Oracle® Analytics

Visualizing Data in Oracle Analytics Server

5.9.0

F24230-09
July 2021

Oracle Analytics Visualizing Data in Oracle Analytics Server, 5.9.0

F24230-09

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Preface

Learn how to use Oracle Analytics Server to explore and analyze data by building and sharing projects and reports.

Topics:

- Audience
- Documentation Accessibility
- Conventions

Audience

This guide is intended for data consumers and analysts who use Oracle Analytics Server.

- Data consumers customize dashboard pages and work with their favorite reports. Dashboards allow consumers to quickly analyze and manage activity across their system.
- Data analysts load and model data and create reports for consumers. Data integration options range from self-service import to operational ETL updates. Analysts can select interactive visualizations and create advanced calculations to reveal insights in the data.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

Conventions

Conventions used in this document are described in this topic.

Text Conventions

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Videos and Images

Your company can use skins and styles to customize the look of the application, dashboards, reports, and other objects. It is possible that the videos and images included in the product documentation look different than the skins and styles your company uses.

Even if your skins and styles are different than those shown in the videos and images, the product behavior and techniques shown and demonstrated are the same.

Part I

Introduction to Visualizing and Reporting in Oracle Analytics Server

This part introduces you to visualizing data and building reports.

Topics:

- Get Started with Visualizing Data and Building Reports

1

Get Started with Visualizing Data and Building Reports

This topic describes how to get started with visualizing data and building reports.

Video

Topics:

About Oracle Analytics Server

Oracle Analytics Server is a powerful tool that empowers business analysts and consumers to uncover new insights and make faster, more informed business decisions.

Oracle Analytics Server brings the modern, industry-leading capabilities of Oracle Analytics Cloud to organizations that require on-premise deployments. With Oracle Analytics Server, your organization can take advantage of augmented analytics and world-class data discovery capabilities.

Oracle Analytics Server enables organizations in highly regulated industries or with multi-cloud architectures to experience the latest analytics capabilities on their own terms and preferred deployment architecture. With Oracle Analytics Server, your heritage systems can be maintained while a clear, easy, and seamless path to Oracle Cloud is ready when you are.

Oracle Analytics Server includes modern, AI-powered, self-service analytics capabilities for data preparation, visualization, enterprise reporting, augmented analysis, and natural language processing/generation. You can use these features to:

- Collect up-to-date data from your organization.
- Present the data in easy-to-understand formats, such as tables and graphs.
- Deliver data in a timely fashion to the employees in your organization.

These capabilities and the information they help you discover enable your organization to make better decisions, take informed actions, and implement more-efficient business processes.

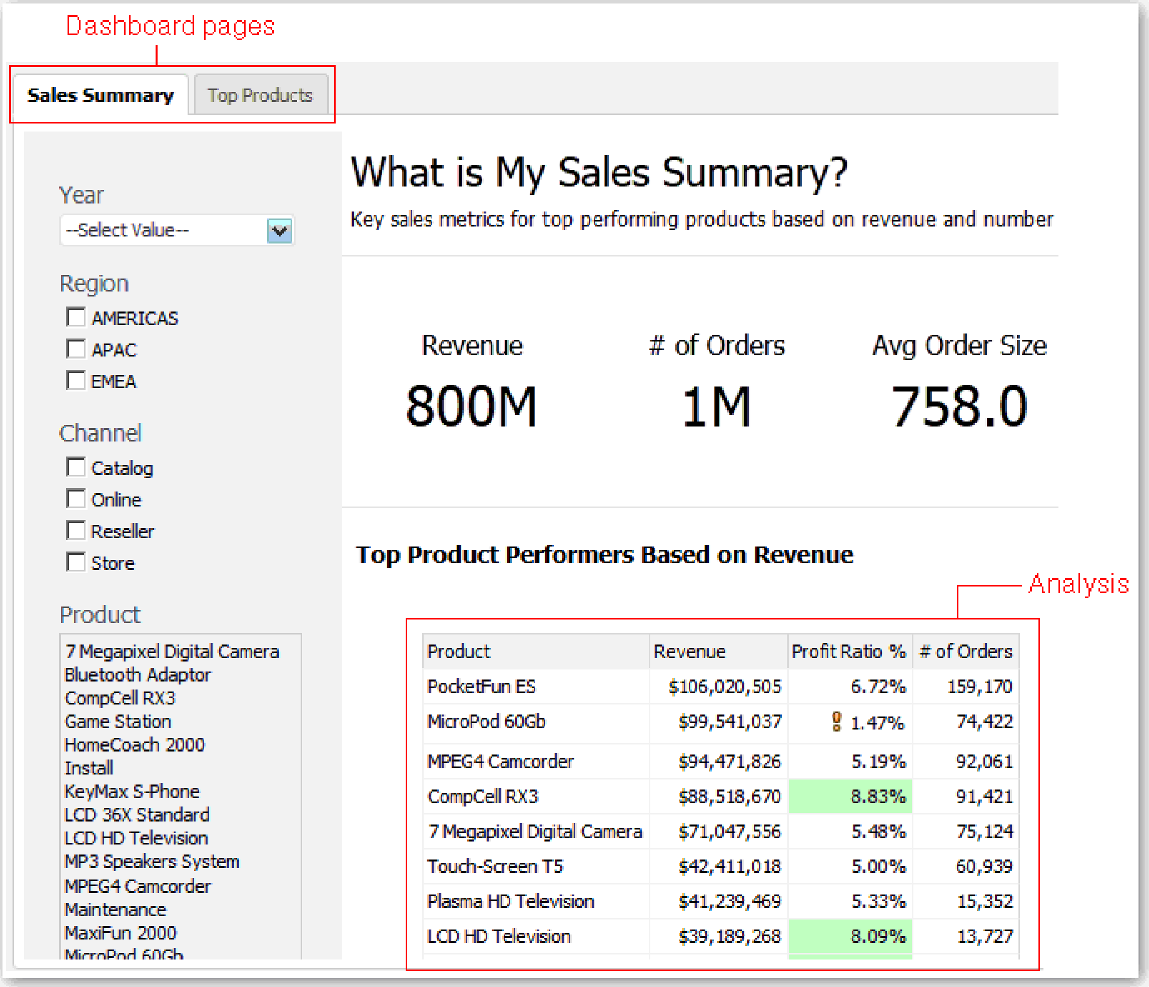
About Reports and Dashboards

You use analyses, projects, and dashboards to find the answers that you need from key business data displayed in graphical formats.

An analysis is a query against your organization's data that provides you with answers to business questions. Analyses enable you to explore and interact with information visually in tables, graphs, pivot tables, and other data views. You can also save, organize, and share the results of analyses with others.

A project enables you to dynamically explore multiple data sets in graphical way, all within a single interface. You can upload data from many commonly used data sources to create robust sets of information within project visualizations.

Dashboards can include multiple analyses to give you a complete and consistent view of your company's information across all departments and operational data sources. Dashboards provide you with personalized views of information in the form of one or more pages, with each page identified with a tab at the top. Dashboard pages display anything that you have access to or that you can open with a web browser including analyses results, images, text, links to websites and documents, and embedded content such as web pages or documents.



What is My Sales Summary?

Key sales metrics for top performing products based on revenue and number

Revenue	# of Orders	Avg Order Size
800M	1M	758.0

Top Product Performers Based on Revenue

Product	Revenue	Profit Ratio %	# of Orders
PocketFun ES	$106,020,505	6.72%	159,170
MicroPod 60Gb	$99,541,037	! 1.47%	74,422
MPEG4 Camcorder	$94,471,826	5.19%	92,061
CompCell RX3	$88,518,670	8.83%	91,421
7 Megapixel Digital Camera	$71,047,556	5.48%	75,124
Touch-Screen T5	$42,411,018	5.00%	60,939
Plasma HD Television	$41,239,469	5.33%	15,352
LCD HD Television	$39,189,268	8.09%	13,727

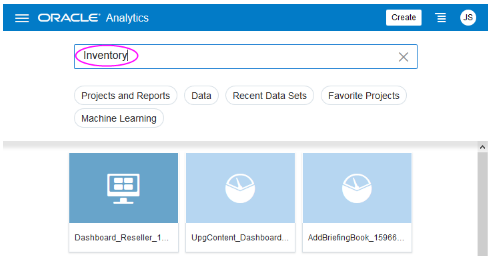
When you embed an analysis in a dashboard, the analysis automatically displays the most current data every time you access the dashboard. For example, if you're a sales executive whose company captures sales data on a daily basis, then you can have the dollar volume by product sold today displayed when you open or run the dashboard.

Find and Explore Your Content

From the Home page you can easily find your analytics content, such as projects, data sets, connections, and data flows.

On the Home page, use one or more of the search bar or Navigator menu options to locate the content you’re interested in.

1. To find content, use the Search bar
   a. Type in a search term and either press Enter to search for content or Shift + Enter to visualize data.
   b. Specify the full or partial name of what you're looking for. The search is case-insensitive.



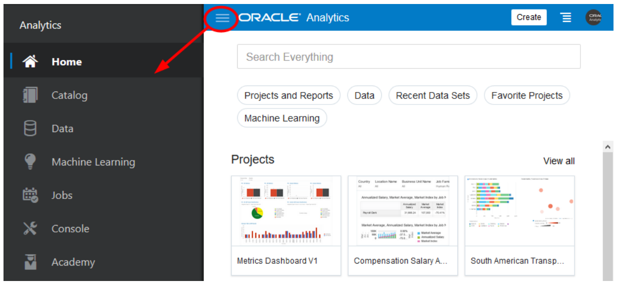
   c. Click in the search bar for a drop-down list of all content types, such as project, dashboard, report, connection, or model. Click a content type to add it to the search bar. For example:
      - click **Project** to display visualization content
      - click **Dashboard** or **Analysis** to display reporting content
      - click **Report** to display pixel-perfect reporting content
      - click an option in the **Data** category to display connections, data sets, data flows, machine learning models, and other data-related content.
   d. Enter `'type:'` or `'filter:'` to display a list of search tags that you can select from.
   e. Paste in `'type:'` or `'filter:'` followed by one search term (not case-sensitive). For example:
      - Paste in `type:connection` to find your connections. Or, paste in `type:project` to find your visualization projects.
      - Paste in `filter:recent` to display your recently accessed content. Paste in `filter:favorites` to find content that you've marked as a favorite.
        You can combine the `filter` command with the `type` command. For example, paste in `type:project filter:recent`.
   f. To refine your search, add or remove other search tags.

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

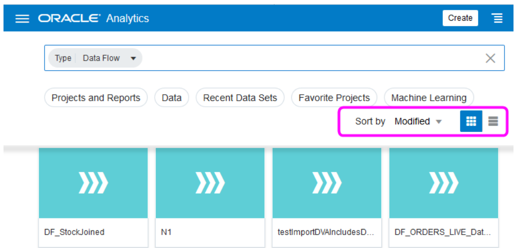
h. (Browser dependent) Click **Dictate** (if displayed) and speak your search term.

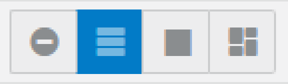
i. To clear your search terms, in the search bar click X or select search tags and hit delete.

2. To quickly access your content, use the **Navigator** bar.



3. To sort or change how content is displayed, click **Sort by/Grid/List** .



4. To customize your home page, click **Page Menu**, then **Customize Home Page** to use the options on the Customize page.
   - To change the order of content categories (Favorites, Catalog, Data Sets and so on), 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** ()

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're 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* aren't included in the drop-down list of suggestions.

- **Searching for New Objects and Data** - If you create or save a project or create a data set and then immediately try to search for it, then it’s likely that your search results won’t contain matches. If this happens, refresh your browser. If you still can't find the new object or data, then wait a few minutes for the indexing process to run, and retry your search. The system automatically runs the indexing process every two minutes. Users can access only the data they've been given permission to access.

View Content on Mobile Devices

You can access your content with a mobile device.

To access your content (analyses, projects, and dashboards), use the browser on your mobile device.

Top Tasks to Visualize Data and Build Reports

Choose a category.

- Top Tasks to Explore Data
- Top Tasks to Analyze
- Top Tasks to Manage Data

Top Tasks to Explore Data

The top tasks for exploring are identified in this topic.

- Create a Project and Add Data Sets
- Add Spreadsheets as Data Sets
- Print a Visualization, Canvas, or Story

Top Tasks to Analyze

The top tasks for analyzing are identified in this topic.

- Create Your First Analysis
- Create Your First Dashboard
- Edit Graph Views

Top Tasks to Manage Data

The top tasks for managing are identified in this topic.

- Find and Explore Your Content
- Assign Access Permissions
- Send Email Reports Once, Weekly, or Daily

Part II

Visualize Data

This part explains how to visualize data.

Topics

- Visualize and Analyze Data
- Create and Apply Filters
- Use Other Functions to Visualize Data
- Create Custom Data Action Plug-ins
- Connect to Data Sources
- Manage Data and Data Sets
- Use Oracle Analytics Predictive Models and Oracle Machine Learning Models
- Curate Your Data Using Data Flows
- Import and Share Projects
- Use BI Composer to Analyze Your Data

2

Connect to Data Sources

Connect to databases and upload spreadsheets to get the data you need to create data sets.

Topics

Typical Workflow to Build a Data Set From a Connection

Here are the common tasks for building a data set from a connection.

Task	Description	More Information
Work with spreadsheets and subject areas	Upload data from spreadsheets. Retrieve data from Oracle Applications (subject areas and analyses) and databases.	Add Spreadsheets as Data Sets Compose Data Sets from Subject Areas
Control sharing of data sources	Specify which users can access the data that you added.	Share Your Data

About Data Sources

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 aren't 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 project, the permissions are synchronized between the project and the external sources that it uses. If you share the project with other users, then the external sources are also shared with those same users.

Data Sources and Subject Areas

You can combine data sources with 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.

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, suppose you purchased demographic information for postal areas or credit risk information for customers and want 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 company matches company and business unit matches business unit.
- 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.

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.

Database Connection Options

When you specify connection details using the Create Connection dialog or Inspect dialog, some database types have extra options.

General Options

- When you create connections to Oracle Databases, you can connect in two ways using the **Connection Type** option:
  - **Basic** - Specify the **Host**, **Port**, and **Service Name** of the database.
  - **Advanced** - In the **Connection String** field specify the Single Client Access Name (SCAN) ID of databases running in a RAC cluster. For example:
    ```
    sales.example.com =(DESCRIPTION= (ADDRESS_LIST= (LOAD_BALANCE=on)
    (FAILOVER=ON) (ADDRESS=(PROTOCOL=tcp)(HOST=123.45.67.111)
    (PORT=1521)) (ADDRESS=(PROTOCOL=tcp)(HOST=123.45.67.222)
    (PORT=1521)) (ADDRESS=(PROTOCOL=tcp)(HOST=123.45.67.333)
    (PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=
    salesservice.example.com)))
    ```
- **Enable Bulk Replication** - If you’re loading a data set for a project, then this option should be turned off and you can ignore it. This option is reserved for data analysts and advanced users for replicating data from one database to another database.

Authentication Options

- **Always use these credentials** - The login name and password you provide for the connection are always used and users aren’t prompted to log in.
- **Require users to enter their own credentials** - Prompt users to enter their own user name and password for the data source. Users required to log in see only the data that they have the permissions, privileges, and role assignments to see.
- (Displayed if Oracle Analytics supports impersonation for this database type) **Use the active user’s credentials** - Users aren’t prompted to sign in to access the data. The same credentials they used to sign in to Oracle Analytics Cloud are also used to access this data source.

Database Connection Limits

Understand your database connection requirements before your create the database connection.

The maximum number of database tables displayed in Oracle Analytics is 10,000. If you need additional tables, Oracle recommends that you ask your database administrator to create a database user with access to the specific objects you want to analyze and specify that user's credentials when you create the database connection.

Create Data Sets from Databases

After you create database connections, you can use those connections to create data sets.

1. On the Home page, click **Create**, and then click **Data Set**.

2. In Create Data Set, click the database connection containing the data to use.
3. In Add Data Set, click the schema containing the table with your data. Click the table to use for the data set.
4. In the column list, browse or search for the columns you want to include in the data set. You can click **Add All**, or select a column or columns and then click **Add Selected**.
5. Optional: Use the **Data Access** option to specify how to refresh the data set.

   Alternatively, you can select the **Enter SQL** option to view or modify the data source’s SQL statement or to write a SQL statement.
6. Click **Add**.

Edit a Data Source Connection

You can update a data source's connection details.

1. On the Home page click the Navigator, select **Data**, and then click **Connections**.
2. Hover over the connection that you want to edit. To the right of the highlighted connection, click **Actions menu**, and select **Inspect**.
3. In the Inspect dialog, edit the connection details.
4. Click **Save**.

If you’re editing an SSL connection to an Oracle Database and you need to use a new `cwallet.sso` file, in the **Client Wallet** field, click **Select** to browse for the `cwallet.sso` file. Ask your administrator for the location of the `cwallet.sso` file.

You must provide a unique **Connection Name**. If a connection with the same name already exists in your system, an error message is displayed. You can’t see or edit the current password for your connection. If you need to change it, you must create a connection that uses the same password.

Delete a Data Source Connection

You can remove a data source connection from Oracle Analytics Cloud. For example, you must delete a database connection and create a new connection when the database's password has changed.

If the connection contains any data sets, then you must delete the data sets before you can delete the connection.

1. Go to the Data page and select **Connections**.
2. Hover over the connection that you want to delete. To the right of the highlighted connection, click **Actions menu**, and select **Delete**.
3. Click **Yes**.

Connect to an Oracle Database

Create a connection to access an Oracle Database, use the connection to create data sets.

Topics:

- Create a connection for an Oracle Database

- Create the ZIP File Needed for a Database Connection with Kerberos Authentication
- Create a Database Connection with Kerberos Authentication

Create a connection for an Oracle Database

You can create a connection to a database and use the connection to access data and build a data set.

You can't use remote connections to save a data set from a Data Flow.

1. On the Home page, click **Create**, then click **Connection**.
2. In Create Connection dialog, click the connection type, for example, **Oracle Database**.
3. Enter a unique name for the new connection, and database connection details.
    - If you're not creating an SSL connection, specify the connection information for the database, such as the hostname, port, credentials, service name and so on.
    - If you're creating an SSL connection, in the **Client Wallet** field, click **Select** to browse for the `cwallet.sso` file. Ask your administrator for the location of the `cwallet.sso` file.
4. Use the **Connection Type** option to specify how you'd like to connect.
    - When you create connections to Oracle Databases, you can connect in two ways using the **Connection Type** option:
        - **Basic** - Specify the **Host**, **Port**, and **Service Name** of the database.
        - **Advanced** - In the **Connection String** field specify the Single Client Access Name (SCAN) ID of databases running in a RAC cluster. For example:

          ```
          sales.example.com =(DESCRIPTION= (ADDRESS_LIST=
          (LOAD_BALANCE=on)(FAILOVER=ON) (ADDRESS=(PROTOCOL=tcp)
          (HOST=123.45.67.111)(PORT=1521)) (ADDRESS=(PROTOCOL=tcp)
          (HOST=123.45.67.222)(PORT=1521)) (ADDRESS=(PROTOCOL=tcp)
          (HOST=123.45.67.333)(PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=
          salesservice.example.com)))
          ```
    - **Enable Bulk Replication** - If you're loading a data set for a project, then this option should be turned off and you can ignore it. This option is reserved for data analysts and advanced users for replicating data from one database to another database.
5. If you're connecting to an on-premises database, click **Use Remote Data Connectivity**.

   Check with your administrator that you can access the on-premises database.
6. Click **Save**.

Create the ZIP File Needed for a Database Connection with Kerberos Authentication

You need a ZIP file that contains specific configuration files to create an SSL connection that uses Kerberos authentication.

The zip file must have a directory named kerberos that contains the following files :

- `kerberos/krb5conf`
- `kerberos/oac.keytab`
- `kerberos/service_details.json`

You may need to create or modify the files.

The `service_details.json` file must contain values for Host, Port, and ServicePrincipalName, for example:

```
{
 "Host" : "myHost.com",
 "Port" : "10000",
 "ServicePrincipalName" : "hive/myHostDB.com@BDA.COM",
}
```

You must enclose all parameter values in quotation marks ("`value`").

1. Get the Kerberos configuration files from your database administrator (for example, to connect to Apache Hive).
2. Create a folder named `kerberos` to contain the Kerberos configuration files.
3. Copy the `krb5conf` file into the `kerberos` folder that you created.
4. Ensure the `.keytab` file is named `oac.keytab` (rename it if required), and copy the file into the folder you created.
5. Get or create the `service_details.json` file and save it in the folder you created.
6. Create a ZIP file containing the three files that you added to your folder, and provide an appropriate name, for example `SSLKerberos.ZIP`.

Create a Database Connection with Kerberos Authentication

You can configure a database connection to use Kerberos network authentication protocol.

To find out which database types support Kerberos authentication, look for databases with 'Supports Kerberos' in the **More Information** column in the Supported Data Sources list. See Certification - Data Sources.

1. On the Home page, click **Create**, and then click **Connection**.
2. In the Create Connection dialog, click the icon for the connection type such as **Apache Hive**.
3. Click **Authentication Type** and select **Use Kerberos**.

4. In the **Client Credentials** field, either drag and drop or click **Select** to browse for a prepared ZIP or CONF file.

   Do one of the following to get the appropriate configuration files for a SSL or a Non-SSL connection:

   - Ask your administrator to provide the appropriate ZIP or CONF files.
   - Prepare your own ZIP file.
5. If you added a `ZIP` file, enter the ZIP password in the **ZIP Password** field.
6. If you added a `krb5conf` file, either drag and drop or click **Select** to browse for the `oac.keytab` file in the **Keytab** field.

   The **Host**, **Port**, and **Service Principal** fields automatically display values taken from the `service_details.json` file.
7. If you're creating a SSL connection, click **Enable SSL** to enable the connection to use SSL.
8. Click **Save**.

Connect to Oracle Applications

You can connect to Oracle Applications and create data sets that help you visualize, explore, and understand your Oracle Applications data.

Topics:

- Oracle Applications Connector
- Create an Oracle Applications Connection
- Configure Impersonate User for the Use Active User's Credentials Option

Oracle Applications Connector

Oracle Applications Connector supports Oracle Applications Cloud. You can also use Oracle Applications Connector to connect to your on-premises Oracle BI Enterprise Edition deployments (if patched to an appropriate level) and another Oracle Analytics service.

Oracle Applications Cloud applications you can connect to:

- Oracle Sales Cloud
- Oracle Financials Cloud
- Oracle Human Capital Management Cloud
- Oracle Supply Chain Cloud
- Oracle Procurement Cloud
- Oracle Project Cloud
- Oracle Loyalty Cloud

Create an Oracle Applications Connection

You can create a connection to Oracle Applications and use the connection to access your data.

1. On the Data page or Home page, click **Create**, then click **Connection**.
2. Click the **Oracle Applications** icon.
3. Enter the connection details.
4. For **URL**, enter the URL for Oracle Fusion Applications with Oracle Transactional Business Intelligence or Oracle Analytics Server.
5. Under **Authentication**, specify how you'd like to authenticate the connection:
    - **Always use these credentials** - The login name and password you provide for the connection are always used and users aren't prompted to log in.
    - **Require users to enter their own credentials** - Prompt users to enter their own user name and password for the data source. Users required to log in see only the data that they have the permissions, privileges, and role assignments to see.
    - (Displayed if Oracle Analytics supports impersonation for this database type) **Use the active user's credentials** - Users aren't prompted to sign in to access the data. The same credentials they used to sign in to Oracle Analytics Cloud are also used to access this data source.
6. Save the details.

    You can now create data sets from the connection.

The connection is visible only to you (the creator), but you can create and share data sets for it.

Configure Impersonate User for the Use Active User's Credentials Option

You can configure impersonate user to enable the active user's credentials option when you create an Oracle Applications connection.

You can implement impersonate user for connections to Oracle Fusion Applications with Oracle Transactional Business Intelligence and Oracle BI EE. Users aren't prompted to enter their user name and password. Users can only access and view data allowed for the active user's permissions, privileges, and role assignments.

Provision Impersonate User for Connection to Oracle Fusion Applications

You can provision the impersonate user functionality in Oracle Fusion Applications when your Oracle Application connection target is Oracle Fusion Applications with Oracle Transactional Business Intelligence.

1. Log in to Oracle Fusion Applications as an administrator with privileges to create or modify a role.
2. Display the Security Console dialog, and display the **Users** tab.
3. Click **Add User Account** to create a user. For example, create a user called DV Admin.
4. Display the **Roles** tab, and click **Create Role**.
5. Enter a role name in the **Role Name** field. For example, enter `DV Access`.

6. Enter a code for the role name in the **Role Code** field. For example, enter `DV_ACCESS`.
7. Select `BI - Abstract Roles` in the **Role Category** field.
8. Skip the steps Function Security Policies and Data Security Policies.
9. In the Role Hierarchy step, click (+) **Add Role** and select the existing `BIImpersonator` role in the Add Role Membership dialog.
10. Select the user that you created (for example, DV Admin).
11. Click **Add User to Role** in the Add User dialog.
12. Click **Save and Close**.

    The DV Admin user is added to the BI Impersonator role, and you can use the DV Admin user in Oracle Analytics in conjunction with the **Use Active User's Credentials** option in the Create Oracle Application Connection dialog.

    You can now test the impersonate functionality.

Provision Impersonate User for Connections to Oracle BI EE On-Premises

You can provision the impersonate user functionality in Oracle Fusion Middleware when your Oracle Application connection target is an on-premises installation of Oracle BI EE.

1. Log in to Oracle Fusion Middleware Control for your Oracle BI EE instance using an administrator account.
2. Click the **Weblogic Domain** option, and select **Security** and **Application Policies**.
3. Click **Create** to display the Create Application Grant dialog.
4. Click (+) **Add** in the Permissions area.
5. Select **Resource Types**.
6. Select **oracle.bi.user** from the drop-down list.
7. Click **Continue**.
8. Enter an asterisk (*) in the **Resource Name** field.
9. Select "`impersonate`" in **Permission Actions**.
10. Click **Select**.
11. Click (+) **Add** in the Grantee section.
12. Select **User** from the **Type** drop-down list.

    You grant the newly created permission to either an application role or user.
13. Select **Includes** from the **Principal Name** drop-down list and enter an asterisk (*) into the field.
14. Click the **>** arrow to display a list of users.
15. Select the user that you want to give the permission to and click **OK**.

    You can now test the impersonate functionality.

Compose Data Sets from Subject Areas

You can build data sets from subject areas used in other Oracle products such as Oracle Fusion Applications with Oracle Transactional Business Intelligence.

You must create an Oracle Applications connection before you can create a subject area data set.

1. On the Home page, click **Create** and click **Data Set**. Click **Connection** and use the Create Connection dialog to specify the details for your data set.
2. In the Data Set editor, choose **Select Columns** to view, browse, and search the available subject areas and columns.
3. Optional: You can also perform the following steps:
   - In the breadcrumbs click the **Add/Remove Related Subject Areas** option to include or exclude related subject areas. Subject areas are related when they use the same underlying business or logical model.
   - After you've selected columns, go to the Step editor at the top of the Data Set editor and click the **Filter** step to add filters to limit the data in the data set. After you've added filters, click **Get Preview Data** to see how the filters limit the data.
   - Click **Enter SQL** to display the logical SQL statement of the data source. View or modify the SQL statement in this field.

     If you edit the data source's logical SQL statement, then the SQL statement determines the data set and any of the column-based selection or specifications are disregarded.
   - Go to the Step editor at the top of the Data Set editor and click the last step in the Step editor to specify a description for the data set.
4. Before saving the data set, go to the **Name** field and confirm its name. Click **Add**.

   The Data Set page is displayed.
5. Optional: In the Data Set page you can view the column properties and specify their formatting. The column type determines the available formatting options.

Compose Data Sets from Analyses

You can build data sets from analyses created in other Oracle products such as Oracle Fusion Applications with Oracle Transactional Business Intelligence.

You must create an Oracle Applications connection before you can create an analysis data set.

1. On the Home page click **Create** and click **Data Set**. In the Create Data Set dialog, select **Create Connection** and use the Create Connection dialog to create the connection for your data set.
2. In the Data Set editor, select the **Select an Analysis** option to view, browse, and search the available analyses to use in your data set.
3. Double-click an analysis to use it for your data set.
4. You can also optionally perform the following steps:
   - Click **Enter SQL** to display the SQL Statement of the data set. View or modify the SQL statement in this field.

  - Click a column’s gear icon to modify its attributes, like data type and whether to treat the data as a measure or attribute.
  - Go to the Step editor at the top of the Data Set editor and click the last step in the Step editor to specify a description for the data set.

5. Before saving the data set, go to the **Name** field and confirm its name. Click **Add**.
6. In the Data Set page you can optionally view the column properties and specify their formatting. The column type determines the available formatting options.

Edit an Oracle Applications Connection

You can edit an Oracle Applications connection. For example, you must edit a connection if your system administrator changed the Oracle Applications login credentials.

1. In the Data page, click **Connections**.
2. In the Edit Connection dialog, edit the connection details. Note that you can’t see or edit the password that you entered when you created the connection. If you need to change the connection’s password, then you must create a new connection.
3. Click **Save**.

Delete an Oracle Applications Connection

You can delete an Oracle Applications connection.

1. Delete any data sets that use the connection you need to delete.
2. In the Data page, click **Connections**.
3. Click **Yes**.

Connect to Essbase Data Sources

You can create, edit, and delete Essbase connections and use the connections to create data sets from Essbase cubes.

Topics:

- Create a Connection to Oracle Essbase
- Create Data Sets from Essbase Cubes

Create a Connection to Oracle Essbase

You can create a connection to Oracle Essbase 11g and use the connection to access source data.

1. Click **Create**, and then click **Connection**.
2. Click **Oracle Essbase**.
3. Enter the connection details.
4. For **DSN** (data source name), enter the agent URL for your data source.

If you want to connect to an Oracle Essbase 11g database, enter the hostname and agent port number on which Oracle Essbase is running. Use the format: `hostname:port`

For example: `essbase.example.com:1423`

The default port is 1423.

Your Essbase administrator must open agent port 1423 and server ports in the range 30000-34000 to allow the connection.

5. For **Username** and **Password**, enter user credentials with access to the Essbase data source.
6. Under **Authentication**, specify how you'd like to authenticate the connection:
   - **Always use these credentials** - The login name and password you provide for the connection are always used and users aren't prompted to log in.
   - **Require users to enter their own credentials** - Prompt users to enter their own user name and password for the data source. Users required to log in see only the data that they have the permissions, privileges, and role assignments to see.
   - (Displayed if Oracle Analytics supports impersonation for this database type) **Use the active user's credentials** - Users aren't prompted to sign in to access the data. The same credentials they used to sign in to Oracle Analytics Cloud are also used to access this data source.
7. Save the details.

   You can now create data sets from the connection.

Create Data Sets from Essbase Cubes

After you create Essbase connections, you can use those connections to create data sets.

You must create the Essbase connection before you can create a data set for it.

1. On the Home page click **Create** and click **Data Set**.
2. In the Create Data Set dialog, select an existing Essbase connection.
3. In the Add Data Set page, double-click the Essbase cube that you want to use as a data set.

   Essbase cube details are displayed.
4. If required, you can edit the **Description**, and select an **Alias** value.

   If you select an alias value other than the default, then values from the selected alias table are displayed in visualizations that use this Essbase data set.
5. Click **Add** to save the Essbase cube.

Connect to Dropbox

You can create a connection to Dropbox and use the connection to access data.

Before you start, set up a Dropbox application. See the Dropbox documentation.

1. Ask your Oracle Analytics administrator to allow connections to Dropbox.

   Your Oracle Analytics administrator must register the following domains as safe:

   `api.dropboxapi.com`

    `*.dropbox.com`

2. On the Oracle Analytics Home page, click **Create**, and then click **Connection**.
3. Click **Dropbox**.
4. Configure the connection details.
    a. Enter a **Connection Name** and **Description**.
    b. Open and sign into the Dropbox application. Copy and paste the **Redirect URL** into the Dropbox **OAuth 2 Redirect URIs** field, and then click **Add**.
    c. In Dropbox, locate the **App Key** field, copy the key value and paste it in the Oracle Analytics **Client ID** field.
    d. In Dropbox, locate the **App Secret** field, and then click **Show**.
    e. In Oracle Analytics, paste the App Secret value in the **Client Secret** field.
    f. Click **Authorize**.
    g. In the Dropbox prompt to authorize the connection, click **Allow**. Don't include the Create Connection dialog sentence.

       The Create Connection dialog refreshes and displays the name of the Dropbox account and associated email account.
5. Save the connection.

Connect to Google Drive or Google Analytics

You can create a connection to Google Drive or Google Analytics and use the connection to access data.

Before you start, set up a Google Drive or Google Analytics application. See the Google documentation.

1. Ask your Oracle Analytics administrator to allow connections to Google.

    Your Oracle Analytics administrator must register the following domains as safe:

    `api.google.com`

    `*.google.com`
2. On the Oracle Analytics Home page, click **Create**, and then click **Connection**.
3. Click **Google Drive** or **Google Analytics**.
4. Configure the connection details.
    a. Enter a **Connection Name** and **Description**.
    b. Open and sign into the Google application. Copy and paste the **Redirect URL** into the Google **Authorized redirect URIs** field and then click **Add**.
    c. In Google, locate the **Client ID** field, copy the key value and paste it in the Oracle Analytics **Client ID** field.
    d. In Google, locate the **Client Secret** field, and then click **Show**.
    e. In Oracle Analytics, paste the Client Secret value in the **Client Secret** field.
    f. Click **Authorize**.
    g. In the Google prompt to authorize the connection, click **Allow**.

The Create Connection dialog refreshes and displays the name of the Google account, and its associated email account.

5. Save the connection.

Create JDBC Connections

You can create JDBC connections to databases and use those connections to access data sources, for example, to connect to databases that aren't listed with the default connection types.

You can use drivers in a JDBC JAR file to connect to databases.

Check with your administrator that the JDBC driver version must match the database version, even when using an Oracle database. A version mismatch can result in data issues.

For the connection criteria:

- Avoid using instance-specific connection names such as host names, because the same connection can be configured against different databases in different environments, for example, development and production.
- Check the driver documentation and the JAR file for specifying the URL of your JDBC data sources.
- Find the driver class name in the JAR file or from wherever you downloaded the JAR file.
- For the **Host** value, enter the connection string provided by your administrator for the JDBC driver that you're using, for example, `jdbc:oracle:thin:@host:port/database`.
- For the **Driver Class Name** value, enter the text provided by your administrator for the JDBC driver that you're using, for example, `oracle.jdbc.driver.OracleDriver`.

1. Ask your administrator to set up the required JDBC driver.

   (The administrator copies the required JDBC driver's JAR file to the `OracleHome/user_projects/domains/bi/lib` folder on the Oracle Analytics Server machine.)
2. On the Data or Home page, click **Create**, then click **Connection**.
3. In the Create Connection dialog, locate and click the **JDBC** icon.
4. Enter the connection criteria.
5. Click **Save**.

   You can now create data sets from the connection.

If you import a project containing a JDBC connection into an Oracle Analytics installation where the JDBC driver isn't installed, the import still works. However, the connection doesn't work when you try to run the project or Data Flow. You must recreate the JDBC connection and JDBC driver to a suitable data source.

Create Generic ODBC Connections

You can create generic ODBC connections to databases and use the connections to access data sources. For example, to connect to databases and database versions that aren't listed with the default connection types.

You can only use generic ODBC connections to connect on Windows systems.

1. Create the new ODBC data source in Windows.

   a. In Windows, locate and open the ODBC Data Source Administrator dialog.
   b. Click the **System DSN** tab, and then click **Add** to display the Create New Data Source dialog.
   c. Select the driver appropriate for your data source, and then click **Finish**.
   d. The remaining configuration steps are specific to the data source you want to configure.

      Refer to the documentation for your data source.

2. Create the generic ODBC data source.
   a. On the Data or Home page, click **Create**, then click **Connection**.
   b. In the Create Connection dialog, locate and click the **ODBC** icon.
   c. Enter the connection criteria. Note the following:
      - **Name** - Any name that uniquely identifies the connection.
      - **DSN** - The name of the system DSN that you set up on your computer.
   d. Click **Save**.

      You can now create data sets from the connection. See Create Data Sets from Databases.

If you import a project containing an ODBC connection into an Oracle Analytics Desktop installation where the ODBC DSN doesn't exist, and the ODBC driver isn't installed, the import still works. However, the connection doesn't work when you try to run the project or Data Flow. You must recreate the ODBC connection, and recreate the ODBC DSN, and ODBC driver to a suitable data source.

Connect to Oracle Autonomous Data Warehouse

You can create a connection to Oracle Autonomous Data Warehouse and use the connection to access data.

1. To enable secure communication between Oracle Analytics and Oracle Autonomous Data Warehouse, you must upload trusted SSL certificates from Oracle Autonomous Data Warehouse to Oracle Analytics.

   See Download Client Credentials (Wallets) in *Using Oracle Autonomous Database on Shared Exadata Infrastructure*.

   The credentials wallet file secures communication between Oracle Analytics and Oracle Autonomous Data Warehouse. The wallet file (for example, `wallet_ADWC1.zip`) that you upload must contain SSL certificates, to enable SSL on your Oracle Autonomous Data Warehouse connections.

2. To create a connection to Oracle Autonomous Data Warehouse:
   a. On the Home page, click **Create** then click **Connection**.
   b. Click **Oracle Autonomous Data Warehouse** to display the fields for the connection.
   c. Enter the connection details.
   d. For **Client Credentials** field, click **Select** to browse for the Client Credentials wallet file (for example, `wallet_ADWC1.zip`).

      The **Client Credentials** field displays the `cwallet.sso` file.

   e. Enter the **Username** and **Password**, and select a **Service Name** from the list.
   f. Save the details.

      You can now create data sets from the connection.

Connect to Oracle Autonomous Transaction Processing

You can create a connection to Oracle Autonomous Transaction Processing and use the connection to access data.

To enable secure communication between Oracle Analytics and Oracle Autonomous Transaction Processing, you must upload trusted SSL certificates from Oracle Autonomous Transaction Processing to Oracle Analytics.

See Download Client Credentials (Wallets) in *Using Oracle Autonomous Database on Shared Exadata Infrastructure*.

The credentials wallet file secures communication between Oracle Analytics and Oracle Autonomous Transaction Processing. The wallet file (for example, `wallet_SALESATP.zip`) that you upload contain SSL certificates, to enable SSL on your Oracle Autonomous Transaction Processing connections.

1. On the Home page, click **Create** then click **Connection**.
2. Click **Oracle Autonomous Transaction Processing**.
3. Enter the connection details.
4. For **Client Credentials**, click **Select** to browse for the Client Credentials wallet file (for example, `wallet_SALESATP.zip`).
5. Enter the **Username**, and **Password**, and select a **Service Name** from the list.
6. Click **Save**.

Connect to Oracle Talent Acquisition Cloud

You can create a connection to Oracle Talent Acquisition Cloud and use the connection to access data.

1. Click **Create** and then click **Connection**.
2. Click **Oracle Talent Acquisition** to display the fields for the connection.
3. Enter the connection details.
4. For **Host**, enter the URL for the Oracle Talent Acquisition data source.

   For example, if the Oracle Talent Acquisition URL is `https://example.taleo.net`, then the connection URL that you must enter is `https://example.taleo.net/smartorg/Bics.jss` .
5. Select an **Authentication** option.
   - Select **Always use these credentials**, so that the login name and password you provide for the connection are always used and users aren’t prompted to log in.
   - Select **Require users to enter their own credentials** when you want to prompt users to enter their user name and password to use the data from the Oracle Talent Acquisition Cloud data source. Users are required to log in see only the data that they have the permissions, privileges, and role assignments to see.

6. Click **Save**.

Connect to Snowflake Data Warehouse

You can create a connection to Snowflake Data Warehouse and use the connection to access data.

See format guidelines, `https://docs.snowflake.net/manuals/user-guide/connecting.html`.

1. On the Home page, click **Create**, and then click **Connection**.
2. Click **Snowflake Data Warehouse**.
3. Enter a Connection Name.
4. In **Hostname**, enter the host account name using the following format.

   `<account>.snowflakecomputing.com`

   Where `account` is the Snowflake account name that you want to use to access the data, for example: `exampleaccountname.snowflakecomputing.com`.
5. For **Username** and **Password**, enter user credentials with access to the Snowflake data source.
6. For **Database Name**, enter the name of the database containing the schema tables and columns that you want to connect to.
7. For **Warehouse**, enter the name of the warehouse containing the database, schema tables and columns that you want to connect to. For example, `Example-WH`.
8. Click **Save**.

Model Data in a Snowflake Data Warehouse

You can model data in a Snowflake Data Warehouse before you visualize the data.

1. Configure your environment to enable data modeling. See Configure Your Environment for Modeling Snowflake Data.
2. Create a modeling connection to your Snowflake Data Warehouse and model your data. See Create a Connection for Modelling Snowflake Data.

Configure Your Environment for Modeling Snowflake Data

Configure your environment so that you can model data in a Snowflake database.

You need a Data Gateway installation so that you can import and model your Snowflake tables using Developer Client Tool. You configure your Data Gateway agent with a suitable driver to connect to Snowflake. When you've modeled your Snowflake tables and uploaded the metadata repository (RPD) to Oracle Analytics, you can disable or remove Data Gateway (it isn't used when Oracle Analytics runs queries).

The connection pool in the data model uses a JDBC connection. Before you start, install Data Gateway and Oracle Analytics Developer Client Tool on the same Windows computer in your on-premises environment.

1. Configure the Oracle Analytics Server domain by downloading and installing the Snowflake JDBC driver so that BI users can run queries:
    a. Download the latest Snowflake JDBC driver (for example, in file snowflake-jdbc-3.9.0.jar).
    b. Copy the downloaded JAR file to the Oracle Analytics Server domain /lib folder:

       `OracleHome/user_projects/domains/bi/lib`
    c. Re-start Oracle Analytics Server.
2. Configure a local Data Gateway agent to so that you can use Developer Client Tool to import metadata and view data for modeling:
    a. Copy the downloaded Snowflake JDBC driver JAR file to the Data Gateway installation folder.

       In a personal deployment on Windows, copy the JAR file into: `<Data Gateway_extract_path>\thirdpartyDrivers`.
    b. Re-start Data Gateway.

Create a Connection for Modelling Snowflake Data

Connect to a Snowflake database so that you can model data.

1. In Oracle Analytics Developer Client Tool, enable the JDBC connection pool functionality by loading Java data sources.
    a. From the **File** menu, click **Open**, then **In the Cloud**, and use the Open in the Cloud dialog to specify the details of your Cloud data model.
    b. From the **File** menu, click **Load Java Data Sources**.
    c. At the Connect to Java Datasource Server dialog:
        - In the **Hostname** field, enter the machine name that you noted in Step 1. Fully qualify the hostname. For example, if you noted `machine` in Step 1, you might specify `machine.us.example.com`.
        - In the **Port** field, enter the port that you noted in Step 1. For example, `51811`.
        - In the **Username** and **Password** fields, enter `dummy` or any string (these credentials aren't validated because this is a public call to discover the capabilities advertised by the Data Gateway).
2. In Oracle Analytics Developer Client Tool, create a new database and set the type to Snowflake.
3. Add a Connection Pools and specify these details on the General tab:
    - **Call Interface**: JDBC(Direct Driver).
    - **Require fully qualified table names**: Yes.
    - **Data source name**: Enter the connection string, for example: jdbc:snowflake://xxxx.snowflakecomputing.com?db=ODEV&warehouse=xxxxxx&schema=xxxxxx
    - **RDC Version**: Leave this field blank.
4. On the Miscellaneous tab, specify these details:
    - **JDS Server URL**: Leave this field blank (remove any entry in this field).
    - **Driver Class**: `net.snowflake.client.jdbc.SnowflakeDriver`.

  - `Use SQL over HTTP`: false.

5. Model your data using this connection.
6. When you have completed your model, upload or save your repository (RPD) back to Oracle Analytics.

Note: Make sure that both your Developer Client Tool node where Data Gateway is installed, and your Oracle Analytics Server nodes have network access to the Snowflake endpoints.

Connect to NetSuite

Connect to a NetSuite (NetSuite2.com) data source to visualize ERP and CRM data.

When you analyze data from a NetSuite2.com data source, you create a connection to store connection details. To obtain the connection details for your NetSuite application, go to the NetSuite Portal home page, and navigate to **Settings** then **Set up SuiteAnalytics Connect**.

Use a Subject Area as a Data Set

A project can contain one or more subject areas. You can also create projects that contain subject areas and any other type of data source, for example a spreadsheet or database data source.

To see the list of available subject areas, click the **Subject Area** link in the Add Data Set page. The subject areas that display in this list are the same subject areas that you can use to create analyses in the Analyses Editor. Only the data to which you have the proper permissions to access and work with displays in the data set you select. Permissions are also applied when another user views or works with the projects that you create from data sets.

You can’t use Oracle Analytics to modify the subject areas like you do with other types of data sets. For example, you can’t exclude a column, change a column’s data type or aggregation rule, or change the column from a measure column to an attribute column. You must use the enterprise reporting and modeling tools to make changes to subject areas.

Add Spreadsheets as Data Sets

Topics

- About Adding Spreadsheets or Other Data Files
- Add a Spreadsheet from Your Computer
- Add a Spreadsheet from Dropbox or Google Drive
- Index File-Based Data Sets
- Certify Data Sets

About Adding Spreadsheets or Other Data Files

You can create data sets from data stored in Microsoft Excel spreadsheets (XLSX and XLS), CSV files, and TXT files. The maximum file size you can upload is 250 MB and the data column limit for a single file is 250 columns.

