Oracle
**Construction Intelligence Cloud Analytics
Data Visualization User Guide**

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Oracle Construction Intelligence Cloud Analytics Data Visualization User Guide

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Contents

Getting Started

This chapter describes how to get started with using CIC Analytics with a few basic procedures before you begin to create data visualization and build narratives.

In This Section

About Construction Intelligence Cloud Analytics

Construction Intelligence Cloud Analytics or CIC Analytics is an industry solution built on a modern analytics platform delivering value to stakeholders to track project cost, schedule and risk. With CIC Analytics, you can centralize and curate information and discover insights through captivating data visualizations that empowers executives, decision-makers, and business analysts track KPIs, identify outliers, and make proactive decisions for your organization.

You can use CIC Analytics to drive business decisions for your organization by

- creating and sharing data visualizations combining data from subject areas of any of the following applications:
  - Primavera P6 Enterprise Project Portfolio Management (P6 EPPM)
  - Primavera Unifier
  - Oracle Primavera Cloud

  For more details on the supported subject areas, see *CIC Analytics Subject Areas* (on page 140) section.
- creating data sets by using data from Excel and CSV files for use in visualizations
- blending and curating data from subject areas across products to uncover business insights through visualizations

For a comprehensive synopsis of its capabilities, watch this Introduction to CIC Analytics.

This guide describes how to effortlessly create data visualizations in CIC Analytics.

About Your Login Credentials

New customers receive an initial email from no-reply@oracle.com to activate their Oracle Cloud account. The link has an expiration date mentioned at the bottom of the email. Make sure to activate your account before the link expires.

You will receive a separate welcome email from no-reply@primavera.oraclecloud.com that includes the URL to access CIC Analytics.

All other email communications coming from your CIC Analytics environment will be sent from no-reply@primavera.oraclecloud.com.

Tips

▶ If you do not receive either email, check the spam or junk folder in your email account, or reach out to your customer success manager or application administrator.

▶ In case you miss the activation window to activate your CIC Analytics account, reach out to your customer success manager or application administrator.

▶ Add no-reply@oracle.com and no-reply@primavera.oraclecloud.com to your address book or list of approved contacts.

Reset Your Password

You can reset your password for CIC Analytics at any time.

To reset your password:

1) Navigate to the **Oracle Cloud Account Sign In** page.
2) Select the **Need help Signing in? Click here** link.
3) On the **Forgot your password** page, enter your username, and then select **Next**.
4) Review the on-screen message, and select **Submit**.
5) Select the **Password Reset** button in the email you receive.
6) On the **Reset Your Password** page, complete the **New Password** and **Confirm New Password** fields.

> **Note**: The **Confirm New Password** field will not be active until your new password meets the specified criteria.

7) Select **Submit**.
8) Select **Click here** to continue to navigate back to the **Oracle Cloud Account Sign In** page, and log in with your new password.

> **Note**: To allow time for system processing, it is recommended that you wait a few minutes before logging in with your new password.

Finding and Exploring your Content

From the **Home** page you can use the search bar to find your content, such as workbooks, datasets, and data flows.

Finding Your Content

From the **Home** page you can use the search bar to find the content you are interested in. Locate your content using search terms, content types and search tags.

> **Note**: You can use advanced search commands in combination with search terms to refine your search results for exact matches, multi-term matches, and field-level matches. See *Search Options* (on page 11).

1) On the Home page, in the search bar, type in a search term and either press Enter to search for content or Shift + Enter to visualize data.

   a. Specify the full or partial name of what you're looking for. The search is case-insensitive.

   b. (Browser dependent) Click **Dictate** (if displayed) and speak your search term.

2) Click in the search bar for a drop-down list of all content types, such as workbook, dashboard, report, connection, or model. Click a content type to add it to the search bar. For example:

   ▸ Click **Workbook** to display visualization content

   ▸ Click **Dashboard** or **Analysis** to display reporting content

   ▸ Click **Report** to display pixel-perfect reporting content

   ▸ Click an option in the **Data** category to display connections, datasets, data flows, machine learning models, and other data-related content.

   ▸ To narrow your search, add a free text search term to the search bar. For example, if you've searched on Workbooks, enter `'My Web Analysis'` to display a workbook named My Web Analysis.

3) Add or remove search tags to your search term.

   ▸ Enter `'type:'` or `'filter:'` to display a list of search tags that you can select from.

   ▸ Paste in `'type:'` or `'filter:'` followed by one search term (not case-sensitive). For example:

      ▪ Paste `type:connection` to find your connections. Or,

      ▪ Paste `type:workbook` to find your workbooks.

      ▪ Paste `filter:recent` to display your recently accessed content.

      ▪ Paste `filter:favorites` to find content that you've marked as a favorite.

      You can also combine the `filter` command with the `type` command. For example, paste in `type:workbook filter:recent`.

4) To clear your search terms, in the search bar click X or select search tags and press delete.

Search Options

You can enter advanced search commands in the search bar to tailor your search results for exact matches, multi-term matches, and field-level matches.

You can combine multiple search terms with commands to narrow or widen your search. For example, `name:(revenue AND Analysis)`. Search commands and search terms are case-insensitive.

Search Command	Description	Example
AND	Enter AND between search terms to only display content which contains all the search terms. All forms of AND, such as, and, &&, or entering two search terms together, will return the same results.	Revenue AND Forecast Revenue and Forecast Revenue && Forecast Revenue Forecast
OR	Enter OR between search terms to display content that contains any of the search terms.	Revenue OR Profit Revenue or Profit Revenue || Profit
NOT	After entering a search term, enter NOT followed by more search terms to exclude any content from the results which match the search terms entered after the NOT command.	Revenue NOT Product Revenue not Product
?	Enter the question mark (?) character in a search term as a wildcard to signify a single unknown character. This ensures that the search results include content with words matching the known characters from the search term. For example, searching for st?r would include results containing star and stir.	st?r
*	Enter the asterisk (*) character at the end of a partial search term or root word as a wildcard to find all content that contains the partial search term as well as content that contain variations of the root word. For example, searching for employ* would include results for employee, employment, or employer.	Employ*

Search Command	Description	Example
`name:`	Enter `name:` followed by a search term to search for content where the search term is part of the Name field.	`name:`Revenue Analysis
`description:`	Enter `description:` followed by a search term to search for content where the search term is contained in the Description field of the content.	`description:`template `desc:`template
`owner:`	Enter `owner:` followed by a search term to search for content where the search term is contained in the Owner field of the content.	`owner:`Admin
`columns:`	Enter `columns:` followed by a search term to search for objects that reference columns matching the search term.	`columns:`product
`text:`	Enter `text:` at the beginning of a search followed by a search term to search for content where the search term is contained in any of the content's fields.	`text:`Revenue
`" "`	Enclose a search term with double quotation marks to search for content that includes phrases or stop words which match the search term.	"Balance Letter" "Research by analysis"

Search Tips

Use these tips to help you find your content.

▶ **Searching in Non-English Locales** - When you enter criteria in the search field, what displays in the drop-down list of suggestions can differ depending upon your locale setting. For example, if you're using an English locale and enter *sales*, then the drop-down list of suggestions contains items named *sale* and *sales*. However, if you are using a non-English locale such as Korean and type *sales*, then the drop-down list of suggestions contains only items that are named *sales* ,and items such as *sale* are not included in the drop-down list of suggestions.

▶ **Searching for New Objects and Data** - If you create or save a workbook or create a dataset and then immediately try to search for it, then it's likely that your search results will not contain matches. If this happens, refresh your browser. If you still cannot find the new object or data, then wait a few minutes for the indexing process to run, and retry your search. Users can access only the data they have been given permission to access.

Exploring Your Content

You can quickly access your analytics content using the **Navigator** bar.

1) On the **Home** page click the **Navigator** menu.

2) To customize your home page, click**Page Menu** ⋮, then select **Customize Home Page** to use the options on the **Customize** page.
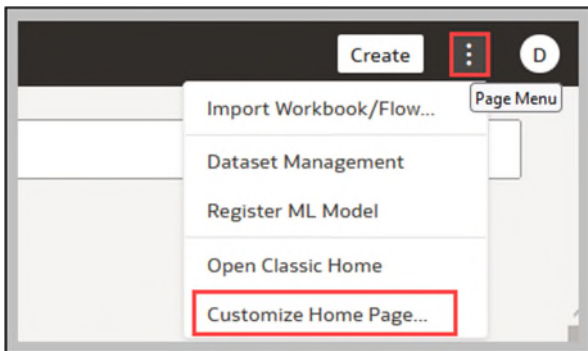
▶ To change the order of content categories such as Favorites, Catalog, Datasets and others, click the **Handle** ⋮ next to a category and drag to a new position.

▸ To change how you display content, hover over a **Category**, and click one of the display options **Hidden**, **Tiny**, **Standard**, or **Mosaic** ▫▫▫.
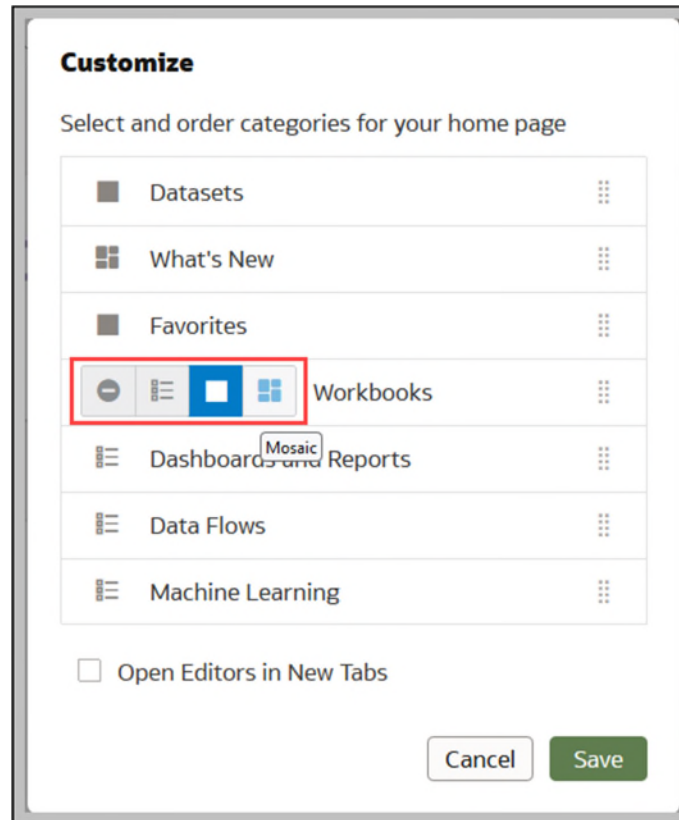
For a comprehensive list of options available on the home page and in each canvas layout, watch this navigation overview CIC Analytics Navigation Overview video.

Preparing Your Data

To prepare your data, complete the following tasks:

- ▶ *Connecting With Data Sources* (on page 17)
- ▶ *Preparing your Data Set for Analysis* (on page 23)
- ▶ *Managing Data Sets* (on page 35)
- ▶ (Optional) *Creating Datasets Using Data Flows* (on page 39)

This chapter describes how to accomplish the above tasks.

In This Section

Connecting With Data Sources

Connect to data sources and upload spreadsheets to get the data you need to create datasets. You can create a dataset from the following types of data sources:

- ▶ Local subject area

  For more details, see *Creating Datasets From Subject Areas* (on page 19) and a comprehensive list of subject areas in the CIC Analytics Subject Area Reference.

- ▶ Spreadsheets (XLS, XLSX, CSV, and TXT file formats)

  For more details, see *Creating Datasets From Spreadsheets* (on page 21).

A data source is any tabular structure. You get to see data source values after you load a file or send a query to a service that returns results.

A data source can contain any of the following:

- ▶ **Match columns** - These contain values that are found in the match column of another source, which relates this source to the other, for example, Customer ID or Product ID.
- ▶ **Attribute columns** - These contain text, dates, or numbers that are required individually and are not aggregated, for example, Year, Category Country, Type, or Name.
- ▶ **Measure columns** - These contain values that should be aggregated, for example, Revenue or Miles driven.

You can analyze a data source on its own, or you can analyze two or more data sources together, depending on what the data source contains. If you use multiple sources together, then at least one match column must exist in each source. The requirements for matching are:

- ▶ The sources contain common values, for example, Customer ID or Product ID.

▶ The match must be of the same data type, for example, number with number, date with date, or text with text.

When you save a workbook, the permissions are synchronized between the workbook and the external sources that it uses. If you share the workbook with other users, then the external sources are also shared with those same users.

About Data Sources and Subject Areas

You can combine data sources with CIC Analytics subject areas to explore and analyze the data.

A subject area either extends a dimension by adding attributes or extends facts by adding measures and optional attributes. You can't define hierarchies in data sources.

A subject area organizes attributes into dimensions, often with hierarchies, and a set of measures, often with complex calculations, that can be analyzed against the dimension attributes, for example, the measure net revenue by customer segment for the current quarter, and the same quarter a year ago. For a detailed list of subject areas supported by CIC Analytics, see CIC Analytics Subject Area Reference section.

When you use data from a source such as an Excel file, the file adds information that is new to the subject area. For example, include demographic information for postal areas or credit risk information for customers to use this data in an analysis before adding the data to the data warehouse or an existing subject area.

Using a source as standalone means that the data from the source is used independently of a subject area. It's either a single file used by itself or it's several files used together and in both cases a subject area isn't involved.

You can extend a dimension by adding attributes from a data source to a subject area:

▶ You can only make matches to a single dimension.
▶ The set of values in matched columns are unique in the data source. For example, if the data source matches on ZIP code, then ZIP codes in the source are unique.
▶ You make matches between one or composite columns. An example of a one column match is that product key matches product key. For composite columns, an example is that city and state from separate columns creates the composite City_State in a customers address.
▶ All other columns must be attributes.

You can add measures from a data source to a subject area:

▶ You make matches to one or more dimensions.
▶ The set of values in matched columns aren't necessarily unique in the data source. For example, if the data source is a set of sales matched to date, customer, and product, then you can have multiple sales of a product to a customer on the same day.
▶ You make matches between one or composite columns. An example of a one column match is that product key matches product key. For composite columns, an example is that company matches company and business unit matches business unit.

A data source that adds measures can include attributes. You can use these attributes alongside external measures and not alongside curated measures in visualizations. For example, when you add a source with the sales figures for a new business, you can match these new business sales to an existing time dimension and nothing else. The data might include information about the products sold by this new business. You can show the sales for the existing business with those of the new business by time, but you can't show the old business revenue by new business products, nor can you show new business revenue by old business products. You can show new business revenue by time and new business products.

Creating Datasets From Subject Areas

A workbook can contain one or more subject areas and data sets and/or data sources. For example a spreadsheet data source.

You must have permission to use a specific data set to create a workbook. If you don't have permissions to the specific workbook, that workbook isn't available for you to use in any other workbook as a dataset or analysis. Permissions are also applied when another user views or works with the workbooks that you create from data sets. You can set permissions on the workbook, depending on how you'd like to share it with other users.

To see the list of available subject areas, click the **Subject Area** link in the **Add Data Set** page.

> **Note**: You can't modify subject areas like you can with spreadsheets. Subject areas are pre-configured in the Analytics warehouse, and therefore, element names, types, etc. can't be altered. For example, you can't change a column's data type or aggregation rule, or change the column from a measure column to an attribute column.

To add subject areas as a data set:

1) On the **Home** page, click **Create**, and then click **Dataset**.
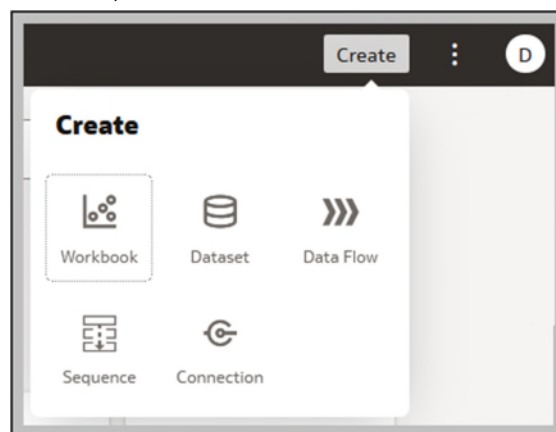
2) Click **Local Subject Area** to select subject areas for creating the data set.
3) Click **Search** or scroll to select a subject area from the available list.
4) Click ⊕ **Add** to select multiple subject areas to the data set.

5) Click **OK**.

6) Expand each selected subject area and double-click to include desired columns in the data set.

7) In the **Add Data Set** field, enter a name for the data set created and click **Add**.

8) Click **Ctrl+S** to save the project.

    a. In the **Name** field, enter a name for the data set.

    b. In the **Description** field, describe the purpose of the data set.

9) Click **Save.**

On the **Home** page, the data set will now display under the **Workbooks** section.

About Data Sources and Measure Columns

You can work with data sources that either include or don't include a measure column.

▶ You can match tables with measures to other tables with a measure, a dimension, or both.

▶ When you match tables to other tables with measures, the tables don't need to be at the same grain. For example, you can match a table of daily sales table to a sales by quarter table.

A table with no measures is treated as a dimension.

▶ Matches can be between single or composite columns. A single column match might be the product key in one table matching the product key in another. A composite column match might be where company and business unit in one table matches company and business unit in the other table.

▶ All other columns must be attributes.

Dimension tables can be matched to other dimensions or they can be matched to tables with measures. For example, a table with Customer attributes can be matched to a table with demographic attributes provided both dimensions have unique Customer key columns and Demographic key columns.

Formatting Spreadsheets and Other Files

You can upload Microsoft Excel spreadsheets (XLSX and XLS), CSV files, and TXT files and then create datasets from them.

> **Note**: The maximum file size you can upload is 250 MB and the data column limit for a single file is 250 columns.

Formatting Rules For Excel Spreadsheet Files

▶ Tables start in Row 1 and Column 1 of the Excel file.

▶ Tables have a regular layout with no gaps, repeated column names, or inline headings. An example of an inline heading is one that is repeated on every page of a printed report.

▶ Tables don't contain pivoted data.
▶ Row 1 contains unique names of the columns in the table.
▶ Row 2 and greater contain data for the table.
▶ Data in a column must be of the same type. For example, don't use a phone number column to hold email addresses.
▶ Data is at the same granularity.

Also see, *How To Stop Excel From Changing Number Format to Scientific Notation*? (***Doc ID 2234511.1 https://support.oracle.com/epmos/faces/DocumentDisplay?id=2234511.1***)

Click ***here https://docs.oracle.com/cd/F58835_01/CIC_Import_Spreadsheet/index.html*** to see an example of an Excel spreadsheet formatted for CIC Analytics. l

Character Set Encoding Rules for CSV and TXT Files

▶ Encode source files using UTF-8.
▶ Before you edit your files, configure your text editor to use the appropriate font and script (or subset).

Creating Datasets From Spreadsheets

You can upload Excel spreadsheets (XLSX or XLS), CSV files, and TXT files from your computer and use them to create datasets.

> **Note**: Files aren't available to create or include in a dataset with multiple tables.

Confirm that the file that you want to upload meets these requirements:

▶ The file is either an Excel spreadsheet in .XLSX or .XLS format, a CSV file, or a TXT file.
▶ The spreadsheet contains no pivoted data. See ***Formatting Spreadsheets and Other Files*** (on page 20).
▶ The spreadsheet is structured properly for import and use as a dataset.

To upload the spreadsheet to use as a dataset:

1) On the **Home** page, click **Create**, and then click **Dataset**.
2) In the Create Dataset dialog, either drag and drop a file to the dialog, or click the **Upload** icon to browse your computer for a file to upload. "
3) Click **Open** to open the spreadsheet you want to upload.
4) Make any required name, description, or column attribute changes.
5) Click **Add** to create the data set.

Creating Datasets Using Google Drive or OneDrive

You can add datasets by adding files ((XLSX or XLS, or TXT) from Google drive or One Drive.

Confirm that the file that you want to upload meets these requirements:

▸ The file is either an Excel spreadsheet in .XLSX or .XLS format, a CSV file, or a TXT file.
▸ The spreadsheet contains no pivoted data.
▸ The spreadsheet is structured properly for import and use as a dataset. See ***Formatting Spreadsheets and Other Files*** (on page 20).

Creating Datasets from Google Drive

Map a network drive to Google drive and then create a dataset using the files from Google drive.

1) Download and install Google Drive Desktop.
2) Log in to the account that contains the files that you need
3) Google Drive will be automatically mapped to G:
4) When browsing for local files, you can treat the mapped drive just like any drive on your local machine.

Creating Datasets from OneDrive

Map a network drive to OneDrive and then create a dataset using the files from OneDrive.

1) Download and install OneDrive.
2) Log in to your OneDrive Account (Microsoft Account).
3) A OneDrive folder will be automatically created. You can treat this folder as regular local folder to create data sets.

Creating Datasets from Microsoft SharePoint

You can also create a dataset using SharePoint. Contact your IT administrator to sync SharePoint files with OneDrive.

Prerequisites

You will need:

▸ An Office 365 with SharePoint subscription
▸ A local installation of OneDrive
▸ A OneDrive folder that is set up with files you want to sync from SharePoint

Creating Data Sets from SharePoint

To create a dataset using SharePoint and OneDrive:

1) On the **Home** page, click **Create**, and then click **Dataset**.
2) Select **Drop data file here or click to browse** to browse to your local OneDrive folder that is set up with files synced using SharePoint.
3) Click **Open** to select the file.
4) Click **Add** to create the dataset.

Preparing your Data Set for Analysis

Data preparation involves cleansing, standardizing, and enriching your data set before you analyze the data in a visualization canvas.

You can create data visualizations using either of the following options:

▶ *Creating Datasets From Spreadsheets* (on page 21)

Select this option if you want to import data from a spread sheet to create a new data set for the data visualization.

▶ *Creating Datasets From Subject Areas* (on page 19)

Select this option if you want to use the subject areas available in CIC Analytics from P6, Unifier, Oracle Primavera Cloud.

About Data Enrichment and Transformation in CIC Analytics

CIC Analytics makes it easy to enrich and transform your data before you make it available for analysis.

Navigate to the transform editor

Workbooks - If you open a workbook, click the Data page, and in the **Data Diagram**, select the dataset you want to prepare. If the dataset contains multiple tables, you'll see a Join Diagram, with a tab for each table. Select a table to open it in the transform editor.

Datasets - If you open a dataset, you'll see the transform editor. If the dataset contains multiple tables, you'll see a **Join Diagram**, with a tab for each table. Select a table to open it in the transform editor.

Applying Recommended Transformations

When you create a workbook and add a dataset to it, the data undergoes column level profiling that runs on a representative sample of the data. After profiling the data, you can implement transformation and enrichment recommendations provided for the recognizable columns in the dataset. The following types of recommendations are provided to perform single-click transforms and enrichments on the data:

▶ Column concatenations, for example, adding a column with the person's first and last name.
▶ Date part extractions, for example, separating out the day of week from a date that uses a month, day, year format to make the data more useful in the visualizations.

▸ Delete columns containing sensitive fields.

▸ Duration enrichments for date columns, with Extract Age in Years, Months, or Days. For example, you might use the generated numeric column to assign data into bins, such as 0-3 months, 3-6 months, 6+ months, and so on.

▸ Global positioning system enrichments such as latitude and longitude for cities or zip codes.

▸ Obfuscation or masking of sensitive fields (full and partial).

▸ Part extractions, for example, separating out the house number from the street name in an address.

▸ Semantic extractions, for example, separating out information from a recognized semantic type such as domain from an email address.

Applying Your Own Transformations

In addition to the recommended transformations that you see in the Column Action Panel, you can create your own transformations in different ways:

▸ Use the **Options** menu at the top of each column to apply common transformations such as Rename, Uppercase, and Trim. See *Transforming Data Using Column Menu Options* (on page 27).

▸ Click **Add Preparation Step** in the Data Panel to add a column based on a custom transformation. You can build your column using a wide range of functions, for example, operators, math, aggregates, and conversion. See *Adding Columns to a Dataset* (on page 34).

▸ Use the **Element** options pane in the bottom left hand corner of the Data Panel to select **Treat As** - Attribute or Measure, or change the default Aggregation type.

How Dataset Transformations Affect Workbooks and Data Flows

The data transformation and enrichment changes that you apply to a dataset affect all workbooks and data flows that use that particular dataset. When you open a workbook that shares the dataset, you'll see a message indicating that the workbook uses updated data. When you refresh data in a dataset, the preparation script changes are automatically applied to the refreshed data.
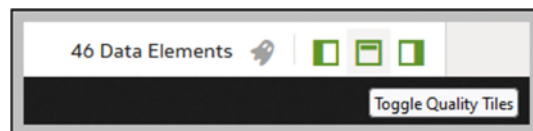
Set Up Your Transform Editor

Before you start, it's best to configure your transform editor by displaying the Data Panel, Recommendations Panel, and Quality Tiles. Use these toggle options displayed bottom right: **Toggle Data Panel** , **Toggle Column Action Panel** , and **Toggle Quality Tiles**.

Enriching and Transforming Your Data

Before you deploy your visualization workbooks, you typically enrich and transform your data. For example, you might rename data columns, fix cell phone data, or add calculations.

1) On the Home page, open a dataset or workbook.

   ‣ Select the dataset, click the **Actions Menu** , and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ‣ Select the workbook that contains the dataset, click the **Actions Menu** , select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets.

2) Select columns and use the enrich and transform tools to enhance your data.

   ‣ Use the **Recommendations** panel to apply suggested enrichments and transformations.

   ‣ Use the **Options** menu at the top of each column to apply common transformations such as Rename, Uppercase, and Trim.

   ‣ From the **Options** menu at the top of a column, click **Edit** to enhance columns with functions and expressions from the CIC Analytics functions library. For example, aggregates, strings, expressions, and math functions.

   ‣ Click **Add Preparation Step** in the Data Panel to add a column based on a custom transformation. You can build your column using a wide range of functions and expressions from the CIC Analytics functions library. For example, aggregates, strings, expressions, and math functions.

   ‣ Use the properties pane at the bottom of the Data Panel to review and change a column's type and aggregation. For example, you might select **Treat As** and change from attribute to measure, or change the default Aggregation type from Sum to Average.

   ‣ Use the Quality Insights tile above each column to explore and enrich your data.

   When you edit data, a step is automatically added to the Preparation Script panel. A blue dot indicates that a step hasn't been applied.

3) To save your data preparation changes and apply them to your data, click **Save Dataset.**

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

4) If you're working in a workbook, click **Save** and click **Visualize** to review the enriched columns.

   > **Note**: It's best to configure your transform editor by displaying the Data Panel, Recommendations Panel, and Quality Insights. Use these toggle options displayed bottom right **Toggle Data Panel** , **Toggle Column Action Panel** , and **Toggle Quality Insights**.

Accepting Enrichment Recommendations

When you edit a dataset in the transform editor, CIC Analytics suggests recommendations for enriching your data.

You can upload or open an existing data set to modify the data using enrichment recommendations. After making the changes to the data set, you can create a workbook.

If an enrichment recommendation adds information to data such as enhancing a zip code attribute column with the state name, a new column is added to the data set containing the name of the states associated with the zip codes. When you select a recommendation, the change is added to the Preparation Script. If you delete or undo the change, the recommendation is displayed once again as an available option in the **Recommendation Panel** (2 in the illustration).
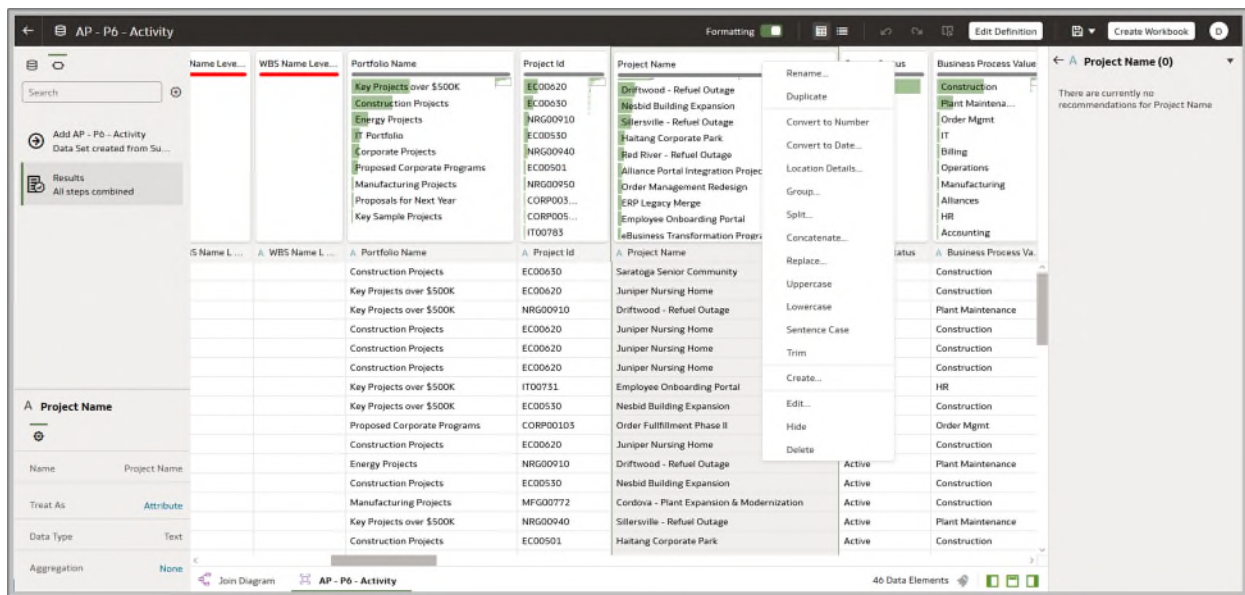
If you don't apply the Preparation Script and you close the workbook or the data set, you lose all the data changes you've performed.

1) On the Home page, open a dataset or workbook.

   ▸ Select the dataset, click the **Actions Menu** 🗐, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ▸ Select the workbook that contains the dataset, click the **Actions Menu** 🗐, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) Select a column to enrich, then in the **Recommendation Panel**, click recommendations to add them as steps to the **Preparation Script**.

> **Note**: Make sure that you've toggled the **Column Action** Panel option bottom right to display recommendations.

3) Use the **Preparation Script** panel to review your data enrichments and make changes if required.

   For example, hover-over a step and click X to remove an enrichment.

4) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

> **Note**:If the System Knowledge or Custom Knowledge has been updated and you have author privileges on the dataset, you can reprofile and refresh the results for the currently open dataset by clicking **Refresh Profile.** Use **Refresh Profile Results** to reprofile the data if the System Knowledge has been updated after an upgrade, or the Custom Knowledge has been updated and you want to incorporate this in the currently open dataset.

Transforming Data Using Column Menu Options

You can use column menu options to transform data. For example, you might convert text to uppercase or trim leading and trailing spaces from data.

If you don't apply the transformation script and close the workbook or dataset, you lose all the data transform changes you've performed.

1) On the Home page, open a dataset or workbook.

   ‣ Select the dataset, click the **Actions Menu** ▤, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ‣ Select the workbook that contains the dataset, click the **Actions Menu** ▤, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

> **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) In the Preview data panel, select a column to transform.

3) Click **Options**, and select a transformation option (for example, Uppercase or Trim).

   CIC Analytics adds a step to the **Preparation Script** panel.

4) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Transforming Data Using Replace

Transform data in a column using a simple pattern match or a regular (regex) expression. For example, in a State column, you might change CA to California.

