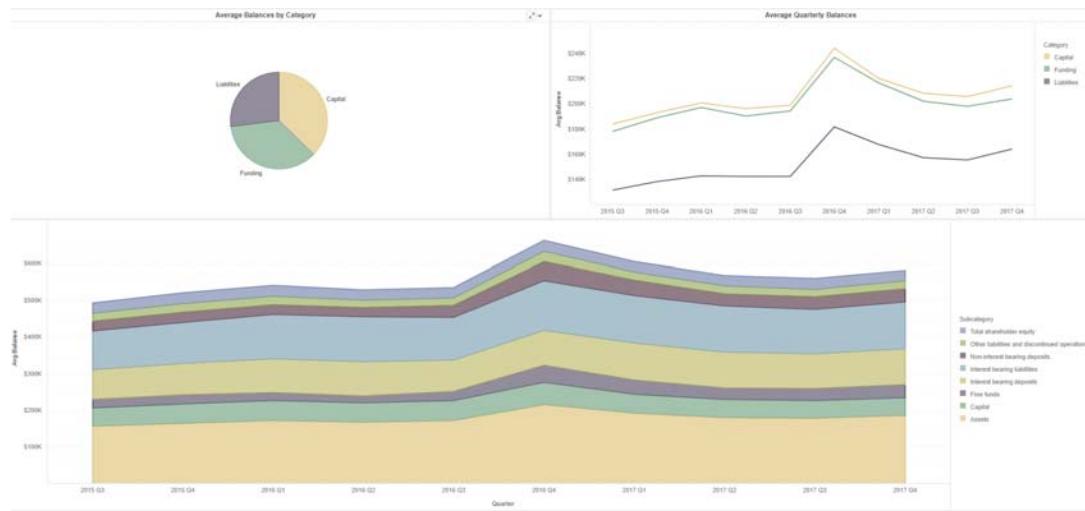
Each visualization has different format options. Click the **Format** panel, then click the object container you would like to edit to format that object. In the image below, the Sales by Aisle visualization has been selected.



Communicate visually: Leveraging data visualizations

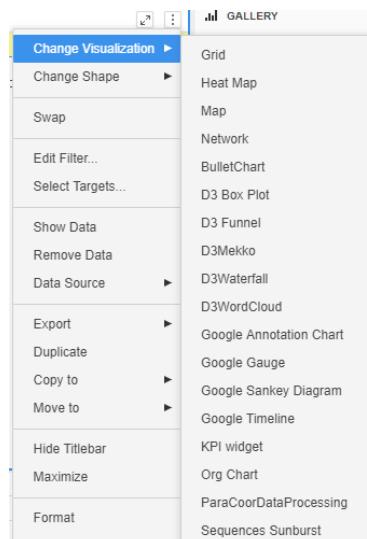
Data visualizations are essential to tell an analytical story through your business intelligence that might have otherwise been lost in a sea of data. Visualizations

form a picture of business trends at a glance, explore relationships between data, and quickly identify areas of improvement.



MicroStrategy Web provides an extensive library of out-of-the-box visualizations you can add to your dossier, found in the Visualization Gallery. Additional visualizations can be found on the Community gallery: <https://community.microstrategy.com/s/gallery>.

You should design your dossier with clear, intuitive, and interactive visualizations that make data analysis easy for business users and encourage follow-up action. Adding visualizations to a page is simple -- select the appropriate visualization from the gallery then drag and drop dataset objects to the **Editor** panel. If you choose to change a visualization, for example, switch from a bar chart to a line chart, click the **menu** icon, hover over **Change Visualization**, then select the appropriate visualization.



You can also use visualizations as filters, which we will discuss in the Analyze Visualizations chapter.

Common dossier visualizations are introduced below, however there are more options in MicroStrategy Web. For more information on leveraging visualizations, take the *Dashboarding and Visualizations 10.142* course.

Grid

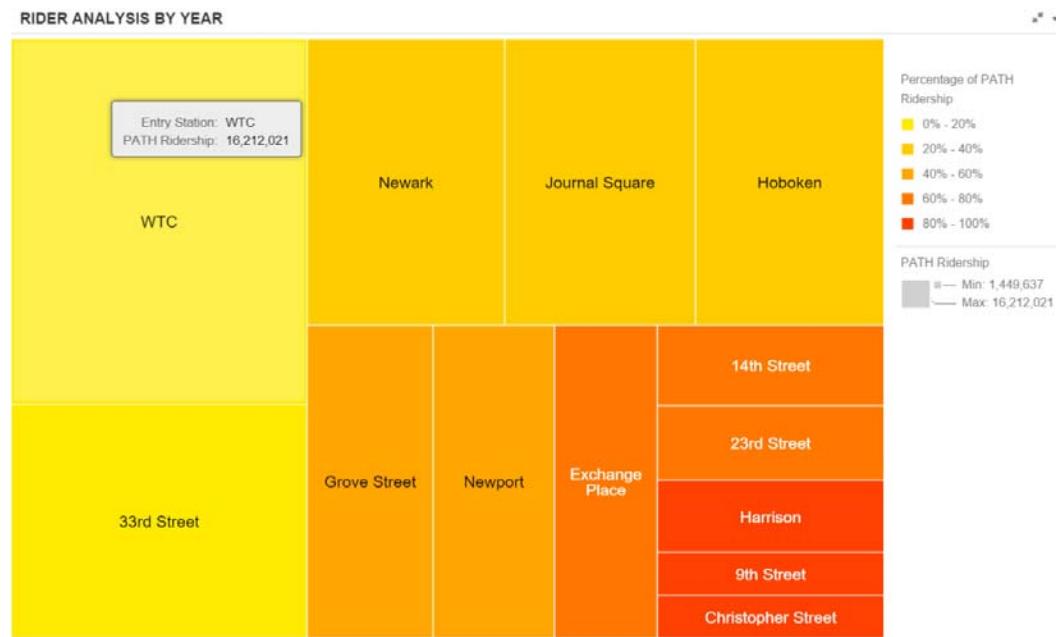
A grid is the most basic visualization. By default, when you add a new visualization without selecting a specific visualization from the gallery, the page displays a grid. You can use a grid to analyze data displayed in a tabular layout.

Category	Region	Cost	Profit	Profit Margin
Books	Central	\$295,518	\$81,328	7193.90%
	Mid-Atlantic	\$264,869	\$72,789	7152.58%
	Northeast	\$506,497	\$139,928	7187.38%
	Northwest	\$101,148	\$26,038	7187.30%
	South	\$319,308	\$86,801	7135.36%
	Southeast	\$133,819	\$36,611	7186.47%
	Southwest	\$220,098	\$60,699	7178.64%
	Web	\$229,582	\$63,072	7233.43%

Heat map

A heat map is a combination of rectangles colored by metrics, each representing an attribute element, which is typically a row entry on a grid report, such as New

York or Boston for the city attribute, that allows you to quickly grasp the status and impact of multiple variables.

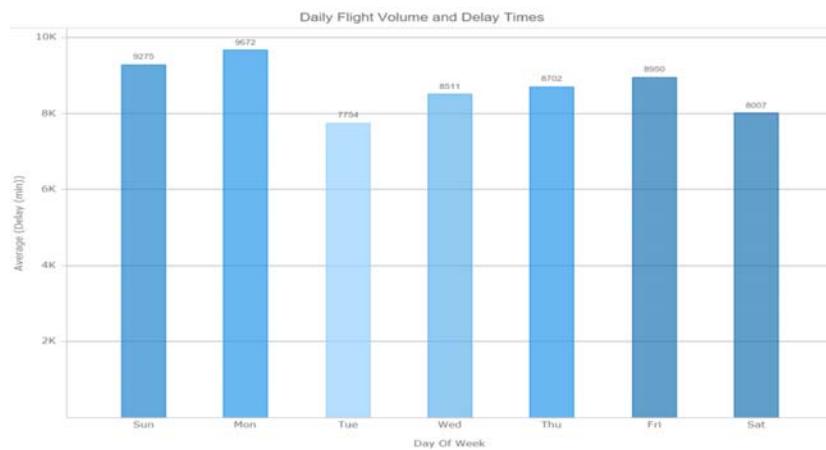


To create a heat map, you need at least one attribute and two metrics. Choose which metric adjusts the size of the boxes (Size By) and which controls the color (Color By).

In the example above, the rectangles represent PATH stations, colored and sized by ridership per year.

Bar chart

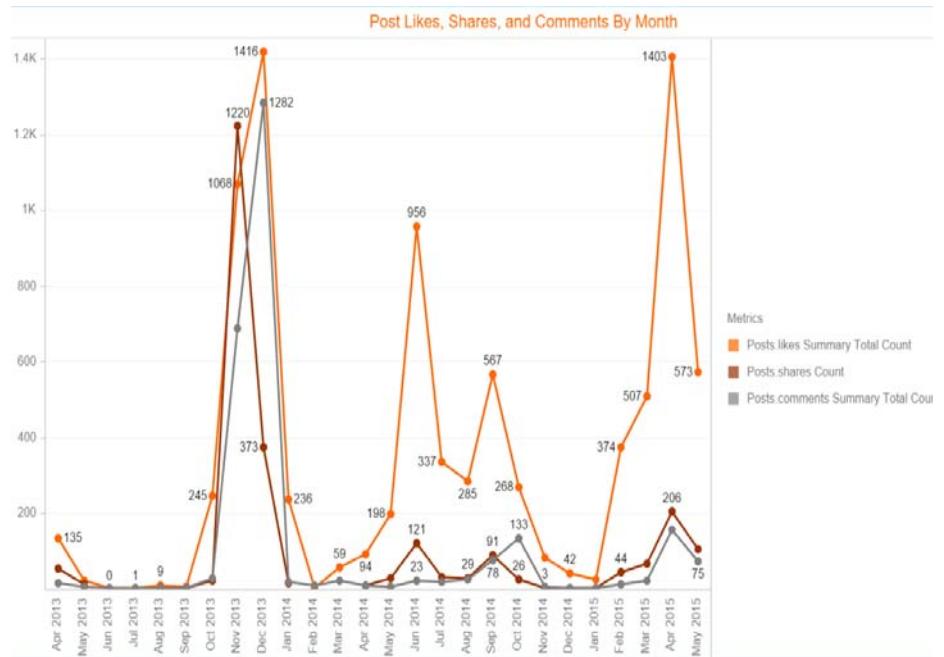
Bar charts compare different groups or track changes over time.



You need at least one attribute and one metric to create a bar chart. You can change the orientation of the graph by placing the objects in the Vertical or Horizontal drop zones in the Editor panel. The graph below shows daily flight delays colored by volume of flights in all US airports.

Line chart

Line charts compare multiple series over time.



The minimum requirements of line charts are one attribute and one metric. You can add additional attributes to the Color By and Break By areas to break the visualization into different series, and create a more detailed visual analysis. You can change the orientation of the graph by placing the objects in the Vertical or Horizontal drop zones in the Editor panel. The line chart above shows Facebook likes, shares, and comments per month for an outdoor adventure company.

Area chart

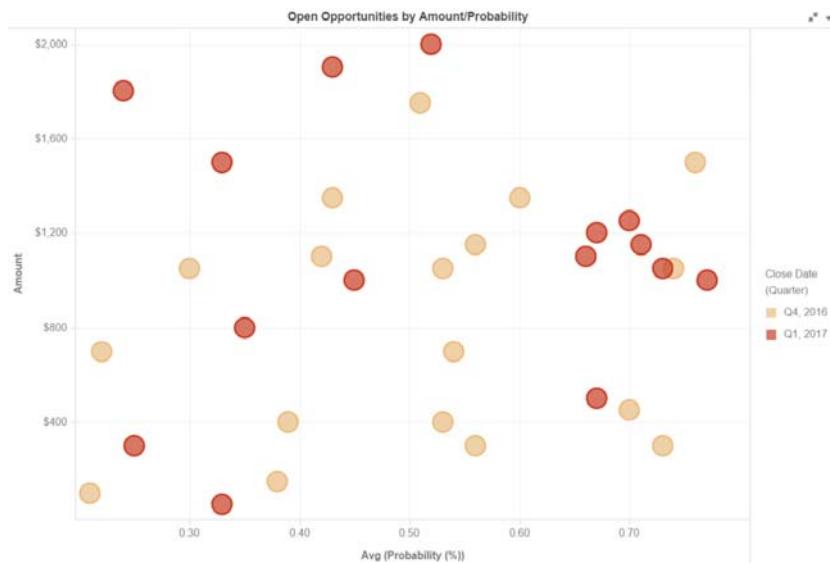
Like line charts, you can use area charts to display the development of quantitative values over an interval or time period.



They are most commonly used to show trends, rather than convey specific values. The colored area between the axis and line represents metric values for each element of the attribute. By selecting more than one metric, you can create multiple areas on one chart.

Bubble chart

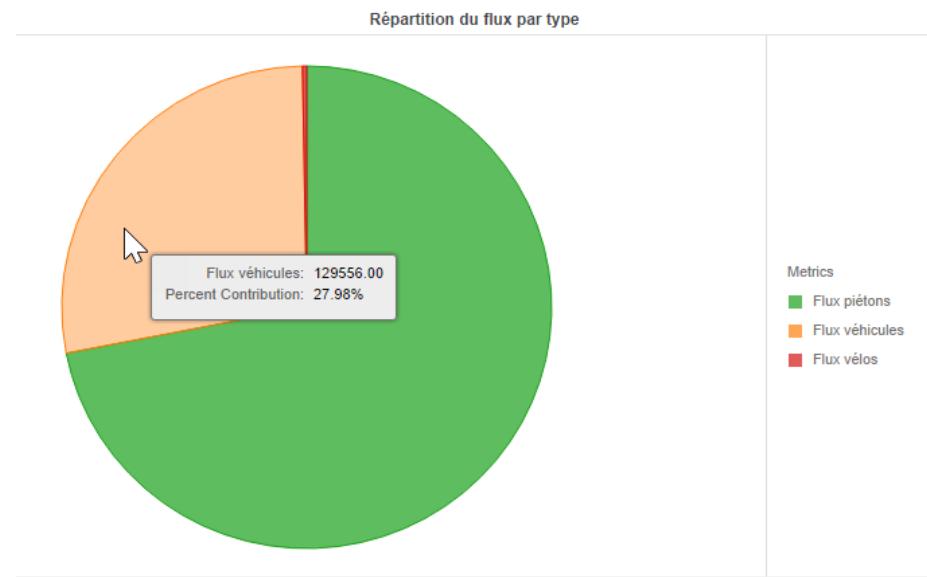
Bubble charts help you analyze the relationship between two variables and detect patterns in the data.



You can customize the bubble chart by adding objects to the Color By and Size By areas. You can also choose which axis your attributes and metrics are added to. This bubble graph uses Salesforce pipeline data to visualize the probability of sale and opportunity amount by quarter.

Pie chart

Pie charts are commonly used to analyze percentage of a total. When using pie charts, be sure to keep the number of components to six or fewer or label components for an easy-to-read chart.

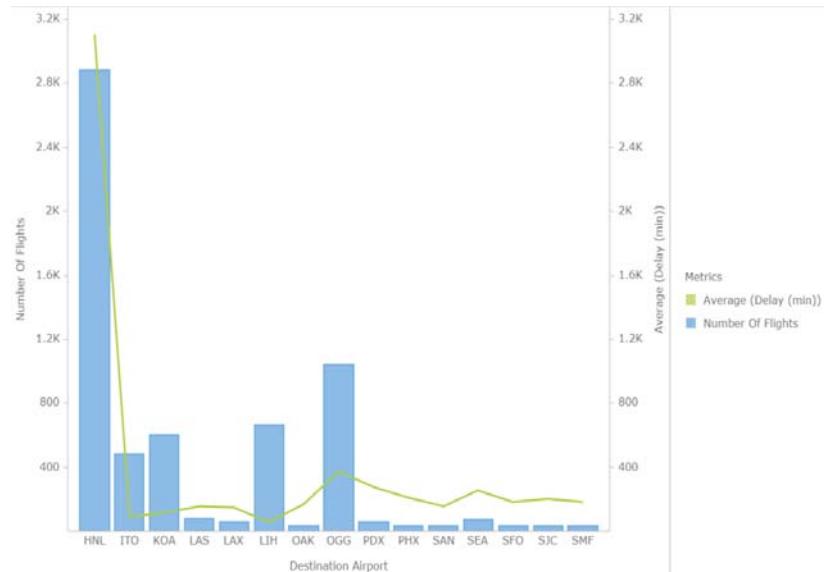


To create a pie chart, place at least one attribute in the Slice area and one metric in the Angle drop zone in the Editor panel.

You can add more than one attribute to the Slice drop zone. This creates additional slices for each combination of attribute elements. You can also add additional metrics to the Angle area. This pie chart displays distribution of transportation in Paris by either foot, bike, or vehicle over a three week period.

Combo chart

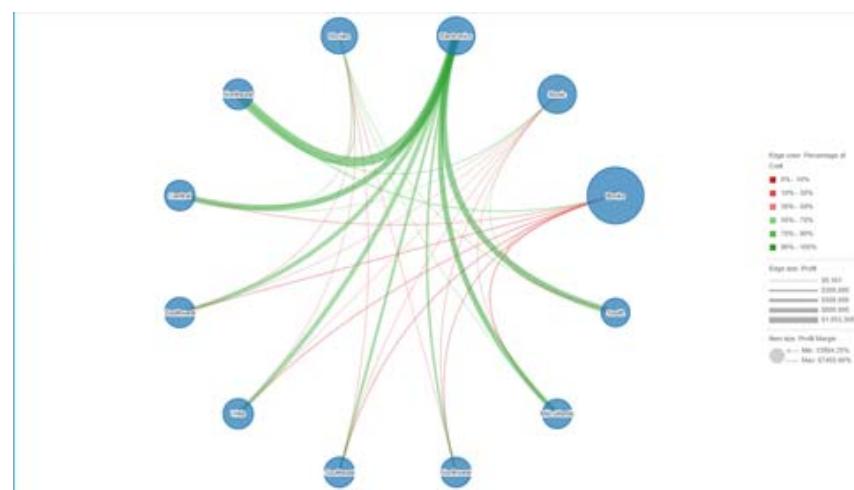
The combo chart displays multiple metrics on one graph with each metric displayed using a different graph type (graph types are customizable).



The minimum requirements for combo charts are two metrics and one attribute. The combo graph above visualizes flight delays by origin airport -- the line shows average delay in minutes, while the bars represent the number of flights per day.

Network visualization

A Network visualization allows you to easily identify relationships between related items displayed by data clusters.



This visualization requires just one attribute, but can be enhanced by additional attributes and metrics. Attribute elements are displayed as nodes, and the lines between them represent the relationship between the elements. Node size, edge thickness, line thickness, and colors are indicative of relationship characteristics.

ESRI map

ESRI map visualizations display your data as markers on an interactive map. For example, you can create a visualization that displays how customer households are clustered in different parts of the country using a density map, or display retail locations as a series of map markers that users can click to view additional information about stores in their area.



To display map markers in the ESRI Map visualization, you must provide a geo attribute that contains longitude and latitude. During the data import process, you can assign an attribute, such as city or state, as a geo attribute. MicroStrategy Web automatically assigns that attribute a latitude and longitude. You can then use that attribute on an ESRI map visualization.

There are three different map styles: marker, density, and area. You also have the option to select the type of map such as topographical, satellite, light gray, and street (see map example above for street view).

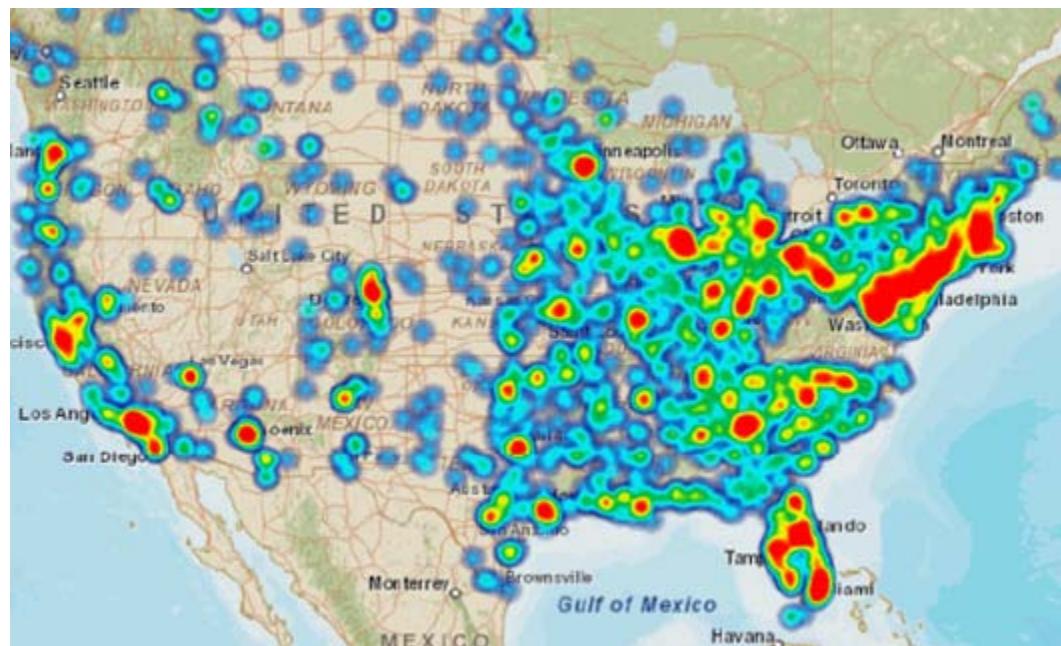
Map markers

Map markers are ideal when you want to display an individual marker for distinct geographic locations, such as a store or supplier location. You can display markers as images or as bubble markers.

Bubble markers have the widest variety of uses. Bubble markers give you the ability to use metrics to size and color the bubbles, as in the example above. These bubbles quickly provide a variety of information and data simply by viewing the map. For example, a retailer can use the bubble sizes to easily identify stores with performance problems by sizing the markers by yearly cost and coloring them by profit margin.

Density map

A density map is a type of ESRI map used to analyze patterns and trends across geographic locations. The trends are displayed by color gradients based on the concentration of geographic data. In the example below, the density map indicates the volume of stores in a given area. Red indicates the highest volume and blue the lowest. The color range can be customized.



Map areas

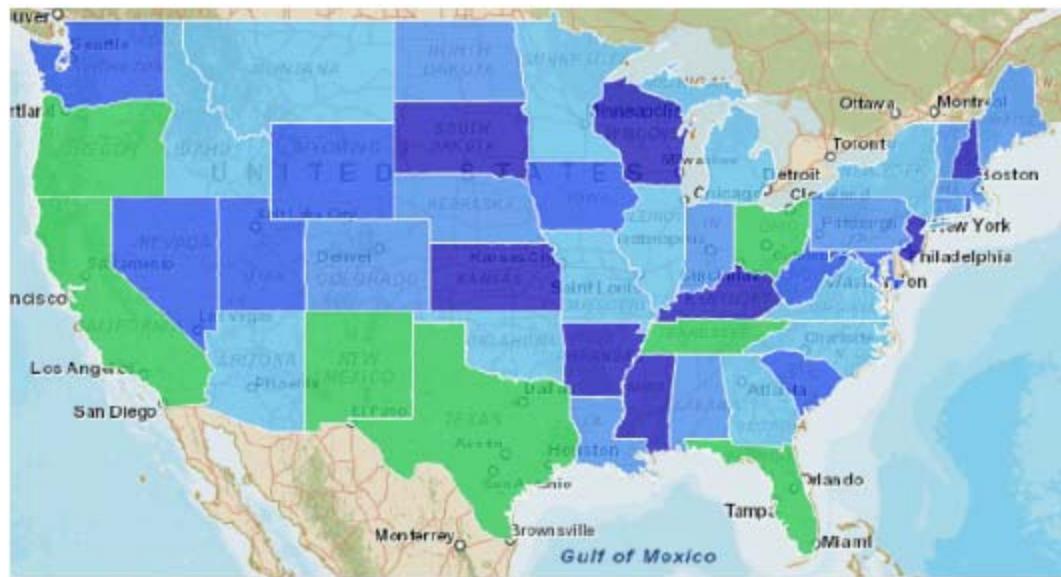
Geographic data such as countries, states, and counties are indicated by colored regions on a map. You can include metrics on the map to differentiate the colors. There are various base maps built into MicroStrategy Web. To use base maps, your attribute must include data that matches the available base maps.

Some examples of base maps include:

- Countries of the world

- United States state names
- United States counties

As an example, if your attribute contains US state name data, you can select the United States state names base map to display the data. As you see below, the base map combined with the attributes shows data on a state level. The metric, if added, changes the color of the map areas.