You must structure your Excel spreadsheets in a data-oriented way with no pivoted data. These rules apply for Excel tables:

- Tables must start in Row 1 and Column 1 of the Excel file.
- Tables must have a regular layout with no gaps or inline headings. An example of an inline heading is one that is repeated on every page of a printed report.
- Row 1 must contain the names of the columns in the table. For example, Customer Given Name, Customer Surname, Year, Product Name, Amount Purchased, and so on. In this example:
  - Column 1 has customer given names.
  - Column 2 has customer surnames.
  - Column 3 has year values.
  - Column 4 has product names.
  - Column 5 has the amount each customer purchased for the named product.
- The names in Row 1 must be unique. If two columns hold year values, then you must add a second word to one or both of the column names to make them unique. For example, if you have two columns named Year Lease, then you can rename the columns to Year Lease Starts and Year Lease Expires.
- Row 2 and greater must contain the data for the table, and those rows can't contain column names.
- Data in a column must be of the same type because it's often processed together. For example, the Amount Purchased column must contain only numbers (and possibly nulls), enabling it to be summed or averaged. The Given Name and Surname columns must contain text values because they might be concatenated, and you might need to split dates into months, quarters, or years.
- Data must be at the same granularity. A table can't contain both aggregations and details for those aggregations. For example, suppose that you have a sales table at the granularity of Customer, Product, and Year that contains the sum of Amount Purchased for each Product by each Customer by Year. In this case, you wouldn’t include invoice level details or daily summary values in the same table, because the sum of the Amount Purchased values wouldn't be calculated correctly. If you must analyze at the invoice level, the day level, and the month level, then you can do either of the following:
  - Have a table of invoice details: Invoice Number, Invoice Date, Customer, Product, and Amount Purchased. You can roll these up to the day, month, or quarter.
  - Have multiple tables, one at each granular level (invoice, day, month, quarter, and year).

Add a Spreadsheet from Your Computer

You can create a data set from an Excel spreadsheet (XLSX or XLS), CSV file, or TXT file located on your computer.

You can't import an Excel spreadsheet that contains pivoted data. See About Adding Spreadsheets or Other Data Files.

1. On the Home page, click **Create**, and then click **Data Set**.
2. Click **File** and browse to select an XLSX or XLS (with unpivoted data), CSV, or TXT file.
3. Click **Open** to upload and open the selected spreadsheet.
4. Make any required name, description, or column attribute changes.
5. If you're uploading a CSV or TXT file, then in the **Separated By**, **Thousand Separator**, and **Decimal Separator** fields, confirm or change the default delimiters.

   If needed, choose Custom in the **Separated By** field and enter the character you want to use as the delimiter. In the CSV or TXT file, a custom delimiter must be one character. The following example uses a pipe (|) as a delimiter: Year|Product|Revenue|Quantity|Target Revenue| Target Quantity.
6. Click **Add** to create the data set.

Add a Spreadsheet from Dropbox or Google Drive

You can upload Excel spreadsheets (XLSX or XLS), CSV files, and TXT files directly from Dropbox or Google Drive.

Before you start, you must set up a connection to Dropbox or Google Drive where your data files are stored. See Connect to Dropbox and Connect to Google Drive or Google Analytics.

- Confirm that the spreadsheet you want to use is either an Excel spreadsheet in .XLSX or .XLS format, a CSV file, or a TXT file.
- For an Excel spreadsheet, ensure that it contains no pivoted data.
- Understand how the spreadsheet needs to be structured for successful import.

1. In the Data page, click **Create** and click **Data Set**.
2. In the Create Data Set dialog, click the connection to Dropbox or Google Drive.
3. In the Data Set editor, search or browse the Dropbox or Google Drive directories and locate the spreadsheet that you want to use.

   You can use breadcrumbs to quickly move back through the directories.
4. Double-click a spreadsheet to select it.
5. Click **Add** to create the data set.

Index File-Based Data Sets

You can specify if and how to index data sets created from uploaded spreadsheet files.

A file-based data set must be indexed before you and the users you've given permission to access the data set can use it to build visualizations. You must certify the data set if you and other users want to use the Home page to search for its data.

The **Data Model** pane on the Search Index page controls which subject areas are indexed. See Configure Search Indexing.

1. In the Home page, click **Navigator** and select **Data**.
2. Locate the data set and click its **Actions menu** button and click **Inspect**.

   The Inspect Data Set Properties dialog is displayed.
3. Click the **Search** tab.
4. Click **Index Data Set for Searching** field and specify how you want the data set to be indexed.
   - Select **Names only** to index metadata for all attributes.
   - Select **Names and values** to index metadata and data for all attributes.
   - Select **Custom** to select the attributes that you want to index and how you want them indexed.
5. Optional: Use the Indexing Schedule section to specify when you want the data indexed.
6. Optional: If you want other users to access the data in the data set to build visualizations, then in the Inspect Data Set dialog, click the **Access** tab.
7. Confirm that the administrator is granted full control.
8. Use the Users and Roles tabs to add users and roles and set data access permissions as needed.
9. Click **Save**.

Certify Data Sets

When a user certifies a data set, the user is confirming that the data set contains good, reliable data that other users can search for from the Home page.

When users search from the Home page, the data in certified data sets is ranked high in the search results.

For best search results only certify the data sets that users need to find. Certifying all data sets yields too many search results. Oracle recommends that you first certify the minimum number of data sets and then certify additional data sets only as needed.

Before you perform this task, confirm that the data set you want to certify is ready for indexing and that users have been granted permissions to access the data set.

1. In the Home Page, click **Navigator** and select **Data**.
2. Locate the data set and click its **Actions menu** button and click **Inspect**.

   The Inspect Data Set dialog is displayed.
3. Click the **General** tab.

4. Go to the **Certified By** field and click the **Certify** button.
5. Click **Save**.

Share Your Data

When you add data, by default the data is visible only to you as the user who uploaded and owns it. You can share data with other users and control what access privileges they have.

1. In the Data Sources pane, right-click the data source, and select **Inspect**.
2. On the Permissions tab, double-click a user or role to grant access. Select the appropriate level of access:
    - **Full Control** — User can modify and set permissions on the data set.
    - **Modify** — User can read, refresh data, and edit data set properties
    - **Read** — User can view and create projects using this data set.
    - **No access** — User can't view or access the data set.
3. On the Permissions tab, click the **X** beside a user or role to remove it from the selection of permissions that you're managing.

Share a Data Source Connection

You can assign access permissions to the data source connections that you create or administer.

1. On the Home page click the **Navigator**. Click **Data**, and then click **Connections**.
2. Hover over the connection that you want to share. Select the connection, click the **Actions menu**, and then select **Inspect**.
3. Click **Access**, and use the tabs to grant access:
    - **All** - Share the connection with individual users or roles.
    - **Users** - Share the connection with individual users.
    - **Roles** - Share the connection with application roles (for example, BI Consumer), so that all users with those roles can use the connection.

    When users next log in, they can use connections that you've shared to visualize data from this database.

3

Prepare Your Data Set for Analysis

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

Topics

Typical Workflow to Prepare Your Data Set for Analysis

Here are the common tasks for performing data preparation actions in the Prepare canvas.

Task	Description	More Information
Apply enrichment recommendations	Enhance or add information to column data using the enrichment recommendations.	Accept Enrichment Recommendations
Apply transform recommendations	Modify column data using the transformation recommendations or available options.	Transform Data Using Column Menu Options
Change column properties	Change the column properties such as data type, number format.	Edit the Column Properties
Edit the data preparation script	Select and edit the changes applied to a column.	Edit the Data Preparation Script

About Data Preparation

You can transform and enrich the data that you're preparing for analysis.

When you create a project and add a data set 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 data set. The following types of recommendations are provided to perform single-click transforms and enrichments on the data:

- Global positioning system enrichments such as latitude and longitude for cities or zip codes.
- Reference-based enrichments, for example, adding gender using on the person’s first name as the attribute for make the gender decision.
- Column concatenations, for example, adding a column with the person’s first and last name.
- 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.
- 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.
- Full and partial obfuscation or masking of detected sensitive fields.
- Recommendations to delete columns containing detected sensitive fields.

You can also use and configure a wide range of data transformations from the column’s **Options** menu. See Transform Data Using Column Menu Options.

Applying Transformations

The data transformation and enrichment changes that you apply to a data set affect all projects and data flows that use the same data set. When you open the project that shares the data set, a message appears indicating that the project uses updated data. When you refresh the data in a data set, the preparation script changes are automatically applied to the refreshed data.

When you transform data, a step is automatically added to the Preparation Script pane. A blue dot indicates that a step hasn't yet been applied. After applying the script, you can make additional changes to the data set, or you can create a project.

Data Profiles and Semantic Recommendations

After creating a data set, the data set 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.

Topics

- Semantic Type Categories
- Semantic Type Recommendations
- Recognized Pattern-Based Semantic Types

- Reference-Based Semantic Types
- Recommended Enrichments
- Required Thresholds

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 data set, 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 data set, 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 the 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
- First Names (typical first names in the United States)
- Last Names (typical surnames in the United States)
- 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.

Accept Enrichment Recommendations

You can use the enrichment recommendations to enhance or add information to 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 project.

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.

If you don’t apply the Preparation Script and you close the project or the data set, you lose all the data changes you’ve performed.

1. Navigate to the enrich and transform canvas for your data set.
    - On the Home page, do one of the following:
        - Select a project, click the **Actions** menu, and the select **Open**. Click **Prepare** from the project Visualize page.
        - Select a data set, click the **Actions** menu, and then select **Open**.
2. Select a column to enrich, then in the Recommendation Panel, select a recommendation to add the change to the Preparation Script.
3. Continue implementing enrichment recommendations on the data set.
4. In the Preparation Script Panel, click **Apply Script** to apply the data changes to the entire data set.

   If you're working with a project, click **Save** and click **Visualize** to review the enriched columns.

Transform 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.

You can upload or open an existing data set to transform the data using column menu options. After making the changes to the data set, you can create a project or open an existing project and add the data set to the project.

The data transform changes update the column data using the selected option or add a new column to the data set.

The list of available menu options for a column depends on the type of data in that column. See Transform Recommendation Reference and Column Menu Options for Quick Data Transformations.

If you don’t apply the transformation script and close the project or the data set, you lose all the data transform changes you’ve performed.

1. Open a project, and click **Prepare**. In the Preview data panel, select a column to transform.
2. Click **Options**, and select a transformation option (for example, click **Edit** to display an Expression Editor that enables you to create complex functions, or click **Trim** to extract part of a column).
3. In the step editor, update the fields to configure the changes. You can review the changes in the data preview table.
4. Click **Add Step** to apply the data changes, close the step editor, and add a step to the Preparation Script Panel.
5. Continue implementing data transform changes in the data set.
6. Click **Apply Script** in the Preparation Script Panel to apply the data transform changes to the entire data set.
7. Optional: Click **Save**, and then click **Visualize** to see the transformed columns.

This example shows a Gender column with the data values F, f, M and m. You can use Group in the column menu options to change the column data to use Female and Male.

- Open the project or data set with the Gender column. If you're working on a project, go the Prepare canvas.
- Select the **Gender** column and click **Options**, then click **Group**.
- In the group editor, change the new column name to `Gender_Fix`.
- Change the name of Group 1 to `Female` and select **F** and **f**.
- Click **(+) Group** to add a new group and change the name to `Male`.
- Click **Add all** to select the remaining values in the Gender columns that should represent men.
- Click **Add Step** to include the new column Gender_Fix and standardized gender groups in the data set.
- In the Preparation Script pane, click **Apply Script** to apply the data changes.

Convert 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. Navigate to the transform editor for your data set.
   - **Projects -** If you open a project, click the Data page, and in the **Data Diagram**, select the data set you want to prepare.
     If the data set 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.
   - **Data Sets -** If you open a data set, you'll see the transform editor.
     If the data set 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.

   > **Note:**
   >
   > You can create data sets with multiple tables from most data sources. Exceptions include Oracle Applications, Google Analytics, Dropbox, Essbase, and local subject areas.

2. Hover over the column that you want to convert.
3. Click **Options**, for the conversion options, for example, **Convert to Number**, **Convert to Date**.
4. To further refine the format, select the column, and use the options on the properties pane.
5. If you want to change the Source Format's default value then click **Source Format** and select a format. For example, 2017.01.23, 01/23/2017, Mon, Jan 23, 2017, or Mon, Jan 23, 2017 20:00:00.

   The **Source Format** field automatically displays a suggested format based on the input column text. However, if the **Source Format** field doesn’t display a suggested format, for example, for Sat 03/28 2017 20:10:30:222, then you can enter a custom format.
6. Click **Custom** if you need to enter your own format into the field at the bottom of the Convert to Date/Time dialog.

   The custom format you enter must be in a format recognized by Oracle Business Intelligence before conversion. If you enter a custom format that isn’t recognized, an error message is displayed.
7. The **Hide Source Element** is selected by default and hides the original source column after conversion. If you deselect this option, the original column is displayed next to the converted column after conversion.
8. Click **Convert** to convert the text column into a date or time column.

   The changes you make apply to all projects using the data source with a modified date or time column.

Adjust the Display Format of Date or Time Columns

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, 2017` to `2017-11-01`, or change the level of granularity from year to month.

1. Open the project or the data set that includes the date and time column that you want to update. If you're working in a project, then confirm that you're working in the project's Prepare canvas.
2. Click the date column or time column you want to edit.
3. Adjust the format by doing one of the following:
   - Click **Options**, then **Extract** to display a portion of the date or time (for example, the year or quarter only).
   - In the properties pane, click the **Date/Time Format** tab, and use the options to adjust your dates or times (for example, click **Format**) to select from short, medium, or long date formats, or specify your own format by selecting **Custom** and editing the calendar string displayed.
4. If you're working in the Results area of the Data Panel, adjust the format by doing one of the following:
   - If you want to display just a portion of a calendar column (for example, the year or quarter only), then select and expand a calendar column and select the part of the date that you want to display in your visualization. For example, to only visualize the year in which orders were taken, you might click Order Date and select Year.
   - In the properties pane, click the **Date/Time Format** tab, and use the options to adjust your dates or times.
5. If you're working in table view, select the column header and click **Options**, then in the properties pane click Date/Time Format to display or update the format for that column.

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.

General Format String	Result
[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]`.
[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.
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`.

General Format String	Result
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.

Create 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. Open a project, and click **Prepare**. In the Preview data panel, select a column that you want to modify using the bin option.
2. Click **Options** for the selected column, and select **Bin**.
3. 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.
4. Click **Add Step** to apply the data changes, close the step editor, and add a step to the Preparation Script Panel.

Edit the Column Properties

You can view and edit the properties of each column in the project's Prepare canvas.

Column property changes aren't affected by data transform changes. For example, if you've updated the name of a column after you use a data transform change on the same column, the name of the column is updated automatically.
You must select the **Result** step in the Preparation Script Panel to edit column properties in the properties pane or metadata view.

1. Confirm that you're working in the Prepare canvas of a project.

   If you've added more than one data set to the project, go to the tabs at the bottom of the window and select a data set in which you want to edit the column properties.
2. In the Preparation Script Panel, select the **Results** step and do one of the following:
   a. In the Metadata view data panel or Data Panel, select a column.
      - In the properties pane, use the General tab to change the selected column properties such as Treat As and Data Type.

   b. Click the view selector list on the Metadata view data panel toolbar and select metadata view, then click a row in the Metadata view data panel.

      You see the properties that you can edit (such as Data Element, Data Type, and Aggregation) in the Preview data panel. Each row represents a column in the data set.
      - Click a data element and click a property you want to edit, then select an option. For example, you might change the aggregation type from Sum to Average.
      - Toggle the checkbox in the Hidden column to hide and unhide a data column in the data set.

   For each property change, a step is added to the Preparation Script Panel, alongside any data transformation changes you have applied to the data set using the column's **Options** menu or the Recommendation Panel.
3. Click **Apply Script** in the Preparation Script Panel to apply the property changes to the data set.

The Hidden columns icon at the bottom of the window shows the number of hidden columns in the data set and is available for all views. You can click the Hidden columns icon to unhide one or all hidden columns.

You can also use the column menu options to hide a column. But you can only use the metadata view or Hidden columns icon to unhide a column.

Edit the Data Preparation Script

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

Both before and after you've executed **Apply Script**, you can edit the data transformation steps. The edit option isn't available for all types of transform steps. If you're editing the steps after executing **Apply Script**, you must re-apply the script to the entire data set. If you don't save the updates to a step and navigate to another step, a warning message is displayed indicating that you haven't 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. Open a project or data set.

   If you're working with a project, go to the Prepare canvas and click the data set you want to edit.
2. Select a step in the Preparation Script pane and click **Edit Transform**.
3. Select a transform step in the Preparation Script pane and click the pencil icon or **Edit Transform**.

   If a step isn't 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. Click **Apply Script** in the Preparation Script pane to apply the data transform changes to the entire data set.

Add Columns in Data Preparation

You can create new columns to enhance your data.

1. Open a project or data set.

   If you're working with a project, go to the Prepare canvas and click the data set you want to edit.
2. In the Preparation Script pane, click **Add Preparation Step**.

   Alternatively, to create a column similar to an existing column, click **Options** on the column, and click **Create**.
3. Use the Create Column pane to specify the column details.

   Use the function picker to use operators and mathematical functions in your column. For example, you might specify `COLUMN1+COLUMN2` to calculate the sum of values in COLUMN1 and COLUMN2.
4. Click **Add Step**.

Transform 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. In your project (on the Prepare pane) or data set editor, select the text column that you want to transform.
2. Click **Options**, and then click **Replace**.
3. 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".
4. 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 won't 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.
5. Click **Add Step** to save the details and add the transform step to the Preparation Script pane.

   You apply the transformation when you click **Apply Script**.

Example Replace Transforms Using Regular Expressions

Here're just a few examples of using regular (regex) expressions to transform data.

In these examples, the Search Expression column shows what you'd enter in the **String to replace** field, and the Replace Value shows what you'd enter in the **New string** field.

Table 3-1 Example replace transforms

Search Expression	Replace Value	Original Text	Replaced Text	Notes
`@([a-z]+)(?=\.[a-z]{3})`	@example	MichelePFalk@yahoo.com	MichelePFalk@example.com	This example replaces domain details in email addresses.

Table 3-1 (Cont.) Example replace transforms

Search Expression	Replace Value	Original Text	Replaced Text	Notes
`^Gray|Grey$`	Silver	Grey Gray Graystone	Silver Silver Graystone	The ^$ characters mean only look for entire string matches. The vertical bar is the regular expression for OR, so in this case the regular expression looks for either "Gray" or "Grey" and replace with "Silver". The string Graystone isn't transformed because the regular expression is looking for entire value matches only.
`\d+`	9999	8398 Park Street 123 Oracle Parkway	9999 Park Street 9999 Oracle Parkway	This regular expression looks for one" \d" or more "+" digits and replaces them with "9999". The replace also works when the original text has only three digits.
`([A-z]+)(\d+)`	$2	UA101654 US829383	101654 829383	This regular expression is looking for one "[A-z]" or more "+" consecutive letters followed by one" \d" or more "+" digits - each of the two expressions is bounded by parentheses, which captures two groups - the first one ([A-z]) and the second one (\d+) - these groups are numbered automatically and can then be used in the replacement by using the dollar sign for the second group, for example, "$2".
`([A-z]+)(\d+)`	Postal Code: $2	UA101654 US829383	Postal Code: 101654 Postal Code: 829383	This example uses the same match expression as the previous example, except that it shows how to insert your own replacement text in addition to a group. Text can be inserted before and after a recalled match group.

4

Manage Data and Data Sets

This topic describes the functions available to manage the data that you added from data sources.

Topics:

- Typical Workflow to Manage Added Data
- Manage Data Sets
- Types of Data You Can Refresh
- Refresh Data in a Data Set
- Update Details of Data that You Added
- Delete Data Sets
- Rename a Data Set
- Duplicate Data Sets
- Blend Data that You Added
- About Mismatched Values in Blended Data
- Change Data Blending in a Project
- View and Edit Object Properties

Typical Workflow to Manage Added Data

Here are the common tasks for managing the data added from data sources.

Task	Description	More Information
Refresh data	Refresh data in the data set when newer data is available. Or refresh the cache for Oracle Applications and databases if the data is stale.	Refresh Data in a Data Set
Update details of added data	Inspect and update the properties of the added data.	Update Details of Data that You Added
Manage data sets	See the available data sets and examine or update a data set's properties.	Manage Data Sets
Renaming a data set	Rename a data set listed on the data sets page.	Rename a Data Set
Duplicate data sets	Duplicate a data set listed on the data sets page.	Duplicate Data Sets
Blend data	Blend data from one data source with data from another data source.	Blend Data that You Added About Mismatched Values in Blended Data

Manage Data Sets

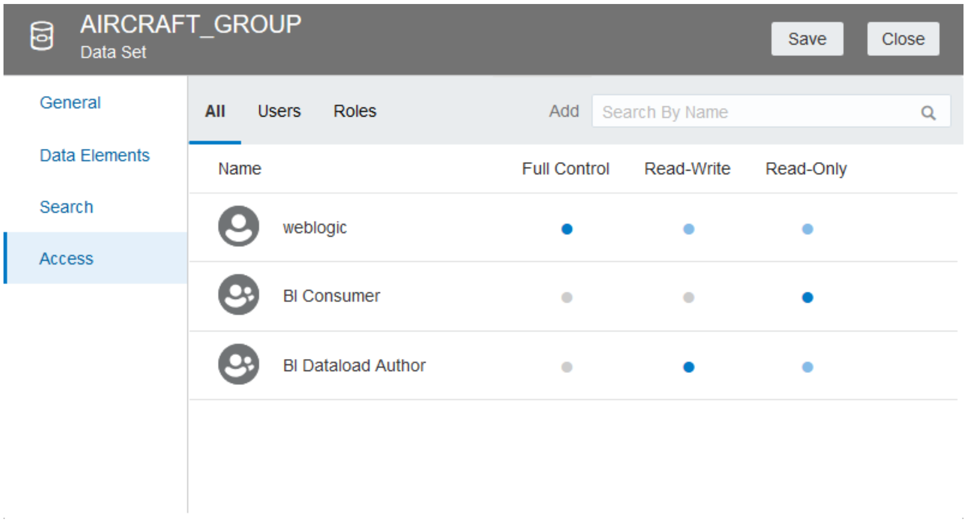
You can update and delete the data that you added from various data sources.

You can use the Data Sets page to examine data set properties, access permissions, and free up space by deleting data sets that you no longer need.

1. Go to the **Data** page, then **Data Sets** section.
2. Click the **Actions menu** of a data set or right-click the data set that you want to manage, and click **Inspect**.
3. Optionally, use the **Inspect** option to review data set columns and change the data set properties. For example, you can change the Name and Description.
4. Optionally, use the **Inspect** option to change whether to treat data set columns as measures or attributes.

   You can't change how a column is treated if it's already matched to a measure or attribute in the data model.
5. Optionally, use the **Inspect** option to specify the access permissions that users and roles have for the data.

   You're allowed to set permissions on some data sources, such as uploaded data sets. See Control Share of Data You Added.



Name	Full Control	Read-Write	Read-Only
weblogic	●	○	○
BI Consumer	○	○	●
BI Dataload Author	○	●	○

6. Optionally, use the **Inspect** option to change the Data Access for a database table. The default is **Live** because database tables are typically large and shouldn't be copied to cache. If your table is small, then select **Automatic Caching** and the data is copied into the cache if possible. If you select **Auto**, then you have to refresh the data when it's stale.
7. Optionally, download a data set created from a Microsoft Excel file by right-clicking the data set and selecting **Download File**. Note that the columns in the download match the columns in the file that you originally uploaded. Any derived columns that you added in the Visualize editor's Prepare canvas aren't included in the data set download.
8. Optionally, update data for a data set created from a Microsoft Excel file or Oracle Applications by right-clicking the data set and selecting **Reload Data**.

If you have Full Control permissions, you can grant permissions to others and delete uploaded data sets, but be careful not to delete a data file that is still a data source for projects. See Delete Data that You Added.

Types of Data You Can Refresh

After you add data, the data might change, so you must refresh the data from its source.

Rather than refreshing a data set, you can replace it by loading a new data set with the same name as the existing one. However, replacing a data set can be destructive and is discouraged. Don't replace a data set unless you understand the consequences:

- Replacing a data set breaks projects that use the existing data set if the old column names and data types aren't all present in the new data set.
- Any data wrangling (modified and new columns added in the data stage) is lost and projects using the data set are likely to break.

Databases

For databases, the SQL statement is rerun and the data is refreshed.

CSV or TXT

To refresh a CSV or TXT file, you must ensure that it contains the same columns that are already matched with the date source. If the file that you reload is missing some columns, then you'll see an error message that your data reload has failed due to one or more missing columns.

You can refresh a CSV or TXT file that contains new columns, but after refreshing, the new columns are marked as hidden and don't display in the Data Panel for existing projects using the data set.

Excel

To refresh a Microsoft Excel file, you must ensure that the newer spreadsheet file contains a sheet with the same name as the original one. In addition, the sheet must contain the same columns that are already matched with the data source. If the Excel file that you reload is missing some columns, then you'll see an error message that your data reload has failed due to one or more missing columns.

You can refresh an Excel file that contains new columns, but after refreshing, the new columns are marked as hidden and don't display in the Data Panel for existing projects using the data set. To resolve this issue, use the **Inspect** option of the data set to show the new columns and make them available to existing projects.

Oracle Applications

You can reload data and metadata for Oracle Applications data sources, but if the Oracle Applications data source uses logical SQL, reloading data only reruns the statement, and any new columns or refreshed data won't be pulled into the project. Any new columns come into projects as hidden so that existing projects that use the data set aren't affected. To be able to use the new columns in projects, you must unhide them in data sets after you refresh. This behavior is the same for file-based data sources.

Refresh Data in a Data Set

You can refresh data in a data set from all source types such as databases, files, and Oracle Applications.

1. If you're in a project:
    - On the Visualize canvas, click **Refresh Data** to ensure that you see the most up-to-date data (by re-executing the visualization queries for all views in your project).
2. If you're on the **Data Sets** panel on the Data page, click **Actions menu** next to a data set and select **Reload Data**.

    After you reload a data set, in each project that uses that data set, on the Visualize canvas, click **Refresh Data**.

Update Details of Data that You Added

After you add data, you can inspect its properties and update details such as the name and description.

1. Go to the Data page and select **Data Sets**.
2. Select the data set whose properties you want to update and click the **Actions menu** or right-click, then select **Inspect**.
3. View the properties in the following tabs and modify them as appropriate:
    - General
    - Data Elements
    - Search
    - Permission

Delete Data Sets

You can delete data sets when you need to free up space on your system.

Deleting a data set permanently removes it and breaks any projects that use the deleted data set. You can’t delete subject areas that you’ve included in projects. Deleting data differs from removing a data set from a project.

1. Go to the Data page and select **Data Sets**.
2. Select the data set you want to delete and click the **Actions Menu** or right-click, then select **Delete**.

Rename a Data Set

Renaming a data set helps you to quickly search and identify it in the data set library.

Even if you change the name of a data set, that change doesn't affect the reference for the project; that is, the project using the specific data set continues to work.

1. Go to the Data page and select **Data Sets**.

2. Select a data set and click the **Actions menu** or right-click, then select **Open**.
3. Click **Edit Data Set** on the Results toolbar.
4. Select the last step and go to the **Name** field, then change the value.
5. Click **Save**.

If a data set with the same name already exists in your system, an error message is displayed. Click **Yes** to overwrite the existing data set (with the data set whose name you're changing) or cancel the name change.

Duplicate Data Sets

You can duplicate an uploaded data set that is listed in the Data Sets page to help you further curate (organize and integrate from various sources) data in projects.

For example, suppose an accounts team creates a specific preparation of a data set, and a marketing team wants to prepare the same data set but in a different way. The marketing team duplicates the data set for their own purposes.

1. Go to the Data page and select **Data Sets**.
2. Select a data set that you want to duplicate and click the **Actions menu** or right-click, then select **Duplicate**.
   - The duplication happens immediately.
   - The default name of the duplicated data set is `<Data set>Copy`.
   - If the data set name already exists, the new name is set to `<Data set>Copy#` in sequential order based on available names.
   - You can rename the duplicate data set by editing it in the Inspector dialog.
   - The user that duplicates the data set becomes the owner of the new data set.
   - Any user who can view a data set can also duplicate the data set.
   - All properties on the new data set, unless specifically stated, are reset (as if it’s a new data set). For example, ACL, certified, indexed, custom-attributes.
   - Data preparation changes made on the source are retained in the new data set.
   - Conformance rules on the source are retained in the new data set.

Blend Data that You Added

You might have a project where you added multiple data sets. You can blend data from one data set with data from another data set.

Video

For example, Data Set A might contain new dimensions that extend the attributes of Data Set B. Or Data Set B might contain new facts that you can use alongside the measures that already exist in Data Set A.
When you add more than one data set to a project, 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 data set.

Data sets that aren't joined are divided by a line in the Data Panel of the project. If the project includes multiple data sets and if any aren't joined, then you'll see restrictions between data elements and visualizations. For example, you can't use the data elements of a data set in the filters, visualizations, or calculations of another data set if they're not joined. If you try to do so, you see an error message. You can match data elements of data sets that aren't joined in the Data Diagram of a project, or you can create individual filters, visualizations, or calculations for each data set.

You can specify how you want the system to blend your data.

1. Add one or multiple data sets to your project. Confirm that you're working in the Prepare canvas.
2. Go to the tabs at the bottom of the Prepare canvas and click **Data Diagram**. Alternatively, in the Data Panel, right-click and select **Data Diagram**.
3. Click the number along the line that connects the external source to the newly loaded source to display the Connect Sources dialog.
4. In the Connect Sources dialog, make changes as necessary.
   a. To change the match for a column, click the name of each column to select a different column from the data sets.

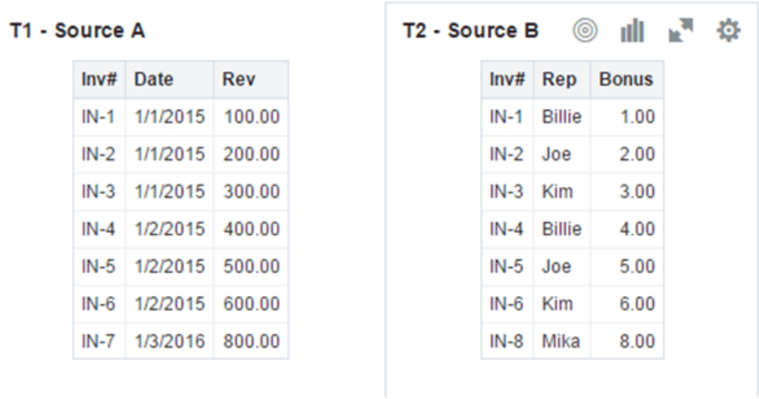
      If columns have the same name and same data type, then they’re recognized as a possible match. You can customize this and specify that one column matches another by explicitly selecting it even if its name isn’t the same. You can select only those columns with a matching data type.
   b. Click **Add Another Match**, and then select a column from the data sets to match.
   c. For a measure that you’re uploading for the first time, specify the aggregation type such as *Sum* or *Average*.
   d. Click the **X** to delete a match.
5. Click **OK** to save the matches.

About Mismatched Values in Blended Data

In some cases when the rows of data that you expect to see in a data set are missing, then you must specify which data set to use for data blending.

Sometimes rows of data are missing when your project includes data from two data sets that contain a mixture of attributes and values, and there are match values in one source that don’t exist in the other.

Suppose we have two data sets (Source A and Source B) with slightly different rows, as shown in the following image. Note that Source A doesn‘t include IN-8 and Source B doesn’t include IN-7.



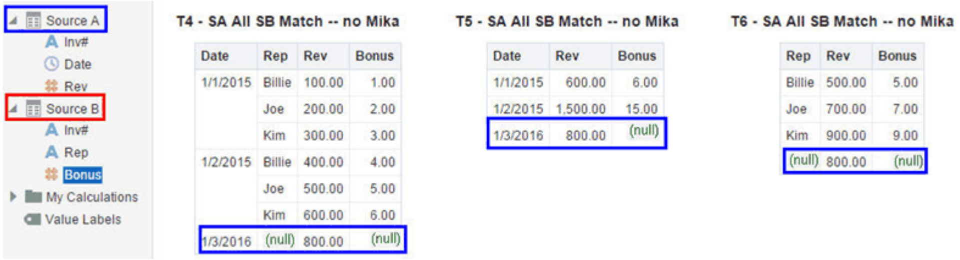
T1 - Source A

Inv#	Date	Rev
IN-1	1/1/2015	100.00
IN-2	1/1/2015	200.00
IN-3	1/1/2015	300.00
IN-4	1/2/2015	400.00
IN-5	1/2/2015	500.00
IN-6	1/2/2015	600.00
IN-7	1/3/2016	800.00

T2 - Source B

Inv#	Rep	Bonus
IN-1	Billie	1.00
IN-2	Joe	2.00
IN-3	Kim	3.00
IN-4	Billie	4.00
IN-5	Joe	5.00
IN-6	Kim	6.00
IN-8	Mika	8.00

The following results are displayed if you select the **All Rows** data blending option for Source A and select the **Matching Rows** data blending option for Source B. Because IN-7 doesn't exist in Source B, the results contain null Rep and null Bonus.



T4 - SA All SB Match -- no Mika

Date	Rep	Rev	Bonus
1/1/2015	Billie	100.00	1.00
	Joe	200.00	2.00
	Kim	300.00	3.00
1/2/2015	Billie	400.00	4.00
	Joe	500.00	5.00
	Kim	600.00	6.00
1/3/2016	(null)	800.00	(null)

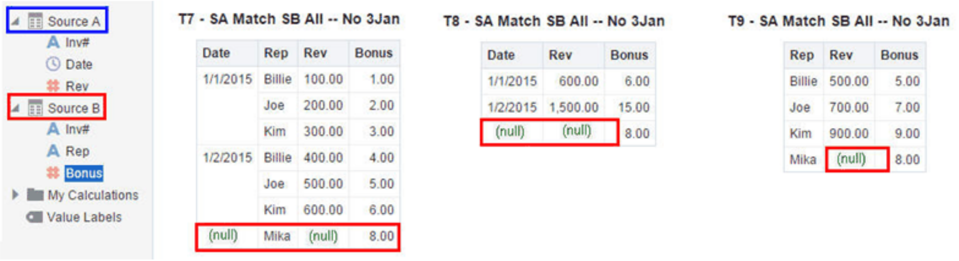
T5 - SA All SB Match -- no Mika

Date	Rev	Bonus
1/1/2015	600.00	6.00
1/2/2015	1,500.00	15.00
1/3/2016	800.00	(null)

T6 - SA All SB Match -- no Mika

Rep	Rev	Bonus
Billie	500.00	5.00
Joe	700.00	7.00
Kim	900.00	9.00
(null)	800.00	(null)

The following results are displayed if you select the **Matching Rows** data blending option for Source A and select the **All Rows** data blending option for Source B. Because IN-8 doesn't exist in Source A, the results contain null Date and null Revenue.



T7 - SA Match SB All -- No 3Jan

Date	Rep	Rev	Bonus
1/1/2015	Billie	100.00	1.00
	Joe	200.00	2.00
	Kim	300.00	3.00
1/2/2015	Billie	400.00	4.00
	Joe	500.00	5.00
	Kim	600.00	6.00
(null)	Mika	(null)	8.00

T8 - SA Match SB All -- No 3Jan

Date	Rev	Bonus
1/1/2015	600.00	6.00
1/2/2015	1,500.00	15.00
(null)	(null)	8.00

T9 - SA Match SB All -- No 3Jan

Rep	Rev	Bonus
Billie	500.00	5.00
Joe	700.00	7.00
Kim	900.00	9.00
Mika	(null)	8.00

The visualization for Source A includes Date as an attribute, and Source B includes Rep as an attribute, and the match column is Inv#. Under dimensional rules, you can't use these attributes with a measure from the opposite table unless you also use the match column.

There are two settings for blending tables that contain both attributes and measures. These are set independently in each visualization based on what columns are used in the visualization. The settings are **All Rows** and **Matching Rows** and they describe which source rows the system uses when returning data to be visualized.

The system automatically assigns data blending according to the following rules:

- If the visualization contains a match column, then the system sets sources with the match column to **All Rows**.

- If the visualization contains an attribute, then the system sets its source to **All Rows** and sets the other sources to **Matching Rows**.
- If attributes in the visualization come from the same source, then the system sets the source to **All Rows**, and sets the other sources to **Matching Rows**.
- If attributes come from multiple sources, then the system sets the source listed first in the project's elements panel to **All Rows** and sets the other sources to **Matching Rows**.

Change Data Blending in a Project

You can change data blending in a project with multiple data sets. Data blending specifies which data set takes precedence over the other.

1. Select a visualization on the canvas that uses more than one data set and in the properties pane click **Data Sets**.
2. To change the default blending, click **Data Blending**, and select either **Auto** or **Custom**.

   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**.

Add or Update Data Set Permissions

You can assign users and roles and access permissions (Full Control, Read-Write, and Read-Only) to a data set that you create or administer.

A data set's default permissions are based on roles. Roles and the permissions you assign in the **Access** tab determine who can access the data set and what they can do with the data set. For example, create project, open, inspect, refresh data, and download.

1. In the Home Page, click **Navigator**, and then click **Data**.
2. Click **Data Sets**, and then navigate to the data set that you want to update permissions for.
3. Hover over the data set, 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.
5. Click **Save**.

View and Edit Object Properties

You can view and edit the properties of standalone objects such as projects, data sets, connections, and data flows.

For example, you can check and modify the access permissions to specify the users who can change or read a data set, or see the source and target data sets for the data flow.

You can use the object inspector in the Home, Data, Catalog, and other top-level pages to view and edit the properties of an object. Based on the object's level, the properties also provide references to other objects, such as lower level objects that are part of the object that you're inspecting and other standalone objects that are referenced or used by that object. For example, a project property provides a list of data sets that are included in the project. The properties of lower level objects aren't part of the top-level object's inspector (such as data set properties), so they're not displayed as part of a project's properties. You can inspect the properties of the following objects:

- Projects
- Data Sets
- Connections
- Data Flows
- Sequences
- Schedules
- Folders

For example, perform the following steps to view or edit data flow properties in the inspector.

1. Go to the Data page and select **Data Flows**, then locate a data flow whose properties you want to view or edit.
2. Click the data flow's **Actions menu** or right-click and select **Inspect**.
3. In the Inspector dialog, check and modify the object properties (such as Name and Description).
4. In the Inspector dialog, modify the object properties (such as Name and Description). Common and type-specific properties are organized in tabs in the Inspector dialog, and the following tabs are displayed:
   - **General** - Lists standard life-cycle properties (such as Name, Description, Created By, and Modified By) that are common to all types of object.
     This tab also lists high-level properties (such as Type, File Name, File Size, and Location), depending on the type of object that you're inspecting.
   - **Sources/Targets** - Lists the source and target data sets for the data flow. The Parameter Name column is displayed if you've applied parameters to the data flow.
   - **Schedules** - Lists schedules for the object (such as Name, Frequency, and Next Start Time of the schedule).
   - **History** - Lists the recent activity for the object.
   - **Permissions** - Lists each user's levels and level of permission.
   - **Related** - Lists objects that are related, referenced, or used by the object that you're inspecting. The objects listed depend on the type of object that you're inspecting.

The Inspector dialog also displays other specific tabs (such as Data Elements, Parameters, and Data Flows), depending on the type of object that you’re inspecting.

5. Click **Save**.

5

Visualize and Analyze Data

This topic describes the many ways you can explore and analyze your data.

Video

Topics

Typical Workflow for Exploring Data

Here are the common tasks for exploring your data.

Task	Description	More Information
Create a project and add data sets	Create a new project and add one or more data sets to the project.	Create a Project and Add Data Sets
Add data elements	Add data elements (for example, data columns or calculations) from the selected data set to visualizations on the Prepare canvas.	Build a Visualization by Adding Data from Data Panel
Adjust the canvas layout	Add, remove, and rearrange visualizations.	Adjust the Visualize Canvas Layout and Properties
Filter content	Specify how many results and which items to include in visualizations.	Create and Apply Filters
Build stories	Capture your insights about visualizations within a story to revisit later, include in a presentation, or share with a team member.	Build Stories
Discover data insights	Use Diagnostic Analytics (Explain) to show patterns and uncover insights in your data set, and add the visualizations that Explain provides to your projects.	Use Explain to Discover Data Insights
Visualize reporting data	Visualize data in an analysis.	Visualize Data in an Analysis

Create a Project and Add Data Sets

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

When you create a project, you add one or more data sets containing the data that you want to visualize and explore. Data sets contain data from subject areas, Oracle Applications, databases, or uploaded data files such as spreadsheets. You can also add multiple data sets to your existing projects.

You can use the Data Set page to familiarize yourself with all available data sets. Data sets have distinct icons to help you quickly identify them by type.

1. To create a new project, go to the Home page, click **Create**, then click **Project**.
2. You can add data to a project using one of the following options:
   - If you're working with a new project, then in the Add Data Set dialog browse and select the data sources that you want to analyze, then click **Add to Project**.
     You can add data sources based on data sets, subject areas, or database connections.

    - If you’re working with an existing project, then in the Data Panel click **Add** (+), then **Add Data Set** to display the Add Data Set dialog and add a data source.
    - You can also create a new data source based on a file, subject area, or connection using the Create Data Set dialog, then add it your projects.

3. Drag the data elements that you want to visualize from the Data Panel onto the visualization canvas, and start building your project. .
    - You can transform your data set to improve the quality of your analysis and visualization using data preparation script in the Prepare canvas.

Build a Visualization by Adding Data from Data Panel

You can build visualizations by adding data elements such as measure, text, or attribute from the Data Panel to a canvas.

As you build the visualization, you add as many data elements as required or move them to specific areas on the canvas to explore and analyze your data.

Topics:

- Different Methods to Add Data
- Automatically Create Best Visualization
- Add Data to the Visualization Using Grammar Panel
- Add Data to the Visualization Using Assignments Panel
- Modify a Visualization's Tooltips

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.

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 Best Visualization

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

1. Confirm that you're working in the Visualize canvas.
2. 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.
3. 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:

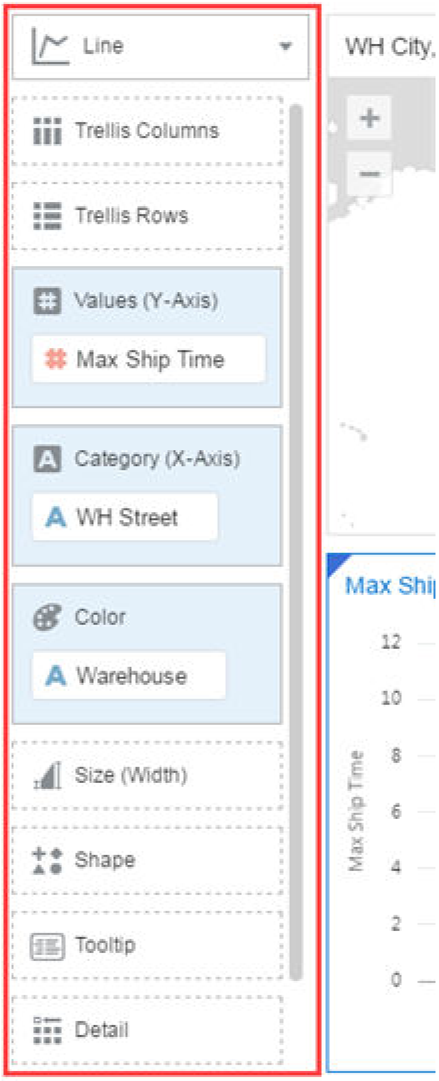
- Changing the visualization properties such as type.
- Adding or removing analyses from the Analytics tab in the Data Panel.
- Dropping a data element onto a specific area of the Grammar Panel or Assignments Pane.
- Changing the filter setting.

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.

Add Data to the Visualization Using Grammar Panel

After you've selected the data sets 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 data sets and drop them onto the Grammar Panel 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. Open or create a project.
2. If you created a project, then add a data set to it.
3. Confirm that you’re working in the Visualize canvas.

   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**.

Add Data to the Visualization Using Assignments Panel

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

You must create a project or open an existing project and add one or more data sets to the project 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. Confirm that you’re working on the Visualize canvas.
2. 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.
3. 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.
4. Drop the data element on the selected assignment.

To display the Assignment Panel, click **Show Assignments** on the visualization toolbar.

Modify 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.

Note the following restrictions:

- You can drag and drop only measure columns to the Tooltip section in the Grammar Panel.
- The Tooltip section in the Grammar Panel doesn't display for all visualization types.

1. Confirm that you’re working on the Visualize canvas and select a visualization.
2. 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.

3. 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**.

Use 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.

Topics:

- Add Advanced Analytics Functions to Visualizations
- Add Reference Lines to Visualizations

Add Advanced Analytics Functions to Visualizations

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

1. Confirm that you’re working in the Visualize canvas.
2. To display the available advanced analytic functions, click the **Analytics** icon in the Data Panel.
3. To edit the applied advanced analytics in a visualization, highlight the visualization, and in the properties pane click the **Analytics** icon.
4. To add advanced analytic functions to a visualization, do one of the following:
   - Drag and drop an advanced analytic function (such as Clusters, Outliers, Reference Line) from the **Analytics** pane to a visualization.
   - Right-click a visualization, and select an advanced analytic function.
   - In the properties pane select the **Analytics** icon and click **Add (+)**, then select a function such as **Add Clusters** or **Add Outliers**.

Add Reference Lines to Visualizations

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

1. Confirm that you’re working on the Visualize canvas.
2. In the Data Panel, click the **Analytics** icon.

3. Drag and drop **Reference Line** into a visualization. Alternatively, you can double-click **Reference Line** to add it to the selected visualization.
4. In the properties pane select the **Analytics** tab and do the following:
   a. Click the current **Method** and select **Line** or **Band**.
   b. Click the current reference **Function** (for example, **Average** and **Custom**) and select the reference function that you want to use.
   c. If you choose the **Line** method, you can select reference functions such as **Median**, **Percentile**, **Top N**, and **Constant**.
      - **Percentile** - Percentile rank number ranks the percentile of the data element added to the visualization.
      - **Top N** - N value marks the highest values (ranked from highest to lowest) of the data element added to the visualization.
      - **Bottom N** - N value marks the lowest values (ranked from highest to lowest) of the data element added to the visualization.
   d. If you choose the **Band** method, you can select either **Custom** or **Standard Deviation** as the reference function.
      - **Custom** - Select the *to and from* range of the data element values (such as **Median** to **Average**).
      - **Standard Deviation** - Select a value from 1 to 3 to show the standard deviation for the selected value of the data element.
5. Click **Save**.