You can use any Perl Compatible Regular Expression (PCRE), which are also referred to as regex expressions. Transforms are applied to every applicable row in a data set.

1) On the Home page, open a dataset or workbook.

   ▸ Select the dataset, click the **Actions Menu** 📄, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ▸ Select the workbook that contains the dataset, click the **Actions Menu** 📄, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) Select the text column that you want to transform.
3) Click **Options**, and then click **Replace**.
4) In the Replace step editor, specify how you'd like to match values.
   Click **Use regular expression** to match using a complex regular expression (regex).
   Click **Match entire values only** to change "male" to "M" but not "female" to "feM".
5) In the **String to replace** field and **New string** field, specify the literal text or regular expressions to search and replace (case-sensitive).
   Examples:
   ▸ To change "2553 Bolman Court" to "2553 #Bolman# #Court#", select **Use regular expression**, enter ([A-Za-z]+) in the **String to replace** field, and enter #$1# in the **New String** field.
   ▸ To change "male" with "M", select Match entire values only, enter male in the **String to replace** field, and enter M in the **New String** field. . This changes "male" to "M" but will not change "female" to "feM".
   When you complete both fields, you'll see a preview of the transformed data in the preview pane. Adjust the replace options until you get the transformation you want in the preview pane.
6) Click **Add Step**.
   CIC Analytics adds a step to the Preparation Script panel.
7) To save your data preparation changes and apply them to your data, click **Save Dataset**.
   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Converting Text Columns to Date or Time Columns

You can convert any text column to a date, time, or timestamp column.

For example, you can convert an attribute text column to a true date column.

1) On the Home page, open a dataset or workbook.

   ▸ Select the dataset, click the **Actions Menu** ▤, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ▸ Select the workbook that contains the dataset, click the **Actions Menu** ▤, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets.

2) Hover over the column that you want to convert.
3) Click **Options** and select one of the conversion options, for example, **Convert to Number**, or **Convert to Date**.

   CIC Analytics adds a step to the Preparation Script panel.
4) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

   The changes you make apply to all workbooks using that data source.

Adjusting the Display Format of a Date or Number Column

You can adjust the display format of a date or a time column by specifying the format and the level of granularity.

For example, you might want to change the format of a transaction date column from November 1, 2021 to 2021-11-01, or change the level of granularity from year to month.

1) On the Home page, open a dataset or workbook.

   ▸ Select the dataset, click the **Actions Menu** ▤, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ▸ Select the workbook that contains the dataset, click the **Actions Menu** ▤, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) Hover over the column you'd like to edit and click **Options**.

3) To change the format of a date column, click **Convert to Date**, then click **Source Format** and select the format you want to use in the visualization.

4) To change the format of a number column, click **Edit**, and use functions in the functions library to change the format.

   For example, to round up a number column DISCOUNT_VALUE from two decimal places to no decimal places, specify ROUND(DISCOUNT_VALUE, 0).

5) Click **Add Step**.

   CIC Analytics adds a step to the Preparation Script panel.

6) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Creating a Bin Column When You Prepare Data

Binning a measure creates a new column based on the value of the measure.

You can assign a value to the bin dynamically by creating the number of equal-sized bins or by explicitly specifying the range of values for each bin. You can create a bin column based on a data element.

1) On the Home page, open a dataset or workbook.

   ‣ Select the dataset, click the **Actions Menu** 🗐, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ‣ Select the workbook that contains the dataset, click the **Actions Menu** 🗐, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) Select a column that you want to modify.

3) Click **Options** for the selected column, and select **Bin**.

4) In the **Bin** step editor, specify the options for the bin column.

   ‣ Enter a number or use the arrows to increment or decrement the number of bins.

   ‣ Based on your selection in the **Method** field, the range and count of the bins are updated.

      ▪ In the **Manual** method, you select the boundary (that is, minimum and maximum) of each bin. You can also change the default name of each bin.

      ▪ In the **Equal Width** method, the boundary of each bin is the same, but the count differs. Based on your selection in the Bin Labels field, the bin column labels are updated.

      ▪ In the **Equal Height** method, the height of each bin is the same or very slightly different but the range is equal.

        ▸ If you select the **Equal Width** method, click to select a dimension (that is, an attribute data element) on which to apply the bin.

5) Click **Add Step**.

   CIC Analytics adds a step to the Preparation Script pane, ready to be applied when you click **Apply Script** or **Save Dataset**.

6) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Configuring Column Properties in a Dataset

  In the Transform editor you can edit the Data Type, Treat As, Aggregation, Hidden, or number format properties of a dataset column. For example, you might configure a number column as currency so that you can create financial reports.

In Data view, you configure the properties of one column at a time. In Metadata view   you can update the properties of multiple columns at the same time. CIC Analytics adds each property change to the Preparation Script panel. You can select to rollback changes using the **Undo** command.

1) On the Home page, open a dataset or workbook.

     ▸ Select the dataset, click the **Actions Menu** 🗐, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

     ▸ Select the workbook that contains the dataset, click the **Actions Menu** 🗐, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

> **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets.

2) To configure the properties of one column:

   a. From the toolbar, click **Data** .

   b. Select a column and use the properties pane at the bottom of the Data Panel to change the properties. For example, use **Number Format** to configure a number column as currency.

3) To update the **Data Type**, **Treat As**, **Aggregation** or **Hidden** properties of multiple columns at the same time:

   a. From the toolbar, click **Metadata**.

      Dataset columns are listed as Data Elements.

   b. Select multiple data elements to configure.

      CIC Analytics highlights selected data elements and displays an arrow in the first data element that you selected

   c. Use the properties pane at the bottom of the Data Panel to change the properties. For example, you might set the **Aggregation** property of selected columns to Count.

You can also change properties by clicking the arrow in the first data element selected and selecting a configuration value from the drop-down list.

Hiding or Deleting a Column

In the Transform editor, you can hide or delete a column from the dataset. Hiding or deleting columns doesn't permanently remove them, and you can restore columns when needed.

It's important to understand that deleting a column is different than removing a column from a dataset:

▶ Use the Transform editor to delete a column.
▶ Deleting a column creates a step in the Preparation Script Panel. Remove the step to restore the deleted column.
▶ Use **Edit Definition** to remove a column.
▶ The Transform editor doesn't indicate which columns were removed, and removing a column doesn't add a step to the Preparation Script Panel. To confirm which columns were removed or to re-add them, go to **Edit Definition**.

Hidden columns are available for table joins. Deleted columns aren't available for table joins.

You can also hide columns in the dataset. Hiding a column is useful when you want to use a column to create a formula but don't need the column to display in the dataset.

1) On the Home page, open a dataset or workbook.

   ▶ Select the dataset, click the **Actions Menu** , and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   ▶ Select the workbook that contains the dataset, click the **Actions Menu** , select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

   > **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets.

2) Hover over the column that you want to hide or delete.
3) Click **Options**, and select **Hide** or **Delete**.

Restoring a Hidden or Deleted Column

In the Transform editor, you can restore any dataset columns that you hid or deleted.

If you don't see a column's **Delete Step** in the Preparation Script Panel, then the column might have been removed from the dataset. Use **Edit Definition** to confirm if the column has been removed instead of deleted.

1) On the Home page, open a dataset or workbook.

▸ Select the dataset, click the **Actions Menu** ▤, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

▸ Select the workbook that contains the dataset, click the **Actions Menu** ▤, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

> **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets.

2) To restore a hidden or deleted columns, go to the Preparation Script Panel and locate the **Hide Column** or **Delete Column** step.

3) Click **Delete Step**.

4) Optional: To unhide one or more hidden columns, in the Transform editor, click **Hidden columns** and click **Unhide All**.

Editing the Data Preparation Script

You can edit the data transformation changes added to the Preparation Script.

Both before and after you have executed **Apply Script**, you can edit the data transformation steps. The edit option is not available for all types of transform steps. If you are editing the steps after executing **Apply Script**, you must re-apply the script to the entire data set. If you do not save the updates to a step and navigate to another step, a warning message is displayed indicating that you have not saved the changes.

The updates to the columns are applied only to the data set and not to the visualization. To ensure that you see the most up-to-date data, on the **Visualize** canvas, click **Refresh Data** ⊕ .

1) On the Home page, open a dataset or workbook.

▸ Select the dataset, click the **Actions Menu** ▤, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

▸ Select the workbook that contains the dataset, click the **Actions Menu** ▤, select **Open**, then click **Data**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

> **Note**:CIC Analytics displays a Data Diagram for single-table datasets or a Join Diagram for multi-table datasets. For file-based data sources, Oracle Analytics displays the transform editor directly.

2) Select a step in the **Preparation Script** pane and click **Edit Step**.

3) Select a transform step in the **Preparation Script** pane and click the **pencil** icon or **Edit Transform**.

If a step is not editable, a message is displayed when you hover over the pencil icon that editing for the transform step has been disabled.

4) In the step editor, update the fields to edit the data transform changes that are applied to the columns.

5) Click **OK** to update the column and close the step editor.

6) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Adding Columns to a Dataset

You can develop your datasets by adding columns. For example, you might create a new column that concatenates columns ADDRESS_LINE_1, ADDRESS_LINE_2, and ADDRESS_LINE_3.

1) On the **Hom**e page, select the dataset, click the **Actions** menu, and then select **Open**. In the Data Diagram or Join Diagram, right-click a data source and click **Open** to display the transform editor.

2) In the transform editor, click **Add Preparation Step**.

3) In **Create Column**, enter a **Name** for the column, and in the expression box define an expression to add values to the column. For example, to concatenate values in columns **Category** and **Sub-category**, you might specify: CONCAT(Category, Sub Category).

4) Use the **f(x)** function picker to build an expression using operators, mathematical, string, and conversion functions.

5) Click **Validate** and review the new column in the data preview.

6) Click **Add Step**.

   CIC Analytics adds a step to the Preparation Script panel.

7) To save your data preparation changes and apply them to your data, click **Save Dataset**.

   If you're working with a single table dataset or a file-based dataset, click **Apply Script**.

Creating Calculated Data Elements in a Workbook

You can create a new data element to add to your visualization. For example, you might use a BIN function to classify AGE values into four buckets: 0 to 20, 21 to 40, 41 to 60, and 60 plus.

The calculated data elements are stored in the dataset's My Calculations folder and not in the workbook. In a workbook with a single dataset only one My Calculations folder is available and the new calculated data elements are added to it. In a workbook with multiple datasets My Calculations folder is available for each set of joined and not-joined datasets. Ensure that you're creating the calculated data elements for the required dataset or joined dataset. The new calculated data elements are added to the My Calculations folder of the datasets (joined and non-joined) that you create the calculation for.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Select a canvas to work in.

3) Navigate to the bottom of the Data Panel, right-click **My Calculations**, and click **Add Calculation** to open the **New Calculation** dialog.

4) Enter a name.

5) Optional: Enter a description.

 The description displays in the tooltip when you hover over a calculation.

6) In the expression builder pane, compose and edit an expression.

 You can drag and drop a column into the expression builder pane only if the column is joined to the dataset.

7) Click **Validate**.

8) Click **Save**.

Managing Data Sets

This section describes how to manage the data you have added from data sources.

Viewing a List of Datasets and Information About Them

 You can access, browse, sort, or search a list of datasets. You can choose any available dataset to use in a workbook.

You can use the dataset list to find out more information about each dataset, for example which data source connection it uses and what data elements it contains. See Dataset Type Icons.

1) On the **Home** page, click **Navigator** and then click **Data**.

2) Click the **Datasets** tab.

3) Optional: Enter a term in the **Search** field to search the list for a specific dataset.

4) To check a dataset's details, click **Actions** and then click **Inspect**.

5) Click the tabs to navigate and inspect the dataset's properties.

 a. Optional: Click the **General** tab to see information about the dataset, such as the connection used to create it and the database type that the dataset gets its data from.

 b. Optional: Click the **Data Elements** tab to find information that can help you decide if the dataset contains the data that you need for your visualizations. For example, each element's name, data type, and aggregation.

Reloading a Dataset's Data

This topic explains the relationship between reloading the data used in a dataset and refreshing the data used in a workbook. It also explains the different ways that you can reload a dataset's data.

About Reloading a Dataset's Data

You can reload a dataset that uses one file as its source, when one or more tables in the dataset are cached, or when the dataset is created from running a data flow. Or you can reload the files and tables of datasets individually.

Reloading data ensures that workbooks and visualizations contain current data. The most current data is displayed in workbooks and visualizations after the dataset reload is complete and you refresh the workbooks.

How you reload data depends on the dataset's data source type.

Reloading Excel, CSV, or TXT File

When you reload a Microsoft Excel file (XLSX or XLS), you must ensure that the newer spreadsheet file contains a sheet with the same name as the original file. And the sheet must contain the same columns that are in the dataset. The data reload fails if the file you load is missing columns.

When you reload a CSV or TXT file, make sure that it contains the same columns that are in the dataset. A reload will fail if the file you load is missing columns.

To reload a dataset that uses one file as its source, use the Data page or Dataset editor. If a dataset uses two or more files, then use the Dataset editor to manually reload each file. If a dataset uses a combination of files and external connections, then use the Dataset editor to manually reload each file.

Reloading All Tables in a Dataset

Use the **Datasets** tab to reload data for the dataset's tables that use connections and have the **Data Access** field set to *Automatic Caching*. Reloading queries the tables' data sources and loads the current data into cache.

If you want to reload a dataset that contains more than one table and uses files as its source, or if the dataset contains a combination of tables created from connections and files, then see Reload a Dataset's Files.

The **Reload Data** option is available for any dataset when the **Data Access** field is set to *Automatic Caching* for one or more table, and when the data source connection includes credentials for one or more table .

Dataset tables with the **Data Access** field set to *Live* aren't included in the reload.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to reload, click **Actions**, then click **Reload Data**.

Reloading a Dataset's Files

Use the Dataset editor to individually reload the XLSX, XLS, CSV, or TXT files that supply the dataset's tables.

Note the following information:

▸ If a dataset contains one table and it uses a file as its source, then use the **Data** page or **Dataset** editor to reload the file.
▸ If a dataset uses two or more files, then use the **Dataset** editor to reload each file.
▸ If a dataset uses a combination of files and external connections, then use the **Dataset** editor to upload each file. See *Reloading All Tables in a Dataset* (on page 36).

For information about structuring spreadsheets to ensure a successful upload, see *Formatting Spreadsheets and Other Files* (on page 20).

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to open, click **Actions**, and then click **Open**.
4) In the **Table Page Tabs**, locate the table that you want to reload, and click its arrow.
5) In the menu, click **Reload Data**.
6) In the **Reload Data** dialog, drag and drop the file onto the dialog or click **Select File** to browse for the file.

Inspecting a Dataset's Properties

You can view information about the dataset such as when it was created, when it was last modified, and a list of its data elements.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to inspect properties for, click **Actions**, and then click **Inspect**.
4) Click the tabs to navigate and inspect the dataset's properties.
5) Click **Close**.

Renaming a Dataset and Changing Its Description

You can rename and change the description of any dataset.

Renaming a dataset doesn't affect a workbook's reference to the dataset, and any workbooks using the dataset display the new name and continue to work as designed. When you add a dataset to a workbook, the workbook connects to the dataset by the dataset's fixed object ID, which was assigned when the dataset was created and saved, and not by its name. See *Copying a Dataset's Object ID* (on page 38).

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to rename, click **Actions**, and then click **Inspect**.
4) Click the **General** tab.
5) Go to the **Name** field and rename the dataset.
6) Go to the **Description** field and update the dataset's description.
7) Click **Save**.

Copying a Dataset's Object ID

Each dataset has an assigned, unique, fixed object ID. You can use this ID to help troubleshoot CIC Analytics errors and issues, search log files, or log an Oracle Support request.

The dataset's object ID, and not the dataset's name, is used to reference, track, and manage the dataset. In most cases, the object ID is based on the name that you provide when you create the dataset. Updating a dataset's name doesn't update its object ID. See *Renaming a Dataset and Changing Its Description* (on page 37).

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that with the ID that you want to copy, click **Actions**, and then click **Inspect**.
4) Click the **General** tab.
5) Go to the **Object ID** field and click the **Copy** button.

Viewing a Dataset's Data Elements

The data elements list contains information such as data element name, data type, and aggregation. You can use this information to determine if the dataset contains data that you want to visualize and analyze.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to view data elements for, click **Actions**, and then click **Inspect**.
4) Click the **Data Elements** tab.

Downloading a Dataset's Source File

You can download a file from a dataset that contains one table and one source file.

Here are some reasons why you would download a dataset's source file:

▸ You uploaded the dataset file, but deleted, lost, or misplaced the original file.

▶ You imported the workbook and need to access the original dataset file.

When you download a dataset's source file, by default the resulting file is the same format as the file used to create the dataset. However, you can change the file type if you choose to save the file.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to download, click **Actions**, and then click **Download File**.
4) When prompted, open or save the file.

Duplicating a Dataset

You can duplicate any dataset. Duplicating a dataset and modifying the copy can be faster than creating and building a dataset.

You're the owner of the duplicate dataset. The default name of the duplicate dataset is the copied dataset's name appended with Copy. For example, *P6-Activity-Copy*.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to duplicate, click **Actions**, and then click **Duplicate**.

Deleting a Dataset

Delete a dataset when it'sno longer needed or you need to free up space on your system.

> **Note**: Deleting a data set permanently removes it and breaks any workbooks that use it. When you choose to delete a dataset, CIC Analytics won't list workbooks that use the dataset. Before you delete a dataset you must be sure that it isn't used in any workbooks.

1) On the **Home** page, click **Navigator** and then click **Data**.
2) Click the **Datasets** tab.
3) Locate the dataset that you want to delete, click **Actions**, and then click **Delete**.

Creating Datasets Using Data Flows

Use data flows to combine, organize, and integrate data into datasets.

About Data Flows

Data flows enable you to organize and integrate your data to produce curated datasets that your users can visualize.

For example, you might use a data flow to:

▸ Create a dataset.
▸ Combine data from different sources.
▸ Aggregate data.

You create data flows in the data flow editor.

To build a data flow, you add steps. Each step performs a specific function, for example, add data, join tables, merge columns, transform data, save your data. Use the data flow editor to add and configure your steps. Each step is validated when you add or change it. When you've configured your data flow, you execute it to produce or update a dataset.

When you add your own columns or transform data, you can use a wide range of SQL operators (for example, BETWEEN, LIKE, IN), conditional expressions (for example, CASE), and functions (for example, Avg, Median, Percentile).

What Steps Can I Use to Organize and Integrate My Data?

Use these steps in data flows to organize, integrate, and transform your data. For example, you might merge data sources, aggregate data, or perform geo-spatial analysis.

Use the data flow editor to apply steps to your data flows.

Add Columns

Add custom columns to your target dataset. For example, you might calculate the value of your stock by multiplying the number of units in a UNITS column by the sale price in a RETAIL_PRICE column (that is, UNITS * RETAIL_PRICE).

Add Data

Add data sources to your data flow. For example, if you're merging two datasets, you add both datasets to your data flow.

Aggregate

Create group totals by applying aggregate functions. For example, count, sum, or average.

Analyze Sentiment

Detect sentiment for a given text column. For example, you might analyze customer feedback to determine whether it's positive or negative. Sentiment analysis evaluates text based on words and phrases that indicate a positive, neutral, or negative emotion. Based on the outcome of the analysis, a new column contains Positive, Neutral, or Negative.

Bin

Assign data values into categories, such as high, low, or medium. For example, you might categorize values for RISK into three bins for low, medium, and high.

Branch

Creates multiple outputs from a data flow. For example, if you have sales transactions data based on country, you might save data for United States in the first branch and data for Canada in the second branch.

Cumulative Value

Calculate cumulative totals such as moving aggregate or running aggregate.

Filter

Select only the data that you're interested in. For example, you might create a filter to limit sales revenue data to the years 2020 through 2022.

Graph Analytics

Perform geo-spatial analysis, such as calculating the distance or the number of hops between two vertices. To display this step type in the data flow editor, you must connect to an Oracle database or Oracle Autonomous Data Warehouse (the analytics are computed in the database, not in Oracle Analytics). See Graph Analytics Functions.

Group

Categorize non-numeric data into groups that you define. For example, you might put orders for lines of business Communication and Digital into a group named Technology, and orders for Games and Stream into a group named Entertainment.

Join

Combine data from multiple data sources using a database join based on a common column. For example, you might join an Orders dataset to a Customer_orders dataset using a customer ID field.

Merge

Combine multiple columns into a single column. For example, you might merge the street address, street name, state, and ZIP code columns into one column.

Rename Columns

Change the name of a column to more meaningful. For example, you might change CELL to Contact Cell Number.

Save Data

Specify where to save the data generated by the data flow. You can save the data in a dataset in Oracle Analytics or in a database. You can also specify runtime parameters, or change the default dataset name.

Select Columns

Specify which columns to include or exclude in your data flow (the default is to include all data columns).

Split Columns

Extract data from within columns. For example, if a column contains 001011Black, you might split this data into two separate columns, 001011 and Black.

Time Series Forecast

Calculate forecasted values based on historical data. A forecast takes a time column and a target column from a given dataset and calculates forecasted values for the target column.

Transform Column

Change the format, structure, or values of data. For example, you might convert text to uppercase, trim leading and trailing spaces from data, or calculate a percentage increase in value.

Union Rows

Merge the rows of two data sources (known as a UNION command in SQL terminology).

Creating a Dataset Using a Data Flow

Use a data flow to curate data and create a dataset. For example, you might merge two datasets, cleanse the data, and output the results to a new dataset.

1) On the **Home** or **Data** page, click **Create** and select **Data Flow**.
2) In the **Add Dataset** dialog, select a data set or data source and click **Add**.

   You can add more data sources at any time by clicking **Add Step (+)** and then clicking **Add Data**.
3) Optional: In the **Add Data** pane, configure your data. For example, Include or exclude columns. or Rename columns.
4) Build your data flow:

   For each function that you want to perform, click **Add a step** (**+**), click the step type you want, then specify the properties in the **Step editor** pane.

   > **Tip**: Hover over the last step to display the **Add a step** (**+**) option. You can also edit your flow and add steps using **Options** in the Column header. For example, you can rename, reformat, merge, or transform columns.
5) Add a **Save Data** step at the end of your data flow.
6) Save your data flow.

   You can start processing your data now by clicking **Run Data Flow** or later using the **Data Flows** panel on the **Data** page (from the **Home** page, click **Navigator**, then click **Data**). Yu can access the generated data set on the **Data Sets** panel on the **Data** page.

Generating or Updating a Dataset Using a Data Flow

Run a data flow to generate or update a dataset.

1) On the **Home** page, click **Navigator**, then **Data**, then **Data Flows**.
2) Right-click the data flow and select **Run**.
3) You can also run a data flow from the data flow editor by clicking **Run Data Flow**.

To view the dataset, from the **Home** page, click **Navigator**, then **Data** and navigate to the **Datasets** page.

Reusing a Data Flow

In a data flow, you can add parameters so that can specify the data source and output dataset to use at runtime.

1) On the **Home** page, click **Navigator**, then **Data**, then **Data Flows**.
2) Open your data flow.
3) In the **Step** editor pane, select the parameter prompt options to your steps.
4) To specify the datasource at runtime, in an **Add Data** step, select the **When Run Prompt to select Dataset** option then provide the **Name** and **Prompt** values for the parameter.
5) To specify the output dataset at runtime, in a **Save Data** step, select the **When Run Prompt to specify Datas**et option, then provide the **Name** and **Prompt** values for the parameter.

When you run (or execute) the data flow, you'll see a Dataflow Prompt dialog, which enables you to either use the default values or specify alternative values. For example:

▸ If you added a parameter to specify the data source, you can either click **OK** to accept the default, or click the default dataset name displayed in the Sources section to display the **Add Dataset** dialog where you can select an alternative.

▸ If you added a parameter to specify the data target, you can either click **OK** to accept the default, or edit the default dataset name displayed in the **Targets** section to specify an alternative.

Processing Data Using a Sequence of Data Flows

A sequence is collection of data flows that you run together. They're useful when you want to run multiple data flows as a single transaction. If any flow within a sequence fails, then all the changes made in the sequence are rolled back.

You can also include other saved sequences inside a sequence.

1) On the Home page click **Create** and select **Sequence**.
2) Drag and drop the data flows and sequences to the **Selections** pane.

3) Optional: To reorder items, hover over an item and click **Ellipsis** with three vertical dots to use the ordering options.

4) Click **Save**. When you save a sequence, it's displayed in the Sequence area of the **Data** page.

5) Go to the Sequence area of the **Data** page, select the sequence, and click **Execute Sequence**.

   You can also schedule a sequence to execute at a particular date and time.

6) To schedule a sequence to execute at a particular date and time:

   a. From the **Home** page, click the **Navigator**, and click **Data**, then **Sequences**.

   b. Right-click a sequence, click **New Schedule**, and complete the information on the **Schedule** page.

      Note: To manage scheduled sequences, from the **Home** page, click the **Navigator**, then **Jobs**, then **Schedules**.

Managing Your Data Flows

Manage your data flows on the **Data Flows** page. For example, you might schedule when you process your data, or export a data flow.

1) From the **Home** page, click **Navigator**, then **Data**, then **Data Flows**.

2) Hover over a data flow and use the **Actions** menu or right-click to access the options described in the table below.

   ‣ Use **Run** to execute the data flow to prepare your data.

   ‣ Use **Open**/**Open in a New Tab** to edit the data flow.

   ‣ Use **New schedule** to execute the data flow regularly.

   ‣ Use **Inspect** to view general information about the data flow, such as the source and target data, when the flow was last executed, scheduled executions, and execution history.

   ‣ Use **Export** to export a data flow project with its dependent data and credentials as a .DVA file to the download folder of your machine. Use the export and import options to migrate data flow projects from one system to another or back up your data flow projects. When you export data flow projects, you can select what to include in the export file. For example, enable **Include Permissions** to include access permissions so that shared connections continue to work when you import the data flow.

      To import a data flow that you've downloaded:

      1. On the **Data Flows** page, click **Page Menu**, then click **Import Workbook/Flow**.

      2. Follow the on-screen instructions to select a local .DVA file to import.

      3. When you import the data flow, select **Import Permissions (if available)** to include access permissions so that shared connections continue to work.

   ‣ Use **Delete** to remove the data flow from your system (there's no undo).

Visualizing Your Data

After preparing your data, you can now analyze the data to discover insights and draw inferences that would benefit your organization's goals.

This chapter describes the various ways you can visualize and analyze your data.

In This Section

Visualizing and Analyzing Data

This section describes the various ways you can explore and analyze your data.

Creating a Workbook Using Datasets and/or Subject Areas

Workbooks contain visualizations that help you to analyze your data in a productive and meaningful ways.

When you create a workbook, you add one or more datasets containing the data that you want to visualize and explore. Datasets contain data from subject areas, or uploaded data files such as spreadsheets. You can also add multiple datasets to your existing workbooks.

You can use the Dataset page to familiarize yourself with all available datasets. Datasets have distinct icons to help you quickly identify them by type.

To create a new workbook:

1) Go to the **Home** page, click **Create**, then click **Workbook**.
2) You can add data to a workbook using one of the following options:
    ▸ If you're working with a new workbook, then in the **Add Dataset** dialog browse and select the data sources that you want to analyze, then click **Add to workbook**.
    ▸ You can add data sources based on datasets, or subject areas.
    ▸ If you're working with an existing workbook, then in the Data Panel click **Add (+)**, then **Add Dataset** to display the **Add Dataset** dialog and add a data source.
    ▸ You can also create a new data source based on a file, or subject area using the **Create Dataset** dialog, then add it your workbooks.
3) Drag the data elements that you want to visualize from the Data Panel onto the visualization canvas and start building your workbook.

    You can transform your dataset to improve the quality of your analysis and visualization using data preparation script in the Present canvas.

Begin to Build a Workbook and Create Visualizations

To start a workbook, choose and add a dataset and then drag and drop its columns onto the Visualize page's canvas to create visualizations.

If you want to learn about the datasets that are available to you, then you can view a list of datasets and find out more information about each dataset. See View a List of Datasets and Information About Them.

A workbook can contain one or more datasets. When you add more than one dataset, CIC Analytics blends the data. You can check the default blending, or update or add data blending between datasets. See Blend Datasets.

1) On the **Home** page, click **Create** and click **Workbook**.
2) In the **Add Dataset** dialog, click a dataset and then click **Add to Workbook**.
3) Optional: To add another dataset, go to the Data Panel, click **Add (+)**.
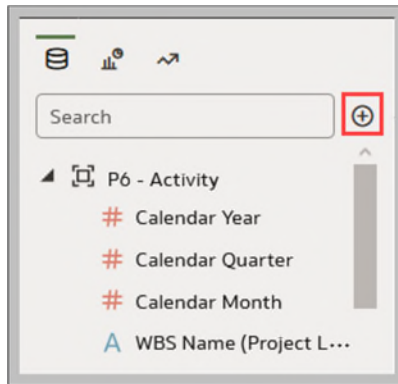
4) Optional: Select **Add Dataset**, and in the Add Dataset select a dataset and click **Add to Workbook**.
5) In the Data Panel, locate and drag and drop data columns onto the Visualize canvas to start building visualizations.
6) Click **Save**.

Working with a Workbook's Datasets

This topic describes what you need to know to work with a workbook's datasets.

Adding Datasets to a Workbook

Your workbook can use more than one dataset.

When you add more than one dataset, Oracle Analytics blends the data. You can check the default blending, or update or add data blending between datasets. See *Blending Datasets* (on page 50).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, go to the Data panel, click **Add (+)**.
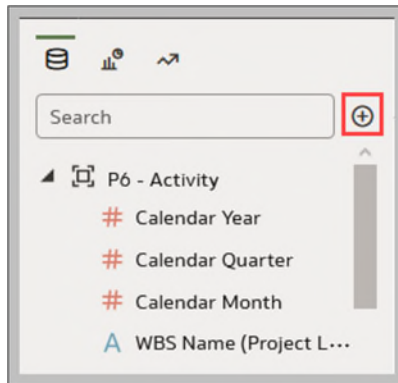
3) Select **Add Dataset**. In Add Dataset, select a dataset and click **Add to Workbook**.
4) Optional: Click **Data** to go to the **Data Diagram** and view how the datasets are blended.

Replacing a Dataset in a Workbook

When you replace a dataset, CIC Analytics suggests how you can re-map the columns from the dataset that you replaced to the replacement dataset. You can accept or update these suggested mappings.

For example, you might replace a workbook's test dataset with a production dataset. Or you can copy a workbook and its visualizations, and then use the duplicate workbook as a template. After you rename the duplicated workbook, you can add a different dataset.

When you replace the dataset, any data mapping that you specify is applied to the workbook. For example, if you map a data element to **None**, the specific data is removed from the workbook's visualizations, calculations, and filters.

1) On the **Home** page, select a workbook to use as a template, click the **Actions menu**, and then select **Open**.
2) From the **Visualize** page, click **Data**.
3) In the **Data** page, click the **Data Diagram**.