Exercise 2.1: Enhance the Supplier Dossier with visualizations

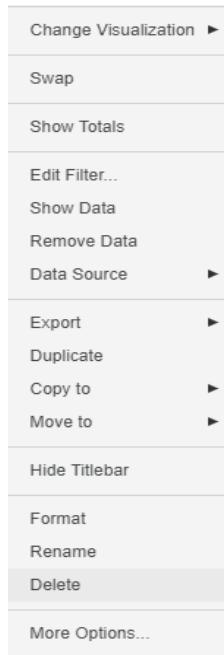
In this exercise, we use the Supplier Report by Region datasets to add visualizations and shape Page 1. We will add three visualizations:

- A bubble map to display profit and revenue by supplier location
- A network visualization to analyze profit by region and category
- A bar chart to show revenue per supplier

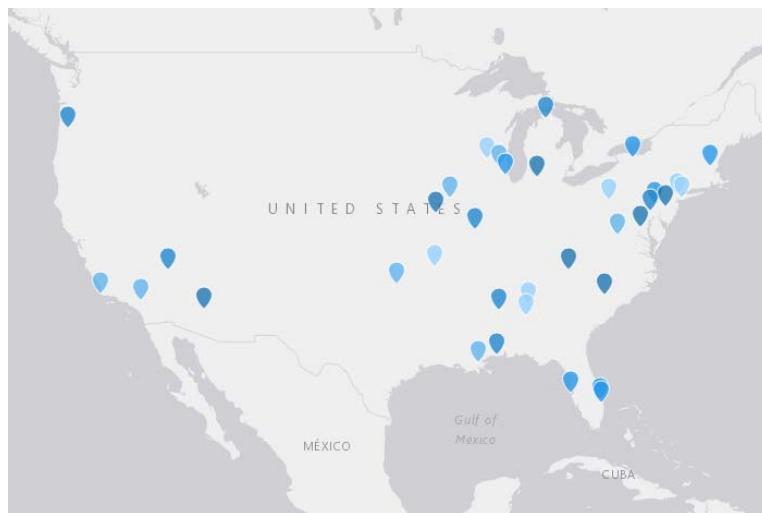
Add a bubble map

- 1 Navigate to and open the **Supplier Dossier**.

- 2 Since you want to add new visualization, remove the grid currently on the dossier. Click the **Menu** icon on the corner of the visualization, then click **Delete**.

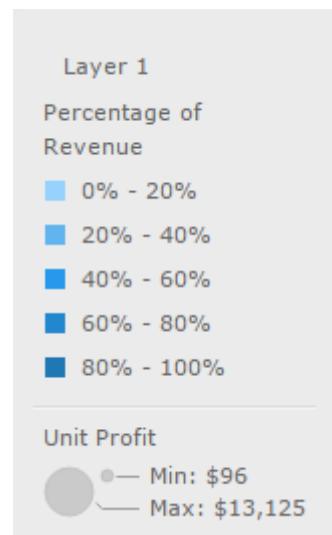


- 3 Click the **Map**  icon from the Visualization Gallery.
- 4 In the Dataset panel, click and drag the **Supplier Latitude** attribute to the **Latitude** area on the Editor panel, and add the **Supplier Longitude** attribute to the **Longitude** area.
- 5 Click and drag the **Revenue** metric to the **Color By** area. Now, the darker the marker, the higher the revenue.



- 6 Select the **Format** panel.
- 7 In the **Map style** drop-down list, keep the default **Light gray** style.
- 8 In the **Graphic type** drop-down list, select **Bubble**. Markers are ideal when you want to display an individual map marker for each geographic location, such as stores or cities. However, since we want to show regions a bubble map is a better map style here.
- 9 Select **Show Legend**.
- 10 Select the **Editor** panel and add the **Unit Profit** metric to the **Size By** drop zone. The bigger the bubble, the higher the unit profit.
- 11 Click **Save**.

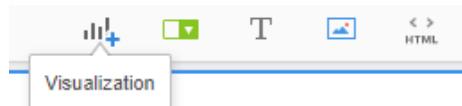
View the legend on the map -- the bubbles are colored by their percentage of the Revenue and sized by the Unit Profit.



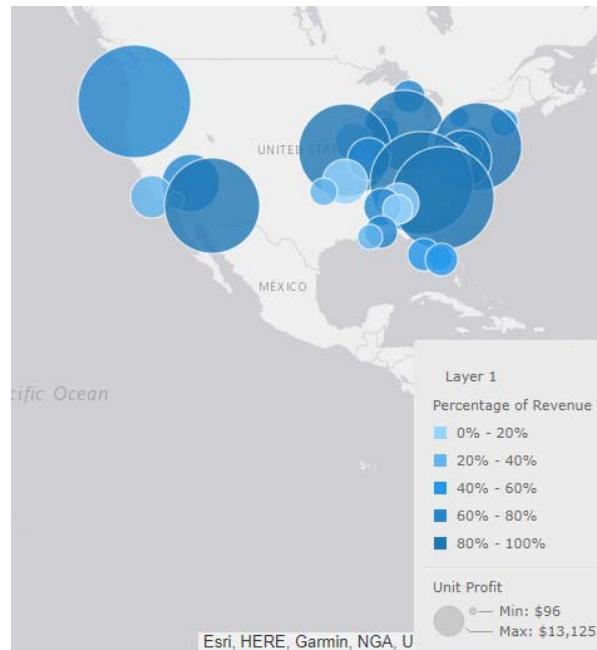
The map now shows the location of our suppliers, what they contribute to the overall revenue, and which suppliers are the most profitable.

Add a network visualization

- 1 On the toolbar, click **Insert Visualization**.



- 2 A new visualization container appears below the map. Click the **Visualization 2 container**. A blue box appears around the visualization container -- the blue box signifies which visualization you are editing.
- 3 To move the visualization container to another area of the dossier, hover over the title, **Visualization 2**.
- 4 When the move arrow appears, click and drag the container to the right of the map.
- 5 To properly view the map, select the **Legend** and move it to the right corner of the visualization container. You may need to zoom and pan within the map visualization to match the image below. To zoom click + on the map. To pan, click and drag the map.

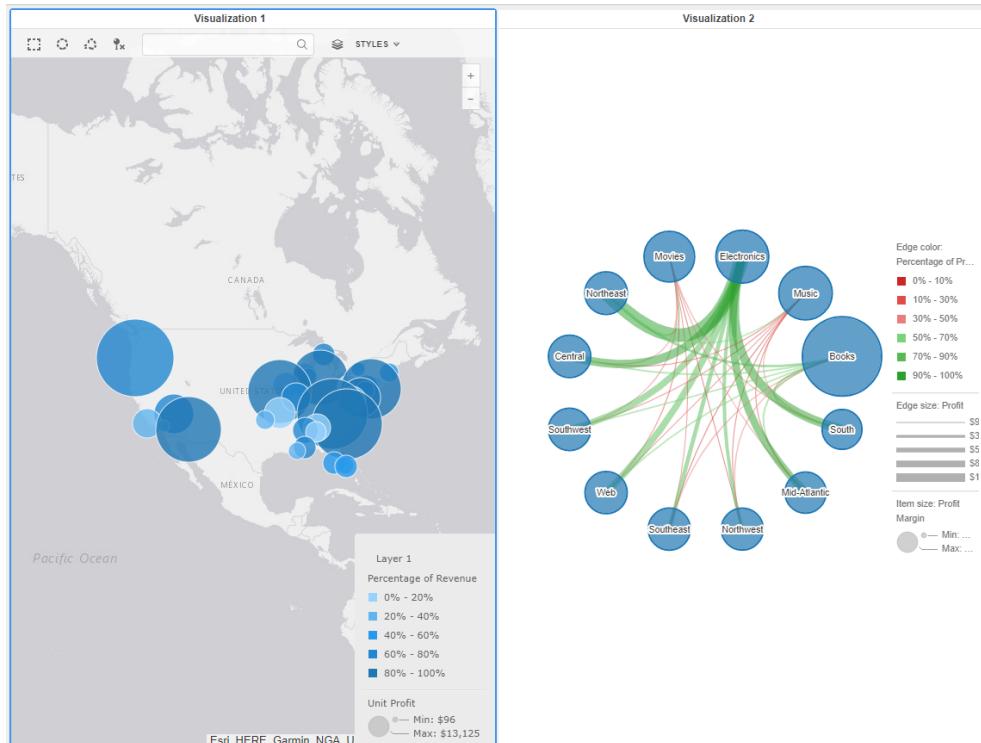


- 6 Click the **Visualization 2 container**.

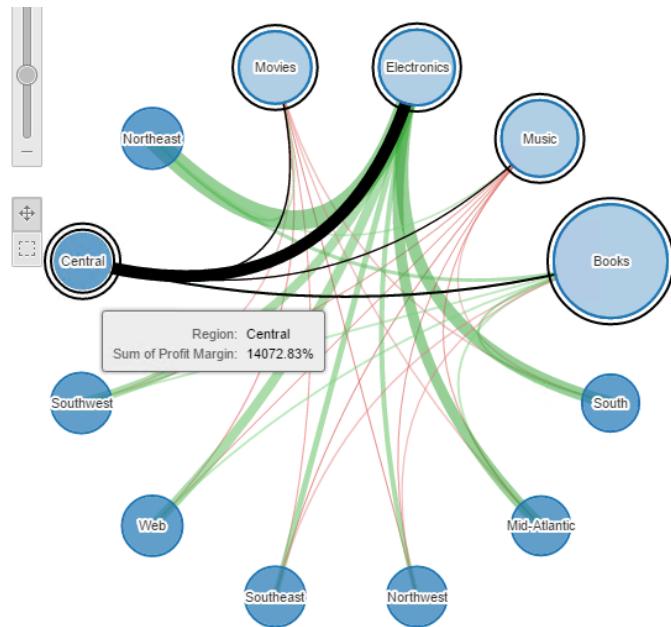
7 In the Visualization Gallery, select **Network** .

- 8 You want to create a network visualization that shows the relationship between categories and region. In the **Editor** panel, click and drag the **Category** attribute to the **From Item** drop zone. This displays the Category attribute elements as nodes.
- 9 Add the **Region** attribute to the **To Item** drop zone. This displays the Region attribute elements as nodes opposite the Category elements.
- 10 To color the relationship lines, add the **Profit** metric to the **Edge Color** drop zone. Now, the more profitable relationships are in green, and less profitable are in red.
- 11 To view the profit relationship between category and region more clearly, add the **Profit** metric to the **Edge Size** drop zone. Now, the more profitable a relationship is, the thicker the lines.
- 12 To analyze a metric for all the attribute nodes (Category), add the **Profit Margin** metric to the **Item size** drop zone. Now, the nodes are sized by Category Profit Margin.

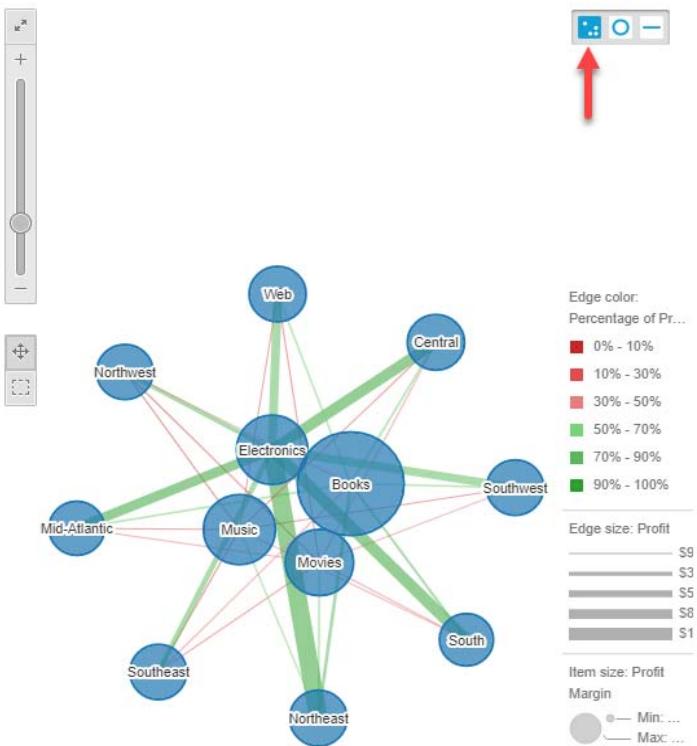
Your dossier should now match the following image:



13 Hover your cursor over the node labeled **Central** in the network visualization to see what other nodes it connects to. The relationship lines appear in black.



14 Change the look of the Network visualization by clicking in the **network visualization container**, then selecting the **highlighted option**, seen below:



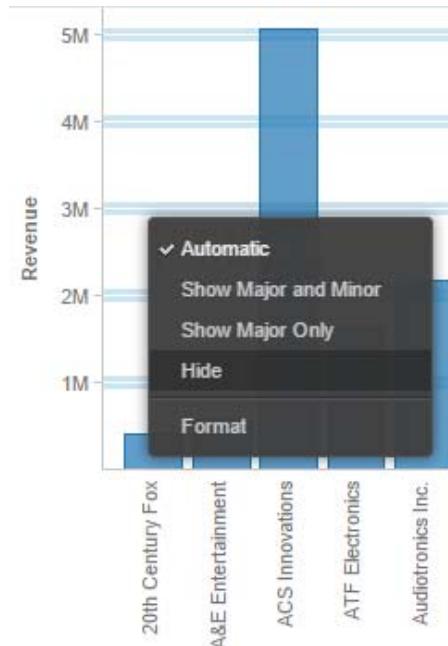
15 Save the dossier.

Add a bar chart to show revenue by supplier

- 1 Click **Insert Visualization** to add a third visualization to the dossier.
- 2 Move the **Visualization 3** below the other two visualizations.
- 3 Select the **Visualization 3** container.
- 4 In the Visualization Gallery, click **Bar Chart**.
- 5 Add the **Supplier** attribute from the second dataset (Supplier Report by Region) to the **Horizontal** drop zone to separate the bars by supplier.
- 6 Add the **Revenue** metric to the **Vertical** drop zone. Now, the taller the bar, the higher the supplier revenue.

Format the chart

- 7 To hide the grid lines in the graph, right-click a grid line and select **Hide**.



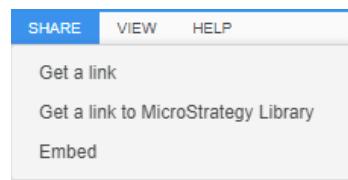
- 8 To change the color of the bars, select the **Format** panel.
- 9 In the first drop-down list, select **Shapes and Data Labels**.

10 In the **Shape Formatting** section, change the fill color to **Sea Green**.

11 Click **Save**.

View the dossier in MicroStrategy Library

1 To see how other end users will interact with the dossier, launch the Supplier Dossier in Library. To start, click the **Share** menu on the toolbar.



2 Select **Get a link to MicroStrategy Library**.

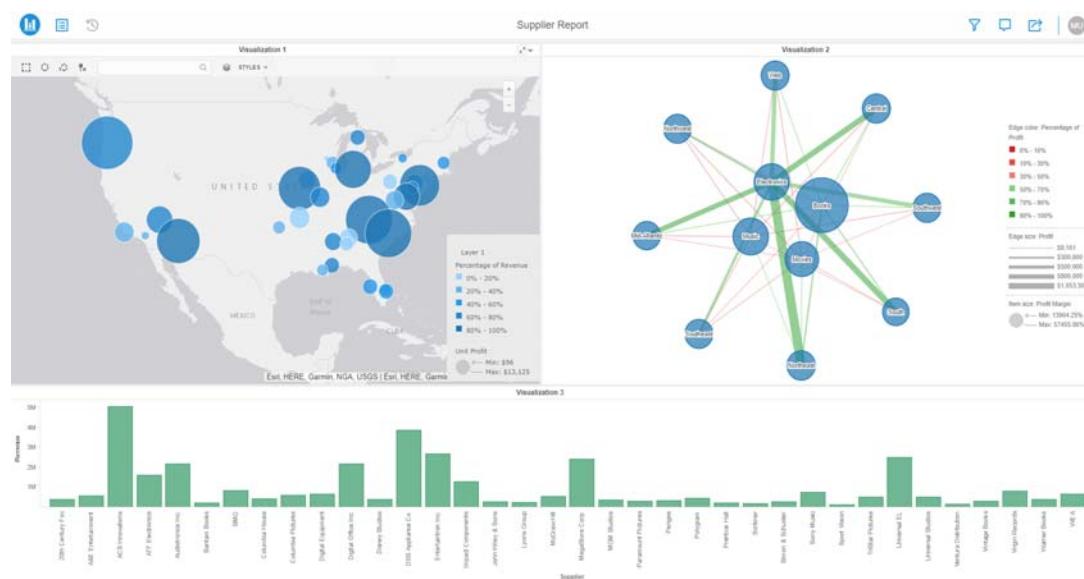
3 Click **Launch** under the Library link.

4 Log in using your **Username** and **Password**.

5 On the black bar, click **Add to Library**.



6 Compare your dossier to the one below:



Workshop 1: Import data and add the appropriate visualization to a dossier

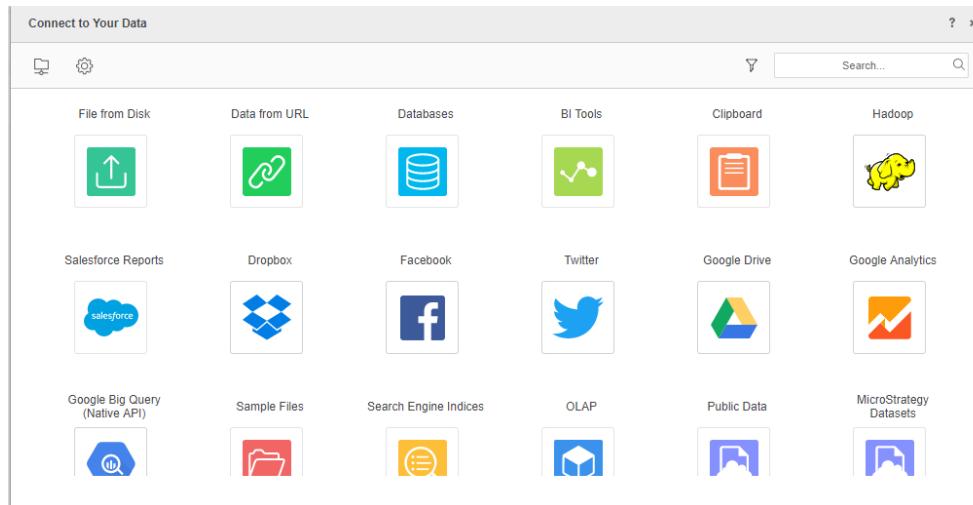
In this workshop, you will create a dossier based on imported data. You will clean and wrangle the data so it is a readily usable dossier dataset. Finally, you will add a visualization using the dataset.

Import data

- 1 If needed, log back into **MicroStrategy Web** using your **User name** and **Password**.
- 2 From the **My Reports** folder, click **Create** and click **New Dossier**.
- 3 From the Datasets panel, click **New Data**.



4 The Connect to Your Data window opens. Select **File from Disk**.



5 From the Upload Your Files window, click **Choose files**, then select **Facebook data.csv**.



6 Click **Open**. The file is listed on the Upload Your Files window.

7 Click **Prepare Data** at the bottom of the Upload Your Files window.

- 8** The Preview window opens. Click the **arrow** above the data grid to expand the full preview of your data.

State	Population	FB Users	Penetration
Alabama	4,779,756	1,979,916	41%
Alaska	769,421	347,048	45%
Arizona	6,931,617	2,847,700	41%
Arkansas	2,919,518	1,174,948	40%
California	37,039,832	14,770,038	40%
Colorado	5,029,916	2,110,428	42%
Connecticut	3,574,917	1,322,998	37%
Delaware	942,400	396,960	42%
Florida	20,841,518	8,601,008	41%
Georgia	9,647,652	4,023,548	42%
Hawaii	1,304,916	517,988	40%
Idaho	1,847,682	771,088	42%
Illinois	12,231,612	4,833,548	40%
Indiana	6,491,902	2,770,618	42%
Iowa	3,994,912	1,590,408	40%
Kansas	2,935,118	1,045,228	35%
Kentucky	4,379,917	1,817,768	42%
Louisiana	4,643,648	1,844,468	40%
Maine	1,253,642	428,708	34%
Maryland	5,773,912	2,334,688	40%
Massachusetts	6,957,628	3,414,688	51%
Michigan	9,853,648	4,136,128	42%
Minnesota	5,303,648	2,304,388	43%
Mississippi	2,967,797	1,177,098	40%
Missouri	6,098,917	2,867,028	47%
Montana	909,412	381,548	35%
Nebraska	1,624,916	683,688	42%
Nevada	2,798,652	1,164,648	42%

- 9** Click **Wrangle**.

The Wrangle Your Data window displays.

State	Population	FB Users	Penetration
Alabama	4,779,756	1,979,916	41%
Alaska	769,421	347,048	45%
Arizona	6,931,617	2,847,700	41%
Arkansas	2,919,518	1,174,948	40%
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Mississippi	2,967,797	1,177,098	40%
Missouri	6,098,917	2,867,028	47%
Montana	909,412	381,548	35%
Nebraska	1,624,916	683,688	42%
Nevada	2,798,652	1,164,648	42%

As a reminder, the Wrangle Your Data window allows you to explore data and evaluate its quality and usability. You can then prepare the data and improve its quality before importing it into MicroStrategy Web.

For example, you can remove white space, filter data, delete duplicate rows or cells, find and replace data, and concatenate columns.

- 10** There are no corrections that need to be made, so click **Cancel** and return to the data preview.

- 11 Click **Finish** to return to the dossier. Your dataset is ready to use in the dossier.

Rename an attribute

This dataset shows the relationship between Facebook use and the population of a particular state. You and your team want to understand the percentage of Facebook users per state. In this dataset, the attributes are named State and Penetration (the percentage of a state population that uses Facebook), and the metrics are named Population and Facebook Users (the total number of Facebook users in a given state).

To ensure that other users have a clear understanding of all the dataset objects' meanings, we will rename attributes and metrics.

- 12 In the Dataset panel, right-click the **Penetration** attribute, select **Rename**, and rename it as **Facebook Users per State**.
-

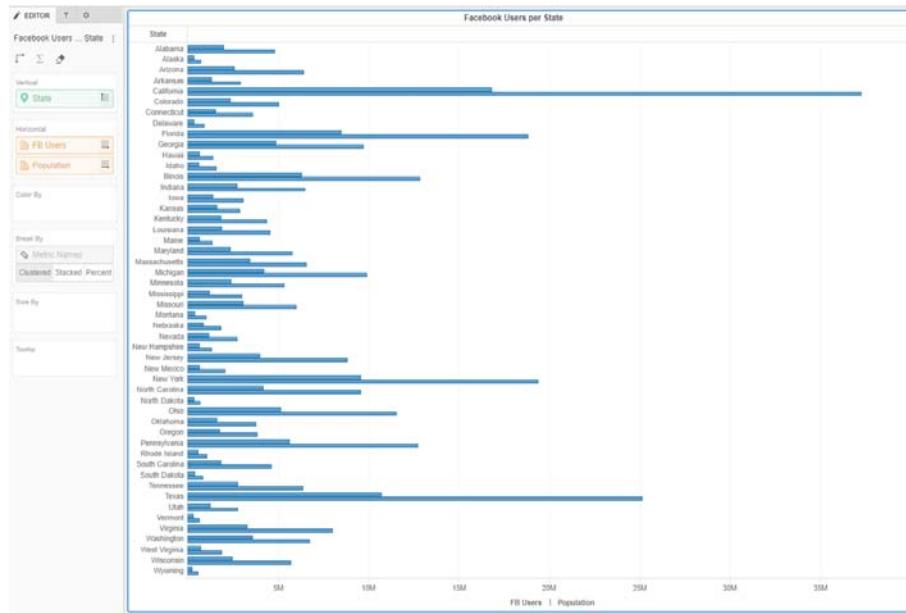
Add a visualization

You would like to add a visualization that displays how much Facebook has penetrated the market in individual states. Viewers should be able to quickly understand the connection between the population of a state and the number of Facebook users in a state.

There are many possible approaches; a good place to begin is with a simple and familiar visualization, in this case, a bar chart. To start, create a bar chart that presents the state population and the rate of Facebook use side by side as bars.

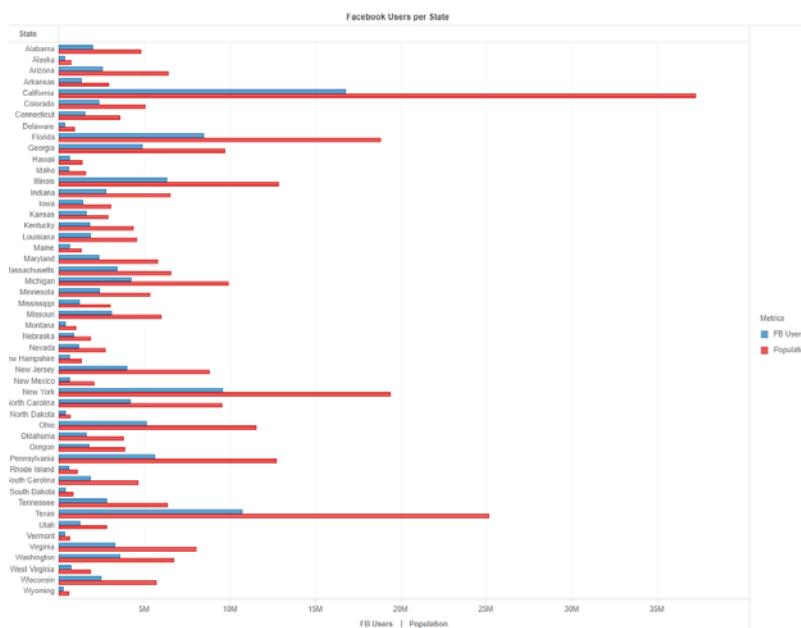
- 1 Click the **Bar Chart** icon in the Visualization Gallery.
- 2 Drag the **Population** and **FB Users** metrics from the Dataset panel to the **Horizontal** area in the Editor panel. Drag the **State** attribute to the **Vertical** drop zone in the Editor panel.