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

Use Spark Charts to Examine Trends

You can add a spark chart to a tile visualization to view aggregate data trends over time.

1. Open or create a project and click **Visualize**.
2. In the Data pane, drag an aggregate data element to the canvas to create a tile visualization. For example, select **Revenue**.
3. In the Data pane drag a time-based data element to **Category (Chart)** to add a spark chart to the tile visualization. For example, select and drag **Month**.

   The red dot on the spark chart line shows the lowest value, and the green dot shows the highest value. The tooltip shows the first, last, lowest, highest and average aggregate values for the selected category. Hover your cursor anywhere over the spark chart to display the tooltip.
4. If you want to add a filter, drag a data element from the Data pane to **Click here or drag data to add a filter**.

   For example, **Year**.
   The filter changes the spark line to show the trend for the filtered data.
5. If you want to change spark chart display settings, click General in the Properties pane.
   - Click **Chart** to display one of the following spark charts, Line, Bar, or Area.

- Click **Reference Line** to display or remove a reference line. Use the **Average** option to display a reference line showing the average trend. Use the **None** option to remove the reference line.
- Click **High/Low Marks** to hide or show the high and low marks, displayed as a green and a red dot.

6. Click **Save**.

Create Calculated Data Elements in a Data Set

You can create a new data element (typically a measure) to add to your visualization. For example, you can create a new measure called Profit that uses the Revenue and Discount Amount measures.

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

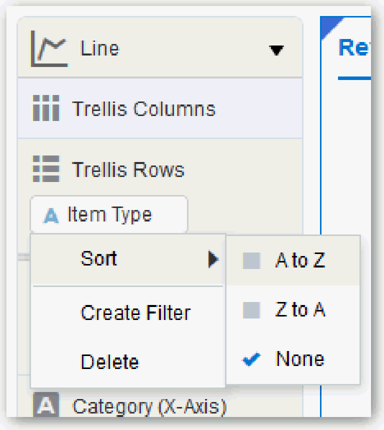
1. In the Visualize canvas navigate to the bottom of the Data Panel, right-click My Calculations, and click **Add Calculation** to open the New Calculation dialog.
2. Enter a name.
3. In the expression builder pane, compose and edit an expression. See About Composing Expressions.

   You can drag and drop a column into the expression builder pane only if the column is joined to the data set.
4. Click **Validate**.
5. Click **Save**.

Sort 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.

- 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, 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).

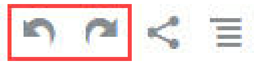


Undo and Redo Edits

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. For example, in the Create Data Set page, you've selected an analysis from an Oracle Application data source to use as a data set in the project. In the next step, if you use the undo option to remove the data set, you can't redo this change.

- 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 project, click **Menu** on the project 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 project for the first time. This option is automatically disabled if you select the **Auto Save** option.

Refresh Data in a Project

Refresh ensures that you see the most up-to-date data in your projects.

- On the Visualize canvas, click **Refresh Data**. This option ensures that you see the most up-to-date data by re-executing the visualization queries for all views in your project.

Pause Data Queries in a Project

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

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

1. Open or create a project.
2. If you've created a project, then add a data set to it.
3. Confirm that you’re working in the Visualize canvas.
4. Click the **Auto Apply Data** button to pause data queries.

   Data queries are temporarily disabled.
5. Make changes to a visualization in the project.

   Your changes are displayed but data isn't updated, and a bubble is displayed indicating the number of data requests that have been skipped.
6. Click the bubble if you want to refresh the data now.

   Data queries are still disabled.
7. Click the **Auto Apply Data** button to re-enable data queries.

Adjust the Visualize Canvas Layout and Properties

You can use the Visualize canvas' options to perform many different tasks. For example, copy and paste a visualization or the whole canvas, copy a visualization's data, or adjust the canvas' properties.

1. To access canvas properties, right-click a canvas tab and click **Canvas Properties**.
2. To access the canvas options, right-click a canvas tab. For example, **Add**, **Rename**, **Duplicate**.
3. To access visualization options, click **Menu**, then **Edit**. or right-click a visualization.

Visualize Canvas Layout and Properties

Use the Visualize canvas' options to perform many different tasks. For example, copy and paste a visualization or the whole canvas, copy a visualization's data, or adjust the canvas' properties.

Options:

Option	Location	Description
Canvas Properties	Right-click a canvas tab	Change the name, layout, width, and height of the canvas in the Canvas Properties dialog. Use the **Synchronize Visualizations** setting to specify how the visualizations on your canvas interact.

Option	Location	Description
Canvas Layout	Right-click a canvas tab	Select **Canvas Properties**, **Layout**, and one of the following: • **Freeform** – If you select Freeform, you can perform the following functions: – **Select All Visualizations** selects all the visualizations on a canvas for you to copy. – **Order Visualization** and options: Bring to Front, Bring Forward, Send Backward, or Send to Back moves a visualization on a canvas with multiple visualizations. – Rearrange a visualization on the canvas using drag and drop to a space between visualizations where you want to place it. The target drop area is displayed with a blue outline. – Resize a visualization by dragging its edges to the appropriate dimensions. • **Auto Fit** – Auto-arrange or correctly align the visualizations on a canvas with multiple visualizations. Resize a visualization by dragging its edges to the appropriate dimensions: – Resize one visualization by using **Ctrl** and dragging a visualization edge to an appropriate dimension. Other visualizations resize to fit the remaining space. – Resize all visualizations to the same size by dragging a visualization edge to an appropriate dimension. Use **Height**, and **Width** settings in conjunction with **Layout** settings to specify the layout size of visualizations in a canvas: • **Screen** - Layout fits in the available screen space. This option is removed 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.
Add Canvas	Canvas tabs bar	Add a new canvas to the project. You can drag a canvas to a different position on the canvas tabs bar.
Rename	Right-click a canvas tab	Rename a selected canvas.

Option	Location	Description
Duplicate Canvas	Right-click a canvas tab	Add a copy of a selected canvas to the project’s row of canvas tabs.
Copy Canvas	Right-click a canvas tab	Copies the whole canvas. You can use the **Paste Canvas** option to paste the canvas to the current project or to another project.
Clear Canvas	Right-click a canvas tab	Remove all the visualizations on the canvas.
Delete Canvas	Right-click a canvas tab	Delete a specific canvas of a project.
Duplicate Visualization	Visualization **Menu**, **Edit** or right-click a visualization	Add a copy of a selected visualization to the canvas.
Copy Visualization	Visualization **Menu**, **Edit** or right-click a visualization	Copy a visualization on the canvas.
Paste Visualization	Visualization **Menu**, **Edit**, or right-click a visualization or blank canvas	Paste a copied visualization into the current canvas, another canvas, or another project.
Copy All Data	Visualization **Menu**, **Edit**	Copy all of the visualization's data to the clipboard. You can then paste it to another application, like Word or Excel. Optionally, you can copy specific data in the visualization. Highlight the data you want to copy, right-click, and select **Copy Data**.
Delete Visualization	Visualization **Menu** or right-click a visualization	Delete a visualization from the canvas.
Brushing	Right-corner of canvas tabs bar	Turn on to keep multiple charts in sync when you make changes.
Toggle Grammar Panel	Right-corner of canvas tabs bar	Turn on to display the options for the currently displayed visualization, such as columns, rows, and colors.
Toggle Data Panel	Right-corner of canvas tabs bar	Turn on to display the left-hand panel to add data, visualizations, or analytics.

Copy and Paste a Visualization or Canvas

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

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

- Data - The data set for the pasted visualization or canvas is added to the target project. When you open or create the target project that you're pasting to, it doesn't need to include the data set used by the visualization or canvas that you'll copy and paste.
- Filters - The filters in the target project and in the pasted visualization or canvas are maintained. You don't need to add the visualization or canvas filters to the target project. If there's a conflict between the target project 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 project is applied to the pasted visualization or canvas.
- Calculations - If the same calculation name exists in the target project, then the pasted calculation is added and renamed.

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

1. In the Home page, search for and open a project to copy a visualization or canvas from.
2. 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**.

Change Visualization Types

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

When you create a project 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. Confirm that you’re working in the Visualize canvas. Select a visualization on the canvas, and on the visualization toolbar, click **Change Visualization Type**.
2. Select a visualization type. For example, select Treemap to change the visualization type from Pivot to Treemap.

   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.

Adjust Visualization Properties

You can customize how the visualizations in your project 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.

1. In the Visualize canvas, select a visualization.

The visualization's properties display in the Properties pane.

2. Use the tabs in the Properties pane to adjust the visualization's properties as needed.

Visualize Properties

Use the Visualize properties to see the functions of each tab.

Properties:

Properties Pane Tab	Description
General	Change and format the visualization's title and legend. Change the title's font, size, and color. Add a custom background image or fill color and adjust its transparency. Turn the tooltip on or off.
Axis	Turn grid lines on or off. Set the axis labels for horizontal and vertical values and the axis values to start and end. Display or hide the axis labels. Change the axis label's text. Change the label text's font, size, and color.
Edge Labels	Show or hide a table visualization's headers. Change the table's header, data, and total text's font, size, and color. Add or remove column totals. Wrap column labels. Change a column text's font, size, and color.
Action	Add URLs to Tile, Image, and Text Box visualizations.
Values	Change the display and placement of the data labels. Change the labels' font, size, and color. Change numbers to display as currency or percentage. Change the aggregation method. Display a trellis row (Y2 axis).
Analytics	Add clusters or outliers to the visualization. Add reference lines, trend lines, and bands to display at the minimum or maximum values of a measure included in the visualization.
Filters	Change and format the visualization's filter title and selection names. Change the font, size, and color.

Apply Color to Visualizations

Use color to enhance visualizations.

Topics:

- About Color Assignments in Visualizations
- Access Color Options
- Change the Color Palette
- Assign Colors to Columns

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.

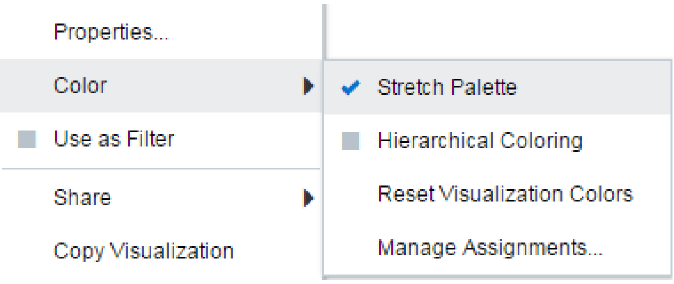
The **Visualize** canvas has a Color section in the Grammar Panel where you can put a measure column, attribute column, or set of attributes columns. Note how the canvas assigns color to the columns that are included in the Color section:

- 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.

Access Color Options

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

1. If you want to edit color options for the whole project:
   a. Click **Menu** on the project toolbar and select **Project Properties**.
   b. Use the **General** tab to edit the color series or continuous coloring.
2. 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.

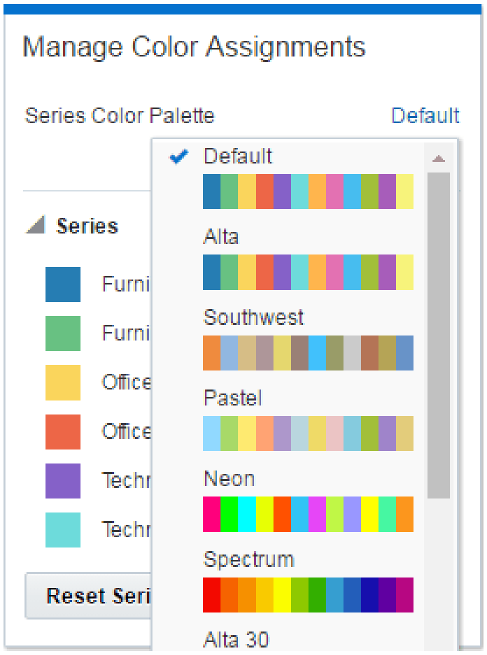
d. Select **Stretch Palette** to turn this option on or off.
Color palettes have a set number of colors, and if your visualization contains more values than the number of color values, then the palette colors are repeated. Use the Stretch Palette option to expand the number of colors in the palette. 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.

Change 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. Select the visualization that you want to change the color palette for.
2. Click **Menu** or right-click and select **Color**, then select **Manage Assignments**.
3. Locate the **Series Color Palette** and click the color palette that's currently used in the visualization (for example, Default or Alta).



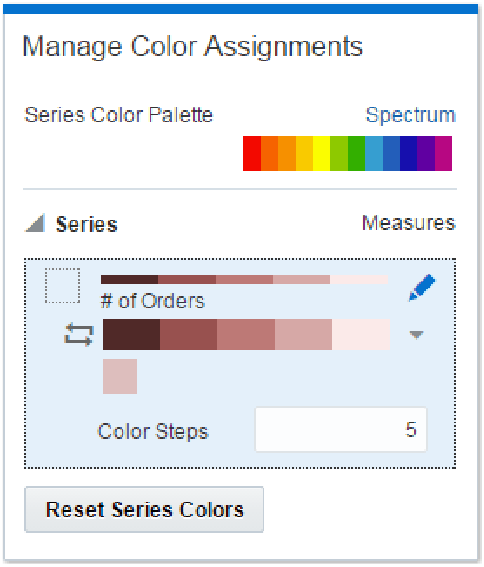
4. From the list, select the color palette that you want to apply to the visualization.

Assign Colors to Columns

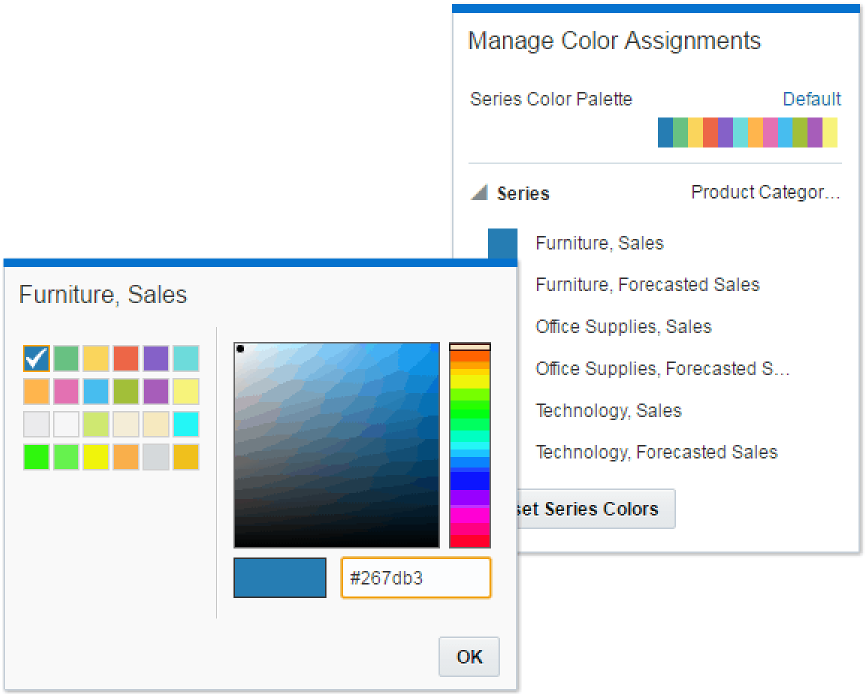
Instead of using the palette's default colors, you can choose specific colors to fine-tune the look of your visualizations.

1. Select the visualization that you want to manage the colors for.
2. Click **Menu** on the visualization toolbar or right-click and select **Color**, then select **Manage Assignments**.

3. 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).



4. 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**.



Format 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. Create or open the project that contains the numeric column whose properties you want to change.
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**.

Format 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. Create or open the project that contains the visualization whose properties you want to change.
2. In the Visualize canvas, select the 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**.

Set 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 project 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. Create or open the project.
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**.

Apply Map Backgrounds and Map Layers to Enhance Visualizations

You can use geographical information to enhance the analysis of your data.

Topics:

- About Map Backgrounds
- Enhance Visualizations with Map Backgrounds
- Use Different Map Backgrounds in a Project
- Interpret Data Values with Color and Size in Map Visualizations
- Add Custom Map Layers
- Update Custom Map Layers
- Apply Multiple Data Layers to a Single Map Visualization
- Use an Image as a Map Background and Draw Map Layer Shapes on the Image
- Review Location Matches for a Map Visualization
- Create Heatmap Layers on a Map Visualization
- Create Cluster Layers on a Map Visualization
- Represent Point Data With Custom Icons on a Map
- Select Points or Area on a Map
- Represent Line Data Using Size and Color on a Map
- Make Map Layers and Backgrounds Available to Users
- Use a Map Background as the Default
- Add Map Backgrounds

About Map Backgrounds

You can enhance map visualizations in projects by adding and maintaining map backgrounds.

You can apply the ready-to-use map backgrounds to a project. You can also add backgrounds from the available list of Web Map Service (WMS) providers such as Google Maps and Baidu Maps, or you can add a map background by specifying appropriate Web Map Service or Tiled Web Map details. Background maps from these providers offer details and language support (such as city or region name) that certain geographic regions (such as Asian countries) require.

You can modify backgrounds in the following ways:

- Modify the background parameters such as map type, format and API keys. The parameters are different for each WMS provider.
- Assign or change the default background in a project.
- Reverse the inherited default background settings in a project.

You can add a WMS provider and perform the following types of functions:

- Add the WMS map servers, and make them available as additional map background options.
- Select one or more map backgrounds available from the WMS provider.
- Assign an added WMS provider’s map as the default map background.

Enhance Visualizations with Map Backgrounds

You can use map backgrounds to enhance visualizations in a project.

Based on the column values, a specific set of dimensions and metrics is displayed on the map visualization. You'll see either the default map background or an existing Oracle map background if no default is set.

1. On the Home page open a project and click **Visualize**.
2. To select a column and render it in a map view, do one of the following:
   - Right-click a map-related column in the Data Element pane and click **Pick Visualization**, then select **Map**.
   - Drag and drop a map-related column from the Data Element pane to the blank canvas, or between visualizations on the canvas. On the visualization toolbar, click **Change Visualization Type** and select **Map**.
3. In the properties pane, click **Map** and specify the visualization properties.
4. If you want to use a different map background, click the **Background Map** value in the properties pane and select a background. For example, select Google Maps, and the visualization displays Google Maps as the map background.
   - If you want to see the list of available map backgrounds or change the backgrounds that you can use, do one of the following:
     - Click the **Background Map** value and select **Manage Map Backgrounds** to display the Map Background tab.
     - Open the Console page, click **Maps** and select the Backgrounds tab.
   - Select another map background such as Satellite, Road, Hybrid, or Terrain.
5. Click **Save**.

Use Different Map Backgrounds in a Project

As an author you can use different map backgrounds in map visualizations.

Here is an example of how you might use a map background in a project.

1. On the Home page click **Create**, then click **Project**.
2. Select a data set in the Add Data Set dialog.
3. Click **Add to Project**.

   The Project pane and list of Data Elements is displayed.
4. Select a map-related data element (for example, click **City**), and click **Pick Visualization**.
5. Select **Map** from the list of available visualizations.

Either the default map background or an existing Oracle map background if no default is set is displayed.

6. In the visualization properties pane, select the **Map** tab.
7. Click the **Background Map** value and select a map from the drop-down list.

   For example, select Google Maps and Google Maps as the map background is displayed.
8. Optional: Click another value to change the type of map (such as Satellite, Road, Hybrid, or Terrain).
9. Optional: Click **Manage Map Backgrounds** from the **Background Map** options to display the Map Backgrounds pane.

   Use this option to maintain the map backgrounds that you want to use.

Interpret Data Values with Color and Size in Map Visualizations

You can use the color and size of a shape such as a polygon or a bubble, to interpret values in a map visualization.

1. Create or open a project and confirm that you're working in the Visualize canvas.
2. Select a column and render it in a map view, doing one of the following:
   - Right-click a map-related column in the Data Element pane and click **Pick Visualization**, then select **Map**.
   - Drag and drop a map-related column from the Data Element pane to the blank canvas, or between visualizations on the canvas. On the visualization toolbar, click **Change Visualization Type** and select **Map**.
3. Drag and drop columns to the following sections on the Visualization Grammar Pane.
   - Use **Color** to change the color for geometries displayed in the corresponding map layer (for example, polygon fill color, bubble color) based on the values.
   - Use **Size (Bubble)** to change color bubble size based on the measure column values. To change the size of the color bubble you've to drag and drop measure columns only. The size shows the aggregated measure for a specific geographic location in a map visualization.
   - Use **Trellis Columns / Rows** to Compare multiple map visualizations based on the column values using filters.

In the map visualization, you can also use the following to interpret measure columns and attribute values:

- **Legend** - If a measure column or an attribute has multiple values, then the legend is displayed that shows values by size or color.
- **Tooltip** - If you hover the mouse pointer over a color bubble or data point, then the values are displayed in a tooltip.

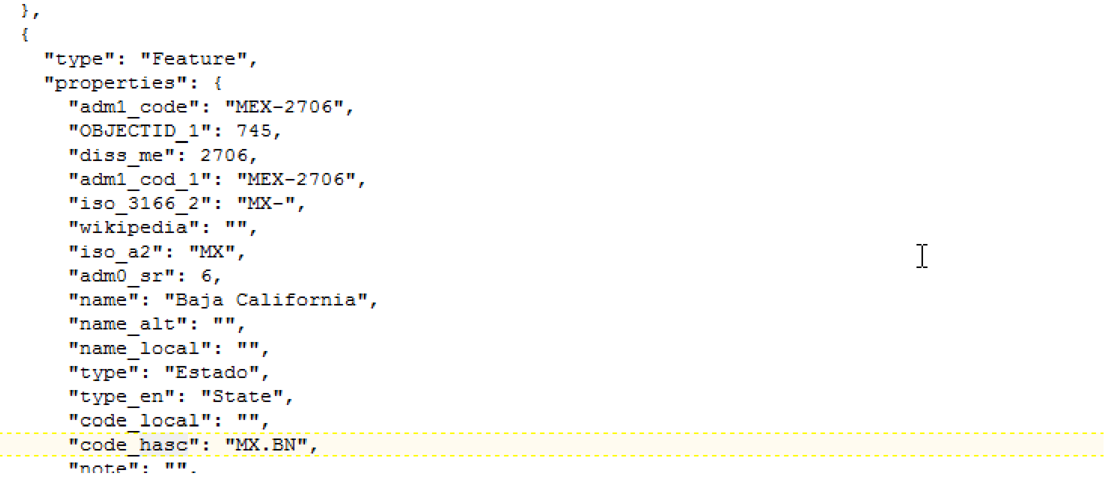
Add Custom Map Layers

You can add custom map layers to use in map visualizations.

Video

You add a custom map layer using a geometric data file with the .json extension that conforms to GeoJSON schema https://en.wikipedia.org/wiki/GeoJSON (the maximum file size allowed is 20MB). You then use the custom map layer to view geometric map data in a project. For example, you might add a Mexico_States.json file to enable you to visualize geometric data in a map of Mexico States.

When creating a custom map layer, you must select layer keys that correspond with data columns that you want to analyze in a map visualization. For example, if you want to analyze Mexican States data on a map visualization, you might start by adding a custom map layer for Mexican States, and select HASC code layer key from the Mexican_States.json file. Here is an extract from the Mexican_States.json file that shows some of the geometric data for the Baja California state.