4) Optional: If the dataset that you want to replace has been blended with another dataset, then in the **Data Diagram**, click the number between the dataset icons.
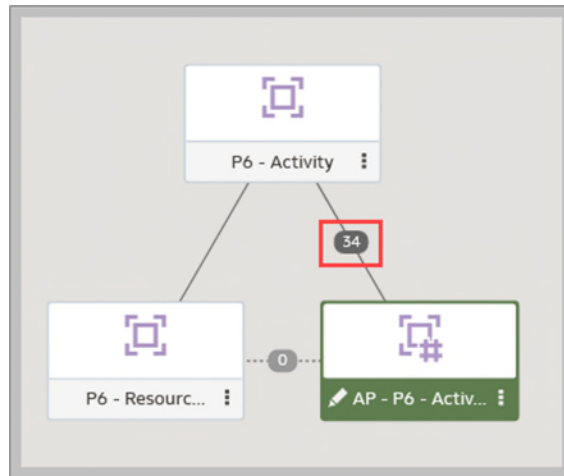
5) Optional: In the Blend Data dialog, click **Delete All Matches**, specify which dataset to delete conformance from, and then click **OK**.

6) Locate the dataset to replace and click **Actions**.
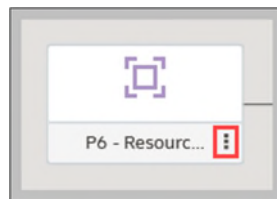
7) Select **Replace Dataset**.
8) In the Replace Dataset dialog, click the replacement dataset. Click **Select**.
9) Review, update, and specify the column mappings for the workbook's visualizations, calculations, and filters.
10) Click **Replace**.
11) Optional: If you want to add blending between datasets, then in the **Data Diagram**, click between the datasets that you want to blend, and in the Blend Data dialog add column matches.

Removing a Dataset from a Workbook

You can remove a dataset from a workbook. When you do this, you remove all of the dataset's columns from the workbook's visualizations, filters, and calculations.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, go to the Data Panel pane, right-click the dataset that you want to remove, and select **Remove from Workbook**.
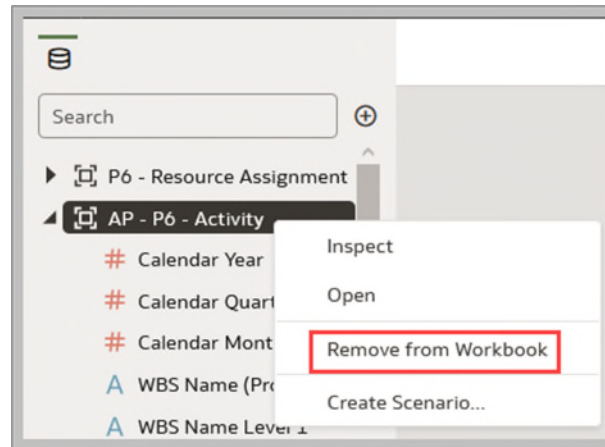
3) Click **Save**.

Modifying a Workbook's Datasets

You can use the Workbook Editor's **Data** page to navigate to the Dataset editor or Transform editor to view or modify a workbook's datasets.

When you locate a dataset's icon in the data diagram and click **Edit**, a new window opens that contains the editor that you use to view or modify the dataset. The Workbook Editor remains open in its own window and immediately reflects any saved dataset changes.
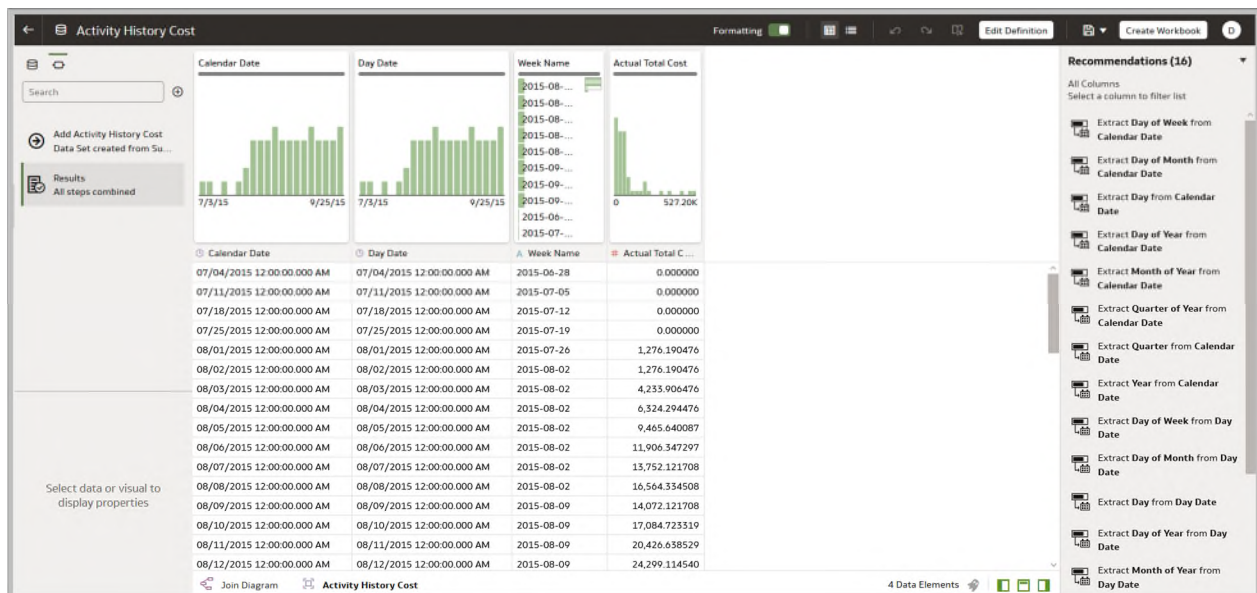
> **Note**:A dataset can be used in multiple workbooks and data flows. Modifying a dataset impacts all workbooks and data flows that use the dataset.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the workbook editor, click **Data** to go to the **Data** page.
3) In the data diagram, locate the dataset and click its **Open** button.
4) The Transform Editor opens in a tab when the dataset uses a spreadsheet, file,or a subject area.
5) Optional: If the Dataset editor is displayed, click the tab for the table that you want to view or modify and the Transform Editor is displayed.
6) Modify and save the dataset.

Blending Datasets

This section explains how to blend a workbook's datasets.

Understanding Blending

When you add more than one dataset to a workbook, Oracle Analytics tries to match columns between the datasets that you added. This matching is called blending.

For example, Dataset A might contain new dimensions that extend the attributes of Dataset B. Or Dataset B might contain new facts that you can use alongside the measures that already exist in Dataset A.

Blending automatically matches external dimensions where they share a common name and have a compatible data type with attributes in the existing dataset.

Blend Data

This connection will   Add Facts

Match   Delete All Matches

AP - P6 - Activity	P6 - Resource Assignment	
Calendar Year	Calendar Year	×
Calendar Quarter	Calendar Quarter	×
Calendar Month	Calendar Month	×
WBS Name (Project Level)	WBS Name (Project Level)	×
WBS Name Level 1	WBS Name Level 1	×
WBS Name Level 2	WBS Name Level 2	×
WBS Name Level 3	WBS Name Level 3	×
WBS Name Level 4	WBS Name Level 4	×

Add Another Match   OK   Cancel

Datasets that aren't blended are divided by a line in the workbook's Data Panel.
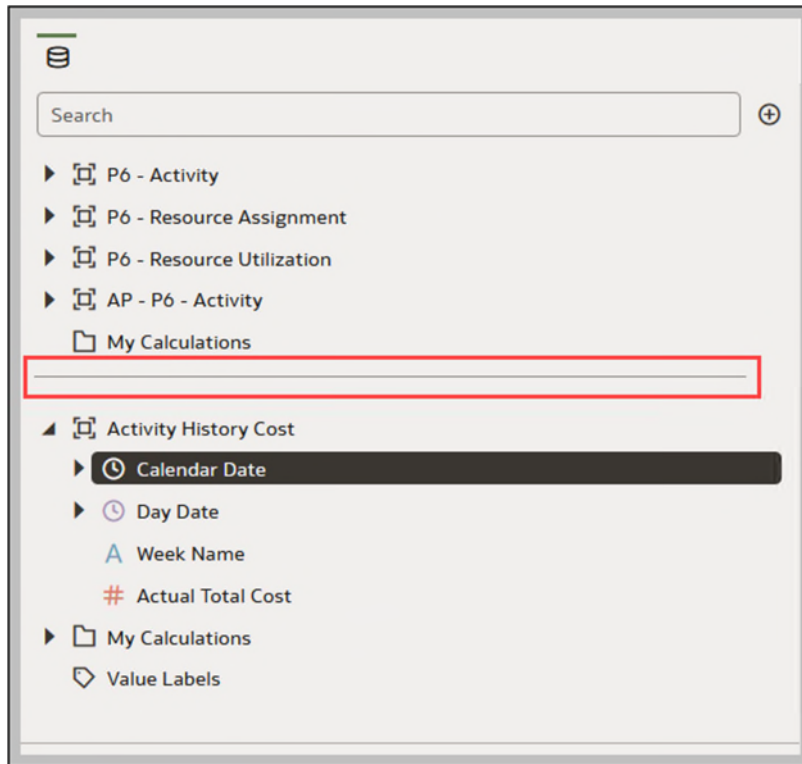
There are restrictions between data elements and visualizations when a workbook contains datasets that aren't blended. For example, if your workbook contains two datasets that aren't blended, then you can't include the data elements of one dataset in the filters, visualizations, or calculations of the other dataset.

Blending relationships are stored in the tables and not in the workbook. So any blending matches that you add or remove impact the other datasets that use the same tables.

Your workbook might contain a dataset that includes tables from different connections and schemas. When a dataset contains multiple tables, the tables will contain joins. In your workbook, you can blend datasets that contain multiple tables and joins. For example, you can add and blend datasets with multiple tables when you want your workbook to contain cross fact analysis.

Blending Datasets

If your workbook contains multiple datasets, then you can blend data in one dataset with data in another dataset.

When you add more than one dataset to a workbook, the system tries to find matches for the data that's added. It automatically matches external dimensions where they share a common name and have a compatible data type with attributes in the existing dataset. Blending relationships are stored in the tables and not in the workbook. So any blending matches that you add or remove affects the other datasets that use the same tables.

See *Understanding Blending* (on page 50).

> **Note**:Datasets can include tables from different connections and schemas. These datasets use joins, which are defined in the Dataset editor. To reduce or eliminate blending in workbooks, Oracle suggests that whenever possible you create datasets that contain multiple tables and use joins.

1) On the Home page, select a workbook, click the **Actions menu**, and then select **Open**.
2) To add another dataset to the workbook, then click **Data**, and in the **Data** page, go to the Data Panel, click **Add (+)**, and then **Add Dataset**.
3) In the **Add Dataset** dialog, select a dataset and click **Add to Workbook**.
4) In the **Data** page, go to the Data Diagram and locate the datasets to blend.
5) Click the number between the dataset icons.

6) Optional: To change the match for a column, click the name of the column and select a different column.

   If columns have the same name and same data type, then they're recognized as a possible match. You can customize this and specify that one column matches another by explicitly selecting it even if its name isn't the same. You can select only those columns with a matching data type.
7) Optional: Click **Add Another Match**, and in the table, select the columns that you want to join.
8) Optional: For a measure that you're uploading for the first time, specify the aggregation type such as *Sum* or *Average*.
9) Click **OK**.

Changing Data Blending in a Visualization

You can modify a visualization's properties to override the workbook's data blending settings.

See *Understanding Blending* (on page 50).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the workbook, select a visualization, and in the **Properties** Panel click **Datasets**.

3) To change the default blending, click **Data Blending**, and select either **Auto** or **Custom**.

4) If you choose **Custom**, you can set the blending to either **All Rows** or **Matching Rows**.

   ‣ You must assign at least one source to **All Rows**.

   ‣ If both sources are **All Rows**, then the system assumes that the tables are purely dimensional.

   ‣ You can't assign both sources to **Matching Rows**.

Building a Visualization by Adding Data from Data Panel

This section describes how to add data to a visualization.

Different Methods to Add Data

You can use different methods to add data from the **Data Panel** to create or update visualizations on a canvas.
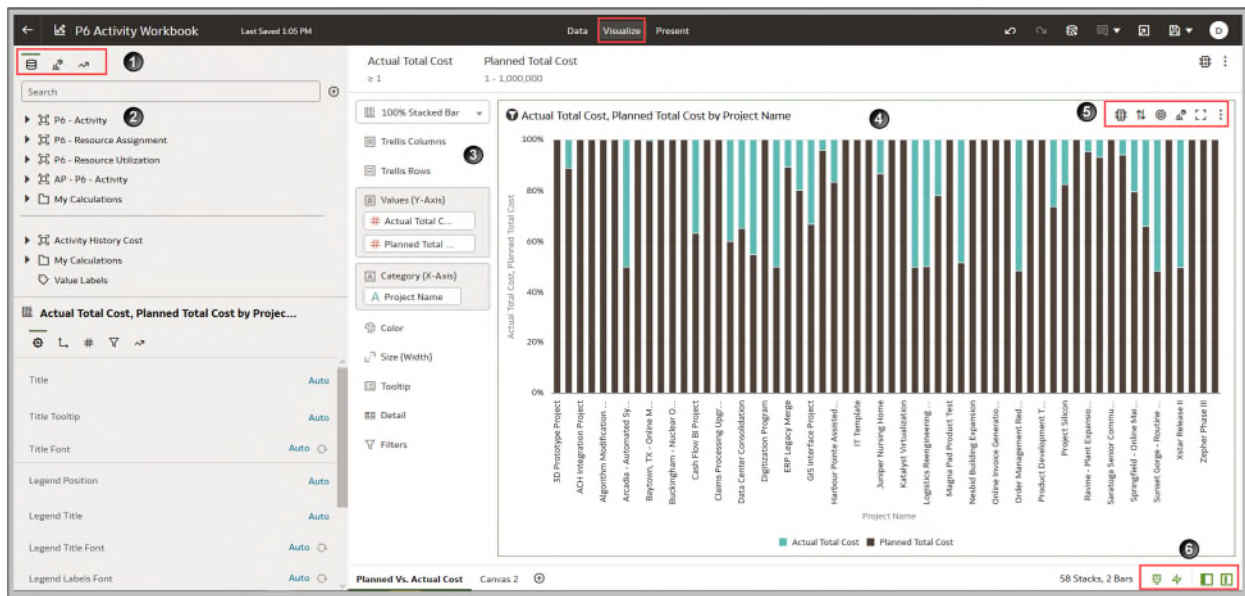
Area	Description
1	The Data Panel on the left contains three tabs: ‣ Data tab (displayed in Area 2) ‣ Visualizations tab ‣ Analytics tab
2	Data tab of the Data Panel.

Area	Description
3	Grammar Panel
4	Visualize Canvas
5	Click the relevant icon to perform the following actions: ▸ Manage Conditional Formatting Rules ▸ Sort ▸ Show Assignments to change data elements in the **Assignments Pane** ▸ Change Visualization Type ▸ Maximize Visualization ▸ Menu to access additional visualization options
6	Toggle Panel to perform the following actions: ▸ Enable or disable Brushing ▸ Enable or disable Auto Apply Data ▸ Show or Hide Data Panel (Area 2) ▸ Show or Hide Grammar Panel (Area 3)

Use one of the following methods to add data from the Data Panel:

▸ Drag data elements from the Data Panel and drop them onto the canvas.
▸ Select a data element or use Shift-click or Ctrl-click to select multiple data elements in the Data Panel, then right-click to select either a particular visualization type or the option to create a visualization automatically.
▸ Double-click a data element or use Shift-click or Ctrl-click to select multiple data elements in the Data Panel, then right-click to add them to the canvas.

When you update an existing visualization, you can add data from the Data Panel onto the Grammar Panel or Assignments Pane on the canvas. You can move the data elements from one area to another in the Grammar Panel or Assignments Pane. The visualization is updated based on your selection.

You can create a visualization by selecting a visualization type from the Visualization tab of the Data Panel and adding data elements to the canvas.

Automatically Create the Best Visualization

You can automatically create the best visualization on the canvas based on a set of data elements.

1) Select the **Visualize** canvas.
2) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
3) To automatically create a visualization on the canvas, do one of the following:
   ▸ Drag data elements from the Data Panel and drop them directly onto the canvas.

> ▸ Right-click data elements on the Data Panel and click **Create Best Visualization**.

> ▸ Double-click data elements to add it to the canvas.

> A visualization is automatically created on the canvas, and the best visualization type is selected based on the preconfigured logic. The selected data element is also positioned on a specific area of the Grammar Panel. For example, if you add a revenue measure to the canvas, the data element is placed in the Values area of the Grammar Panel, and **Tile** is selected as the visualization type.

4) Continue adding data elements directly to the canvas to build your visualization.

The visualization type and the position of the data elements on the Grammar Panel might change when you add more data elements to the canvas.

You turn off the mode to automatically create visualizations when you perform actions such as:

▸ Changing the visualization properties such as type.

▸ Adding or removing analyses from the **Analytics** tab in the Data Panel.

▸ Dropping a data element onto a specific area of the Grammar Panel or Assignments Pane.

▸ Changing the filter setting.

When the automatically create visualization mode is turned off, you can select the wizard icon or **Auto Visualization** in the visualization type list to turn on the automatically create mode.

Using the Grammar Panel to Add Data to the Visualization

After you've selected the datasets for your project, you can begin to add data elements such as measures and attributes to visualizations.

You can select compatible data elements from the datasets and drop them onto the Grammar Panel (shown below) in the Visualize canvas. Based on your selections, visualizations are created on the canvas. The Grammar Panel contains sections such as Columns, Rows, Values, and Category.
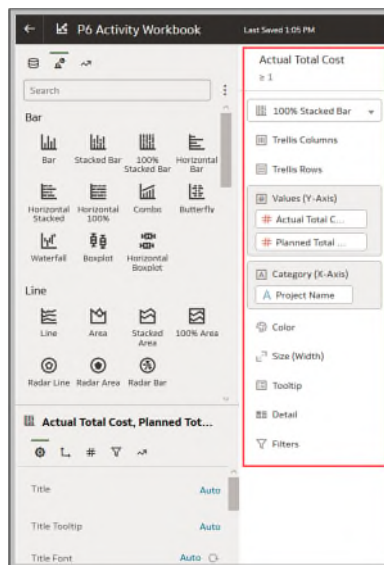
1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) If you created a workbook, then add a dataset to it.

3) Select the **Visualize** canvas.

4) Use one of the following methods to add data elements to the Grammar Panel:

   You can only drop data elements based on attribute and type onto a specific Grammar Panel section.

   ‣ Drag and drop one or more data elements from the Data Panel to the Grammar Panel in the Visualize canvas.

      The data elements are automatically positioned, and if necessary the visualization changes to optimize its layout.

   ‣ Replace a data element by dragging it from the Data Panel and dropping it over an existing data element.

   ‣ Swap data elements by dragging a data element already inside the Visualize canvas and dropping it over another data element.

   ‣ Reorder data elements in the Grammar Panel section (for example, Columns, Rows, Values) to optimize the visualization, if you've multiple data elements in the Grammar Panel section.

   ‣ Remove a data element by selecting a data element in the Grammar Panel, and click **X**.

Using the Assignment Panel to Add Data to the Visualization

You can use the Assignment Panel to help you position data elements in the optimal locations for exploring content.

A workbook must contain one or more datasets before you can add data elements to the Assignment Panel. The sections in the Assignment Panel are the same as in the Grammar Panel.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Select the **Visualize** canvas.

3) Select a visualization on the canvas.

   Alternatively, drag and drop a data element to the blank canvas or between visualizations on the canvas to create a new visualization.

4) Drag a data element to the visualization (but not to a specific drop target); you'll see a blue outline around the recommended assignments in the visualization.

   Hover the data element on the Assignment Panel to identify other valid assignments.

5) Drop the data element on the selected assignment.

To display the Assignment Panel, click **Show Assignments** on the visualization toolbar.
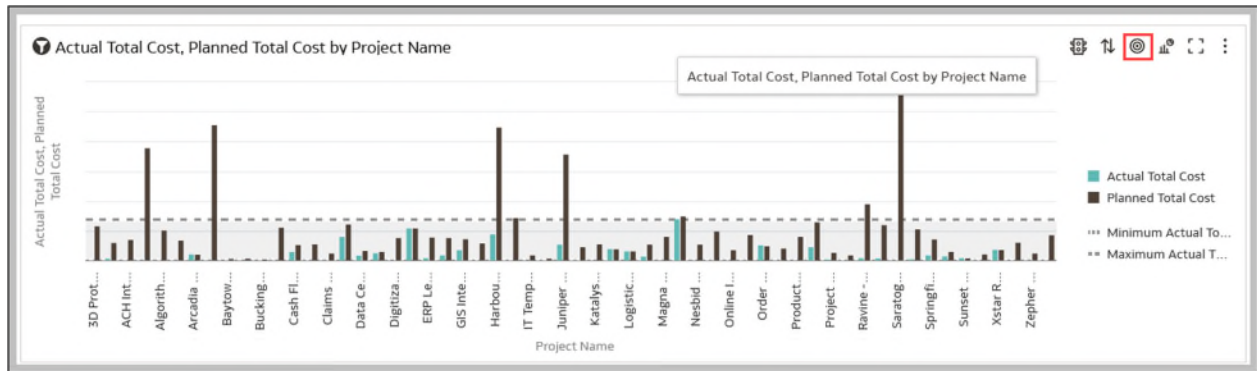
Modifying a Visualization's Tooltips

When you hover over a data point in a visualization, a tooltip displays and provides specific information about the data point. You can choose to see all tooltips or only the measures included in the Tooltip section of the Grammar Panel.

For example, if you create a simple bar chart visualization that shows revenue for countries in the Americas region, the tooltip displays the region's name, the country's name, and exact revenue amount. If you add Target Revenue to the Tooltip section of the Grammar Panel, then the target revenue amount is displayed in the tooltip and the user can easily compare the actual revenues with the target revenues. Set the **Tooltip** field in the **General Properties** Pane to **Tooltip Grammar Only** if you want the tool tip to contain only the target revenue amount.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Select the **Visualize** canvas.

3) Select a visualization on the canvas.

4) Drag and drop one or more measure columns from the Data Panel to the Tooltip section in the Grammar Panel.

   Hover the mouse pointer over a data point on the visualization to display the tooltip. Because the **Tooltip** field is set to **All Data** by default, the tooltip contains the data point's values for all columns included in the visualization. The data values for the columns that you added to the Tooltip section are displayed at the bottom of the tooltip.

5) Optional: Use the **Tooltip** field to display only the data values that you want or to turn off the tooltip.

   ▸ If you want the tooltip to display data values for only the columns you dragged to the Tooltip section, then set the **Tooltip** field to **Tooltip Grammar Only**.

   ▸ If you don't want the tooltip to be displayed, then confirm that there are no columns in the Tooltip section and set the **Tooltip** field to **Tool Tip Grammar Only**.

About Visualization Types

CIC Analytics comes with a wide variety of visualization types ready to use for just about any data analysis scenario.

Bar Graphs

Bar graphs are one of the most commonly used visualization types. You can use them to compare data across categories, identify outliers, and uncover historical high and low data points.

Visualization Type	Description
Bar	Compares groups of data over time using one categorical variable in a vertical format and is best used to show large changes.
Boxplot	Depicts groups of numerical data through quartiles and identifies outliers in a vertical format.
Butterfly	Plots data as two horizontal bars with the same X-axis in the center and visually resembles butterfly wings.
Combo	Displays different types of data in different ways, all within the same graph.
Horizontal 100%	Graphs data in the form of horizontal rectangular bars where the length of each bar equals 100%.
Horizontal Bar	Graphs data in the form of horizontal rectangular bars where the length of the bars is proportional to the values they represent.
Horizontal Boxplot	Depicts groups of numerical data through quartiles and identifies outliers in a horizontal format.
Horizontal Stacked	Renders numeric values across two categorical variables in a horizontal bar format.
Overlay Chart	Enables advanced combination charts with a multi-layer grammar experience and support for stacked bar charts.
100 % Stacked Bar	Displays numeric values across one categorical variable where the length of each vertical bar equals 100%.
Stacked Bar	Extends the standard bar graph by looking at numeric values across two categorical variables instead of one and is best used to show the total sizes of groups.
Waterfall	Shows how a starting value of something becomes a final value, uses the X, Y, Z axes to display intermediate values, and is useful in executive presentations.

Filter and Other Visualization Types

You can create visualizations that directly filter data to a workbook canvas and use a variety of other visualizations to help you make your data quickly come to life.

Visualization Type	Description
Dashboard Filter	Enables content authors to build filter bars directly on canvases so that content consumers can focus in on the data they're interested in. Content authors can format the filter to set display orientation (horizontal/vertical), add the Apply and Reset buttons, and turn wrap on or off. Dashboard filters are displayed in the Visualize canvas, Present canvas, and in presentation mode, and are available for date, measure, and attribute columns. See Filter Data Using a Dashboard Filter Visualization.
Language Narrative	Creates natural language descriptions of the attributes and measures in your dataset in the form of breakdown or trend.
List	Filters data directly to the workbook canvas as a list format visualization.
List Box	Filters data directly to the workbook canvas for some or all of the visualizations in a list box (drop down) format visualization.
Spacer	Adds spacers on the workbook canvas to provide filler space between visualizations.
Tag Cloud	Visualizes text data and is primarily used to conduct word-frequency analysis across tags and keywords.
Text Box	Provides a contained area for adding text to the workbook canvas.
Tile	Enables content authors to add one or more metrics to a tile visualization and specify the layout and positioning of labels and values for the primary and secondary measures. **Note**:A visualization tile grammar element is added automatically to the Grammar panel whenever a new visualization is created. This enables you to build and format composite card style visualizations for up to 3 measures.
Tile (Deprecated)	Focuses on a single piece of aggregate data using color, labels, and styles to show status. This visualization can only include one measure.
Timeline	Depicts a sequential view of events or objects within a period of time.

Geospacial Graphs

Geospacial graphs enable you to overlay your data on to a map with support for many common map APIs such as Google Maps, Mapbox, and EZ Map.

Visualization Type	Description
Image	Uses an uploaded image as a background for maps or other visualizations.
Map	Displays geographically related data in a map format and most used to anaylize the distribution or proportion of data in each region.
Multi-layer Map	Based on the Map graph and uses the data layer feature to display multiple data series (different sets of dimensions and metrics) on a single map visualization.
REST Background	Based on the Map graph and uses custom REST APIs to tranform data into map backgrounds.

Grid Graphs

Grid graphs enable you to investigate your data using grid-like structures made of graphical objects and tables.

Visualization Type	Description
Correlation Matrix	Presents a table containing correlation coefficients between variables.
Grid Heat Map	Plots a main variable across two axis variables as a grid of colored squares.
Picto	Uses icons to visualize an absolute number, or the relative sizes of the different parts of a whole.
Pivot	Based on the table graph but it groups values that aggregate the individual items of a more extensive table within one or more discrete categories.
Table	Displays data in rows and columns in a tabular format.

Line Graphs

Line graphs enable you to connect several distinct data points as a single continuous progression. You can use them to identify changes in one value relative to another.

Visualization Type	Description
Area	Based on a line chart with the area between the axis and line filled in. These graphs show you the amount of change over time, and are useful for evaluating a total value across a trend.
100% Area	Based on the area graph but with the entire graph filled in to 100%.
Line	Depicts an entire series of values over time in a line format.
Radar Area	Based on the radar line graph but the areas between lines are filled in.
Radar Bar	Based on the radar line graph and presents multivariate data by plotting each variable on an axis and the data as a polygonal shape over all axes.
Radar Line	Displays multivariate data in the form of a two-dimensional chart of three or more quantitative variables represented on an axes starting from the same point.
Stacked Area	Based on the area graph and is useful for tracking not only the total value, but also seeing the breakdown of that total by groups.

Network Graphs

Network graphs illuminate relationships between entities using lines, nodes, or other graphics.

Visualization Type	Description
Chord Diagram	Represents flows or relationships between entities (many-to-many connections) and identifies where there are commonalities.
Circular Network	Based on the network graph, but shows how connections happen within a circular flow.
Network	Illustrates a schematic or network map and its connections.
Parallel Coordinates	Shows a set of points in an n-dimensional space with a backdrop consisting of n parallel lines, typically vertical, and equally spaced.
Sankey	Depicts a flow diagram in which the width of the arrows is proportional to the flow rate and are useful for performing material flow analysis.
Tree Diagram	Represents a series of independent events or conditional probabilities in a node tree digram, where each node represents an event and is associated with the probability of that event.

Pie and Treemap Graphs

Pie graphs show percentages of data as slices of data of a whole circle over a set timeframe and treemap graphs enable you to visualize different segments as smaller rectangles of data within a whole square.

Visualization Type	Description
Donut	Based on the circular pie graph, but with a hollow center. It's divided into multiple segments in proportion with the related values.
Pie	Presents a circular statistical graphic divided into slices to illustrate numerical proportion.
Sunburst	Displays hierarchical data where each level of the hierarchy is represented by one circle with the innermost circle as the top of the hierarchy.
Treemap	Depicts data grouped and nested in a hierarchical (or tree-based) structure and is useful for quickly identifying patterns.

Scatter Graphs

Scatter graphs enable you to interpret the relationship between multiple variables, if any of the variables are a good predictor of another, or if the variables change on their own. You can make scatter graphs go even further by adding clusters or trend lines.

Visualization Type	Description
Category	Shows you a set of vertices (or nodes) connected by links called edges (or arcs), which can also have associated directions.
Scatter	Uses dots to represent values for two numeric variables where the position of each dot on the horizontal and vertical axis indicates values for an individual data point. Scatter plots are good to use if you want to see the relationships between variables.
Stacked Category	Based on the category graph where values are stacked by category.

Using Advanced Analytics Functions

Advanced analytics are statistical functions that you apply to enhance the data displayed in visualizations.

The Analytics area in the Data Panel contains standard analytics functions (for example, Clusters and Trend Line). You can use analytics functions as they are, or use them to create your own calculated columns that reference statistical scripts.

About Advanced Analytics Functions

You can use advanced analytics functions, like forecast, cluster, and outliers, in charts to achieve better insights into your data.

Forecast

The forecast function uses linear regression to predict future values based on existing values along a linear trend.

You can set a number of time periods in the future for which you want to predict the value, based on your existing time series data. See *Adding Advanced Analytics Functions to Visualizations* (on page 65).

Oracle supports these forecast model types:

▸ **Auto-Regressive Integrated Moving Average (ARIMA)** - Use if your past time series data is nonseasonal but provides enough observations (at least 50, but preferably more than 100 observations) to explain and project the future.

▸ **Seasonal ARIMA** - Use if your data has a regular pattern of changes that repeat over time periods. For example, seasonality in monthly data might be when high values occur during summer months and low values occur during winter months.

▸ **Exponential Triple Smoothing (ETS)** - Use to analyze repetitive time series data that doesn't have a clear pattern. This model type produces an exponential moving average that takes into account the tendency of data to repeat itself in intervals over time.

Create a custom calculation using the FORECAST function to have more control over settings, or if you want to use the forecast in other visualizations.

Clusters

The cluster function groups a set of objects in such a way that objects in the same group show more coherence and proximity to each other than to objects in other groups. For example, you can use colors in a scatter chart to show clusters of different groups. See *Adding Advanced Analytics Functions to Visualizations* (on page 65).

▸ **K-means clustering** - Use to partition "n" observations into "k" clusters in which each observation belongs to the cluster with the nearest mean, serving as a prototype of the cluster.

▸ **Hierarchical clustering** - Use to create a hierarchy of clusters built using either an agglomerative (bottom-up) approach, or a divisive (top-down) approach.

Create a custom calculation using the CLUSTER function to have more control over settings, or if you want to use the cluster in other visualizations.