- 3** To merge the graphs, drag **Metric Names** to the **Break By** drop zone. Select **Clustered** to stack the bars on top of each other.



Use Color-by to distinguish data points

- 4** Drag **Metric Names** into the **Color By** area. A legend appears on the graph that indicates Population and FB Users



Q. What other visualization types might work for this dossier page?

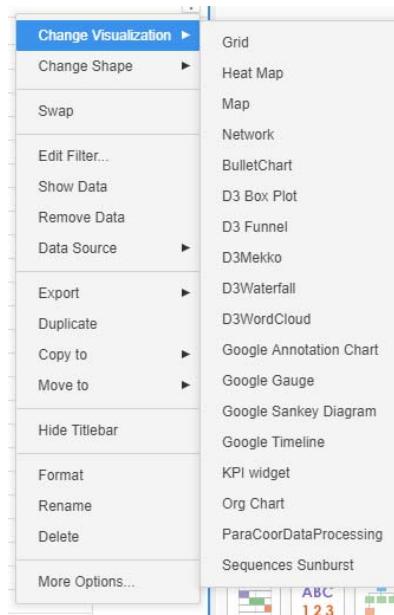
Rename the visualization

- 5 At the top of the visualization container, double-click **Visualization 1**.
- 6 Type **Facebook Users per State**.

Explore the data using other visualizations

You want the visualization to clearly express the relationship between the number of Facebook users per state and the overall state population. We will change the bar chart to two other visualizations to see which one works best for our business needs.

- 7 Click **Menu** (the three dots) at the top of the visualizations, then hover over **Change Visualization**.



- 8 Select **Heat Map**.

A heat map displays a combination of colored rectangles, each representing an attribute element, sized by a metric. You should choose a heat map when

you need to display the impact of a metric on a large number of attribute elements at once.



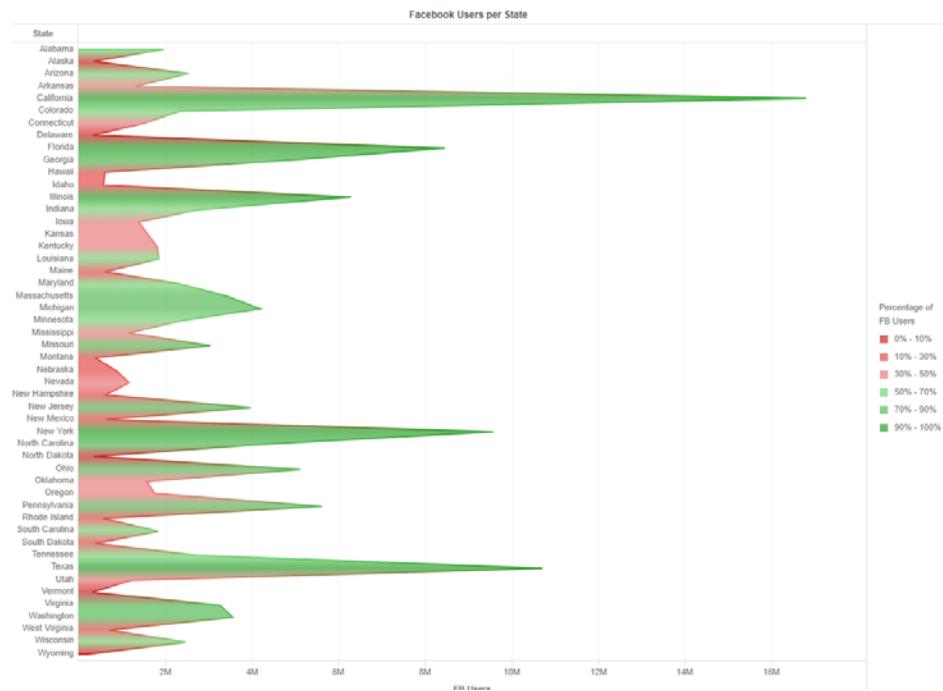
The Facebook data heat map shows the rectangles colored and sized by number of Facebook users. The contrast of red and green makes the visualization easy to analyze -- California and Texas clearly have the most Facebook users. The concept of the heat map fits well with the goal of our dossier, however some of the rectangles are too small to display the state names.

As a dossier best practice, the page should always be easy to read and all text should be clearly readable so users can quickly grasp the analytical message.

To see if another visualization fits your business needs sufficiently, let's convert the heat map into an area chart.

- 9 Click the **Area Chart**  icon in the Visualization Gallery.

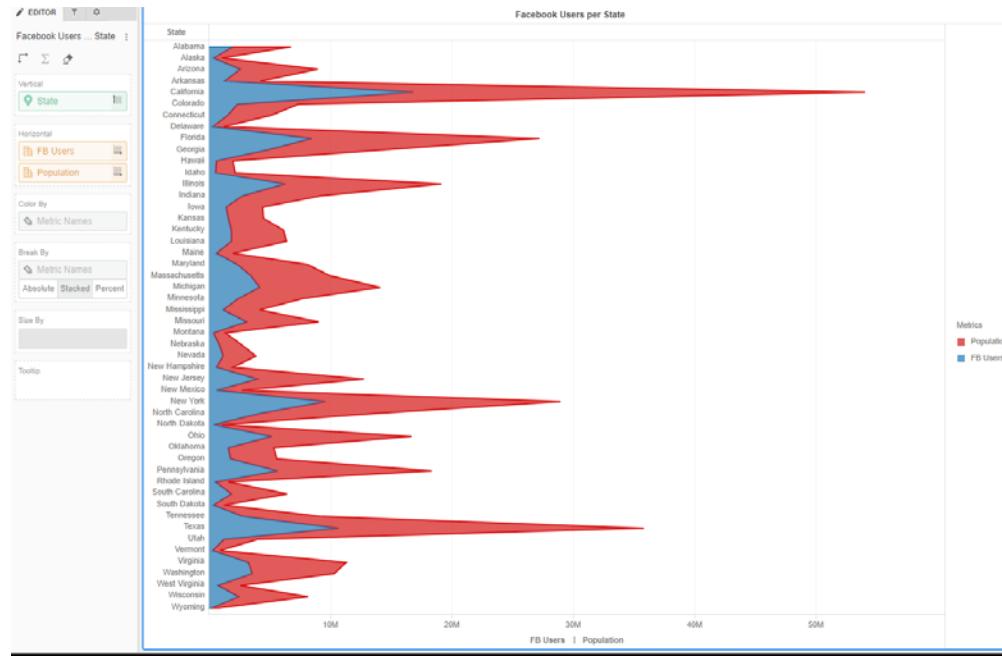
10 On the Editor panel, click **Swap**  to switch the Vertical and Horizontal axes.



11 Drag **Population** from the **Color By** drop zone to the **Horizontal** drop zone.

12 Drag **Metric Names** to the **Break By** drop zone to combine the graphs. Keep the metrics **Stacked**.

13 Drag **Metric Names** to the **Color By** drop zone so the metrics have different colors. Your visualization should now match the image below:



While the bar chart displays horizontal bars to compare individual items, the area graph stacks two data series and shades the area between the axis and the line that creates a visual comparison of the two items.

Area charts are helpful for showing overall trends -- this particular chart shows a clear relationship between Facebook users and state populations. The higher the population, the more Facebook users. The area chart is a better choice than the previous heat map as we can read all data points clearly.

Q: What other conclusions can you draw from this visualization?

14 Save the dossier as **Facebook Users per State Dossier**. Close the dossier.

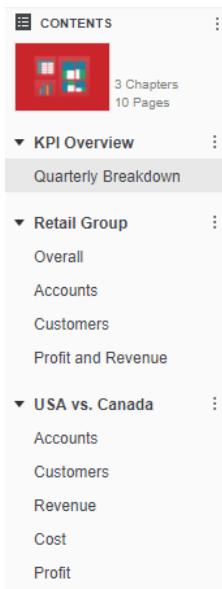
LAYERING, FILTERING, SORTING, AND THRESHOLDING

Now that you've added visualizations to our dossier to analyze your business intelligence, we will explore ways to enhance the data discovery experience with innovative design features. In this chapter, we will focus on:

- Layering related data through chapters and pages
- Narrowing data through filters
- Sorting data
- Drilling within visualizations to view data at a different level
- Applying thresholds to highlight specific data points and outliers
- Inserting text and images

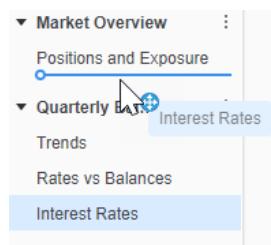
Layer related data: Chapters and pages

Dossier pages and chapters allow designers to logically group related data. The table of contents then helps end users navigate through that related content. Grouping like data together will allow users to navigate through the information easily, notably when multiple users with different goals or from different departments are viewing the same dossier.



To add a page, click the **Add A Page** icon from the toolbar. To add a chapter, click the **Add A Chapter** icon from the toolbar.

To change the order of chapters and pages, click the desired title and drag the chapter or page to the new position.



Exercise 3.1: Add a page to the Supplier Dossier

You would like to add a page outlining the details of your suppliers by name, profit, cost, and units sold. The best visualization here is a grid -- the purpose of

this page is to view the numbers in detail. As this page will include detailed data points, not an overview like Page 1, we are going to add a new page to Chapter 1.

Add a page and grid visualization

1 If needed, navigate to **My Reports** and reopen the **Supplier Dossier**.

2 Click **Add A Page** .

The page defaults to a grid visualization, so we don't need to change the visualization type.

3 Drag the **Supplier** attribute from the second dataset (Supplier Report by Region) to the **Rows** drop zone.

4 Add **Unit Cost**, **Unit Profit**, and **Units Sold** to the **Columns** drop zone.

5 **Save** the dossier.

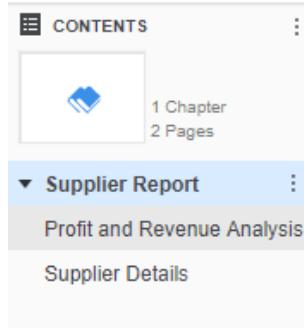
Supplier	Unit Cost	Unit Profit	Units Sold
20th Century Fox	\$7,413	\$864	27928
A&E Entertainment	\$2,059	\$277	24185
ACS Innovations	\$35,065	\$8,913	11422
ATF Electronics	\$57,642	\$13,125	2247
Audiotronics Inc.	\$12,731	\$3,115	13611
Bantam Books	\$4,005	\$1,332	15858
BMG	\$7,010	\$587	62621
Columbia House	\$5,073	\$504	30305
Columbia Pictures	\$4,303	\$388	48912
Digital Equipment	\$6,066	\$1,501	8370
Digital Office Inc.	\$26,343	\$6,265	6605
Disney Studios	\$1,438	\$186	23673
DSS Appliance Co.	\$36,186	\$9,455	8382

Rename the dossier chapter and pages

The default chapter and page names in dossiers are Chapter 1, Page 1, Chapter 2, and so on. It is best practice to name all pages and chapters with names that let other analysts understand the data they contain. In this simple exercise, we will rename the chapter and pages in the Supplier Dossier.

1 In the Table of Contents panel, double-click **Chapter 1** so the text is highlighted.

- 2** Type: **Supplier Report**.
- 3** Double-click **Page 1**.
- 4** Type: **Profit and Revenue Analysis**.
- 5** Double-click **Page 2**.
- 6** Type: **Supplier Details**.



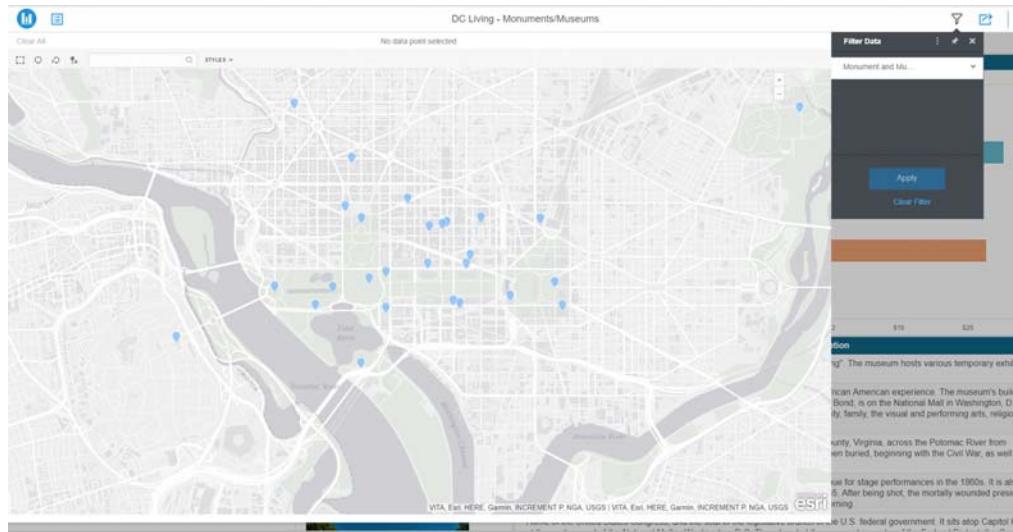
- 7** **Save** your dossier.

Narrowing data: Filters

As a dossier designer, you may have a diverse audience that wants to analyze distinct data points. For example, a CEO of an online retailer may want to see sales numbers across the country, but a Regional Manager only needs to view data for his sales territory. Dossiers make slicing and dicing data simple through sleek, modern filters that allow anyone to navigate their data and hone in on specific areas of interest.

In addition to filtering on specific attributes and metrics, dossier designers can add visualizations as filters in the Filter panel for highly contextual and intuitive filtering without using valuable page space. As in the example below (shown here in Library), the dossier designer added a marker map with options to select specific Washington, DC monuments. A user can click on the monuments they're

interested in visiting to narrow the information on the DC Living - Monuments/Museums page.

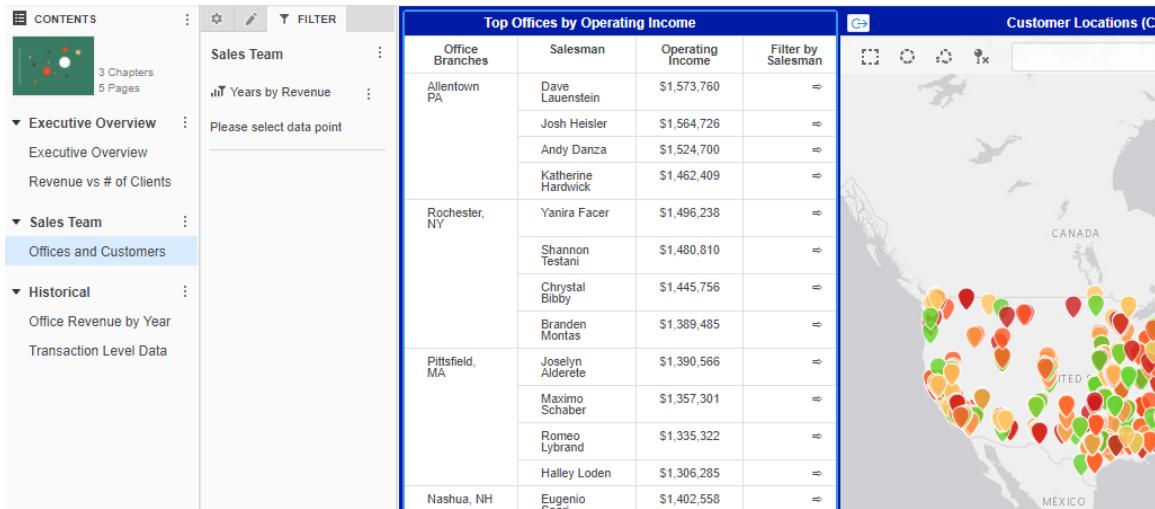


Filtering chapters

Using the Filter panel, you can create filters that target all pages within a chapter. In the example below, the Executive Overview chapter Filter panel has three filters -- office branch, year, and sales rep. These filters are only applied to the Executive Overview and Revenue vs # of Clients pages.

Office Branches	Revenue
Allentown PA	\$1,291,450.72
Rochester, NY	\$1,183,494.90
Akron, OH	\$1,127,780.87
Pittsfield, MA	\$1,124,343.35
Binghamton, NY	\$1,113,986.19
Utica, NY	\$1,103,323.86
Syracuse, NY	\$1,098,318.53
Nashua, NH	\$1,096,422.83
Albany, NY	\$1,064,036.41

The second chapter, Sales Team, contains a Years by Revenue filter.



To create a metric or attribute filter, drag the desired object over to the Filter panel. Using the menu next to the filter, you can customize the filter, such as change the display style and rename the filter.

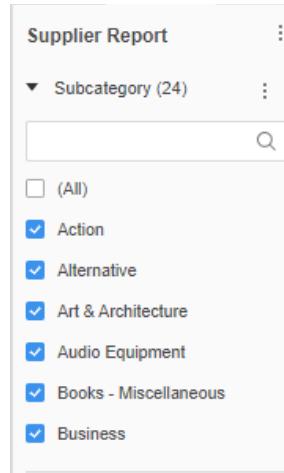
In the next exercise, we will add a filter to the Supplier Report chapter of the Supplier dossier.

Exercise 3.2: Add a subcategory filter to the Supplier Report chapter

Your supply chain team is organized by product subcategory -- there is an assistant manager for audio equipment, action movies, TVs, etc. They would like to narrow the data in the Supplier Report chapter by subcategory so they can analyze their own suppliers. To do so, in this exercise you will add a filter in the Filter panel for Subcategory.

- 1 If necessary, navigate to the **My Reports** folder and open the **Supplier Dossier**.
- 2 Select the **Filter** panel.

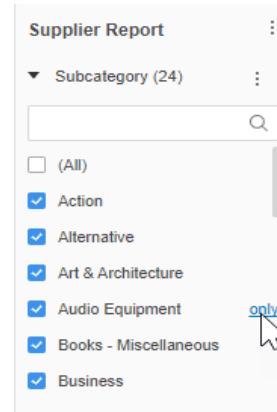
-
- 3 Click and drag **Subcategory** into the Filter panel.



- 4 On the next page, **Save** your dossier.

Use the Subcategory filter to narrow chapter data

- 1 From the **Filter** panel, hover over **Audio Equipment** and click **Only**.



The map and bar chart have been filtered to show audio equipment data only.
Why is the Network visualization not affected by the filter?

- 2 From the Table of Contents, click the **Supplier Details** page. The Subcategory filter is applied to this page as well since it is in the Supplier Report chapter.
- 3 To clear the filter, from the **Filter** panel, select **All**.

The filter has been cleared from the chapter.

Filtering specific pages and visualizations

To further customize the data displayed in your dossier, you can apply filters to pages and specific visualizations. For example, you can use a pie chart on one page to filter a bar chart on another page.

All the different types of filters interact with each other. For example, a visualization can be targeted by both a chapter filter and a page filter. Both filters determine what the visualization displays.

Combine chapters, pages, and the different types and levels of filters to create layers of data focused on what you need. When you share your dossier with other users, they can change the filter selections and share those results to collaborate with other users.

Exercise 3.3: Add an object filter to the Supplier Details page

You would like to be able to view the Supplier Details page by year, but the Profit and Revenue Analysis does not need to be filtered by year. To accomplish this, you will add a Year filter to the Supplier Details page.

Add the Year object filter

- 1 From the Table of Contents panel, select the **Supplier Details** page.
- 2 From the toolbar, click **Filter**  to add the filter onto the page.
- 3 Click and drag the **Year** attribute onto the **Filter** container.

- 4 In the drop-down menu, point to **Display Style** and select **Drop-down**.
- 5 Click **Select Target**.
- 6 Select **Visualization 1**, then click **Apply**.
- 7 The filter is currently displayed as a drop-down, however you would like users to be able to select specific years easily and select one at a time. To change the filter style, hover over the visualization container and click the **Menu** icon.

8 Click Allow multiple selections.

9 Click the **Menu icon on the visualization container.**

10 Hover over **Display Style and select **Button Bar**.**

The screenshot shows a data grid titled "Visualization 1". At the top, there is a horizontal bar with four buttons labeled "(All)", "2012", "2013", and "2014". Below this is a table with four columns: "Supplier", "Unit Cost", "Unit Profit", and "Units Sold". The table contains approximately 40 rows of data, each representing a different supplier with their respective financial metrics. The data includes entries like "20th Century Fox", "A&E Entertainment", "ACS Innovations", etc., with values such as Unit Cost ranging from \$1,029 to \$38,748, and Units Sold ranging from 1,191 to 20,909.

Supplier	Unit Cost	Unit Profit	Units Sold
20th Century Fox	\$4,950	\$576	20909
A&E Entertainment	\$1,372	\$186	18234
ACS Innovations	\$23,417	\$5,945	8620
ATF Electronics	\$38,748	\$8,827	1719
Audiotronics Inc.	\$8,441	\$2,064	10190
Bantam Books	\$2,673	\$693	11919
BMG	\$4,678	\$389	47353
Columbia House	\$3,386	\$343	23027
Columbia Pictures	\$2,869	\$257	36755
Digital Equipment	\$4,051	\$1,004	6307
Digital Office Inc.	\$17,627	\$4,193	4970
Disney Studios	\$959	\$124	17861
DSS Appliance Co.	\$24,146	\$6,317	6381
Entertainron Inc.	\$28,996	\$7,250	10234
Impact Components	\$8,045	\$2,008	6259
John Wiley & Sons	\$1,481	\$512	12662
Lyons Group	\$701	\$64	15668
McGrav Hill	\$1,877	\$625	10292
MegaStore Corp.	\$28,301	\$7,179	3329
MGM Studios	\$3,051	\$258	21222
Paramount Pictures	\$3,318	\$320	17150
Perigee	\$1,353	\$384	28515
Polygram	\$3,184	\$574	24108
Prentice Hall	\$3,379	\$1,163	10790
Scribner	\$1,289	\$399	12634
Simon & Schuster	\$2,883	\$1,002	13145
Sony Music	\$4,731	\$503	42309
Sport Vision	\$1,029	\$122	4556
TriStar Pictures	\$2,532	\$264	27929
Universal EL	\$19,915	\$5,092	4924
Universal Studios	\$3,159	\$259	29312
Ventura Distribution	\$965	\$74	6819
Vintage Books	\$2,158	\$692	19548
Virgin Records	\$5,674	\$700	40647
Warner Books	\$2,704	\$824	25588

11 Save the dossier.

Interact with the year filter

12 Click the **Year buttons to change the data in the grid.**

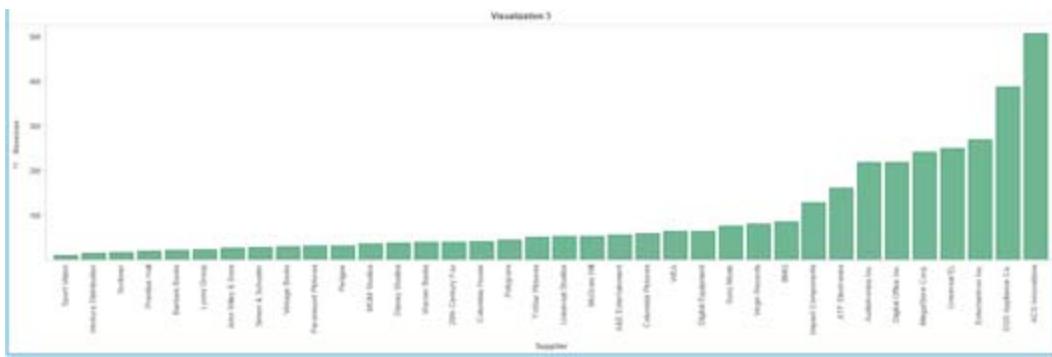
13 Go to the Profit and Revenue Analysis page. Notice this page does not have the year filter applied.

Easily identify trends

There are several ways to further enhance the analyst's dossier experience and pinpoint pertinent information. All of the methods below can also be added by the user when interacting with dossiers in MicroStrategy Library.

Sort data

When analysts can sort data in ascending or descending order, they can better visualize trends and identify key information, such as Sales Reps with the highest profit. To sort, right-click the X or Y axis on a grid or graph and select the sort order. In the image below, suppliers are sorted in ascending order by revenue. The object label is the data label found on the graph axis. In the image below, Revenue and Supplier are the object labels.

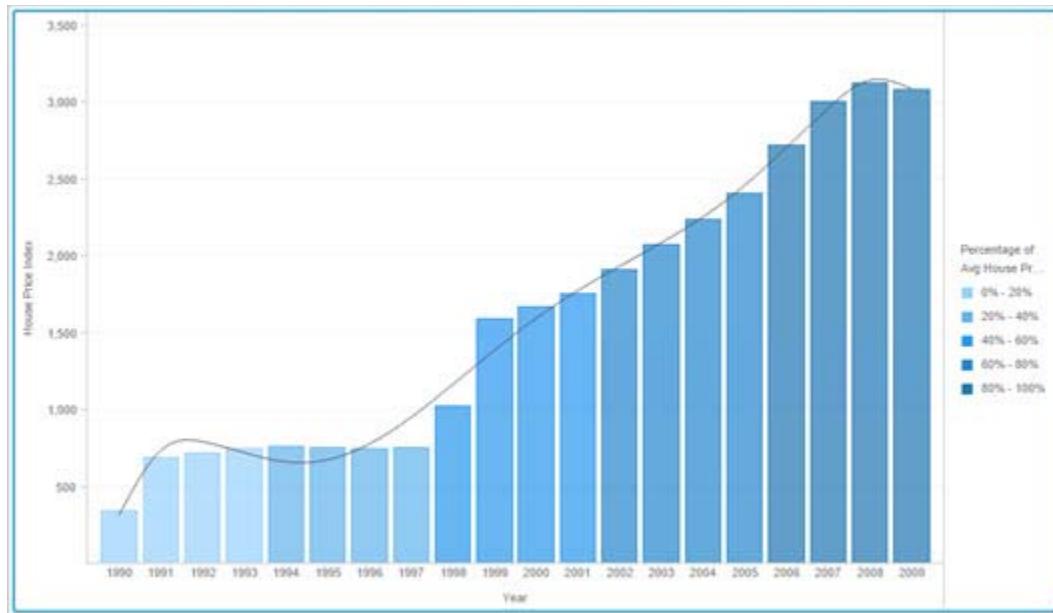


To remove the sort once has been applied, right-click the sorted chart and click **Clear Sort**.