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      "iso_a2": "MX",
      "adm0_sr": 6,
      "name": "Baja California",
      "name_alt": "",
      "name_local": "",
      "type": "Estado",
      "type_en": "State",
      "code_local": "",
      "code_hasc": "MX.BN",
      "note": "",
```

If you wanted to use the Mexican_States.json file, the layer keys that you select must match columns that you want to analyze from the Mexican States Data tables. For example, if you know there is a data cell for the Mexican state Baja California then select the corresponding name field in the JSON file to display state names in the Map visualization. When you create a project and select column (such as State, and HASC), then Mexican states are displayed on the map. When you hover the mouse pointer over a state, the HASC code (such as MX BN) for each state is displayed on the map.

1. Open the Console page and click **Maps** to display the Map Layers page.

   You can enable and disable System Map Layers but you can't create or delete them.

2. To add a custom map layer, click **Add Custom Layer** or drag and drop a JSON file from File Explorer to the Custom Maps area.

3. Browse the Open dialog, and select a JSON file (for example, Mexico_States.json).

   The JSON file must be a GeoJSON file that conforms to the standard specified in https://en.wikipedia.org/wiki/GeoJSON (the maximum file size allowed is 20MB).

   Custom layers that use the Line String geometry type aren't fully supported. The Color and Size section on Visualization Grammar pane doesn't apply to line geometries.

4. Click **Open** to display the Map Layer dialog.

5. Enter a **Name** and an optional **Description**.

6. Select the layer keys that you want to use from the Layer Keys list.

   The layer keys are a set of property attributes for each map feature, such as different codes for each state in Mexico. The layer keys originate from the JSON file. Where possible, select only the layer keys that correspond with your data.

7. Click **Add**. A success message is displayed when the process is complete and the layer is added.

Update Custom Map Layers

You can maintain custom map layers.

1. Open the Console page and click **Maps** to display the Map Layers page.
2. In the Custom Map Layers section, right-click the map layer and click **Options**, then do the following:
    - To view or make changes to the map layer settings, select **Inspect**.
      The Map Layer dialog is displayed where you can update the **Name**, **Description**, or the **Layer Keys** used in this layer.
    - To upload the JSON file again, select **Reload**.
    - To save the JSON file locally, select **Download**.
    - To delete the custom map layer, select **Delete**.
      You can disable or enable a System Map Layer and a Custom Map Layer, but you can't add or delete a System Map Layer.
3. Click the map layer to enable or disable it. For example, if you want to exclude us_states_hexagon_geo on the map, click the layer to disable it and remove it from searches.
4. To switch from using one map layer to another, do the following:
    a. In the properties pane, select the **Map** tab to display the map properties.
    b. Click the current **Map Layer** for example Mexican States. This displays a list of available custom map layers that you can choose from.
    c. Click the map layer that you want to use to match your data points.

Apply Multiple Data Layers to a Single Map Visualization

You can use the data layer feature to display multiple data series (different sets of dimensions and metrics) on a single map visualization. The data layers are overlaid on one another in a single map visualization.

1. Create or open the project where you want to display multiple data layer overlays on a single map visualization. Confirm that you're working in the Visualize canvas.
2. Drag and drop a measure or attribute columns containing map-related data from the Data Panel to the Category (Geography) section on the Grammar Panel.

   If you're creating a map visualization, in the Data Panel, right-click an attribute column and click **Pick Visualization** then select **Map**.
3. Click **Layer options** in the Category (Geography) section of the Grammar Panel and click **Add Layer** to add a new data layer (for example, Layer 2).

   Alternatively in the Data Layers tab click **Add Layer (+)**.
4. Drag and drop a column to the Category (Geography) section. Based on the column values the map visualization automatically updates with a different set of dimensions, and it overlays on the previous layer.
5. Repeat step 3 and 4 to add multiple data layers on the map visualization.

6. Click **Layer options** to use other options such as Order Layer, Hide Layer, and Manage Layers.
7. In the Data Layers tab of the properties pane, you can specify the options for a layer such as Layer Type, Map Layer, Transparency, and Show Layer.
8. To refine the data shown for the measure and attribute columns in all the data layers, you can apply a filter such as a Range Filter or List Filter, to the map visualization. For example, you can select a measure or attribute for a layer, then apply filter to reduce the amount of data shown, and add the same measure or attribute to the Color section on the Grammar Panel.

Assign a Map Layer to a Data Column

Assign a map layer to a data column to use it consistently in any project.

You can assign a map layer to a column that contains text or numeric attributes, for example, columns such as Airport Name, Latitude, and Longitude. When you select a data column with a map layer assignment for a visualization, Oracle Analytics automatically creates a map visualization.

1. On the Home page, select the project with the map layer.
2. In the Prepare tab, click **Options** for any numeric or text attribute column, and then click **Location Details**.
3. In Location Details, review the associated map layer, change the map layer if you want to, and then click **OK**.

   The property change is listed as a Change Property step in the Preparation Script pane.
4. In the Preparation Script pane, click **Apply Script**.

   The updated column displays the location icon indicating that the location preference has been set.
5. In the Properties dialog for the updated column, click the **Location** icon to verify the map layer associated with the column.
6. Create a visualization with the data columns for which you have set the location details.

   The visualization type is now automatically set as Map and the map layer is available for the specific columns. You no longer need to set the location details for each visualization.

Auto Focus on Data for a Map Visualization

You can override the current viewport when you focus on new data in a map visualization.

The ability to auto focus on data enables you to view the visualization for the specific data that you displayed in a map. For example, if your map visualization displays sales by countries and you have first viewed sales for Australia, the map zooms to Australia. However, if you focus on sales for Italy, the map zooms to Italy.

1. Create or open the project with map visualizations and confirm that you're working on the Visualize canvas.
2. In Visualization Properties, click **Map**, and then set **Auto Focus on Data** to **On**.

   The default value of this property is **Off**.

Review Location Matches for a Map Visualization

You can review mismatch issues between data and match results in map layers, such as when there are ambiguous or partial matches between words.

If ambiguous results are present, consider adding more columns to the map visualization to get the specific match. For example, your map might have layers for City, Country, and Continent. You can also exclude rows of data.

1. Create or open a project that contains map data with one or more data layers in a map visualization.
2. Click the **Visualization** tab.
3. Right-click the map visualization and select **Location Matches** from the menu to display the Location Matches dialog.
4. Select a tab representing a map layer in the current visualization to inspect how well your data matches the map layer.

   For example, select the **Country** tab to see how well your data matches with the Country map layer.
5. Optional: Click **Map Layer** to select a different layer or click **Manage Map Layers** to display the Console page.
6. Review and resolve data mismatches use the columns.

   Use **Match** to see what data items match with the map layer information. A match can be anything from No Match, Partial Match, to a 100% match. Matches are displayed initially sorted top down from the worst to the best matches.

   - No Match - Displays a red warning triangle indicator.
   - A Match with an issue - Displays a yellow warning triangle indicator.
     The warning doesn't indicate a poor match but an imperfect match for which you might want to review the use case.
   - A Perfect Match - Displays no warning triangle indicator.
   - If you are matching Latitude and Longitude, the match values are Valid or Invalid.

   The summary section above the table displays the number of locations and any issues.
7. Click the filter icon in the **Match** column title and select a filter option.

   - Use **All Data** to display all types of matches.
   - Use **Good Matches** to display only 100% perfect matches.
   - Use **All Issues** to display partial matches, multiple matches and no match.
   - Use **Partial Matches** to indicate the percentage difference between the strings being matched. For example: Part of a string is exactly right, such as `Paulo` versus `Sao Paulo`. Most of a word is exactly right, such as `Caiyro` versus `Cairo`.
   - Use **Multiple Matches** to indicate how many matches exist for ambiguous cases. For example, you may see `Barcelona, Spain` matching with `Barcelona Argentina`. In this case you might want to revisit the data to add more detail to your GEO columns to ensure that you only match the correct columns.

8. Click in the **Exclude** column for each row of data that you want to exclude.
9. Click the **Exclude** menu:
   - Click **Select All** or **Deselect All**.
   - Click one of **Project Scope**, **Canvas Scope**, or **Visual Scope**.
10. Optional: Add in more columns to the Category (Location) edge on the visualization to make your match more specific. For example, add Country data to remove a mismatch like Barcelona, Spain versus Barcelona, Argentina.
11. Display the Location Matches dialog to check the summary for any remaining mismatches, and click **OK** when you are satisfied, or repeat previous steps as required.

Create Heatmap Layers on a Map Visualization

You can use a heatmap as a data layer type on a map visualization to identify the density or high concentration of point values or metric values associated with the points. For example, you can use a heatmap to identify the high profit stores in a geographic region or country.

You can create two types of heatmap layers:

- **Density heatmap** - Uses only map-related column data (such as latitude and longitude columns). Density heatmap layers show the cumulative sum of a point, where each point carries a specific weight. A point has a radius of influence around it, such that other points that fall in the same area also contribute to the total cumulative result of a point.
- **Metric heatmap** - Uses measure column data in the same layer. For example, if you add a measure column to the Color section on the Grammar Panel the heatmap is updated to show interpolated metric values.

1. Create or open the project where you want to use a heatmap layer on a map visualization. Confirm that you're working in the Visualize canvas.
2. Create an empty map visualization.
3. Drag and drop attribute columns containing map-related data from the Data Panel to the Category (Geography) section on the Grammar Panel.
   - If you're creating a project with a map visualization, in the Data Panel, right-click an attribute column and click **Pick Visualization** then select **Map**.
4. Go to the Data Layers tab of the properties pane.
   - Alternatively, click **Layer options** in the Category (Geography) section and click **Manage Layers**.
5. To create a density heatmap, click **Layer Type** value and select **Heatmap**.
   - Alternatively, you can add a new map layer, change the layer type to **Heatmap** and then add attribute columns to the Category (Geography) section.
6. To create a metric heatmap, drag and drop a metric column from the Data Panel to the Color section. The heatmap visualization changes from density to metric.
7. In the Data Layers tab of the properties pane, specify the options for the heatmap layer such as Radius, Interpolation, Transparency, and Color.
   - The default interpolation method is automatically selected based on the aggregation rule of the metric column or value that you've selected for the layer.
   - You can select the radius value in pixels (px). The radius value is the extent of influence of a measure around a point value on a map.

The heatmap is automatically updated based on the options selected in the Data Layers tab.

Create Cluster Layers on a Map Visualization

You can use a cluster layer as a type of data layer on a map visualization. In a cluster layer, points that are positioned near each other are grouped together into a common bubble.

The number of points clustered in the group is indicated in the bubble's label. If selected points are grouped with unselected points, the circle is dotted to indicate a partial selection. Individual points are displayed as pin icons to emphasize the distinction between grouped and ungrouped points. Points are grouped based on their proximity in pixels and on the map's zoom factor.

1. Create or open the project where you want to use a point cluster layer on a map visualization. Confirm that you’re working in the Visualize canvas.
2. Create an empty map visualization by dragging the Map visualization from the Data Panel to the canvas.
3. Drag and drop attribute columns containing map-related data from the Data Panel to the Category (Geography) section on the Grammar Panel.

   If you’re creating a project with a map visualization, in the Data Panel, right-click an attribute column and click **Pick Visualization** then select **Map**.
4. Click the Data Layers tab of the properties pane.

   Alternatively, click **Layer options** in the Category (Geography) section and click **Manage Layers**.
5. To create a point cluster, click **Layer Type** value and select **Cluster**.

   Alternatively, you can add a new map layer, change the layer type to **Cluster** and then add attribute columns to the Category (Geography) section.

The point cluster is automatically updated based on the zoom level.

Represent Point Data With Custom Icons on a Map

You can use the Shapes edge to represent point data with custom icons in a map visualization.

You can associate a column with the Shape edge to display a custom shape for point data. For example, you can distinguish between cities by displaying them using custom shapes (for example, a square, a triangle, or a currency symbol). You can also change which custom shape you want to apply to one or more data points.

1. Create or open the project with a map visualization that contains point data and confirm that you're working on the Visualize canvas.
2. Drag and drop an attribute column containing point data (for example, city) from the Data Panel to the Category (Geography) edge on the Grammar Panel.
3. Drag and drop a column from the Data Panel to the **Shapes** edge and optionally to the **Color** edge on the Grammar Panel.

   The map visualization automatically updates based on your selection and overlays the previous layer.

4. Optional: You can change how you assign custom shapes to data points and to the map legend.
    1. Highlight one or more data points on the map using one of the selection tools, or use Ctrl-click to select one or more data points.
    2. Right-click one of the multiple-selected data points, select **Custom Shapes** and then select **Series** or **Data Point**.
    3. Select a custom shape and click **Done**.

        Custom shapes are applied as follows:

        - **Series dialog -** custom data point shape not previously set
          Replaces highlighted data points and series items with the custom shape.
        - **Series dialog -** custom data point shape previously set
          Replaces only corresponding series items with the custom shape.
        - **Data Point dialog**
          Replaces only highlighted data points with the custom shape.
5. If you want to reassign the custom shape for a data point:
    1. Right-click any data point, select **Shape**, and click **Custom Shapes**.
    2. To change the custom shape assigned to a data point, click the shape corresponding to the data point that you want to change.
    3. Select a new custom shape and click **Done**, then click **Done** again.
6. If you want to reset all of the custom shapes currently applied to data points on a map visualization, right-click any data point, select **Shape**, and click **Reset Custom Shapes**.

    This resets all of the shapes applied to data points on the map to the default setting.

Select Points or Area on a Map

You can select multiple points on the map in a specific area that you define using the selection tools.

1. Create or open the project with map visualizations and confirm that you're working on the Visualize canvas
2. Select the map visualization.
3. On the visualization toolbar, do one of the following:
    - Click the **Rectangle Selection** tool and drag a rectangle on the map to select the points or area you want.
    - Click the **Radial Selection** tool and select a point on the map, then drag outward to create a circle. The unit shows the total distance covered on the map.
    - Click the **Polygon Selection** tool and drag a freehand border around the points or area you want to select on the map.

    The selected points or area is highlighted on the map.

Represent Line Data Using Size and Color on a Map

You can represent the weight of line data through thickness and color in a map visualization.

You can associate a measure with the Size edge to indicate the relative weight of a line. For example, to compare delays in airline routes, you can display flight routes with varying line thickness, where a thicker line and a darker color correspond to a higher number of delays.

1. Create or open the project with a map visualization that contains line data and confirm that you're working on the Visualize canvas.
2. Select the map visualization that displays the line data.
3. Drag and drop a column containing line data (for example airline routes) from the Data Panel to the Category (Geography) edge on the Grammar Panel.
4. Drag and drop a line measure column from the Data Panel to the **Size** edge and optionally to the **Color** edge on the Grammar Panel.

   The map visualization automatically updates based on your selection and overlays the previous layer.

Make Map Layers and Backgrounds Available to Users

For visualization projects, as an administrator you can hide or display map layers and backgrounds for users.

1. On the Home page, click **Navigator** and then click **Console**.
2. Click **Maps** and then click **Backgrounds** or **Map Layers**.
3. Click the **Include** blue tick option to make the selected row item available or hidden from end users.

   You can hide or display map backgrounds, image backgrounds, custom map layers, and system map layers.

Use a Map Background as the Default

For visualization projects, as an administrator you can make a map background the default for users.

1. On the Home page, click **Navigator**, and then click **Console**.
2. Click **Maps**, click **Backgrounds** and then click **Map Backgrounds**.
3. Click the **Default** column field in the row of a map background to make it the default.

   The map background is used by default in new visualizations.

Use an Image as a Map Background and Draw Map Layer Shapes on the Image

You can upload an image, prepare the image as a map background, draw map layer shapes onto the image, and associate data with the map background layer.

▶ Video

Topics:

- Upload an Image as a Map Background
- Draw Custom Map Layer Shapes on an Uploaded Image
- Associate a Data Set with Map Layer Shapes Drawn on an Uploaded Image

Upload an Image as a Map Background

You can upload an image as a map background and then draw layers on top of the uploaded image.

1. On the Home page, click **Navigator**, and then click **Console**.
2. On the Console page, click **Maps**.
3. In Maps, click the **Backgrounds** tab, and expand **Image Backgrounds**.
4. Click **Add Image**, select your image, and click **Open**.
5. Enter a name and description for the uploaded image, and click **Save**.

Draw Custom Map Layer Shapes on an Uploaded Image

You can draw and edit custom map layer shapes on an uploaded image and associate the shapes with data in map visualizations.

1. In Image Backgrounds, select the image, click **Options**, and then select **Create Map Layer**.
2. Select **Polygon**, **Line**, or **Point**, and draw a shape onto the image.

Shape	Actions
Polygon	Click the image, drag and click to draw each edge of the polygon until the shape is complete, then click to finish.
Circle	Click the image, drag to increase the circle size until the circle reaches the required size, then click to finish.
Line	Click the image, then drag and click to draw each line edge until the line is complete.
Point	Click the image in the location where you want to draw a data point.

   If you uploaded a motorcycle image, you could draw a shape outline over each visible part. For example, you might draw a polygon to represent an irregular shape like the fuel tank, or a line to represent a fork, or a circle to represent a tire, and so on.

   Each new shape that you create is given a default name and is listed under Features.

3. Enter a name for each shape that corresponds to a key column value in the data set.

   For example, if you drew a petrol tank polygon shape and the key column PartID in the data set has the value PT for petrol tank, then you must enter `PT` as the shape name.

   You can also edit a shape name by clicking the corresponding object in the Features list.

4. Optional: If you want to reposition a shape, click the shape, then drag it to move it to a new position.
5. Optional: If you want to resize a shape, click and hold the shape, or edge, and drag it until it reaches the required size, then click again to finish.
6. Click **Save**.

Associate a Data Set with Map Layer Shapes Drawn on an Uploaded Image

You can associate a data set with the map background layer shapes that you drew on an uploaded image, and use it in a project.

1. In the Home page, click **Create** to bring in a data set file that you want to associate with your map background.

   For example, you might select `motorbike.xls` to create a motorcycle data set with a PartID key column containing values that match the part names of the shapes that you drew.

2. In the key column of the data set, click **Options**, select **Location Details**, choose the custom map layer, and click **OK** to assign the key column to the selected map layer.
3. Click **Apply Script** to associate the key column with the map layer.
4. Create a project.
5. Drag and drop the key column into the visualization. This automatically places the column into Category (Location).

   A map visualization is suggested based on the key column, and the associated map background is displayed.

6. Continue to add columns, and create visualizations as required.
7. Click **Save**.

Add Map Backgrounds

You can add Google, Baidu, and other web map service backgrounds to use in visualizations.

Topics:

- Add Google Map Backgrounds
- Add Baidu Map Backgrounds
- Add Web Map Service (WMS) Backgrounds
- Add Tiled Web Map (XYZ) Backgrounds
- Web Map Background Troubleshooting Tips

Add Google Map Backgrounds

You can add Google map backgrounds to use in map visualizations.

1. On the Home page, click **Navigator**, and click **Console**.

2. In the Console, select **Maps**, click **Backgrounds**, and then click **Map Backgrounds**.
3. Click **Add Background** and select a **Google** from the list.
4. Enter a helpful description if needed.
5. Click **Account Type** to select your account.
6. Copy and paste your Google Maps API access key.

   To use Google Maps tiles, you must obtain a Google Maps API access key from Google. Google prompts you to enter your Maps API access key and, when applicable, your Google "Client ID". Usage of the tiles must meet the terms of service specified by Google in the Google Developers Site Terms of Service.
7. Click **Default Map Type** if applicable.
8. Click **Save** to include the map in the list of available map backgrounds.

Add Baidu Map Backgrounds

You can add Baidu map backgrounds to use in map visualizations.

1. On the Home page, click **Navigator**, and click **Console**.
2. In the Console, select **Maps**, click **Backgrounds**, and then click **Map Backgrounds**.
3. Click **Add Background** and select **Baidu** from the list.
4. Enter a helpful description if needed.
5. Copy and paste your Baidu Maps API access key.

   To use the Baidu Maps tiles, you must obtain a Baidu Maps API access key from Baidu. Baidu prompts you to enter your Maps API access key. Usage of the tiles must meet the terms of service specified by Baidu in their user agreement.
6. Click **I agree to trust this external host** if applicable.
7. Click **Save** to include the map in the list of available map backgrounds.

Add Web Map Service (WMS) Backgrounds

You can add web map service backgrounds and use them in map visualizations.

Web map service backgrounds are hosted dynamically on a web server using the Web Map Service (WMS) protocol. You can use them to integrate maps containing information that you might not have in your enterprise, and easily present it spatially with your data.

1. On the Home page, click **Navigator**, and click **Console**.
2. In the Console, select **Maps**, click **Backgrounds**, and then click **Map Backgrounds**.
3. Click **Add Background** and select **Web Map Service** from the list.
4. Click the **General** tab and enter a name and description.
5. In **URL**, enter the full URL for the web map service.

   Contact your web map service provider to find out the correct URL.

   For example, `https://www.gebco.net/data_and_products/gebco_web_services/web_map_services/mapserv`.

Version automatically displays the web map service protocol version used by the WMS provider. The default value is 1.1.1 but you can select an alternative version from the drop-down list.

Coordinate Reference System automatically displays the reference system used by the host provider. The default value EPSG:3857 is the coordinate system used for projecting maps in 2 dimensions. Hover over the tooltip icon for details.

6. Click **I agree to trust this external host** to automatically add the host to your list of safe domains.
7. In **Layers**, enter the name of each background map layer that you want to use. Click the cross **(x)** icon to remove a layer.
8. Click **Format** if you need to change the image type.
9. Display the **Parameters** tab and click **Add Parameter**.

   Parameters that you enter are included in the URL and tell the hosting server what to display in the map background (for example, image type, layer, geographic extent of the map, size of the returned image).
10. Enter parameters that you want to pass in the URL to the host server in `key:value` format.

    Use this URL to find parameters that you can use for this web map service:

    `http://<url_of_the_map_server>?request=getCapabilities&service=wms`
11. Click **Save** to add the background map layer to the list of available map backgrounds.

    You must refresh a page to see any changes.
12. Click **Preview** to display a preview of the map background.

    The Preview tab only becomes available after the page is saved and refreshed or Oracle Analytics is restarted. This is because the refresh or restart enables recognition of the safe domains.

Add Tiled Web Map (XYZ) Backgrounds

You can add tiled web map (XYZ) backgrounds and use them in map visualizations.

Tiled web map (XYZ) backgrounds are displayed in a browser by seamlessly joining dozens of individually requested image or vector data files over the Internet through a web server. You can use them to integrate maps containing information that you might not have in your enterprise, and easily present them spatially with your data.

You configure tile URL strings to specify vector tiles or raster tiled map images to load. The host evaluates each string and determines which tile to load.

Contact your tiled web map service provider to find out the correct URLs. Parameters in the URLs tell the hosting server what to display in the map background. For example, the map name, version, and the number of tiles to use at the specified focus. Here are some examples of Mapbox tiled web map background URLs:

- `https://api.mapbox.com/styles/v1/mapbox/streets-v11/tiles/256/{z}/{x}/{y}`
- `https://api.mapbox.com/styles/v1/mapbox/satellite-v9/tiles/256/{z}/{x}/{y}`

- `https://api.mapbox.com/styles/v1/mapbox/light-v10/tiles/256/{z}/{x}/{y}`
- `https://api.mapbox.com/styles/v1/mapbox/dark-v10/tiles/256/{z}/{x}/{y}`
- `https://api.mapbox.com/styles/v1/mapbox/outdoors-v11/tiles/256/{z}/{x}/{y}`

1. On the Home page, click **Navigator**, and click **Console**.
2. In the Console, select **Maps**, click **Backgrounds**, and then click **Map Backgrounds**.
3. Click **Add Background** and select **Tiled Web Map** from the list.
4. Click the **General** tab and enter a name and description.
5. In **URL**, enter the full URL for the host tiled web map service.
6. Click the plus **(+)** icon to enter additional server URLs in the same domain, for load balancing.
7. Click **I agree to trust this external host** to automatically add the host to your list of safe domains.
8. Display the **Parameters** tab and click **Add Parameter**.

   Parameters that you enter are included in the URL and tell the hosting server what to display in the map background (for example, image type, layer, geographic extent of the map, size of the returned image).

   For example, you might enter `access_token` with a value of `exampleaccessTokenXyZ123456789nnnxxxZZz`.

   Contact your provider for details.
9. Enter parameters that you want to pass in the URL to the host server in `key:value` format.
10. Click **Save** to add the specified tiled web maps to the list of available map backgrounds.

    You must refresh a page to see any changes.
11. Click **Preview** to display a preview of the map background.

    The Preview tab only becomes available after the page is saved and refreshed or Oracle Analytics is restarted. This is because the refresh or restart enables recognition of the safe domains.

Web Map Background Troubleshooting Tips

Use this topic if you experience errors when you add a web map background.

When a web map background image isn't displayed in the Preview tab or in a visualization, you must take action to resolve the issue.

- If the error persists and you want to diagnose the issue:
  - Click **F12** to display the browser Developer Tools application and search for errors in the browser console tab. For example, search for `error` or `CORS`. Error messages are displayed in red text.
  - If you see an error message similar to `Access to image at http://example.com has been blocked by CORS policy...`, contact the host provider to resolve the issue. Error messages that refer to the Cross Origin Resource Sharing (CORS) policy can only be resolved by the host provider.
- Alternatively, if the error persists contact Oracle Support to help you resolve the issue.

Sort and Select Data in Visualization Canvases

While adding filters to visualizations helps you narrow your focus on certain aspects of your data, you can take a variety of other analytic actions to explore your data (for example, drilling, sorting, and selecting). When you take any of these analytic actions, the filters are automatically applied for you.

Select a visualization and click **Menu** or right-click, then select one of the following analytics actions:

- Use **Sort By** to sort attributes in a visualization, such as product names from A to Z. If you're working with a table view, then the system always sorts the left column first. In some cases where specific values display in the left column, you can't sort the center column. For example, if the left column is Product and the center column is Product Type, then you can't sort the Product Type column. To work around this issue, swap the positions of the columns and try to sort again.
- Use **Drill** to drill to a data element and drill through hierarchies in data elements, such as drilling to weeks within a quarter. You can also drill asymmetrically using multiple data elements. For example, you can select two separate year members that are columns in a pivot table, and drill into those members to see the details.
- Use **Drill to [*Attribute Name*]** to directly drill to a specific attribute within a visualization.
- Use **Keep Selected** to keep only the selected members and remove all others from the visualization and its linked visualizations. For example, you can keep only the sales that are generated by a specific sales associate.
- Use **Remove Selected** to remove selected members from the visualization and its linked visualizations. For example, you can remove the Eastern and Western regions from the selection.
- Use **Add Reference Line** to add a reference line to highlight an important fact depicted in the visualization, such as a minimum or maximum value. For example, you can add a reference line across the visualization at the height of the maximum revenue amount.

Explore Data on Mobile Devices

Explore your data at your desk and on the move. You can use mobile devices using Android, Windows, or Apple operating systems.

Topics:

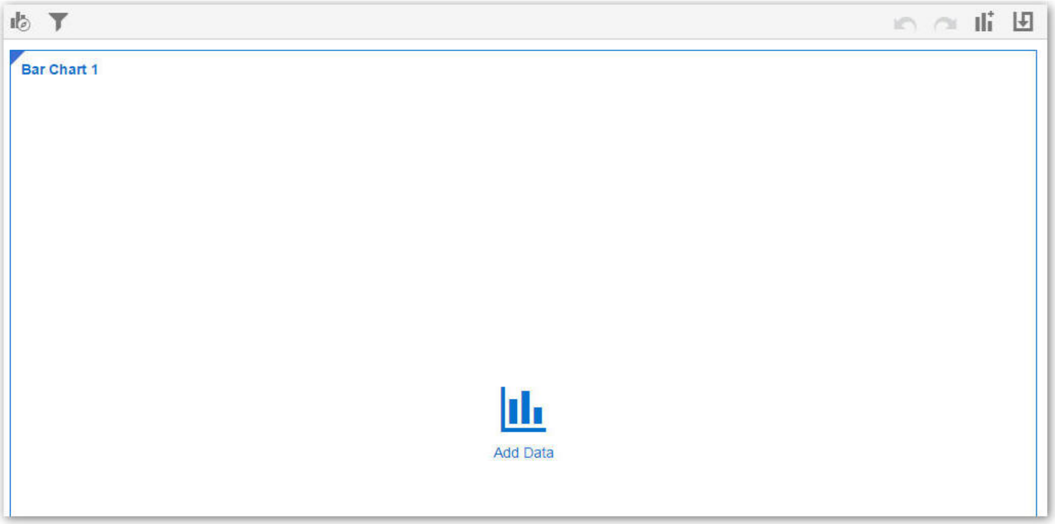
- What You See on a Tablet
- What You See on a Mobile Phone

What You See on a Tablet

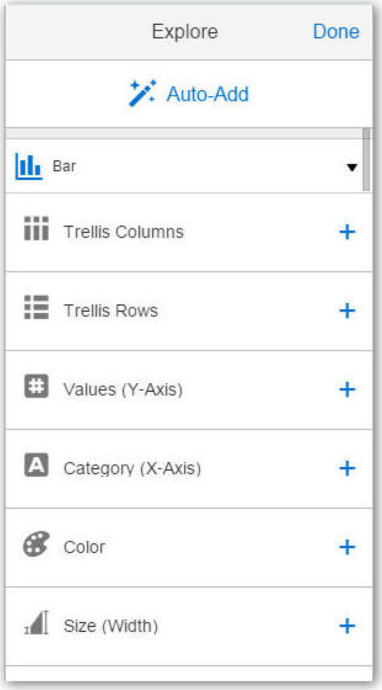
This topic covers the differences you see in projects when you explore data on a tablet.

- You can search for and use existing data sources in projects. See Create a Project and Add Data Sets.

- To create a project, on the Home page, tap **Add Data** on the canvas to display the Explore pane.

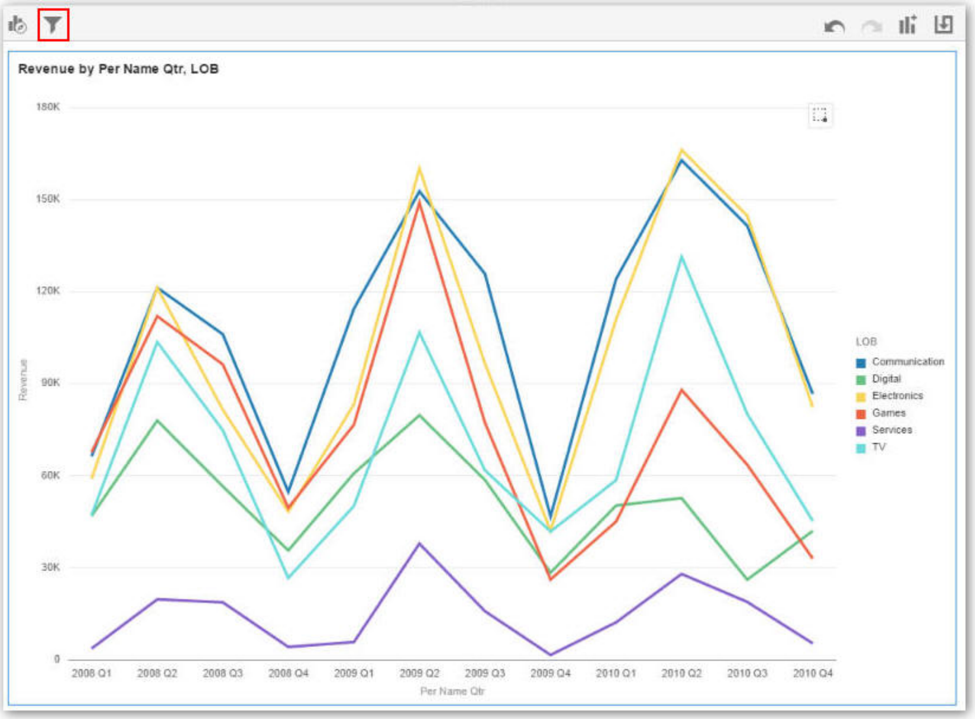
  

  In the Explore pane, tap **Auto-Add** to select data elements. This action automatically positions the selected data elements and picks the best visualization type on the canvas.

  See Add Data Elements to Visualizations and Change Visualization Types.

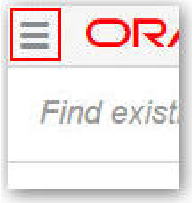
- To create a filter, tap **Filter** to display the Filter pane, and add data elements to the filter.



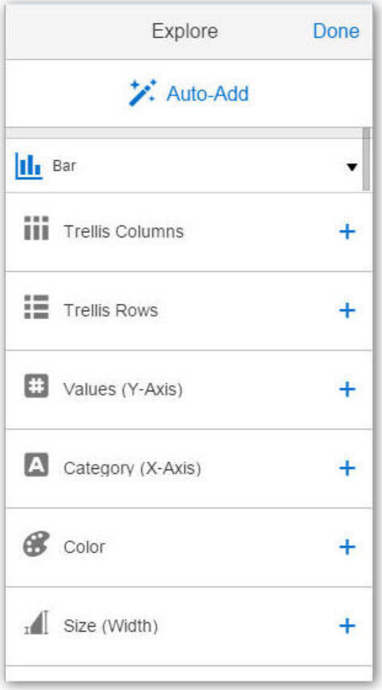
What You See on a Mobile Phone

This topic covers what you'll see in projects when you explore data on a mobile phone.

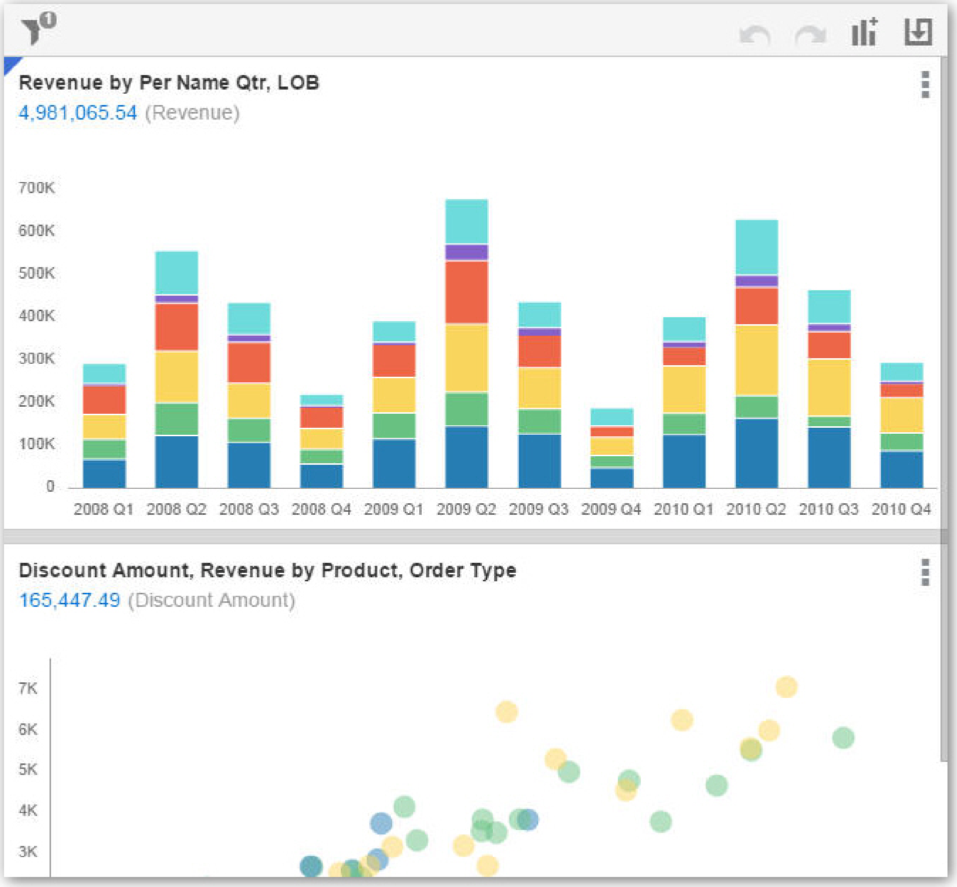
- You can only search for and use existing data sources in projects. See Create a Project and Add Data Sets.
- To create a project, on the Home page, tap the mobile slider, and then select **VA Project**.



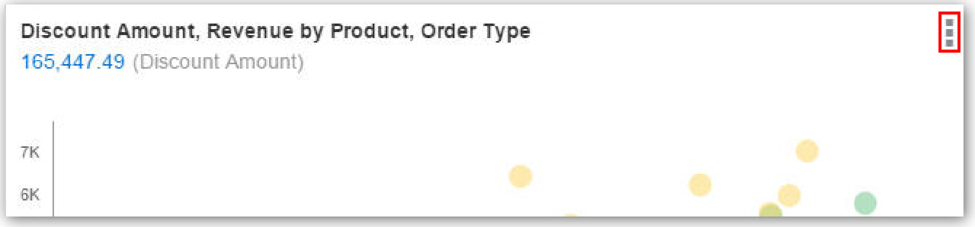
In the Explore pane, tap **Auto-Add** to select data elements. This action automatically positions the selected data elements and picks the best visualization type on the canvas.



- When a project contains multiple visualizations on the canvas, they are each displayed as the same size in a summary view.



- A visualization can display an aggregated value of all measures within it. To set this display value, tap **Visualization Properties** to select the measure that you want to aggregate or to show or hide the value.


Discount Amount, Revenue by Product, Order Type
165,447.49 (Discount Amount)

Replace a Data Set in a Project

You can replace a data set by re-mapping columns used in a project to columns from a different data set.

As part of replacing a data set, you can review and re-map only those columns that are used in the project and replace them with columns of the same data type in the replacement data set. For example, you can replace a test data set with a production data set, or use a project as a template in which you can replace the data but maintain the added structures, visualizations, and calculations.

The **Replace Data Set** option is available for projects using multiple data sets that aren't joined.

1. Create or open the project where you want to replace the data set.

   Confirm that you're working in the **Visualize** canvas.
2. In the Data Panel pane, right-click the data set and select **Replace Data Set**.
3. In the Replace Data Set dialog, perform the following tasks:
   - Select the data set that replaces the existing data set in the project and click **Select**.
   - Review the mapping of the data between the existing and the new data sets in the data-mapping table. The data-mapping table includes all the data elements used in the project's visualizations, calculations, and filters. The data elements with similar type and names in the two data sets are automatically mapped. In the table, based on data types, the data elements are grouped and sorted alphabetically.
   - In the new data set column, click the drop-down arrow in a cell and select a specific data element to adjust the mapping of the data.
     - Only data elements of the same type are displayed in the data element selection dialog.
     - You can navigate back to select a different data set.
4. Click **Replace**.

The new data set replaces the existing data set in the project. You see a notification if you've selected a data set that is joined to other data sets in the project. Review and adjust the joins in the project's **Data Diagram**.

In the data-mapping table based on the selection, the data is updated throughout the project. For example, if you map a data element to **None**, the specific data is removed from the visualizations, calculations, and filters.

Remove a Data Set from a Project

You can remove a data set from a project.

Removing data from a project, which only impacts the data for that project, differs from permanently deleting the data set from your system.

1. Open your project and in the Data Panel, select the data set that you want to remove.
2. Right-click and select **Remove from Project**.

Analyze Data with Explain

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

Topics:

- What is Explain?
- What Are Insights?
- Use Explain to Discover Data Insights
- Use Explain with Local Subject Areas

What is Explain?

Explain analyzes the selected column within the context of its data set and generates text descriptions about the insights it finds. Explain creates corresponding visualizations that you can add to your project's canvas.

Video

Explain uses Oracle's machine learning to generate accurate, fast, and powerful information about your data. To use Explain, choose a column in your data set and select the Explain option. Explain automatically applies machine learning's statistical analysis to find the most significant patterns, correlations (drivers), classifications, and anomalies in your data. Explain then returns visualizations displaying the insights it found. Users can select a visualization to open the project editor and customize the visualizations and drill further into the data.

For example, suppose you want to look for information about your company's employee attrition. You create a project using a data set that contains attrition information and various profile attributes about employees who have left the organization compared to employees who are still in the organization. Select Explain for the Attrition column, and Explain reveals that one of the key drivers of employee attrition is marital status.

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 data sets.

What Are Insights?

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

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 data set'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 data set across the member values of the attribute.
Key Drivers	Shows the columns in the data set 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.

Use Explain to Discover Data Insights

When you select a column and choose the Explain feature, Oracle 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.

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

1. In the Home page, click **Create** and then **Project** to create a new project.
2. Click **Visualize** to open the Visualize canvas.
3. In the Data Panel, right-click a column and select **Explain <Data Element>**.

   You must have write access to the data set 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. Optional: If your results contain too many correlated and highly ranked columns (for example, ZIP code with city and state), then excluding some columns from the data set so that Explain can identify more meaningful drivers.

   To do this, exit Explain, go to the Prepare canvas and either hide or delete columns, return to the Visualize canvas, locate and right-click the column, and select **Explain <Data Element>**.
6. For each visualization that you want to include in your project's canvas, hover over it and click its checkmark.
7. After you've selected all the visualizations that you want to include in the canvas, click **Add Selected**. You can manage the Explain (data insight) visualizations like any other visualizations you’ve manually created on the canvas.

Create a Local Subject Area to Use with Explain

Explain isn't available for subject areas. You can work around this issue by using a subject area to create a local subject area. You can then use Explain to analyze the columns in the local subject area.

1. On the Home page, click **Create**, and then click **Data Set**.
2. Click **Local Subject Area**.
3. In the Add Data Set editor, double click a subject area and then add columns to the local subject area.

4. Optional: Click the **Filters** step and select the column and values that you want to filter on.
5. Optional: Click the **Sample** step and in the **Description** field update the description.
6. Click **Add**.

   In the Results dialog you can click the **Create Project** button now or from the Home page's **Create** button to create a project later. In the project's Prepare canvas, right-click a column and select **Explain <Data Element>**.

About Warnings for Data Issues in Visualizations

You see a data warning icon when the full set of data associated with a visualization isn't rendered or retrieved properly. If the full set of data can't be rendered or retrieved properly, then the visualization displays as much data as it can as per the fixed limit, and the remaining data or values are truncated or not displayed.

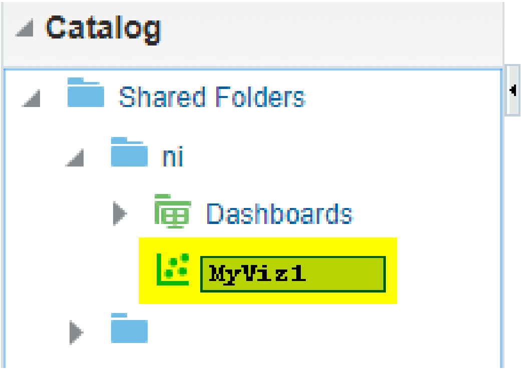
Embed a Visualization in a Dashboard

Embed visualizations and insights in dashboards to share them with analysts.

Before you start, create your visualization projects and store them in the catalog. Avoid using variable prompts and image prompts in your visualization projects. If your project contains more than one canvas or insight, you can choose which one to display on the dashboard.

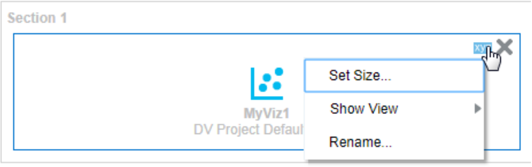
1. From the Classic Home page, open or create a dashboard for the visualization.
2. In the **Catalog** pane, navigate to your visualization project and drag it onto the dashboard canvas.

   For example, you might have stored your visualization project in Shared Folders.



3. To modify its display size or specify which canvas or insight to display, click **Properties**.

   By default, the last canvas in the project is displayed.



Assign Shared Folder and Project Permissions

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

- Add or Update Shared Folder Permissions
- Add or Update Project Permissions
- Project Permissions Rules

Add or Update Project Permissions

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

The shared folder's permissions default into the project's Access and Share tabs. You can set permissions on the project to fine-tune the default permissions. See Project Permissions Rules.

A project's default permissions are based on roles. Roles and the permissions you assign in the **Access** tab determine who can access the project 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 determine which actions users can perform on the project, such as rename, move to, save and save as.

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

1. In the Home Page, click **Navigator**, and then click **Catalog**.
2. Click **Shared Folders**, and then navigate to the project.
3. Hover over the project, click **Actions menu**, and then click **Inspect**.
4. Click the **Access** tab to add or update users and roles and permissions. The permissions in this tab default from the access permissions set on the folder.
5. Click the **Share** tab to add or update users and roles and permissions. The permissions that default into this tab are the same permissions that default into the **Access** tab.
6. 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.

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

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.
5. Click **Save**.

Project Permissions Rules

Use these rules to help you set a project's permissions.

Access (Read-Only and Read-Write) Rules:

- Permissions are evaluated by hierarchies configured for roles.
- Permissions set for roles closest to the top level in the role hierarchy are superseded by permissions set for roles at a lower level in the role hierarchy.
- User permissions always override role permissions.

Share (Edit and View) Rules:

- If a user is a member of any role with edit permission, that user can edit the project.
- If a user has edit permission, that user can edit the project.
- If a user is a member of any role with view permission, that user can view the project.
- If a user has view permission, that user can view the project.

6

Create and Apply Filters

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

Topics:

Typical Workflow to Create and Apply Filters

Here are the common tasks for creating and applying filters to projects, visualizations, and canvases.

Task	Description	More Information
Choose the appropriate filter type	Filter types (Range, Top / Bottom N filter, List, Date, and Expression) are specific to either a project, visualization, or canvas.	Apply Range Filters Apply Top Bottom N Filters Apply List Filters Apply Date Range Filters
Create filters on projects and visualizations	Create filters on a project or visualization to limit the data displayed and focus on a specific section or category.	Create Filters on a Project Create Filters on a Visualization

Task	Description	More Information
Build and use expression filters	You can build and use expression filters to define more complex filters using SQL expressions.	Build Expression Filters
Set visualization interaction properties	Define how you want visualizations to affect each other.	How Data Sets Interact with Filters

About Filters and Filter Types

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

The Range, List, Date, and Expression filter types are specific to either a visualization, canvas, or project. 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 Apply Date Range Filters.
- **Expression filters** - Let you define more complex filters using SQL expressions. See Build Expression Filters.
- **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 Apply List Filters.
- **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 Add an On-Canvas Filter.
- **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 Apply Range Filters.
- **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 Apply Top Bottom N Filters.

How Data Sets Interact with Filters

There are several ways that data sets can interact with filters in a project. For example, filters might interact differently with visualizations depending on the number of data sets, whether the data sets are joined, and what the filters are applied to.

Various factors affect the interaction of data sets and filters in projects:

- The number of data sets within a project.
- The data sets that are joined (connected) or not-joined (for a project with multiple data sets).

- The data elements (columns) that are matched between joined data sets.

You can use the Data Diagram in the Prepare canvas of a project to:

- See joined and not-joined data sets.
- Join or connect multiple data sets by matching the data elements in the data sets.
- Disconnect the data sets by removing matched data elements.

How the Number of Data Sets Affects Filters

Filters can interact differently with visualizations depending on the number of data sets, whether the data sets are joined, and what the filters are applied to.

You can add filters to the filter bar or to individual visualizations in a project.

Single Data Set	Filter Interaction
Add a filter to the filter bar	It applies to all visualizations in the project.
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 Data Sets	Filter Interaction
If you add filters to the filter bar.	• The filters apply to all the visualizations using the joined data sets. For visualizations using the not-joined data sets, you must add a separate filter to each data set. • You can't specify data elements of a data set as a filter of other data sets, if the two data sets aren't joined. • If a data element of a data set is specified as a filter, but doesn’t match the joined data sets, then the filter applies only to the visualization of that particular data set, and does not apply to other visualizations of joined or not-joined data sets. • You can select **Pin to All Canvases** of a filter, to apply a filter to all canvases in the project.
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.
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 data sets 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.

Synchronize Visualizations in a Project

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. You can deselect **Synchronize Visualizations** to unlink your visualizations and turn automatic synchronization off.

When **Synchronize Visualizations** is on (selected), 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 off (deselected), 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.

Create Filters on a Project

You can add filters to limit the data that’s displayed in the visualizations on the canvases in your project.

If your project contains multiple data sets 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.

Instead of or in addition to adding filters to the project or to an individual canvas, you can add filters to an individual visualization.

1. Click **+ Add Filter**, and select a data element. Alternatively, drag and drop a data element from the Data Panel to the filter bar.

   You can't specify data elements of a data set as a filter of other data sets, if the two data sets aren’t joined.
2. Click the filter **Menu** and hover the mouse pointer over the **Filter Type** option to select an alternative compatible filter type.
3. Set the filter values. How you set the values depends upon the data type that you’re filtering.
   - Apply a range filter to filter on columns such as Cost or Quantity Ordered.

- Apply a list filter to filter on columns such as Product Category, Product Name, or Date.
- Apply a date filter to filters on columns such as Ship Date or Order Date.

4. Click the filter bar menu or right-click, then select **Add Expression Filter**.
5. 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.
6. Click the filter bar menu or right-click and select **Auto-Apply Filters**, then click **Off** to turn off the automatic apply. When you turn off the automatic apply, then each filter's selection displays an **Apply** button that you must click to apply the filter to the visualizations on the canvas.
7. Click the filter bar menu or right-click and select **Pin to All canvases** of a filter to apply a filter to all canvases in the project.

You can also go to the filter bar and perform the following steps:

- Select a filter and right-click, then select **Delete** to remove it from the project.
- Right-click and select **Clear All Filter Selections** to clear the selection list of all the filters in the filter bar.
- Right-click and select **Remove All Filters** to remove all the filters in the filter bar.

Create Filters on a Visualization

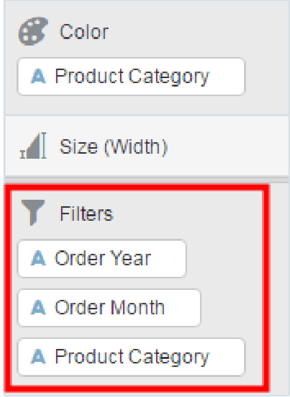
You can add filters to limit the data that's displayed in a specific visualization on the canvas.

If a project contains multiple data sets 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 project or to an individual canvas. Any filters included on the canvas are applied before the filters that you add to an individual visualization.

1. Confirm that you're working in the Visualize canvas.
2. Select the visualization that you want to add a filter to.
3. 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've to join both the data set, before using the data elements as filters.

4. 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 Apply Range Filters.
    - To set filters on columns such as Product Category or Product Name, see Apply List Filters.
    - To set filters on columns such as Ship Date or Order Date, see Apply Date Range Filters.
5. 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.
6. Optional: Click **Visualization Filter Bar** in the **Filter** tab of the **Grammar Panel** to show or hide the visualization filter.

Change 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 project, 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 bar** - 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.

Use a Visualization as a Filter

You can configure a visualization to filter other visualizations on the canvas.

If a project contains multiple data sets and some aren't joined, then there are restrictions for how you can use filters. To use data elements of a data set as a filter in the visualization of another data set, you must join both the data sets, before using the data elements as filters. Any visualization that doesn't use the data element of the filter is dimmed.

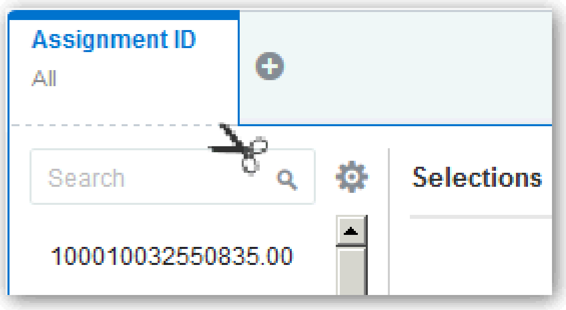
1. On the Home page, select a project, click the **Action Menu**, and then select **Open**.
2. Click the **Visualize** tab.
3. Select a visualization to use as a filter.
4. Click the **Use as Filter** button to activate.

Move Filter Panels

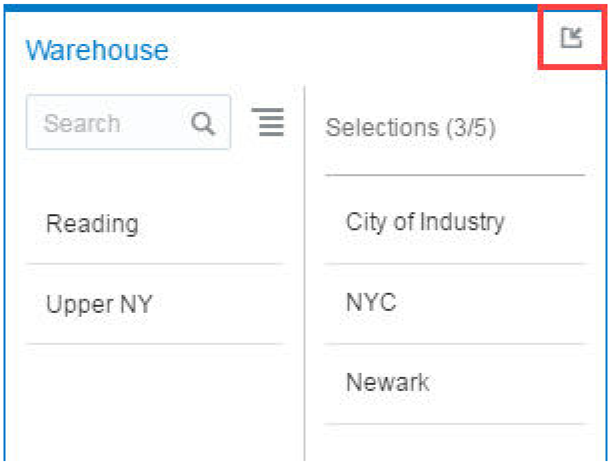
You can move filter panels from the filter bar to a different spot on the canvas.

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. To detach a filter panel from the filter bar, 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.



2. To reattach the panel to the filter bar, click the reattach panel icon.



Apply 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).

1. In the Visualize canvas, go to the filter bar and click the filter to view the Range list.
2. In the Range list, click **By** to view the selected list of Attributes. You can perform any of the following steps:
   - 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 sliders in the histogram.
3. Click outside of the filter to close the filter panel.

Apply 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 project:
   a. In the Data Panel, locate the attribute or measure that you want to filter on and drag and drop it to the filter bar.
   b. Click the filter menu and select **Filter Type**, 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 project:

   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 drop target, click the attribute or measure's name, hover over the **Filter Type** option, then click **Top Bottom N**.
3. To change the filter method (top or bottom), go to the **Method** value and click Top or Bottom to choose the method you want.
4. To specify the number of rows that are displayed, click the **Count** field and enter the number of rows.
5. 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.
6. Click outside of the filter to close the filter panel.

Apply List Filters

List filters are applied to text, non-aggregatable numbers, and dates. After you add a list filter, you can change the selected members that it includes and excludes.

1. In the Visualize canvas, go to the filter bar and select a filter to view the Selections list.
2. Locate the member you want to include and click it to add it to the Selections list. Alternatively, use the **Search** field to find a member you want to add to the filter. Use the wildcards * and ? for searching.
3. Optional: You can also perform the following steps:
   - In the Selections list click a member to remove it from the list of selections.
   - In the Selections list, you can click the eye icon next to a member to cause it to be filtered out but not removed from the selections list.
   - In the Selections list, you can click the actions icon at the top, and select **Exclude Selections** to exclude the members in the Selections list.
   - Click **Add All** or **Remove All** at the bottom of the filter panel to add or remove all members to or from the Selections list at one time.
4. Click outside of the filter to close the filter panel.

Apply 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.

1. In the Visualize canvas, go to the filter bar and click the filter to view the Calendar Date list.
2. In **Start**, select the date that begins the range that you want to filter.

   Use the **Previous** arrow and **Next** arrow to move backward or forward in time, or use the drop-down lists to change the month or year.
3. In **End**, select the date that ends the range that you want to filter.

4. Optional: To start over and select different dates, right-click the filter in the filter bar and select **Clear Filter Selections**.
5. Click outside of the filter to close the filter panel.

Apply 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 Oracle Analytics server 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 Oracle Analytics server which is set using the server configuration setting NLS_TERRITORY.

1. In the Visualize canvas, go to the filter bar and add a date range filter.
2. Click the filter context menu, select **Filter Type**, and **Relative Time** to switch to a relative time filter.
3. In the **Relative Time** filter, 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.

Build Expression Filters

Using expression filters, you can define more complex filters using SQL expressions. Expression filters can reference zero or more data elements.

For example, you can create the expression filter "Sample Sales"."Base Facts"."Revenue" < "Sample Sales"."Base Facts"."Target Revenue". After applying the filter, you see the items that didn't achieve their target revenue.

You build expressions using the Expression Builder. You can drag and drop data elements to the Expression Builder and then choose operators to apply. Expressions are validated for you before you apply them.

1. In the Visualize canvas, go to the filter bar and click **Action** and then select **Add Expression Filter**.
2. In the Expression Filter panel, compose an expression.
3. In the **Label** field, give the expression a name.
4. Click **Validate** to check if the syntax is correct.
5. When the expression filter is valid, then click **Apply**. The expression is applied to the visualizations on the canvas.

Add an On-Canvas Filter

You can add a filter directly to the canvas so that users can choose and display the results for some or all of the visualizations on the canvas. This filter is available for attribute columns.

The on-canvas filters that you add are displayed in the Visualize canvas, Narrate canvas, and in presentation mode.

By default the on-canvas filter's values are limited by other filters (canvas, on-canvas, and visualization filters). You can use the Properties pane to modify how the filters interact.

1. Confirm that you're working on the Visualize canvas.
2. Go to the Data Panel, locate the attribute that you want to filter on, and drag and drop it to the canvas to create a new visualization.
3. On the visualization's toolbar, click **Change Visualization Type** and select **List Box**.
4. Optional: Go to the 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.
5. Optional: Go to the list box's General pane and adjust how you want the filter to display (for example, **Title**, **Label** and **Align**) and how you want it to function (for example, **Multi Select** and **Default Value**).

7

Use Other Functions to Visualize Data

This topic describes other functions that you can use to visualize your data.

Topics:

- Typical Workflow to Prepare, Connect, and Search Artifacts
- Build Stories
- Add Notes
- Identify Content with Thumbnails
- Identify Content with Tooltips
- Manage Custom Plug-ins
- Compose Expressions
- Use Data Actions to Connect to Canvases and External URLs and Use in Publisher Reports
- Create Custom Data Action Plug-ins
- Visualize Data from the Home Page
- Save Your Changes Automatically
- Sort the Items in a Page

Typical Workflow to Prepare, Connect, and Search Artifacts

Here are the common tasks for using available functions to prepare, connect, and search artifacts.

Task	Description	More Information
Build stories	Capture the insights that you discover in your visualizations into a story that you can revisit later, include in a presentation, or share with team members.	Build Stories
Manage custom plug-ins	Upload, download, search for, and delete custom plug-ins that you can use to customize various objects such as visualizations types or projects.	Manage Custom Plug-ins
Compose expressions	Compose expressions to use in filters or in calculations.	Compose Expressions
Create and apply data actions	Create data action links to pass context values from canvases to URLs or project filters.	Use Data Actions to Connect to Canvases, External URLs, Oracle Analytics Publisher Reports, and Use in External Containers

Build Stories

This topic covers how you capture insights and group them into stories.

Topics:

- Capture Insights
- Create Stories
- View Streamlined Content

Capture 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 project 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. Display the Narrate pane, and build your story:
   - Use the **Search** option in the Canvases pane to locate visualizations to include in your story. Right-click each canvas to include and click **Add To Story**.
   - Click **Add Note** to annotate your canvases with insights, such as notes or web links.
   - Use the tabs on the properties pane to further refine your story. For example, click **Presentation** to change the presentation style from compact to film strip.
   - To synchronize your story canvases with your visualizations, display the Visualize pane, click **Canvas Settings**, then select **Synchronize Visualizations**. Alternatively, click **Canvas Properties** and select this option.
   - To synchronize your story canvases with your visualizations, display the Visualize pane and right-click the canvas tabs to select **Canvas Properties**, then change the **Synchronize Visualizations** setting to on (selected).
2. Continue adding insights to build a story about your data exploration.

   The story builds in the Narrate canvas. Each insight has a tab.

Create Stories

After you begin creating insights within a story, you can cultivate the look and feel of that story. For example, you can rearrange insights, include another insight, or hide an insight title. Each project can have one story comprising multiple pages (canvas).

1. In your project, click **Narrate**.
2. Create the story in the following ways:
    - Add one or more canvases to the story and select a canvas to annotate.
    - To annotate a story with insights, click **Add Note**. You can add text and web links.
    - To change the default configuration settings for a story, use the properties pane on the Canvases panel.
    - To edit an insight, click or hover the mouse pointer over the insight, click the menu icon, and select from the editing options.
    - To include or exclude an insight, right-click the insight and use the **Display** or **Hide** options. To display insights, on the canvas property pane, click **Notes**, then **Show All Notes**.
    - To show or hide insight titles or descriptions, on the canvas property pane, click **General**, and use the **Hide Page** and **Description** options.
    - To rearrange insights, drag and drop them into position on the same canvas.
    - To limit the data displayed in a story, on the canvas property pane, click **Filters**. If no filters are displayed, go back to the Visualize pane and add one or more filters first, then click **Save**.
    - To update filters for a story, on the canvas property pane, click **Filters**, and use the options to hide, reset, or selectively display filters.
    - To rename a story, click the story title and update.
    - To add the same canvas multiple times to a story, right-click a canvas and click **Add to Story**. You can also right-click the canvases at the bottom of the Narrate pane and click **Duplicate**.
    - To display the story at any time click **Present**.
    - To close present mode and return to the **Narrate** pane click **X**.
    - To toggle insights use the **Show Notes** option.

    You can modify the content on a canvas for an insight. For example, you can add a trend line, change the chart type, or add a text visualization. After changing an insight, you'll notice that its corresponding wedge (in the Insight pane) or dot (in the Story Navigator) changes from solid blue to hollow. When you select **Update** to apply the changes to the insight, you'll see the wedge or dot return to solid blue.

View Streamlined Content

You can use the presentation mode to view a project and its visualizations without the visual clutter of the canvas toolbar and authoring options.

1. On the Narrate toolbar, click **Present**.
2. To return to the interaction mode, click **X**.

Add Notes

You can add notes to a canvas on the Narrate pane to refer to a specific spot or data point such as a column in a table, a particular horizontal bar, or a cluster in a Scatter plot.

1. In your project, click **Narrate** and select the canvas where you want to add notes.

Alternatively, in the Canvases Panel, select a canvas and click **Canvases List** or right-click, then click **Add to Story**. You can also drag and drop the canvas from the Canvases Panel to the Story page.

2. Select a data point or spot on the visualization where you want to add a data reference annotation and click **Add Note**.

   Alternatively, click **Add Note** to annotate your canvas with insights.

3. Enter the text you want to show in the note.
4. In the format text dialog, do the following:
   - Define the format of the note text.
   - Click **Link** if you want to insert a web address in the note. In the Hyperlink dialog, enter the web address and click **OK**.
5. Continue adding notes to your canvas.

A connector or line connects the note to the data point or spot on the visualization. If you select more than ten data points, the connectors won't be displayed. To show the connectors select the note body and click the drop-down arrow, then select **Show Connector**. If you change or remove a data point on the Visualize canvas, the note attached to that data point is automatically hidden.
You can’t connect a note to a data point or spot on the following visualization types:

- List
- Tile
- Correlation Matrix
- Map
- Parallel Coordinates
- Chord Diagram

Edit a Note

You can edit the text or web addresses inserted in notes.

1. Select the canvas where you added the note you want to edit.
2. Click the note on the visualization.

   Alternatively, select the note body and click the drop-down arrow, then click **Edit**.

3. Edit the text or web address in the note.
4. Click outside of the note body.

Adjust a Note

You can adjust a note after you add it to a canvas on the Narrate pane. For example, you can move the note around on the canvas, connect or detach it from a data point, resize it, or hide it.

1. In the Narrate pane, select the canvas where you added the note that you want to adjust.
2. Select the note body and click the drop-down arrow, then select the appropriate option such as **Duplicate**, **Show Connector**, or **Hide Note**.

3. In the properties pane, click the **Note** tab, and use the options to hide or delete the note.
4. To connect the note to a data point, hover the mouse pointer over the note to see the connection dots be displayed on the note body.

   Click a connection dot and drag the cursor to a data point on the visualization.
5. To alter the data points attached to the note, do the following:
   a. Select the note body and click the drop-down arrow, then select **Detach from Data**.
   b. Select a connection dot and drag the cursor to the new data points.
6. Select a note body and perform the following actions:
   - Drag the selected note to a new position.
   - Drag the note body sizing handle left and right or up and down.

Identify Content with Thumbnails

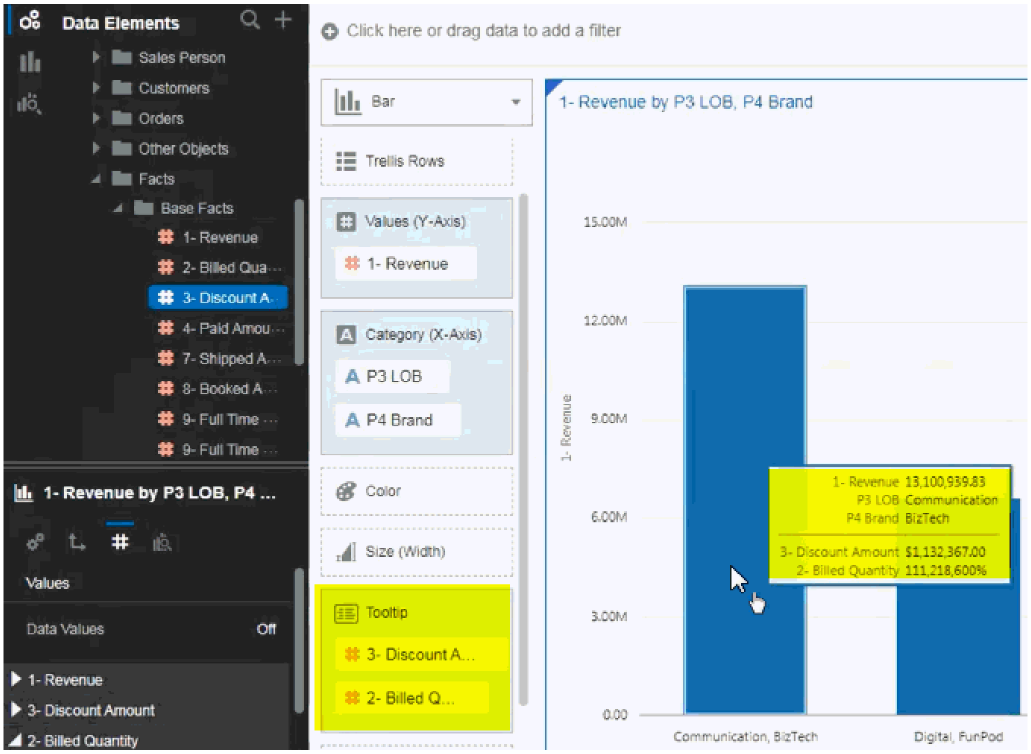
You can quickly visually identify content on the Home page and within projects by looking at thumbnail representations.

Project thumbnails on the Home page show a miniature visualization of what projects look like when opened. Project thumbnails are regenerated and refreshed when projects are saved. If a project uses a Subject Area data set, then the project is represented with a generic icon instead of a thumbnail.

Identify 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.



Manage Custom Plug-ins

You can upload, download, search for, and delete custom plug-ins. Plug-ins are custom visualization types or custom data actions that you create externally and then import into your system.

For example, you can upload a custom plug-in that provides a visualization type that you can use in projects.

1. On the Home page, click the **Navigator**, and then click **Console**.
2. Click **Extensions**.

   You use this page to upload, search for, delete, or download a custom plug-in.
3. 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.
4. Perform any of the following tasks.
   - If the plug-in provides a visualization type, you can select that type from the list of available 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.

- To delete a custom plug-in, click **Options** on the custom plug-in and select **Delete**, and click **Yes** to delete the custom plug-in.
  If you delete a custom visualization type that's used in a project, then that project displays an error message in place of the visualization. Either click **Delete** to remove the visualization, or upload the same custom plug-in so that the visualization renders correctly.
- To download a custom plug-in, click **Options** on the custom plug-in and select **Download**.

Compose 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 can't create a calculation from an expression filter. See Create Calculated Data Elements and Build 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).

See Expression Editor Reference.

Use Data Actions to Connect to Canvases, External URLs, and Use in Publisher Reports

A Data Action link can pass context values as parameters to external URLs, filters to other projects or to visualizations embedded in external containers.

When a link navigates to a project, 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.

Topics:

- Create Data Actions to Connect Visualization Canvases
- Create Data Actions to Connect to External URLs from Visualization Canvases
- Create Data Actions to Connect to REST APIs from Visualization Canvases
- Use Data Actions to Connect to Oracle Analytics Publisher Reports
- Invoke Data Actions from Visualization Canvases

Create Data Actions to Connect Visualization Canvases

You can create data actions to navigate to a canvas in the current project or to a canvas in another project.

Video

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 project.

1. Create or open a project and confirm that you're working in the Visualize canvas.
2. Click **Menu** on the project 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 **Project** field and select the project you want to use for the anchor:
   - **Use This Project** - Select if you want to link to a canvas in the active project. Columns that you select must be in the current visualization.
   - **Select from Catalog** - Select to browse for and select the project 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.

Create Data Actions to Connect to External URLs from Visualization Canvases

You can use data actions to navigate to an external URL from a canvas so that when you select a column such as the supplier ID, it displays a specific external website.

1. Create or open a project and confirm that you're working in the Visualize canvas.
2. Click **Menu** and select **Data Actions**.
3. Click **Add Action** and enter a name for the new navigation link.

   You can add multiple navigation links.
4. Click the **Type** field and select **URL Navigation**.
5. 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.
6. Enter a URL address and optionally include notation and parameters.

   For example, where `http://www.example.com?q=${keyValuesForColumn:"COLUMN"}` is displayed like `www.oracle.com?q=${keyValuesForColumn:"Sales"."Products"."Brand"}` The column names that you select here are replaced with values when you invoke the data action.
7. 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).
8. Click **OK** to save.
9. In the **Canvas**, click a cell, or use Ctrl-click to select multiple cells.
10. 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 (that is, the URL tokens).

Create Data Actions to Connect to REST APIs from Visualization Canvases

You can use HTTP API data actions in a canvas so that when you select a column, it sends the value to a REST API which returns a response from the external website.

You must configure the domain that you're trying to connect to as a safe domain before you create an HTTP API data action. See Register Safe Domains.

1. Create or open a project and confirm that you're working in the Visualize area.
2. Click **Menu** and then select the **Data Actions** tab.
3. Click **Add Action** and enter a name for the new HTTP API data action. For example, enter `HTTP API Example`.

You can add multiple HTTP API data actions.

4. Click the **Type** field and select **HTTP API**.
5. Click the **Anchor To** field and select the columns that you want the HTTP API data action to apply to. 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 **HTTP Method** field and select an appropriate value (that is, GET, POST, PUT, DELETE) to send to the REST API.
7. Enter the URL for the REST API that starts with http or https and optionally includes replacement tokens.

   Replacement tokens in the URL pass contextual values to a data action (for example, data values, user name, project path, canvas name).

   For example, you can pass a column value (for example, a value for the Category column) to a REST API (for example, the Google books API) using: `http://www.googleapis.com/books/v1/volumes?q=${valuesForColumn:"Category"}` The value that you select from a cell in the Category column (for example, "Books") passes to the REST API.
8. If you selected the POST method, a field is displayed where you enter each parameter on a separate line.

   You enter each parameter as a name-value pair with the name and value separated by "**=**". You can use the same URL token syntax in the name-value pairs as required by the API that you're calling.

   For example:

   - `paramName1=paramValue1`
   - `paramName2=${valuesForColumn:"Product"}`
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.
11. Click a data point in the visualization.

    For example, you might select "Books" from the Category column.
12. Right-click and select **HTTP API Example** to display the result.

    The selected data-points determine which values to pass to the URL tokens.

    A success or failure message is displayed confirming the REST API has been successfully invoked using the selected value.

Invoke Data Actions from Visualization Canvases

You can invoke data actions from a canvas to other canvases and URLs.

1. Create or open a project. Confirm that you’re working in the Visualize canvas.

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 Project 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 project'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 project'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 project 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 project, canvas, or visualization level filters.

Use Data Actions to Connect to Oracle Analytics Publisher Reports

A data action link can pass context values as URL parameters in Oracle Analytics Publisher reports.

When you click a link to open a Publisher report, the link might include attributes associated with the column selected in the visualization.

Topics:

- About Creating Data Actions to Connect to Oracle Analytics Publisher Reports
- Create Data Actions to Connect to Oracle Analytics Publisher Reports
- Create Custom Column Names in Data Actions to Pass in Oracle Analytics Publisher Report URLs

About Creating Data Actions to Connect to Oracle Analytics Publisher Reports

You can create a data action to link to an Oracle Analytics Publisher report.

You configure a data action to pass selected column values from a visualization to display in a Publisher report.

- You must store your Publisher report in a local folder.

- When the Publisher report uses the analysis as the data model, prompts in the underlying analysis must have **User Input** value set to **Choice List** to enable selected values to pass to prompts in the Publisher report.
- You can pass lists of values and list filters to display as prompts in your Publisher report. However, you can't pass number filters, date filters, or expression filters.

Create Data Actions to Connect to Oracle Analytics Publisher Reports

You can create an analytics data action link to transfer selected data points from an Oracle Analytics project to an Oracle Analytics Publisher report.

The Oracle Analytics project, Publisher report, and analysis can be in different folders.

1. Open an Oracle Analytics project that uses the data model used in the Publisher report.
2. Click **Menu** on the project toolbar and click **Data Actions**.
3. Click **Add Action** and enter a name for the new navigation link.
4. Click the **Type** field and select **Analytics Link**.
5. Enter a name for the data action in the **Name** field.
6. Click the **Target** field, select **Select from Catalog**, then browse to select the Publisher report that you want the data action to pass data to, and click **OK**.
7. Verify that **Parameter Mapping** is set to `Default`.
8. Verify the **Pass Values** field value is set to `All`.
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**.
11. Select data points in the visualization and choose the data action to test that the values are passed to the Publisher report.

Create Custom Column Names in Data Actions to Pass in Oracle Analytics Publisher Report URLs

You can create a data action link that passes custom column names in the URL of an Oracle Analytics Publisher report.

1. Open an Oracle Analytics project.
2. Click **Menu** on the project toolbar and click **Data Actions**.
3. Click **Add Action** and enter a name for the new navigation link.
4. Click the **Type** field and select **Analytics Link**.
5. Enter a name for the data action in the **Name** field.
6. Click the **Target** field, select **Select from Catalog**, then browse to select the Publisher report that you want the data action to pass data to, and click **OK**.

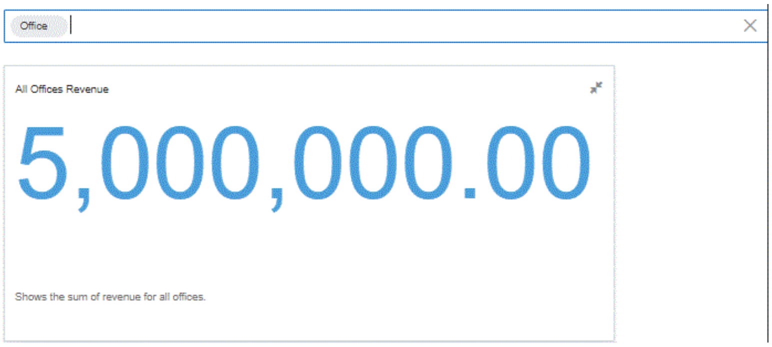
7. Click **Parameter Mapping** and select **Set Custom Mapping** to specify custom column names to pass as URL parameters to the Publisher report.
8. Click **Add Row** and click **Select a Column** for each column that you want to pass to the Publisher report using a custom name.
9. Click **Enter Parameter** and enter a custom name for each column name that you want to replace.

   The custom name passes to the Publisher report in the URL.
10. Verify the **Pass Values** field value is set to `All`.
11. 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).
12. Click **OK**.
13. Select data points in the visualization and choose the data action to verify that the custom column names are displayed in the URL of the Publisher report.

Visualize 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 project.

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.



Office

All Offices Revenue

5,000,000.00

Shows the sum of revenue for all offices.

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**.

Save Your Changes Automatically

You can use the auto save option to save your updates to a visualization project in real-time automatically.

If you’ve already saved your project in a specific location, the Save Project dialog isn’t displayed after you click **Auto Save**.

1. Create or open a project.
2. From the Save menu, select **Auto Save**.
3. In the Save Project dialog, enter the **Name** and optional **Description** to identify your project.
4. Select the folder where you want to save your project.
5. Click **Save**. Any project updates are saved in real-time.

Suppose that two users are updating the same project and **Auto Save** is enabled. The **Auto Save** option is automatically disabled when different types of updates are made to the project. A message is displayed that states that another user has updated the project.

Sort the Items in a Page

You can quickly reorganize items in the Catalog, Data, and Machine Learning pages by sorting the items based on their attributes.

As you add more data or projects, 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. Go to the page with the items you want to sort.
2. Click the **Sort By** menu on the page toolbar and select a sort option such as **Modified** or **Reverse Order**.
3. 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.

8

Create Custom Data Action Plug-ins

You can create custom data action plug-ins to use in Oracle Analytics.

Data action plug-ins extend Oracle Analytics and enable users to select data-points in visualizations and to invoke specific actions. Oracle Analytics provides a core set of data actions that cover many common use cases, but by writing your own data action plug-in, you can extend this functionality even further.

You must have a basic understanding of the following to create custom data action plug-ins:

- JavaScript
- RequireJS
- JQuery
- KnockoutJS

Topics:

- About Data Action Plug-ins and the Data Actions Framework
- Choose the Best Data Action Class to Extend
- Generate Data Action Plug-ins from a Template
- Generated Folders and Files
- Extend a Data Action Base Class
- Choose Which Data Action Inherited Methods to Override
- Test, Package, and Install Your Data Action
- Use an Upgrade Handler for Knockout Model Changes
- Upgrade Data Action Plug-ins
- Data Action Plug-in File Reference

Generate Data Action Plug-ins from a Template

You use a series of commands to generate a development environment and populate it with a HTTP API Data Action along with the necessary folders and files that you need to create a custom data action plug-in.

All plug-in files follow the same basic structure. You can manually create the files and folders or you can generate them from a template. The tools to do this are part of the Oracle Analytics Desktop software development kit (SDK) which is included with Oracle Analytics Desktop. See Oracle Analytics Desktop SDK Reference.

Use Oracle Analytics Desktop version 5.4 or later to access the classes required to create a custom data action plug-in.

Use these commands to generate your development environment and populate it with a HTTP API data action.

1. At a command prompt, specify the root folder of your Oracle Analytics Desktop installation:

   ```
   set DVDESKTOP_SDK_HOME=C:\Program Files\Oracle Analytics Desktop
   ```

2. Specify the location to store your custom plug-ins:

   ```
   set PLUGIN_DEV_DIR=C:\temp\dv-custom-plugins
   ```

3. Add the SDK command line tools to your path using:

   ```
   set PATH=%DVDESKTOP_SDK_HOME%\tools\bin;%PATH%
   ```

4. Create a folder for the directory used to store the custom plug-ins using:

   ```
   mkdir %PLUGIN_DEV_DIR%
   ```

5. Change the directory to the folder for storing custom plug-ins:

   ```
   cd %PLUGIN_DEV_DIR%
   ```

6. Create the environment variables:

   ```
   bicreateenv
   ```

7. Create the template files needed to start developing a custom HTTP API data action, for example:

   ```
   bicreateplugin -pluginxml dataaction -id company.mydataaction -subType
   httpapi
   ```

   Use the `-subType` option to specify the data action type that you want to create from: `httpapi`, `urlNavigation`, `canvasNavigation`, `event`, or `advanced`. The `advanced` option extends from the `AbstractDataAction` base class.

Generated Folders and Files

Your newly generated data action development environment contains these folders and files:

```
1    %PLUGIN_DEV_DIR%\src\customdataaction
2       company-mydataaction\
3          extensions\
4             oracle.bi.tech.plugin.dataaction\
5                company.mydataaction.json
6          nls\
7             root\
8                messages.js
9             messages.js
10         mydataaction.js
11         mydataactionstyles.css
12         plugin.xml
```

- **Line 2**: The `company-mydataaction` folder is the ID that you specify.
- **Line 6**: The `nls` folder contains the files for externalizing strings that enable your plug-in to provide Native Language Support.
- **Line 7**: The strings in the files under the `nls\root` folder are the default strings used when translations for a requested language aren't available.

- **Line 8**: The `messages.js` file contains externalized strings for your plug-in that you can add.
- **Line 9**: The `messages.js` file must contain an entry that you add for each additional language that you want to provide localized strings for. You must add a corresponding folder under the `nls` folder for each locale that you want to add translations for. Each folder must contain the same set of files, with the same file names as those added under the `nls\root` folder.
- **Line 10**: The `mydataaction.js` file is the newly generated JavaScript module template that provides a starting point to develop your custom data action.
- **Line 11**: The `mydataactionstyles.css` file can contain any CSS styles that you want to add, and which your data action's user interface can use.
- **Line 12**: The `plugin.xml` file registers your plug-in and its files with Oracle Analytics.

Extend a Data Action Base Class

Once you've chosen the subclass of data action that you want to extend and have generated the necessary folders and files, you're ready to start writing the code specific to your new data action.

You can find your newly generated data action code under `%PLUGIN_DEV_DIR%\src\dataaction`. See Generated Folders and Files for an explanation of the files and folder structure. The main file you must edit is the JavaScript file. For example, if your custom data action ID is `company.MyDataaction`, then the file you're looking for is `%PLUGIN_DEV_DIR%\src\dataaction\company-mydataaction\mydataaction.js`.

Extending Your Data Action's Knockout Model
If your data action has additional properties that need to be stored, then you must add them as observable properties to the Knockout Model. If your data action is given the ID `company.MyDataaction`, then the Knockout Model is called `mydataaction.MyDataActionKOModel` which is located near the top of `mydataaction.js`. By default, this Knockout Model is configured to extend the Knockout Model used by your data action's superclass so you only need to add additional properties to the model.

For a data action that's extending the `HTTPAPIDataAction` base class, use code similar to the following:

```
1 - mydataaction.MydataactionKOModel = function (sClass, sID, sName,
sVersion, sScopeID, aAnchorToColumns, eValuePassingMode, sURL,
        eHTTPMethod, sPOSTParams)
2 - {
3 - mydataaction.MydataactionKOModel.baseConstructor.call(this, sClass, sID,
sName, sVersion, sScopeID, aAnchorToColumns, eValuePassingMode, sURL,
eHTTPMethod, sPOSTParams);
4 - };
5 - jsx.extend(mydataaction.MydataactionKOModel,
dataaction.HTTPAPIDataActionKOModel);
```

- **Line 1**: This is the constructor for your Knockout Model. It accepts the properties that the model needs to store.
- **Line 3**: This is the superclass's constructor, otherwise known as the `baseConstructor` to which you pass the values for all of the properties that are handled by one of the Knockout Model's superclasses.

- **Line 5**: This sets the superclass for this Knockout Model class.

Use code similar to the following to add a string and an array to set properties that are persisted by the data action.

```
mydataaction.MydataactionKOModel = function (sClass, sID, sName,
sVersion, sScopeID, aAnchorToColumns, eValuePassingMode, sURL,
eHTTPMethod, sPOSTParams)
{
mydataaction.MydataactionKOModel.baseConstructor.call(this, sClass,
sID, sName, sVersion, sScopeID, aAnchorToColumns, eValuePassingMode,
sURL, eHTTPMethod, sPOSTParams);


// Set Defaults
sMyString = sMyString || "My default string value";
aMyArray = aMyArray || [];


// Asserts
jsx.assertString(sMyString, "sMyString");
jsx.assertArray(aMyArray, "aMyArray");


// Add observable properties
this.sMyString = ko.observable(sMyString);
this.aMyArray = ko.observableArray(aMyArray);
};
jsx.extend(mydataaction.MydataactionKOModel,
dataaction.HTTPAPIDataActionKOModel);
```

Choose Which Data Action Inherited Methods to Override

Each data action must implement various methods in order to function properly, so you only need to override those methods that implement behavior that you want to change.

If you're extending one of the concrete data actions classes, for example `HTTPAPIDataAction`, then most of the required methods are already implemented and you only need to override the methods that implement the behavior you want to change.

Generic Methods

This section describes the various methods and what's expected of them.

All types of data action must implement the methods that are described here.

create(sID, sName)

The `create()` static method is called when you're creating a new data action and select a **Data Action Type** from the drop-down menu. This method is responsible for:

- Constructing the Knockout Model class that your data action uses.
  The Knockout Model class must have the ID and name that's passed to the `create()` method along with sensible defaults for all other properties. For example, for a currency conversion data action you might want to set the default

currency to convert into Dollars. The Knockout Model is the correct place to provide your default values.

- Constructing an instance of your data action from the Knockout Model.
- Returning the instance of your data action.

invoke(oActionContext, oDataActionContext)

The `invoke()` method is called when the user invokes your data action from the context menu for a data point in a visualization. The method passes the `DataActionContext` argument which contains metadata describing the selected data points, visualization, filters, project, and session. See Data Action Service Classes.

validate()

The `validate()` method is called on each data action when the user clicks **OK** in the Data Actions dialog. The `validate()` method returns a `null` to indicate that everything is valid or a `DataActionError` if something is invalid. If there's an error in one of the data actions in the dialog, the error prevents the dialog from closing and an error message is displayed to the user. This method validates the name of the data action using the `this.validateName()` method.

getGadgetInfos(oReport)

The `getGadgetInfos()` method is called to enable the user interface to display data action property fields. The method returns an array of `GadgetInfos` in the order you want them to appear in the user interface. Gadgets are provided for all of the most common types of fields (for example, text, drop-down, password, multi-select, radio button, check box) but you can create custom gadgets if you want more complicated fields (for example, where multiple gadgets are grouped together, or where different gadget fields display depending on which option you select). It's a best practice to create a method that constructs each `GadgetInfo` you want in your array, as it makes it easier for potential subclasses to pick and choose from the `GadgetInfos` you've provided. If you follow this best practice there are already various methods implemented by the different data action base classes that can return a `GadgetInfo` for each of the fields that they use in their user interfaces. If you also need one of these `GadgetInfos` then you call the corresponding `create****GadgetInfo()` method and push its return value into your array of gadgets.

isAllowedHere(oReport)

The `isAllowedHere()` method is called when the user right-clicks on a data-point in a visualization and the user interface starts to generate the context menu. If a data action exists that's relevant to the selected data-points, then the method returns `true` and the data action appears in the context menu. If the method returns `false`, then the data action doesn't appear in the context menu. Consider accepting the default behavior inherited from the superclass.

upgrade(oOldDataActionJS)

If you're creating your first data action then don't use the `upgrade(oOldDataActionJS)` method. Only use this method after you've created your first Knockout Model and are making significant changes to properties for a second version of your Knockout Model. For example, if the first version of your data action stores a URL in its Knockout Model, but you decide that the next version will store URL component parts in separate properties (for example, `protocol`, `hostname`, `port`, `path`, `queryString` and `bookmark`).

The second version of your Knockout Model code would request to open a data action that had been saved with the first version of your Knockout Model code which can cause problems. To resolve this issue, the system identifies that your current data action code version is newer than that of the data action being opened and it calls the `upgrade()` method on your new data action class and passes in the old data action Knockout Model (serialized to a JSON object). You can then use the old JSON object to populate your new Knockout Model and return an upgraded version of the JSON object. This ensures that old data action metadata continues to work as you improve your data action code.

HTTPAPIDataAction Methods

If you're extending the `HTTPAPIDataAction` class, then it provides the following additional method that you may choose to override:

getAJAXOptions(oDataActionContext)

The `getAJAXOptions()` method is called by the data action's `invoke()` method. The `getAJAXOptions()` method creates the `AJAX Options` object that describes the HTTP request that you want your data action to make. The `getAJAXOptions()` method is passed the `oDataActionContext` object that contains the metadata describing the selected data-points, visualization, filters, project, and session. Set the `AJAX Options` as required by the HTTP API you're trying to integrate with and specify the functions you want to be called when the `HTTPRequest` is successful or results in an error. See the JQuery website for an explanation of the `jQuery.ajax` object and its properties.

The following implementation is inherited from the `HTTPAPIDataAction` class. You need to rewrite the inherited method to specify requirements. For example, forming the HTTP request, and the code that handles the HTTP response. This implementation is useful as it shows the parameters passed to the `getAJAXOptions()` function, the object that it's expected to return, and gives a clear example of how to structure the code inside the method.

```
/**
 * This method returns an object containing the AJAX settings used when the data action is invoked.
 * Subclasses may wish to override this method to provide their own behavior.
 * @param {module:obitech-reportservices/dataactionmanager.DataActionContext} oDataActionContext The context metadata describing where the data action was invoked from.
 * @returns {?object} A JQuery AJAX settings object (see http://api.jquery.com/jQuery.ajax/ for details) - returns null if there is a problem.
 */
dataaction.HTTPAPIDataAction.prototype.getAJAXOptions = function(oDataActionContext)
{
   jsx.assertInstanceOfModule(oDataActionContext, "oDataActionContext", "obitech-reportservices/dataactionmanager", "DataActionContext");

   var oAJAXOptions = null;
   var oKOViewModel = this.getKOViewModel();
   var sURL = oKOViewModel.sURL();
   if (sURL)
   {
      // Parse the URL
```

```
     var sResultURL = this._parseURL(sURL, oDataActionContext);
     if (sResultURL)
     {
        // Parse the POST parameters (if required)
        var eHTTPMethod = oKOViewModel.eHTTPMethod()[0];
        var sData = null;
        if (eHTTPMethod === dataaction.HTTPDataActionKOModel.HTTPMethod.POST)
        {
           var sPOSTParams = oKOViewModel.sPOSTParams();
           sData = sPOSTParams.replace(dataaction.AbstractHTTPDataAction.RegularExpressions.LINE_END, "&");
           sData = this._parseURL(sData, oDataActionContext, false);
        }
        oAJAXOptions = {
           type: eHTTPMethod,
           url: sResultURL,
           async: true,
           cache: false,
           success: function (/*oData, sTextStatus, oJQXHR*/)
           {
              oDataActionContext.getReport().displaySuccessMessage(messages.HTTP_API_DATA_ACTION_INVOCATION_SUCCESSFUL.format(oKOViewModel.sName()));
           },
           error: function (oJQXHR/*, sTextStatus, sError*/)
           {
              oDataActionContext.getReport().displayErrorMessage(messages.HTTP_API_DATA_ACTION_INVOCATION_FAILED.format(oKOViewModel.sName(), oJQXHR.statusText, oJQXHR.status));
           }
        };
        if (sData)
        {
           oAJAXOptions.data = sData;
        }
     }
  }
  return oAJAXOptions;
};
```

Test, Package, and Install Your Data Action

You use Oracle Analytics Desktop to test your data action from its source location before you install it.

1. If Oracle Analytics Desktop is currently running, close it.
2. If you're working behind a proxy, set the proxy settings in `%PLUGIN_DEV_DIR%\gradle.properties`. For information about accessing the web through HTTP proxy, see Gradle User Manual.

3. Run Oracle Analytics Desktop in SDK mode by using the command prompt you started in Choose Which Data Action Inherited Methods to Override and enter the following commands:

   ```
   cd %PLUGIN_DEV_DIR%
   ```

   ```
   .\gradlew run
   ```

   Oracle Analytics Desktop starts in SDK mode. Your data action plug-in appears in the Console | Extensions page.

   Create a project and test your data action. If you find any issues, you can debug your code using your browser's built-in developer tools.

4. If you created an HTTP API data action:
   1. Go to the Console and display the Safe Domains page.
   2. Add each domain that you want to access.

      For example, if you need access to the apilayer.com APIs, add `apilayer.net` to the list of safe domains.
   3. Click the **Connect** column checkbox for the selected domain.
   4. Reload the Safe Domains page in your browser for the changes to take effect.

5. If you want to prepare your data action plug-in to distribute to other people or to install in Oracle Analytics:
   - Package all of the files into a single ZIP file containing the `%PLUGIN_DEV_DIR%\src\customdataaction` folder and its contents.
   - Name the zip using the same ID you gave to your data action plug-in when you created it.

6. Install your data action plug-in. See Manage Custom Plug-ins.

Use an Upgrade Handler for Knockout Model Changes

For some Knockout Model changes you need to upgrade your data action plug-in using an upgrade handler.

When you're making improvements to your data action plug-in without making changes to the Knockout Model you normally edit your JavaScript or CSS files, create a new ZIP file, and replace the existing data action plug-in with the new ZIP file. However, if you've made changes to your data action's Knockout Model then you might need to change the data action `VERSION` property and provide an upgrade handler.

Decide whether you need to use an upgrade handler:

Upgrade Handler Required

- If you rename a property in your Knockout Model.
- If you combine multiple properties into a single property in your Knockout Model.
- If you split a single property into multiple properties in your Knockout Model.
- If you add a new property to the Knockout Model and the correct default value for it depends on other values in the Knockout Model.

Upgrade Handler Not Required

- If you add a new property to the Knockout Model and can provide a default value that's correct for all existing usages of your data action.
- If you remove a property from the Knockout Model because it's no longer used by your data action code.

Upgrade Data Action Plug-ins

Upgrade your data action plug-ins to improve the data action code or upgrade the metadata to enable existing data actions to work with new data action code.

Use an upgrade handler to upgrade a data action plug-in.

1. Increase the version number of your data action.

   For example, if your data action is called company.MyDataAction, then search `mydataaction.js` for the `mydataaction.MyDataAction.VERSION` property. If it's currently set to `1.0.0` then change it to `1.0.1`.
2. Add a `static upgrade(oOldDataActionJS)` method to your data action's class.

   If the `VERSION` property differs from the `sVersion` value stored in the data action metadata then the Data Action Manager calls the `static upgrade()` method on your data action's class.
3. Implement your `upgrade()` method by calling the `upgrade()` method on the superclass and capture its response.
4. Continue to implement your `upgrade()` method by making further edits to the partially upgraded data action JSON returned by the superclass, until the object matches the correct set of properties required by your latest Knockout Model.
5. To finish call `var oUpgradedDataAction = dataaction.AbstractDataAction.createFromJS(fDataActionClass, sFullyQualifiedDataActionClassName, oUpgradedDataActionJS)`.

   This command constructs a new instance of your data action from the upgraded data action JSON and returns `oUpgradedDataAction.getSettings()`.

About Data Action Plug-ins and the Data Actions Framework

Data action plug-ins leverage the data actions framework to provide custom, data-driven actions that are tightly integrated into the Oracle Analytics user interface.

When a user invokes a data action, the Data Action Manager passes the request context (for example, qualified data reference, measure values, filters and metadata) to the data action plug-in which is responsible for handling the request. Oracle provides four types of data action plug-ins: `CanvasDataAction`, `URLNavigationDataAction`, `HTTPAPIDataAction` and `EventDataAction`. You can extend these data action plug-in types along with their abstract base classes to provide your own data actions.

Topics:

- Data Action Categories
- Data Action Context
- Data Action Code Design
- Data Action Model Classes

- Data Action Service Classes
- Data Action Code Interactions
- Example Data Action plugin.xml File
- Data Action Plug-in Files and Folders

Data Action Categories

The data action categories include Navigate to URL, HTTP API, Navigate to Canvas, and Event actions:

- **Navigate to URL**: Opens the specified URL in a new browser tab.
- **HTTP API**: Uses the `GET/POST/PUT/DELETE/TRACE` commands to target an HTTP API and doesn't result in a new tab. Instead the HTTP status code is examined and a transient success or failure message is displayed.
- **Navigate to Canvas**: Enables the user to navigate from a source canvas to a target canvas in either the same or a different visualization. Any filters that are in effect in the source canvas are passed to the target canvas as external filters. When the target canvas opens, it attempts to apply the external filters to the visualization. The mechanism by which external filters are applied isn't described here.
- **Event Actions**: Publishes an event using the Oracle Analytics event router. Any JavaScript code (for example, a third-party plug-in) can subscribe to these events and handle their custom response accordingly. This provides the maximum flexibility because the plug-in developer can choose how the data action responds. For example, they can choose to display a user interface or pass data to multiple services at once.

Both the **Navigate to URL** and **HTTP API** data action category types can use a token syntax to inject data or metadata from the visualization into the `URL` and `POST` parameters.

URL Token Replacement

HTTP data actions can replace tokens in URLs with values from the context passed to the data action. For example, qualified data reference values, filter values, username, project path, and canvas name.

Token	Notes	Replace With	Example	Result
`${valuesForColumn:COLUMN}`	NA	Column display values from the qualified data reference.	`${valuesForColumn:"Sales"."Products"."Brand"}`	`BizTech,FunPod`

Token	Notes	Replace With	Example	Result
`${valuesForColumn:COLUMN, separator:"/"}`	Any token that can potentially be replaced with multiple values supports the optional separator option. The `separator` defaults to a comma (,) but you can set it to any string. You can escape double quotes inside this string by using a backslash (\).	Column display values from the qualified data reference.	`${valuesForColumn:"Sales"."Products"."Brand"}`	`BizTech,FunPod`

`${valuesForColumn:COLUMN, separationStyle:individual}`	Any `separationStyle` defaults to `delimited` but you can set it to `individual` if the user needs to generate separate URL parameters for each value.	Column display values from the qualified data reference.	`&myParam=${valuesForColumn:"Sales"."Products"."Brand"}`	`&myParam=BizTech`
				`&myParam=FunPod`

`${keyValuesForColumn:COLUMN}`	NA	Column key values from the qualified data reference.	`${keyValuesForColumn:COLUMN}`	`10001,10002`
`${env:ENV_VAR}`	Supported environment variables are: `sProjectPath`, `sProjectName`, `sCanvasName`, `sUserID`, and `sUserName`.	An environment variable.	`${env:'sUserID'}`	`myUserName`

Data Action Context

You can define a context that is passed when the user invokes a data action.

You define how much of the context is passed to the data action when you create the data action.

Qualified Data Reference

When the data action is invoked a qualified data reference is generated for each marked data point using an array of `LogicalFilterTree` objects. A `LogicalFilterTree` consists of multiple `LogicalFilterNode` objects arranged in a tree structure. This object includes:

- The attributes on the row or column edges of the data layout.
- The specific measure on the measure edge that addresses each marked cell.
- The specific measure value for each marked cell.
- Key values and display values.

Environment Variables

In addition to the data and metadata describing each marked data point, certain data actions may need further context describing the environment from where the data action is invoked. Such environment variables include:

- Project Path
- Project Name
- Canvas Name
- User ID
- User Name

Data Action Code Design

You create data actions using API classes.

- There are four concrete classes of data action that inherit from the `AbstractDataAction` class:
  - `CanvasDataAction`
  - `URLNavigationDataAction`
  - `HTTPAPIDataAction`
  - `EventDataAction`
- You can create new types of data actions using the data action plug-in API. See Data Visualizer SDK Reference.
- The registry of data action types is managed by the `DataActionPluginHandler`.
- Code that creates, reads, edits, deletes, or invokes instances of data actions does so by publishing events.
- Events are handled by the `DataActionManager`.

Data Action Model Classes

There are several different types of data action model classes.

AbstractDataAction

This class is responsible for:

- Storing the Knockout Model (subclasses are free to extend this with their own properties).
- Defining the abstract methods that subclasses must implement:
  - `+ invoke(oActionContext: ActionContext, oDataActionContext:DataActionContext) <<abstract>>`
    Invokes the data action with the passed context - should only be called by the `DataActionManager`.
  - `+ getGadgetInfos(oReport): AbstractGadgetInfo[] <<abstract>>`
    Constructs and returns the `GadgetInfos` responsible for rendering the user interface fields for editing this type of data action.

  - `+ validate() : DataActionError`
    Validates the data action and returns null if valid or a `DataActionError` if it's invalid.
- Providing the default implementation for the following methods used to render generic parts of the data action user interface fields:
  - `+ getSettings():JSON`
    Serializes the data action's Knockout Model to JSON ready to be included in the report (uses komapping.toJS(_koModel)).
  - `+ createNameGadgetInfo(oReport) : AbstractGadgetInfo`
    Constructs and returns the `GadgetInfo` that can render the data action's **Name** field.
  - `+ createAnchorToGadgetInfo(oReport) : AbstractGadgetInfo`
    Constructs and returns the `GadgetInfo` that can render the data action's **Anchor To** field.
  - `+ createPassValuesGadgetInfo(oReport) : AbstractGadgetInfo`
    Constructs and returns the `GadgetInfo` that can render the data action's **Pass Values** field.

Subclasses may not need all of the `GadgetInfos` that the base class provides so they may not need to call all of these methods. By separating out the rendering of each field in this way, subclasses are free to pick and choose the gadgets they need. Some subclasses may even choose to provide a different implementation of these common data action gadgets.

CanvasDataAction, URLNavigationDataAction, HTTPAPIDataAction, EventDataAction

These are the concrete classes for the basic types of data actions. These classes work by themselves to provide the generic user interface for these types of data action. They can also act as convenient base classes for custom data action plug-ins to extend.

- **CanvasDataAction**: Used to navigate to a canvas.
- **URLNavigationDataAction**: Used to open a web page in a new browser window.
- **HTTPAPIDataAction**: Used to make a `GET/POST/PUT/DELETE/TRACE` request to an HTTP API and handle the `HTTP Response` programatically.
- **EventDataAction**: Used to publish JavaScript events through the Event Router.

Each class is responsible for:

- Implementing the abstract methods from the base class.
  - `invoke(oActionContext: ActionContext, oDataActionContext:DataActionContext)`
    This method should invoke the data action by combining the properties defined in the KOModel with the specified `DataActionContext` object.
  - `getGadgetInfos(oReport): AbstractGadgetInfo[]`
    This method should:
    - Create an array containing `AbstractGadgetInfos`.
    - Call individual `createXXXGadgetInfo()` methods pushing each `AbstractGadgetInfo` into the array.
    - Return the array.
- Providing the additional methods for creating the individual gadgets that are specific to the particular subclass of data action.

Subclasses of these concrete classes may not need to use all of the gadgets provided by their superclasses in their custom user interfaces. By separating out the construction of each gadget in this way, subclasses are free to pick and choose the gadgets they need.

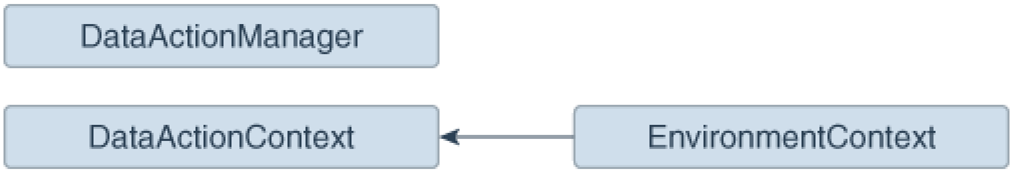
DataActionKOModel, ValuePassingMode

The `DataActionKOModel` class provides the base KOModel shared by the different subclasses of `AbstractDataAction`. See DataActionKOModel Class.

Data Action Service Classes

There are several different data action service classes.

DataActionManager



All communication with `DataActionManager` uses `ClientEvents.DataActionManager` which implements event handlers for:

- Managing the set of data actions defined in the current project.
- Invoking a data action.
- Retrieving all the data actions defined in the current project.
- Retrieving all the data actions that are applicable to the current marked data points.

DataActionContext, EnvironmentContext

When a data action is invoked, the `DataActionContext` class contains the context that's passed to the target.

- `getColumnValueMap()`
  Returns a map of attribute column values keyed by attribute column names. These define the qualified data reference for the data points that the data action is invoked from.
- `getLogicalFilterTrees()`
  Returns a `LogicalFilterTrees` object describing the qualified data references for the specific data points that the data action is invoked from (see the `InteractionService` for details).
- `getEnvironmentContext()`
  An instance of the `EnvironmentContext` class describing the source environment such as:
  - `getProjectPath()`
  - `getCanvasName()`

  - `getUserID()`
  - `getUserName()`
- `getReport()`
  Returns the report that the data action is invoked from.

DataActionHandler

The `DataActionHandler` class registers the various data action plug-ins. Its API is broadly consistent with the other plug-in handlers (for example, `VisualizationHandler`).

The `DataActionHandler` class provides the following public methods:

- `getClassName(sPluginType:String) : String`
  Returns the fully qualified class name for the specified data action type.
- `getDisplayName(sPluginType:String) : String`
  Returns the translated display name for the specified data action type.
- `getOrder(sPluginType:String) : Number`
  Returns a number used to sort lists of the types of data action into the preferred order.

The `DataActionHandler` class provides the following static methods:

- `getDependencies(oPluginRegistry:Object) : Object.<String, Array>`
  Returns a dependency map covering all the registered data action types.
- `getHandler(oPluginRegistry:Object, sExtensionPointName:String, oConfig:Object) : DataActionPluginHandler`
  Constructs and returns a new instance of the `DataActionHandler` class.

DataActionUpgradeHandler

The `DataActionUpgradeHandler` class is called by the `UpgradeService` when a report is opened.

The `DataActionHandler` class provides two main methods:

- `deferredNeedsUpgrade(sCurrentVersion, sUpgradeTopic, oDataActionJS, oActionContext) : Promise`
  Returns a `Promise` that resolves to a Boolean indicating whether the specified data action must be upgraded (`true`) or not (`false`). The method decides whether the data action must be upgraded by comparing the version number of the data action instance with the version number obtained from the data action's constructor. If the instance's version number is less than the constructor's version number, the data action instance must be upgraded.
- `performUpgrade(sCurrentVersion, sUpgradeTopic, oDataActionJS, oActionContext, oUpgradeContext) : Promise`
  Carries out the upgrade on the specified data action and resolves the `Promise`. The upgrade itself is carried out by calling the `upgrade()` method on the data action (only the specific subclass of data action being upgraded is qualified to upgrade itself).
- `getOrder(sPluginType:String) : Number`
  Returns a number used to sort lists of the types of data action into the preferred order.

Data Action Code Interactions

A data action interacts with Oracle Analytics code when it creates a user interface field, and when a user invokes a data action.

Create the Field for a New Data Action Instance

This interaction starts when Oracle Analytics wants to render a data action user interface field. To do so, it:

1. Creates a `PanelGadgetInfo` that acts as the parent `GadgetInfo` for the `GadgetInfos` that the data action returns.
2. Calls `getGadgetInfos()` on the data action.
3. Adds the data action's `GadgetInfos` as children of the `PanelGadgetInfo` created in the first step.
4. Creates the `PanelGadgetView` that renders the `PanelGadgetInfo`.
5. Sets the `HTMLElement` that's the container of the `PanelGadgetView`.
6. Registers the `PanelGadgetView` as a child `HostedComponent` of a `HostedComponent` that's already attached to the `HostedComponent` tree.
   This renders the data action's gadgets inside the Panel gadget in the order they appear in the array returned by `getGadgetInfos()`.

Invoke a Data Action

This interaction starts when the user invokes a data action through the Oracle Analytics user interface (for example, from the context menu on a data point in a visualization).

In response to the user interaction, the code:

1. Publishes an `INVOKE_DATA_ACTION` event containing the data action's ID, the `DataVisualization` that the data action is invoked from, and a `TransientVizContext` object.
2. The `DataActionManager` handles this event by:
   a. Obtaining the data action instance from its ID.
   b. Obtaining the `LogicalFilterTrees` for the marked data points in the specified `DataVisualization`.
   c. Constructing a `DataActionContext` that contains all the information to pass to the data action's target.
   d. Calling `invoke(oDataActionContext)` on the data action.

Example Data Action plugin.xml File

This topic shows an example plugin.xml file for a `CanvasDataAction` data action.

Example plugin.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<tns:obiplugin xmlns:tns="http://plugin.frameworks.tech.bi.oracle"
```

```
               xmlns:viz="http://plugin.frameworks.tech.bi.oracle/extension-
points/visualization"
               xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
               id="obitech-currencyconversion"
               name="Oracle BI Currency Conversion"
               version="0.1.0.@qualifier@"
               optimizable="true"
               optimized="false">


   <tns:resources>
      <tns:resource id="currencyconversion" path="scripts/
currencyconversion.js" type="script" optimizedGroup="base"/>
      <tns:resource-folder id="nls" path="resources/nls" optimizable="true">
         <tns:extensions>
            <tns:extension name="js" resource-type="script"/>
         </tns:extensions>
      </tns:resource-folder>
   </tns:resources>


   <tns:extensions>
      <tns:extension id="oracle.bi.tech.currencyconversiondataaction" point-
id="oracle.bi.tech.plugin.dataaction" version="1.0.0">
         <tns:configuration>
         {
            "resourceBundle": "obitech-currencyconversion/nls/messages",
            "properties":
            {
               "className": "obitech-currencyconversion/
currencyconversion.CurrencyConversionDataAction",
               "displayName": { "key" : "CURRENCY_CONVERSION", "default" :
"Currency Conversion" },
               "order": 100
            }
         }
         </tns:configuration>
      </tns:extension>
   </tns:extensions>


</tns:obiplugin>
```

Data Action Plug-in Files and Folders

The following files and folders are used to implement data action plug-ins.

`bitech/client/plugins/src/`

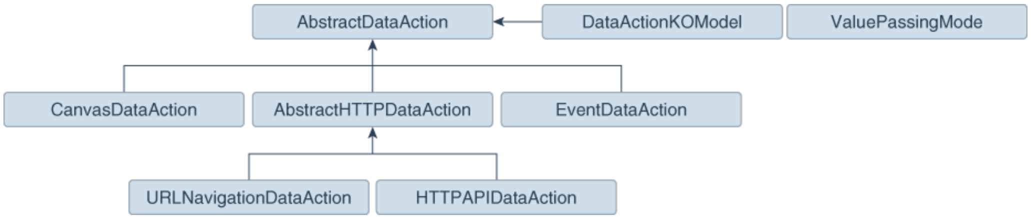
- `report`
  - `obitech-report`
    - `scripts`
      - `dataaction`

        - `dataaction.js`
        - `dataactiongadgets.js`
        - `dataactionpanel.js`
        - `dataactionupgradehandler.js`
- `obitech-reportservice`
  - `scripts`
    - `dataaction`
      - `dataactionmanager.js`
      - `dataactionhandler.js`

Choose the Best Data Action Class to Extend

Before you start writing your custom data action plug-in, decide which of the existing data action classes you want to extend. Choose the data action class that provides functionality that most closely matches what you want your data action to do.

Each data action inherits from the `AbstractDataAction` class as shown in the class diagram. The class diagram shows the two abstract data action classes (`AbstractDataAction` and `AbstractHTTPDataAction`) and the four concrete data action classes (`CanvasDataAction`, `URLNavigationDataAction`, `HTTPAPIDataAction`, and `EventDataAction`) that you can extend. Each data action that you provide must extend one of these classes. Which class you extend depends on the behavior you want to implement when you invoke your data action. Most third-party data actions are likely to extend either `URLNavigationDataAction`, `HTTPAPIDataAction` or `EventDataAction`.



Regardless of which class you extend, when your data action is invoked, you're provided with metadata describing the full context of the data-point from which the data action is invoked. See Data Action Context.

AbstractDataAction Class

`AbstractDataAction` is the abstract base class from which all types of data action inherit. It's responsible for providing common functionality and default behavior that the subclasses can use.

AbstractDataAction

All types of data action are subclasses of the `AbstractDataAction` base class. It provides the core set of functionality common to all data actions. Unless you're creating a complex data action that carries out multiple types of action when invoked, or you need to do something not supported by the concrete classes, you shouldn't extend this class directly. If you need to create a complex data action then consider extending the concrete class that most closely provides the functionality you require.

AbstractDataAction Syntax

```
+ AbstractDataAction(oKOModel)



+ getKOViewModel():DataActionKOModel



+ createFromJS(fDataActionConstructor, sClassName, oDataActionKOModelUS) :
AbstractDataAction


+ invoke(oActionContext, oDataActionContext)
+ getGadgetInfos(oReport) : AbstractGadgetInfo[]
+ validate() : DataActionError


+ getSettings() : Object
+ requiresActionContextToInvoke() : Boolean
+ isAllowedHere() : Boolean


# createNameGadgetInfo(oReport) : AbstractGadgetInfo
# createAnchorToGadgetInfo(oReport) : AbstractGadgetInfo
# createPassValuesGadgetInfo(oReport) : AbstractGadgetInfo
```

DataActionKOModel Class

Each subclass of `AbstractDataAction` is likely to create its own subclass of `DataActionKOModel`. The `DataActionKOModel` base class provides the following properties:

DataActionKOModel, ValuePassingMode

- `sID:String`
  The unique ID given to the data action instance.
- `sClass:String`
  The class name of this specific type of data action.
- `sName:String`
  The display name given to the data action instance.
- `sVersion`
- `sScopeID`
- `eValuePassingMode:ValuePassingMode`
  The mode used when passing context values. The mode can be one of the `ValuePassingMode` values (`ALL, ANCHOR_DATA, NONE, CUSTOM`).
- `aAnchorToColumns: ColumnKOViewModel[]`

The columns that this data action is anchored to. This is optional. If not supplied, then the data action is available on all columns.

- `aContextColumns : ColumnKOViewModel[]`
  The columns that this data action includes in the context passed to the data action target when the data action is invoked. If not supplied, all marked columns are included in the context.

CanvasDataAction Class

`CanvasDataAction` is a subclass of the `AbstractDataAction` base class. You can extend this concrete class to provide the functionality you require.

CanvasDataAction

Use the `CanvasDataAction` class to navigate from a data point in a visualization to a different canvas. The canvas you're navigating to can be in the same project or a different one. All the active filters for the source visualization are passed to the target canvas along with new filters that describe the Qualified Data Reference of the data point itself. If your data action needs to navigate to a different canvas then this is the class your data action should extend.

```
+ CanvasDataAction(oKOModel)



+ create(s)ID_sName) : CanvasDataAction
+ upgrade(oOldDataActionJS) : Object



+ invoke(oActionContext: ActionContext,
oDataActionContext:DataActionContext)
+ getGadgetInfos(oReport) : AbstractGadgetInfo[]
+ validate() : DataActionError


# createProjectGadgetInfo(oReport) : AbstractGadgetInfo
# createCanvasGadgetInfo(oReport) : AbstractGadgetInfo
```

EventDataAction Class

`EventDataAction` is a subclass of the `AbstractDataAction` base class. You can extend this concrete class to provide the functionality you require.

EventDataAction

Use the `EventDataAction` class to publish a client-side event. You can then register one or more subscribers that listen for that event and perform their own actions. Use this type of data action in more complex use cases where you've a large amount of code and can benefit from keeping your data action code loosely coupled to the code that performs the necessary actions when the data action is invoked.

```
+ EventDataAction(oKOModel)



+ create(sID_sName) : EventDataAction
+ upgrade(oOldDataActionJS) : Object


+ invoke(oActionContext: ActionContext, oDataActionContext:DataActionContext)
+ getGadgetInfos(oReport) : AbstractGadgetInfo[]
+ validate() : DataActionError


# createEventGadgetInfo(oReport) : AbstractGadgetInfo
```

AbstractHTTPDataAction Class

`AbstractHTTPDataAction` is the abstract base class that the `URLNavigationDataAction` and `HTTPAPIDataAction` subclasses inherit common functionality and default behavior from.