Outliers

The outliers function displays data records that are located the furthest away from the average expectation of individual values. For example, extreme values that deviate the most from other observations fall into this category. Outliers can indicate variability in measurement, experimental errors, or a novelty. If you add outliers to a chart that already has clusters, then the outliers are depicted as different shapes.

Outliers can use K-means clustering or hierarchical clustering. See ***Adding Advanced Analytics Functions to Visualizations*** (on page 65).

Create a custom calculation using the OUTLIER function to have more control over settings, or if you want to use the outlier in other visualizations.

Reference Lines

The reference lines function defines horizontal or vertical lines in a chart that correspond to the X-axis or Y-axis values. See ***Adding Reference Lines to Visualizations*** (on page 66).

▶ **Line** - You can choose to compute the line between average, minimum, or maximum. For example, in the airline industry, if passenger turnout is plotted against time, the reference line can show whether passenger turnout for a particular month is above or below average.
▶ **Band** - A band represents upper and lower range of data points. You can choose a custom option or a standard deviation function, and between average, maximum, and minimum. For example, if you're analyzing sales by month and you use a custom reference band from average to maximum, you can identify months where sales are above average, but below the maximum.

Trend Lines

The trend line function indicates the general course of the metric in question. A trend line is a straight line connecting a number of points on a graph. A trend line helps you analyze the specific direction of a group of value sets in a visualization. See ***Adding Advanced Analytics Functions to Visualizations*** (on page 65).

▶ **Linear** - Use with linear data. Your data is linear if the pattern in its data points resembles a line. A linear trend line shows that your metric is increasing or decreasing at a steady rate.
▶ **Polynomial** - Use this curved line when data fluctuates. It's useful, for example, for analyzing gains and losses over a large dataset.
▶ **Exponential** - Use this curved line when data values rise or fall at increasingly higher rates. You can't create an exponential trend line if your data contains zero or negative values.

Use the TRENDLINE function to create custom calculations, or if you want to use the trend line in other visualizations.

Adding Advanced Analytics Functions to Visualizations

You can apply advanced analytics functions to your workbook's visualizations.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Confirm that you're working in the Visualize canvas.
3) Click the **Analytics** [icon] icon in the Data panel.
4) Drag and drop an advanced analytic function from the Analytics pane to a visualization.

Adding Reference Lines to Visualizations

You can use advanced analytics reference lines to identify the range of data element values in a visualization.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Confirm that you're working in the Visualize canvas.
3) In the Data Panel, click the **Analytics** [icon] icon.
4) Drag and drop **Reference Line** into a visualization. Alternatively, you can double-click **Reference Line** to add it to the selected visualization.

5) In the Properties pane select the **Analytics** tab.
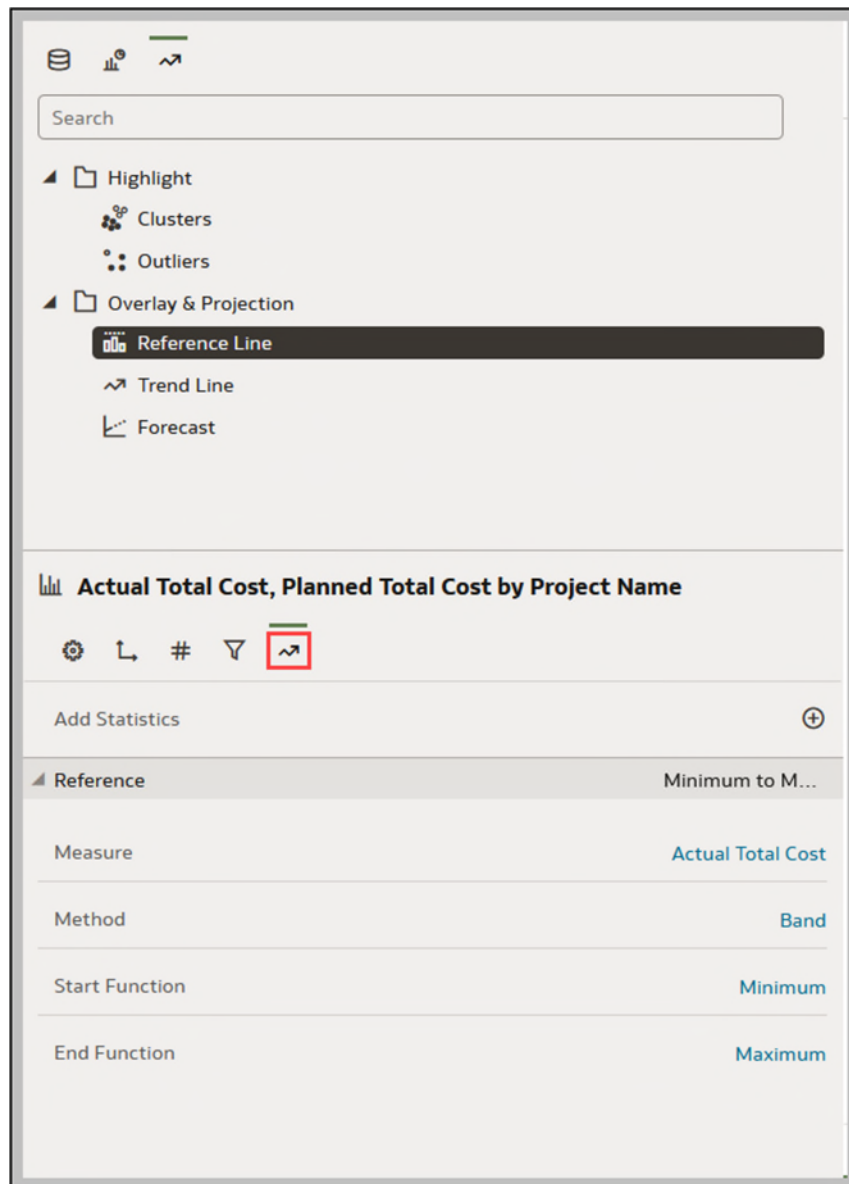
6) In the **Method** row, click the value to select **Line** or **Band**.
7) Click the current reference **Function** and select the function you want to use.
    ▸ When you choose the **Line** method, select a reference function and enter the appropriate values as required.
    ▸ When you choose the **Band** method, select one or more reference functions, and enter appropriate values if required.
8) Click **Save**.

Based on the selected **Method** or reference **Function**, a line is displayed in the visualization to highlight the value.

Creating Calculated Data Elements in a Workbook

You can create a new data element to add to your visualization. For example, you might use a BIN function to classify AGE values into four buckets: 0 to 20, 21 to 40, 41 to 60, and 60 plus.

The calculated data elements are stored in the dataset's My Calculations folder and not in the workbook. In a workbook with a single dataset only one My Calculations folder is available and the new calculated data elements are added to it. In a workbook with multiple datasets My Calculations folder is available for each set of joined and not-joined datasets. Ensure that you're creating the calculated data elements for the required dataset or joined dataset. The new calculated data elements are added to the My Calculations folder of the datasets (joined and non-joined) that you create the calculation for.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Select a canvas to work in.
3) Navigate to the bottom of the Data Panel, right-click **My Calculations**, and click **Add Calculation** to open the New Calculation dialog.

4) Enter a name.
5) In the expression builder pane, compose and edit an expression.
   You can drag and drop a column into the expression builder pane only if the column is joined to the dataset.
6) Click **Validate**.
7) Click **Save**.

Sorting Data in Visualizations

Sometimes you're working with a lot of data in visualizations. To optimize your view of that data in the project's visualization canvas, you need to sort it.

If your workbook doesn't have a visualization, create one. See ***Begin to Build a Workbook and Create Visualizations*** (on page 46).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the **Visualize** canvas, do one of the following:

‣ In the main editing panel, right click the data element you want to sort, hover over **Sort By** next to the element label, and select a sorting option (for example, Low to High, High to Low, None).

‣ In the Visualization Grammar Panel, **Grammar** pane, right click the data element you want to sort, hover over **Sort By** then click a sorting option (for example, Low to High, A to Z, None).
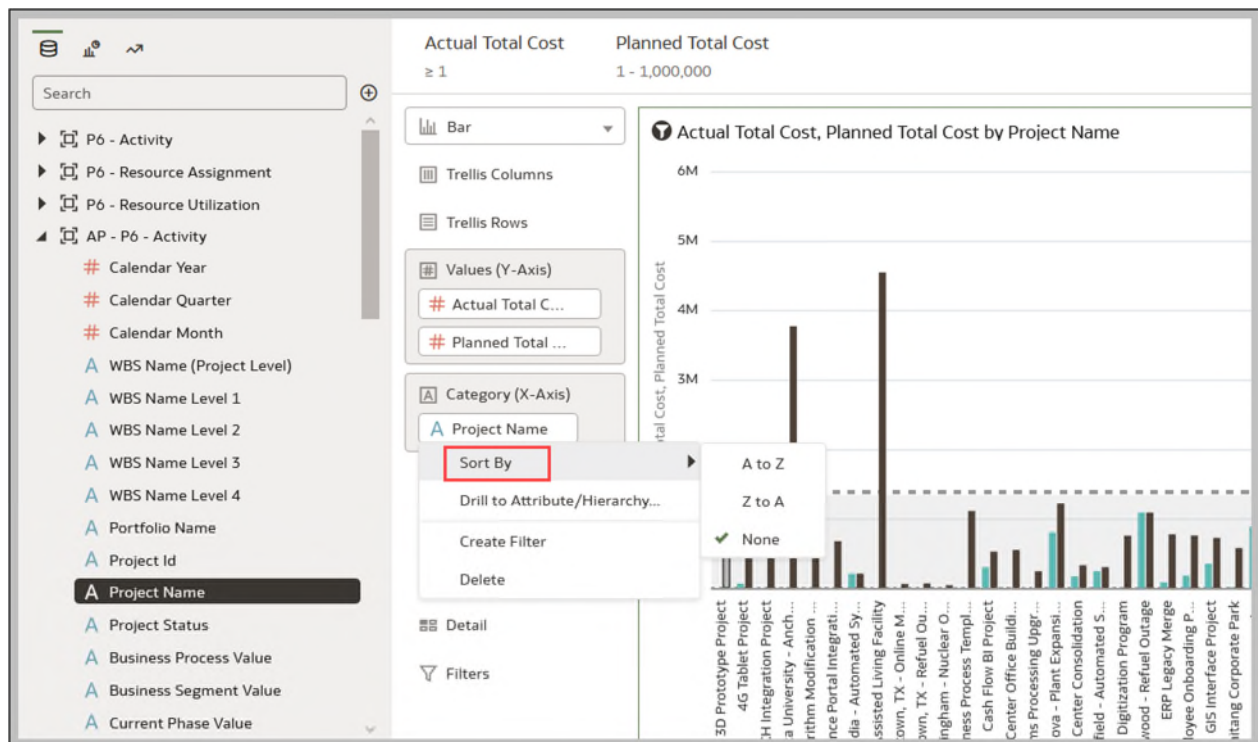
Undo and Redo Edits

You can quickly undo your last action and then redo it if you change your mind. For example, you can try a different visualization type when you don't like the one you've just selected, or you can go back to where you were before you drilled into the data.

The undo and redo options are useful as you experiment with different visualizations. You can undo all the edits you've made since you last saved a project. However, in some cases, you can't undo and then redo an edit.

▶ To undo or redo an edit, go to the toolbar for the project or the data set and click **Undo Last Edit** or **Redo Last Edit**. You can use these options only if you haven't saved the project since making the changes.
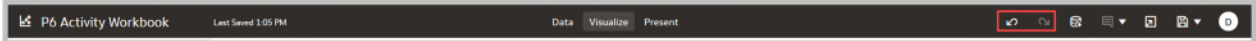
▶ When you're working on a workbook, click **Menu** on the workbook toolbar and select **Revert to Saved** to undo all the edits you've made since you last saved your project.

Revert to Saved is enabled after you've saved the workbook for the first time. This option is automatically disabled if you select the **Auto Save** option.

About Refreshing a Workbook's Data

Refreshing the data in a workbook ensures that it uses current data.

When you click the **Refresh Data** button for a workbook, it runs the queries for the visualizations on the canvas. How the datasets are configured and the data sources they use determines where the canvases get their refreshed data.

If a dataset table's access mode is set to **Live**, then the table bypasses any presentation caches to fetch new data from the source. If a datasets table's access is set to **Automatic Caching**, then the table re-queries the cached data.

Refreshing data doesn't trigger a data cache reload. Sometimes the cached data is stale, so if you refresh the data and the data isn't the most current, then the datasets may need to be reloaded. Add hyperlink to

Oracle recommends that you refresh a workbook's dataset rather than replace it. Replacing a dataset can be destructive. Don't replace a dataset unless you understand what can happen:

▶ If the columns and data types don't match between the existing dataset and the new dataset, then replacing a dataset breaks the workbooks that use the existing dataset.

▶ Any modified or added columns in the existing dataset are lost and workbooks using the dataset are likely to break.

Refreshing a Workbook's Data

Refresh the data in a workbook to ensure that your visualizations contain the most current data.

See **About Refreshing a Workbook's Data** (on page 70).

You can set the **Refresh Data when Canvas Is Opened**, **Auto Refresh Data**, and **Refresh Interval** properties to automatically refresh the canvas data. See **About Canvas Data Refresh Properties** (on page 74).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Visualize canvas, go to the workbook toolbar and click **Refresh Data**.

Pausing Data Queries in a Workbook

You can disable the Auto Apply Data option to pause issuing new queries as you change visualization content in a workbook.

You can quickly configure a visualization without having to wait for data updates after each change.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Click **Visualize**.

3) In the bottom right corner of the Toggle pane, click the **Auto Apply Data** button to pause data queries.

   Data queries are temporarily disabled.

4) Make changes to a visualization in the workbook.

   Your changes are displayed but data isn't updated, and a bubble is displayed indicating the number of data requests that have been skipped.

5) Click the bubble if you want to refresh the data now.

   Data queries are still disabled.

6) Click the **Auto Apply Data** button to re-enable data queries.

Working with Canvas Properties

You can work with canvas properties, such as layout, width, height, synchronizing visualizations on a canvas, and refreshing data.

Updating Canvas Properties

You can use the canvas properties to perform many different tasks. For example, change the layout, set brushing, or configure canvas refresh settings.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the canvas bar, right-click a canvas tab and click **Canvas Properties.**
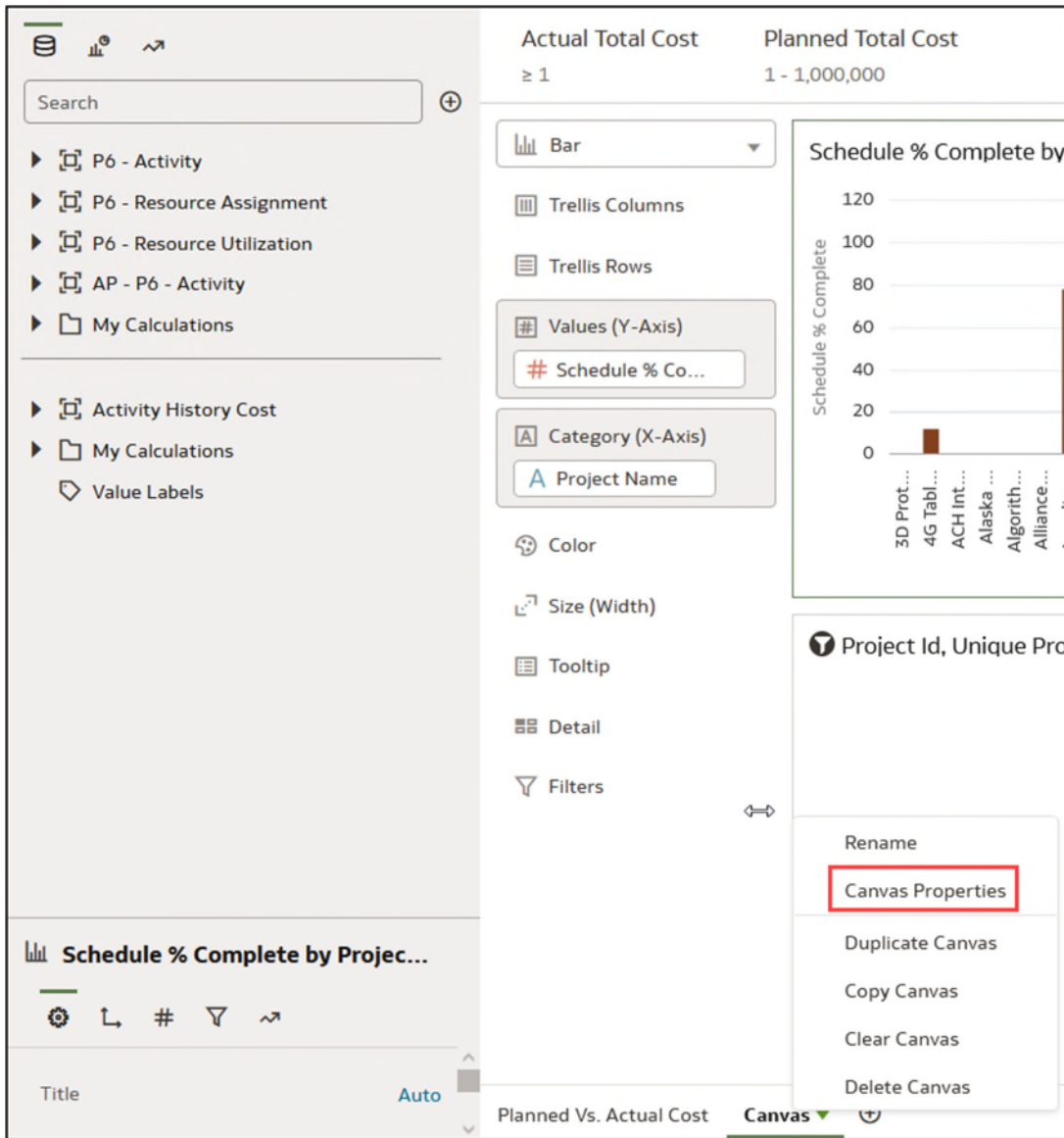
3) Update the canvas properties.
4) Click **Save**.

About Canvas Layout Properties

You can configure the layout, width and height of visualizations on a canvas.

You configure how visualizations are displayed in a canvas using canvas property settings.

Layout

Configures whether visualizations are displayed as freeform or auto fit.

▶ **Auto Fit** - Use to automatically arrange or correctly align visualizations on a canvas with multiple visualizations. You can also resize a visualization by dragging its edges to the appropriate dimensions.

▶ **Freeform** - Use to rearrange a visualization on the canvas using drag and drop to a space between visualizations where you want to place it. You can also resize a visualization by dragging its edges to the appropriate dimensions.

The **Order Visualization** option (only available when you use the **Freeform** canvas layout) enables you to use **Bring to Front**, **Bring Forward**, **Send Backward**, or **Send to Back**, to move a visualization on a canvas with multiple visualizations.

Width and Height

Use **Width**, and **Height** settings in conjunction with Layout settings to specify the layout size of visualizations in a canvas

▶ **Screen** - Layout fits in the available screen space.

Not available when you select Freeform.

▶ **Grow** - Layout automatically grows in height or width to accommodate a visualization at its optimal size.

   For example, if you add multiple visualizations, or rows of visualizations to a canvas, the layout grows so that the added visualizations display at their optimum size.

▶ **Fixed** - Layout uses the specified size.

About Brushing Between Visualizations on a Canvas

You can configure brushing on a canvas so that when a user selects data points in a visualization, the datapoints are automatically highlighted in other visualizations.

Brushing can only work when visualizations share the same dataset.

In the lower right-corner of the canvas tabs bar, you can set the **Brushing** 🖉 canvas property to be on or off, for a selected canvas. See *Updating Canvas Properties* (on page 71).

▶ **On** - If you select one or more data points in a visualization, then corresponding data points are highlighted in the other visualizations on the canvas that use the same dataset.

▶ **Off** - If you select one or more data points in a visualization, then corresponding data points are not highlighted in other visualizations on the canvas.

About Synchronizing Visualizations in a Canvas

You can specify whether or not to synchronize Visualizations in a canvas.

You use the **Synchronize Visualizations** setting to specify how the visualizations on your canvas interact. By default, visualizations are linked for automatic synchronization.

When **Synchronize Visualizations** is set to **On**, and you add or remove data values from a visualization, this automatically adds or removes the values in corresponding visualizations. When **Synchronize Visualizations** is set to **Off**, this unlinks your visualizations and turns off automatic synchronization.

When **Synchronize Visualizations** is **On**, then all filters on the filter bar and actions that create filters (such as Drill) apply to:

▸ All the visualizations in a canvas with a single dataset.

▸ All the visualizations of joined datasets with multiple datasets.

  If a data element from a dataset is specified as a filter but isn't matched with the joined datasets, then the filter only applies to the visualization of the dataset that it was specified for.

When you hover the mouse pointer over a visualization to see the filters applied to the visualization, any filter that isn't applied to the visualization is grayed out.

Any visualization-level filters are applied only to the visualization.

When **Synchronize Visualizations** is set to **Off**, then analytic actions such as Drill affect only the visualization to which you applied the action.

About Canvas Data Refresh Properties

You can configure canvas data to refresh when you open a canvas, or to refresh automatically at a specified interval.

You configure how canvas data is refreshed using canvas property settings.

Refresh Data when canvas is opened

Configures whether to refresh data when a user opens the canvas.

▸ **On** - Use to refresh the data when the canvas is opened.

  The client and server caches are cleared every time the canvas is opened, ensuring that you see the current data.

▸ **Off** - Use to not refresh the data when the canvas is opened.

Auto Refresh Data

Configures whether to automatically refresh the canvas data at specified time intervals.

▸ **Enabled** - Use to automatically refresh the canvas data using a Refresh Interval that you enter.

▸ **Disabled** - Use to not automatically refresh the canvas data.

Auto start for viewers

Configures whether to start the automatic data refresh when the canvas is opened.

▸ **On** - Use to automatically refresh canvas data when the canvas is opened, and then at the specified intervals.

▶ **Off** - Use to not automatically start the canvas data at the specified refresh interval when the canvas is opened, until the user clicks Refresh Data in the workbook.

Copying and Pasting a Visualization or Canvas

You can copy and paste a visualization or canvas within the same workbook, to another open workbook, or to another workbook open in a different browser tab.

When you copy a visualization or canvas from one workbook to another, CIC Analytics does the following:

▶ Data - The dataset for the pasted visualization or canvas is added to the target workbook. When you open or create the target workbook that you're pasting to, it doesn't need to include the dataset used by the visualization or canvas that you'll copy and paste.

▶ Filters - The filters in the target workbook and in the pasted visualization or canvas are maintained. You don't need to add the visualization or canvas filters to the target workbook. If there's a conflict between the target workbook and the pasted visualization or canvas filters, then the pasted filters won't overwrite the target's filters.

▶ Color assignments - The color scheme of the target workbook is applied to the pasted visualization or canvas.

▶ Calculations - If the same calculation name exists in the target workbook, then the pasted calculation is added and renamed.

Use the following steps to copy and paste a visualization or canvas:

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, copy a visualization or canvas.

  ▶ To copy a visualization, click its **Menu**, hover over **Edit**, and then click **Copy Visualization**.

  ▶ To copy a canvas, right-click it and click **Copy Canvas**.
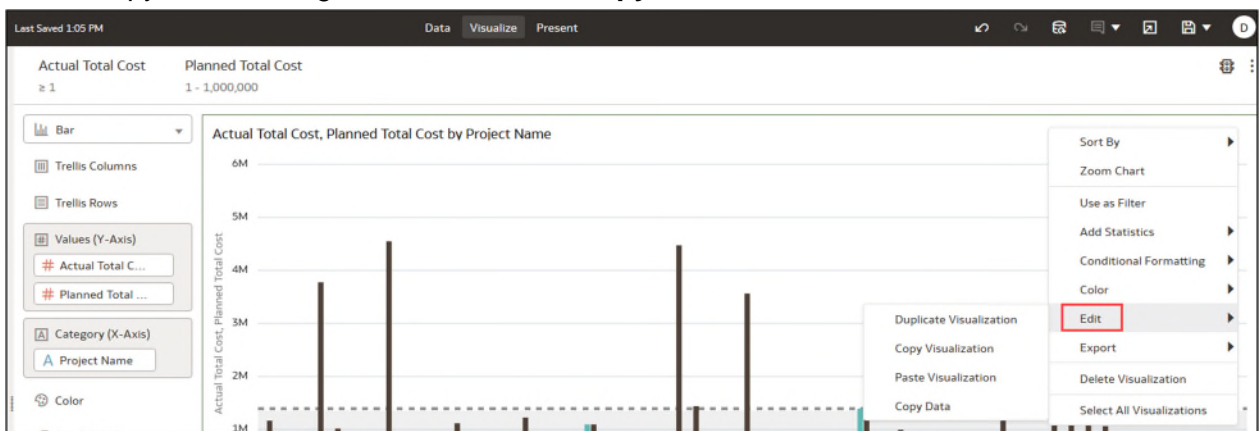
3) Navigate to a visualization or canvas and paste the object.

  ▶ To paste a visualization into a canvas that contains visualizations, click an existing visualization's **Menu**, hover over **Edit**, and then click **Paste Visualization**.

‣ To paste a visualization into a blank canvas, right-click the canvas bar and select **Add Canvas**. Right-click the new canvas, hover over **Edit**, and then click **Paste Visualization**.

‣ To paste a canvas, right-click the canvas bar and then click **Paste Canvas**.

Copy and Paste a Visualization's Data

You can copy all of a visualization's data to the clipboard and then paste the data to an another application, like Word or Excel.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click a visualization's **Menu**, hover over **Edit**, and then click **Copy Data**.

This copies the visualization data to the clipboard.
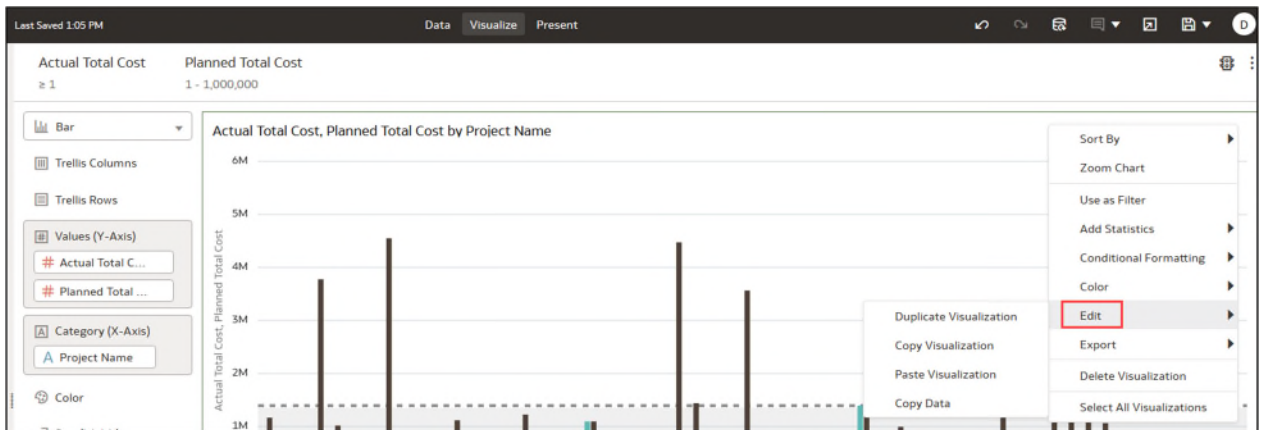
3) Open a target application and paste in the visualization's data.

Working with Multiple Visualizations on a Canvas

You can work with multiple visualizations at the same time, update common visualization properties, copy and paste multiple visualizations, and delete multiple visualizations on a canvas.

Updating Common Properties for Multiple Visualizations on a Canvas

You can update visualization properties for multiple selected visualizations on a canvas.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Visualize canvas, use Ctrl-click to select multiple visualizations on the canvas.
3) In **Common Properties** click the property to change and apply your changes.

4) Common property values are displayed when they share the same value for each of the selected visualizations.

5) Click **Save**.

Copy and Paste Multiple Visualizations on a Canvas

You can copy and paste multiple selected visualizations on a canvas.

1) On the **Home** page, select a workbook that contains the visualizations you want to copy and paste, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, use Ctrl-click to select multiple visualizations on the canvas.

3) To copy the selected visualizations hover over the selected visualizations, right-click, click **Edit**, and then click **Copy Visualizations**.

4) To paste the copied multiple visualizations, click a canvas location where you want to paste the copied visualizations, right-click and click **Paste Visualizations**.

5) Click **Save**.

Delete Multiple Visualizations on a Canvas

You can delete multiple selected visualizations on a canvas.

1) On the **Home** page, select a workbook that contains the visualizations you want to delete, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, use Ctrl-click to select multiple visualizations.

3) Right-click, and select **Delete Visualizations**.

4) Click **Save**.

Changing Visualization Types

You can change visualization types to best suit the data you're exploring.

When you create a workbook and add data elements to the canvas, Auto Visualization mode chooses the most appropriate visualization type based on the selected data element. The Auto Visualization mode is on (selected) by default. If you add more data elements, the visualization type is automatically updated, and the best type is selected based on the data elements.

If you want to use a different visualization type, then you need to select it from the visualization type list. When you change the visualization type, Auto Visualization mode is turned off. When the Auto Visualization mode is off (deselected), adding more data elements to the canvas won't change the visualization type automatically.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Select a visualization on the canvas, and on the visualization toolbar, click **Change Visualization Type**.
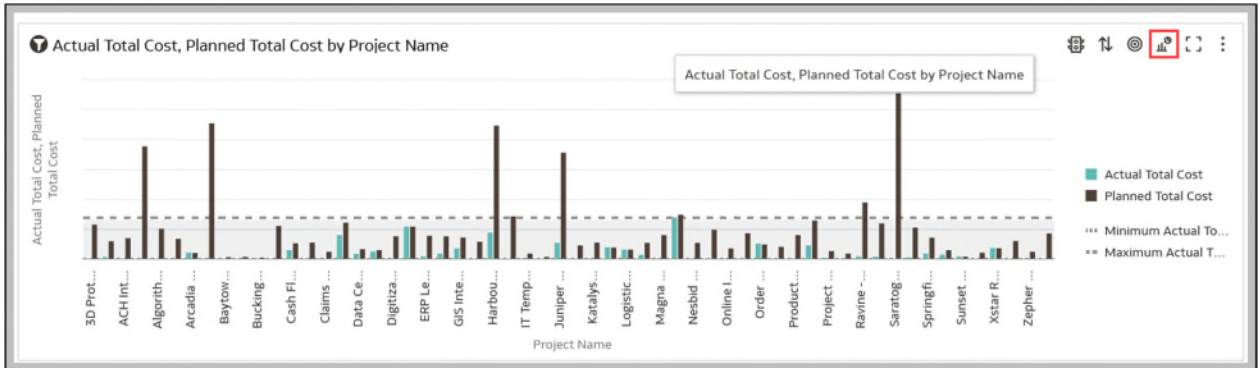
3) Select a visualization type. For example, select Treemap to change the visualization type from Pivot to Treemap.

4) When you change the visualization type, the data elements are moved to matching drop target names. If an equivalent drop target doesn't exist for the new visualization type, then the data elements are moved to a Grammar Panel section labeled **Unused**. You can then move them to the Grammar Panel section you prefer.

About Visualization Properties

You can customize the appearance and functionality of a visualization by changing its properties.