Keep in mind that sorting may not be available for every visualization because not all data makes sense to sort.

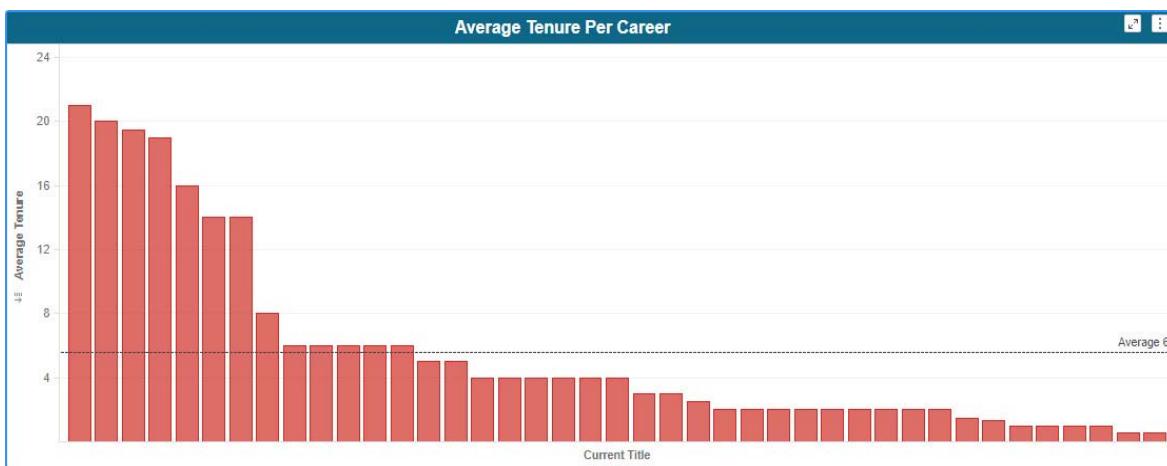
Forecast data: Trend lines

You can display a trend line for each metric or for a specific metric to not only analyze your current data, but to also forecast or predict future values. Right-click the visualization container and select **Enable trendline** to add a trend line.



Reference lines

You can add a reference line to a graph to help make comparisons between data points and to make a base line, such as average or max, easier to see. In the example below, the author added an average reference line to show the average tenure across all job titles.



Similar to the trend line, add a reference line by right-clicking the graph and selecting **Add Reference Line**. The reference line types include:

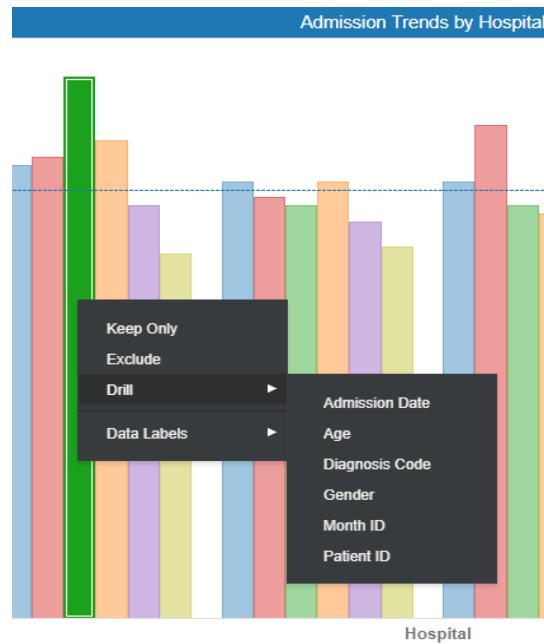
- Minimum
- Maximum
- Average
- Median
- First
- Last
- Constant

Dig deeper into your data: Drilling

Within a visualization, you can drill down to reveal additional detail and explore the data at different levels than what is immediately visible in the visualization. For example, if your dataset contains geographical regions, states, and cities, you may want to drill up to a more summarized level from regional to state data, or at the down to the most granular level to city or an individual store.

In the example below, a dossier detailing safety benchmarks for hospitals in the Northeast includes a bar chart showing admission trends grouped by hospital. You noticed that in March, Grace Hospital had an unusually high admission rate.

So, you'd like to further analyze admission trends by diagnosis code for Grace Hospital in March.



By right-clicking on the March bar for Grace Hospital, you can see all the available levels. Once you select a level, in this example Diagnosis Code, the graph will transform to show admissions by diagnosis code, specified hospital, and month.



Drilling is available for Grid, Graph, Network, and Heat Map visualizations. Drilling within a specific visualization will not affect other dossier visualizations, unless visualization is used as a filter for other visualizations. If the drilled visualization is used as a filter, the targeted visualizations will only show data relevant to the new level. Available drill options are dependent upon the dataset and the visualization.

Activity: Sort data

- 1 Reopen the **Supplier Dossier** from **My Reports**.
- 2 In the Supplier Dossier, in Visualization 3, right-click the **Revenue** metric name on the Y-axis of the bar graph.
- 3 Click **Sort Ascending**.

What information can you now quickly determine by glancing at the graph?

Highlight important changes in data: Thresholds

When data meets a specific condition you can highlight that data in a visualization by displaying the data in a different color or replacing the data with an image. For example, you can display revenue values less than \$1,000 in red. After you add a color or image-based threshold, MicroStrategy Desktop automatically applies a color scale, such as light blue for the lowest revenue to dark blue for the highest revenue, or images to any data that meets the chosen

threshold condition. This can make analyzing large amounts of data easier as the user can quickly identify trends at a glance based on different colors and images.

Sales Rep Ranking		
Owner	Total (\$)	Total Growth
Kendall Leon	\$5,986,528	↑
Kennedy Chase	\$1,953,983	↓
Luke Preston	\$963,567	↓
Lynn Luna	\$1,477,483	↓
MacKensie Savage	\$3,452,000	↓
Marcia Andrews	\$906,668	↓
Mira Crawford	\$1,640,000	↓
Nina Burns	\$3,200,630	↔
Noah Adkins	\$4,087,900	↓
Otto Gentry	\$4,788,926	↔



A threshold consists of two parts: the condition the value must meet to have the threshold formatting applied, and the formatting that gets displayed when the threshold is met. When you add a metric to the **Color By** area of a visualization, a default threshold is applied to the data. For a grid visualization, right-click the column header to which you want to apply the threshold, and select **Thresholds**.

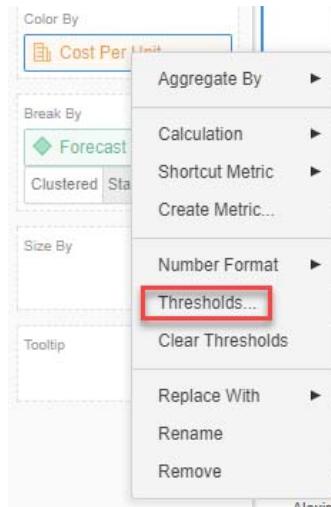
You can apply the threshold formatting to:

- Metric values
- Metric subtotals
- Metric values and subtotals
- You can also apply attribute element thresholds when you use Grid visualizations.

The elements of a business attribute are the unique values for that attribute. For example, 2016 and 2017 are elements of the Year attribute, while New York and London are elements of the City attribute.

You can create multiple thresholds on the same visualization, including thresholds with multiple conditions. Below you will find high-level steps for adding a threshold to a metric.

- 1 Select the visualization to apply the threshold.
- 2 In the Editor panel, right-click the metric to apply the threshold.
- 3 Select **Thresholds** from the menu.



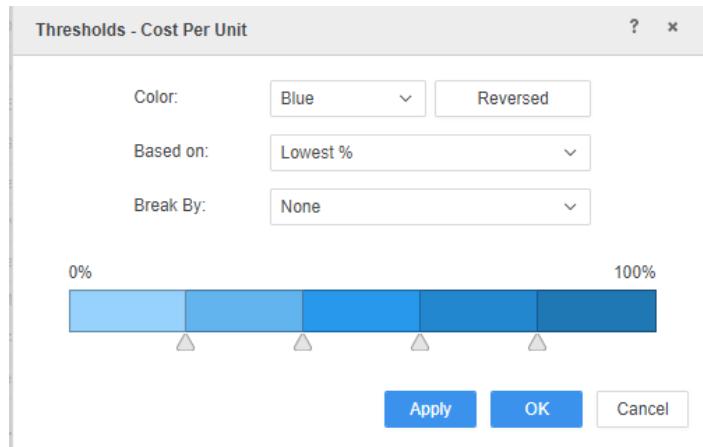
- 4 In the Thresholds window, you can make the following selections:

Color: Select the color, or color range, that you want to apply to the metric when it meets the threshold's conditions.

Based on: Determine whether you want the threshold color to be applied to the metric's rank or its value, when the metric meets the threshold's condition. For example, you can display metric values greater than 5 million in blue or the top 5 metric values in green.

Break by: Select the attribute level to restart counting rank or percentage values. Select **None** to continue without restarting. This option is only available for rank or percentage values.

Color band: Click and drag the spacers to increase or decrease range values.



- 5 Click **OK** to apply the threshold.
- 6 To remove the threshold, return to the Editor panel for the visualization, right-click the metric, and select **Clear Thresholds**.

Workshop 2: Visualization analysis

In this workshop, you are a travel coordinator for a boutique consulting firm. The company has delegated two consultants, Milo and Clarissa, to travel and speak at multiple conferences throughout the year. To help these employees reach their destination in a timely manner, as their highly talented travel coordinator, you will create a dossier to examine airport data, including the number of flights and percent of delayed or canceled flights for each airport so that you can make decisions such as which airport they should fly out of, and what airline and day of the week they should fly. Milo is based in Washington, D.C. while Clarissa is based in Los Angeles, so the dossier must be filtered for their home base airports.

Analyze airports and airlines

You need to analyze which airports the speakers should fly out of and which airlines have the lowest percentage of delayed or canceled flights. To begin, you will import a dataset into MicroStrategy Web. That dataset must contain the following information:

- Total number of flights for major U.S. airports

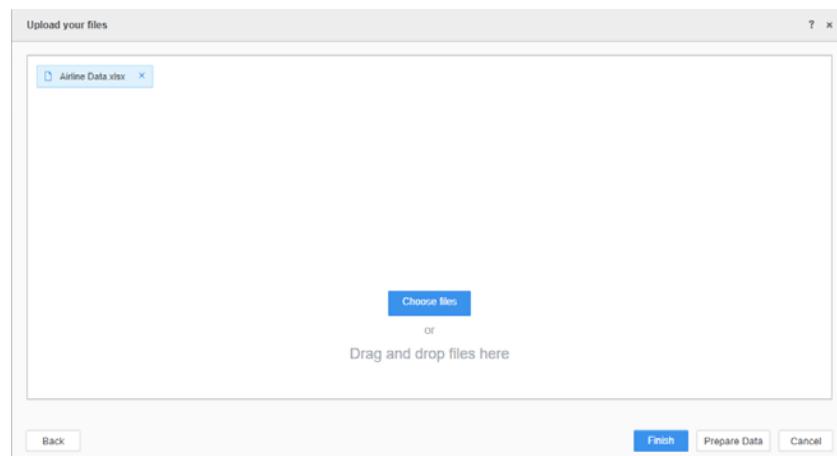
- Total number of cancellations for major U.S. airports
- Total number of delays for major U.S. airports

For the purpose of this exercise, we will assume that you have already located or created a dataset that meets all of these criteria. We will import a preformatted spreadsheet that conveniently includes all the necessary data.

You will create a bubble graph for the initial visualization.

Create the initial visualization

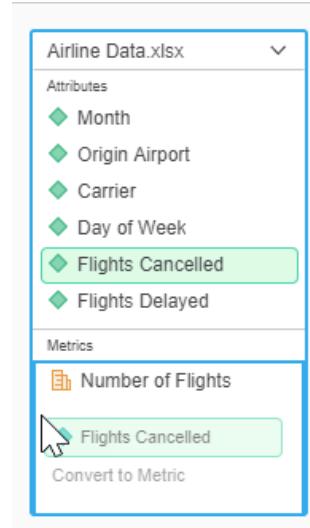
- 1 From the My Reports page, click **Create** and select **New Dossier**.
- 2 In the Datasets panel, click **New Data**.
- 3 Select **File From Disk**.
- 4 In the Upload Your Files window, click **Choose files**, then select the file **Airline Data.xlsx**
- 5 Click **OK**.



- 6 Click **Prepare Data**. Notice that all the objects are listed as attributes. We need to revise the data to include metrics before creating our visualizations.
- 7 Convert the following columns to metrics:
 - Number of Flights
 - Flights Canceled

- Flights Delayed

To convert these columns to metrics, click and drag the objects to the **Metrics** row in the data table.



The data preview page now looks like this:

Month	Origin Airport	Carrier	Day of Week	Number of Flights	Flights Cancelled	Flights Delayed
January	Lehigh Valley International	AirTran Airways Corporation	Sun	5	0	2
January	Lehigh Valley International	AirTran Airways Corporation	Mon	4	0	1
January	Lehigh Valley International	AirTran Airways Corporation	Tue	4	0	3
January	Lehigh Valley International	AirTran Airways Corporation	Wed	4	0	0
January	Lehigh Valley International	AirTran Airways Corporation	Thu	4	0	3
January	Lehigh Valley International	AirTran Airways Corporation	Fri	5	0	1
January	Lehigh Valley International	AirTran Airways Corporation	Sat	10	0	7
January	Lehigh Valley International	Atlantic Southeast Airlines	Sun	10	0	7
January	Lehigh Valley International	Atlantic Southeast Airlines	Mon	8	0	2
January	Lehigh Valley International	Atlantic Southeast Airlines	Tue	4	0	1
January	Lehigh Valley International	Atlantic Southeast Airlines	Wed	3	0	4
January	Lehigh Valley International	Atlantic Southeast Airlines	Thu	6	1	4

8 Click **Finish**.

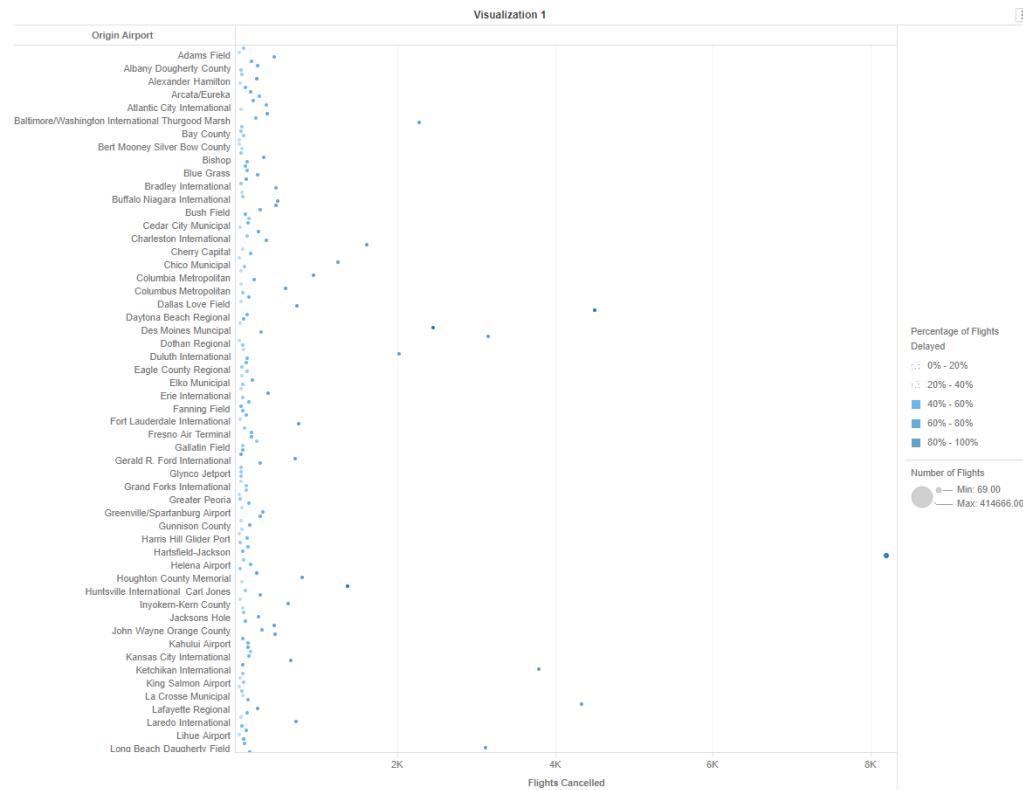
9 Save the dossier as **Airline Data Dossier**. In the window, select **Run newly saved dossier**.

Add a visualization

10 Click the **Bubble Chart**  icon in the Visualization Gallery.

11 In the dossier, place the following dataset objects in the indicated areas:

- Add the **Origin Airport** attribute to the **Vertical** drop zone.
- Add the **Flights Canceled** metric to the **Horizontal** drop zone.
- Drag the **Flights Delayed** metric to the **Color By** drop zone.
- Drag the **Number of Flights** metric to the **Size By** drop zone.

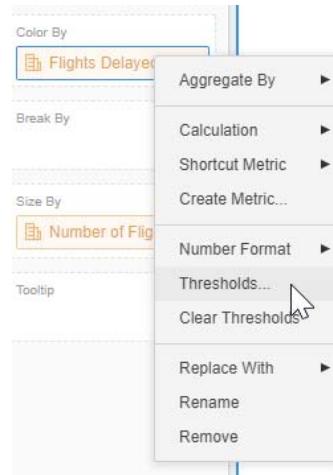


The location of each bubble in the graph shows the number of flights that were canceled for each airport: the further right the bubble, the more flights were canceled. The size of each bubble represents how many flights flew out of each airport: the bigger the bubble, the more flights. The color of the bubbles represents the percent of flights delayed: green bubbles had 0-20% of all flights in the dataset delayed, while red bubbles had 80% or more flights in the dataset delayed.

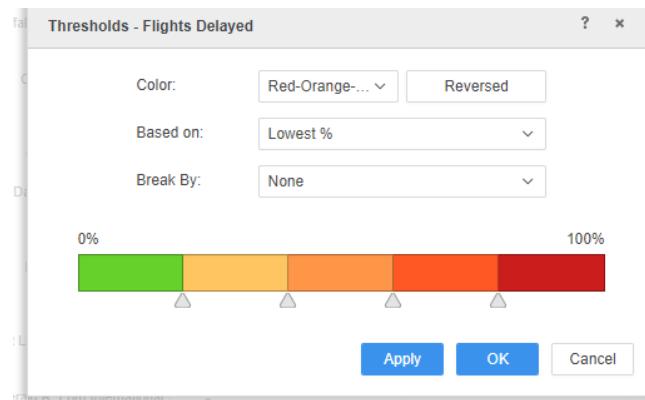
Improve the bubble chart

- 1 The size of the bubbles in this visualization is too difficult to read and interpret. Through editing, you can improve the visualization and the effectiveness of the dossier. To improve the readability of the bubbles, you can

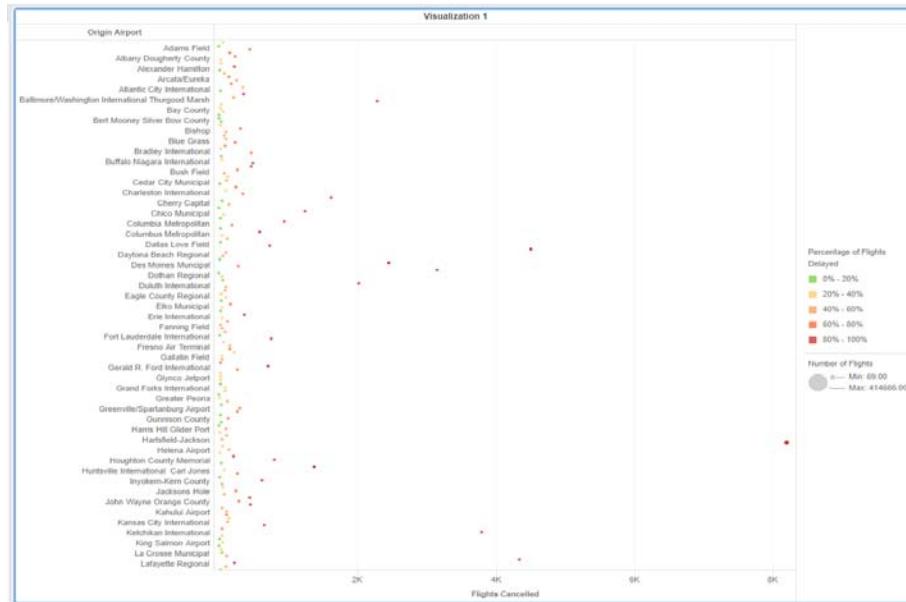
change the threshold color. Right-click the **Flights Delayed** metric in the Color By box and select **Thresholds**.



- 2 From the **Color** drop-down, select **Red-Orange-Green**, then select **Reversed**. Click **OK**.



3 Save the dossier.

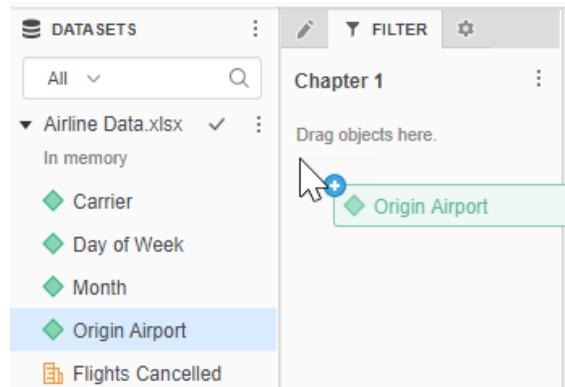


To help choose which airport and airline are best, add a filter for the Origin Airport attribute that displays only the airports in those two metropolitan areas the employees are traveling from.

Filter the data

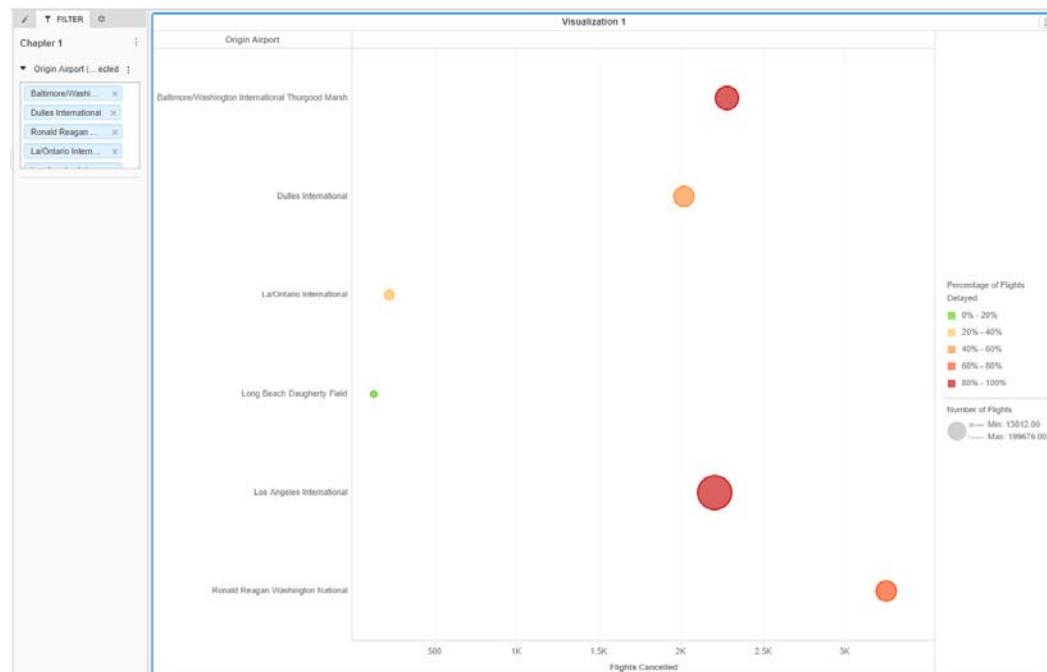
1 Click the **Filter** panel to apply a filter to the dossier.

2 Drag **Origin Airport** to the **Filter** panel.



3 In the **Origin Airport** box, type the below airports in the Los Angeles and Washington, DC areas. When you begin to type the airport name, the field will auto-populate with the names below.

- **Baltimore/Washington International Thurgood Marshall**
- **Dulles International**
- **Ronald Reagan Washington National**
- **La/Ontario International**
- **Los Angeles International**
- **Long Beach Daugherty Field**



4 Click **Save**.

A quick glance the graph shows you should book a flight from Los Angeles International airport for Clarissa. Though the cancellation rate is higher, there are more flight options available.

While Baltimore has a higher percentage of delayed flights, it has a low cancellation rate and more flights. On the other hand, Dulles has a lower percentage of delays, but a higher percentage of cancellations and fewer flights. The employees would rather have their flight delayed than canceled, so you choose Baltimore for Milo.