AbstractHTTPDataAction

The `AbstractHTTPDataAction` abstract base class is shared by both the `URLNavigationDataAction` and `HTTPAPIDataAction` classes. If your data action needs to open a web page in a new browser tab you must extend `URLNavigationDataAction`. If your data action needs to invoke an HTTP API then you should extend `HTTPAPIDataAction`. You may decide it's better to extend `AbstractHTTPDataAction` directly.

```
+ HTTPDataAction(oKOModel)


+ validate() : DataActionError


# createURLGadgetInfo(oReport) : AbstractGadgetInfo
```

URLNavigationDataAction Class

`URLNavigationDataAction` is a subclass or the `AbstractHTTPDataAction` base class.

URLNavigationDataAction

Use the `URLNavigationDataAction` class to open a specific URL in a new browser tab. You compose the URL using tokens that are replaced with values derived from data points that the user selects when they invoke the data action. The data point values are passed as part of the data action context to the external web page. For example, create a data action invoked using a `CustomerID` column that opens a customer's web page in your Customer Relations Management application such as Oracle Sales Cloud.

```
+ URLNavigationDataAction(oKOModel)


+ create(sID_sName) : URLNavigationDataAction
+ upgrade(oOldDataActionJS) : Object


+ invoke(oActionContext: ActionContext,
oDataActionContext:DataActionContext)
+ getGadgetInfos(oReport) : AbstractGadgetInfo[]
```

HTTPAPIDataAction Class

`HTTPAPIDataAction` is a subclass or the `AbstractHTTPDataAction` base class. You can extend this concrete class to provide the functionality you require.

HTTPAPIDataAction

Use the `HTTPAPIDataAction` class to invoke HTTP APIs by creating an asyncronous `XMLHTTPRequest` (XHR) and submitting it to the specified URL. The HTTP response code enables a message to be displayed briefly on the canvas. For example, you can customize the request to send JSON or XML payloads to a REST or SOAP server and you can customize the response handler to show a custom user interface.

For the `HTTPAPIDataAction` data action to work, you must add the URL of the HTTP API you want to access to your list of Safe Domains and grant it **Connect** access. See Register Safe Domains.

```
+ HTTPAPIDataAction(oKOModel)


+ create(sID_sName) : HTTPAPIDataAction
+ upgrade(oOldDataActionJS) : Object


+ invoke(oActionContext: ActionContext,
oDataActionContext:DataActionContext)
+ getGadgetInfos(oReport) : AbstractGadgetInfo[]


# createHTTPMethodGadgetInfo(oReport) : AbstractGadgetInfo
# createPostParamGadgetInfo(oReport) : AbstractGadgetInfo
```

Data Action Plug-in File Reference

Each data action plug-in requires a plugin.xml file and each plugin.xml file can contain any number of data actions.

Topics:

- Data Action plugin.xml File Example
- Data Action plugin.xml File Properties Section - tns:obiplugin
- Data Action plugin.xml File Resources Section - tns:resources
- Data Action plugin.xml File Extensions Section - tns:extension

Data Action plugin.xml File Example

The plugin.xml file has three main sections, `tns:obiplugin`, `tns:resources`, and `tns:extension`.

Example plugin.xml

This example shows a typical plugin.xml file for one data action.

```
<?xml version="1.0" encoding="UTF-8"?>
<tns:obiplugin xmlns:tns="http://plugin.frameworks.tech.bi.oracle"
               id="obitech-currencyconversion"
               name="Oracle BI Currency Conversion"
               version="0.1.0.@qualifier@"
               optimizable="true"
               optimized="false">


   <tns:resources>
      <tns:resource id="currencyconversion" path="scripts/currencyconversion.js" type="script" optimizedGroup="base"/>
      <tns:resource-folder id="nls" path="resources/nls" optimizable="true">
         <tns:extensions>
            <tns:extension name="js" resource-type="script"/>
         </tns:extensions>
      </tns:resource-folder>
   </tns:resources>


   <tns:extensions>
      <tns:extension id="oracle.bi.tech.currencyconversiondataaction" point-id="oracle.bi.tech.plugin.dataaction" version="1.0.0">
         <tns:configuration>
         {
            "host": { "module": "obitech-currencyconversion/currencyconversion" },
            "resourceBundle": "obitech-currencyconversion/nls/messages",
            "properties":
            {
               "className": "obitech-currencyconversion/currencyconversion.CurrencyConversionDataAction",
               "displayName": { "key" : "CURRENCY_CONVERSION", "default" : "Currency Conversion" },
               "order": 100
            }
         }
         </tns:configuration>
      </tns:extension>
   </tns:extensions>

 </tns:obiplugin>
```

Data Action plugin.xml File Properties Section - tns:obiplugin

The `tns:obiplugin` section defines properties common to all types of plug-ins.

Plug-in Properties

The `tns:obiplugin` section defines properties common to all types of plug-ins.

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <tns:obiplugin xmlns:tns="http://plugin.frameworks.tech.bi.oracle"
3                id="obitech-currencyconversion"
4                name="Oracle BI Currency Conversion"
5                version="0.1.0.@qualifier@"
6                optimizable="true"
7                optimized="false">
```

- **Line 1**: The XML declaration.
- **Line 2**: The opening tag for the plug-in's root XMLElement and the declaration for the `tns` namespace that's used throughout plugin.xml files.
- **Line 3**: The plug-in's unique ID.
- **Line 4**: The plug-in's default display name (used when a localized version isn't available).
- **Line 5**: The plug-in's version number.
- **Line 6**: A boolean indicating whether or not the JS/CSS can be optimized (compressed).
- **Line 7**: A boolean indicating whether or not the JS/CSS has been optimized (compressed).

Data Action plugin.xml File Resources Section - tns:resources

The `tns:resources` section registers all of the files that contribute to your plug-in.

Resources

```
<tns:resources>
```

```
   <tns:resource id="currencyconversion" path="scripts/
currencyconversion.js" type="script" optimizedGroup="base"/>
   <tns:resource-folder id="nls" path="resources/nls" optimizable="true">
      <tns:extensions>
         <tns:extension name="js" resource-type="script"/>
      </tns:extensions>
   </tns:resource-folder>
</tns:resources>
```

You need to register each JavaScript, CSS, Image, and Translation Resource File here. The section is contained within the `<tns:resources>` element and contains any number of the following elements:

- `<tns:resource>`
  These elements are used to register a single file (for example, a JavaScript or CSS file).
- `<tns:resource-folder>`
  These elements are used to register all the files under a specified folder at the same time. For example, an image folder or the folder containing the resource files for Native Language Support.

More information on how to register each type of file is provided in the following sections.

JavaScript Files

Each JavaScript file in your plug-in must be registered with a line similar to the one shown below.

```
<tns:resource id="currencyconversion" path="scripts/currencyconversion.js"
type="script" optimizedGroup="base"/>
```

Where:

- **id** is the ID given to the file.
  Set the ID to match the JavaScript filename without the .js extension.
- **path** is the relative path to the JavaScript file from the plugin.xml file. JavaScript files should be stored under your plug-in's `scripts` directory.
  Use all lowercase for your JavaScript files with no special characters (for example, underscore, hyphen).
- **type** is the type of file being registered. It must be set to `script` for JavaScript files.
- **optimizedGroup** groups multiple JavaScript files into a single compressed file. Third-party plug-ins must leave this set to `base`.

CSS Files

Each CSS file in your plug-in must be registered with a line similar to the one shown below.

```
<tns:resource id="currencyconversionstyles" path="resources/
currencyconversion.css" type="css"/>
```

Where:

- **id** is the ID given to the file.
  Set the ID to match the CSS filename without the .css extension.

- **path** is the relative path to the CSS file from the plugin.xml file. CSS files should be stored under your plug-in's `resources` directory.
  Use all lowercase for your CSS files with no special characters (for example, underscore, hyphen).
- **type** is the type of file being registered. It should always be set to `css` for CSS files.

Image Folders

If your plug-in has images that you need to refer to from within your JavaScript code, then put them in a `resources/images` directory within your plug-in's directory structure and add a `<tns:resource-folder>` element to your `plugin.xml` as follows:

```
<tns:resource-folder id="images" path="resources/images"
optimizable="false"/>
```

If your images are only referenced by your CSS files, then you don't need to add this `<tns:resource-folder>` element to your `plugin.xml` file. In this case, you must still add them to the `resources/images` directory so that you can then refer to them using a relative path from your CSS file.

Native Language Support Resource Folders

Oracle Analytics implements Native Language Support. This requires developers to externalize the strings they display in their user interface into separate JSON resource files. You can then provide different localized versions of those files in a prescribed directory structure and Oracle Analytics automatically uses the correct file for the user's chosen language. You can provide as many translated versions of the resource files as needed. A Native Language Support resource folder points Oracle Analytics to the root of the prescribed Native Language Support directory structure used by your plug-in. All plug-ins that use Native Language Support resource files must have a `<tns:resource-folder>` entry that looks exactly like the example below.

```
<tns:resource-folder id="nls" path="resources/nls" optimizable="true">
   <tns:extensions>
      <tns:extension name="js" resource-type="script"/>
   </tns:extensions>
</tns:resource-folder>
```

See Generated Folders and Files for details about the contents of the files and the prescribed directory structure that you should follow.

Data Action plugin.xml File Extensions Section - tns:extension

For each data action you want your plug-in to provide, you must register a data action extension using a `<tns:extension>` element similar to this:

```
<tns:extension id="oracle.bi.tech.currencyconversiondataaction" point-
id="oracle.bi.tech.plugin.dataaction" version="1.0.0">
   <tns:configuration>
   {
      "host": { "module": "obitech-currencyconversion/
currencyconversion" },
      "resourceBundle": "obitech-currencyconversion/nls/messages",
      "properties":
      {
         "className": "obitech-currencyconversion/
currencyconversion.CurrencyConversionDataAction",
         "displayName": { "key" : "CURRENCY_CONVERSION", "default" :
"Currency Conversion" },
         "order": 100
      }
   }
   </tns:configuration>
</tns:extension>
```

Where:

- **id** is the unique ID you give to your data action.
- **point-id** is the type of extension you want to register. For data action extensions, this must be set to `oracle.bi.tech.plugin.dataaction`.
- **version** is the extension API version that your extension definition uses (leave this set to **1.0.0**).

The `<tns:configuration>` element contains a JSON string that defines:

- **host.module** - This is the fully qualified name of the module containing your data action. This fully qualified module name is formulated as `%PluginID%/%ModuleName%`, where:
  - `%PluginID%` must be replaced with the plug-in ID you specified in the id attribute of the `<tns:obiplugin>` element.
  - `%ModuleName%` must be replaced with the resource ID you specified in the id attribute of the `<tns:resource>` element for the JavaScript file containing your data action.
- **resourceBundle** - This is the Native Language Support path to the resource file that contains this data action's localized resources. If your resource files are named messages.js and stored correctly in the prescribed `nls` directory structure, then set this property to `%PluginID%/nls/messages` (where `%PluginID%` must be replaced with the plug-in ID you specified in the id attribute of the `<tns:obiplugin>` element at the top of the `plugin.xml` file).
- **properties.className** - This is the fully qualified class name given to the data action you're registering. This fully qualified class name is formulated as `%PluginID%/%ModuleName%.%ClassName%`, where:
  - `%PluginID%` must be replaced with the plug-in ID you specified in the id attribute of the `<tns:obiplugin>` element.
  - `%ModuleName%` must be replaced with the resource ID you specified in the id attribute of the `<tns:resource>` element for the JavaScript file containing your data action.
  - `%ClassName%` must be replaced with the name you gave to the data action class in your JavaScript file.
- **properties.displayName** - This property contains an object and two further properties:
  - **key** is the Native Language Support message key that can be used to lookup the data action's localized display name from within the specified `resourceBundle`.
  - **default** is the default display name to use if for some reason the localized version of the display name can't be found.

- **properties.order -** This property enables you to provide a hint that's used to determine the position that this data action should appear when shown in a list of data actions. Data actions with lower numbers in their order property appear before data actions with higher numbers. When there's a tie, the data actions are displayed in the order they're loaded by the system.

9

Use Oracle Analytics Predictive Models and Oracle Machine Learning Models

Predict data with Oracle Analytics predictive models or machine learning models that reside in Oracle Database or Oracle Autonomous Data Warehouse.

Topics:

- Create and Use Oracle Analytics Predictive Models
- Register and Use Oracle Machine Learning Models
- Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set

Create and Use Oracle Analytics Predictive Models

Oracle Analytics predictive models use several embedded machine learning algorithms to mine your data sets, predict a target value, or identify classes of records. Use the data flow editor to create, train, and apply predictive models to your data.

Topics:

- What Are Oracle Analytics Predictive Models?
- How Do I Choose a Predictive Model Algorithm?
- Typical Workflow to Create and Use Oracle Analytics Predictive Models
- Create and Train a Predictive Model
- Inspect a Predictive Model
- Add a Predictive Model to a Project

What Are Oracle Analytics Predictive Models?

An Oracle Analytics predictive model applies a specific algorithm to a data set to predict values, predict classes, or to identify groups in the data.

You can also use Oracle machine learning models to predict data. See How Can I Use Oracle Machine Learning Models in Oracle Analytics?.

Oracle Analytics includes algorithms to help you train predictive models for various purposes. Examples of algorithms are classification and regression trees (CART), logistic regression, and k-means.

You use the data flow editor to first train a model on a training data set. After the predictive model has been trained, you apply it to the data sets that you want to predict.

You can make a trained model available to other users who can apply it against their data to predict values. In some cases, certain users train models, and other users apply the models.

Note:

If you're not sure what to look for in your data, you can start by using Explain, which uses machine learning to identify trends and patterns. Then you can use the data flow editor to create and train predictive models to drill into the trends and patterns that Explain found. See What is Explain?

You use the data flow editor to train a model:

- First, you create a data flow and add the data set that you want to use to train the model. This training data set contains the data that you want to predict (for example, a value like sales or age, or a variable like credit risk bucket).
- If needed, you can use the data flow editor to edit the data set by adding columns, selecting columns, joining, and so on.
- After you've confirmed that the data is what you want to train the model on, you add a training step to the data flow and choose a classification (binary or multi), regression, or cluster algorithm to train a model. Then name the resulting model, save the data flow, and run it to train and create the model.
- Examine the properties in the machine learning objects to determine the quality of the model. If needed, you can iterate the training process until the model reaches the quality you want.

Use the finished model to score unknown, or unlabeled, data to generate a data set within a data flow or to add a prediction visualization to a project.

Example

Suppose you want to create and train a multi-classification model to predict which patients have a high risk of developing heart disease.

1. Supply a training data set containing attributes on individual patients like age, gender, and if they've ever experienced chest pain, and metrics like blood pressure, fasting blood sugar, cholesterol, and maximum heart rate. The training data set also contains a column named "Likelihood" that is assigned one of the following values: absent, less likely, likely, highly likely, or present.
2. Choose the CART (Decision Tree) algorithm because it ignores redundant columns that don't add value for prediction, and identifies and uses only the columns that are helpful to predict the target. When you add the algorithm to the data flow, you choose the Likelihood column to train the model. The algorithm uses machine learning to choose the driver columns that it needs to perform and output predictions and related data sets.
3. Inspect the results and fine tune the training model, and then apply the model to a larger data set to predict which patients have a high probability of having or developing heart disease.

How Do I Choose a Predictive Model Algorithm?

Oracle Analytics provides algorithms for any of your machine learning modeling needs: numeric prediction, multi-classifier, binary classifier, and clustering.

Oracle's machine learning functionality is for advanced data analysts who have an idea of what they're looking for in their data, are familiar with the practice of predictive analytics, and understand the differences between algorithms.

Normally users want to create multiple prediction models, compare them, and choose the one that's most likely to give results that satisfy their criteria and requirements. These criteria can vary. For example, sometimes users choose models that have better overall accuracy, sometimes users choose models that have the least type I (false positive) and type II (false negative) errors, and sometimes users choose models that return results faster and with an acceptable level of accuracy even if the results aren't ideal.

Oracle Analytics contains multiple machine learning algorithms for each kind of prediction or classification. With these algorithms, users can create more than one model, or use different fine-tuned parameters, or use different input training datasets and then choose the best model. The user can choose the best model by comparing and weighing models against their own criteria. To determine the best model, users can apply the model and visualize results of the calculations to determine accuracy, or they can open and explore the related data sets that Oracle Analytics used the model to output. See What Are a Predictive Model's Related Data Sets?

Consult this table to learn about the provided algorithms:

Name	Type	Category	Function	Description
CART	Classification Regression	Binary Classifier Multi-Classifier Numerical	-	Uses decision trees to predict both discrete and continuous values. Use with large data sets.
Elastic Net Linear Regression	Regression	Numerical	ElasticNet	Advanced regression model. Provides additional information (regularization), performs variable selection, and performs linear combinations. Penalties of Lasso and Ridge regression methods. Use with a large number of attributes to avoid collinearity (where multiple attributes are perfectly correlated) and overfitting.

Name	Type	Category	Function	Description
Hierarchical	Clustering	Clustering	AgglomerativeClustering	Builds a hierarchy of clustering using either bottom-up (each observation is its own cluster and then merged) or top down (all observations start as one cluster) and distance metrics. Use when the data set isn't large and the number of clusters isn't known beforehand.
K-Means	Clustering	Clustering	k-means	Iteratively partitions records into k clusters where each observation belongs to the cluster with the nearest mean. Use for clustering metric columns and with a set expectation of number of clusters needed. Works well with large datasets. Result are different with each run.
Linear Regression	Regression	Numerical	Ordinary Least Squares Ridge Lasso	Linear approach for a modeling relationship between target variable and other attributes in the data set. Use to predict numeric values when the attributes aren't perfectly correlated.
Logistic Regression	Regression	Binary Classifier	LogisticRegressionCV	Use to predict the value of a categorically dependent variable. The dependent variable is a binary variable that contains data coded to 1 or 0.
Naive Bayes	Classification	Binary Classifier Multi-Classifier	GaussianNB	Probabilistic classification based on Bayes' theorem that assumes no dependence between features. Use when there are a high number of input dimensions.

Name	Type	Category	Function	Description
Neural Network	Classification	Binary Classifier Multi-Classifier	MLPClassifier	Iterative classification algorithm that learns by comparing its classification result with the actual value and returns it to the network to modify the algorithm for further iterations. Use for text analysis.
Random Forest	Classification	Binary Classifier Multi-Classifier Numerical	-	An ensemble learning method that constructs multiple decision trees and outputs the value that collectively represents all the decision trees. Use to predict numeric and categorical variables.
SVM	Classification	Binary Classifier Multi-Classifier	LinearSVC, SVC	Classifies records by mapping them in space and constructing hyperplanes that can be used for classification. New records (scoring data) are mapped into the space and are predicted to belong to a category, which is based on the side of the hyperplane where they fall.

Typical Workflow to Create and Use Oracle Analytics Predictive Models

Here are the common tasks for creating predictive models, and how to apply the models to data sets and use them in projects.

Task	Description	More Information
Train a model using sample data	Use one of the supplied algorithms to train a model to predict trends and patterns in your sample data.	Create and Train a Predictive Model
Evaluate a model	Use related data sets to evaluate the effectiveness of your model, and iteratively refine the model until you're satisfied with it.	Inspect a Predictive Model
Apply a model to your data using a data flow	Apply a training predictive model to your data to generate a data set that includes the predicted trends and patterns.	Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set

Task	Description	More Information
Apply a predictive model to your project data	Use a scenario to add a predictive model to your project.	Add a Predictive Model to a Project

Create and Train a Predictive Model

Based on the problem that needs to be solved, an advanced data analyst chooses an appropriate algorithm to train a predictive model and then evaluates the model's results.

Arriving at an accurate model is an iterative process and an advanced data analyst can try different models, compare their results, and fine tune parameters based on trial and error. A data analyst can use the finalized, accurate predictive model to predict trends in other data sets, or add the model to projects.

Oracle Analytics provides algorithms for numeric prediction, multi-classification, binary-classification and clustering. For information about how to choose an algorithm, see How Do I Choose a Predictive Model Algorithm?

1. On the Home page, click **Create**, and then select **Data Flow**.
2. Select the data set that you want to use to train the model. Click **Add**.

   Typically you'll select a data set that was prepared specifically for training the model and contains a sample of the data that you want to predict. The accuracy of a model depends on how representative the training data is.
3. In the data flow editor, click **Add a step (+)**.

   After adding a data set, you can either use all columns in the data set to build the model or select only the relevant columns. Choosing the relevant columns requires an understanding of the data set. Ignore columns that you know won't influence the outcome behavior or that contain redundant information. You can choose only relevant columns by adding the **Select Columns** step. If you're not sure about the relevant columns, then use all columns.
4. Navigate to the bottom of the list and click the train model type that you want to apply to the data set.
5. Select an algorithm and click **OK**.
6. If you're working with a supervised model like prediction or classification, then click **Target** and select the column that you're trying to predict. For example, if you're creating a model to predict a person's income, then select the Income column.

   If you're working with an unsupervised model like clustering, then no target column is required.
7. Change the default settings for your model to fine tune and improve the accuracy of the predicted outcome. The model you're working with determines these settings.
8. Click the **Save Model** step and provide a name and description. This will be the name of the generated predictive model.
9. Click **Save**, enter a name and description of the data flow, and click **OK** to save the data flow.

10. Click **Run Data Flow** to create the predictive model based on the input data set and model settings that you provided.

Inspect a Predictive Model

After you create the predictive model and run the data flow, you can review information about the model to determine its accuracy. Use this information to iteratively adjust the model settings to improve its accuracy and predict better results.

Topics:

- View a Predictive Model's Details
- Assess a Predictive Model's Quality
- What Are a Predictive Model's Related Data Sets?
- Find a Predictive Model's Related Data Sets

View a Predictive Model's Details

A predictive model's detail information helps you understand the model and determine if it's suitable for predicting your data. Model details include its model class, algorithm, input columns, and output columns

1. On the Home page, click **Navigator**, and then click **Machine Learning**.
2. Click the menu icon for a training model and select **Inspect**.
3. Click the **Details** to view the model's information.

Assess a Predictive Model's Quality

View information that helps you understand the quality of a predictive model. For example, you can review accuracy metrics like model accuracy, precision, recall, F1 value, and false positive rate.

Oracle Analytics provides similar metrics irrespective of the algorithm used to create the model, thereby making comparison between different models easy. During the model creation process, the input data set is split into two parts to train and test the model based on the Train Partition Percent parameter. The model uses the test portion of the data set to test the accuracy of the model that is built.

Based on your findings in the **Quality** tab, you may need to adjust the model parameters and retrain it. See Create and Train a Predictive Model.

1. On the Home page, click **Navigator**, and then click **Machine Learning**.
2. Click the menu icon for a training model and select **Inspect**.
3. Click the **Quality** tab to review the model's quality metrics.

What Are a Predictive Model's Related Data Sets?

When you run the data flow to create the Oracle Analytics predictive model's training model, Oracle Analytics creates a set of related data sets. You can open and create projects on these data sets to learn about the accuracy of the model.

See Find a Predictive Model's Related Data Sets.

Depending on the algorithm you chose for your model, related data sets contain details about the model such as prediction rules, accuracy metrics, confusion matrix, and key drivers for prediction. You can use this information to fine tune the model to get better results, and you can use related data sets to compare models and decide which model is more accurate.

For example, you can open a Drivers data set to discover which columns have a strong positive or negative influence on the model. By examining those columns, you find that some columns aren't treated as model variables because they aren't realistic inputs or that they're too granular for the forecast. You use the data flow editor to open the model and based on the information you discovered, you remove the irrelevant or too-granular columns, and regenerate the model. You check the Quality and Results tab and verify if the model accuracy is improved. You continue this process until you're satisfied with the model's accuracy and it's ready to score a new data set.

Different algorithms generate similar related data sets. Individual parameters and column names may change in the data set depending on the type of algorithm, but the functionality of the data set stays the same. For example, the column names in a statistics data set may change from Linear Regression to Logistic Regression, but the statistics data set contains accuracy metrics of the model.

These are the related data sets:

CARTree

This data set is a tabular representation of CART (Decision Tree), computed to predict the target column values. It contains columns that represent the conditions and the conditions' criteria in the decision tree, a prediction for each group, and prediction confidence. The Inbuilt Tree Diagram visualization can be used to visualize this decision tree.

The CARTree data set is outputted when you select these model and algorithm combinations.

Model	Algorithm
Numeric	CART for Numeric Prediction
Binary Classification	CART (Decision Tree)
Multi Classification	CART (Decision Tree)

Classification Report

This data set is a tabular representation of the accuracy metrics for each distinct value of the target column. For example, if the target column can have the two distinct values Yes and No, this data set shows accuracy metrics like F1, Precision, Recall, and Support (the number of rows in the training data set with this value) for every distinct value of the target column.

The Classification data set is outputted when you select these model and algorithm combinations.

Model	Algorithms
Binary Classification	Naive Bayes Neural Network Support Vector Machine

Model	Algorithms
Multi Classification	Naive Bayes Neural Network Support Vector Machine

Confusion Matrix

This data set, which is also called an error matrix, is a pivot table layout. Each row represents an instance of a predicted class, and each column represents an instance in an actual class. This table reports the number of false positives, false negatives, true positives, and true negatives, which are used to compute precision, recall, and F1 accuracy metrics.

The Confusion Matrix data set is outputted when you select these model and algorithm combinations.

Model	Algorithms
Binary Classification	Logistics Regression CART (Decision Tree) Naive Bayes Neural Network Random Forest Support Vector Machine
Multi Classification	CART (Decision Tree) Naive Bayes Neural Network Random Forest Support Vector Machine

Drivers

This data set provides information about the columns that determine the target column values. Linear regressions are used to identify these columns. Each column is assigned coefficient and correlation values. The coefficient value describes the column's weight-age used to determine the target column's value. The correlation value indicates the relationship direction between the target column and dependent column. For example, if the target column's value increases or decreases based on the dependent column.

The Drivers data set is outputted when you select these model and algorithm combinations.

Model	Algorithms
Numeric	Linear Regression Elastic Net Linear Regression
Binary Classification	Logistics Regression Support Vector Machine
Multi Classification	Support Vector Machine

Hitmap

This data set contains information about the decision tree's leaf nodes. Each row in the table represents a leaf node and contains information describing what that leaf node represents, such as segment size, confidence, and expected number of rows. For example, expected number of correct predictions = Segment Size * Confidence.

The Hitmap data set is outputted when you select these model and algorithm combinations.

Model	Algorithm
Numeric	CART for Numeric Prediction

Residuals

This data set provides information on the quality of the residual predictions. A residual is the difference between the measured value and the predicted value of a regression model. This data set contains an aggregated sum value of absolute difference between the actual and predicted values for all columns in the data set.

The Residuals data set is outputted when you select these model and algorithm combinations.

Model	Algorithms
Numerics	Linear Regression Elastic Net Linear Regression CART for Numeric Prediction
Binary Classification	CART (Decision Tree)
Multi Classificatin	CART (Decision Tree)

Statistics

This data set's metrics depend upon the algorithm used to generate it. Note this list of metrics based on algorithm:

- Linear Regression, CART for Numeric Prediction, Elastic Net Linear Regression - These algorithms contain R-Square, R-Square Adjusted, Mean Absolute Error(MAE), Mean Squared Error(MSE), Relative Absolute Error(RAE), Related Squared Error(RSE), Root Mean Squared Error(RMSE).
- CART(Classification And Regression Trees), Naive Bayes Classification, Neural Network, Support Vector Machine(SVM), Random Forest, Logistic Regression - These algorithms contain Accuracy, Total F1.

This data set is outputted when you select these model and algorithm combinations.

Model	Algorithm
Numeric	Linear Regression Elastic Net Linear Regression CART for Numeric Prediction

Model	Algorithm
Binary Classification	Logistics Regression CART (Decision Tree) Naive Bayes Neural Network Random Forest Support Vector Machine
Multi Classification	Naive Bayes Neural Network Random Forest Support Vector Machine

Summary

This data set contains information such as Target name and Model name.

The Summary data set is outputted when you select these model and algorithm combinations.

Model	Algorithms
Binary Classification	Naive Bayes Neural Network Support Vector Machine
Multi Classification	Naive Bayes Neural Network Support Vector Machine

Find a Predictive Model's Related Data Sets

Related data sets are generated when you train a predictive model.

Depending on the algorithm, related data sets contain details about the model like: prediction rules, accuracy metrics, confusion matrix, key drivers for prediction, and so on. These parameters help you understand the rules the model used to determine the predictions and classifications.

See What Are a Predictive Model's Related Data Sets?

1. On the Home page, click **Navigator**, and then click **Machine Learning**.
2. Click the menu icon for a training model and select **Inspect**.
3. Click the **Related** tab to access the model's related data sets.
4. Double-click a related data set to view it or to use it in a project.

Add a Predictive Model to a Project

When you create a scenario in a project, you apply a predictive model to the project's data set to reveal the trends and patterns that the model was designed to find.

> **Note:**
>
> You can't apply an Oracle machine learning model to a project's data.

After you add the model to the project and map the model's inputs to the data set's columns, the Data Panel contains the model's objects, which you can drag and drop onto the canvas. Machine learning generates the model's values based on the visualization's corresponding data columns.

1. On the Home page, click **Create**, and then click **Project**.
2. Select the data set that you want to use to create the project and click **Add to Project**.
3. In the Data pane, click **Add**, and select **Create Scenario**.
4. In the Create Scenario - Select Model dialog, select a model and click **OK**.

   You can only apply a predictive model. You can't apply an Oracle machine learning model.

   If each model input can't be matched to a data element, then the Map Your Data to the Model dialog is displayed.
5. If the Map Your Data to the Model dialog is displayed, then in the **Data Set** field, select the data set to use with the model.
6. Match the model input and data elements as needed. Click **Done**.

   The scenario is displayed as a data set in the Data Elements pane.
7. Drag and drop elements from the data set and the data model onto the Visualize canvas.
8. To adjust the scenario, right-click the scenario in the Data Elements pane and select **Edit Scenario**.
9. Change the data set and update the model input and data elements mapping as needed.
10. Click **Save** to save the project.

Register and Use Oracle Machine Learning Models

You can register and use Oracle machine learning models from Oracle Database or Oracle Autonomous Data Warehouse to score data in Oracle Analytics. Use the data flow editor to apply the machine learning models to your data.

Topics:

- How Can I Use Oracle Machine Learning Models in Oracle Analytics?
- Typical Workflow to Register and Use Oracle Machine Learning Models

- Register Oracle Machine Learning Models in Oracle Analytics
- Inspect Registered Oracle Machine Learning Models
- Visualize a Registered Oracle Machine Learning Model's View

How Can I Use Oracle Machine Learning Models in Oracle Analytics?

Oracle Analytics allows you to register and use Oracle machine leaning models from Oracle Database or Oracle Autonomous Data Warehouse.

Using Oracle machine learning models with Oracle Analytics greatly increases the level of predictive analytics that you can perform on data sets because the data and the model reside in the database, the data scoring is performed in the database, and the resulting data set is stored in the database. This allows you to use the Oracle machine learning execution engine to score large data sets.

You can register and use Oracle machine learning models from these database data sources:

- Oracle Autonomous Data Warehouse
- Oracle Database

In Oracle Analytics you can register any of the database's Oracle machine learning models in the mining classes Classification, Regression, Clustering, Anomaly, or Feature Extraction that were created using the Oracle Machine Learning for SQL API (OML 4SQL). Your Oracle Analytics user role and database permissions determine the Oracle machine learning models that are available for you to register and use.

You can also create predictive models in Oracle Analytics. See What Are Oracle Analytics Predictive Models?

Typical Workflow to Register and Use Oracle Machine Learning Models

Here are the common tasks for registering Oracle machine learning models from Oracle Database or Oracle Autonomous Data Warehouse, and how to apply the models to data sets and use them in projects.

Task	Description	More Information
Register the Oracle machine learning model	Use an Oracle Database or Oracle Autonomous Data Warehouse connection to find Oracle machine learning models and register them for use with Oracle Analytics.	Register Oracle Machine Learning Models in Oracle Analytics
Inspect and visualize the model's views	Access a list of the model's views to learn more information about the registered model such as the model statistics, target value distribution, and algorithm settings. Visualize the model's views to help you better understand and utilize the model.	Inspect Registered Oracle Machine Learning Models Visualize a Registered Oracle Machine Learning Model's View
Apply a model to your data using a data flow	Create a data flow to apply an Oracle machine learning model to your data and generate a data set that includes the predicted trends and patterns.	Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set

Register Oracle Machine Learning Models in Oracle Analytics

The Oracle machine learning models must be registered in Oracle Analytics before you can use them to predict data. You can register and use models that reside in your Oracle Database or Oracle Autonomous Data Warehouse data sources.

1. On the Home page, click **Page Menu**, and then click **Register ML Model**.

   This option is available for users with the BI Service Administrator or DV Content Author role.
2. In the Register an ML Model dialog, select a connection.

   In the Select a Model to Register dialog, you'll see the database's Oracle machine learning models in the mining classes Classification, Regression, Clustering, Anomaly, or Feature Extraction that were created using the Oracle Machine Learning for SQL API (OML 4SQL).
   If needed, click **Create Connection** to create a connection to the Oracle Database or Oracle Autonomous Data Warehouse data source containing the Oracle machine learning model that you want to use.
3. In the Select a Model to Register dialog, click the model that you want to register and review the model's information. For example, the model class and algorithm used to build the model, the target the model predicts, the columns the model is trained on, model predictions, and parameters.
4. Click **Register**.
5. From the Home page, click **Navigator**, and then click **Machine Learning** to confirm that the model was imported successfully.

Inspect Registered Oracle Machine Learning Models

You can access and review information about the Oracle machine learning models that you registered in Oracle Analytics.

Topics:

- View a Registered Model's Details
- What Are a Registered Model's Views?
- View a Registered Model's Views List

View a Registered Model's Details

View an Oracle machine learning model's detail information to help you understand the model and determine if it's suitable for predicting your data. Model details include model class, algorithm, input columns, output columns, and parameters.

When you register a model, its detail information is included. This information is gotten from Oracle Database or Oracle Autonomous Data Warehouse.

1. On the Home page, click **Navigator**, and then click **Machine Learning**.
2. Select a model, click its **Actions** menu, and then select **Inspect**.
3. Click **Details** to view the model's information.

What Are a Registered Model's Views?

When an Oracle machine learning model is created, views containing specific information about the model are generated and stored in the database. Use Oracle Analytics to access a list of a model's views, and then build data sets that you can use to visualize the information contained in the views.

Views contain information about the registered model such as model statistics, target value distribution, and algorithm settings. The number and kind of views created are determined by the model's algorithm. So a model built from the Naive Bayes algorithm has one set of views and a model built from the Decision Tree algorithm has a different set of views. For example, some of the views generated for a Decision Tree model are:

- Scoring Cost Matrix - Describes the scoring matrix for classification models. The view contains `actual_target_value`, `predicted_target_value`, and `cost`.
- Global Name-Value Pairs - Describes global statistics related to the model like number of rows used in the model build and convergence status.
- Decision Tree Statistics - Describes the statistics associated with individual nodes in the decision tree. The statistics include a target histogram for the data in the node. For every node in the tree, this view has information about `predicted_target_value`, `actual_target_value`, and `node` support.

Each view's name is unique, for example DM$VCDT_TEST. The format used to generate view names is DM$V*Alphabet_Model Name* where:

- DM$V - Represents a prefix for views generated from a registered model.
- *Alphabet* - Represents a value that indicates the type of output model. For example, C indicates that the view type is Scoring Cost Matrix, and G indicated that the view type is Global Name-Value Pair.
- *Model Name* - Holds the name of the registered Oracle machine learning model and its view. For example, DT_TEST.

For more information about views, see the documentation for your Oracle database version.

Oracle Analytics provides a list of any registered model's views. However, you can only access and visualize views for Oracle Database 12*c* Release 2 or later. If you're working with an early version of Oracle Database, then you can't use Oracle Analytics to access and visualize views.

View a Registered Model's Views List

A registered model's views are stored in the database, but you can use Oracle Analytics to display a list of the model's views.

Views contain information such as a model's size, settings, and the attributes used in the model. This information can help you better understand and utilize the model.

> **Note:**
>
> You can access and visualize views for Oracle Database 12*c* Release 2 or later. If you're working with an earlier version of Oracle Database, then these views don't exist in the database and you can't use Oracle Analytics to access and visualize them.

See What Are a Registered Model's Views?

1. On the Home page, click **Navigator**, and then click **Machine Learning**.
2. Locate and click a registered model's **Actions menu**, and then click **Inspect**.
3. Click the **Related** tab to view a list of the model's views.

Visualize a Registered Oracle Machine Learning Model's View

Visualize any of a registered model's views to discover information that helps you better understand and utilize the model.

> **Note:**
>
> You can access and visualize views for Oracle Database 12*c* Release 2 or later. If you're working with an earlier version of Oracle Database, then these views don't exist in the database and you can't use Oracle Analytics to access and visualize them.

You must identify a view and then create a data set from it before you can visualize the information in the view. See Create Data Sets from Databases.

When creating the data set, you'll need to know the model's view name and the database schema name. Use the following task to find these names, create the data set, and visualize the view's information.

1. On the Home Page, click **Navigator**, and then click **Machine Learning**.
2. Locate the registered machine learning model and click its **Actions menu**. Click **Inspect**.
3. Click **Details** and confirm that the **Model Info** section is expanded. Go to the **DB Model Owner** field and record the database schema name.
4. Click **Related** and locate and record the name of the view. Click **Close**.
5. On the Home page, click **Create** and click **Data Set**.
6. Select the connection that contains the machine learning model and its views.
7. In the Data Set editor, browse for and click the database schema name that you located on the **Details** tab.
8. Select the view that you located on the **Related** tab, and double-click columns to add them to the data set. Click **Add**.
9. Click **Create Project** to build visualizations.

Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set

Use the data flow editor to score a predictive model on any data set, or score a registered Oracle machine learning model on a data set in its corresponding database.

Running the model outputs a new data set with columns containing predicted values that you can use for analysis and visualization.

When you run a predictive model, the data is moved into and processed by Oracle Analytics. When you run a registered Oracle machine learning model, data isn't moved from the database into Oracle Analytics. Instead the model resides, is processed, and the output data set is stored in the database.

Use this information to understand the data flow editor and **Apply Model** step options:

- The registered models are displayed and available for review and analyses. Unregistered models aren't displayed.
- The available output columns are specific to the model type. For example, for numeric prediction, output columns include PredictedValue and PredictedConfidence, and for clustering, output columns include the clusterId.
- The available parameters are specific to the model type. For example, if you use a clustering model for scoring, maximum null values is a parameter that you can provide for the scoring process. This parameter is used in the missing value imputation.
- The model and the mapped input data types must match when you're working with an Oracle machine learning model. See View a Registered Model's Details.

1. On the Home page, click **Create**, and then click **Data Flow**.
2. Select the data set that you want to apply the model to. Click **Add**.
3. In the Data Flow editor, click **Add a step (+)**.
4. From the Data Flow Steps pane, double-click **Apply Model**, and then select the model to use.
5. In Apply Model, go to the Inputs section, and then select a column as the input.
6. In Apply Model, go to the Outputs section, and then select the columns that you want created with the data set, and update the **Column Name** fields as needed.
7. In the data flow editor, click **Add a step (+)** and select **Save Data**.
8. Enter a name. In the **Save data to** field, specify the location for saving the output data.

   If you're working with an Oracle machine learning model, then the data set's connection information defaults to the input data set's connection.
9. Set data preferences as needed in the **Treat As** and **Default Aggregation** fields.

   When you save data, the apply model appends the model's output columns that you selected to the data set.
10. Click **Save**, enter a name and description for the data flow, and click **OK** to save the data flow.
11. Click **Run Data Flow** to create the data set.

10

Curate Your Data Using Data Flows

You can use data flows to produce curated (combined, organized, and integrated) data sets.

▶ Video

Topics:

- Typical Workflow to Curate Data with Data Flows
- About Data Flows
- Create a Data Flow
- Apply Incremental Processing to a Data Flow
- Customize the Names and Descriptions of Data Flow Steps
- Schedule a Data Flow
- Run a Data Flow
- Save Output Data from a Data Flow
- Run a Saved Data Flow
- Reuse a Data Flow
- Modify Parameter Prompts When You Run a Data Flow
- Create a Sequence of Data Flows
- Manage Your Data Flows
- Using Steps

Typical Workflow to Curate Data with Data Flows

Here are the common tasks for creating curated data sets with data flows.

Task	Description	More Information
Create a data flow	Create data flows from one or more data sets.	Create a Data Flow
Run a data flow	Run (that is, execute) data flows to create data sets.	Run a Data Flow
Run a saved data flow	Run a saved data flow to create data sets or to refresh the data in a data set.	Run a Saved Data Flow
Create a sequence of data flows	Create and save a sequential list of data flows.	Create a Sequence of Data Flows
Schedule data flows	Create a time-based schedule to run a data flow.	Schedule a Data Flow
Use Machine Learning to analyze data	Create, interpret, and score models using data flows.	Typical Workflow to Create and Use Oracle Analytics Predictive Models

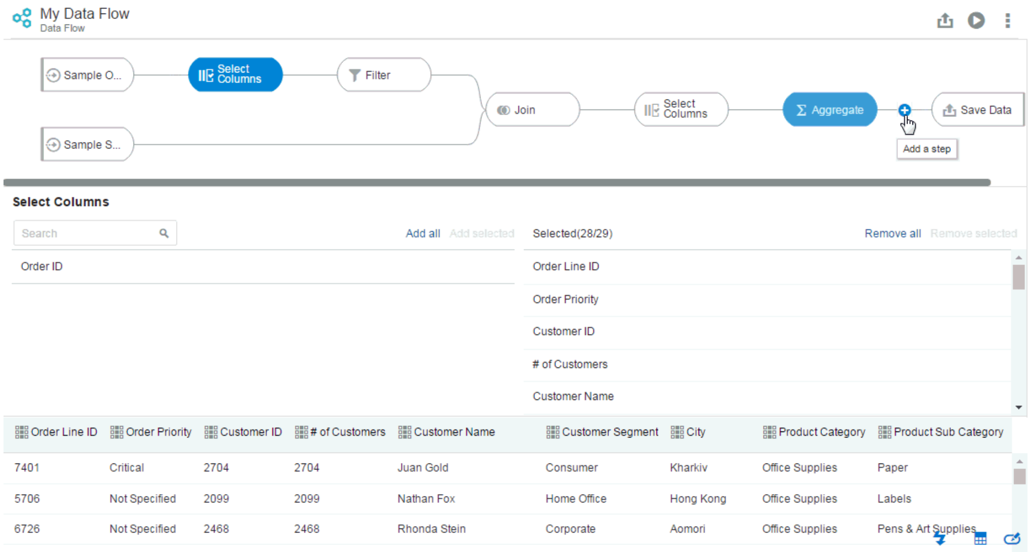
Task	Description	More Information
Manage data flows	Monitor, run, schedule, import and export flows.	Manage Your Data Flows

About Data Flows

Data flows enable you to organize and integrate your data to produce a curated data set that your users can analyze.

For example, you might merge two data sets containing order data, strip out columns you don't need, aggregate the value of orders, and save the results in a new data set named `Order Summary`.

Figure 10-1 A data flow in the data flow editor



Order Line ID	Order Priority	Customer ID	# of Customers	Customer Name	Customer Segment	City	Product Category	Product Sub Category
7401	Critical	2704	2704	Juan Gold	Consumer	Kharkiv	Office Supplies	Paper
5706	Not Specified	2099	2099	Nathan Fox	Home Office	Hong Kong	Office Supplies	Labels
6726	Not Specified	2468	2468	Rhonda Stein	Corporate	Aomori	Office Supplies	Pens & Art Supplies

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 a data set.

To add steps, either right-click an existing step and click **Add step** or drag a step from the left-hand **Data Flow Steps** pane and drop it into the data flow editor.

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).

Create a Data Flow

You can create a data flow from one or more data sets. With a data flow, you produce a curated data set that you can use to create meaningful visualizations.

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

   You can select an existing data set or click **Create Data Set** to create a new one based on a file, local subject area, or database connection.

   In the data flow editor, you can add more data sources at any time by clicking **Add Step (+)**, then clicking **Add Data**.
3. In the Add Data pane, configure your data. For example, you can:
   - Replace the selected data set (click the data source name next to **Add Data -**).
   - Include or exclude columns.
   - Rename columns.
   - Prompt for a data source when the data flow is executed (using the **When Run Prompt to select Data Set** option).
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.
   - To remove a step, hover over the step and click **X** or right-click the step and click **Delete**. If you've invalidated part of the data flow by deleting a step you'll see a red X icon over the offending step.
   - To undo or redo an edit in a data flow that you haven't saved, go to the workflow diagram panel toolbar and click **Undo Last Edit** or **Redo Last Edit**.
   - At the end of your data flow, add a **Save Data** step and specify a meaningful name.
5. Save your data flow.

   You can start the data flow now using the **Run Data Flow** option or later using the **Data Flows** panel on the Data page. If you run it now you can access the generated data set on the **Data Sets** panel on the Data page).

Run a Data Flow

Run (that is, execute) a data flow to produce a data set that you can use to create visualizations.

To successfully run a data flow, it must be free of validation errors.

1. Create or open the data flow that you want to execute and produce a data set from.
2. Click **Run Data Flow** to execute the data flow. If there is no validation error, a completion message is displayed.

   When you execute a data flow without saving it, the data flow isn’t saved and isn't displayed in the Data Flows list. Therefore, the data flow isn’t available for you to modify or run.

   Go to the Data page and select Data Sets to see your resulting data set in the list.
3. Click **Save** or **Save As**. In the Save Data Flow As dialog enter a **Name** and **Description** to identify your data flow.

Go to the Data page and select Data Flows to see your resulting data flow in the list.

Run a Saved Data Flow

You can run a saved data flow to create a new data set or to refresh existing data.

1. In the Data page, go to the Data Flows section, and locate the data flow that you want to run.
2. Right-click the data flow and select **Run** now (or click **New schedule** to run later).
    - Complex data flows take longer to run. While the data flow is running, you can go to and use other parts of the application, and then come back to the Data Flows pane to check the status of the data flow.
    - You can cancel a long-running data flow. To do so, go to the Data Flows section, click the data flow's **Action menu** and select **Cancel**.
    - If it's the first time you're running a data flow, then a new data set is created, and you can find it in the Data Sets section of the Data page. The data set contains the name that you specify on the data flow's **Save Data** step. If you've run the data flow before, then the resulting data source already exists, and its data is refreshed.
    - When creating a new database data source, set the database's query mode to **Live**. Setting the query mode to **Live** allows the data flow to access data from the database (versus the data cache) and pushes any expensive operations such as joins to the database.

Reuse a Data Flow

In a data flow, you can add parameters so you can reuse the data flow with a different source data set or use different criteria to process and select data. Parameters help you identify the type of data appropriate for the data flow and if you want to select an alternative data set when running or scheduling the data flow. You can also apply parameters to modify default values when creating an Essbase cube.

For example, using a parameter you can:

- Process a new data set that has the same format as the default input data set.
- Process and store different aspects of a large data set based on date range, individual departments, or regions into alternative target data sets.

1. Open your data flow.
2. In the Step editor pane, apply parameters to your steps.
   In an Add Data step, select the **When Run Prompt to select Data Set** option then provide the **Name** and **Prompt** values for the parameter.

   In a Save Data step, select the **When Run Prompt to specify Data Set** option, then rovide the **Name** and **Prompt** values for the parameter.

   In a Create Essbase Cube step, select the **When Run Prompt to specify Data Set** option, then provide the **Cube** name, **Application** name, and **Prompt** value for the parameter.

Schedule a Data Flow

You can schedule a data flow to run at a particular time or on a recurring basis such as hourly, daily, monthly, or yearly.

For example, you can create a scheduled task to ensure that the new data is available on specific days of the week or to run a data flow after the data sources are updated.

- Create a Scheduled Task for a Data Flow
- Modify a Scheduled Task

Create a Scheduled Task for a Data Flow

You can create a new scheduled task and specify its properties such as date, time, and frequency.

1. Go to the Data page and select **Data Flows**.
2. Select a data flow and click the **Actions menu** or right-click, then click **New schedule**.
3. In the Schedule dialog, specify the name, start date, start time, and repeat.
    - In the Repeat field, select the frequency of the scheduled task such as Hourly, Daily, Weekly, Monthly, and Yearly. For each frequency type, you have to define particular properties such as the end date, specific days of the week, or dates in the month.
4. If you’ve added parameters to the data flow, in the Parameters section, specify other values.
    - In the Source field, click the source data set. In the Add Data Set dialog, select a new data set and click **Add**.
    - In the Targets field, change the data set name. For a data flow with **Create Essbase Cube** step, change the Application and Cube names.
5. Click **OK**.

Modify a Scheduled Task

You can check and modify the predefined properties of the scheduled task.

1. Go to the Data page and select **Data Flows**.
2. Select a data flow for which you’ve added a scheduled task.
3. Click the **Actions menu** or right-click and click **Inspect**.
4. In the data flow inspector dialog, click the **Schedules** tab, then select a scheduled task.
5. Check and modify the properties such as name, start date, start time, and frequency.
6. Click **Save**, then click **Close**.

Apply Incremental Processing to a Data Flow

Use incremental processing to determine the last data processed in the data flow and to process only the newly added data.

1. Select a data element column as an incremental identifier for the data set.

   You can select an incremental identifier only for those data sets that are sourced through database connections.

   a. Go to the Data page and select **Data Sets**.

   b. Select a data set and click the **Actions menu** or right-click, then select **Open**.

   c. Click **Edit Data Set** on the Results toolbar.

   d. Select the data set node in the diagram. From the **New Data Indicator** list, select a column, then click **Save**.

2. Apply incremental processing to the data flow using the data sets for which you've selected the incremental identifier.

   a. Create or open the data flow in which you want to apply incremental processing.

   b. In the Data Flow editor select the data set.

   c. In the Step editor pane, select **Add new data only** to mark the data set as incremental.

   d. Click **Save**.

In a data flow with multiple data sets, you can select only one data set as incremental. If you try to select a second data set as incremental, you see a warning message. Click **Yes** to enable incremental processing for the second data set for which you've selected **Add new data only**. Incremental processing is deselected for the first data set.

Modify Parameter Prompts When You Run a Data Flow

Parameter prompts are displayed before the job runs, when you run a data flow with parameter prompts. Prompts allow you to review the default values or settings and to select or define an alternate value or setting.

1. Go to the Data page and click Data Flows to select the data flow with parameter prompts that you want to run.
2. Click the data flow's **Actions menu** or right-click and select **Run**.
3. In the Data Flow Prompt dialog, either use the default values or define alternate values.
   - In the Sources section, click the default Target - existing data set name, then select a new source data set in the Add Data Set dialog. Click **Add**.
   - In the Targets section, do one of the following:
     - Change the default Target - existing data set name.
     - For a data flow with **Create Essbase Cube** step, change the default Target - Application and Target - Cube names.

4. Click **OK**.

Customize the Names and Descriptions of Data Flow Steps

You can change the names of steps to make flows easier to understand, and annotate data flows by adding your own descriptions.

1. Open a data flow.
2. Click the step you want to customize.

   Notice that the step name is displayed in the panel below the step diagram.
3. In the panel below the step diagram, click the step name (for example, **Merge Columns**).
4. Use the **Name** and **Description** fields to change the default values.

   The new name that you specify is appended to the default name.
5. To save your changes, press **Enter**.

Create a Sequence of Data Flows

A sequence is a saved sequential list of specified data flows and is useful when you want to run multiple data flows as a single transaction. If any flow within a sequence fails, then all the changes done in the sequence are rolled back.

Video

1. On the Home page click **Create** and select **Sequence**.
2. Drag and drop the data flows and sequences to the Sequence pane.
3. Click the menu icon to move an item up or down in the list, and to remove an item.
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**.
6. Go to the Data page and click **Data Sets** to see the list of resulting data sets.

Manage Your Data Flows

Manage your data flows on the Data Flows page.

1. From the Home page, click **Navigator**, then **Data**, then **Data Flows**.
2. Hover over a data flow and use the **Actions menu** 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 project. To import a data flow project that you've downloaded, on the Data Flows page, click **Page Menu**, then click **Import Project/Flow**. Follow the on-screen instructions to select a local .DVA file to import. 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.

Using Steps

You build data flows using steps to curate your data. Steps are functions that change your data in a specific way. For example, steps can aggregate values, perform time series analysis, or perform machine learning algorithms.

Step	Use this step to:	More Information
Add Columns	Add a new output data column to your data flow using a wide range of functions, conditional expressions, and SQL operators.	Add Columns in a Data Flow
Add Data	Add a data source to your data flow.	Add Data in a Data Flow
Aggregate	Apply aggregate functions to group data in a data flow.	Add Aggregates to a Data Flow
Analyze Sentiment	Detect sentiment for a text column by applying a sentiment analysis to the data flow.	Add a Sentiment Analysis to a Data Flow
Apply Model	Apply a machine learning model to your data (also known as scoring a data model).	Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set
Bin	Assign your data values into categories, such as high, low, or medium.	Create a Bin Column in a Data Flow
Branch	Creates multiple outputs from a data flow using a branch.	Create Multiple Pipelines in a Data Flow Using a Branch
Cumulative Value	Group data by applying cumulative aggregate functions in a data flow.	Add Cumulative Values to a Data Flow
Database Analytics	Use advanced analytic functions, such as anomaly detection, unpivot, sampling, and advanced clustering (Requires Oracle database or Oracle Autonomous Data Warehouse).	Add Database Analytics to a Data Flow
Filters	Use filters to limit the data in a data flow output.	Filter Your Data in a Data Flow
Group	Create a group column of attribute values in a data set.	Create a Group in a Data Flow
Join	Join multiple tables or data sets.	Add a Join in a Data Flow
Merge Columns	Combine two or more columns in your data flow.	Merge Columns in a Data Flow
Merge Rows	Combine two or more rows in your data flow.	Merge Rows in a Data Flow

Step	Use this step to:	More Information
Rename Columns	Change the name of data columns to something more meaningful.	Rename Columns in a Data Flow
Save Data	Before running a data flow, modify or select the database name, attribute or measure, and aggregation rules for each columns of the output data set.	Save Output Data from a Data Flow
Save Model	Change the default model name (untitled) and provide a description.	Save Model
Select Columns	Specify which data columns to include in your data flow.	Select Columns to Include in a Data Flow
Split Columns	Extract useful data from within data columns.	Split Columns in a Data Flow
Time Series Forecast	Apply a time series forecast calculation to a data set to create additional rows.	Add a Time Series Forecast to a Data Flow
Train Binary-Classifier	Train a machine learning model to classify your data into one of two predefined categories.	Train a Binary Classifier Model in a Data Flow
Train Clustering	Train a machine learning model to segregate groups with similar traits and assign them into clusters.	Train a Clustering Model in a Data Flow
Train Multi-Classifier	Train a machine learning model to classify your data into three or more predefined categories.	Train a Multi-Classifier Model in a Data Flow
Train Numeric Prediction	Train a machine learning model to predict a numeric value based on known data values.	Train a Numeric Prediction Model in a Data Flow
Transform Column	Modify data in a column using a wide range of functions, conditional expressions, and SQL operators.	Transform Data in a Data Flow

Add Columns in a Data Flow

You can add columns to your target data and customize the format. 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.

Use the **Add Columns** step in the data flow editor.

1. Click **Add a step (+)**, and select **Add Columns**.
2. In the Add Columns pane, use the expression builder to define your column. For example, to calculate the value of stock items you might specify `UNITS * RETAIL_PRICE`.

   Select SQL operators, functions, and conditional expressions from the expression pick list.

Add Data in a Data Flow

When you create a new data flow and select a data set, you'll see a step with the name of your data set. You can add additional data from multiple data sources to your data flow.

Use the **Add Data** step in the data flow editor. If you've created a new data flow project, your data set will be selected.

Note: Oracle Essbase and EPM Cloud data sets cannot be used in the **Add Data** step as inputs to Data Flows.

1. Use the options on the Add Data pane to configure the data set. For example, change the default name, or include and exclude columns.
2. To add another data set to your flow, click **Add a step (+)**, and select **Add Data**.

   If matching columns are found in data sets, a Join step is automatically added to enable you to define the relationship between the data sets. For example, you might want to combine rows from two data sets where the `CustomerID` in the first data set matches the `CustomerID` in the second data set.
3. If you don't get a Join step automatically, click **Add a step (+)**, and select **Join**.

   To complete the join, on the data flow diagram click the circle on the dotted line between the data source step and the Join step. Then use the Join pane to configure the relationship between the data sets
4. Click your data set step again and use the options on the Add Data pane to configure the data set.
   - Use **Add Data - <Data source name>** to edit the step name and description.
   - Use **Select...** to change the data set or data source. Changing the data set or data source might break other steps in your flow.
   - Use **When Run Prompt to select Data Set** to specify the name of the output data set when the data flow is executed. For example, you might want to specify a different name for the output data set each time the flow is executed.
   - Use **Remove Duplicates** to remove duplicate rows based on the selected column. For example, you might select this option for City if you want only one row for each city.

Add Aggregates to a Data Flow

Create group totals by applying aggregate functions such as count, sum, and average.

Use the **Aggregate** step in the data flow editor.

1. Click **Add a step (+)** and select **Aggregate**.

   In the Aggregate pane you'll see a suggested aggregate column for each numeric column.
2. Use the options on the Aggregate pane to configure your aggregate.
   - Use **Aggregate** to select a column you want to aggregate.
   - Use **Function** to select an aggregate function such as Sum, Average, Minimum, or Count to apply to the selected column.
   - Use **New column name** to change the default name of the aggreate column.
3. Add or remove aggregates.
   - To remove an aggregate, select the aggregate and click **X**.
   - To see the **Add Aggregate** option, scroll to the bottom of the Aggregate pane.

Add a Sentiment Analysis to a Data Flow

You can detect sentiment for a given text column by applying a sentiment analysis to your data flow.

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 a Positive, Neutral, or Negative string type result.

Use the **Analyze Sentiment** step in the data flow editor.

1. Click **Add a step (+)**, and select **Analyze Sentiment**.
2. In the Analyze Sentiment pane and Output section, specify an output column for the emotion result value.
3. Optional: Change the default column name 'emotion'.
4. In the Analyze Sentiment pane and Parameters section, specify the value for **Text to Analyze**.

   Select a text column with natural language content to analyze.

Apply a Machine Learning Model

Use the data flow editor to score a predictive model on any data set, or score an Oracle machine learning model on a data set in its corresponding database.

See Apply a Predictive or Registered Oracle Machine Learning Model to a Data Set.

Create a Bin Column in a Data Flow

Use a bin to categorize your data by creating a new column based on the value of a measure. For example, you might categorize values for `RISK` into three bins for low, medium, and high.

Use the **Bin** step in the data flow editor.

1. Click **Add a step (+)**, and select **Bin**.

   You also create bins when you add columns using the **Add Column** step.
2. Select the column whose values you want to categorize.
3. Use the options on the Bin pane to configure your bin.
   - The **Bin** option displays the column that you selected in Step 2. To categorize values in a different column, click the column name and select a different column.
   - In **Histogram View**, based on the **Method** selected, you'll see the histogram range (width) and histogram count (height) of the bins.
   - Use **List View** to change the name of the bins and define the range for each bin (if you select the **Manual** option).
   - Use **Method** to specify how the data boundaries are calculated.
   - – In the **Manual** method, the range is divided by the number of bins.
     – In the **Equal Width** method, the histogram range is divided into intervals of the same size. For equal width binning, the column values are measured, and the

range is divided into equal-sized intervals. The edge bins can accommodate very low or very high values in the column.

- In the **Equal Height** method, the height of each bin is same or very slightly different but the histogram range is equal. For equal height or frequency binning, the intervals of each bin is based on each interval containing approximately the equal number of elements (that is, records). **Equal Height** method is preferred specifically for the skewed data.

Based on your changes, the data preview (for example, the bin column name) is updated.

Create Multiple Pipelines in a Data Flow Using a Branch

Creates multiple outputs from a data flow using a branch. 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.

Use the **Branch** step in the data flow editor.

1. Click **Add a step (+)** and select **Branch**.

   You'll see a **Branch** step and two **Save Data** steps added to the data flow. Select the **Branch** step and use the **Branch into** option to add or remove branches. The minimum number of branches is two, and the maximum is five.

2. To configure each branch, click connection line between the **Branch** step and the **Save Data** step, click **Add a step (+)** and select a step type that processes your branch.

   For example, you might add a **Filter** to the first branch that saves data from United States, and add a **Filter** to the second branch that saves data from Canada. Or, you might use the **Split Columns** step to save some columns in the first branch and other columns in the second branch.

3. Click each **Save Data** step and in the Save Data Set pane specify the properties for saving the output data sets.

Add Cumulative Values to a Data Flow

You can calculate cumulative totals such as moving aggregate or running aggregate.

Use the **Cumulative Value** step in the data flow editor.

1. Click **Add a step (+)**, and select **Cumulative Value**.

2. Use the options on the Cumulative Value pane to configure your aggregate.

   For example, use the **Aggregate** option to select the data column to calculate, or use the **Function** option to select the cumulative function to apply.

Filter Your Data in a Data Flow

You use filters to limit the amount of data included in the data flow output. For example, you might create a filter to limit sales revenue data to the years 2017 through 2019.

Use the **Filter** step in the data flow editor.

1. Click **Add a step (+)**, and select **Filter**.

2. In the Filter pane, select the data element you want to filter.
    - Use **Add Filter (+)** to select the data element you want to filter, in the Available Data dialog. Alternatively, click **Data Elements** in the Data Panel, and drag and drop a data element to the Filter pane.
    - Use **Filter Fields** to change the values, data or selection of the filter (for example, maximum and minimum range). Based on the data element, specific filter fields are displayed. You can apply multiple filters to a data element.
    - Use **Filter menu icon** to select a function to clear the filter selection and disable or delete a filter.
    - Use **Filter pane menu icon** to select a function to clear all filter selections, remove all filters, and auto-apply filters. You can select to add an expression filter.
    - Use **Add Expression Filter** to select to add an Expression Filter. Click **f(x)**, select a function type, and then double-click to add a function in the **Expression** field. Then click **Apply**.
    - Use **Auto-Apply Filters** to select an auto-apply option for the filters, such as Default (On).

Create a Group in a Data Flow

You can 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`.

Use the **Group** step in the data flow editor.

1. Click **Add a step (+)**, and select **Group**.
2. For each group that you want to create, use the Group pane:
    a. Use the pop list of columns to select the column you'd like categorize. For example, to categorize orders by line of business, you might select LINE_OF_BUSINESS.
    b. Optional: Click the group name to change the default name `Group 1`. For example, you might change `Group 1` to `Technology`.
    c. Optional: In the **Name** field, change the default name of the new column from `new_name1` to a more meaningful name.
    d. In the center box, select one of more categories to add to the group. For example, to analyze line of business you might put `Communication` and `Digital` in a group named Technology.

        In the Preview Data pane, you'll see a new column with the groups that you defined displayed as the value for each row. For example, values might be Technology or Entertainment.
3. To add more groups, click **Group (+)**.

Add a Join in a Data Flow

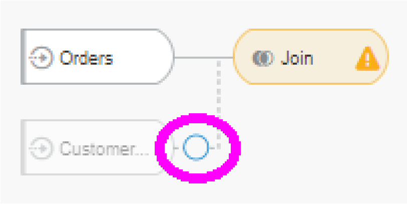
When you add data from multiple data sources to your data flow, you can join them on a common column. For example, you might join an `Orders` data set to a `Customer_orders` data set using a customer ID field.

When you use the **Add Data** step to add an extra data source, a **Join** step is automatically added to your data flow. But you can also manually add a **Join** step if you have more than one data source defined in your data flow.

Use the **Join** step in the data flow editor.

1. Add the data sources you'd like to join.
2. Select a data source, click **Add a step**, then click **Join**.

   You'll see a suggested connection with a node on the connection line.

3. Click the node on the connection line to complete the connection.
4. Use the options on the Join pane to configure your step.
   - Use **Keep rows** to specify how you want to join your data. Click an option to preview your merged data (if you're displaying the Data Preview pane).
   - Use **Match columns** to specify the common field on which you'd like to join the data sources.

Merge Columns in a Data Flow

You can combine multiple columns into a single column. For example, you might merge the street address, street name, state, and ZIP code columns so that they display as one item in visualizations.

Use the **Merge Columns** step in the data flow editor.

1. Click **Add a step (+)**, and select **Merge Columns**.
2. Use the options on the Merge Columns pane to configure your merge:
   - **(+) Column** field - Select more columns you want to merge.
   - **Delimiter** field - Select a delimiter to separate column names (for example, Space, Comma, Dot, or Custom Delimiter).

Rename Columns in a Data Flow

Rename columns to create more meaningful data column names in your generated data sets.

Use the **Rename Columns** step in the data flow editor.

1. Click **Add a step (+)**, and select **Rename Columns**.

2. Use the **Rename** fields to specify a more meaningful name for columns in your generated data set.

Save Output Data from a Data Flow

For the data created by a data flow you can change the default name and description, specify where to save the data, and specify runtime parameters. If you're saving the output from your data flow to a database, before you start, create a connection to one of the supported database types.

Use the **Save Data** step in the data flow editor.

1. Click **Add a step (+)** and select **Save Data**. Or, if you've already saved the data flow, then click the **Save Data** step.
2. In the Save Data Set pane, optionally change the default **Name** and add a **Description**.

   If you don't change the default **Name** value, you'll generate a data set named 'untitled'. After you run this data flow, you'll see the generated data set in the Data Sets page (click **Data** from the navigator on the Home page).
3. Click **Save data to** and select a location:
   - Choose **Data Set Storage** to save the output data in a data set in Oracle Analytics.
   - Choose **Database Connection** save the output data in one of the supported database types.
4. If you've selected **Database Connection**, specify details about the database connection.

   Before you start, create a connection to one of the supported database types.
   a. Click **Select connection** to display the Save Data to Database Connection dialog, and select a connection.

      You can save to a range of databases, including Oracle, Oracle Autonomous Data Warehouse, Apache Hive, Hortonworks Hive, and Map R Hive.
   b. In the **Table** field, optionally change the default table name.

      The table name must conform to the naming conventions of the selected database. For example, the name of a table in an Oracle database can't begin with numeric characters.
   c. In the **When run** field, specify whether you'd like to replace existing data or add new data to existing data.
5. Select the **When Run Prompt to specify Data Set** option if you want to specify the name of the output data set or table at run time.
6. In the **Columns** table, change or select the database name, the attribute or measure, and the aggregation rules for each column in the output data set:

When you run the data flow

- If you've selected data set storage, go to the Data page and select Data Sets to see your output data set in the list.
  – Click **Actions menu** or right-click and select **Inspect**, to open the data set dialog.
  – In the data set dialog, click **Data Elements** and check the Treat As and Aggregation rules that you've selected for each column in the **Save Data** step.
- If you're saving output data to a database, go to the table in that database and inspect the output data.

Save Model

You can change the default name of your model and add a description.

Use the **Save Model** step in the data flow editor. You'll see this step added automatically in the data flow editor when you add one of the train model steps, for example, Train Numeric Prediction, or Train Binary Classifier.

1. Add one of the train model steps to your data flow. For example, Train Numeric Prediction, or Train Binary Classifier.
2. Click the **Save Model** step.
3. Optional: In the Save Model pane, change the default **Model name**, and specify a **Model description** to identify the model type and script used.

   If you don't change the default **Model name** value, you'll save a model named 'untitled'. After you run this data flow, you'll see your new model in the Machine Learning page. Click **Machine Learning** from the navigator on the Home page to apply a saved model to your data.

Select Columns to Include in a Data Flow

Select which columns to include in your data flow. By default, all data columns are included in your data flow.

Use the **Select Columns** step in the data flow editor.

1. Click **Add a step (+)**, and select **Select Columns**.
2. Use the on-screen options to select or remove columns.

Split Columns in a Data Flow

You can strip out useful data from columns of concatenated data. For example, if a column contains `001011Black`, you might split this data into two separate columns, `001011` and `Black`.

Use the **Split Columns** step in the data flow editor.

Before you start, turn on Data Preview so that you can see the new columns as you configure the split. If your data source has many columns, use a **Select Columns** step to remove extraneous columns first to improve the preview.

1. Click **Add a step (+)**, and select **Split Columns**.
2. Use the options on the Split Columns panel to configure the data flow.
   - In the **Split Column** option, click **Select Column** to specify the data column you'd like to split. If a column is already chosen, click the column name to choose a different column.
   - Use **On** to specify whether to split the column by delimiter or by position. Select **Delimiter** if the column has separator characters, such as commas or spaces. Select **Position** if the column doesn't have separator characters. If you split on position, you can only create two new columns.
   - (Displayed when **On** is set to **Delimiter**) Use **Delimiter** to specify the separator used in your data column (for example, space, comma, custom).

- (Displayed when **On** is set to **Position**) Use **Position** to specify where the second column starts. For example, if your column contains `AABBBCCCDDD`, specify 6 to put `AABBB` in the first column and `CCCDDD` in the second column.
- Use **Number of parts to create** to specify the number of new columns to create when **On** is set to **Delimiter** (you can't change the default value 2 if **On** is set to **Position**). For example, if your source data column contains `AA BBBBB CCC DD`, you might select **4** to put each sub-string into a different column.
- Use **Occurrence** to specify how many of the sub-strings in the source column to include in each new column. Examples based on data `AA BBBBB CCC DD` with **Delimiter** set to **Space**:
-
  - If you set **Occurrence** to **1**, **Number of parts to create** to **1**, the new column contains `AA`. If you set the **Occurrence** to **2**, the new column contains `AA BBBBB`.
  - If you set **Occurrence** to **1**, **Number of parts to create** to **2**, the first new column contains `AA` and the second new column contains `BBBBB CCC DD`.
  - If you set **Occurrence** to **1**, **Number of parts to create** to **4**, the first new column contains `AA`, the second new column contains `BBBBB`, the third new column contains `CCC`, and the fourth new column contains `DD`.
- Use **New column <number>** name to change the default name of new columns to a more meaningful name. Use the adjacent check box to display or hide new columns.

Add a Time Series Forecast to a Data Flow

You can calculate forecasted values by applying a Time Series Forecast calculation.

A forecast takes a time column and a target column from a given data set and calculates forecasted values for the target column and puts the values in a new column. All additional columns are used to create groups. For example, if an additional column 'Department' with values 'Sales', 'Finance', and 'IT' is present, the forecasted values of the target column are based on the past values of the given group. Multiple columns with diverse values lead to a large number of groups that affect the precision of the forecast. Select only columns that are relevant to the grouping of the forecast.

Use a **Time Series Forecast** step in the data flow editor.

1. Click **Add a step (+)**, and select **Time Series Forecast**.
2. In the Time Series Forecast pane and Output section, specify an output column for the forecasted value.
3. In the Time Series Forecast pane, configure your forecast calculation.
   - Use **Target** to select a data column with historical values.
   - Use **Time** to select a column with date information. Forecasted values use a daily grain.
   - Use **Periods** to select the value that indicates how many periods (days) are forecasted per group.

Train a Binary Classifier Model in a Data Flow

You train a machine learning model using your existing data to evaluate how accurate the model is in predicting known outcomes.

Train a Binary Classifier model to evaluate how accurately it classifies your data into one of two predefined categories. For example, you might predict whether a product instance will pass or fail a quality control test.

Use the **Train Binary Classifier** step in the data flow editor.

1. Click **Add a step (+)**, and select **Train Binary Classifier**.
2. At the Select Train Two-Classification Model Script dialog, select a script type, then click **OK**. For example, you might select Naive Bayes.
3. Click **Select a column** and select the data column to analyze.
4. Use the on-screen options to configure the script parameters.

Create and Train a Predictive Model

Train a Clustering Model in a Data Flow

You train a machine learning model using your existing data to evaluate how accurate the model is in predicting known outcomes.

Train a Clustering model to evaluate how accurately it segregates groups with similar traits and assigns them into clusters. For example, you might assign your customers into clusters (such as big-spenders, regular spenders and so on) based on their purchasing habits.

Use the **Train Clustering** step in the data flow editor.

1. Click **Add a step (+)**, and select **Train Clustering**.
2. At the Select Train Clustering Model Script dialog, select a script type, then click **OK**. For example, you might select Hierarchical Clustering for model training.
3. Use the on-screen options to configure the script parameters.

Create and Train a Predictive Model

Train a Multi-Classifier Model in a Data Flow

You train a machine learning model using your existing data to evaluate how accurate the model is in predicting known outcomes.

Train a Multi-Classifier model to evaluate how accurately it classifies your data into three or more predefined categories. For example, you might predict whether a piece of fruit is an orange, apple, or pear.

Use the **Train Multi-Classifier** step in the data flow editor.

1. Click **Add a step (+)**, and select **Train Multi-Classifier**.
2. At the Select Train Two-Classification Model Script dialog, select a script type, then click **OK**. For example, you might select Naive Bayes.
3. Click **Select a column** and select the data column to analyze.
4. Use the on-screen options to configure the script parameters.

Create and Train a Predictive Model

Train a Numeric Prediction Model in a Data Flow

You train a machine learning model using your existing data to evaluate how accurate the model is in predicting known outcomes.

Train a Numeric Prediction model to evaluate how accurately it predicts a numeric value based on known data values. For example, you might predict the value of a property based on square-footage, number of rooms, zip code, and so on.

Use the **Train Numeric Prediction** step in the data flow editor.

1. Click **Add a step (+)**, and select **Train Numeric Prediction**.
2. At the Select Train Numeric Prediction Model Script dialog, select a script type, then click **OK**. For example, you might select Random Forest for Numeric model training.
3. Click **Select a column** and select the data column to analyze.
4. Use the on-screen options to configure the train model.

Create and Train a Predictive Model

Transform Data in a Data Flow

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

You can quickly transform the data in a column by using the **Options** column menu in Data Preview. For example, you might choose **Convert to Number**, **Uppercase**, or **Trim**. The list of available menu options for a column depends on the type of data in that column. Use transform options to:

- Update or modify the data in a column.
- Group or merge multiple columns in a data set.
- Add a column to or remove a column from a data set.

Use the **Transform Column** step in the data flow editor.

1. To add a data transform step, do one of the following:
   - Click **Add a step (+)**, select **Transform Column**, then select a column.
   - Drag and drop the **Transform Column** step from the Data Flow Steps panel to the workflow diagram panel and select a column.
   - Select a column in the Preview data panel and click **Options**, then select a transform option, for example, **Uppercase**, or **Trim**. See Column Menu Options for Quick Data Transformations.
2. In the Step editor pane, compose an expression or update the fields to configure the changes. You can review the changes in the Preview data panel.

   If you're composing an expression, do the following:

   - Click **Validate** to check if the syntax is correct.
   - If the expression is valid, click **Apply** to transform the column data.

Merge Rows in a Data Flow

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

Before you merge the rows, do the following:

- Confirm that each data set has the same number of columns.
- Check that the data types of the corresponding columns of the data sets match. For example, column 1 of data set 1 must have the same data type as column 1 of data set 2.

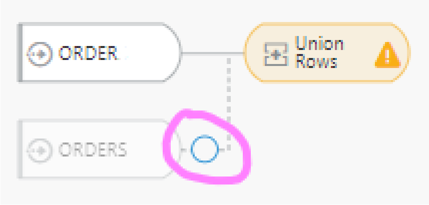
Use the **Union Rows** step in the data flow editor.

1. In your data flow, add the data sources you want to merge.

   For example, you might add data sets named Order and Orders.

2. On one of the data sources, click **Add a step (+)** and select **Union Rows**.

   You'll see a suggested connection with a node on the connection line.

3. Click the node on the connection line to complete the connection.
4. Use the options on the Union Rows pane to configure your step.

Field	Description
Keep	Use these options to specify how you want to join your data. Click an option to display an explanatory diagram and preview your merged data (if you're displaying the Data Preview pane).

Add Database Analytics to a Data Flow

Database analytics enable you to perform advanced analysis and data mining analysis. For example, you can detect anomalies, cluster data, sample data, and perform affinity analysis. To use database analytics, connect to an Oracle database or Oracle Autonomous Data Warehouse (the analytics are computed in the database, not in Oracle Analytics).

Use the **Database Analytics** step in the data flow editor.

Before you start, create a connection to your Oracle database or Oracle Autonomous Data Warehouse and use it to create a data set.

1. In the data flow editor, click **Add a step (+)**, and select **Database Analytics**.

   If you aren't connected to an Oracle database or Oracle Autonomous Data Warehouse, you won't see the **Database Analytics** option.

2. At the Select Database Analytics page, select the analytics operation you want to use, then click **OK**.

3. On the **Analytics Operation <type>** pane, configure the operation.
    - Use the **Inputs** or **Outputs** area to specify the data columns to analyze.
    - Use the **Parameters** area to configure options for the operation.
      To help you configure the operation, use the on-screen guidance displayed for each parameter.

Database Analytics Functions

Database analytics functions enable you to perform advanced analysis and data mining analysis, for example, detecting anomalies, clustering data, sampling data, and affinity analysis. Analytics Functions are available when you connect to an Oracle database or Oracle Autonomous Data Warehouse.

Functions:

Function Types	Description
Dynamic Anomaly Detection	Detect anomalies in your input data without a pre-defined model. For example, you might want to highlight unusual financial transactions. When you deploy this function with large data sets, configure the partition columns to maximize performance.
Dynamic Clustering	Cluster your input data without a pre-defined model. For example, you might want to characterize and discover customer segments for marketing purposes. When you deploy this function with large data sets, configure the partition columns to maximize performance.
Frequent Item Set	Discover relationships in your data by identifying sets of items that often appear together. This data mining technique is also known as association rule learning, affinity analysis, or in the retail industry as market basket analysis. If you use frequent item set as a market basket analysis tool, you might find that customers who buy shampoo also buy hair conditioner. This operation is resource intensive and its performance depends on several factors, such as input data set volume, cardinality of transaction id, and cardinality of Item value column. To avoid potential performance degradation on the database, try with a higher value of minimum support percent (default is 0.25) and gradually reduce it to accommodate more itemsets in your output.
Sampling Data	Selects a random sample percentage of data from a table. You simply specify the percentage of data you want to sample. For example, you might want to randomly sample ten percent of your data.

Function Types	Description
Text Tokenization	Analyze textual data by breaking it down into distinct words and counting the occurrences of each word. When you run your data flow, Oracle Analytics creates a table in the database named DR$*IndexName*$I, which contains the token text and the token count related details. Use the DR$*IndexName*$I table to create a data set. • Under **Outputs**, use the **Create** option next to each field to select the columns to index. • Under **Parameters**, then **Text Column**, click **Select a column** to select the field you'd like to break down into separate words. Use the **Reference Column<number>** options to include one or more columns in the output data set. The database connection that you use for your data flow requires special database privileges. Check with your administrator that: • Your database account has `grant EXECUTE on CTXSYS.CTX_DDL to schema name`. • You use an Oracle Analytics connection with the same username as the schema where the source table exists. This is best practice to avoid access privilege issues when the data flow runs. • The database table column you're analyzing has no existing CONTEXT index. If there's an existing CONTEXT index on the database table that you're analyzing, remove that index before you run the text tokenization data flow.
Un-pivoting Data	Transpose data that's stored in columns into row format. For example, you might want to transpose multiple columns showing a revenue metric value for each year to a single revenue column with multiple value rows for the year dimension. You simply select the metric columns to transpose and specify a name for the new column.You'll get a new data set with fewer columns and more rows.

Note: To use analytic functions, make sure that the administrator has enabled analytics functions (via Console, System Systems, Performance and Compatibility, Enable Database Analytics Node in Data Flows).

11

Import and Share Projects

You can import projects, or share projects with other users.

Topics:

- Import a Project File
- Share a Project
- Export a Project or Folder as a File
- Export a Visualization or Story as a File
- Export a Visualization's Data to a CSV File
- Share a Visualization, Canvas, or Story to Social Media
- Manage Files Shared to Social Media
- Email a File of a Visualization, Canvas, or Story
- Print a Visualization, Canvas, or Story

Import a Project File

You can import a project file (.dva file) that was exported from Analytics Cloud or Oracle Analytics Desktop. You can also import projects that were exported from Oracle Fusion Applications.

Depending upon how the file was exported, you'll be prompted to enter a password to decrypt the project's data or to access the project's data source.

The import includes everything that you need to use the project 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 Project/Flow**.
2. In the Import Project/Flow dialog, click **Select File** or drag a project file onto the dialog, and then click **Import**.

Share a Project

You can easily share a project with others by copying and sharing the project URL.

You must save the project in a shared folder and grant appropriate privileges to the project.

1. Create or open a project and save it to a shared folder.

   If you don't have a shared project folder, click **Save As**, **New Folder**, enter a name and click **Create**.

2. Grant roles to the shared project to enable users with the same roles to view or edit the project as appropriate.
   a. In the Home Page, click **Navigator**, and then click **Catalog**.

   b. Click **Shared Folders**, and then navigate to the shared project.
   c. Hover over the project, click **Actions menu**, and then click **Inspect**.
   d. Click the **Share** tab.
   e. Add or edit roles as appropriate.

Role	Description
BI Consumer	Enables users with this role to view projects and control which filters they use.
BI Content Author	Enables users with this role to edit projects.

3. Copy the project URL and share with your users.

   Users can now see the project in the catalog.

Export a Project or Folder as a File

You can export a project or folder as an archive file (.DVA) that another user can import.

The .DVA file includes items that you specify such as the associated data sets, 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 project 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 project or folder.
5. Enable the **Include Connection Credentials** option so that users can open the project without having to sign in. Use the following guidelines to set this field:
   - **Excel, CSV, or TXT data source -** These data sources don’t use a data connection, therefore you can clear the **Include Connection Credentials** option.
   - **Database data source** - If you enable the **Include Connection Credentials** option, the user must provide a valid user name and password to load data into the imported project.
   - **Oracle Applications or Oracle Essbase data source** - Selecting the **Include Connection Credentials** option works if on the connection setup’s Create Connection dialog you specified the **Always use these credentials** option in the **Authentication** field.

     If you clear the **Include Connection Credentials** option or specify the **Require users to enter their own credentials** option in the **Authentication** field, then the user must provide a valid user name and password to load data into the imported project.
6. If you enable **Include Data** or **Include Connection Credentials**, enter and confirm a password that the user must provide to import the project or folder and decrypt its connection credentials and data.

7. Enable **Include Permissions** to include access permission details so that shared connections work when users import the project.
8. Click **Save**.

Export a Visualization or Story as a File

You can share visualizations or stories as a file in a variety of formats, such as DVA (a visualization project), Powerpoint (PPTX), Adobe Acrobat (PDF), PNG, or CSV (data only).

1. Create or open a project.
2. On the Visualize or Narrate canvas, click the **Export** icon on the project toolbar, then click **File**.
3. Use the **Format** option to select the output format you want, and specify 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 project. 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 project data, connection credentials and access permissions. To enable users to open the project DVA file without having to enter a password, click **Include Connection Credentials** and specify the password.
4. Click **Save**.

Export 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 and work with the data in an application such as Excel.

1. Open the project that contains the visualization that you want to export data for.
2. In the Visualize or Narrate canvas, click the visualization that you want to export data for to select it.
3. Go to the project 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.

Share a Visualization, Canvas, or Story to Social Media

You can share visualizations, canvases, or stories to social media channels such as Oracle Social Network (OSN), Oracle Content and Experience (OCE), Slack, Twitter, and LinkedIn.

You can share to social media channels set up by your administrator. If you don't see the social media channel you'd like to share to, contact your administrator.

All of the links you share are displayed in your user profile. You can use the User Profile page to manage your shared links.

1. Create or open a project.
2. On the Visualize or Narrate canvas, click the **Export** icon on the project toolbar, then click the icon for the social channel to use.

   If you’re opening a social channel for the first time, you might be prompted to sign in.
3. Use the social channel options pane to specify sharing options.
4. Click **Send**.

Manage Files Shared to Social Media

You can view and delete the links that you shared to social channels such as Oracle Social Network (OSN), Oracle Content and Experience (OCE), Slack, Twitter, and LinkedIn.

1. From the Home page, click the user profile icon.
2. In the User Profile page, click the **Shared Links** tab.
3. Review your list of shared file links. Delete links as needed.

Email a File of a Visualization, Canvas, or Story

You can email visualizations, canvases, or stories in formats like Powerpoint (PPTX), Acrobat (PDF), Image (PNG), CSV (data only), or Package (the whole project including connection credentials).

1. Open the project, and on the Visualize or Narrate canvas, click the **Export** icon on the project toolbar, then click **Email**.

   If you don't see the Email option, ask your administrator if this option was configured.
2. Use the **Format** option to select the output format you want, and specify output options:
   - For **Powerpoint (pptx)**, **Acrobat (pdf)**, and **Image (png)** - Specify the file name, paper size, and orientation.
     When you email any of these visual formats, the visualization or pages are re-rendered based on the size and orientation you select. So if you're emailing a table, then your output file might not contain all of the table's rows and columns included in your visualization, canvas, or story.

- For **Data (csv)** - Specify the output file name. This option only includes the data used in the project. 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 project data, connection credentials, and access permissions). To enable users to open the project DVA file without having to enter a password, click **Include Connection Credentials** and specify the password.

3. Click **Email**.

   Your email client opens a new partially composed email with the .DVA file attached.

Print a Visualization, Canvas, or Story

You can print your project's visualizations, canvases, or stories.

1. Open the project, and on the Visualize or Narrate canvas, click the **Export** icon on the project toolbar.
2. Set the **Include**, **Size**, and **Orientation** fields as needed.
3. Click **Print**.

   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.

Part III

Report Data

This part explains how to work with data reports.

Topics:

- Create Analyses
- View Data in Different Ways
- Build Dashboards
- Filter and Select Data for Analyses
- Prompt in Analyses and Dashboards
- Make Analyses Interactive
- Manage Content
- Use BI Composer to Analyze Your Data

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Create Analyses

This topic describes how to create an analysis.

▶ Video

Topics:

Typical Workflow to Create Analyses

Here are the common tasks to start creating analyses.

Task	Description	More Information
Create an analysis	Select and arrange columns that you want to use in an analysis.	Create Your First Analysis
Set properties for columns	Specify properties such as heading and value formats, display of data, and conditional formatting.	Set Properties for Columns
Work with the data in the analysis	Add formulas and calculated measures to the analysis.	Edit Formulas or Calculated Measures

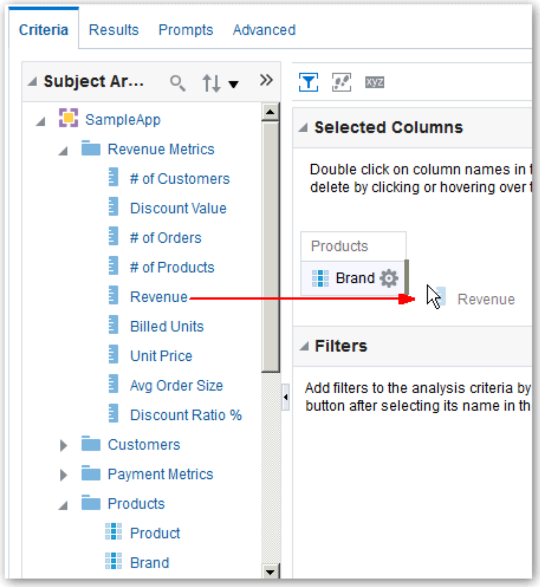
Task	Description	More Information
Affect the values of data in the analysis	Specify filters, selection steps, groups, and calculated items for the analysis.	Filter and Select Data for Analyses

Create Your First Analysis

You can quickly create an analysis to query against your organization's data. The analysis results help you answer your business questions. For example, you can create an analysis using the SampleApp subject area Brand and Revenue columns.

Video

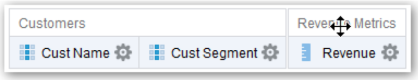
1. On the Classic Home page, in the **Create** pane, click **Analysis**.
2. Use the Select Subject Area dialog to search for and select a subject area.
3. Add the columns that you want to include in the analysis by dragging and dropping them from the Subject Areas pane to any position within the Selected Columns pane. You can select multiple non-contiguous columns by using the Ctrl key, selecting each column to include, and then dragging the columns to the Selected Columns pane.



Double click on column names in t
delete by clicking or hovering over t

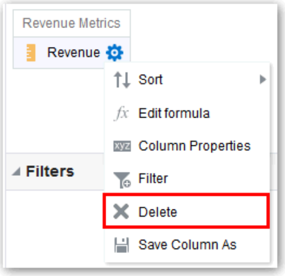
Add filters to the analysis criteria by
button after selecting its name in th

4. To change the column order, use the crosshairs on the column to drag and drop the column to a different position.



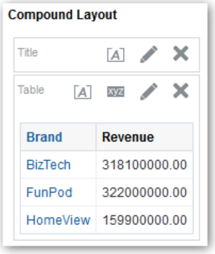
5. To save a column to the catalog, in the Selected Columns pane, click **Options** beside the column name, and click **Save Column As**.

6. In the Save As dialog, specify the folder, name, and description for the column and click **OK**.
7. To remove a column, in the Selected Columns pane, click **Options** beside the column name, and click **Delete**.



To remove all columns, click **Remove all columns from criteria**. Note that there is no undo action available for this option. Instead of removing columns, you can hide the columns whose appearance adds no value to the analysis.

8. Click the Results tab to see the results of the analysis in a table or pivot table.



Brand	Revenue
BizTech	318100000.00
FunPod	322000000.00
HomeView	159900000.00

9. Click **Save Analysis** to display the dialog to save the analysis.
10. In the Save As dialog, select a folder, and specify a name, and optional description for the analysis.

    If you want others to be able to view the analysis, then save it in the shared folder area. If your analysis contains other objects, then you'll be prompted to assign access permissions to those objects.

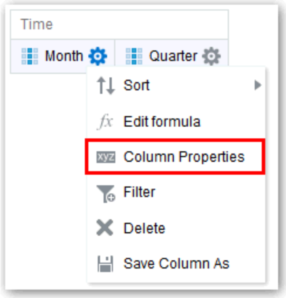
    If you don’t want anyone else but yourself to be able to view the analysis, then save it in `My Folders`.
11. Click **Refresh** at the bottom of the pane to double-check that the analysis is listed under the folder in which you saved it.

Set Properties for Columns

When you build an analysis, you can edit column properties to control the look and feel of the column. For example, you can specify that values in the Revenue column are displayed with two decimal places and a dollar sign.

1. Open the analysis for editing.

2. In the Selected Columns pane, click **Options** beside the column name, and then select **Column Properties**.



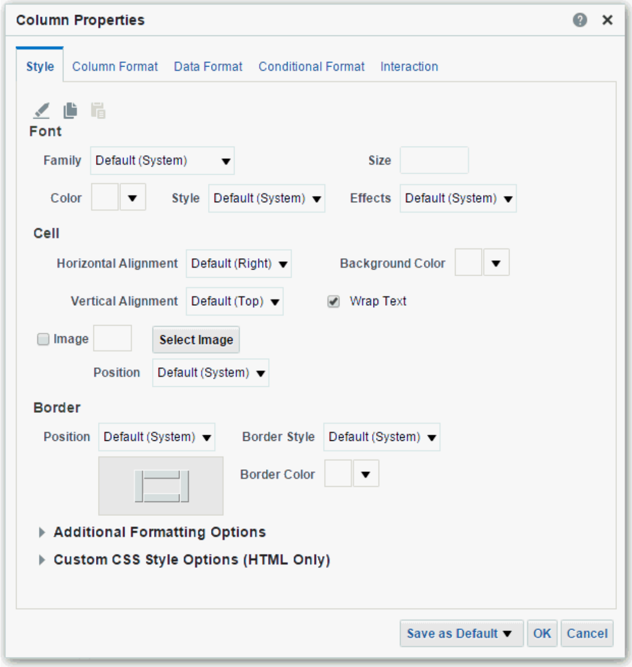
3. Specify how you want column values to be displayed.
4. Format column headings and custom text, and add data display conditions.
5. Specify what action you want to happen when a user clicks a column heading or value.
6. Set default column formatting.
7. Click **OK**.

Apply Formatting to Content

You can apply basic formatting to values in many types of content including columns, views, and dashboard page sections.

For example, you might want region names in a column to be displayed as Arial 14 point and red. You might also want state names to be displayed as Calibri 12 point and blue.

1. In the Selected Columns pane, click **Options** beside the column name, and then select **Column Properties**.
2. Specify the style characteristics of the column such as font, cell alignment, and border.



Family: Default (System)
Size:
Color:
Style: Default (System)
Effects: Default (System)
Horizontal Alignment: Default (Right)
Background Color:
Vertical Alignment: Default (Top)
☑ Wrap Text
☐ Image
Position: Default (System)
Position: Default (System)
Border Style: Default (System)
Border Color:

3. Click **OK**.

Format Columns

When you create an analysis, you can edit properties for columns to control their appearance and layout. You can also specify formatting to apply only if the contents of the column meet certain conditions.

For example, you can specify that values that exceed $1 million in the Revenue column are displayed with a green background.

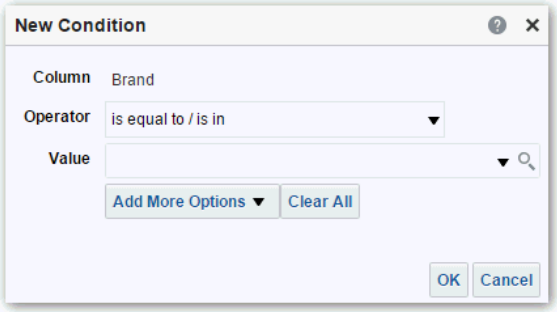
1. In the Selected Columns pane, click **Options** beside the column name, and then select **Column Properties**.
2. In the Column Properties dialog, click the Column Format tab.
3. To hide the column in the analyses without affecting value aggregation, select the **Hide** check box.

   For example, you might want to build an analysis that includes only Illinois customers. You can hide the Customers.State column because you only added this column for filtering purposes.
4. To enter your own values in the **Folder Heading** and **Column Heading** fields, select **Custom Headings** . You can use these fields to reference variables and format the heading values. These values identify the column in the analysis.
5. If you have administrator privileges and want to customize headings with HTML markup, including JavaScript, select **Custom Heading**, then select **Contains HTML Markup**, and then enter the HTML markup you want to apply.
6. To affect the display of repeating data values for the column, select one of the **Value Suppression** options.

   When the same value occurs in multiple consecutive rows, you can specify to show that value only once.
7. To override the default display of data for the column, click the Data Format tab.

The options on the tab differ depending on the data type.

8. To specify if column values are displayed in a certain way based on certain criteria, click the Conditional Format tab. Conditional formats can include colors, fonts, images, and so on, for the data and for the cell that contains the data. You can't apply conditional formatting to the data cell background or font color in a heat matrix.
9. Click **Add Condition**, and then select a column.



New Condition

Column Brand

Operator is equal to / is in

Value

10. Select an operator such as **is equal to / is in** or **is greater than**.
11. Specify a value for the operator by either entering a value directly (such as 1000000) or by selecting a value from the list.
12. Optional: Click **Add More Options** to add a variable to the condition.
13. Specify the formatting to apply when the condition is true.
14. Click **OK**.

Make Your Analyses Dynamic

You can specify what you want to happen when a user clicks a column heading or value in an analysis. For example, you could specify that when a user clicks the Product column value, it drills down into the data that was summed to create the column value.

Video

Topics:

- Add Interactivity to Analyses
- Make Interactions Available

Add Interactivity to Analyses

You can make views more interactive by adding interactions that are available to users who left-click in a view or right-click to display a popup menu. For example, you might specify the default primary interaction (the left-click action) for a geographical region column as **Drill**. This enables users to drill down to sub-regions.

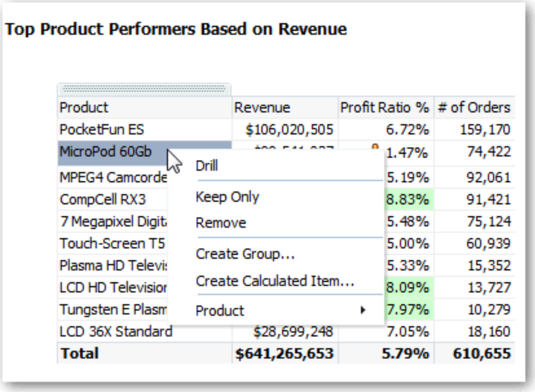
For hierarchical data, the default left-click interaction is to drill down to detail in the data. You can add right-click options that display a web page or link to a view.

1. Open the analysis for editing.

2. In the Selected Columns pane, click **Options** beside the column name, and then select **Column Properties**.
3. In the Column Properties dialog, click the Interaction tab.

   You can specify interactions for the column heading and data values.
4. Click **Primary Interaction** next to **Column Heading** or **Value** and select the behavior you want. For example, select None to disable the action or select Drill to display more detail.
   - Use None to disable all interactions on the column.
   - Use **Drill** to display a deeper level of detailed content if the data is hierarchical. If no hierarchy is configured for the column, then drilling isn't enabled.
   - Use **Action Links** to opens a web page or navigates to supporting BI content.
   - Use **Send Master-Detail Events** to connect views so that one view drives changes in one or more other views.
5. Click **OK**.

   You can specify the interactions that are available at runtime when you right-click a dashboard column or data cell. Here's an example of the available interactions when you right-click a product name in the Products column. This column is in a Top Product Performers Based on Revenue table.



Top Product Performers Based on Revenue

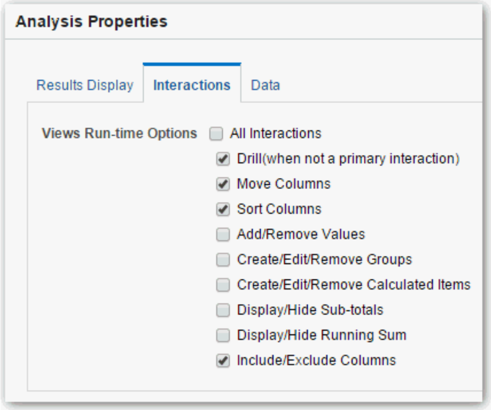
Product	Revenue	Profit Ratio %	# of Orders
PocketFun ES	$106,020,505	6.72%	159,170
MicroPod 60Gb	[illegible]	1.47%	74,422
MPEG4 Camcorde		5.19%	92,061
CompCell RX3		8.83%	91,421
7 Megapixel Digit		5.48%	75,124
Touch-Screen T5		5.00%	60,939
Plasma HD Televi		5.33%	15,352
LCD HD Televisior		8.09%	13,727
Tungsten E Plasm		7.97%	10,279
LCD 36X Standard	$28,699,248	7.05%	18,160
Total	**$641,265,653**	**5.79%**	**610,655**

Of the selections shown, you can set **Drill**, **Create Group**, and **Create Calculated Item**.

Make Interactions Available

When you add interactions to analyses, you then make those interactions available to others in popup menus.

1. Open the analysis for editing.
2. Click either the Criteria tab or the Results tab.
3. Click **Edit Analysis Properties** on the toolbar.
4. Click the Interactions tab.



Views Run-time Options
☐ All Interactions
☑ Drill(when not a primary interaction)
☑ Move Columns
☑ Sort Columns
☐ Add/Remove Values
☐ Create/Edit/Remove Groups
☐ Create/Edit/Remove Calculated Items
☐ Display/Hide Sub-totals
☐ Display/Hide Running Sum
☑ Include/Exclude Columns

5. Select the interactions that you want to make available for that analysis.
6. Click **OK**.

Set Default Formats for Your System

If you have the appropriate privileges, then you can save the formatting of a column as default formatting. When you set a system-wide default, it can provide users with a more consistent experience and save them time when working with analyses.

For example, you might set Times New Roman as the system-wide default for text columns.

A best practice is to change the default value rather than overriding the default with specific values.

1. Open an analysis for editing.
2. In the Selected Columns pane, click **Options** beside the column name, and then select **Column Properties**.
3. In the Column Properties dialog, specify how you want columns to be formatted by default.
4. Click **Save as Default**.
5. Click **OK**.

Export Content from Analyses and Dashboards

You can export content from analyses and dashboards.

Topics:

- Export the Results of Analyses
- Export Dashboards and Dashboard Pages
- Tips for Exporting

Export the Results of Analyses

You can export analyses results to various formats, including data and formatting in Microsoft Office Excel, Adobe PDF, and CSV formats, and various data-only formats (that is, with no formatting).

For example, you can export a Stock Control analysis, so that one of your suppliers can see the results in Microsoft Excel.

If you're exporting data with over one million rows, ask your administrator about the maximum number you're allowed to export.

1. Open the analysis for editing.
2. To export data and formatting, click **Export this analysis** then **Formatted**, and choose an output format.
3. To export just data, click **Export this analysis** then **Data**, and choose an output format.

Export Dashboards and Dashboard Pages

You can export an entire dashboard or a single dashboard page to Microsoft Excel 2007+. When you export dashboard content to Microsoft Excel, the state of the dashboard (such as prompts or drills) won't change.

For example, you can export the dashboard page that contains the Brand Revenue analysis. This enables brand managers to review this data in Microsoft Excel.

1. Open the dashboard or dashboard page that you want to export.
2. On the Dashboard page toolbar, click **Page Options**, select **Export to Excel**, and select either **Export Current Page** or **Export Entire Dashboard**.

   If you export an entire dashboard:

   - Each page is included on its own sheet in an Excel workbook.
   - Each sheet is given the name of its corresponding dashboard page.
3. Use the File Download dialog to open or save the dashboard or dashboard page as a spreadsheet file.

Tips for Exporting

Here are some tips on exporting data from analyses, dashboards, and dashboard pages.

- If you're exporting data with over one million rows, as your administrator about the maximum number you're allowed to export.
- By default, the **Value Suppression** option in the Column Properties dialog:Column Format tab determines if the cells in tables or pivot tables that span rows and cells that span columns are repeated when exporting to Excel (rather than always repeated). Don't suppress values when exporting to Excel if those who use the Excel spreadsheets want to manipulate the data.
  - If **Value Suppression** is set to **Suppress**, then cells that span rows and cells that span columns aren't repeated. For example, in a table that has Year and Month values, Year is displayed only once for Month values. This value suppression is useful if you want to simply view data in Excel spreadsheets.

  - If **Value Suppression** is set to **Repeat**, then cells that span rows and cells that span columns are repeated. For example, in a table that has Year and Month values, Year is repeated for all Month values.
- In PDF format, rows are split across page breaks rather than kept together.
- Action links aren't included in exported formats.
- When exporting to Excel, numbers and dates are exported in raw format with full number precision and format mask, rather than as a string in the data format specified.
- While you can export directly to an Excel format, you might notice better performance during the export of large numbers of rows if you export first to CSV, and then import that file into Excel.

Edit Formulas or Calculated Measures

You can fine-tune the columns in an analysis by editing the formulas of columns or editing calculated measures.

Topics:

- Edit the Formula for a Column
- Edit Calculated Measures

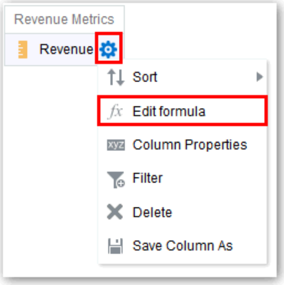
Edit the Formula for a Column

You can edit the formulas for attribute columns and measure columns when you specify the criteria for an analysis. This editing affects the column only in the context of the analysis and doesn't modify the formula of the original column in the subject area.

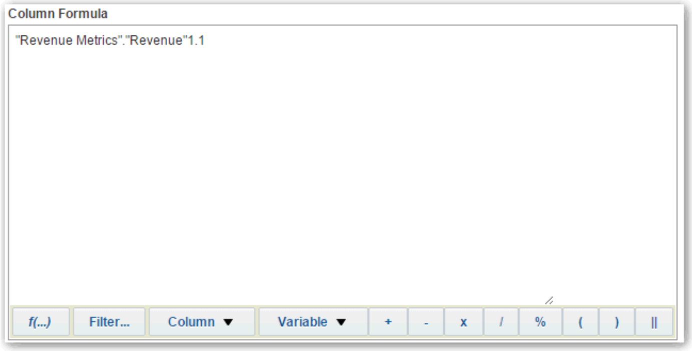
Video

A column formula specifies what the column values represent. In its most basic form, such as "Revenue Metrics"."Revenue", a column takes the data from the data source as is. You can edit the formula to add functions, conditional expressions, and so on. This editing enables you to present analysis results in a variety of ways. For example, you can edit the formula of a Revenue column to display values after a 10% increase in revenue. You can do this by writing a formula that multiplies the Revenue column by 1.1.

1. Open the analysis for editing.
2. In the Selected Columns pane, click **Options** beside the column name, and then select **Edit Formula**.



3. On the Column Formula tab of the Edit Column Formula dialog, enter a formula in the Column Formula pane.



Column Formula

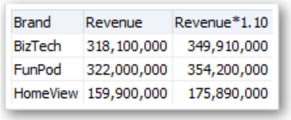
"Revenue Metrics"."Revenue"1.1

By default, the name of the column on the Selected Columns pane is displayed in the Column Formula pane.

- Use the operator and character buttons on the bottom of the Column Formula pane to help build the formula.
- Use the **f(...)** button to display the Insert Function dialog that enables you to include a function in the column formula. For example, you can build a formula based on a SQL function, such as RANK("Sales Measures"."Dollars"). See Expression Editor Reference.
- Use the **Filter...** button to display the Insert Filter dialog that enables you to include a filter expression in the column formula. Start the filter expression with at least one measure column. Include a Boolean expression that contains no measure columns or nested queries.

  For example, you can build a formula that uses the SQL FILTER function to filter the data, such as FILTER("Sales Measures"."Dollars" USING ("Markets"."Region" = 'EASTERN REGION').
- Reference a column name in the formula using the form *Folder-Name*.*Column.Name*. If either the folder name or the column name includes non-alphanumeric characters (such as spaces or underscores), then enclose each name in double quotes. You can enclose the names in double quotes even if they have all alphanumeric characters.
- Use single quotes to include literals or constants that have a data type of string. For example, you can include constants such as ‘John Doe’ or ‘Best Selling Product’ in a formula.

4. Click **OK**. On the Results tab, the column displays its values with the formula applied.



Brand	Revenue	Revenue*1.10
BizTech	318,100,000	349,910,000
FunPod	322,000,000	354,200,000
HomeView	159,900,000	175,890,000

Edit Calculated Measures

You can use calculated measures that are derived from other measures and created by using formulas.

For example, you might need to find the value after discounts are taken off the revenue. You create a calculated measure that subtracts the Discounted Amount from the Revenue value.

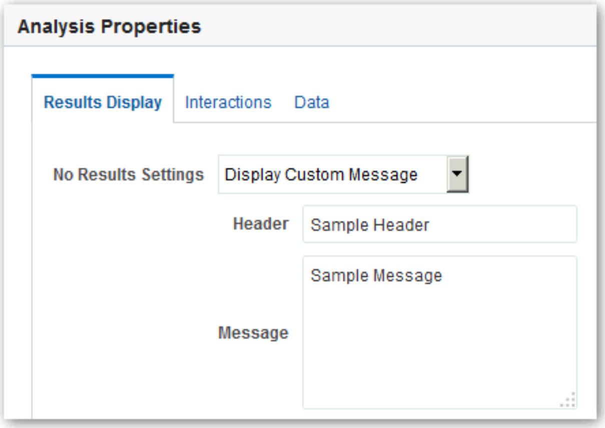
1. Open the analysis for editing.
2. On the Results tab, click **New Calculated Measure** on the toolbar to display the dialog.
3. If you have administrator privileges and want to customize folder and column headings with HTML markup, including JavaScript, select **Contains HTML Markup**, and then enter the HTML markup you want to apply. For examples, see Advanced Techniques: Format with HTML Tags.
4. Edit the formula for the calculated measure.
5. Click **OK**.

Set Properties for Analyses

You can set analysis properties to specify how results are displayed and how data is handled. You can also set which actions are available when users right-click in a pivot table, table, heat matrix, treemap, or trellis view.

For example, you can create a custom message for the Brand Revenue analysis. This message could display when a filter on the Revenue column is too restrictive and no results are displayed.

1. Open the analysis for editing.
2. In the Criteria tab toolbar or the Results tab toolbar, select **Edit Analysis Properties** to display the Analysis Properties dialog.

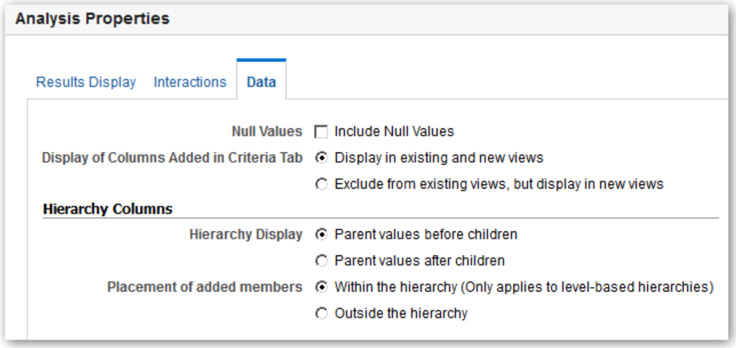


No Results Settings: Display Custom Message
Header: Sample Header
Message: Sample Message

3. On the Results Display tab, select options to affect the display of results. For example, in the **No Results Settings** field, specify the default or custom message that displays if no results are returned when you run the analysis. You might see the message, for example, if you have a very restrictive filter placed on the

columns in the analysis. You don’t see the custom message if you simply create the analysis without including columns.

4. If you have administrator privileges and want to customize messages with HTML markup, including JavaScript, select **Display Custom Message** in the **No Results Settings** field, then select **Contains HTML Markup**, and then enter the HTML markup you want to apply.
5. In the dialog, click the Interactions tab.
6. Specify which actions (for example, **Drill**) are available when you right-click in a pivot table, table, graph, heat matrix, treemap, or trellis view.
7. In the dialog, click the Data tab.



Null Values ☐ Include Null Values

Display of Columns Added in Criteria Tab ● Display in existing and new views

○ Exclude from existing views, but display in new views

Hierarchy Columns

Hierarchy Display ● Parent values before children

○ Parent values after children

Placement of added members ● Within the hierarchy (Only applies to level-based hierarchies)

○ Outside the hierarchy

8. Click **OK**.

Set Your Preferences

You can set account preferences to reflect where you live and to support how you work.

For example, you might select a specific Sales Dashboard as your starting page and Pacific Standard Time as your time zone. By specifying a starting page, you can start working with your dashboard right away.

1. In the Classic Home page, click **My Profile *username*** and select **My Account**.

   If you can’t see **Signed In As**, first click **Open Classic Home** from the toolbar or navigator.
2. Use the tabs of the My Account dialog to specify preferences, such as your starting page, locale, and time zone.
3. Click **OK** to save your changes.

Advanced Techniques: Import Formatting from Another Analysis

You can quickly format new or existing analyses by importing the format of a saved analysis and its views. Most people don’t need to perform this task.

For example, suppose you applied different colors to the Store, City, and Product columns of the Last Year's Brand Revenue analysis. You can apply the same colors to the This Year's Brand Revenue analysis by importing the column color format.

- To import formatting to all views in an analysis, click **Import formatting from another analysis** in the Compound Layout toolbar.

- To import formatting just to the view you're editing, click **Edit View**, then click **Import formatting from another analysis**.

Formatting is applied slightly differently depending on whether you import formatting applied to columns, views, or view containers in the Compound Layout.

About Applying Formatting from Columns

Applying formatting from columns works best for views when the saved analysis has the same number of columns as the target analysis.

For a single column, formatting is applied to all columns in the tables, pivot tables, and trellises of the target analysis.

For multiple columns, formatting is applied from left to right for column headings and values. If there are fewer columns in the saved analysis than in the target analysis, the format of the last column in the saved analysis is repeated in the subsequent columns of the target.

For example, suppose the saved analysis contains four columns in the following color order: red, green, blue, yellow. When applied to the six columns in the target analysis, the color order would be: red, green, blue, yellow, yellow, yellow.

About Applying Formatting from Views

When you import the format of one type of view, that format gets applied to all the views of the same type in the target analysis.

For example, suppose you import the custom formatting of a table to a target analysis containing three tables. The custom format gets applied to all three.

About Applying Formatting from Containers

In the Compound Layout, you can specify formatting properties for view containers, including background color, borders, and padding.

When you import container formatting, the views in the target analysis inherit the exact container formatting properties as the views in the saved analysis.

However, the layout of the views in the two analyses don’t have to be exactly the same. If the target analysis contains more views than the source analysis, the extra views also inherit the imported formatting.

For example, suppose that a saved analysis contains two tables that are stacked on top of each other in one layout column and that the target analysis contains four tables divided between two layout columns. When you import the formatting, the two tables in each of the first and second layout columns of the target analysis inherit the formatting.

Import Formatting from a Saved Analysis to a Target Analysis

You can import formatting from one analysis to another.

For example, suppose you have an analysis that contains one column to which you have applied formatting, such as font family, horizontal alignment, and background color. You can save the analysis and apply the same formatting to all the columns in another analysis.

1. Open the analysis for editing.
2. Display the target analysis in the Results tab, or edit the view.
3. Click **Import formatting from another analysis** on the toolbar.
4. In the Select Analysis dialog, navigate to the saved analysis.
5. Click **OK**.

Advanced Techniques: Format with HTML Tags

If you have administrator privileges, then you'll see the option **Contains HTML/JavaScript/CSS Markup** on some dialogs.

This option allows you to format content with valid HTML markup, including JavaScript, and CSS. If you include additional formatting, prefix the HTML markup with "@". Devices that don't support custom formatting just ignore markup after "@" and display the content without formatting .

For example, this HTML markup sets the width and height of a column in tables and pivot tables. The prefix @[html] means to apply HTML.