The properties that are available depend on the type of visualization that you select.

‣ **General** - Use to change the visualization title, title tooltip, title format, and to set the alignment of table or pivot visualizations on the canvas.

‣ **Axis** - Use to display or hide visualization gridlines, to show or hide horizontal (x) and vertical (y) axis labels, and to update and format the axis label text.

‣ **Edge Labels** - Use with table and pivot visualizations to set column and row labels, and to show or hide and format headers and data.

‣ **Map** - Use to control the zoom, the data focus, and to scale and select a background map.

‣ **Data Layers** - Use with maps to add data layers, and to configure the settings for each data layer.

‣ **Totals** - Use with table and pivot visualizations, to position and format totals.

‣ **Values** - Use to change the display, placement, and format of data labels, and hide and display a Y2 axis.

‣ **Date/Time Format** - Use with visualizations that have a date or time element, to set display and format properties.

‣ **Action** - Use to add a URL to tile, image, and text box visualizations.

‣ **Filters** - Use to change and format the visualization's filter title and selection names.

‣ **Analytics** - Use to add advanced analytics functions to the visualization.

Adjusting Visualization Properties

You can customize how the visualizations in your workbook look and function. For example, the legend's location, number format, and font used in titles and labels.

The tabs and fields displayed depend on the type of visualization that you're working with.

If your workbook doesn't have a visualization, create one. See Begin to Build a Workbook and Create Visualizations.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Visualize canvas, select a visualization.

   The visualization's properties display in the Properties pane.
3) Use the tabs in the Properties pane to adjust the visualization's properties as needed.

Highlighting Important Data Events with Conditional Formatting

Use conditional formatting to highlight important data events in your visualizations so that you can take action.

What Can I Do With Conditional Formatting?

With conditional formatting, you apply rules to your data to highlight when something important happens. For example, you might want to show when revenues meet high, medium, and low thresholds.

You can make conditional formatting rules available to one or multiple visualizations in a workbook.

Conditional formatting provides a way for the user to see events or changes in their data driven rules. For example, if you want to see when sales fall below a threshold, the user would write a rule that says when sales are below 500K, format the data points using the color red.

In each canvas, you can:

▶ Choose which rules to apply to the data in the canvas.
▶ Apply multiple rules to a canvas at the same time.
▶ Apply multiple rules to a measure at the same time.
▶ Change the order in which rules are applied.
▶ Turn rules on and off for a visualization.

Conditional formatting compares measures, such as revenue for a year, the number of units of a product, the number of students that didn't return to school during an academic year, with one of the following:

▶ A set of thresholds.

   For example, highlight values in red if my blood pressure is above 90 or under 70.
▶ A target or goal.

   For example, highlight values in red if my costs exceed my budget.
▶ A percentage of a target.

   For example, highlight values in green when I reach 80% of my sales goal.
▶ A complex expression.

   For example, highlight values in green when I achieve 5% growth in sales compared to the same period last year.

You can format:

▶ Fill color and color density.
▶ Font, font size, font color, and font style.

You can also:

▶ Add tooltips and legends.
▶ Deploy conditional formatting in the Oracle Analytics app.

Applying Conditional Formatting to a Visualization

Apply conditional formatting to a visualization to highlight important events in your data. You can apply existing conditional formatting rules or create your own rules.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click **Visualize**.
3) From the visualization toolbar, click **Manage Conditional Formatting Rules**.
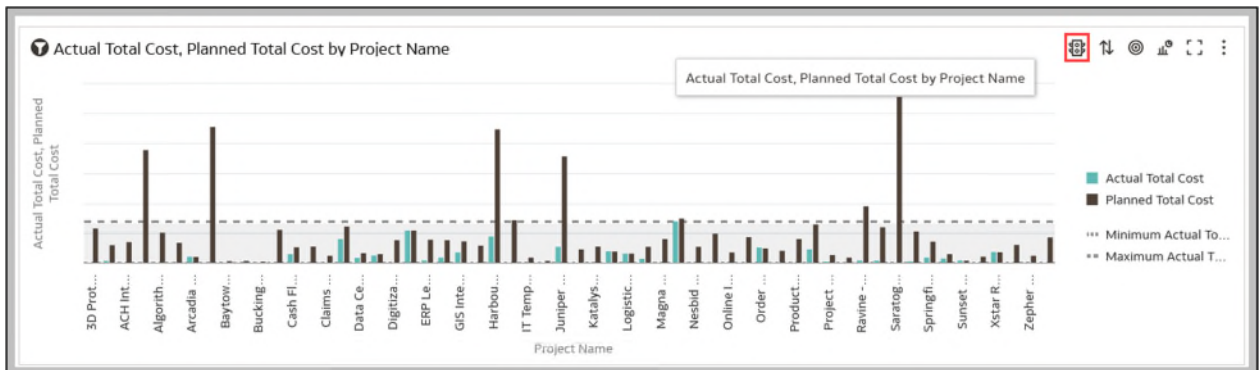
Available formatting rules are displayed at the left side (not selected by default).

4) To highlight data by applying an existing rule to your visualization:

   a. If you want to display existing rules available to all visualizations or just the current measure, click the drop-down list in the top left hand corner, and select either **All Visualizations** or the name of the current visualization.

   If you select **All Visualizations** and the workbook doesn't have any rules in that category, you won't be able to select any rules. Select the name of the current visualization to display rules that you can apply.

   b. Click the check box next to a rule to apply that formatting rule to your visualization. Activated rules have a green tick.

   If a rule is displayed without a check box, click the drop-down list above the rules list and select a measure to display rules that you can use.

   c. If you're applying multiple rules to the same measure, use the grab handles to position the rules in the order you want (rules at the top activate first).

   If you're applying multiple rules to a measure, the last rule that evaluates to true is the one that colors the item. For example, if rule 1 is revenue greater than one million and highlights in green, and rule 2 is revenue less than target and highlights in red, an item where revenue meets both criteria will highlight in red.

5) To highlight data by applying a new rule to your visualization:

   a. Optional: Change the default name in the **Name** field to a more user-friendly term.

   b. In **Measure**, specify the data measure that the rule evaluates.

   For example, to highlight sales channels where revenue is greater than one million, you might select Revenue.

   c. Use the operator field and adjacent value field to specify the threshold.

For example, to highlight sales channels where revenue is greater than one million, select the greater than symbol **>** in the operator field and enter 1,000,000 in the value field.

You can also create a rule by clicking one of the **Presets** and defining a value for each threshold. For example, click **3 Steps Threshold** to create a set of stoplight thresholds.

d. Click **Save**.

Applying Color to Visualizations

Use color to enhance your visualizations. For example, you might change the default color pallet for analyses in a workbook.

About Color Assignments in Visualizations

You can work with color to make visualizations more attractive, dynamic, and informative. You can color a series of measure values (for example, Sales or Forecasted Sales) or a series of attribute values (for example, Product and Brand).

Your color choices are shared across all visualizations on the canvas, so if you change the series or data point color in one visualization, then it appears on the other visualizations.

The **Visualize** canvas has a Color section in the Grammar Panel where you can put a measure column, attribute column, or set of attributes columns. The canvas assigns color to the columns that are included in the Color section:

▸ When a measure is in the Color section, then you can select different measure range types (for example, single color, two color, and three color) and specify advanced measure range options (for example, reverse, number of steps, and midpoint).

▸ When you've one attribute in the Color section, then the stretch palette is used by default. Color palettes contain a set number of colors (for example, 12 colors), and those colors repeat in the visualization. The stretch palette extends the colors in the palette so that each value has a unique color shade.

▸ If you've multiple attributes in the Color section, then the hierarchical palette is used by default, but you can choose to use the stretch palette, instead. The hierarchical palette assigns colors to groups of related values. For example, if the attributes in the Color section are Product and Brand and you've selected Hierarchical Palette, then in your visualization, each brand has its own color, and within that color, each product has its own shade.

Accessing Color Options

You can set color options for your workbook and for individual visualizations within your workbook.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) If you want to edit color options for the whole workbook:

a. Click **Menu** ⋮ on the workbook toolbar and select **Workbook Properties**.
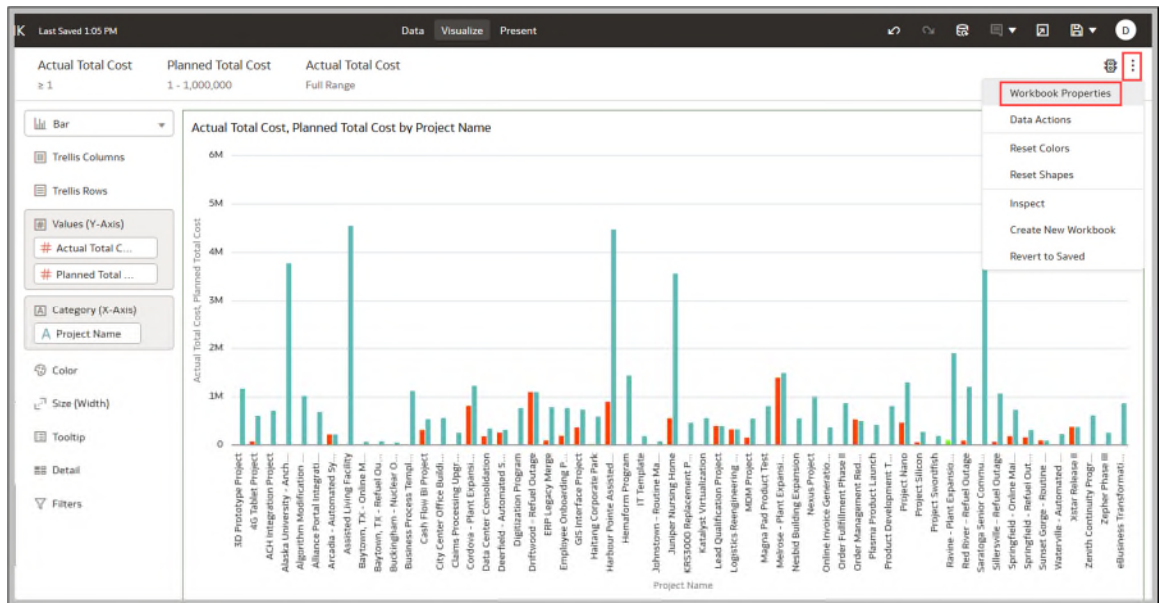
b. Edit the **Color Series** or **Continuous Coloring**.

3) If you want to edit color options for a visualization:

a. Select the visualization and click **Menu** ⋮ or right-click.

b. Select **Color**. The available color options depend on how the measures and attributes are set up in your visualization.

c. You can experiment with visualization colors and select **Reset Visualization Colors** to revert to the original colors.

d. Select **Stretch Palette** to turn this option on or off.

Color palettes have a set number of colors, and if your visualization contains more values than the number of color values, then the palette colors are repeated. Use the **Stretch Palette** option to expand the number of colors in the palette. Stretch coloring adds light and dark shades of the palette colors to give each value a unique color. For some visualizations, stretch coloring is used by default.

Changing the Color Palette

You can switch between the various color palettes until you find the one you want.

Each color palette contains 12 colors that you can apply to a visualization.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Select a visualization to change the color palette for.

3) Click **Menu** ⋮ or right-click and select **Color**, then select **Manage Assignments**.

4) Locate the **Series Color Palette** and click the color palette that's currently used in the visualization.
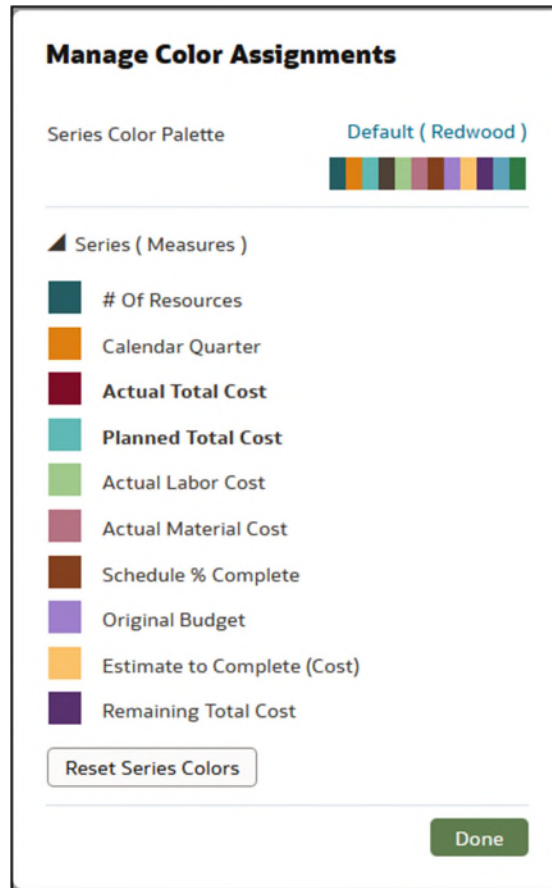
5) From the list, select the color palette that you want to apply to the visualization.

Assigning Colors to Columns

Instead of using the palette's default colors, you can choose specific colors to fine-tune the look of your visualizations.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Select the visualization that you want to manage the colors for.
3) Click **Menu** on the visualization toolbar or right-click and select **Color**, then select **Manage Assignments**.
4) If you're working with a measure column, you can do the following:
   ▸ Click the box containing the color assigned to the measure. From the color picker dialog, select the color that you want to assign to the measure. Click **OK**.

▸ Specify how you want the color range to be displayed for the measure (for example, reverse the color range, pick a different color range, and specify how many shades you want in the color range).

Manage Color Assignments

Series Color Palette   Default (Redwood)

▲ Series (Measures)

Of Resources

Calendar Quarter

Actual Total Cost

Planned Total Cost

Actual Labor Cost

Actual Material Cost

Schedule % Complete

Original Budget

Estimate to Complete (Cost)

Remaining Total Cost

Reset Series Colors

Done
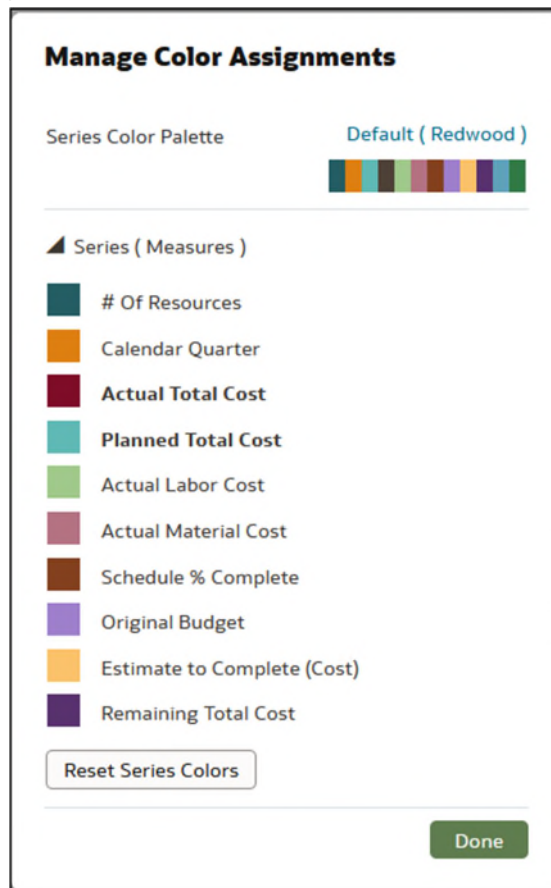
5) If you're working with an attribute column, then click the box containing the color assignment that you want to change. From the color picker dialog, select the color that you want to assign to the value. Click **OK**.

Formatting Numeric Values of Columns

You can format numeric values of a column in your visualizations using a wide range of ready-to-use formats. For example, you might change the aggregation type from Sum to Average.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Data Panel, select the column.
3) In the properties pane for the selected column, use the **General** or **Number Format** tabs to change the numeric properties.

▸ **General** - Change the column name, data type, treat as (measure or attribute), and aggregation type.

For example, to change how a number is aggregated, use the **Aggregation** option.

 ▸ **Number Format** - Change the default format of a number column.

4) Click **Save**.

Formatting Numeric Values of Visualizations

You can format numeric properties of a visualization using a wide range of ready-to-use formats. For example, you might change the aggregation type from Sum to Average.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Click **Visualize** and select a visualization.

3) In the properties pane for the selected visualization, use the **Values** tab to change the numeric properties.

   For example, to change how a number is aggregated, use the **Aggregation Method** option.

4) Click **Save**.

Setting Currency Symbols for Visualizations

You can set measure values in a visualization to display an appropriate currency symbol.

You can configure a measure to use a custom currency to display the symbol associated with a currency. For example, if you set a canvas filter to display a European Ledger, then the Euro symbol is displayed for each measure value that's associated with the custom currency property. The workbook data must contain a currency code column, for example, a Ledger Currency column. The currency code column enables the display of an appropriate currency symbol for the measure column, for example, a Profit column.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the Properties panel for a selected measure, click the **Values** tab, click **Number Format**, and select **Currency**.
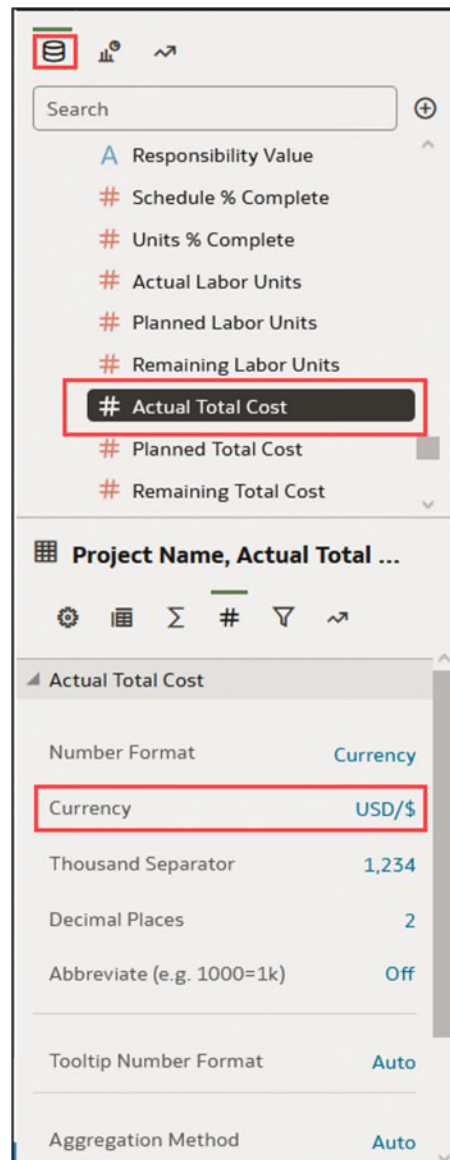
3) In the **Currency** field, click the currently displayed value and select **Custom**.
4) In the **Custom** field, add the column that determines the currency code.
5) Click **Save**.

Adding Notes to Visualizations

Annotate your visualizations with notes to call out areas of interest or emphasize specific data points.

Adding Notes to a Visualization

You can add notes to call out important information in a workbook's visualizations. You can use notes to annotate one or all of the visualizations in a canvas, or to emphasize specific data points in a visualization, such as columns in a table or clusters in a scatter plot.

There are many formatting options that you can use to customize a note's content. For example, you can choose font type, size, and color; add a bulleted or numbered list; and add URL links.

When you add a note, you can add data connectors to call out specific points in the visualization, or you can create the note and add or adjust the data point connectors later. See Connect a Note to Data Points in a Visualization.

By default, the notes that you add are displayed, but you can hide a visualization's notes. See Show or Hide a Visualization's Notes.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the workbook, click **Visualize**.

   ▸ To add a note without data point connectors, click the **Notes** 🗨 icon and select **Add Note**.

   ▸ To add a note with data point connectors, go to the visualization where you want to add the note and hold down the Ctrl key and click up to ten data points that you want the note to connect to. Then click the **Notes** 🗨 icon and select **Add Note**.
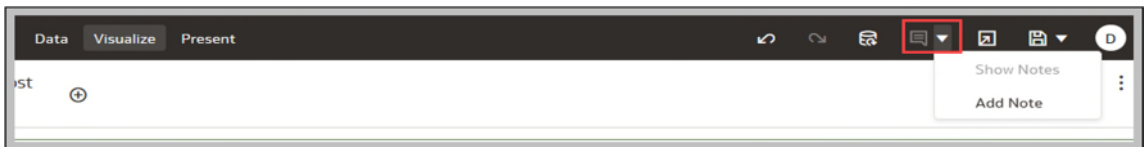
3) In the note box, enter the note text and use the formatting options to specify the note's font style, color, size, and so on.
4) Optional: To add a link to the note, highlight the note text that you want to make into a link. Click **Link** and in the Hyperlink dialog, enter a URL. Click **OK**.
5) Click **Save**.

Connecting a Note to Data Points in a Visualization

Add connectors to a note to identify specific data points in a visualization.

You can connect a note to up to ten data points on a visualization or canvas. You can't connect a note to a data point on these visualization types:

▸ Chord Diagram
▸ Correlation Matrix
▸ List
▸ Map

- ▶ Parallel Coordinates
- ▶ Tile

By default, a note's data point connectors are displayed, but you can hide them. See **Showing or Hiding a Note's Data Point Connectors** (on page 89).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Locate and hover over the note that you want to attach to data points. Click and hold a circle and drag the line to the data point that you want to connect the note to. You can connect a circle to multiple data points.
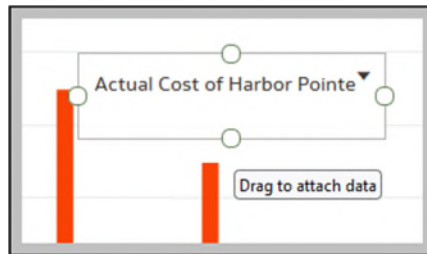
3) Click **Save**.

Showing or Hiding a Note's Data Point Connectors

By default a note's data point connectors are displayed, but you can hide or show them as needed.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Locate and hover over the note with the connectors to hide or show. Click **Click to edit** and then click **Show Connector**.

3) Click **Save**.
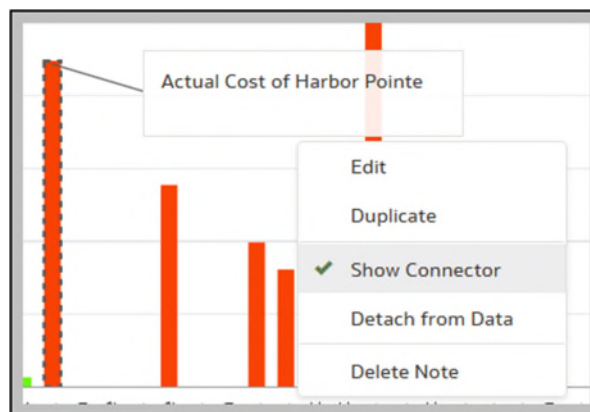
Deleting a Note's Data Connectors

You can delete one or more of a note's data connectors.

Instead of deleting a note's data connectors, you can hide them. See Show or Hide a Note's Data Point Connectors.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Optional: To delete all connectors, locate and hover over a note with connectors. Click **Click to edit** and then click **Detach from Data**.
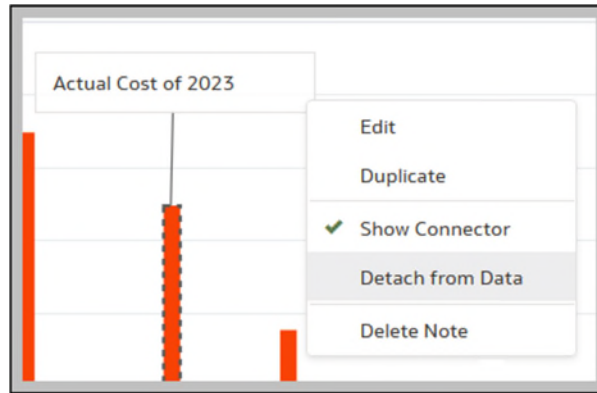
3) Optional: To delete an individual connector, hover over and right-click a connector, and then click **Detach from Data**.
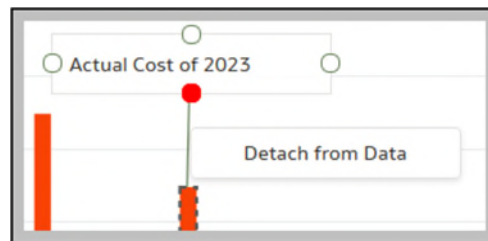
4) Click **Save**.

Showing or Hiding a Visualization's Notes

By default a workbook's visualization notes are displayed, but you can hide or show all notes.

If you create a story from a workbook, then all of the included canvases' notes are displayed in the story even if you hide all notes in Visualize. In Present where you add canvases to create the story, you can use a canvas' Notes properties to show and hide individual notes.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Optional: If the workbook's notes are displayed, then click **Hide Notes**.
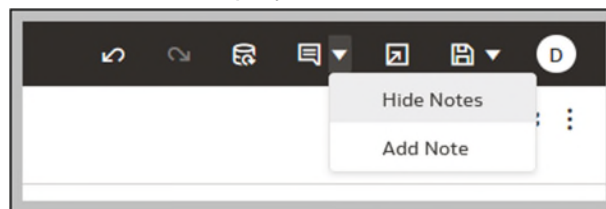
3) Optional: If the workbook's notes aren't displayed, then click **Show Notes**.
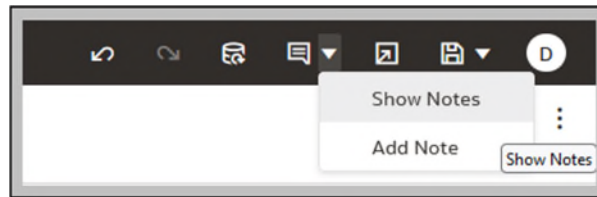
4) Click **Save**.

Analyzing Data with Explain

Explain uses machine learning to find useful insights about your data.

What is Explain?

Explain analyzes the selected column within the context of its dataset and generates text descriptions about the insights it finds. For example, for any column you'll find out basic facts, key drivers, segments that explain the column, and anomalies.

Explain uses Oracle's machine learning to generate accurate, fast, and powerful information about your data, and creates corresponding visualizations that you can add to your workbook's canvas.

Explain is for data analysts who might not know what data trends they're looking for, and don't want to spend time experimenting by either dragging and dropping columns onto the canvas, or using data flows to train and apply predictive models.

Explain is also a useful starting point for data analysts to confirm a trend that they're looking for in their data, and then use that information to create and tune predictive models to apply to other datasets.

What Are Insights?

Insights are categories that describe the selected column within the context of its dataset.

The insights that Explain delivers are based on the column type or aggregation that you chose and will vary according to the aggregation rule set for the chosen metric. Explain generates only the insights that makes sense for the column type that you chose.

Insight Type	Description
Basic Facts	Displays the basic distribution of the column's values. Column data is broken down against each of the dataset's measures. This insight is available for all column types. ▸ For a selected metric, this insight shows the distribution of the aggregated metric value for each member of each attribute column. ▸ For a selected attribute, this insight shows the value of each metric in the dataset across the member values of the attribute.
Key Drivers	Shows the columns in the dataset that have the highest degree of correlation with the selected column outcome. Charts display the distribution of the selected value across each correlated attributes value. This tab displays only when explaining attribute columns, or when explaining a metric column that has an average aggregation rule.
Segments	Displays the key segments (or groups) from the column values. Explain runs a classification algorithm on the data to determine data value intersections and identifies ranges of values across all dimensions that generate the highest probability for a given outcome of the attribute. For example, a group of individuals of a certain age range, from a certain set of locations, with a certain range of years of education form a segment that has a very high probability of purchasing a given product. This tab displays only when explaining attribute columns.
Anomalies	Identifies a series of values where one of the (aggregated) values deviates substantially from what the regression algorithms expect.

Using Explain to Discover Data Insights

When you select a column and choose the Explain feature, CIC Analytics uses machine learning to analyze the column in the context of the data set. For example, Explain searches the selected data for key drivers and anomalies.

> **Note**: The Explain feature only works when you use a dataset or create

a dataset from a local subject area.

Explain displays its findings to you as text descriptions and visualizations. You can select key visualizations and add them to your workbook's canvas.

If you perform explain on a column and the results contain too many correlated and highly ranked columns (for example, ZIP code with city and state), then excluding some columns from the dataset so that Explain can identify more meaningful drivers. See **Hiding or Deleting a Column** (on page 32).

1) In the **Home** page, click **Create** and then **Workbook** to create a new workbook.
2) Click **Visualize**.
3) In the Data Panel, right-click a column and select **Explain <Data Element>**.
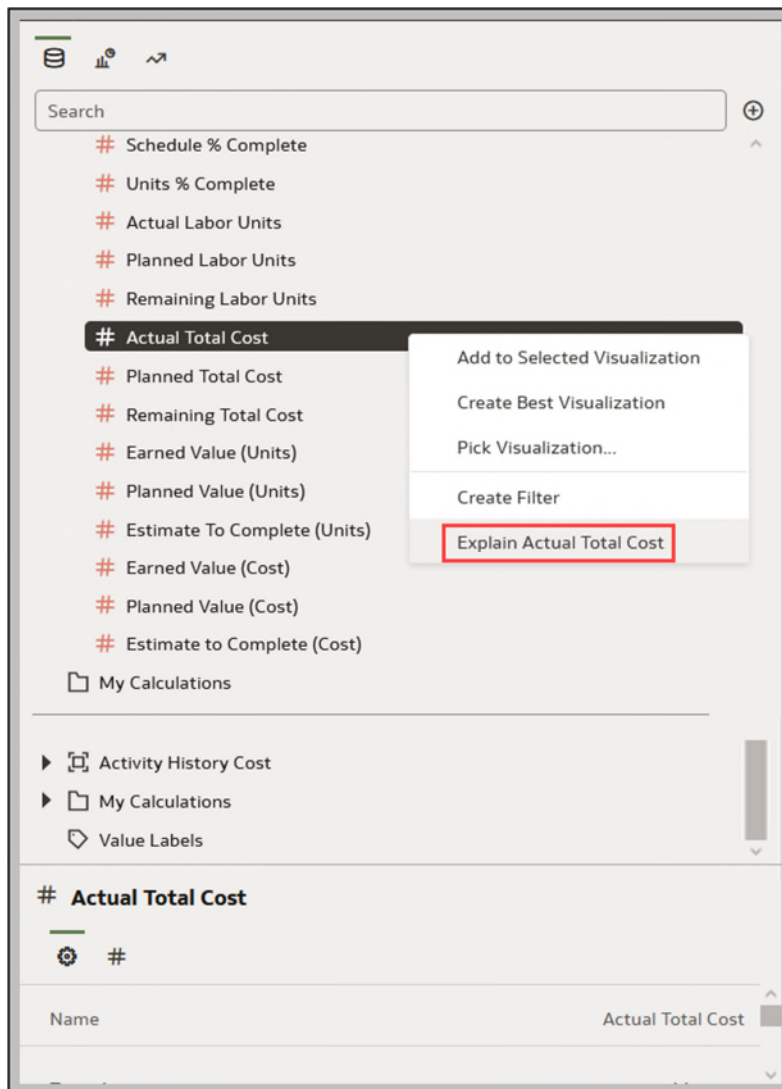
You must have write access to the dataset for the **Explain <Data Element>** option to display.

For Explain to successfully analyze an attribute, the attribute must have three to 99 distinct values.

The **Explain** dialog displays basic facts, anomalies, and other information about the selected column.

4) Optional: In the **Segments** view, select the segments (or groups) that predict outcomes for the column you selected.