Analyze the best day to fly

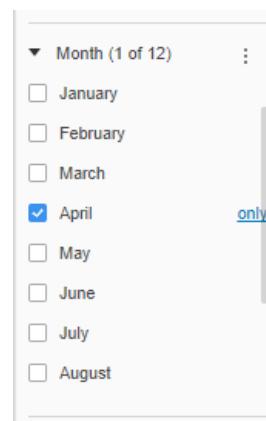
You are making travel plans for Clarissa and Milo's annual joint Spring Convention presentation in April. Clarissa and Milo have decided that Los Angeles (LAX) and Baltimore/Washington (BWI) are their preferred airports for commuting purposes, so you can only make travel plans using those two airports.

Additionally, because their schedules are tight, you need to know which day of the week is best for travel in terms of the percentage of delays. To determine which day of the week in April is most convenient for Milo and Clarissa, you decide to create a heat map. You choose the heat map visualization because the condensed color-coded format of the heat map chart makes the data much more easy to understand.

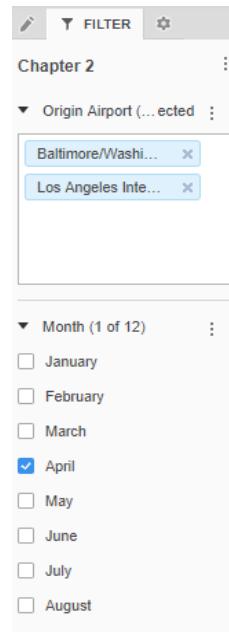
For this portion of the consultant's travel plans, you decide to create a new chapter in your dossier -- this information is separate from their usual week to week travel and you would like to keep it separate and include unique filters.

Create a heat map

- 1 Add a new chapter to the dossier by clicking the **Add a chapter** icon on the toolbar.
- 2 On Page 1 of Chapter 2, click the **Heat Map** icon in the Visualization Gallery.
- 3 Create a filter that ensures the visualization will only include results from the specific month and origin airport. On the Filter panel, drag **Origin Airport** and **Month** to the panel.
- 4 Hover over **April** and click **Only** to filter the page for April only.

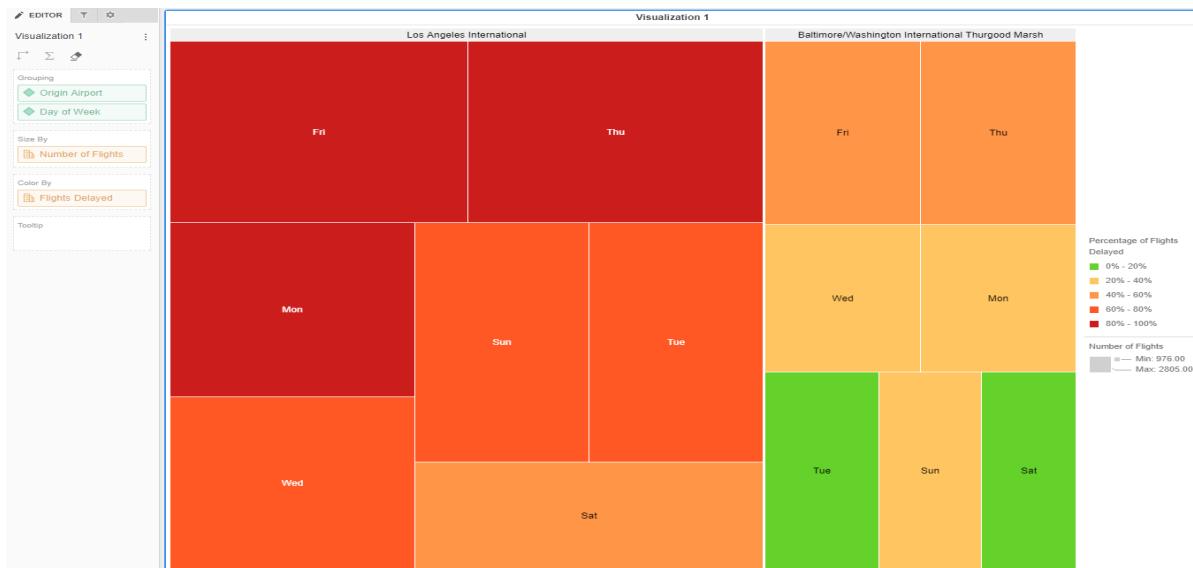


- 5 To filter by airport, begin typing **Baltimore/Washington International Thurgood Marshall** and **Los Angeles International** (the filter will auto-populate) for the Origin Airport filter.



- 6 After the filters are applied, create a heat map that visualizes the number of flights delayed per airline, per day, in the month of April, at the selected airports:
- In the Editor panel, drag the **Origin Airport** and **Day of Week** attributes into the Grouping drop zone.
 - Add the **Number of Flights** metric into the **Size by** drop zone.
 - Remove **Number of Flights** from the **Color By** drop zone.
 - Add the **Flights Delayed** metric into the **Color By** drop zone
- 7 Currently, the days of the week with the fewest flights delayed are red. To reverse the colors, right-click the **Flights Delayed** metric in the **Color By** drop zone and select **Thresholds**.
- 8 On the Thresholds - Flights Delayed window, select **Red Orange Green** for the **Color**, and **Lowest%** for the **Based on** option. Click **Reversed** to have green

represent the lowest end of the spectrum, with red indicating the high end of the spectrum. Click **OK**.



Based on this information, and bearing in mind their travel requirements, which day of the week is the best day for travel for both Milo and Clarissa? According to this heat map, the best travel day for both Milo and Clarissa is Saturday.

- 9 **Save** the dossier. We will continue this workshop after we learn about derived metrics.

Create a metric based on existing metrics: Derived metrics

Derived metrics are metrics that a dossier author can create based on existing dataset objects. For example, you can calculate a monthly average, with the formula $\text{Yearly Profit} / 12$. Derived metrics perform calculations on the fly with available data without needing to re-execute the dossier against the data source. These metrics are an easy way to present already available data in different ways and provide further analysis.

You can use derived metrics to perform analyses such as margins, contributions, and differences between metrics on the report.

Examples of way to include derived metrics are:

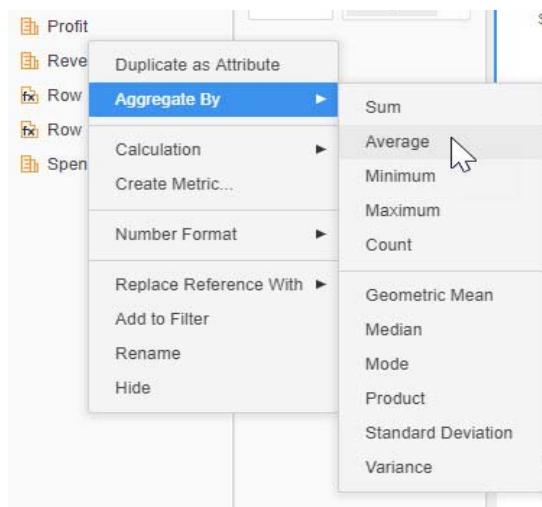
- Subtracting one metric value from another.

- Ranking a metric's value from least to greatest.
- Displaying metric values as a percentage of the total.

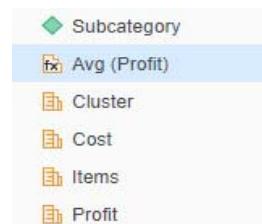
Calculate values in an existing metric: Aggregate By

Aggregation functions, which are a type of derived metric, are used to calculate subtotals for a metric. Examples of aggregate functions include: Sum, Average, Standard Deviation, and Median.

To create a derived metric through an aggregate function, right-click the target metric in the Dataset panel. Select **Aggregate By** and choose a function. The new metric appears as a new dataset object you can now use in your dossier to create visualizations. In the example below, the author is creating a derived metric that shows the average profit.



Once the function is selected, the new metric appears in the dataset as Avg(Profit).

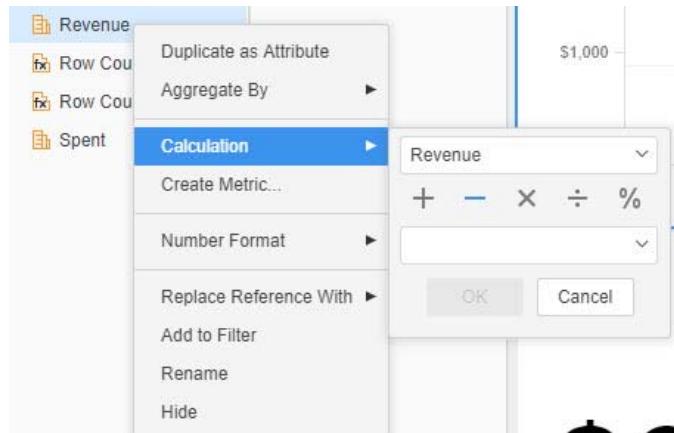


Combine values of metrics: Calculations

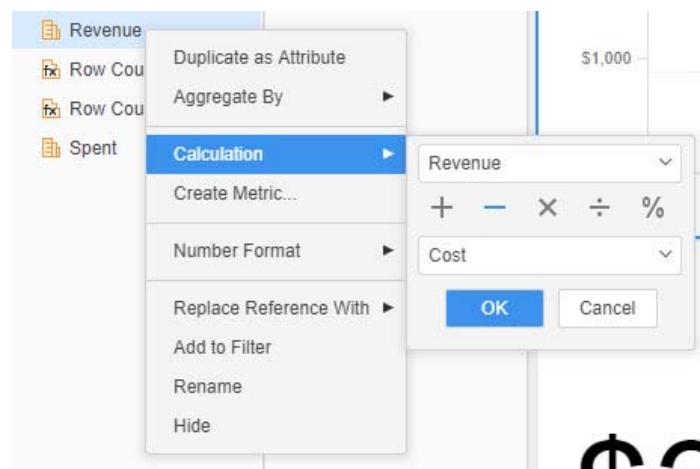
You can create a new derived metric by combining existing metrics with an arithmetic operator. These operators allow you add, subtract, multiply, divide, or find the percentage of the selected metrics.

To create a derived metric by combining two metrics with mathematical operators, right-click a metric in the dataset and select **Calculation**. The metric you initially selected will appear in the first drop-down box, though you can change to another metric. Next, select your mathematical operator.

In the example below the author wants to create a Profit metric. After right-clicking Revenue, she selected the minus sign (-):



Use the drop-down menu in the next text field to select the second metric. In this example, the author selected Cost:



When the new metric is created it will appear as (**Revenue-Cost**) in the dataset. To give more meaning to the derived metric, you can right-click and select **Rename**. In this case, the derived metric was renamed **Profit**.

To learn the advanced uses of derived metrics, take *10.112 Introduction to Analytics Reporting*.

Workshop 3: Visualization analysis

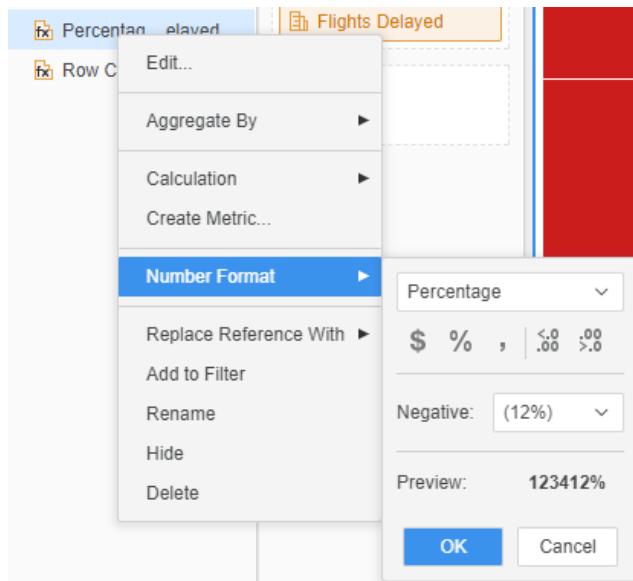
This is a continuation of the previous airline workshop. In Part III, we will add derived metrics to the Airline Data Dossier to find the best airline and day to fly. If you remember, you are booking flights for Milo, flying out of the DC area, and Clarissa, flying out of California.

Analyze airport delays

Create derived metrics to analyze airport delays

- 1 Navigate to the open **Airline Data Dossier**. In Chapter 2, select Page 1.
- 2 On the Datasets panel, right-click **Flights Delayed**.
- 3 Select **Calculation**.
- 4 Choose the division symbol and add **Number of Flights** in the bottom drop-down. Click **OK**. The new metric should be (Flights Delayed/Number of Flights).
- 5 Right-click the new metric and select **Rename**. Type: **Percentage Delayed**.
- 6 Right-click **Percentage Delayed** and select **Number Format**.

- 7 Ensure **Percentage** is selected by right-clicking **Percentage Delayed** and selecting **Number Format**. Remove the decimal points.

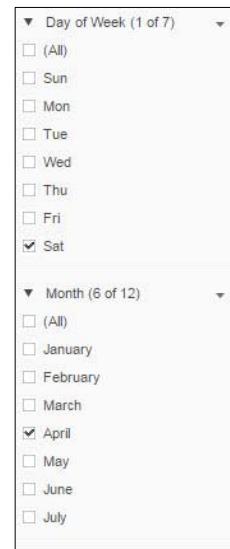


- 8 Click **OK**.
- 9 Add **Percentage Delayed** to the **Tooltip** drop zone on the Editor panel. Now, when you hover your cursor over a square, you can view percentage delayed for each airport.
- 10 Hover over the days for each airport to see which days have the lowest percentage of delayed flights. You will see that Saturday is the best for both airports, which reaffirms your earlier decision to try and book flights on Saturday.

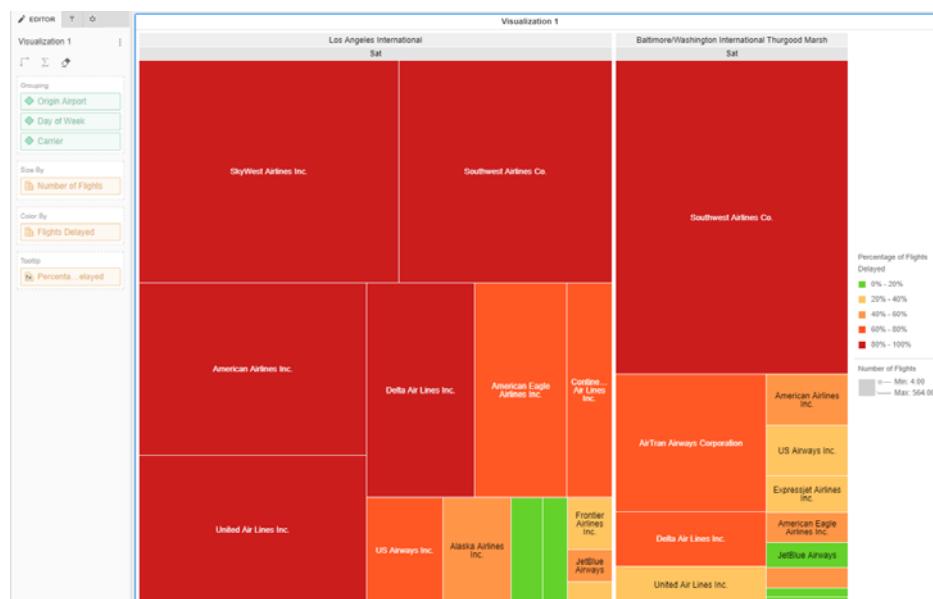
Now that you have confirmed the airport and the day of the week, you should determine which airline is most likely to get Milo and Clarissa to their convention on time.

Determine the best airline

- 1** Add an additional **Day of Week** filter to the heat map by dragging **Day of Week** to the Filter tab. Filter out all days except **Saturday**. This way, we can see what's the most reliable airline for the day we determined has the most delays.



- 2** In the Editor panel, add the **Carrier** attribute to the Heat Map's **Grouping** box to view each box by airline instead of day of the week.

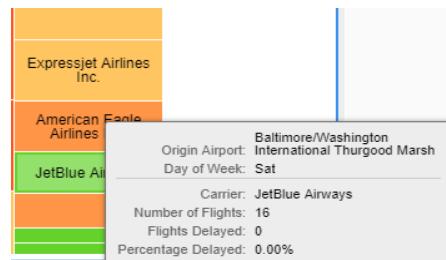


- 3** Click **Save**.

Which airline is most likely to get Milo and Clarissa to their convention on time?

At approximately 8%, Air Tran clearly has the lowest delay rate of any available airline in Los Angeles. Assuming you can find an appropriate booking, he should book Clarissa on Air Tran.

For Milo, the airline with the lowest delay rate is JetBlue, with an excellent 0%, cancellation rate.



In this workshop, you were able to build clear visualizations and easily find the best airport, day of the week, and airline for the consultants. In addition to planning flights for Clarissa and Milo, you can use this dossier to plan a variety of other travel obligations throughout the year.

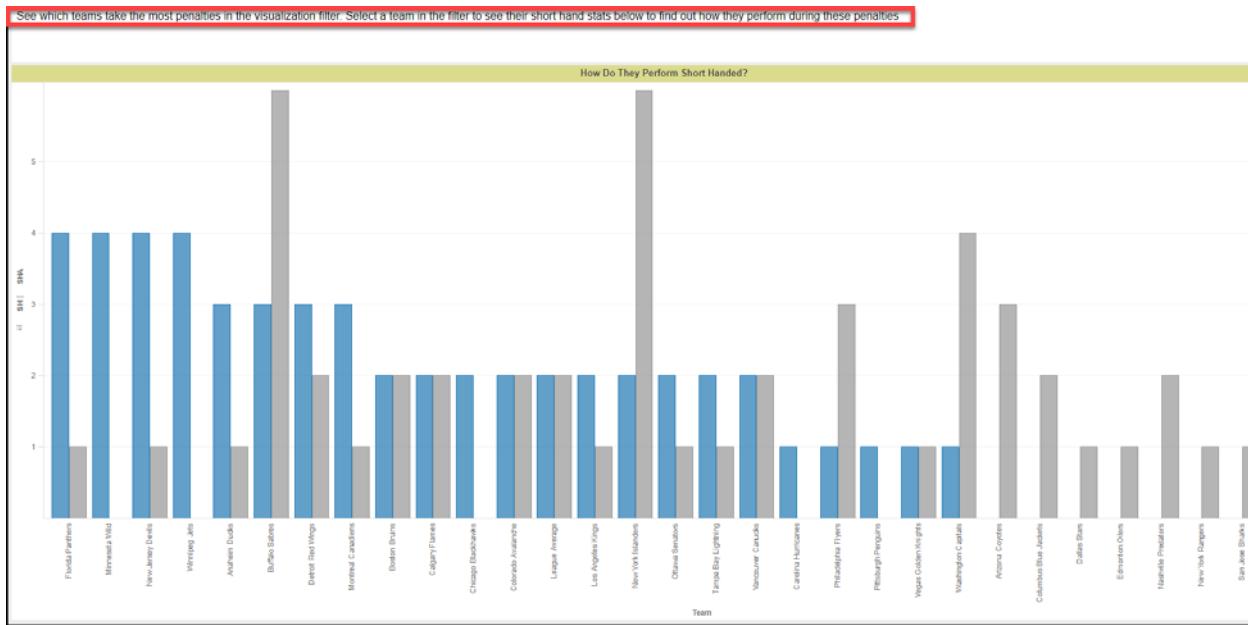
Add dossier details: Insert text or images

The main focus of dossiers is the visual representations of business intelligence, dossier pages can be enhanced by adding text or images. Text can serve as a data label or provide descriptive information to users. Images, such as a corporate logo, can give a dossier a polished and professional look.

Add text

Adding text is a simple way to provide more information to users. Text can provide labels for visualizations, explain the data that is contained in the

visualization, or provide additional information to users. Text can be formatted, resized, and repositioned on the dossier.



In the example above, this dossier page displays penalty trends for NHL teams. The text box, highlighted in red, help provide guidance for the end users by explaining how to maximize the page's analysis.

These are the high-level steps to add text to the dossier:

- 1 Click the **Insert Text** icon on the toolbar.
- 2 The text box by default will appear at the top of the dossier. Click and drag to move it to your desired location.

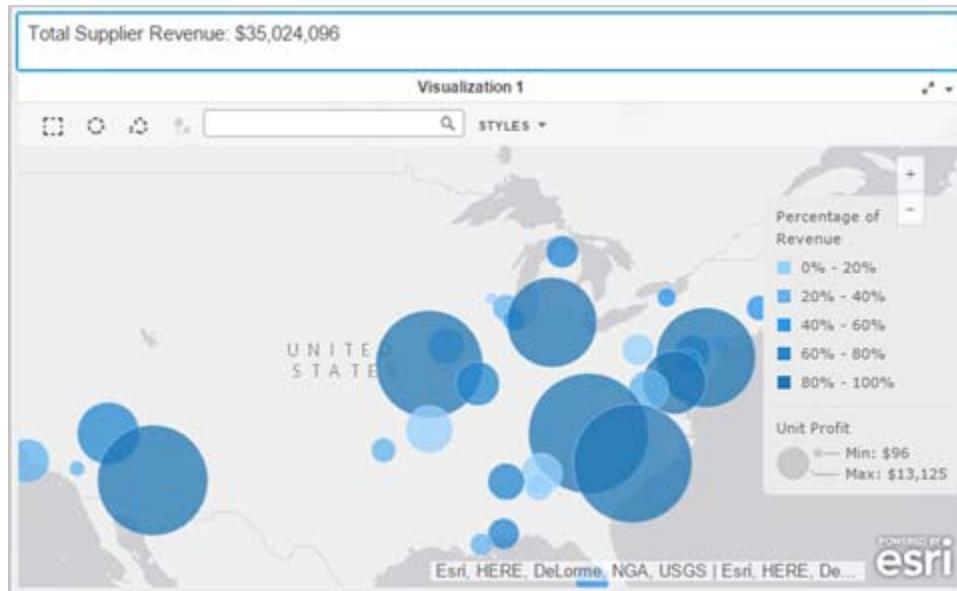
Dynamic text

Dynamic text contains a reference to an object on a report. Each time you view the dossier, the dynamic text field will automatically update based on the latest available data. Create dynamic text by dragging dataset objects into a text box.



In the example above, if you click and drag the **Out of Stock** metric into the text box, the total number of products out of stock in the dataset appear in the text box. The next time someone views the dossier, the Out of Stock dynamic text automatically updates based on the most recent values in the data source.

Combine static text with dynamic text to give the value meaning. For example, combine the static text “Total Supplier Revenue:” before the dynamic text, as seen in the image below, to allow users to identify important metrics at a glance.



Add an image

You can add your corporate logo or a relevant image to enhance the overall look of your dossier. You can specify that when a user clicks the logo, it opens your company homepage. You do this by inserting a URL into the logo.

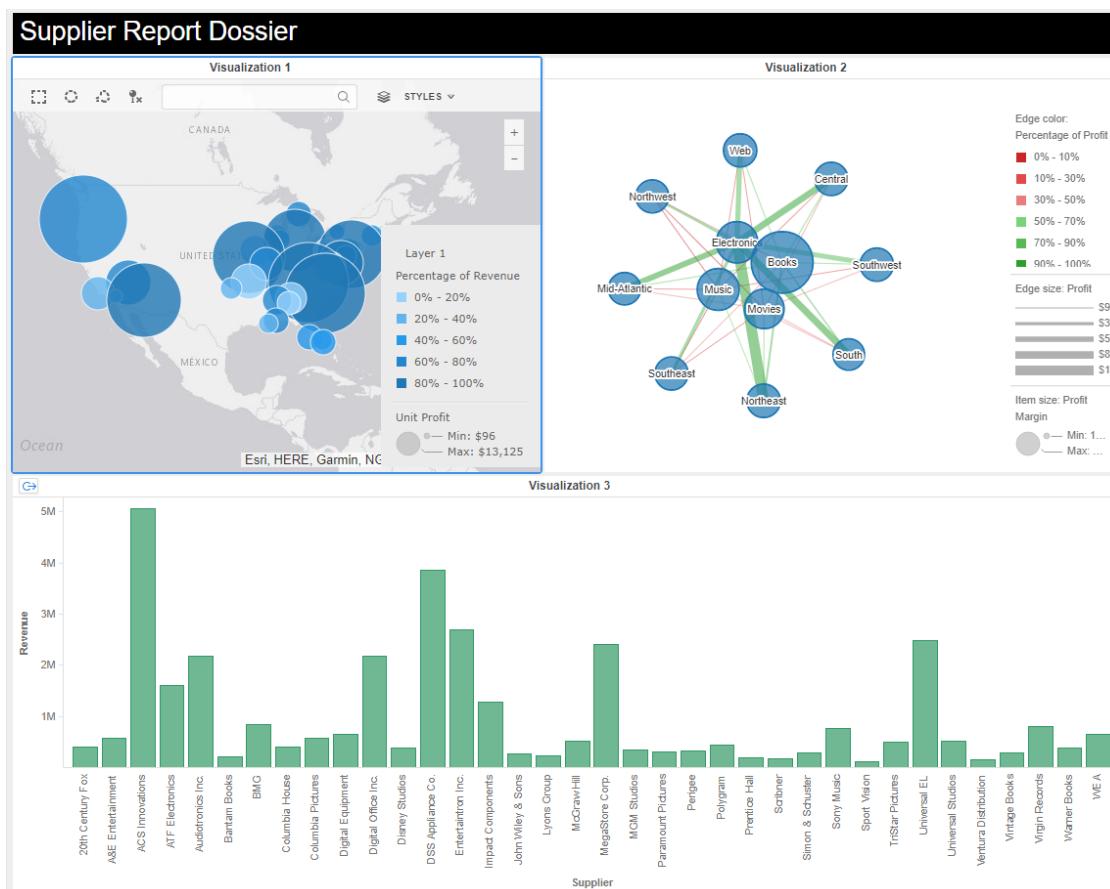
Exercise 3.4: Insert text and complete the dossier

In this exercise, you will give the dossier a title by inserting a text box. Then, to show total supplier revenue, you will add a dynamic text box. To add polish, link to the company’s home page, you will add an image that links to the company website. Lastly, we will rename the visualizations with relevant titles.