   ▸ Click one or more columns to see how they impacts the column's outcome.

   ▸ Sort how the information is displayed in the Segments. For example, confidence high to low or low to high.

5) For each visualization that you want to include in your workbook's canvas, hover over it, and click **Select for Canvas**.

   You'll see a green tick next to selected items.

6) Click **Add Selected**.

   You can manage the Explain (data insight) visualizations like any other visualizations you've manually created on the canvas.

Creating a Data Set From a Subject Area to Use with Explain

Explain isn't available for subject areas. However, you can create a dataset from a local subject and then use Explain to analyze the columns in the dataset.

1) On the **Home** page, click **Create**, and then click **Dataset**.

2) In the Create Dataset dialog, select **Local Subject Area**.

3) Optional: Choose **Select Columns** to view, browse, and search the available subject areas and columns. Select a column and click **Add Selected** to add it to the dataset.

4) Optional: Alternatively, choose **Enter Logical SQL** to write a query or to modify the query for the columns you selected in the **Select Columns** area.

5) Optional: Select **Click here to add a filter** and specify column filter criteria.

6) Click **Add** to save the dataset and go to the Transform editor to transform and enrich the dataset's data.

7) Optional: Click **Create Workbook** to create a workbook with the dataset, and then use Explain.

Assigning Shared Folder and Workbook Permissions

You can view, modify, and add access permissions for folders and workbooks, and share permissions for workbooks. Permissions determine the actions a user can perform when working with folders and workbooks.

Adding or Updating Workbook Permissions

You can assign users and roles, access permissions (Read-Write and Read-Only), and share permissions (View and Edit) to a workbook that you create or administer.

The shared folder's permissions default into the workbook's Access and Share tabs. You can set permissions on the workbook to fine-tune the default permissions.

A workbook's default permissions are based on roles. Roles and the permissions you assign in the **Access** tab determine who can access the workbook and what they can do with it. For example, open, open in a new tab, inspect, favorite, rename, export, move to, duplicate, and delete.

The permissions you assign in the **Share** tab determines which actions users can perform on the workbook, such as rename, move to, save and save as.

Oracle recommends that you use the CIC Analytics Home Page and not the Classic Home Page to update workbook permissions.

1) In the **Home** Page, click **Navigator**, and then click **Catalog**.
2) Click **Shared Folders**, and then navigate to the workbook.
3) Hover over the workbook, click **Actions menu**, and then click **Inspect**.
4) Click the **Share** tab, and select the **All** tab.
5) In the Search bar, enter the name of the custom role created for CIC Analytics or enter multiple user names, and then select **Edit**.

   The permissions that default into this tab are the same permissions that default into the **Access** tab.

   a. Remove **BI Consumer** and **DV Content Author** roles.

   b. Click **Save**.

   For more details, see *How To Secure and Share Data Visualization Projects in Oracle Analytics* (Doc ID 2642690.1).
6) Click the **Access** tab to add or update users and roles and permissions of a custom role as follows:

The permissions in this tab default from the access permissions set on the folder.

	Read-Only	Read-Write
View	Able to see a workbook Unable to change a workbook Unable to Save or Save As content Unable to move content in or out of a workbook	Able to see a workbook Unable to change a workbook Unable to Save or Save As content Unable to move content in or out of a workbook
Edit	Able to see and change content in a workbook Able to save a workbook with a new name Unable to save over existing content Unable to move content into the shared workbook	Able to see and change a workbook Able to save with a new name Able to save over existing content Able to move content into a shared workbook

7) Click **Save**.

Add or Update Shared Folder Permissions

You can assign users and roles and access permissions (Read-Write or Read-Only) to the shared folders you create or administer.

A subfolder's default permissions are based on roles. Roles and the permissions you assign in the **Access** tab determine who can access the subfolder and what then can do with it. For example, open, inspect, rename, move to, duplicate, or delete.

> **Note**: When you move a data visualization to another folder, user roles that have been granted permissions prior to the move will be able to access the data visualization in th new location although their role may not be displayed in the **Permissions** tab.

The users and roles and permissions you specify are applied to any subfolders that you create and the workbooks that you save to the subfolder. You can fine tune permissions on subfolders and workbooks.

1) In the Home Page, click **Navigator**, and then click **Catalog**.
2) Click **Shared Folders**, and then navigate to the folder that you want to update permissions for.
3) Hover over the folder, click **Actions menu**, and then click **Inspect**.
4) Click the **Access** tab to add users and roles and permissions, or update permissions for the existing users and roles.

For more details, see *How To Secure and Share Data Visualization Projects in Oracle Analytics* (Doc ID 2642690.1).

	Read-Only	**Read-Write**
View	Able to see the shared folder Unable to change the folder Unable to Save or Save As content Unable to move content in or out of folder	Able to see a folder Unable to change a folder Unable to Save or Save As content Unable to move content in or out of a folder
Edit	Able to see and change content in a folder Able to save a workbook with a new name Unable to save over existing content Unable to move content into the shared folder	Able to see and change a folder Able to save with a new name Able to save over existing content Able to move content into a shared folder

5) Click **Save**.

Grant Permissions to Access Folders for Users with Specific Roles

To ensure users with a specific role have access to folder's contents, contact an administrator to add permissions for that role at the folder level in BI classic view.

To enable users with a specific role have permissions to access the contents of a folder:

1) Sign in to Oracle Analytics as an administrator.
2) In BI Classic view, select the **Catalog** menu.
3) In the **Folders** pane, select **Shared Folders** and navigate to the parent folder containing the data visualization you want to share.

   For example, select the **Production** folder if the data visualization is located within a sub-folder.
4) In the **Tasks** pane, click **Permissions**.
5) In the **Permissions** dialog box, select the following options:
   ‣ **Apply Permissions to sub-folder**
   ‣ **Apply Permissions to Items within folder**
6) Click **OK**.

Creating and Applying Filters

This section describes how you can use filters to find and focus on the data you want to explore.

About Filters and Filter Types

Filters reduce the amount of data shown in visualizations, canvases, and workbooks.

The Range, List, Date, and Expression filter types are specific to either a visualization, canvas, or workbook. Filter types are automatically determined based on the data elements you choose as filters, but you can also switch to select another compatible filter type.

▶ **Date filters** - Use calendar controls to adjust time or date selections. You can either select a single contiguous range of dates, or you can use a date range filter to exclude dates within the specified range. See *Applying Date Range Filters* (on page 112).

▶ **List filters** - Applied to data elements that are text data types, number data types that aren't aggregatable, and date data types. List filters are applied to the whole canvas or to a specific visualization on the canvas. See *Applying List Filters* (on page 111).

▶ **On-canvas filters** - Applied to attribute data elements. This filter type is added to and displays on the canvas and allows users to choose how to filter visualizations on the canvas. See *Creating On-Canvas Filters* (on page 107).

▶ **Range filters** - Generated for data elements that are number data types and that have an aggregation rule set to something other than none. Range filters are applied to data elements that are measures, and that limit data to a range of contiguous values, such as revenue of $100,000 to $500,000. Or you can create a range filter that excludes (as opposed to includes) a contiguous range of values. Such exclusive filters limit data to noncontiguous ranges (for example, revenue less than $100,000 or greater than $500,000). See *Applying Range Filters* (on page 110).

▶ **Top and bottom filters** - Applied to measure and attribute data elements. You can specify whether to filter by top or bottom, specify the number of items to display, and which measure or attribute to limit by. See *Applying Top Bottom N Filters* (on page 111).

How Datasets Interact with Filters

There are several ways that data sets can interact with filters in a workbook.

Various factors affect the interaction of data sets and filters in workbooks:

▶ The number of datasets within a workbook.
▶ The datasets that are blended or not blended (for a workbook with multiple datasets).
▶ The data elements (columns) that are matched between blended data sets.

You can use the Data Diagram in the Data page of a workbook to:

▶ See blended and not-blended datasets.
▶ Blend and connect multiple datasets by matching the data elements in the datasets.
▶ Disconnect the datasets by removing matched data elements.

How the Number of Datasets Affects Filters

Filters can interact differently with visualizations depending on the number of datasets, whether the datasets are joined, and what the filters are applied to.

You can add filters to the filter bar or to individual visualizations in a workbook.

Single Dataset	Filter Interaction
Add a filter to the filter bar	It applies to all visualizations in the workbook.
Add a filter to a visualization	It is applied after filters on the filter bar are applied.
Add multiple filters	By default filters restrict each other based on the values that you select.

Multiple Datasets	Filter Interaction
If you add filters to the filter bar.	▸ The filters apply to all the visualizations using the joined datasets. For visualizations using the not-joined datasets, you must add a separate filter to each dataset. ▸ You can't specify data elements of a dataset as a filter of other datasets, if the two datasets aren't joined. ▸ If a data element of a dataset is specified as a filter, but doesn't match the joined datasets, then the filter applies only to the visualization of that particular dataset, and does not apply to other visualizations of joined or not-joined datasets. ▸ You can select Pin to All Canvases of a filter, to apply a filter to all canvases in the workbook.
If you hover over a filter name to see the visualization to which the filter is applied.	Any visualizations that don't use the data element of the filter are grayed out.

Single Dataset	Filter Interaction
If you add filters to visualizations	▶ If you specify a filter on an individual visualization, that filter applies to that visualization after the filters on the filter bar are applied. ▶ If you select the Use as Filter option and select the data points that are used as a filter in the visualization, then filters are generated in the other visualizations of joined datasets and matched data elements.

You can use the **Limit Values By** options to remove or limit how the filters in the filter bar restrict each other.

About Synchronizing Visualizations in a Canvas

You can specify whether to synchronize Visualizations in a canvas.

You use the **Synchronize Visualizations** setting to specify how the visualizations on your canvas interact. By default, visualizations are linked for automatic synchronization.

When **Synchronize Visualizations** is set to **On**,and you add or remove data values from a visualization, this automatically adds or removes the values in corresponding visualizations. When **Synchronize Visualizations** is set to **Off**, this unlinks your visualizations and turns off automatic synchronization.

When **Synchronize Visualizations** is **On**, then all filters on the filter bar and actions that create filters (such as Drill) apply to:

▶ All the visualizations in a project with a single data set.

▶ All the visualizations of joined data sets with multiple data sets.

   If a data element from a data set is specified as a filter but isn't matched with the joined data sets, then the filter only applies to the visualization of the data set that it was specified for.

When you hover the mouse pointer over a visualization to see the filters applied to the visualization, any filter that isn't applied to the visualization is grayed out.

Any visualization-level filters are applied only to the visualization.

When **Synchronize Visualizations** is set to   **Off**, then analytic actions such as **Drill** affect the visualization to which you applied the action.

About Automatically Applied Filters

By default, the filters in the filter bar and filter drop target are automatically applied. However, you can turn this behavior off if you want to manually apply the filters.

When the **Auto-Apply Filters** is selected in the filter bar menu, the selections you make in the filter bar or filter drop target are immediately applied to the visualizations. When **Auto-Apply Filters** is off or deselected, the selections you make in the filter bar or filter drop target aren't applied to the canvas until you click the **Apply** button in the list filter panel.

Filtering Data in a Workbook

Use filters in a workbook to limit the data that you visualize. For example, you might filter by Month and visualize data only for January, February, and March.

You can apply filters to one visualization, all visualizations in a canvas, or all canvases in a workbook.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Navigate to a canvas, and select the Visualize pane.
3) Use the filter bar to update existing filters.
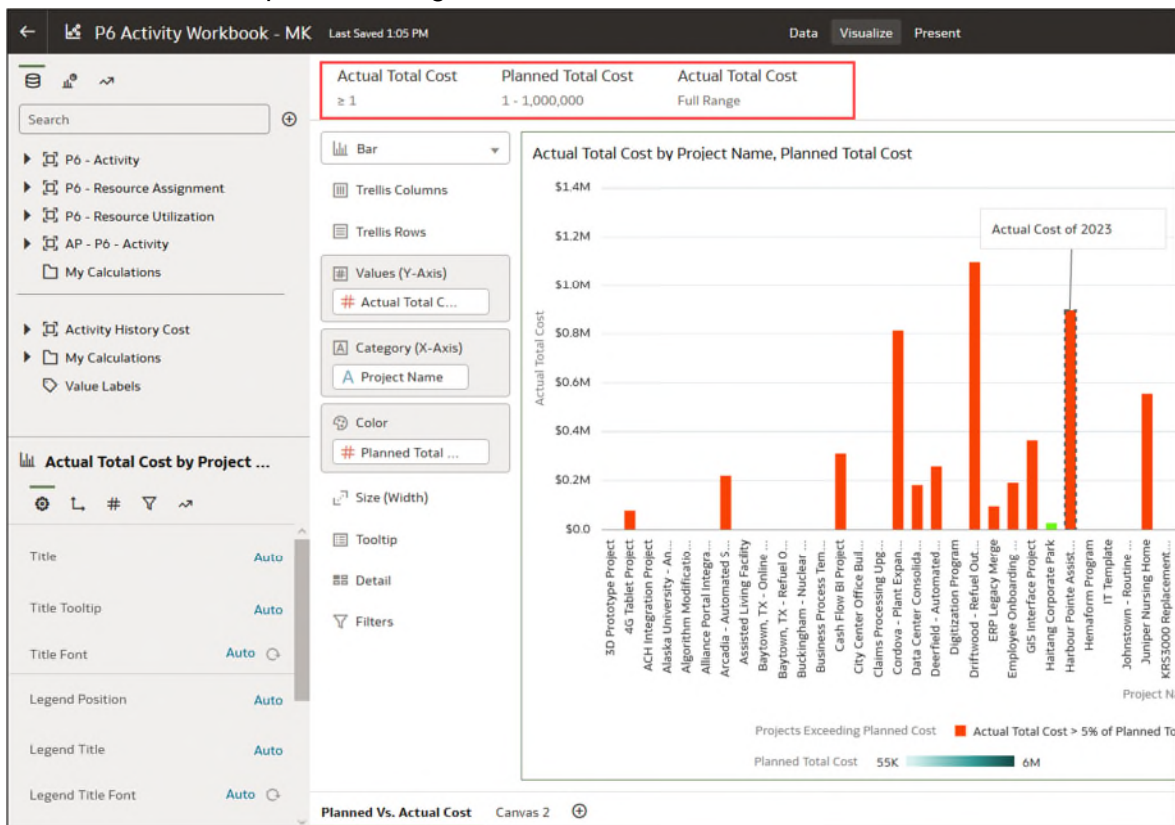
4) To change an existing filter, hover over the filter, then click **Menu**.
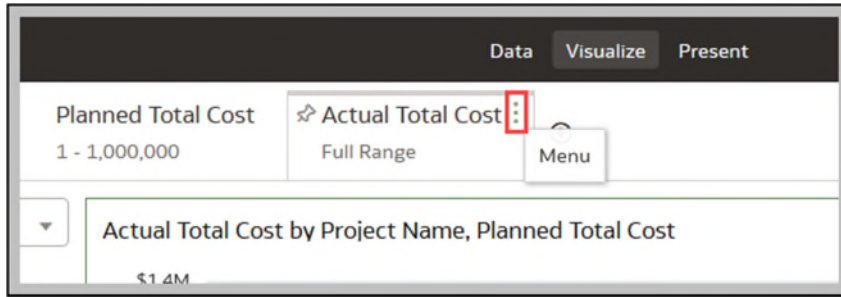
Use the options to configure that filter (for example, you might clear filter selections, pin it to all canvases in the workbook, disable it, or change the filter type).
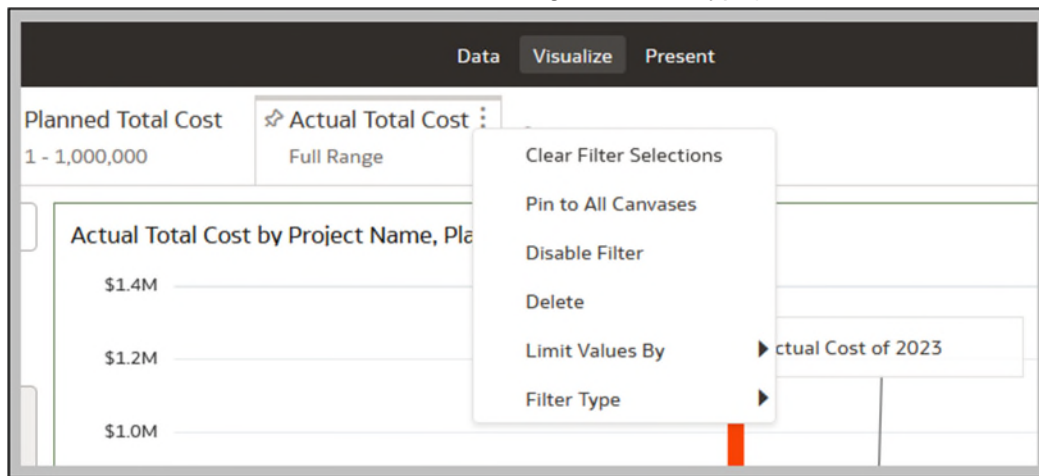
5) To add a filter, hover over the filter bar, click **Add Filter (+)**, and select a data element.
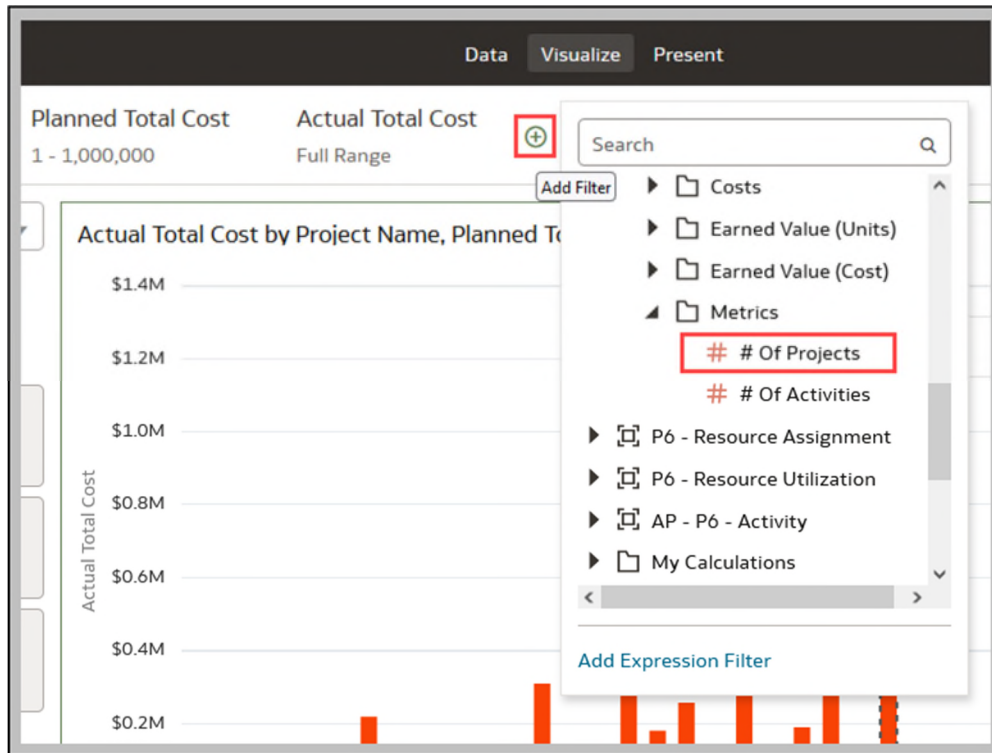
6) To add a complex filter using an expression (for example, field1 + field 2 > 100), click **Add Filter (+)**, then click **Add Expression Filter**.
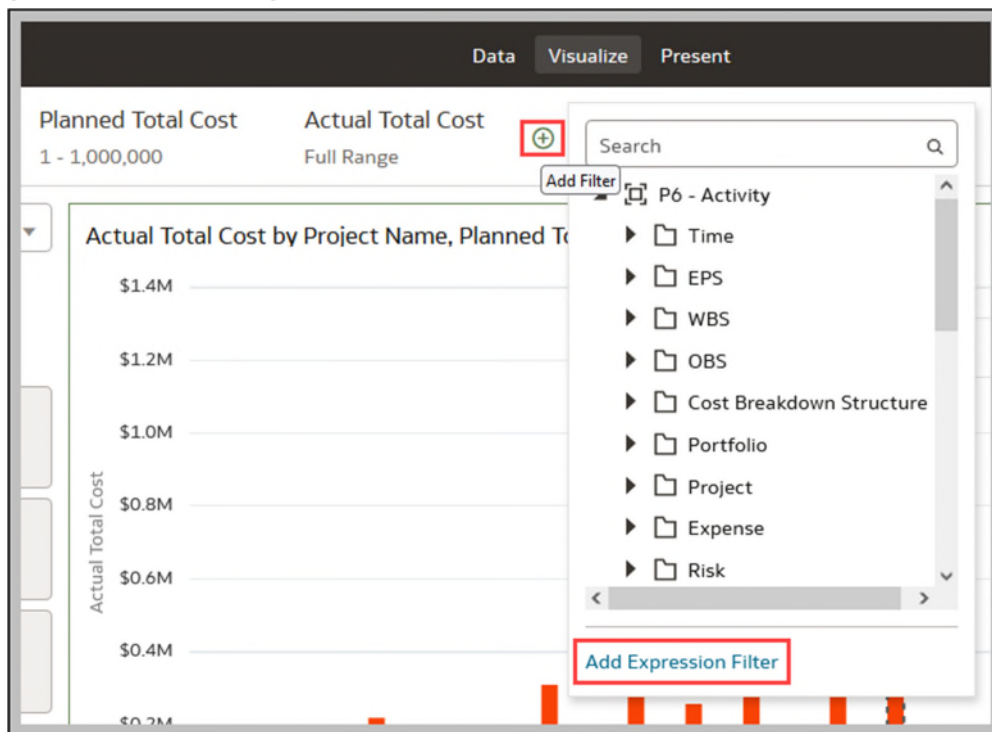
7) To apply a filter to all canvases in a workbook, hover over the filter, click **Menu**, then select **Pin to All Canvases**.

8) To filter on a visualization element, right-click the element and select **Use as Filter**.
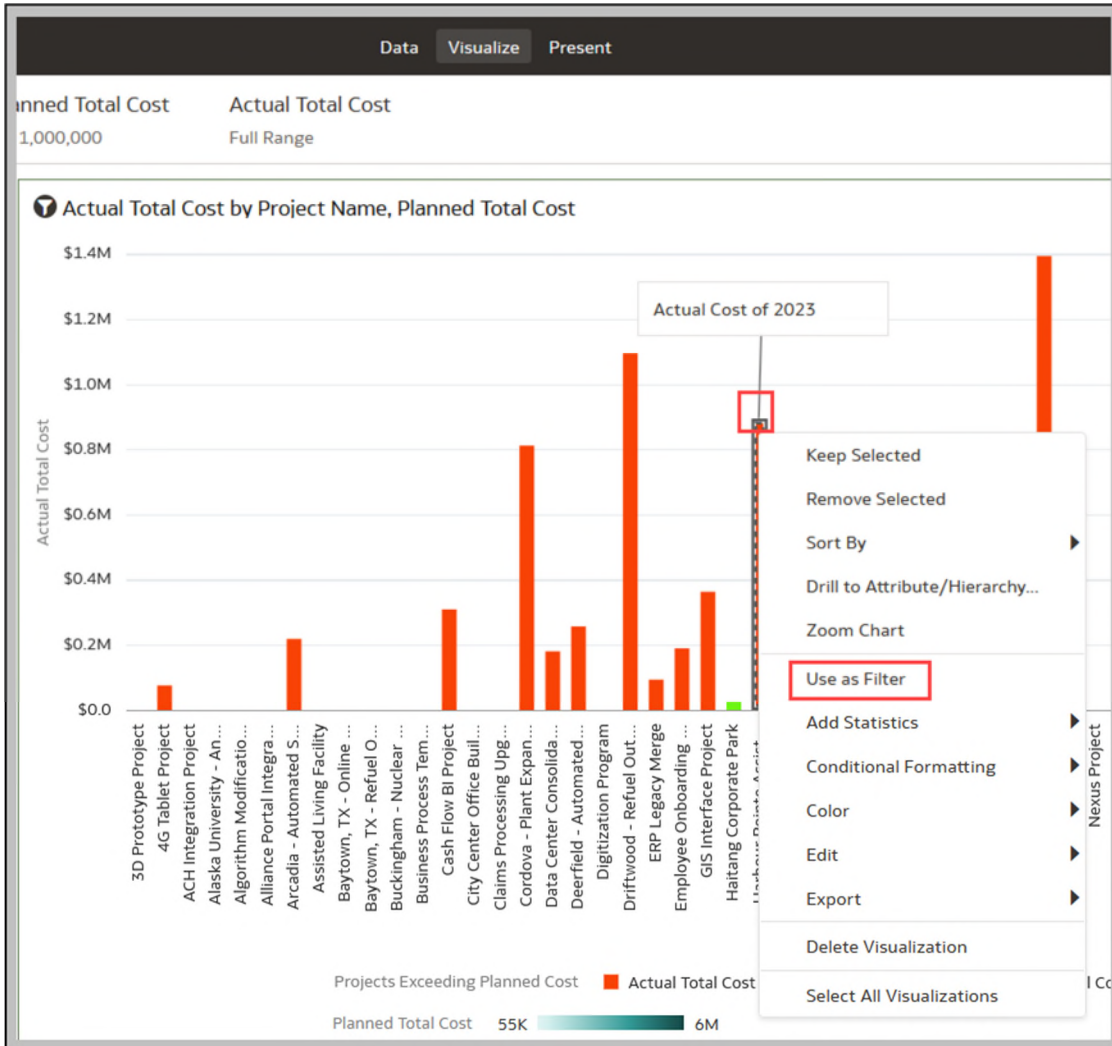
Notes:

- Filters are applied automatically unless you turn this option off the **Auto-Apply Filters** option (click the filter bar menu or right-click and select **Auto-Apply Filters**). When turned off, click **Apply** on individual filters apply them.

- If your workbook contains multiple datasets and some aren't joined, then there are restrictions for how you can use filters. Any visualization that doesn't use the data element of the filter is grayed

out.
- You can add filters to an individual visualization.
- You can't specify data elements of a dataset as a filter of other datasets, if the two datasets aren't joined.
- To select an alternative compatible filter type, click the filter Menu and hover the mouse pointer over the **Filter Type** option.
- Click the filter **Menu** and hover the mouse pointer over the Limit Values By option to specify how the filter interacts with the other filters in the filter bar. Note the following:
- By default, the **Auto** option causes the filter to limit other related filters in the filter bar.
  For example, if you've filters for Product Category and Product Name, and if you set the Product Category filter to Furniture and Office Supplies, then the options in the Product Name filter value pick list is limited to the product names of furniture and office supplies. You can select **None** to turn this limit functionality off.
- You can specify any individual filter in the filter bar that you don't want to limit.
  For example, if you have filters for Product Category, Product Sub Category, and Product Name, and in the **Limit Value By** option for the Product Category filter you click Product Sub Category, then the product subcategory filter shows all values and not a list of values limited by what you select for Product Category. However, the values shown for Product Name is limited to what you select for Product Category.

Creating Filters on a Visualization

You can add filters to limit the data that's displayed in a specific visualization on the canvas.

If a workbook contains multiple datasets and some aren't joined, then there are restrictions for how you can use filters. Any visualization that doesn't use the data element of the filter is grayed out.

Visualization filters can be automatically created by selecting **Drill** on the visualization's **Menu** when the **Synchronize Visualizations** option is turned off in the **Canvas Properties** dialog.

Instead of or in addition to adding filters to an individual visualization, you can add filters to the workbook or to an individual canvas. Any filters included on the canvas are applied before the filters that you add to an individual visualization.

1) On the **Home** page, select a workbook, click the **Actions Menu**, and then select **Open**.
2) Click the **Visualize** tab.
3) Select the visualization that you want to add a filter to.

4) Drag and drop one or more data element from the Data Panel to the Filter drop target in the Grammar Panel.
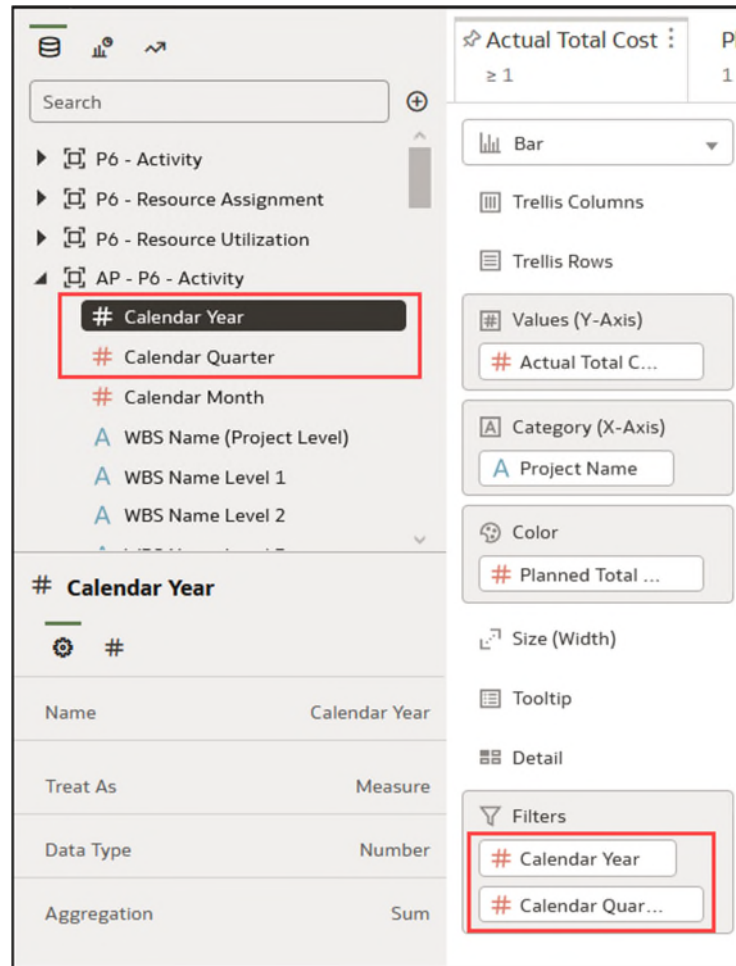
To use data elements of a data set as a filter in the visualization of another data set, you have to join both the data set, before using the data elements as filters.

5) Set the filter values. How you set the values depends upon the data type that you're filtering.

▸ To set filters on columns such as Cost or Quantity Ordered, see **Applying Range Filters** (on page 110).

▸ To set filters on columns such as Product Category or Product Name, see **Applying List Filters** (on page 111).

▸ To set filters on columns such as Ship Date or Order Date, see **Applying Date Range Filters** (on page 112).

6) Optional: Click the filter bar menu or right-click and click **Auto-Apply Filters**, then select **Off** to turn off automatic apply for all filters on the canvas and within the visualization. When you turn off automatic apply, then each filter's selection displays an **Apply** button that you must click to apply the filter to the visualization.

7) Optional: Click **Visualization Filter Bar** in the **Filter** tab of the **Grammar Panel** to show or hide the visualization filter.

Creating On-Canvas Filters

You can add a filter directly to the canvas so that users can filter the data for some or all of the visualizations on the canvas. On-canvas filters are displayed in the Visualize canvas, Present canvas, and in presentation mode, and are available for date, measure, and attribute columns.