Add the dossier title

- 1 Open the **Supplier Dossier**.
- 2 On the Supplier Dossier toolbar, click the **Insert Text** icon.
- 3 Type: **Supplier Report Dossier**

- 4 With the text box selected, click the **Format** panel.
- 5 Change the **Font size** to **20**.
- 6 In the drop-down list next to the font size, set the text color to **White**.
- 7 Set the **Fill color** to **Black**.
- 8 Click **Save**.



Add dynamic text to display supplier revenue

- 1 Click the **Insert Text** icon.
- 2 Click and drag the new text box to the right of the title.
- 3 Place your cursor in the text field and type: **Total Supplier Revenue**

- 4 Click and drag the **Revenue** metric from the dataset and place it to the right of the entered text.

Total Supplier Revenue: \$35,024,096

- 5 With the text box selected, click the **Format** panel on the Editor panel.
- 6 Change the **Font size** to **14**.
- 7 Change the text color to **White**.
- 8 Change the background fill color to **Black**.

Add an image

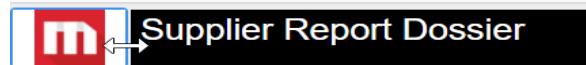
- 1 From the toolbar, click the **Image**  icon.
- 2 Click and drag the image container to the left of the text box as seen below.



- 3 Copy and paste the following URL into the **Enter an image field**: <http://is3.mzstatic.com/image/thumb/Purple118/v4/0c/3a/97/0c3a9786-8f77-bd36-4746-bfd8f9228add/source/175x175bb.jpg>
- 4 Click **OK**. You will see the image appear.

Resize the image container

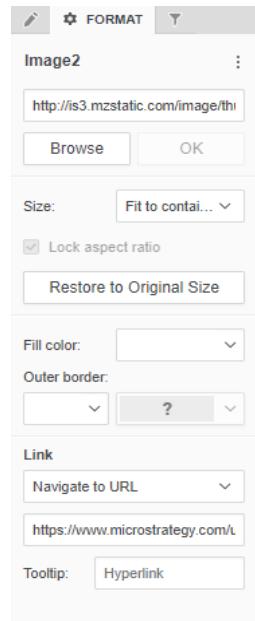
- 5 To resize the image container, click the right side of the container and drag it until it reaches the desired size.



Edit the image

- 6 Select the image container and click the **Format** panel.
- 7 Change the **Fill color** to **Black**.
- 8 In the Link area, in the drop-down list, select **Navigate to URL**.

9 Enter the following URL: <https://www.microstrategy.com/us>



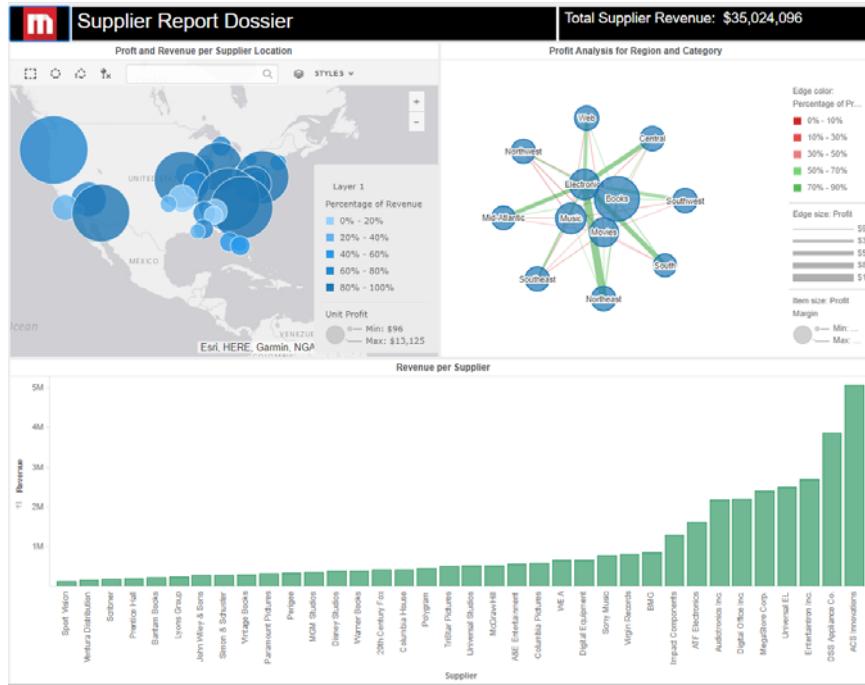
10 Click **Save**.

Now, we will create labels for the visualizations to help users interpret the data.

Rename the visualizations

- 1** To rename the Map visualization, double-click the title **Visualization 1** so the text is highlighted.
- 2** Type the new title: **Profit and Revenue per Supplier Location**.
- 3** Repeat these steps and rename the Network visualization: **Profit Analysis for Region and Category**.

4 Rename Visualization 3 as: Revenue per Supplier.



5 Click **Save**.

Analyze the dossier in Library

- 1 Click **Share** from the toolbar and select **Get a link to MicroStrategy Library**.
- 2 Click **Launch** under the link.
- 3 If needed, log into Library with your **User Name** and **Password**.
- 4 Explore the visualizations by doing the following:
 - Hover over a data point to view more details.
 - Use the Filter panel to change the subcategory.
 - Sort a visualization.
 - View drill options for the bar graph.
 - Use the page to page linking filter to view the targeted grid for specific suppliers.
 - Change the view of the Network visualization.

- Change the style of the map.

Workshop 4: Analyze data to determine areas of opportunity

Sydney Electronics is a growing online retailer selling electronics products. The company recently created a blog to engage with customers and increase its online presence. The executives of Sydney Electronics want to analyze the successes and failures of each blog article author. Specifically, they are looking for any areas that need to be improved or adjusted.

To help gauge blog author performance, they want to see the growth in the number of views and the number of different interactions for each author. In this exercise, you will create a dossier that enables the executives to explore the overall and detailed information about each author. We will create derived metrics and apply them to visualizations to determine areas of success and where improvements can be implemented for the blog articles.

Add a dataset

- 1 From the My Reports page, create a new dossier.
- 2 Click **Add Data** and select **New Data**.
- 3 Click **File From Disk**.
- 4 Click **Choose files** and upload the **Article Database.xlsx** file.
- 5 Click **Prepare Data**. Select both the **Blog Stats** and **Followers** worksheets when prompted, then click **Select**.
- 6 In the Preview window, there are several columns marked as attributes that need to be converted into metrics. Convert the following columns into metrics by clicking the specific attribute and dragging it into the **Metrics** box:
 - Number of Views
 - Number of Comments
 - Number of Favorites
 - Number of Shares
 - Shares

- Favorites
- Comments

The revised data should look like this in the Preview window:

The screenshot shows the Miro workspace. On the left, there is a template for a table with three columns and four rows, labeled "Add a new table". To the right of the workspace are two dataset panels.

Blog Stats (Article D...)

- Attributes:
 - Article ID
 - Article Name
 - Article Topic
 - Author
 - Publish Month
 - Publish Day of W...
 - Publish Day
 - Publish Time
 - Reader
 - View Month
 - View Day of Week
 - View Day
 - View Time
- Metrics:
 - Comments
 - Shares
 - Favorites

Followers (Article D...)

- Attributes:
 - Month Joined
 - Username
 - time
 - favorite topic
- Metrics:
 - Number of Views
 - Number of Com...
 - Number of Favori...
 - Number of Shares

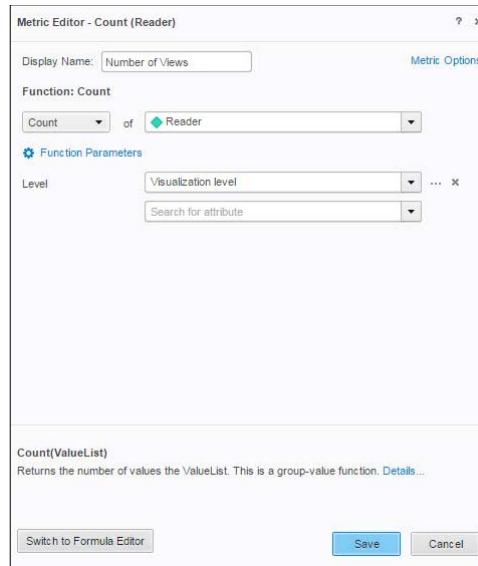
- 7 Click **Finish** to update the dataset.

Create a derived metric to add the Number of Views metric

You would like to show number of views for each article, however that metric is not included in the dataset. To create the Number of View metric, you can create a derived metric based on a count of the Reader attribute, as each view has a unique reader name in the dataset.

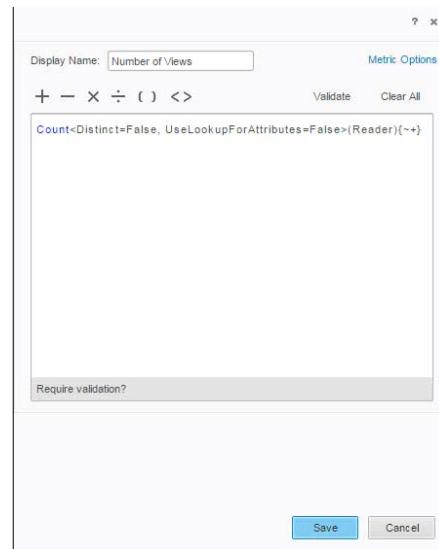
- 8 In the Dataset panel, right-click the **Reader** attribute and select **Duplicate as Metric**. The new Count (Reader) metric is created and displayed.

- 9** In the Dataset panel, right-click the **Count (Reader)** metric and select **Edit**. In the **Display Name** box, type **Number of Views**.



- 10** Click **Switch to Formula Editor**.

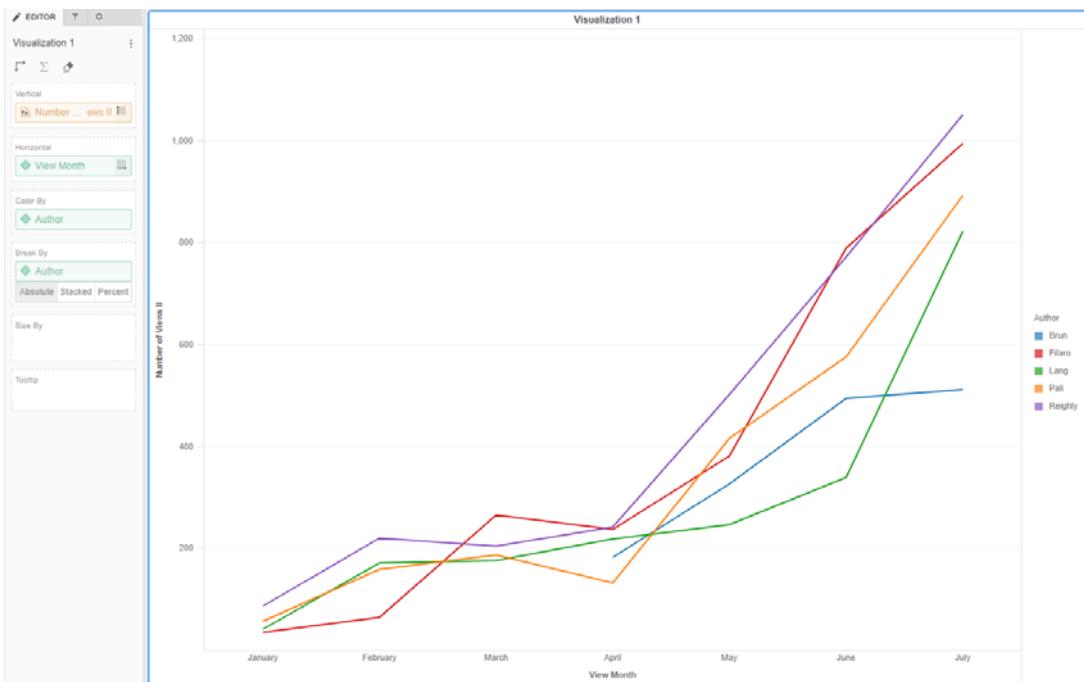
- 11** You want to count each time a reader viewed the blog article, but the formula currently removes all duplicates from the result. To count each view, not each reader name, in the formula box, change **Distinct=True** to **Distinct=False**.



- 12** Click **Save**.

Create a Line chart to show views per month by author

- 1 In the Visualization Gallery, click **Line Chart**.
- 2 In the Dataset panel, drag the **View Month** attribute to the **Horizontal** drop zone to show each view by month.
- 3 Drag the **Number of Views** metric to the **Vertical** drop zone. Now, the chart shows number of views per month, but you would like to see views per author.
- 4 To distinguish each author in the Line chart, drag the **Author** attribute to the **Color By** drop zone. The visualization will display as shown below.

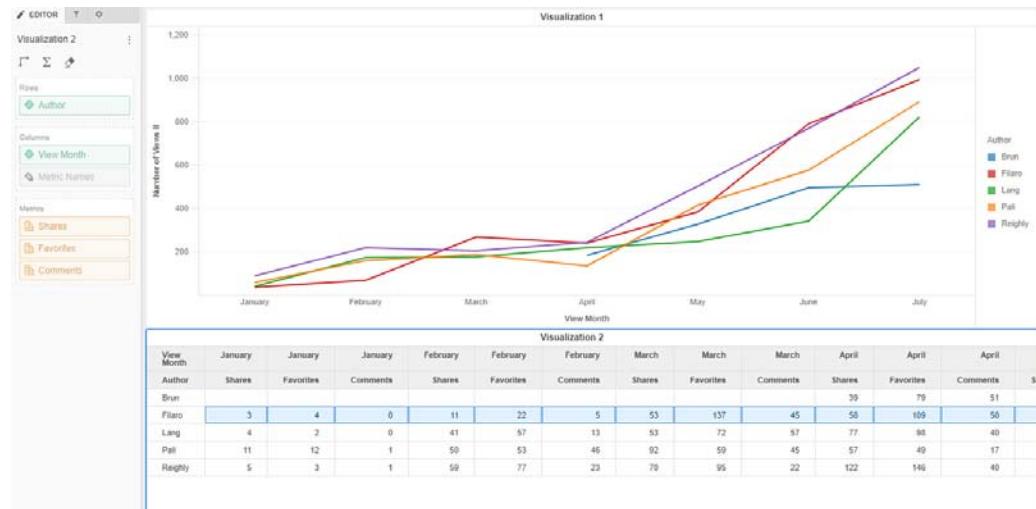


Add a grid visualization

- 1 You would like to add a grid visualization to show key performance indicators, such as shares and favorites, by author. Add a second visualization using the **Insert Visualization** icon on the toolbar.

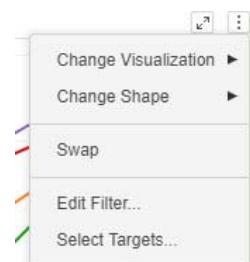
Make sure that the new visualization is displayed as a grid. If not, click the Grid icon in the Visualization Gallery.

- 2** In the new visualization, drag the **Author** attribute to the **Rows** drop zone. Drag the **View Month** attribute to the **Columns** drop zone.
- 3** Add the **Shares**, **Favorites**, and **Comments** metrics to the **Metrics** drop zone.
- 4** Click the Visualization 2 container and drag it below the first visualization.



Use the Line chart to filter the grid visualization by month

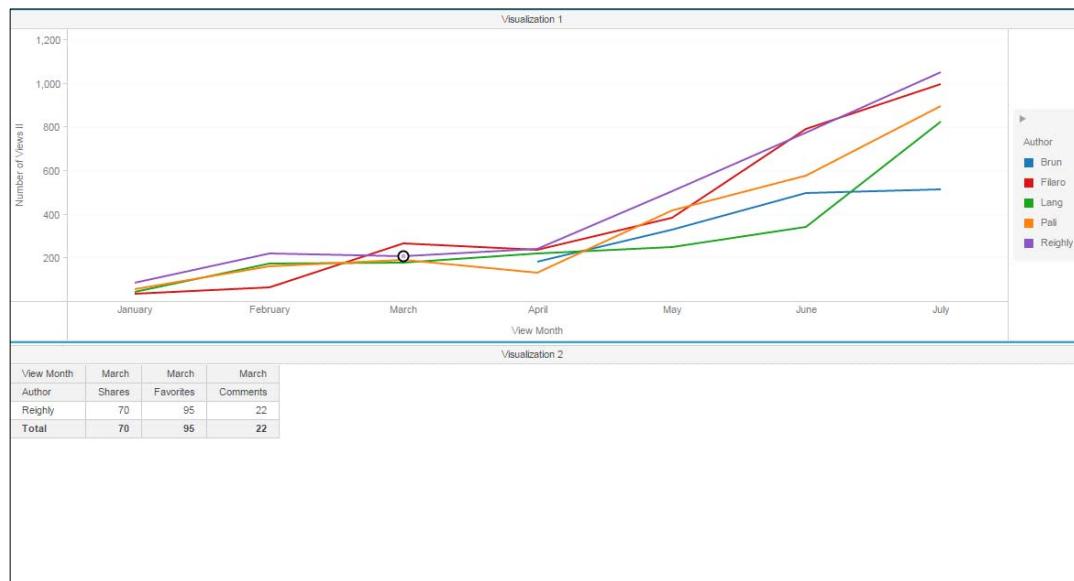
- 5** You would like to add a filter by month to the grid to analyze each author's performance by month to view any outliers. To make an interactive filter using the Line chart, in the first visualization click the **Menu** icon and click **Select Targets**.



6 Click Visualization 2, then click **Apply**.



You can now filter the grid in Visualization 2 by selecting a month or months in Visualization 1.



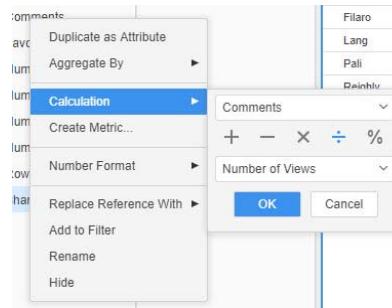
7 Save the dossier as **Article Database Dossier** in the My Dossiers folder.

Analyze the visualization

- Which author had the most views in July?
- In June, which author had the highest number of favorites, shares, and comments?
- In April, which authors show a decrease in the number of views?

Add a new page and create derived metrics

- 1 You would like to further analyze individual author performance by KPI rates. Since this is separate from the actual number of KPIs, you want to create a new page. At the bottom of the dossier window, click the **Add a page** icon in the toolbar.
- 2 You would like to analyze the rate of comments, favorites, and shares per view. In the Dataset panel, right-click **Comments**, point to **Calculation**, and click \div .
- 3 In the top drop-down list, leave **Comments** selected and in the bottom drop-down list, select **Number of Views**. Click **OK**.



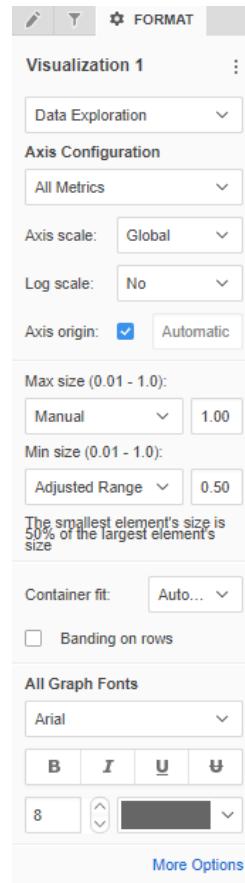
- 4 A derived metric displays in the Dataset panel. This derived metric is named **(Comments/Number of Views)**. Give the metric an easily understood name by right-clicking it and selecting **Rename** to rename it as **Comment Rate**.
- 5 Repeat the appropriate steps above by dividing **Favorites** by **Number of Views**. Name the new metric as **Favorite Rate**.
- 6 Repeat the appropriate steps above by dividing **Shares** with **Number of Views**. Name the new derived metric as **Share Rate**.

Add a bubble chart

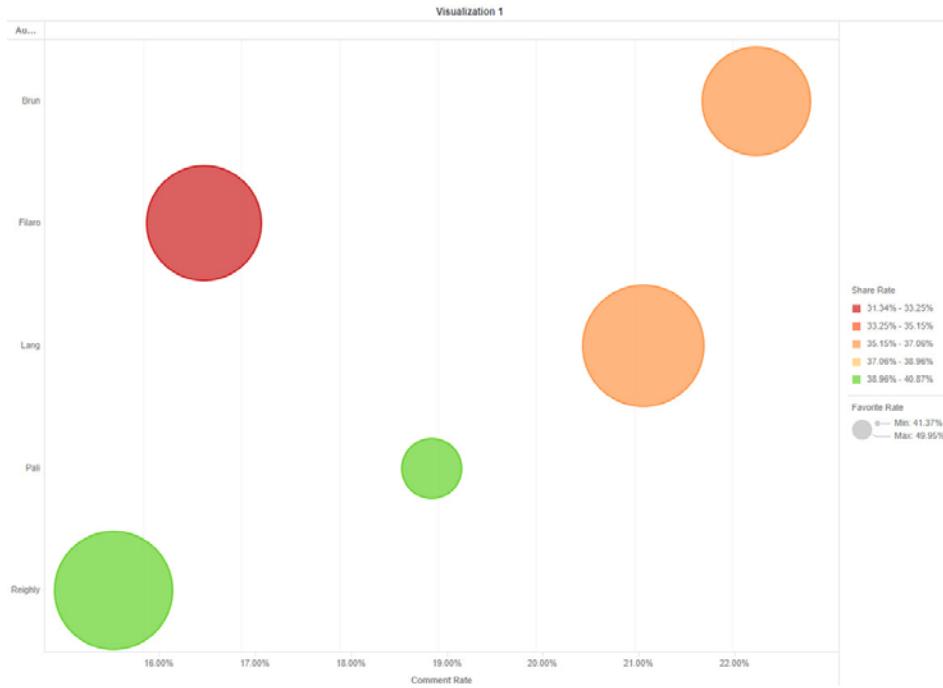
- 1 Click the **Bubble Chart** icon in the Visualization Gallery.
- 2 In the Dataset panel, drag the **Author** attribute to the **Vertical** drop zone.
- 3 Drag the **Comment Rate** metric to the **Horizontal** drop zone. The further left the bubbles, the higher the comment rate.

- 4 Drag the **Share Rate** metric to the **Color By** drop zone. The darker the bubble, the higher the share rate.
- 5 Drag the **Favorite Rate** metric to the **Size By** drop zone. The larger the bubble, the higher the favorite rate.
- 6 A single color scheme for the bubbles does not allow for quick analysis. To make the color scheme more visually representative of the data, right-click the **Share Rate** metric in the **Color By** drop zone. Select **Thresholds**.
- 7 Select **Red-Orange-Green** for a color scheme as it displays a higher degree of contrast. In the **Based on** drop-down list, select **Value** and click **OK**.
- 8 To further distinguish the bubbles to help with the visual analysis, you can change the minimum and maximum size of the bubbles. In the Editor panel, click the **Format** tab.
- 9 In the top drop-down box, select **Data Exploration**.
- 10 In the **Max size** drop-down list, select **Manual**.
 - In the box, type **1**.
- 11 From the **Min size** drop-down list, select **Adjusted Range**.
 - Type **.5** in the box.

The Format tab in the Editor panel should look like the image below:



The dossier should now look like this:



Analyze the visualization

Based on this dossier, answer the following questions.

- Which author has the lowest comment rate?
- Which authors have the best share rate?
- Which author has the highest favorite rate?