By default the on-canvas filter's values are limited by other filters (report, canvas, on-canvas, and visualization filters). You can use the Properties pane to modify how the filters interact.

1) On the **Home** page, select a workbook, click the **Actions Menu**, and then select **Open**.
2) Click the **Visualize** tab.
3) In the Data Elements panel, select a date, attribute, or measure to use as a filter on the canvas, and then drag it to the canvas to create a new visualization.
4) On the visualization's toolbar, click **Change Visualization Type** and select **List Box**.
5) Optional: In the on-canvas filter's list box **Properties** pane, select the **General** tab and click **Type** to specify the on-canvas filter type for:
    ▸ **Dates** - List, Date Range (default), Relative Time

    When you select Date Range or Relative Time, then Multi Select and Default Value on-canvas filter properties aren't available.
    ▸ **Measures** - Measure Range (default), Top Bottom N

    When you select Measure Range or Top Bottom N, then Multi Select and Default Value on-canvas filter properties aren't available.
    ▸ **Attributes** - List (default), Top Bottom N

    When you select Top Bottom N, then Multi Select and Default Value on-canvas filter properties aren't available.
6) Optional: In the on-canvas filter list box **Properties** pane, click the **General** tab and adjust how you want the filter to display (for example, **Title**, **Label**, **Align**).
7) Select the on-canvas filter and set the filter values. See *Applying Different Filter Types* (on page 110).
8) Optional: In the on-canvas filter's list box Properties pane, click the **Filters** tab, and specify how you want the on-canvas filter to interact with the canvas and visualization filters and which items on the canvas to apply the filter to.

Changing the Scope of Filters Between the Main Filter Bar and Visualizations

You can change the scope of a filter by moving or copying it between the main filter bar and visualizations.

1) On the **Home** page, select a workbook, click the **Action Menu**, and then select **Open**.
2) Click the **Visualize** tab.
3) Change the scope of a filter by moving or copying it between the main filter bar and visualizations.

- **Move a main filter to a visualization** - Drag and drop to move a filter from the main filter bar to the **Grammar Panel** or into the visualization.
    - When **Pin to all Canvasses** isn't selected, the filter applies to the visualization but also remains in the main filter bar because it still applies to other canvasses.
    - When **Pin to all Canvasses** is selected, the filter only applies to the visualization, and is removed from the main filter bar.
- **Copy a main filter to a visualization** - Hold down the **Shift** key and drag and drop a filter from the main filter bar to the **Grammar Panel** or into the visualization.
- **Move a visualization filter to the main filter ba**r - Drag and drop a visualization filter from the **Grammar Panel** to the main filter bar.

    This moves the filter into the main filter bar and removes the filter from the visualization.
- **Copy a filter between visualizations** - Drag and drop a visualization filter from the **Grammar Panel** into another visualization.

    This copies the filter into the selected visualization.
- **Move a filter between visualizations** - Hold down the **Shift** key and drag and drop a visualization filter from the **Grammar Panel** into another visualization.

    This moves the filter into the selected visualization.

Using a Visualization as a Filter

You can configure a visualization to filter other visualizations on the canvas.

If a workbook contains multiple datasets and some aren't joined, then there are restrictions for how you can use filters. To use data elements of a dataset as a filter in the visualization of another dataset, you must join both the datasets, before using the data elements as filters. Any visualization that doesn't use the data element of the filter is dimmed.

1) On the **Home** page, select a workbook, click the **Actions Menu**, and then select **Open**.
2) Click the **Visualize** tab.

3) Select a visualization to use as a filter.
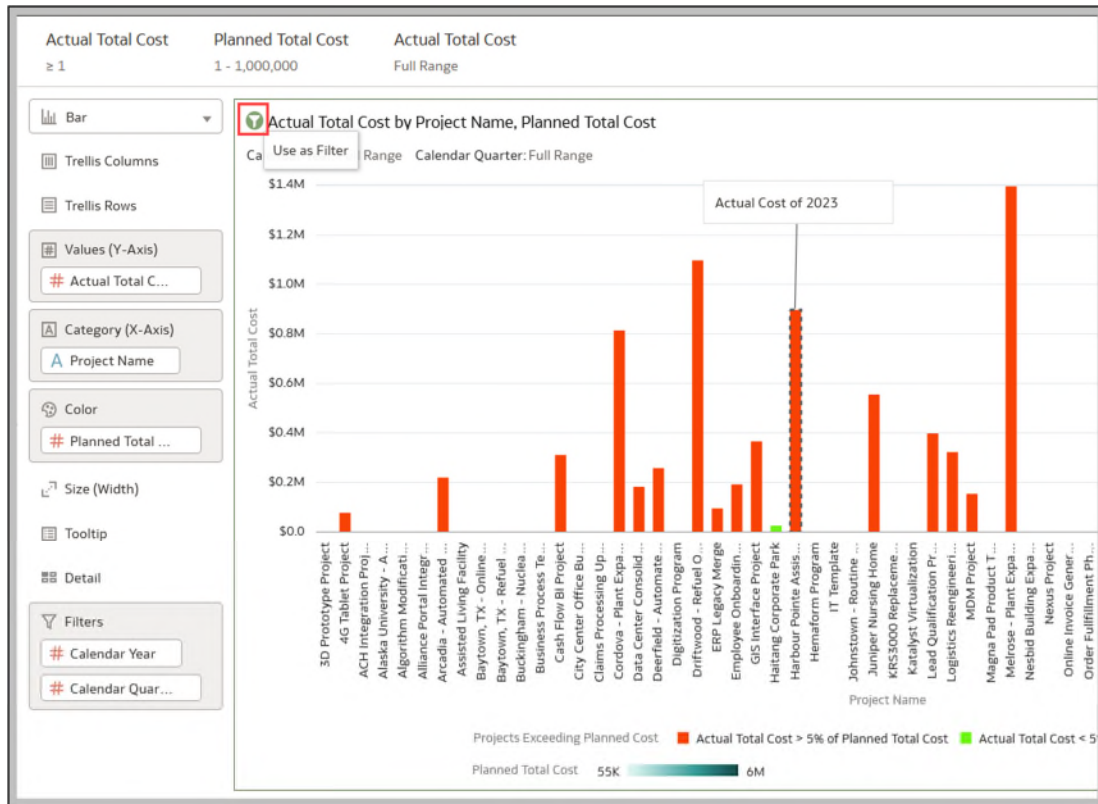
4) Click the **Use as Filter** icon to activate.

Moving Filter Panels

You can move filter panels from the filter bar to a different location on the canvas.

When you expand filters in the filter bar, it can block your view of the visualization that you're filtering. Moving the panels makes it easy to specify filter values without having to collapse and reopen the filter selector.

1) On the **Home** page, select a project, click the **Actions Menu**, and then select **Open**.

2) In the **Visualize** page, place the cursor at the top of the filter panel until it changes to a scissors icon, then click it to detach the panel and drag it to another location on the canvas.
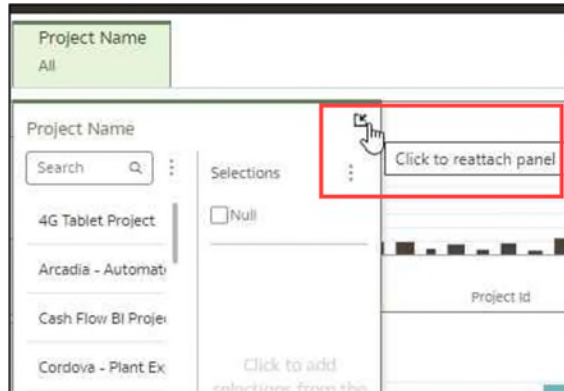
3) To reattach the panel to the filter bar, click the reattach panel icon.

Applying Different Filter Types

Different filter types enable you to focus in on the data that you're interested in.

Applying Range Filters

You use Range filters for data elements that are numeric data types and have an aggregation rule set to something other than none.

Range filters are applied only to measure columns and limits data to a range of contiguous values, such as revenue of $100,000 to $500,000. Alternatively, you can create a range filter that excludes (as opposed to includes) a contiguous range of values. Such exclusive filters limit data to two noncontiguous ranges (for example, revenue of less than $100,000 or greater than $500,000).

If your workbook doesn't have a visualization, create one. See *Begin to Build a Workbook and Create Visualizations* (on page 46).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Visualize canvas, click the filter, then click **Range**.
3) Click **By** to view the selected list of Attributes, then configure the filter:
   ‣ Click a member to remove or add it to the selected list.
   ‣ Click the **Plus (+)** icon to add a new member to the selected list.
   ‣ Set the range that you want to filter on by moving the **Min** and **Max** sliders in the histogram.
4) Click outside of the filter to close the filter panel.

Applying Top Bottom N Filters

Use the Top Bottom N filter to filter a measure or attribute and display its highest or lowest values.

1) To apply the Top Bottom N filter to the canvas and all visualizations in the workbook:
   a. On **the Home** page, select a workbook, click the Actions menu, and then select Open.
   b. In the Data panel of the visualization, select the attribut**e or measur**e that you wa**nt to filter** on and drag and drop it to the filter bar.
   c. In the filter bar, click the filter, then click Top Bottom N. You can only convert a range filter to Top Bottom N filter.
2) To apply the Top Bottom N filter to a specific visualization in the workbook:
   a. In the canvas, select the visualization that you want to filter.
   b. In the **Data Panel**, locate the attribute or measure that you want to filter on and drag and drop it to the Filter drop target in the Grammar Panel.
   c. In the filter bar, click the filter, then click **Top Bottom N**.
3) To apply the Top Bottom N filter to an on-canvas filter:
   a. With the canvas selected, go to the Data Panel and click **Visualizations**, then click the **List Box** filter.
   b. In the Data Panel, locate the attribute or measure that you want to filter on, and drag and drop it to the List Box visualization that you just created.
4) To configure a Top Bottom N filter, click the filter, then:
   a. To change between top to bottom, click **Method** value and click **Top** or **Bottom**.
   b. To specify the number of rows that are displayed, click the **Count** field and enter the number of rows.
   c. To change which attribute or measure column to limit by, click the **By** field and select an attribute or measure or custom calculation included on the canvas. Or click **Plus (+)** to locate and select the attribute or measure or metric that you want to limit by
5) Click outside of the filter to close the filter panel.

Applying List Filters

You apply list filters to text, non-aggregatable numbers, and dates, and you can choose which members to include or exclude from the filter.

If your workbook doesn't have a **visualiz**ation, create one. See ***Begin to Build a Workbook and Create Visualizations*** (on page 46).

1) On the Home page, select a workbook, click the Actions menu, and then select **Open**.
2) In the Visualize canvas, select a filter in the filter bar or select an on-canvas filter, then click **List**.
3) Locate the member you want to include and click it to add it to the **Selections** list. Alternatively, use the **Search** field and the **Search Options Menu** to find a member you want to add to the filter. Use the wildcards * and ? for searching.
4) Optional: Perform the following actions related to the Selections list:

- ▸ Click a member to remove it from the list.
- ▸ Click the eye icon next to a member to filter it out, but not remove it from the list.
- ▸ Click **Menu** at the top, and select **Exclude Selections** to exclude members from the list.
- ▸ Click **Null** to include members with null values in the list.
- ▸ Click **Add** to add all members to the list.
- ▸ Click **Clear** to remove all members from the list.

5) Click outside of the filter to close the filter panel.

Applying Date Range Filters

Date range filters use calendar controls to adjust time or date selections. You can select a single contiguous range of dates, or use a date range filter to exclude dates within the specified range.

If your workbook doesn't have a visualization, create one. See *Begin to Build a Workbook and Create Visualizations* (on page 46).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) In the Visualize canvas, select a filter in the filter bar or on-canvas filter, and click **Date Range**.
3) Click the drop-down list, and select the type of date range you want to apply (for example, Range, Start at, End at, Equal).
4) Use the date pickers to configure the range.
5) Click outside of the filter to close the filter panel.

Applying Relative Time Filters

Use the relative time filter on a Date or Date/Time column to display data for a specified time period based upon the current date and time.

You can specify a relative time period as either an explicit number of past or future time units (for example 2 years), or you can specify a previous period. For example, Year To Date which includes data from 1-January this year to the current date, and Month To Date which includes data from the beginning of the month to the current date.

You can apply a Relative Time filter only to date columns that already exist in the data source, and not to derived columns such as Year, or Quarter. The Relative Time filter type supports Date (with no time of day portion) and DateTime (that is, TIMESTAMP with both date and time of day) column types.

The current date and time used in queries is the CIC Analytics host's date and time in the server's timezone (not the browser host's time or timezone). The starting day of the week (Sunday versus Monday) is based on the locale of the CIC Analytics server which is set using the server configuration setting NLS_TERRITORY.

If your workbook doesn't have a visualization, create one. See *Begin to Build a Workbook and Create Visualizations* (on page 46).

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) In the Visualize canvas, click the filter in the filter bar or canvas, then click **Relative Time**.

3) Select a **Type** that defines the range that you want to filter.

   ▸ **Last** - You specify a **Period** to apply to the selected **Time Level** (Years, Quarters, Months, Weeks, Days, and includes Hours, Minutes, and Seconds if the column time is TIMESTAMP) relative to today's date, to display records for the date values for that period.

   Last filters that are based on a DateTime column and which have a grain of Day or longer (for example, Year, Quarter, Month, Week, Day), retrieve data from the same time of day on the starting day. For example, if the server date/time is currently Thursday 3:15pm , a Last 2 Days filter on a DateTime column retrieves data with timestamps between Tuesday 3:15pm and Thursday 3:15pm in the server's timezone. Filter queries that are based on a DATE column type (which by definition have no time of day associated) only depend on the server host's date, not the time of day.

   ▸ **Next** - You specify a future **Period** number to apply to the selected **Time Level** (Years, Quarters, Months, Weeks, Days, also Hours, Minutes, and Seconds if the column time is TIMESTAMP) relative to today's date, to display records for the date values for that period.

   ▸ **To Date** - You specify a past **Time Level** (Year, Quarter, Month, Week, Day, also includes Hour, and Minute if the column time is TIMESTAMP) relative to today's date, that you want to apply to the date values in the visualization.

   A **To Date** filter retrieves data from the beginning of the chosen period, for example, Month to Date retrieves data from midnight of the first day of this month up until the current date and time (that is, Today or Now).

4) Click outside of the filter to close the filter panel.

Building Narratives

This chapter outlines how to put together the insights you've discovered and the visualizations you've developed into a narrative.

In This Section

Using Data Actions

A **Data Action** link can pass context values as parameters to external URLs, filters to other workbooks or to visualizations embedded in external containers.

When a link navigates to a workbook, the data context is displayed in the form of canvas scope filters in the filter bar. The links data context may include attributes associated with the selections or cell from which the link was initiated.

You can

▸ ***Using Data Actions to Connect Visualization Canvases*** (on page 115)
▸ ***Invoking Data Actions From Visualization Canvases*** (on page 117)

Using Data Actions to Connect Visualization Canvases

You can create data actions to navigate to a canvas in the current workbook or to a canvas in another workbook.

You can also use data actions to transfer context-related information (for example, an order number) where the link displays details about an order number in another visualization or workbook.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click **Menu** on the workbook toolbar and click **Data Actions**.
3) Click **Add Action** and enter a name for the new navigation link.
   ▸ You can use only letters and numbers in the navigation link's name.
   ▸ You can add multiple navigation links.
4) Click the **Type** field and select **Analytics** Link.
5) Click the **Anchor To** field and select the columns from the current visualization to associate with this data action. Don't select measure columns or hidden columns. If you don't specify a value for the **Anchor To** field, then the data action applies to all data elements in the visualizations.

6) Click the **Workbook** field and select the workbook you want to use for the anchor:•

   ‣ **Use This Workbook** - Select if you want to link to a canvas in the active workbook. Columns that you select must be in the current visualization.

   ‣ **Select from Catalog** - Select to browse for and select the workbook that you want to use.

7) Click the **Canvas Link** field and select the canvas that you want to use.

8) Click the **Pass Values** field and select which values you want the data action to pass.

   For example, if in the **Anchor To** field, you specified order number column, then in the **Pass Values** field, select **Anchor Data** to pass the specified column values.

   ‣ **All** - Dynamically determines the intersection of the cell that you click and passes those values to the target.

   ‣ **Anchor Data** - Ensures that the data action is displayed at runtime, but only if the required columns specified in the **Anchor To** field are available in the view context.

   ‣ **None** - Opens the page (URL or canvas) but doesn't pass any data.

   ‣ **Custom** - Enables you to specify a custom set of columns to pass.

9) Click **Supports Multiple Selection** to set the value.

   ‣ **On** - The data action can be invoked when one or multiple data points are selected.

   ‣ **Off** - The data action can only be invoked when a single data point is selected.

   This setting is particularly useful when the selection of multiple data points might result in an error (for example, with some third-party REST APIs).

10) Click **OK** to save.

Using Data Actions with URL Navigation

You can use data actions to navigate to an URL from a canvas so that when you select a column such as the supplier ID, it displays the source of this information.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) Click **Visualize**.

3) Click **Menu** and select **Data Actions**.

4) Click **Add Action** and enter a name for the new navigation link. For example, *Link to Unifier workbooks*.

   ‣ You can use only letters and numbers in the navigation link's name.

   ‣ You can add multiple navigation links.

5) Click the **Type** field and select **URL Navigation**.

6) Click the **Anchor To** field and select the columns that you want the URL to apply to. If you don't specify a value for the **Anchor To** field, then the data action applies to all data elements in the visualizations.

7) Enter a URL address and optionally include notation and parameters.

   For example, you want to open a Unifier link to a project Id in P6 where the Unifier link is:
   `http://<host:port>/unifier/bookmark?p=3581&k=analyticsproject,`
   then use the following in the data action:

```
http://<host:port>/unifier/bookmark?p=${keyValuesForColumn:"Primaver
a - Activity"."General - (Project)"."Project Object
Id"}&k=analyticsproject
```

8) Click **Supports Multiple Selection** to set the value, and then click **OK**.

   ▸ **On** - The data action can be invoked when one or multiple data points are selected.

   ▸ **Off** - The data action can only be invoked when a single data point is selected.

Click **OK** to save.

In the Canvas, click a cell, or use Ctrl-click to select multiple cells.

Right-click and select from the menu the navigation name that you created earlier.

Selecting the cells determines the values to pass to the parameters (the URL tokens).

Invoking Data Actions From Visualization Canvases

You can invoke data actions from a canvas to other canvases and URLs.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.

2) On the canvas that contains a Data Action link leading to another canvas or URL, perform the following steps:

   a. Right-click a data element, or select multiple elements (using Ctrl-click).

   b. Select **Data Actions** from the context menu.

   c. Complete the Workbook Properties dialog.

The name of the data actions that apply in the current view context are displayed in the context menu.

All the values defined in the **Anchor To** field must be available in the view context in order for a data action to be displayed in the context menu.

The following rules apply to matching data elements passed as values with data elements on the target canvas:

   ▸ If the same data element is matched in the target workbook's canvas, and if the target canvas doesn't have an existing canvas filter for the data element, a new canvas filter is added. If there is an existing canvas filter, it's replaced by the value from the source workbook's canvas.

   ▸ If the expected data set is unavailable but a different data set is available, the match is made by using the column name and data type in the different data set, and the filter is added to that.•

   ▸ If there are multiple column matches by name and data type, then the filter is added to all those columns in the target workbook or canvas.

The data action navigates to the target cell or URL that is mapped and filters the data displayed based on the values specified in the **Data Actions** dialog.

The Pass Values context, set in the **Pass Values** field, consists of data elements used in the visualization from which the data action is invoked. The Pass Values context doesn't include data elements in the workbook, canvas, or visualization level filters.

Using Other Functions to Visualize Data

This section describes other functions that you can use to visualize your data.

Building Stories

This section covers how you capture insights and group them into stories.

Capturing Insights

As you explore data in visualizations, you can capture memorable information in one or more insights, which build your story. For example, you might notice before and after trends in your data that you'd like to add to a story to present to colleagues.

Using insights, you can take a snapshot of any information that you see in a visualization and keep track of any moments of sudden realization while you work with the data. You can share insights in the form of a story, but you don't have to. Your insights can remain a list of personal moments of realization that you can go back to, and perhaps explore more. You can combine multiple insights in a story. You can also link insights to visualizations using the Interaction property.

Insights don't take a snapshot of data. They take a snapshot of the workbook definition at a certain point in time. If someone else views the same insight, but that person has different permissions to the data, they might see different results than you do.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click **Present**, and use the story designer options to add your insights:

   ▸ To add a canvas to your story, in the Canvases panel, right click a canvas and select **Add To Story**.

   To locate other canvases in the workbook, use the Search option in the Canvases pane.

   ▸ Use the tabs on the Properties pane in the bottom left-hand corner to further refine your story. For example, click **Presentation** to change the presentation style to Bottom Tabs, Navigation Bar, Filmstrip, or None.

   ▸ To rename, duplicate, hide, or delete a page in your story, right click a canvas displayed in the canvas selector at the bottom of the design area, and select a canvas option.

   ▸ To synchronize your story canvases with your visualizations, display the Visualize pane and right-click the canvas tabs to select **Canvas Properties**, then set **Synchronize Visualizations** to **On**.
3) Continue adding insights to build a story about your data exploration.

   The story builds in the Present canvas. Each insight has a tab.

4) Click **Save** to save your story as part of your workbook.

A workbook can have one story that includes one or more pages. Each page contains a canvas. You can cultivate the look and feel of the story to meet your presentation needs. For example, you can rearrange pages, include another page, or hide a page's title.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click **Present**.
3) In the Present panel, drag and drop one or more canvases to the story.
4) Use the following options to build your story:

   ▸ Add one or more canvases to the story. After you add a canvas to the story, go to the bottom of the Present page, click the page, and use the Properties panel to specify how you want the page to display in the story.

   ▸ To include or exclude a canvas' notes, select the canvas and go to the canvas' Properties panel. Click **Notes** and specify which notes to display or hide. To add notes, go to the Visualize page and click **Add Note**.

   ▸ To delete a page from the story, right-click the page at the bottom of the Present page and click **Delete**.

   ▸ To show or hide a page's titles or descriptions, go to the Properties panel, click **General**, and use the **Hide Page**, **Page Title**, and **Description** options.

   ▸ To rearrange pages, drag and drop them in the pages area at the bottom of the Present page.

   ▸ To limit the data displayed in a page, go to the Properties panel and click **Filters**. If no filters are displayed, then go to the Visualize page and use the Filters bar to add filters.

   ▸ To include or exclude a canvas' filters, select a canvas and go to the canvas' Properties panel. Click **Filters**, and specify which filters to apply to the canvas.

   ▸ To rename a page, click the page's title and update it.

   ▸ To add the same page multiple times to a story, right-click the page at the bottom of the Present canvas and click **Duplicate**.

   ▸ To provide present mode functionality such as adding new filters or adjusting the existing filter values, or providing the context menu to export a visualization, sort a visualization, or drill within a visualization, go to the Properties panel, click the Presentation tab, and set the **Full Interactivity** field to **On**. The interactivity mode that you specify is applied to all pages in the story.

   ▸ To use the Narrate canvas bottom tabs in Present, go to the Properties panel, click the Presentation tab, and set the **Style** field to **Bottom Tabs**.

5) To display the story and check your work, click **Present**. Then click **Go back** to return to the Present panel.
6) Click **Save** to save the story as part of the workbook.

Viewing a Story in Present Mode

You can use present mode to view and interact with a story without the visual clutter of the Present canvas toolbar and authoring options.

If you share a workbook that contains a story with users who have read-only permissions, then those users access and interact with the workbook's story in present mode and not in the Visualize page. Go to the Present page and use the **Full Interactivity** field to show or hide present mode functionality otherwise available to users on the Visualize page.

If a workbook doesn't contain a story and the user has read-only permission, then the workbook's story is displayed in the Visualize page. The user can change filter values, add filters, and use the context menus to export, sort, and drill in the Visualize page.

If the story's **Full Interactivity** field is set to On, then while in present mode, you can access and use context menus to explore a visualization's data. For example, you can add new filters or adjust the existing filter values, export to common formats such as Powerpoint, PDF, PNG, or CSV, or use the right-click menu to sort a visualization or drill within a visualization. The type of visualization and its data determine the available context menu options.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Click **Present** and in the story, click the page that you want to view.
3) If the data is stale, click **Refresh Data**.
4) To print, email, or export the page, click **Export** and choose an export option.
5) To hide or show the page's notes, click **Hide Notes**.
6) To adjust the page's filter values, go to the filters bar and click the filter that you want to adjust the values for.
7) To add a filter to the page, go to the filter bar and click **Add Filter**, select the column that you want to filter, and specify the filter's values.
8) Right-click a visualization to perform visualization or data-specific tasks, such as apply a sort order, zoom in, or drill.
9) To return to the Present tab, go to the story's header and click **Go back**.

Identifying Content with Tooltips

Use tooltips to make your visualizations more interactive without cluttering them with too much information.

In the visualization designer page, use the Tooltip pane to display measures and labels when users click on a measure or hover over a visualization.
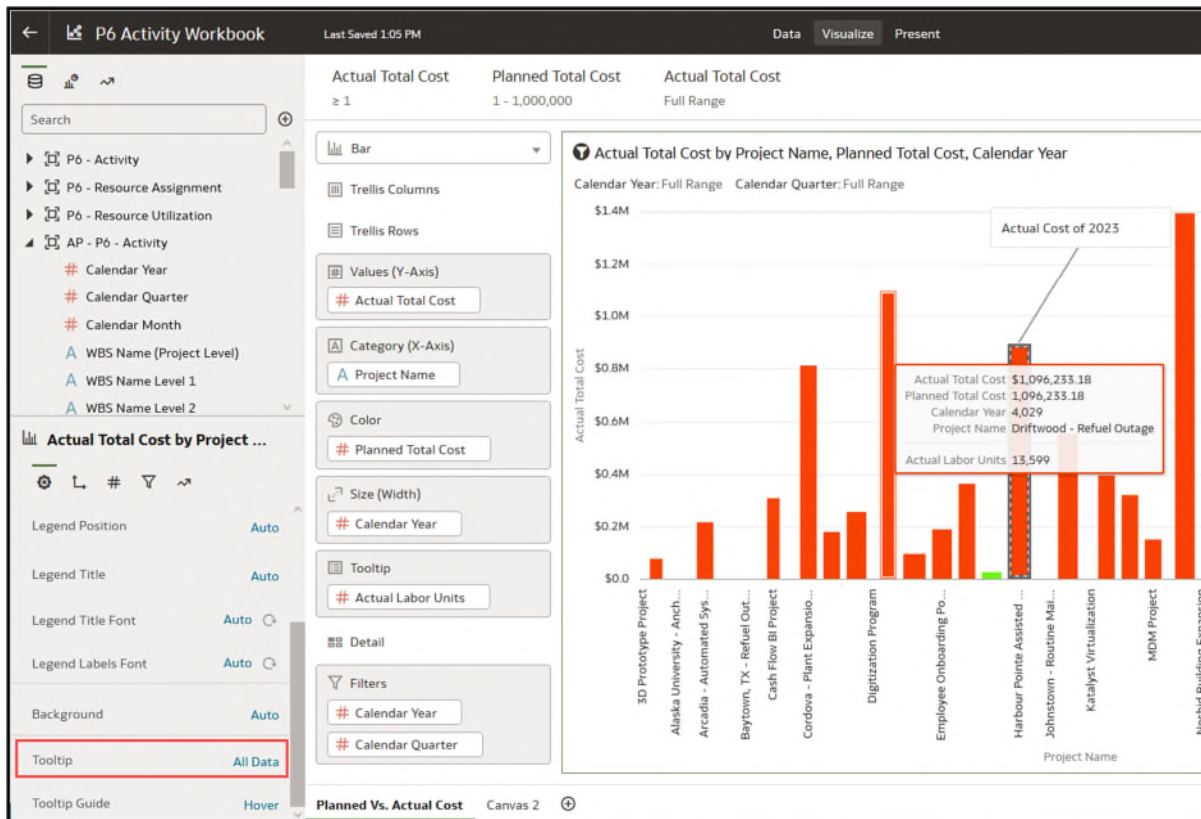
Managing Custom Plug-ins

Plug-ins are extensions to expand visualization options in the Data Visualization platform/application. These plug-ins or extensions can be imported to the application by your CIC Analytics administrator. Alternately, administrators can simply download custom-plug-ins from the ***Analytics Library Extensions for Data Visualizations https://www.oracle.com/ph/business-analytics/data-visualization/extensions/*** or click **Options** on a custom plug-in and select **Download**. Custom plug-ins, once downloaded by an administrator, are available to all users having Analytics Creator privileges to use in their visualization.

> **Note**: Contact your CIC Analytics administrator to manage custom plug-ins or extensions as outlined below.

Managing Custom Plug-ins

As an administrator or a user with administration privileges, you can upload, download, search, and delete custom plug-ins.

For example, you can upload a custom plug-in that provides a visualization type that you can use in workbooks.

To upload a custom plug-in that provides a visualization type which can be used in workbooks:

1) Sign in as a user with administration privileges.
2) On the **Home** page, click the **Navigator**, and then click **Console**.
3) Click **Extensions**.

    You use this page to upload, search for, delete, or download a custom plug-in.
4) To upload a custom plug-in, click **Extension** and perform one of the following actions.

    ▸   Browse to the required plug-in file in your file system, and click **Open** to select the plug-in.

    ▸   Drag the required plug-in file to the **Upload Custom Plugin** object.

    If the uploaded custom plug-in file name is the same as an existing custom plug-in, then the uploaded file replaces the existing one and is displayed in visualizations.
5) Refresh the page to view the uploaded plug-in.

To delete a custom plug-in:

1) Click **Options** on the custom plug-in, and then select **Delete**.
2) Click **Yes** to confirm the deletion.

    If you delete a custom visualization type that's used in a workbook, then that workbook displays an error message in place of the visualization. Either click **Delete** to remove the visualization, or upload the same custom plug-in to ensure the visualization renders correctly.

Using Custom Plug-ins

As a user, you can perform any of the following tasks:

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Select the **Visualize** tab of your workbook.
3) Perform any of the following tasks.

    ▸   If the plug-in provides a visualization type, you can select that type from the list of available visualization types when you create or switch the type of a visualization.

    ▸   To search for a custom plug-in, enter your search criteria in the **Search** field and click **Return** to display search results.

Composing Expressions

You can use the **Expression** window to compose expressions to use in expression filters or in calculations. Expressions that you create for expression filters must be Boolean (that is, they must evaluate to true or false).

While you compose expressions for both expression filters and calculations, the end result is different. A calculation becomes a new data element that you can add to your visualization.

An expression filter, on the other hand, appears only in the filter bar and can't be added as a data element to a visualization. You can create an expression filter from a calculation, but you cannot create a calculation from an expression filter. See Creating Calculated Data Elements in a Data Set and Building Expression Filters.

You can compose an expression in various ways:

‣ Directly enter text and functions in the Expression window.
‣ Add data elements from the Data Elements pane (drag and drop, or double-click).
‣ Add functions from the function panel (drag and drop, or double-click).

Visualizing Data from the Home Page

Use the search bar on the Home page to find your data and quickly visualize it. You can use this functionality to perform impromptu visualizations without having to first build a workbook.

1) On the **Home** page, click the search bar.
2) Enter a search term (for example, "Office") and press SHIFT + ENTER to select the default result or select a specific result displayed in the drop-down list. You'll see your data visualized.