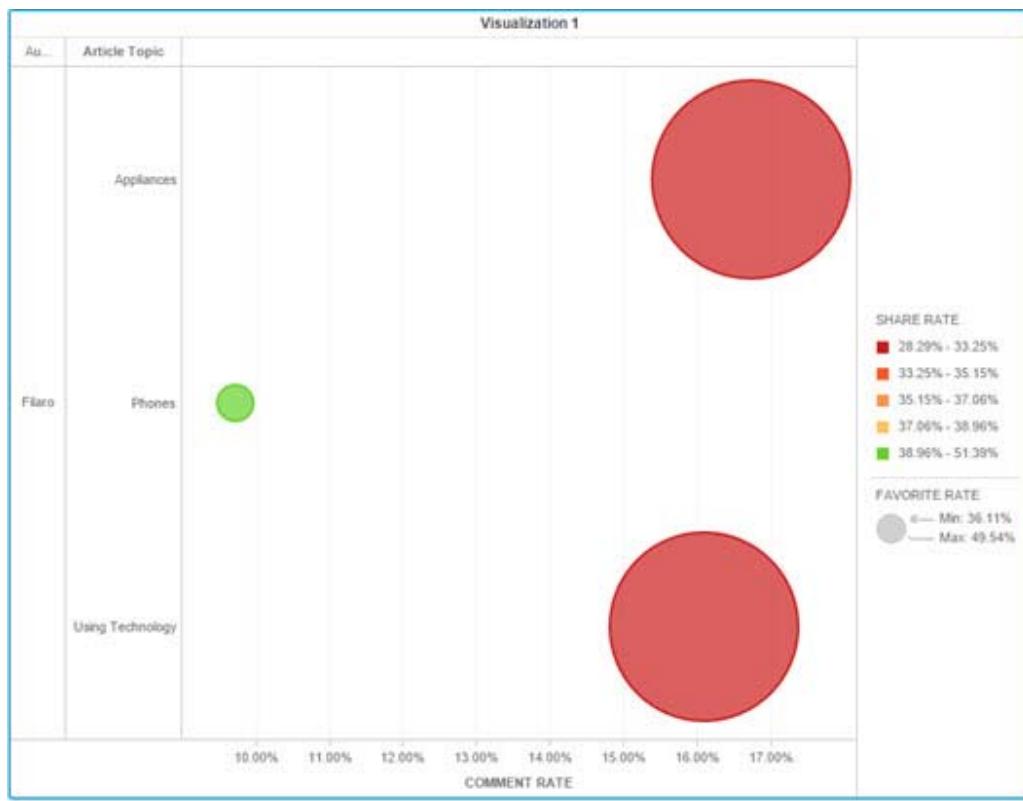
Drill down from author

Filaro has the lowest share rate, so you would like to further analyze his performance by article topic.

- 1 Right-click the circle for **Filaro**, point to **Drill** and select **Article Topic**.



The resulting bubble visualization displays Filaro's article topics.



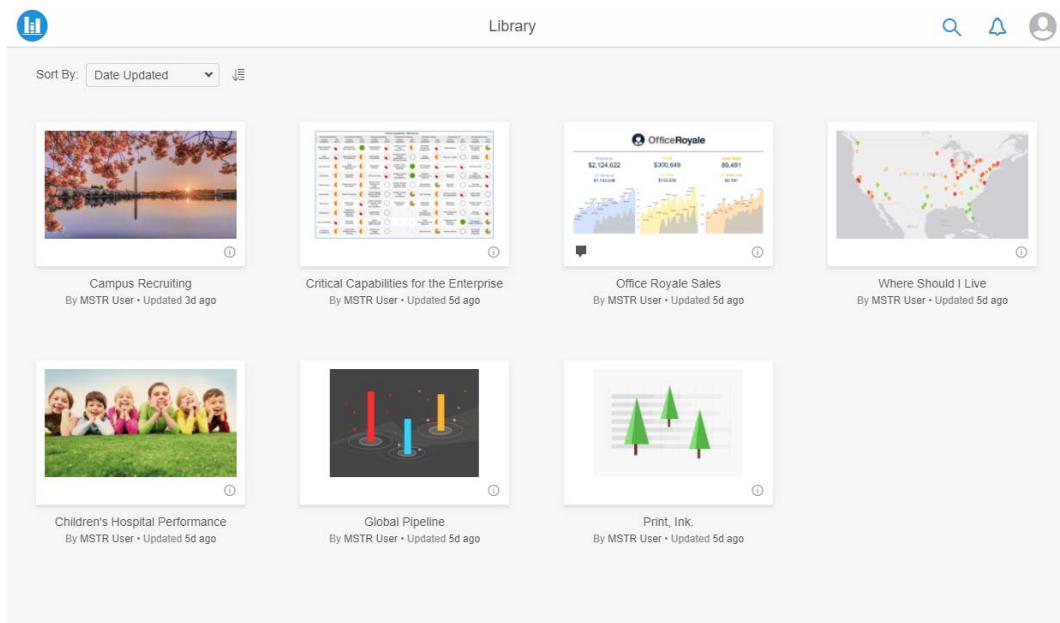
Analyze the visualization

Answer the following questions based on this visualization:

- Which topic had the highest comment rate?
- Which topic had the highest share rate?
- Which topic had the lowest share rate?
- Which topic was the least favorite?

SHARE AND COLLABORATE WITH MICROSTRATEGY LIBRARY

You can access all your dossiers in a single location from a personalized virtual bookshelf called MicroStrategy Library. Library combines powerful search functionality, real-time collaboration, and a simplified design to make accessing and sharing analytics fast and easy.

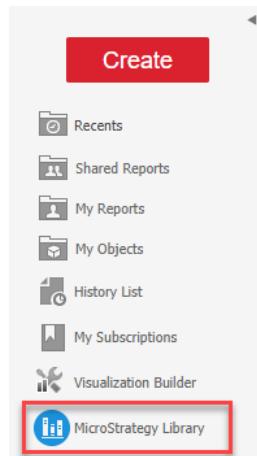


The screenshot displays the MicroStrategy Library interface. At the top, there's a navigation bar with a magnifying glass icon, a bell icon, and a user profile icon. Below the navigation bar, a search bar contains the text "Library". A dropdown menu labeled "Sort By:" is set to "Date Updated". The main area shows a grid of nine dashboard cards:

- Campus Recruiting** (By MSTR User • Updated 3d ago): An image of cherry blossoms over water.
- Critical Capabilities for the Enterprise** (By MSTR User • Updated 5d ago): A complex matrix chart with many colored cells.
- Office Royale** (By MSTR User • Updated 5d ago): A bar chart titled "Office Royale Sales" with values \$2,124,622, \$300,649, and \$8,491.
- Where Should I Live** (By MSTR User • Updated 5d ago): A map of the United States with various colored dots representing data points.
- Children's Hospital Performance** (By MSTR User • Updated 5d ago): An image of children sitting on a grassy hill.
- Global Pipeline** (By MSTR User • Updated 5d ago): A 3D bar chart with red and blue bars.
- Print, Ink.** (By MSTR User • Updated 5d ago): A chart featuring three green pine trees.

Each dossier in the library is represented by a customized thumbnail image, making it easy to visually identify content. Powerful search options are available to find content quickly. Notifications and comments made to the user will show up clearly as an alert, so you won't miss an update.

To launch your Library, simply click **MicroStrategy Library** on the toolbar in MicroStrategy Web.



You can access your Library even when you are away from the office, using Library Mobile. Regardless of what browser or mobile device a user is on, the MicroStrategy Library is responsive and will automatically resize as needed. This course will cover Library in Web, we will explore Library Mobile in Day 3 of Jump Start, *10.123 Enterprise Mobility*.

For more detailed information on Dossier Mobile, take *10.116 Introduction to Dossiers: Storytelling and Collaborating*.

Exercise 4.1: Add a cover image

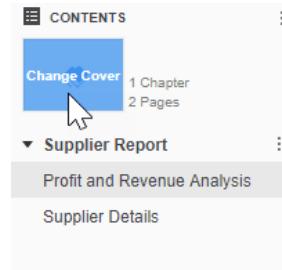
MicroStrategy Library organizes dossiers by displaying them as thumbnails on the main home page to browse through and find content. When selecting a thumbnail, choose from MicroStrategy stock images, add a web URL, or your own custom images.

To quickly identify the Supplier dossier in your Library, we will add a cover page thumbnail in this exercise.

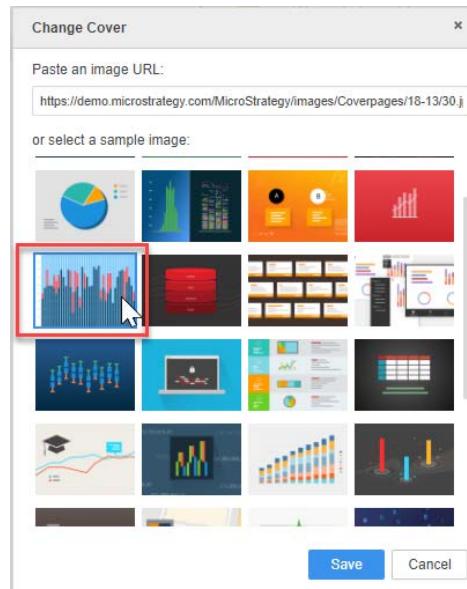
Add a cover image

1 Open the **Supplier Dossier**.

2 From the Table of Contents panel, click **Change Cover**.



3 Click the **Bar Chart** icon, then click **Save** to apply the new cover image.

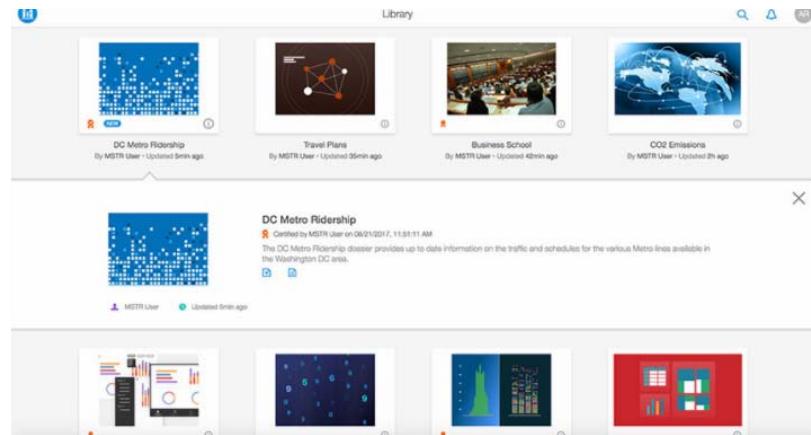


4 **Save** the dossier.

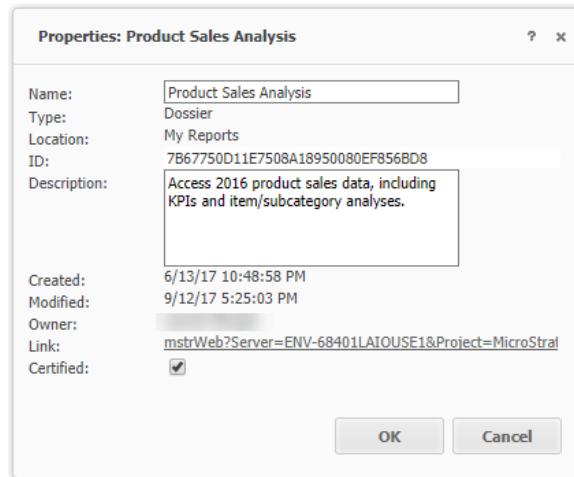
Verify and validate: Certified dossiers

When making business decisions based on data, data governance, the overall management and integrity of data across the enterprise, is a critical asset. To ensure accuracy within MicroStrategy Library, analysts and data stewards can watermark content with a certified stamp. Certification offers an easy way to

implement governance across a self-service deployment and makes it clear for business users which content is tied to trusted data sources.



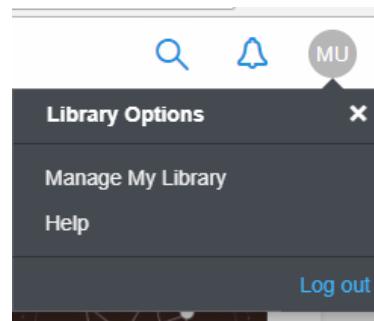
To certify a dossier in MicroStrategy Web, a user with the appropriate permissions can right-click the dossier icon, click **Properties**, and select **Certified**. When the dossier appears in Library, it will show the certified stamp and the name of the user who certified the dossier.



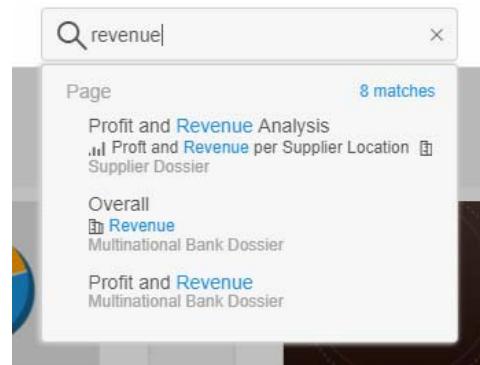
Personalize and manage your Library

As you add more dossiers and other MicroStrategy objects to your Library, you'll want to manage and personalize your virtual bookshelf. To make your Library easy to navigate, you can sort your dossiers by name, date added, date updated, or date viewed. Additionally, you can rename or delete dossiers in your Library.

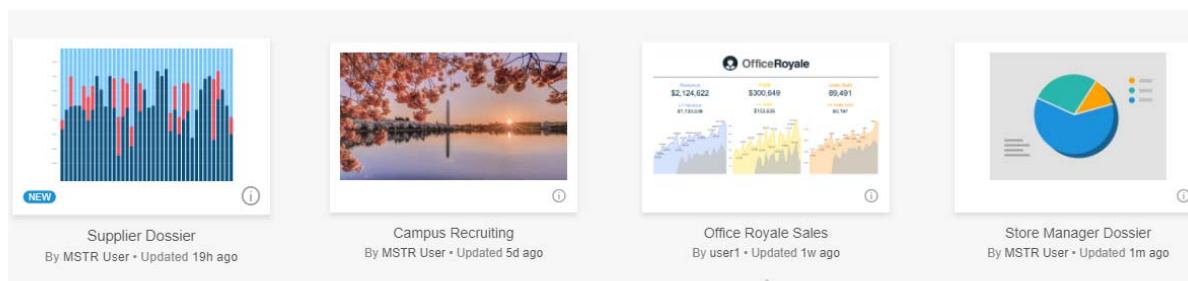
These options are available when you click the user ID icon (for this class, the user ID is MU) and select **Manage My Library**.



To help find the data you need, use Library's powerful search options. Use key words to find dossiers, metrics, attributes, and other MicroStrategy objects in your Library.



Additionally, each dossier thumbnail also indicates the owner name, last updated time, and number of comments made on that dossier. Click the **Information** ⓘ icon on the dossier thumbnail to find details and export the dossier as either a PDF or .MSTR file.

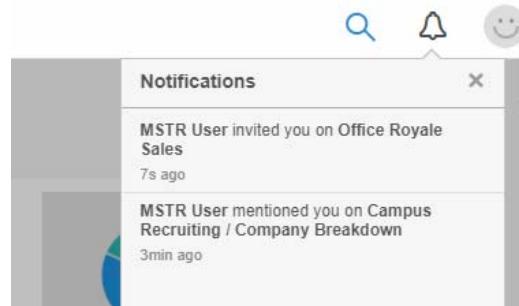


Office Royale Sales

Office Royale Sales Sales teams use this dossier to understand key sales performance and pipeline metrics. There are chapters for opportunity analysis, individual sales rep performance, and performance by product categories.

Collaborate and communicate with MicroStrategy Library

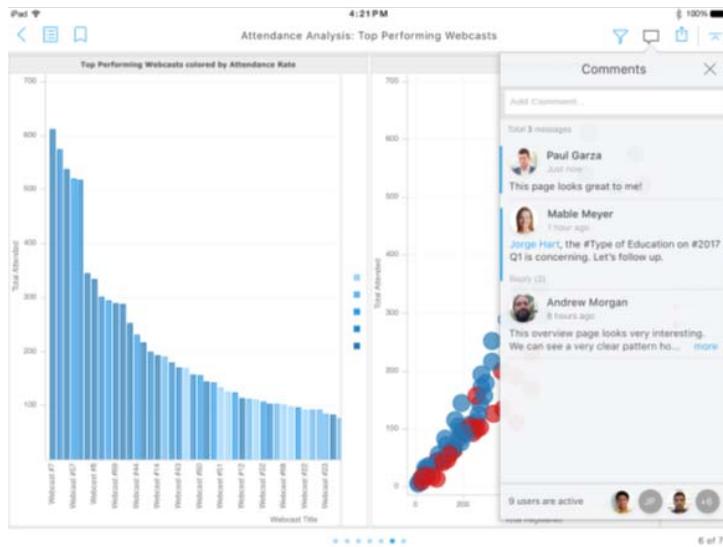
Now that you've created your dossier, you will want to share your findings with colleagues and clients. Through MicroStrategy Library, you can collaborate via page-specific discussion threads and real-time comments within dossier pages. Anyone who has access to a dossier through MicroStrategy Library can ask questions, highlight trends, and share their current filter state with others. Once you tag users in comments or invite them to view a dossier, they can receive real-time notifications via email, browser banners, page and library alerts, or push notifications.



With Library comments, you and your team can:

- Gain new insight on your analytics through reading other users' thoughts and conclusions.
- Share findings with your colleagues in real time, not in another email thread.
- Add comments to specific users by tagging them with @user_name.
- Reach out to subject matter experts and have a real-time conversation alongside your data visualizations.

- Share a link to your "view" of a dossier, such as your current filter settings, to provide additional context by using @filter in your comment. You can reset any filters you've added by clicking the **Reset**  icon on the toolbar.



Activity: Explore collaboration in Library

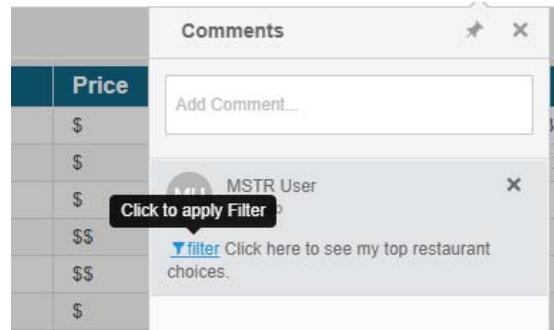
In this activity, we will explore collaboration methods with the Campus Recruiting dossier.

Upload and add the dossier to your Library

- 1 From the **My Reports** page in MicroStrategy Web, click **Create**, then select **Upload MicroStrategy File**.
- 2 Navigate to your Jump Start Exercises folder, then double-click the **Campus Recruiting.mstr** file.
- 3 In the Upload window, click **View Dossier**.
- 4 From the toolbar, click **Share**, then select **Get a link to MicroStrategy Library**.
- 5 Under the link, click **Launch**.
You will arrive on the About MicroStrategy page.
- 6 Click **Add to Library** to add the Campus Recruiting dossier to your Library.

Explore and collaborate on the Campus Recruiting dossier

- 1 While you explore the Campus Recruiting dossier pages and chapters, use collaboration methods to do the following:
 - Ask a question to the dossier author by tagging @mstr_user.
 - In the **DC Living - Restaurants** page, filter the page based on restaurant category and price range.
 - Add a comment with your restaurant choices by using @filter to save your page view. Then, use the **Reset**  icon to return to the unfiltered state. Click the **Filter** icon on your comment to view your restaurant picks.

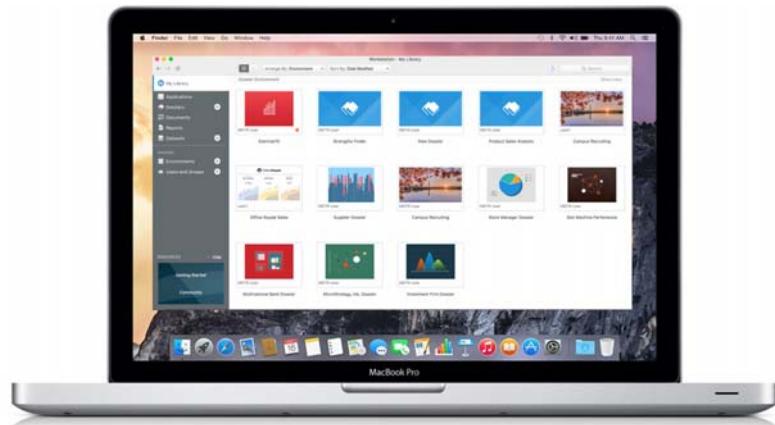


- Use the **Table of Contents** to view all the chapters and pages of the dossier. Be sure to view the different visualizations, filters, and design techniques in the dossier.

- Throughout the dossier, which visualizations did the author use? Which filter types are employed?

UNIFIED AUTHORING AND ADMINISTRATION: WORKSTATION

Workstation: A centralized and unified platform

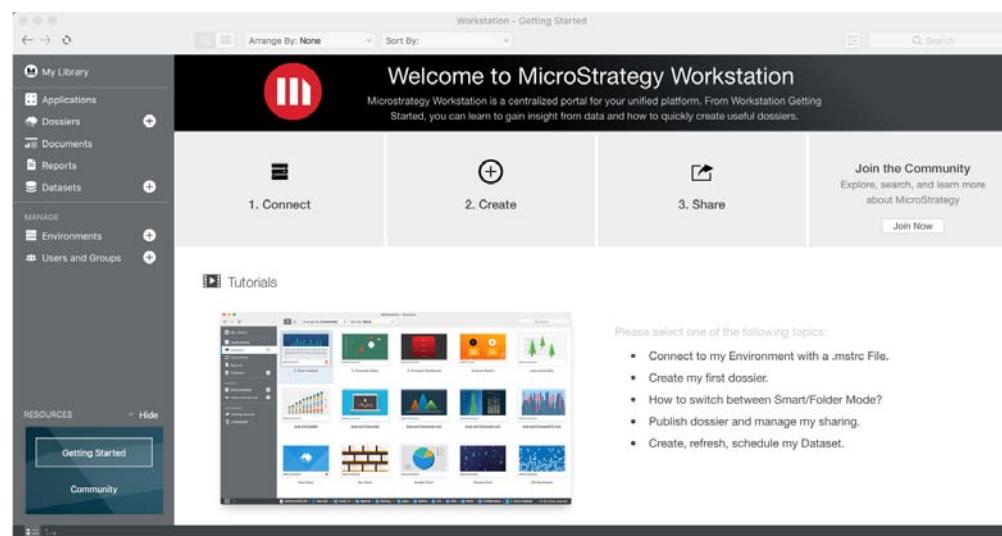


Many business roles today are fast paced and dynamic, with employees rarely working on the same project every day. A banking business analyst may need to analyze data, share compelling information and solutions, and implement new procedures or trainings for multiple bank sites. With that in mind, MicroStrategy

Workstation provides you the tools to accomplish multiple goals all in one platform.

Workstation is a unified tool that combines the power of MicroStrategy Library, user management, and content authoring into a single user experience. Use Workstation to generate insights offline or when connected to the server. You can access dossiers, reports, Library, documents, datasets, and user management in Workstation. If you need assistance or have questions, you can access Workstation tutorials and MicroStrategy Community right from Workstation.

Resources at your fingertips



To get started, you can access live resources directly in Workstation. Select **Getting Started** under Resources to watch video tutorials, such as connecting to an environment, how to build a dossier, and refreshing a dataset. You can also view sample dossiers to provide you ideas to help you create your best in class dossier.

Have more questions or want to learn more about MicroStrategy from product experts and other MicroStrategy users? Select **Community** under Resources to access MicroStrategy Community forum. Leverage the MicroStrategy community

to ask questions, download visualizations, and add your ideas. For example, type **dossier** into **Search** to view articles, ideas, and discussions on dossiers.

The screenshot shows the MicroStrategy Community interface. A search bar at the top contains the term "dossier". Below it, a search result titled "Search results for: dossier" displays two items: "Embedding a dossier" and "Executive dossier". To the right, there are filters for "Type" (SDK Documentation, Discussion, Idea, Example, Article, Documentation, Tutorials, Blog) and "Created Date" (All Time, 146 results). The interface includes a sidebar with "My Library" and a main content area with "Resources" and "Community" buttons.

Design and distribute dossiers

The screenshot shows the MSTR Workstation interface for dossier design. On the left, a sidebar lists "My Library" with sections for Applications, Dossiers, Documents, Reports, Datasets, MANAGE, Environments, and Users and Groups. The main workspace shows a dossier titled "Multinational Bank Dossier - Edited Dossier". It contains a visualization titled "Visualization 1" with a horizontal bar chart and a grid chart. The visualization is connected to datasets like "Banking Data" and "Banking Regions". The interface also includes a timeline chart for "Product Trends" and a table for "Detailed Info".

Workstation provides a parallel authoring and sharing experience with MicroStrategy Web. Adding a dataset to Workstation, or connect to an environment to build your analytical story with the dossier design interface.

The screenshot shows the MSTR Workstation interface for applications. A search bar at the top shows "Searching *web* in All Folders Public Objects". The sidebar lists "My Library" with sections for Applications, Dossiers, Documents, Reports, Datasets, Offline Dossiers, MANAGE, Environments, Data Sources, and Users and Groups. In the center, a "Webcast Overview" item has a context menu open. The menu includes options like Open, Get Info, Share, Get Link, Make Available Offline, Copy To..., Move To..., Rename, and Delete. The "Share" option is highlighted.

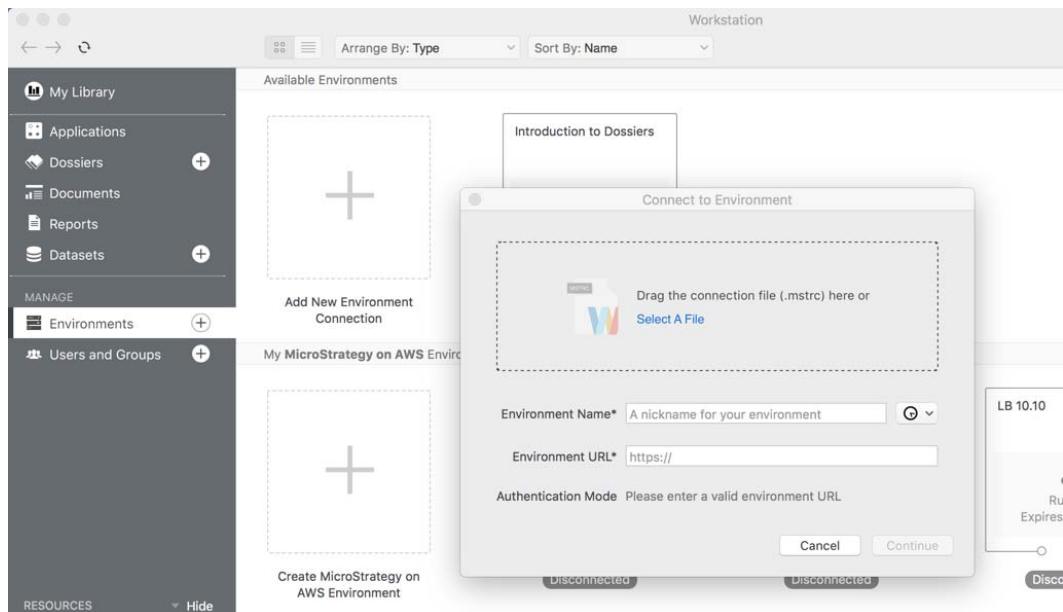
To share your content, right-click the dossier's icon in the dossier area of Workstation. Select Share, then you can send a link, send the dossier to Library, or download the .MSTR file.