   What you select determines the data set for the visualization, and all other criteria that you enter is limited to columns or values in that data set.
3) Build your visualization by searching for and selecting other items.
4) When you're happy with your visualization and you'd like to save it or further enhance it, hover over it and click **Explore in Data Visualization**.

Saving Your Changes Automatically

You can use the auto save option to save your updates to a visualization workbook in real-time automatically.

If you've already saved your workbook in a specific location, the Save Workbook dialog isn't displayed after you click **Auto Save**.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) From the Save menu, select **Auto Save**.
3) In the Save Workbook dialog, enter the **Name** and optional **Description** to identify your workbook.
4) Select the folder where you want to save your workbook.
5) Click **Save**. Any workbook updates are saved in real-time.

Suppose that two users are updating the same workbook and **Auto Save** is enabled. The **Auto Save** option is automatically disabled when different types of updates are made to the workbook. A message is displayed that states that another user has updated the workbook.

Sorting the Items in a Page

You can quickly reorganize items in the Catalog, and Data pages by sorting the items based on their attributes.

As you add more data or workbooks, sorting items helps you to control the order in which they're listed. For example, you can reorganize data sets on the Data page based on their modification dates and times.

1) On the **Home** page, click **Navigator**, and then click **Console**.
2) Click Catalog, or Data depending on which items you want to sort.
3) Click the **Sort By** menu on the page toolbar and select a sort option such as **Modified** or **Reverse Order**.
4) Click the **List View** icon to switch to list view. In the table, click a column header to sort the items in that column in ascending or descending order.

The selected sort and column options are saved as user preferences.

Importing and Sharing Workbooks and Visualizations

You can import workbooks, or share workbooks with other users.

In This Section

Importing a Workbook File

You can import a workbook file (.dva file) that was exported.

Depending upon how the file was exported, you'll be prompted to enter a password to decrypt the workbook's data or to access the workbook's data source.

The import includes everything that you need to use the workbook such as associated data sets, connection string, connection credentials, and stored data.

1) On the **Home** page, click the **Page Menu** icon and then select **Import Workbook/Flow.**
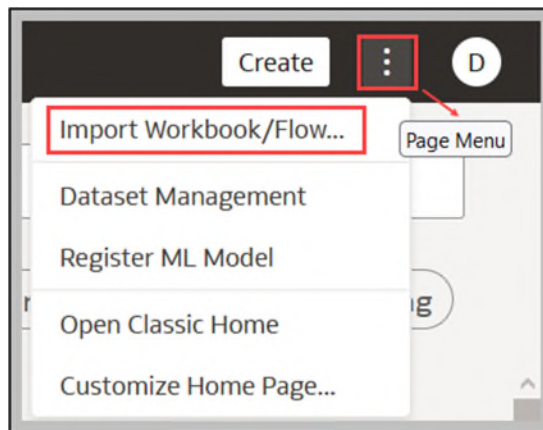
2) In the **Import Workbook/Flow** dialog, click **Select File** or drag a workbook file onto the dialog,and then click **Import**.

   Following a successful import, check that your imported connections are valid by opening and saving them.Also, ensure you have assigned appropriate workbook permissions. For more details, see *Assigning Shared Folder and Workbook Permissions* (on page 94).

Sharing a Workbook

You can easily share a workbook with others by copying and sharing the workbook URL.

You must save the workbook in a shared folder and grant appropriate privileges to the workbook.

How the workbook is displayed when the user opens it depends on the user's permissions and how the workbook was set up.

▸ If the shared workbook contains a story and the user has read-only permissions, then the workbook's story is displayed in presentation mode only and the user can't access the workbook in the Visualize page.

▸ If the shared workbook is displayed in presentation mode, then how the story's **Full Interactivity** field was set determines how the user can interact with the story. If the field is set to **On**, then the user is able to change filter values, add filters, export, sort, and drill. See *Creating Stories* (on page 119).

▸ If the workbook doesn't contain a story and the user has read-only permission, then the workbook's story is displayed in the Visualize page. The user can change filter values, add filters, export, sort, and drill in the Visualize page.

1) On the **Home** page, select a workbook, click the **Actions menu**, and then select **Open**.
2) Save the workbook to a shared folder.
3) If you don't have a shared workbook folder, click **Save As**, **New Folder**, enter a name and click **Create**.
4) Grant roles to the shared workbook to enable users with the same roles to view or edit the workbook as appropriate.
   a. In the **Home** Page, click **Navigator**, and then click **Catalog**.
   b. Click **Shared Folders**, and then navigate to the shared workbook.
   c. Hover over the workbook, click **Actions menu**, and then click **Inspect**.
   d. Click the **Share** tab.
   e. Add or edit roles as appropriate. See *Add or Update Shared Folder Permissions* (on page 96).
5) Copy the workbook URL and share with your users.

   Users can now access the workbook from the catalog.

   > **Note**: If you don't want to share a workbook, save the workbook under **My Folders** instead of **Shared Folders**.

Exporting a Workbook or Folder as a File

You can export a workbook or folder as an archive file (.DVA) that another user can import.

The .DVA file includes items that you specify such as the associated datasets, connection strings, connection credentials, and stored data.

1) On the **Home** page, click **Navigator**, and then click **Catalog**.

2) In the Catalog page, highlight the workbook or folder that you want to share and click **Actions menu**, then select **Export** to open the **Export** dialog.
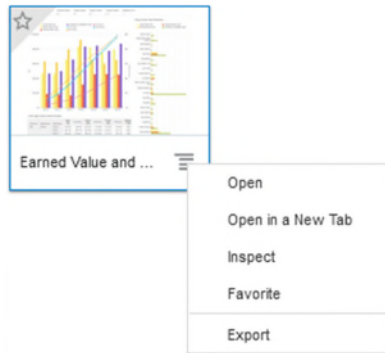
3) For **Name**, keep the default name or enter a new name for the export file (.DVA file).

4) Enable the **Include Data** option to include the data when sharing a workbook or folder.

5) Enable the **Include Connection Credentials** option so that users can open the workbook without having to sign in. Use the following guidelines to set this field:

   ‣ **Excel, or CSV**, **or TXT data source** - These data sources don't use a data connection, therefore you can clear the **Include Connection Credentials** option.

6) Click **Save** to export to a .DVA file.

7) Click **OK** to specify that you want to save the .DVA file rather open it in your browser.

8) Browse to a folder where you want to save the .DVA file.

9) Click **Save** to save the .DVA file to the folder that you specified.

Exporting a Visualization or Story - Future Release

You can export a visualization or story in a variety of formats: DVA (a visualization workbook file), Powerpoint (PPTX), Adobe Acrobat (PDF), PNG, or CSV (data only).

1) On the **Home** page, select a workbook containing the visualization or story that you want to export, click the **Actions menu**, and then select **Open**.

2) Go to the Visualize or Present canvas and locate the visualization or story that you want to export.

3) In the visualization's toolbar, click **Menu**, and **Export**, and then click **File**.

4) In the **Format** field, select the output format you want and specify the output options:

   ‣ For **Powerpoint (pptx), Acrobat (pdf)**, and **Image (png)** - Specify the file name, paper size, and orientation.

   ‣ When you share any of these visual formats, the visualization or pages are re-rendered based on the size and orientation you select. So if you're sharing a table, then your output file might not contain all of the table's rows and columns displayed in your visualization, canvas, or story.

▸ For **Data (csv)** - Specify the output file name. This option only includes the data used in the workbook. The outputted file uses the data delimiter for your computer's locale. For example, if your locale is set to Brazil, then the delimiter for numeric decimals is a comma instead of a period, which is used when your locale is set to United States.

▸ For **Package (dva)** - Specify whether to include workbook data, connection credentials and access permissions. To enable users to open the workbook DVA file without having to enter a password, click **Include Connection** Credentials and specify the password.

5) In the **Include** field, select **Active Visual**.

6) Click **Save**.

Exporting a Visualization's Data to a CSV File

You can export the data from a visualization to a CSV file. This allows you to open the file and work with the data in an application such as Excel.

1) Open the workbook that contains the visualization that you want to export data for.

2) In the Visualize or Present canvas, click the visualization that you want to export data for to select it.

3) Go to the workbook toolbar, and then click **Export**.

4) In the File dialog, go to the **Format** field and select **Data (csv)**.

5) Click **Save**.

The exported file uses the data delimiter for your computer's locale. For example, if your locale is set to Brazil, then the delimiter for numeric decimals is a comma.

Printing a Visualization, Canvas, or Story

You can print your workbook's visualizations, canvases, or stories.

When you print, the visualization or pages are re-rendered based on the size and orientation you selected. So if you're printing a table, then your printed copy might not contain all of the table's rows and columns included in your visualization, canvas, or story.

1) On the **Home** page, select a workbook containing the visualization, canvas, or story to print, click the **Actions menu**, and then select **Open**.

2) On the Visualize or Present canvas, click **Menu**, and **Export**, and then click **Print**.

3) Specify a name, and select an option from the include list.

▸ **Name** - You can update the name if needed.

▸ **Include** - You can select to print the Active Visual, Active Canvas, or All Canvases. You can also click **Include Filters** (if there are filters), and **Include Title** to include them in the printed output.

▸ **Size** - You can use the **Custom** setting (the default size) to print using the height and width displayed on your screen, and optionally select Scale Proportionally, or you can select a different size option (for example, US Letter, A4).

   ‣ **Orientation** - You can select whether to print in Landscape or Portrait format.

4) Optional: If filters are in the visualization or workbook, and you want to include them, click **Include Filters**.

5) Optional: If you want to include the title, click **Include Title**.

6) Optional: From the **Size** list, select the paper to use. When using **Custom**, specify the width and height in inches (in), pixels (px), or millimeters (mm).

7) Optional: Select the print format orientation.

8) Click **Print**.

Accessibility Features and Tips

This chapter describes the accessibility features and information for CIC Analytics.

In This Section

Enabling Accessibility Mode for CIC Analytics

Enable accessibility mode so that you can navigate CIC Analytics using keyboard shortcuts and related accessibility features.

1) At the **login** dialog, click **Accessibility Mode**.
2) To modify your accessibility settings:

   a. In the Classic Home, click *<Username>*, and then **My Account.** On the **Preferences** tab, set the **Accessibility Mode** to **On**.

   BI Composer is then launched in accessibility mode when you create an analysis or edit an existing analysis.

   If you set **Accessibility Mode** to **On** and select the **Wizard** option under **Analysis Editor**, BI Composer is then launched in *normal* mode when you create an analysis or edit an existing analysis.

In accessibility mode, you use BI Composer to create and edit analyses (see Keyboard Shortcuts for BI Composer).

If you're not using a Windows system, use the keystroke equivalent to the Alt key on your platform. For example if you're using a Mac, use the Command key instead of the Control (Ctrl) key. To select multiple data elements or columns, use Ctrl+right-click (on Windows systems) or Command key+right-click (on Mac systems).

Keyboard Shortcuts for Visualizations

You can use keyboard shortcuts to navigate and to perform actions in visualizations.

Use these keyboard shortcuts for working with a workbook in the **Visualize** Canvas.

Task	Keyboard Shortcut
Add data columns to a workbook.	Shift + F10
Export content to PDF.	Ctrl + Shift + E (Win) Command + Shift + E (Mac)

Task	Keyboard Shortcut
Export content to PPT.	Ctrl + Shift + X (Win) Command + Shift + X (Mac)
Print content.	Ctrl + P (Win) Command + Shift + P (Mac)
Reverse the last undo.	Ctrl + Y
Save a newly created workbook with a specific name.	Ctrl + Shift + S
Save a workbook with the changes.	Ctrl + S
Undo the last change.	Ctrl + Z

Use these keyboard shortcuts while working on a visualization in the **Visualize** canvas.

Task	Keyboard Shortcut
Copy a visualization to paste it to another canvas in the workbook or to a canvas in another workbook.	Ctrl + C
Paste the visualization into a canvas in the workbook or into a canvas in another workbook.	Ctrl + V
Duplicate a visualization.	Ctrl + D
Delete a visualization.	Delete key

Use this keyboard shortcut while working with a filter in the filter panel on the filter bar.

Task	Keyboard Shortcut
Add the search string to the selection list.	Ctrl + Enter

Use these keyboard shortcuts when you want to open, create, or edit artifacts such as datasets, workbooks, data flows, and sequences in a new tab or window.

Task	Keyboard Shortcut
Open an artifact in a new browser tab.	Ctrl + Click the artifact
Open an artifact in a new browser window.	Shift + Click the artifact

Reference

This chapter provides additional information on data preparation and subject areas in CIC Analytics.

In This Section

Data Preparation Reference

This section describes the set and types of recommendation and options you can use to perform data transform changes to a dataset.

Transform Recommendation Reference

Find out about the data transform options in the project's **Prepare** canvas.

Option	Description
Edit	Edits the column. For example, you can change the name, select another column, or update functions.
Hide	Hides the column in the Data Panel and in the visualizations. If you want to see the hidden columns, click **Hidden columns** (ghost icon) on the page footer. You can then unhide individual columns or unhide all the hidden columns at the same time.
Group, Conditional Group	Select **Group** to create your own custom groups. For example, you can group States together with custom regions, and you can categorize dollar amounts into groups indicating small, medium, and large.
Split	Splits a specific column value into parts. For example, you can split a column called, Name, into first and last name.
Uppercase	Updates the contents of a column with the values in all uppercase letters.
Lowercase	Updates the contents of a column with the values all in lowercase letters.
Sentence Case	Updates the contents of a column to make the first letter of the first word of a sentence uppercase.
Rename	Allows you to change the name of any column.

Option	Description
Duplicate	Creates a column with identical content of the selected column.
Convert to Text	Changes the data type of a column to text.
Replace	Changes specific text in the selected column to any value that you specify. For example, you can change all instances of Mister to Mr. in the column.
Create	Creates a column based on a function.
Convert to Number	Changes the data type of the column to number, which deletes any values that aren't numbers from the column.
Convert to Date	Changes the data type of the column to date and deletes any values that aren't dates from the column.
Bin	Creates your own custom groups for number ranges. For example, you can create bins for an Age column with age ranges binned into Pre-Teen, Young Adult, Adult, or Senior based on custom requirements.
Log	Calculates the natural logarithm of an expression.
Power	Raises the values of a column to the power that you specify. The default power is 2.
Square Root	Creates a column populated with the square root of the value in the column selected.

Column Menu Options for Quick Data Transformations

You can use the following column menu options to transform data in a data flow.

Option	Description
Bin	Create your custom groups for number ranges.
Convert to Number	Change the data type of the column to number and delete any values that aren't numbers.
Convert to Text	Change the data type of a column to text.
Delete	Select and remove a column from the data set.
Duplicate	Create a column with data that's identical to the selected column.
Group	Create a custom group to combine related values. For example, you can group states with custom regions and categorize dollar amounts into groups showing small, medium, and large.
Lowercase	Convert all the text in the column to lowercase.

Option	Description
Merge Columns	Combine two or more columns to display as one.
Rename	Change the column name.
Sentence Case	Convert the first letter of the first word to uppercase on each row in a column.
Transform	Modify the column data by using an expression.
Trim	Remove leading and trailing spaces from text data. CIC Analytics doesn't show leading or trailing spaces in the data preview, but if the original data source contained leading or trailing spaces, this can affect queries.
Uppercase	Convert all the text in the column to uppercase.

General Custom Format Strings

You can use these strings to create custom time or date formats.

The table shows the general custom format strings and the results that they display. These allow the display of date and time fields in the user's locale.

General Format String	Result
[FMT:dateShort]	Formats the date in the locale's short date format. You can also type `[FMT:date]`
[FMT:dateLong]	Formats the date in the locale's long date format.
[FMT:dateInput]	Formats the date in a format acceptable for input back into the system.
[FMT:time]	Formats the time in the locale's time format.
[FMT:timeHourMin]	Formats the time in the locale's time format but omits the seconds.
[FMT:timeInput]	Formats the time in a format acceptable for input back into the system.
[FMT:timeInputHourMin]	Formats the time in a format acceptable for input back into the system, but omits the seconds.
[FMT:timeStampShort]	Equivalent to typing `[FMT:dateShort] [FMT:time]`. Formats the date in the locale's short date format and the time in the locale's time format. You can also type `[FMT:timeStamp]`.

General Format String	Result
[FMT:timeStampLong]	Equivalent to typing `[FMT:dateLong] [FMT:time]`. Formats the date in the locale's long date format and the time in the locale's time format.
[FMT:timeStampInput]	Equivalent to `[FMT:dateInput] [FMT:timeInput]`. Formats the date and the time in a format acceptable for input back into the system.
[FMT:timeHour]	Formats the hour field only in the locale's format, such as `8 PM`.
YY or yy	Displays the last two digits of the year, for example `11` for 2011.
YYY or yyy	Displays the last three digits of the year, for example, `011` for 2011.
YYYY or yyyy	Displays the four-digit year, for example, `2011`.
M	Displays the numeric month, for example, `2` for February.
MM	Displays the numeric month, padded to the left with zero for single-digit months, for example, `02` for February.
MMM	Displays the abbreviated name of the month in the user's locale, for example, `Feb`.
MMMM	Displays the full name of the month in the user's locale, for example, `February`.
D or d	Displays the day of the month, for example, `1`.
DD or dd	Displays the day of the month, padded to the left with zero for single-digit days, for example, `01`.
DDD or ddd	Displays the abbreviated name of the day of the week in the user's locale, for example, `Thu` for Thursday.
DDDD or dddd	Displays the full name of the day of the week in the user's locale, for example, `Thursday`.
DDDDD or ddddd	Displays the first letter of the name of the day of the week in the user's locale, for example, `T` for Thursday.
r	Displays the day of year, for example, `1`.
rr	Displays the day of year, padded to the left with zero for single-digit day of year, for example, `01`.
rrr	Displays the day of year, padded to the left with zero for single-digit day of year, for example, `001`.

General Format String	Result
w	Displays the week of year, for example, 1.
ww	Displays the week of year, padded to the left with zero for single-digit weeks, for example, 01.
q	Displays the quarter of year, for example, 4.
h	Displays the hour in 12-hour time, for example 2.
H	Displays the hour in 24-hour time, for example, 23.
hh	Displays the hour in 12-hour time, padded to the left with zero for single-digit hours, for example, 01.
HH	Displays the hour in 24-hour time, padded to the left with zero for single digit hours, for example, 23.
m	Displays the minute, for example, 7.
mm	Displays the minute, padded to the left with zero for single-digit minutes, for example, 07.
s	Displays the second, for example, 2. You can also include decimals in the string, such as s.# or s.00 (where #means an optional digit, and 0 means a required digit).
ss	Displays the second, padded to the left with zero for single-digit seconds, for example, 02. You can also include decimals in the string, such as ss.# or ss.00 (where # means an optional digit, and 0 means a required digit).
S	Displays the millisecond, for example, 2.
SS	Displays the millisecond, padded to the left with zero for single-digit milliseconds, for example, 02.
SSS	Displays the millisecond, padded to the left with zero for single-digit milliseconds, for example, 002.
tt	Displays the abbreviation for ante meridiem or post meridiem in the user's locale, for example, pm.
gg	Displays the era in the user's locale.

Data Profiles and Semantic Recommendations

After creating a dataset, the dataset undergoes column-level profiling to produce a set of semantic recommendations to repair or enrich your data. These recommendations are based on the system automatically detecting a specific semantic type during the profile step.

There are various categories of semantic types such as geographic locations identified by city names, a specific pattern such as a credit card number or email address, a specific data type such as a date, or a recurring pattern in the data such as a hyphenated phrase. You can also create your own custom semantic types.

Semantic Type Categories

Profiling is applied to various semantic types.

Semantic type categories are profiled to identify:

▶ Geographic locations such as city names.
▶ Patterns such as those found with credit cards numbers or email addresses.
▶ Recurring patterns such as hyphenated phrase data.

Semantic Type Recommendations

Recommendations to repair, enhance, or enrich the dataset, are determined by the type of data.

Examples of semantic type recommendations:

▶ **Enrichments** - Adding a new column to your data that corresponds to a specific detected type, such as a geographic location. For example, adding population data for a city.
▶ **Column Concatenations** - When two columns are detected in the dataset, one containing first names and the other containing last names, the system recommends concatenating the names into a single column. For example, a first_name_last_name column.
▶ **Semantic Extractions** - When a semantic type is composed of subtypes, for example a us_phone number that includes an area code, the system recommends extracting the subtype into its own column.
▶ **Part Extraction** - When a generic pattern separator is detected in the data, the system recommends extracting parts of that pattern. For example if the system detects a repeating hyphenation in the data, it recommends extracting the parts into separate columns to potentially make the data more useful for analysis.
▶ **Date Extractions** - When dates are detected, the system recommends extracting parts of the date that might augment the analysis of the data. For example, you might extract the day of week from an invoice or purchase date.
▶ **Full and Partial Obfuscation/Masking/Delete** - When sensitive fields are detected such as a credit card number, the system recommends a full or partial masking of the column, or even removal.

Recognized Pattern-Based Semantic Types

Semantic types are identified based on patterns found in your data.

Recommendations are provided for these semantic types:

▸ Dates (in more than 30 formats)
▸ US Social Security Numbers (SSN)
▸ Credit Card Numbers
▸ Credit Card Attributes (CVV and Expiration Date)
▸ Email Addresses
▸ North American Plan Phone Numbers
▸ US Addresses

Reference-Based Semantic Types

Recognition of semantic types is determined by loaded reference knowledge provided with the service.

Reference-based recommendations are provided for these semantic types:

▸ Country names
▸ Country codes
▸ State names (Provinces)
▸ State codes
▸ County names (Jurisdictions)
▸ City names (Localized Names)
▸ Zip codes

Recommended Enrichments

Recommended enrichments are based on the semantic types.

Enrichments are determined based on the geographic location hierarchy:

▸ Country
▸ Province (State)
▸ Jurisdiction (County)
▸ Longitude
▸ Latitude
▸ Population
▸ Elevation (in Meters)
▸ Time zone
▸ ISO country codes
▸ Federal Information Processing Series (FIPS)

- Country name
- Capital
- Continent
- GeoNames ID
- Languages spoken
- Phone country code
- Postal code format
- Postal code pattern
- Phone country code
- Currency name
- Currency abbreviation
- Geographic top-level domain (GeoLTD)
- Square KM

Required Thresholds

The profiling process uses specific thresholds to make decisions about specific semantic types.

As a general rule, 85% of the data values in the column must meet the criteria for a single semantic type in order for the system to make the classification determination. As a result, a column that might contain 70% first names and 30% "other", doesn't meet the threshold requirements and therefore no recommendations are made.

Custom Knowledge Recommendations

Use custom knowledge recommendations to augment the Oracle Analytics system knowledge. Custom knowledge enables the Oracle Analytics semantic profiler to identify more business-specific semantic types and make more relevant and governed enrichment recommendations. For example, you might add a custom knowledge reference that classifies prescription medication into USP drug categories Analgesics or Opioid.

CIC Analytics Subject Areas

This section describes the subject areas supported by CIC Analytics for each source application.

P6 EPPM Subject Areas

CIC Analytics uses P6 EPPM data for the following subject areas:

Subject Area	Description
P6 - Activity	Use this subject area to analyze project, WBS, and activity level details. This subject area includes earned value metrics and percent complete metrics, planned and actual units and hours, and project baseline comparisons.
P6 - Activity History	Use this subject area to analyze daily, weekly, or monthly activity level history, including changes to both facts and dimensions, to better understand changes over time. This subject area requires project-specific configuration in P6.
P6 - Activity Period Actuals	Use this subject area to analyze activity period actuals over a period of time.
P6 - Activity User Defined Fields	Use this subject area to analyze activity User Defined Field (UDF) data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Activity User Defined Fields History	Use this subject area to analyze daily, weekly, or monthly activity User Defined Field (UDF) history data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Burn Down	Use this subject area to analyze daily project performance through burn down charts and schedule adherence metrics. Metrics include planned, actual, remaining, and emergent counts and units. Emergent data is from activities which were added after burn down began. This subject area requires project specific UDF configuration in P6.

Subject Area	Description
P6 - Project History	Use this subject area to analyze project and WBS-level history, including changes to both facts and dimensions, to better understand changes over time. This subject area requires project-specific configuration in P6.
P6 - Resource Assignment	Use this subject area to analyze resource assignment details for costs and units. This subject area includes information on planned, actual, remaining, staffed, unstaffed, and at completion costs and units.
P6- Resource Assignment History	Use this subject area to analyze daily resource assignment-level history, including changes to both facts and dimensions to help you understand changes over time. This subject area requires project specific configuration in P6.
P6 - Resource Assignment User Defined Fields	Use this subject area to analyze resource assignment UDF data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Resource Assignment User Defined Fields History	Use this subject area to analyze resource assignment UDF history data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Resource Period Actuals	Use this subject area to analyze activity period actuals over a period of time.
P6 - Resource User Defined Fields	Use this subject area to analyze resource UDF data for cost, integer, or number types. This subject area requires user defined field configuration using the ETL process.

Subject Area	Description
P6 - Resource User Defined Fields History	Use this subject area to analyze resource assignment UDF history data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Resource Utilization	Use this subject area to analyze resource utilization details including actual, available, planned, remaining, at completion, and resource limit units.
P6 - Role Utilization	Use this subject area to analyze role utilization details for resources.
P6 - Spread Snapshot History	Use this subject area to analyze how your data will appear at different points in time by creating a snapshot at different time intervals, for comparison purposes.
P6 - WBS User Defined Fields	Use this subject area to analyze WBS UDF data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - WBS User Defined Fields History	Use this subject area to analyze WBS UDF history data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
P6 - Work Planning	Use this subject area to analyze weekly work planning process by comparing project scope and schedule freeze dates each week. In this way, potential risks such as activity planned start date changes can quickly be identified. This subject area requires project specific UDF configuration in P6.
P6 / Unifier - Project User Defined Fields	Use this subject area to analyze project UDF data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.

Subject Area	Description
P6 / Unifier - Project User Defined Fields History	Use this subject area to analyze project UDF history data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process.
System - Admin	Use this subject area to analyze all the details of your ETL process, from query run times to the amount of data that is processed during each ETL run.

Primavera Unifier Subject Areas

CIC Analytics uses Unifier data for the following subject areas:

Subject Area	Description
Unifier - Business Process	Use this subject area to analyze cost and non-cost line items in business processes.
Unifier - Business Process History	Use this subject area to analyze weekly historical business process facts to better understand changes over time. Note that dimensional business process history is not supported.
Unifier - Cash Flow	Use this subject area to analyze WBS shell-level cash flows and commitment-level cash flows. You can map columns to predefined WBS shell-level cash flow curves and commitment level cash flow curves respectively. Ten generic columns are included to support cash flow curves.
Unifier - Cash Flow History	Use this subject area to analyze weekly historical cash flow facts and commitment level cash flow facts to better understand changes over time. Note that dimensional cash flow history is not supported.

Subject Area	Description
Unifier - Cost Sheet	Use this subject area to analyze cost sheets. You can map your data source to a predefined list of cost sheet columns. Twenty generic columns are included to support mapping of additional data sources from the cost sheet.
Unifier - Cost Sheet History	Use this subject area to analyze weekly historical cost sheet facts to better understand changes over time. **Note**: Dimensional cost sheet history is not supported.
Unifier - Earned Value Management (Unifier)	Use this subject area to analyze a project's planned value, earned value, actual costs, and the estimated cost at completion.
Unifier - Generic Cost Sheet	Use this subject area to analyze cost-related activities for a generic cost sheet. You can capture and view cost transaction information based on a timescale, such as quarterly or yearly.
Unifier - Resource Cost Summary	Use this subject area to analyze resource costs. You can capture and view resource cost information based on a timescale, such as quarterly or yearly.
Unifier - Space Management	Use this subject area to analyze space utilization for Facilities and Real Estate data from Primavera Unifier.
Unifier - Space Management History	Use this subject area to analyze space utilization over time for Facilities and Real Estate data from Primavera Unifier.
Unifier - Project User Defined Fields	Use this subject area to analyze project UDF data for cost, integer, or number types. This subject area requires UDF configuration using the ETL process. **Note**: A Shell must be mapped to a UDF of Numeric data type in Unifier Analytics to ensure the data will be available as a fact in this subject area of Analytics.
Unifier - Workflow	Use this subject area to analyze the costs, budget, and duration to assess the efficiency of workflows associated with business processes of projects.

Subject Area	Description
System - Admin	Use this subject area to analyze all the details of your ETL process, from query run times to the amount of data that is processed during each ETL run.

Oracle Primavera Cloud Subject Areas

CIC Analytics uses Primavera Cloud data from the following subject areas:

Subject Area	Description
Primavera Cloud - Lean Task	Use this subject area to analyze task commitments, completion, percent complete and reason, if any, for missing commitments.
Primavera Cloud - Resource Assignment	Use this subject area to to analyze resource assignment details for units and hours.
Primavera Cloud - Risk	Use this subject area to analyze risk data at the project level. The data can be aggregated and displayed with its associated project, workspace, and risks.
Primavera Cloud - Schedule Health	Use this subject area to analyze schedule health metrics aggregated for all projects.

Oracle Aconex Subject Areas

CIC Analytics uses Oracle Aconex data from the following subject areas:

Subject Area	Description
Aconex – Mails	Use this subject area to discover information such as (but not limited to): ▶ Identify existing red flags on your projects like delayed correspondences ▶ Identify the most/least active organizations based on mail correspondences/responses ▶ Compare and analyze mail activity across the project portfolio ▶ Track KPIs, view mail details, etc. You can also create your own data sets and/or data flows to: ▶ Implement custom logic to get deeper insights like Avg. RFI turnaround time, Mails overdue >N days, etc. ▶ Achieve custom dashboard requirements using Mail Project Fields ▶ Create use cases that need linking other subject areas with Mails, etc.
Aconex - Documents	Use this subject area to discover information such as, (but not limited to): ▶ Compare statistics across the project portfolio such as documents registered by type, status, discipline, organizations, etc. ▶ Track activity such as organizations that modified or transmitted the most/least docs ▶ View document details, etc. You can also create your own data sets and/or data flows to: ▶ Find if you have shared/transmitted the latest document revision/version, etc. ▶ Achieve custom dashboard requirements using Document Project Fields ▶ Create use cases that need linking other subject areas with Documents, etc.

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Subject Area	Description
Aconex - Workflow	Use this subject area to discover information such as, (but not limited to): ▸ Identify already delayed Workflow document reviews across project portfolio ▸ Know organizations holding on the Workflow document reviews for longer than N days ▸ Find the projects with max overdue workflow document review/steps ▸ View KPIs, track workflow document review status, etc. You can also create your own data sets and/or data flows to: ▸ Classify workflows as low to extreme delay ▸ Create use cases that need linking other subject areas with workflows, etc.
Aconex - User, Project, Organization	Use this subject area to discover information such as, (but not limited to): ▸ identify owner and partner organizations within projects ▸ identify the role of each organization in each project ▸ identify projects and their corresponding owner and partner organizations by geographical locations ▸ count of organizations (owner and participant orgs) involved in a given project ▸ count of all projects that a specific organization is involved in (as an owning organization or a participant organization) ▸ count of all users involved in all those projects that the logged in user is also associated with

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Troubleshooting Issues

This section explains troubleshooting and known issues identified in CIC Analytics.

Issue: Error displayed when migrating Analytics content with BI Publisher reports to CIC Analytics

CIC Analytics does not support BI Publisher set up. Therefore, attempting to unarchive BI Publisher reports will result in an error. This is expected behavior.