Connect to the cloud and on premises data storage: Access multiple environments

Through Workstation, you can connect to and search multiple environments, allowing you to access different projects and datasets from a single interface, known as Live Mode. While some MicroStrategy users choose to locally host their data, MicroStrategy also provides cloud storage through Amazon Web Services (AWS). Enterprises can deploy and manage the full MicroStrategy platform on dedicated AWS infrastructure.

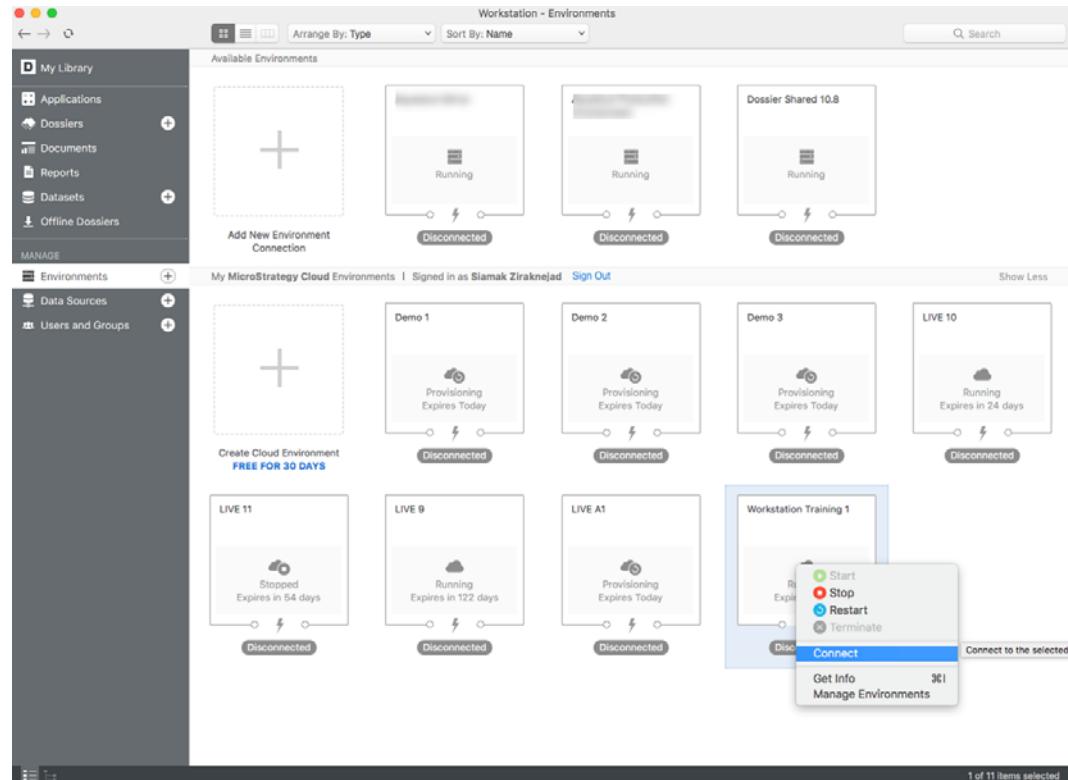
To allow Workstation to access your environment, connect Workstation to your Intelligence Server. Below are the high-level steps to access your environment:

- a From the Workstation Home window, select **Environments**.
- b Click **Add New Environment Connection**.



- c Enter your **Environment Name** and **Environment URL**. The URL is your Library server URL, which is connected to both the Collaboration Server (which allows you to communicate via comments) and the Intelligence Server. Or, you can drag a **.mstrc connection file** to the Connect To Environment window.
- d Click **Continue**.

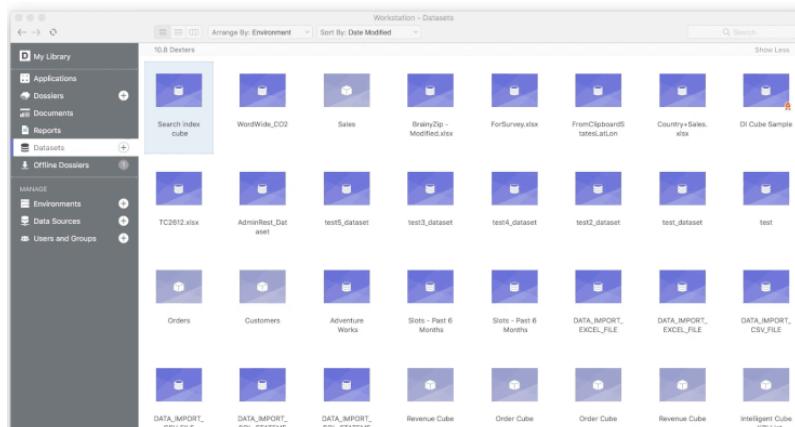
- e Enter your User Name and Password, then click **Connect**.
- f Select a **Project** you would like to work in. A project stores all schema objects you need to create your dossiers and other MicroStrategy objects. You are now connected to your MicroStrategy Environment.



The MicroStrategy Intelligence Server is the architectural foundation of the MicroStrategy platform which shares objects, data, manages the sharing of objects and data, and protects the information in the metadata.

Thinking back to our banking analysts, they can connect to multiple bank environments to access the information they need all in one place. When connected to your environment, you can access your datasets, reports, dossiers, and documents. Reports and datasets open as a new dossier, while documents open in Library.

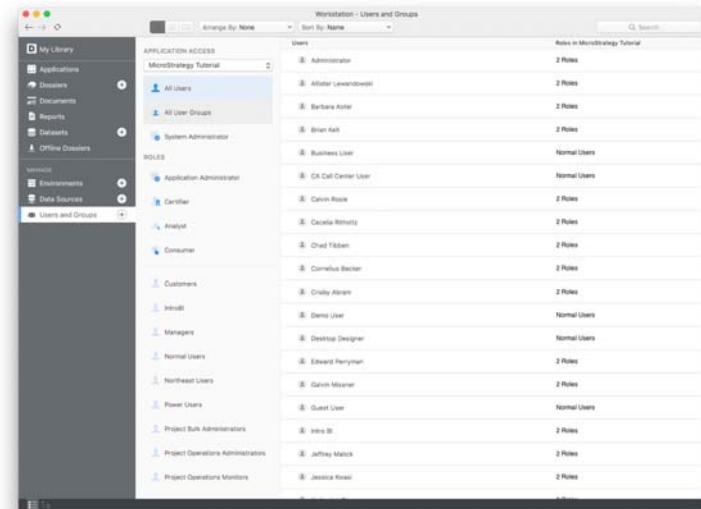
Upload and prepare data



To build your dossiers in Workstation, in addition to connecting to enterprise environments to access data, you can upload data from over 70 sources. Just as in Web, you can wrangle the data to ensure usability and accuracy.

In the image above, all datasets, including those already in an environment, are accessible through the Datasets menu. Right-click a dataset to create a new dossier, edit the data, and refresh the data, among other options. When you double-click a dataset from Workstation, a new dossier window opens.

MicroStrategy administration: User and group management



In Workstation, administrators can create a group of users, providing a convenient way to manage a large number of users. Instead of assigning privileges to

hundreds of users individually, privileges can be assigned to all of the users at one time, as a group. Administrators can manage who views MicroStrategy and how, per each environment.

Administrators can assign the following roles:

- **Consumer:** Can only view and collaborate on a dossier or document that they have access to.
- **Analyst:** Can author dossiers and reports.
- **Application Administrator:** Can access all application specific tasks, such as database and user management.
- **Certifier:** Can certify objects in addition to the authoring capabilities.

WORKSHOP: WORLDWIDE EMISSIONS DOSSIER

Create and analyze the Worldwide Emissions Analysis dossier

For this workshop, you will design a dossier to analyze worldwide, energy-related carbon dioxide emissions data for the past twenty years. The data used in the exercise comes from the US Energy Information Administration office (<http://www.eia.gov>). You will apply the concepts you have used throughout this course to analyze the data.

Add data

- 1** Create a new **dossier**.
- 2** In the Datasets panel, select **New Data**.
- 3** Click **File From Disk**.
- 4** Click **Choose files**.

- 5 Select **Worldwide Emissions 1990-2010 II.xlsx**, and click **Open**. Click **Prepare Data**.

Wrangle data

We need to make sure that USA is listed as United States so that the map can locate the country properly. To ensure this, we need to wrangle the data.

- 6 Click **Wrangle**.
- 7 To see all of the data, click **Sample Size** in the right corner of the data window and enter **5000**. You are indicating that you would like to see the first 5000 rows of data. A message will appear that all data is visible, click **OK**.
- 8 Select the **Country** column and select **Text Selector** from the **Function** drop-down.



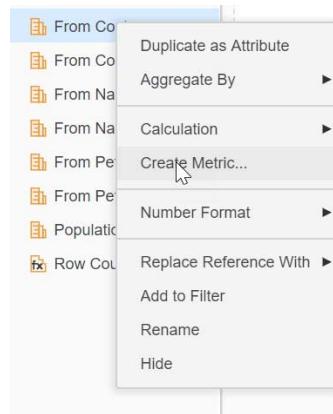
- 9 Locate USA in the list and click **Edit**.
- 10 Change **USA** to **United States** and click **Apply to All**.
- 11 Click **Apply**, then click **Finish**.

Create visualizations

- 1 Place the **Country** attribute in the **Rows** drop zone.

Since this dataset does not contain a metric for Total Emissions, create this metric by adding together the emissions generated by all of the energy sources available. You will also create a derived metric for Emissions per Capita, defined as Total Emissions divided by Population (m).

- 2 In the Dataset panel, right-click the **From Coal** metric and select **Create Metric**

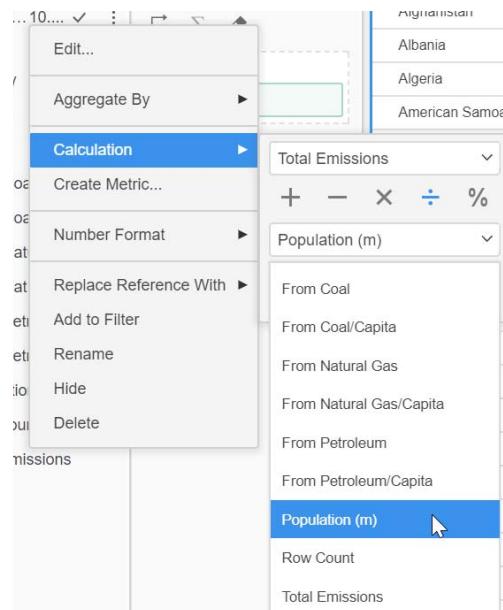


- 3 Click **Switch to Formula Editor** and delete **Sum(Profit){~+}** to clear the formula.
- 4 From the **Objects** list, double-click **From Coal** to add it to the **Formula** panel.
- 5 In the Formula panel, click **+** after the metric. Repeat the above step with the **From Natural Gas** and **From Petroleum** metrics, until the following formula is complete: **[From Coal] + [From Natural Gas] + [From Petroleum]**. In the **Metric Name** box, type **Total Emissions** as the metric name.

A screenshot of the Metric Editor dialog box. The title bar says 'Metric Editor - New Metric'. The left pane shows a list of functions like Add, Average, Avg, Count, First, etc. The middle pane shows an 'Objects' list with items like 'Country', 'Region', 'Year', 'From Coal', 'From Coal/Capita', 'From Natural Gas', 'From Natural Gas/Ca...', 'From Petroleum', and 'From Petroleum/Capita'. The 'From Petroleum' item is selected. The right pane has a 'Metric Name' input field containing 'Total Emissions', a 'Formula' input field containing '[From Coal]+[From Natural Gas]+[From Petroleum]', and a 'Save' button at the bottom.

- 6 Click **Save**.

- 7 In the Dataset panel, right-click **Total Emissions**, point to **Calculation**, and click \div .
- 8 In the top drop-down list, leave **Total Emissions** selected and in the bottom drop-down list, select **Population (m)**.



9 Click **OK**. Rename the derived metric as **Emissions per Capita**.

10 Save the dossier as **Worldwide Emissions Analysis I**.

Now you are ready to create a new visualization.

11 To change the visualization type, click the **Visualization 1 container**. Click the **Map** icon.

12 Drag the **Country** attribute to the **Geo Attribute** drop zone.

13 Drag the **Total Emissions** metric to the **Color By** drop zone.

14 Drag the **Emissions per Capita** metric to the **Tooltip** drop zone.

15 Set the following threshold conditions for the **Total Emissions** metric:

- For **Color**, select **Red-Orange-Green**.
- Click **Reversed** so the countries with higher emissions are red.
- For **Based on**, select **Lowest%**.

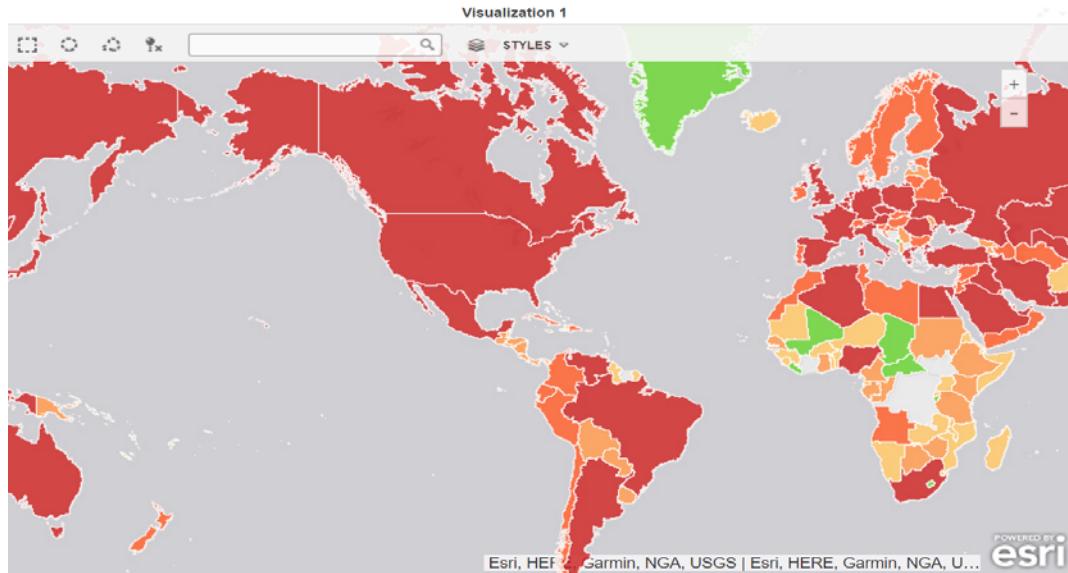
Use the available options to make sure that green represents the lowest end of the spectrum, while red represents the highest.



The selection of color in a visualization is an important element of visualization best practices. In this case, you are creating a visualization to represent different levels of carbon emissions in various locations. When creating visualizations, consider how the viewer will relate to the color scheme and the overall appearance of the visualization. Are there ideas tied to the use of colors and imagery in specific situations?

16 Click **OK**.

17 On the **Format** tab, in the **Graphic type** drop-down list, select **Area**.

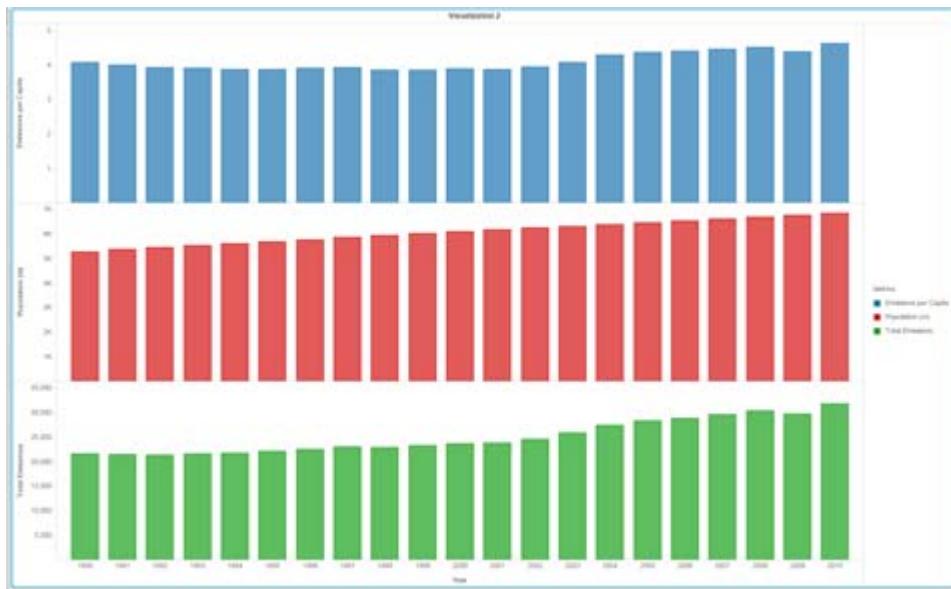
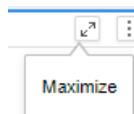


You may need to zoom and center the map.

Now, create a second visualization that will indicate yearly emissions data as a bar chart.

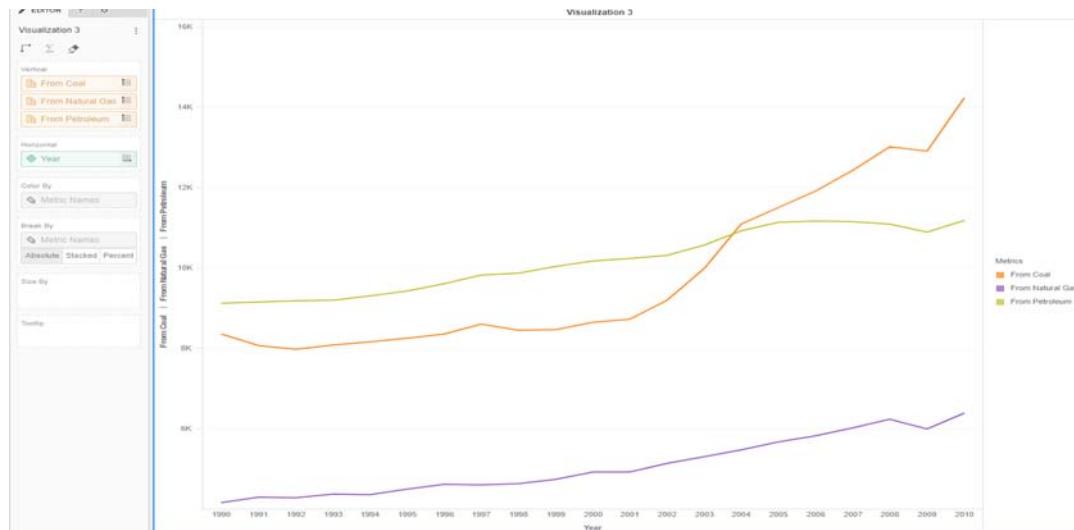
Add a second visualization to the dossier

- 1 Insert a **Combo Chart** from the Visualization Gallery.
- 2 Drag the **Year** attribute to the **Horizontal** drop zone.
- 3 Drag the **Emissions per Capita**, **Population (m)**, and **Total Emissions** metrics to the **Vertical** area.
- 4 Drag **Metric Names** from the **Vertical** drop zone to the **Color By** drop zone.
- 5 Click the **Maximize** icon in the visualization container to see the bar chart more clearly.



- 6 Click the **Minimize** icon to view the entire dossier.
 - 7 Click **Save**.
- Now you will add a third visualization to view detailed emissions data.
- 8 Insert a new visualization, then select **Line Chart** from the Visualization Gallery.

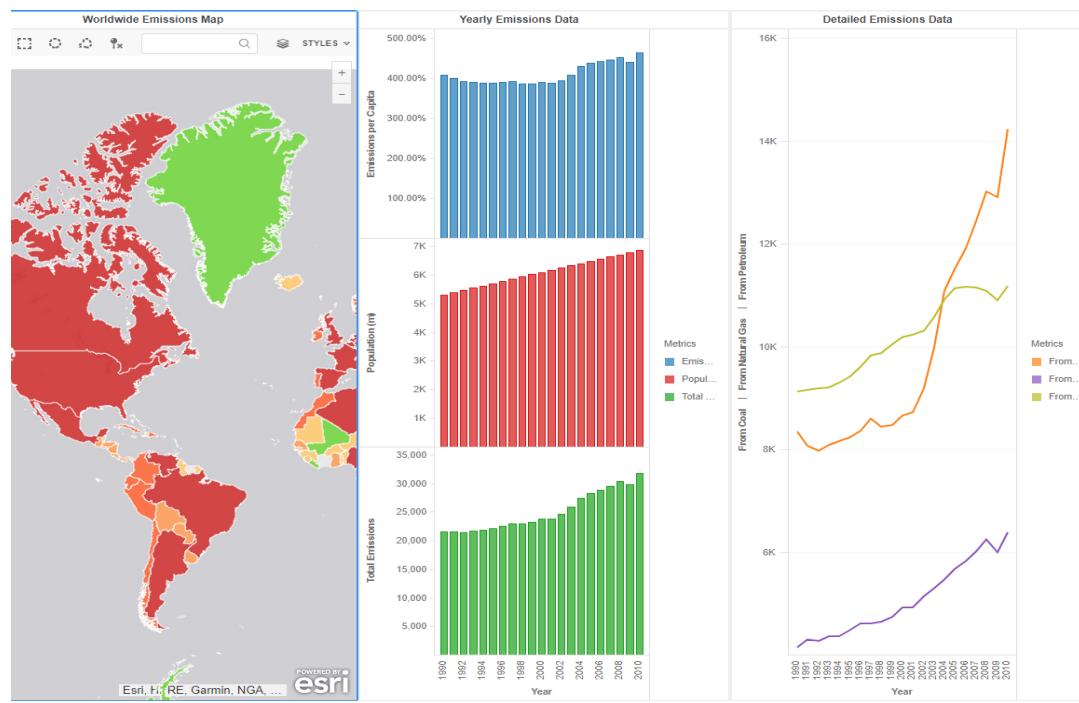
- 9 In the **Editor** panel, drag the **Year** attribute to the **Horizontal** drop zone.
- 10 Next, drag the **From Coal**, **From Natural Gas**, and **From Petroleum** metrics to the **Vertical** drop zone.
- 11 Drag **Metric Names** to the **Break By** drop zone.
- 12 Drag **Metric Names** to the **Color By** zone.



Rename the visualizations

- 1 Rename the visualizations by double-clicking the current titles:
 - Visualization 1 should be renamed **Worldwide Emissions Map**.
 - Visualization 2 should be renamed **Yearly Emissions Data**.
 - Visualization 3 should be renamed **Detailed Emissions Data**.

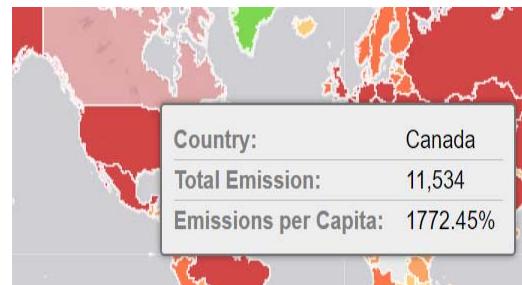
2 Save the dossier. When complete, the dossier should match the image below.



Put the dossier to the test by answering the following questions using the visualizations.

1 What is the emissions per capita of Canada?

Since you need a specific emissions statistic, simply click Canada in the Worldwide Emissions map for the answer.



Use the other two visualizations to acquire insight relating to long-term changes and overall trends.

2 What is the overall trend in worldwide emissions?

- 3 Notice that overall emissions declined in 2009, the only year in the total number of years surveyed that indicates emissions decreases in all three emissions sources. Why is that? What broader socio-political context might explain this single yearly decrease?**

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This product is patented. One or more of the following patents may apply to the product sold herein: U.S. Patent Nos. 6,154,766, 6,173,310, 6,260,050, 6,263,051, 6,269,393, 6,279,033, 6,567,796, 6,587,547, 6,606,596, 6,658,093, 6,658,432, 6,662,195, 6,671,715, 6,691,100, 6,694,316, 6,697,808, 6,704,723, 6,741,980, 6,765,997, 6,768,788, 6,772,137, 6,788,768, 6,798,867, 6,801,910, 6,820,073, 6,829,334, 6,836,537, 6,850,603, 6,859,798, 6,873,693, 6,885,734, 6,940,953, 6,964,012, 6,977,992, 6,996,568, 6,996,569, 7,003,512, 7,010,518,

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