```
@[html]<span style="width:200px; height:50px>@</span>
```

The **Contains HTML/JavaScript/CSS Markup** option is available wherever you can apply formatting:

- For analyses:
  - In the analysis editor.
  - In the Analysis Properties dialog.
  - In the Column Properties dialog.
  - In the New Calculated Measure dialog.
- For dashboards:
  - In the Dashboard Properties dialog.

Here are some examples. If you find an example that is similar to what you want to do, copy and paste the example and tailor it to your needs.

HTML Element	Usage Notes and Examples

Text	Any HTML tags can be used to control the format of the text. For example:
	• To center the text in the section:
	`<CENTER>Centered Text</CENTER>`
	• To make the text bold:
	`<B>Bold Text</B>`
	• To set font size and color:
	`<FONT SIZE="4" COLOR="red">Red Text</FONT>`
	You can also combine tags for additional effects:
	`<CENTER><B><FONT COLOR="red">Bold Centered Red Text</FONT></B></CENTER>`

JavaScript	Use self-contained scripts supported by the browser. Paste or type the script into the HTML text window, including the begin and end tags `<script>` and `</script>`. Specify JavaScript in the opening `<SCRIPT>` tag: `<SCRIPT LANGUAGE="javascript">` .

Advanced Techniques: Combine Columns to Display Data Differently

You can combine columns based on set operations such as Union or Intersect. By combining columns, you create a column for displaying the data in a different way.

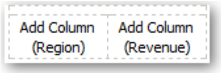
For example, you can combine a Region column with a City column and create a column named Regions and Cities.

The analysis must meet certain criteria if you want to use set operations:

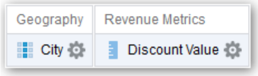
- The number and data types of the columns must be the same.
- You can’t use hierarchical columns, selection steps, or groups when you combine criteria.

1. Open the analysis for editing.
2. On the Criteria tab of the analysis editor, in the Selected Columns pane toolbar, click **Combine results based on union, intersection, and difference operations**.

   The Set Operations area is displayed in the Selected Columns pane. Boxes with a dotted line border indicate columns that you must combine with other columns in the analysis.

3. In the Subject Areas pane, select the columns to combine with the original columns. Note that the dotted line borders and contents have been replaced.



4. In the Result Columns area on the Set Operations pane, click on the **Union** button and select a set operation.
   - Use **Union** to specify that only nonduplicate rows from all columns are returned.
   - Use **Union All** to specify that rows from all columns, including duplicate rows, are returned.
   - Use **Intersect** to specify that only rows common to all columns are returned.
   - Use **Minus** to specify that only rows from the first column that aren't in the second column are returned.
5. Click the **Result Columns** link. The Selected Columns pane shows the newly combined columns.
6. To rename the heading of the column:
   a. Click the **Options** button for the column.
   b. Select **Column Properties**.
   c. Select **Column Format**.
   d. Ensure that **Custom Headings** is selected.
   e. In the **Column Heading** box, enter the new heading.
   f. Click **OK**.
7. Click the Results tab to view the columns in a table view.

Advanced Techniques: Examine the Logical SQL Statements for Analyses

You can examine the logical SQL to see the XML code and logical SQL statement that is generated for an analysis. You can optionally create an analysis based on that SQL statement using the Advanced tab of the analysis editor. Most people don't need to perform this task.

Before using the Advanced tab, keep in mind that this tab is only for advanced users and developers who have the appropriate responsibilities to access the Advanced tab. You must understand advanced SQL statements and have expertise working with the metadata for analyses. You must also understand the content and structure of the underlying data sources.

1. Open the analysis for editing.
2. Click the Advanced tab of the analysis editor.
3. Use the read-only box in the SQL Issued area to examine and copy the SQL statement that is used for executing the analysis.
4. Click **New Analysis** to create an analysis based on the SQL code.

Advanced Techniques: Set Caching Options for Your Analysis

You can specify whether cached data is displayed in your analysis if it's available.

1. Open the analysis for editing.
2. Click the Advanced tab of the analysis editor.
3. Use the **Bypass BI Presentation Services Cache** option to specify a caching policy.

   Clear this option to improve performance by displaying cached data if it’s available. Cached data might be stale if the source data changes rapidly. Select this option to always pull fresh data from the data source, even if cached data is available in the system cache. The analysis might take longer to display if it contains a large amount of data.

Advanced Techniques: Reference Stored Values in Variables

You might want to create an analysis whose title displays the current user's name. You can do this by referencing a variable.

You can reference several different types of variable in your analyses, dashboards, and actions: *session*, *repository*, *presentation*, *request*, and *global*. Content authors can define presentation, request, and global variables themselves but other types (session and repository) are defined for you in the data model.

Type of Variable	Defined in	Defined by	More Information
Session • System • Nonsystem	Data model	Data modeler	About Session Variables
Repository • Dynamic • Static	Data model	Data modeler	About Repository Variables
Presentation	Prompts for analyses and dashboards	Content authors	About Presentation Variables
Request	Prompts for analyses and dashboards	Content authors	About Request Variables
Global	Analyses	Administrators	About Global Variables and Create Global Variables

About Session Variables

Session variables are initialized when a user signs in.

These variables exist for each user for the duration of their browsing session and expire when the user closes the browser or signs out. There are two types of session variable: system and non-system.

System Session Variables

There are several system session variables that you can use in your reports and dashboards.

The system session variables have reserved names so you can’t use them for any other kind of variable.

System Session Variable	Description	Example SQL Query Value (Variable dialog)
PORTALPATH	Identifies the default dashboard a user sees when they sign in (they can override this preference after signing in).	To display ‘mydashboard’ when a user signs in: `select ‘/shared/_portal/mydashboard’ from dual;`
TIMEZONE	Specifies the default time zone for a user when they sign in. A user’s time zone is typically populated from the user’s profile. Users can change their default time zone through preferences (My Account).	To set the time zone when a user signs in: `select ‘(GMT-08:00) Pacific Time (US & Canada)’ from dual;`
DATA_TZ	Specifies an offset from the original time zone for data. This variable enables you to convert a time zone so that users see the appropriate zone.	To convert time data to Eastern Standard Time (EST): `select ‘GMT-05:00’ from dual;` This example means Greenwich Mean Time (GMT) - 5 hours

DATA_DISPLAY_TZ	Specifies the time zone for displaying data.	To display Eastern Standard Time (EST):
		`select ‘GMT-05:00’ from dual;`
		This example means Greenwich Mean Time (GMT) - 5 hours

Non-System Session Variables

The non-system session variables are named and created in your data model.

For example, your data modeler might create a SalesRegion variable that initializes to the name of a user's sales region when they sign in.

About Repository Variables

A repository variable is a variable that has a single value at any point in time.

Repository variables can be static or dynamic. A static repository variable has a value that persists and doesn’t change until the administrator changes it. A dynamic repository variable has a value that is refreshed by data returned from queries.

About Presentation Variables

A presentation variable is a variable that you can create as part of the process of creating a column prompt or a variable prompt.

Type	Description
Column prompt	A presentation variable created as part of a column prompt is associated with a column, and the values that it can take come from the column values. To create a presentation variable as part of a column prompt, in the New Prompt dialog, you must select **Presentation Variable** in the **Set a variable** field. Enter a name for the variable in the **Variable Name** field.
Variable prompt	A presentation variable created as part of a variable prompt isn’t associated with any column, and you define the values that it can take. To create a presentation variable as part of a variable prompt, in the New Prompt dialog, you must select **Presentation Variable** in the **Prompt for** field. Enter a name for the variable in the **Variable Name** field.

The value of a presentation variable is populated by the column or variable prompt with which it was created. That is, each time a user selects one or more values in the column or variable prompt, the value of the presentation variable is set to the value or values that the user selects.

About Request Variables

A request variable enables you to override the value of a session variable but only for the duration of a database request initiated from a column prompt. You can create a request variable as part of the process of creating a column prompt.

You can create a request variable as part of the process of creating one of the following types of dashboard prompts:

- A request variable that is created as part of a column prompt is associated with a column, and the values that it can take come from the column values.

  To create a request variable as part of a column prompt, in the New Prompt dialog, you must select **Request Variable** in the **Set a variable** field. Enter the name of the session variable to override in the **Variable Name** field.

- A request variable that is created as part of a variable prompt isn’t associated with any column, and you define the values that it can take.

  To create a request variable as part of a variable prompt, in the New Prompt dialog (or Edit Prompt dialog), you must select **Request Variable** in the **Prompt for** field. Then enter a name of the session variable that you want to override in the ***Variable Name*** field.

The value of a request variable is populated by the column prompt with which it was created. That is, each time a user selects a value in the column prompt, the value of the request variable is set to the value that the user selects. The value, however, is in effect only from the time the user presses the **Go** button for the prompt until the analysis results are returned to the dashboard.

Certain system session variables (such as, USERGUID or ROLES) can’t be overridden by request variables. Other system session variables, such as DATA_TZ and DATA_DISPLAY_TZ (Timezone), can be overridden if configured in the Oracle BI Administration Tool.

Only string and numeric request variables support multiple values. All other data types pass only the first value.

About Global Variables

A global variable is a column created by combining a specific data type with a value. The value can be a Date, Date and Time, Number, Text, and Time.

The global variable is evaluated at the time the analysis is executed, and the value of the global variable is substituted appropriately.

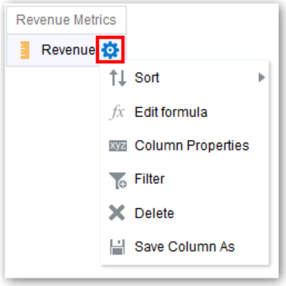
Only users with the BI Service Administrator role can manage (add, edit, and delete) global variables.

You create a global value during the process of creating an analysis by using the Edit Column Formula dialog. The global variable is then saved in the catalog and made available to all other analyses within a specific tenant system.

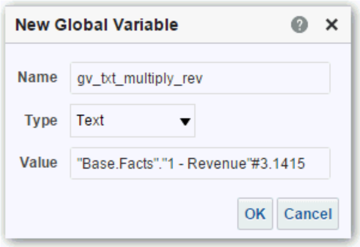
Create Global Variables

You can save a calculation as a global variable then reuse it in different analyses. By just creating a global variable, you don’t have to create a new column in the Data Modeler.

1. Open the analysis for editing.
2. In the Selected Columns pane, click **Options** beside the column name.



3. Select **Edit Formula** to display the Column Formula tab.
4. Click **Variable** and select **Global**.
5. Click **Add New Global Variable**.



Name gv_txt_multiply_rev

Type Text

Value "Base.Facts"."1 - Revenue"#3.1415

6. Enter the value for the **Name**. For example, gv_region, date_and_time_global_variable, or rev_eastern_region_calc_gv.

   The name for a global variable must be fully qualified when referencing the variable, and therefore is prefixed by the text "global.variables". For example, a global variable set to calculate revenue is displayed in the Column Formula dialog as follows:
   `"Base Facts"."1- Revenue"*@{global.variables.gv_qualified}`

7. Enter values for the **Type** and **Value**.

   - If you're selecting "Date and Time" as the data type, then enter the value as in the following example: `03/25/2004 12:00:00 AM`

   - If you're entering an expression or a calculation as a value, then you must use the Text data type, as in the following example: `"Base Facts"."1- Revenue"*3.1415`

8. Click **OK**. The new global variable is added to the Insert Global Variable dialog.

9. Select the new global variable that you just created, and click **OK**. The Edit Column Formula dialog is displayed with the global variable inserted in the Column Formula pane. The **Custom Headings** check box is automatically selected.

10. Enter a new name for the column to which you have assigned a global variable to reflect the variable more accurately.

11. Click **OK**.

Syntax for Referencing Variables

You can reference variables in analyses and dashboards.

How you reference a variable depends on the task that you're performing. For tasks where you're presented with fields in a dialog, you must specify only the type and name of the variable (not the full syntax), for example, referencing a variable in a filter definition.

For other tasks, such as referencing a variable in a title view, you specify the variable syntax. The syntax that you use depends on the type of variable as described in the following table.

Type	Syntax	Example
Session	@{biServer.variables['NQ_SESSION.*variablename*']} where *variablename* is the name of the session variable, for example DISPLAYNAME.	@{biServer.variables['NQ_SESSION.SalesRegion]}

Repository	@{biServer.variables.*variablename*}
	or
	@{biServer.variables['*variablename*']}
	where *variablename* is the name of the repository variable, for example, prime_begin
		@{biServer.variables.prime_begin}
		or
		@{biServer.variables['prime_begin']}

Type	Syntax	Example
Presentation or request	@{variables.*variablename*}[*format*]{*defaultvalue*} or @{*scope*.variables['*variablename*']} where: *variablename* is the name of the presentation or request variable, for example, MyFavoriteRegion. (optional) *format* is a format mask dependent on the data type of the variable, for example #,##0, MM/DD/YY hh:mm:ss. (Note that the format isn't applied to the default value.) (optional) *defaultvalue* is a constant or variable reference indicating a value to be used if the variable referenced by *variablename* isn't populated. *scope* identifies the qualifiers for the variable. You must specify the scope when a variable is used at multiple levels (analyses, dashboard pages, and dashboards) and you want to access a specific value. (If you don't specify the scope, then the order of precedence is analyses, dashboard pages, and dashboards.) When using a dashboard prompt with a presentation variable that can have multiple values, the syntax differs depending on the column type. Multiple values are formatted into comma-separated values and therefore, any format clause is applied to each value before being joined by commas.	@{variables.MyFavoriteRegion}{EASTERN REGION} or @{MyFavoriteRegion} or @{dashboard.variables['MyFavoriteRegion']} or (@{myNumVar}[#,##0]{1000}) or (@{variables.MyOwnTimestamp}[YY-MM-DD hh:mm:ss]{}) or (@{myTextVar}{A, B, C})
Global	@{global.variables.*variablename*} where *variablename* is the name of the global variable, for example, gv_region. When referencing a global variable, you must use the fully qualified name as indicated in the example. The naming convention for global variables must conform to EMCA Scripting language specifications for JavaScript. The name must not exceed 200 characters, nor contain embedded spaces, reserved words, and special characters. If you're unfamiliar with JavaScripting language requirements, consult a third party reference	@{global.variables.gv_date_n_time}

You can also reference variables in expressions. The guidelines for referencing variables in expressions are described in the following topics:

- Session Variables

- Presentation Variables
- Repository Variables

Session Variables

You can use the following guidelines for referencing session variables in expressions.

- Include the session variable as an argument of the VALUEOF function.
- Enclose the variable name in double quotes.
- Precede the session variable by NQ_SESSION and a period.
- Enclose both the NQ_SESSION portion and the session variable name in parentheses.

For example:

```
"Market"."Region"=VALUEOF(NQ_SESSION."SalesRegion")
```

Presentation Variables

You can use the following guidelines for referencing presentation variable in expressions.

When referencing a presentation variable, use this syntax:

@{*variablename*}{*defaultvalue*}

where *variablename* is the name of the presentation variable and *defaultvalue* (optional) is a constant or variable reference indicating a value to be used if the variable referenced by *variablename* isn't populated.

To type-cast (that is, convert) the variable to a string or include multiple variables, enclose the entire variable in single quotes, for example:

```
'@{user.displayName}'
```

If the @ sign isn't followed by a {, then it's treated as an @ sign. When using a presentation variable that can have multiple values, the syntax differs depending on the column type.

Use the following syntax in SQL for the specified column type in order to generate valid SQL statements:

- Text — (@{*variablename*}['@']{'*defaultvalue*'})
- Numeric — (@{*variablename*}{*defaultvalue*})
- Date-time — (@{*variablename*}{timestamp '*defaultvalue*'})
- Date (only the date) — (@{*variablename*}{date '*defaultvalue*'})
- Time (only the time) — (@{*variablename*}{time '*defaultvalue*'})

For example:

```
"Market"."Region"=VALUEOF(NQ_SESSION."SalesRegion")
```

Repository Variables

You can use the following guidelines for referencing repository variables in expressions.

- Include the repository variable as an argument of the VALUEOF function.
- Enclose the variable name in double quotes.
- Refer to a static repository variable by name.
- Refer to a dynamic repository variable by its fully qualified name.

For example:

```
CASE WHEN "Hour" >= VALUEOF("prime_begin") AND "Hour" < VALUEOF("prime_end")
THEN 'Prime Time' WHEN ... ELSE...END
```

Advanced Techniques: Issue Direct Database Requests

You can create and issue a direct request to the back-end database using a connection pool and a database-specific SQL statement, if the administrator has granted you the appropriate privileges

You can also review and change the result columns of the database request by changing the SQL statement. After making the changes and retrieving the required results, you can incorporate the results into dashboards and agents.

Topics:

- Privileges Required for Direct Database Requests
- Create and Execute Direct Database Requests

Privileges Required for Direct Database Requests

Administrators can use the Manage Privileges page in the Classic Administration page to view and set access permissions for direct database requests.

To create and issue a direct database request, you must have been granted the following privileges:

- Edit Direct Database Analysis - You can create and edit direct database requests.
- Execute Direct Database Analysis - You can issue direct requests and see the results

Oracle recommends that you keep the default privileges because they’re optimized for Oracle Analytics. Editing privileges might cause unexpected behavior or access to features.

Create and Execute Direct Database Requests

You can create a direct request to the database from the Classic home page.

Security rules for data are bypassed and can’t be applied when creating direct database requests.

1. On the Classic Home page, in the **Create** pane, click **Analysis** (or click **New** and select **Analysis**).
2. In the Select Subject Area dialog, click **Create Direct Database Query**.

3. In the Criteria tab, enter a connection pool and a query statement.
    - Use **Connection Pool** to specify the name of the connection pool to use for the query.
    - Use **SQL Statement** to specify the database-specific SQL statement for retrieving data from the database.
4. Click **Validate SQL and Retrieve Columns** and review the retrieved columns in the Results Columns field.
5. Click the **Results** tab to issue the request and see the results. The Results Columns field sometimes doesn’t display any columns, because the SQL statement you provided in the Criteria tab retrieved no data from the database.

There are some functions you can’t perform in analyses whose columns originated from direct database requests:

- Select columns in the Subject Areas pane, because you aren’t working with columns from a repository.
- Create groups or selection steps for this analysis.
- Specify conditional formatting for the columns.
- Sort the values in the retrieved columns using the **Sort Ascending** and **Sort Descending** options in the column header of a pivot table, table, or trellis view.

13

View Data in Different Ways

The result of an analysis is represented visually in a view. Depending on your needs and preferences, you can use different types of views to view the same data in different ways.

Topics:

Typical Workflow to View Data in Different Ways

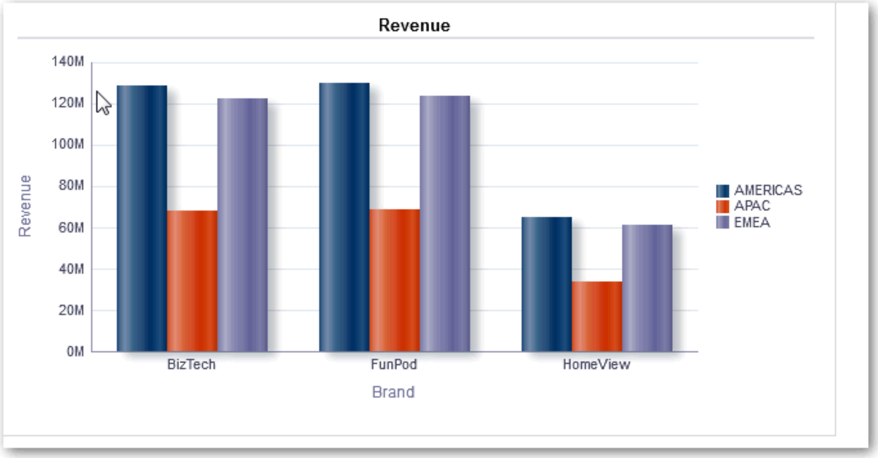
Here are the common tasks to start adding views to analyses to view data in different ways.

Task	Description	More Information
Create an analysis	Select and arrange columns that you want to use in an analysis.	Create Your First Analysis
Add a view	Add views to an analysis to visualize data in different ways.	Add Views
Edit a view	Use the editor that is available for each type of view to edit that view.	Edit Views
Remove a view	Delete a view from a compound layout or from an analysis.	Remove Views
Save a view	Save a view by saving the analysis.	Save Views
Print a view	Print a single view or group of views in printable HTML or printable PDF.	Print Views
Visualize your data	Visualize data in your analysis.	Visualize Data in an Analysis

About Views

A view is a visual representation of the results of an analysis. Views give you different ways of looking at your data to help you discover patterns, trends, outliers, and other interesting characteristics.

You can add a variety of views to the results, such as graphs and pivot tables that allow drilling down to more detailed information, such as explanatory text, filter controls, and more. This example shows the results of a revenue analysis displayed in a bar graph view.



This table describes the view types that you can use to present your data (if you have the required privileges).

View Name	Description
Column Selector	Adds a column selector in the results. A column selector is a set of drop-down lists that contain pre-selected columns. Users can dynamically select columns and change the data that is displayed in the views of the analysis.
Filters	Displays the filters in effect for an analysis. Filters, like selection steps, allow you to constrain an analysis to obtain results that answer a particular question. Filters are applied before the query is aggregated.
Funnel	Displays results as a three-dimensional graph. Typically, funnel graphs represent data that changes over time. For example, funnel graphs are often used to represent the volume of sales over a quarter. In funnel graphs, the thresholds indicate a percentage of the target value, and colors provide visual information for each stage. You can click one of the colored areas to drill down to more detailed information.
Graph	Displays numeric information on a background, called the graph canvas. When precise values are needed, graphs should be supplemented with other data displays, such as tables.
Gauge	Displays a single data value on a background, called the gauge canvas. Due to its compact size, a gauge is often more effective than a graph for displaying a single data value. A gauge view might consist of multiple gauges in a gauge set. For example, if you create a gauge view to show the sales data for the last twelve months, the gauge view consists of twelve gauges, one for each month. If you create one to show the total sales in the US, then the gauge view consists of one gauge.
Heat Matrix	Displays a two-dimensional depiction of data in which values are represented by a gradient of colors. Heat matrixes structure data similarly to pivot tables in that they are formed by grouping rows and columns.
Legend	Adds a legend to the results, which enables you to document the meaning of special formatting used in results, such as the meaning of custom colors applied to gauges.
Map	Displays results overlain on a map. Depending on the data, the results can be overlain on top of a map as formats such as images, color fill areas, bar and pie graphs, and variably sized markers.
Narrative	Displays the results as one or more paragraphs of text. You can type in a sentence with placeholders for each column in the results, and specify how rows should be separated.
Performance Tile	Displays a single piece of aggregate data. Performance tiles use color, labels, and limited styles to show status and use conditional formatting of the background color or measure value to make the tile visually prominent. For example, if revenue isn’t tracking to target, the revenue value may appear in red.
Pivot Table	Pivot tables structure data like standard tables, but can display multiple levels of both row and column headings. Unlike regular tables, each data cell in a pivot table contains a unique value. They are ideal for displaying a large quantity of data, for browsing data hierarchically, and for trend analysis.
Table	Display data organized by rows and columns. Tables provide a summary view of data and let you see different views of data by dragging and dropping rows and columns.
Ticker	Displays the results as a ticker or marquee, similar in style to the stock tickers that run across many financial and news sites on the Internet. You can control what information is presented and how it scrolls across the page.
Title	Displays a title, a subtitle, a logo, a link to a custom online help page, and timestamps to the results.

View Name	Description
Treemap	Displays hierarchical data by grouping the data into rectangles (known as tiles). Treemaps display tiles based on the size of one measure and the color of the second measure. Treemaps are limited by a predefined area and display two levels of data. They are similar to a scatter plot graphs in that the map area is constrained, and the graph allows you to visualize large quantities of data and quickly identify trends and anomalies within that data.
Trellis	Displays a type of graph view that displays a grid of multiple graphs, one in each data cell. A trellis view can be simple or advanced. A simple trellis displays a core inner graph multiplied across row sets and column sets, displaying many small multiples that are ideal for comparing and contrasting. An advanced trellis displays a grid of small spark graphs that are ideal for monitoring trends and spotting patterns in a data set.
Selection Steps	Displays the selection steps in effect for an analysis. Selection steps, like filters, allow you to obtain results that answer particular questions. Selection steps are applied after the query is aggregated. See Edit Selection Steps.
Static Text	Adds static text in the results. You can use HTML to add banners, tickers, ActiveX objects, Java applets, links, instructions, descriptions, graphics, and so on, in the results.
View Selector	Adds a view selector in the results. A view selector is a drop-down list from which users can select a specific view of the results from among the saved views.

Add Views

By default when you create an analysis, you see either a table or pivot table view, depending on the columns that you selected. You can add other views to the analysis that let you visualize the data in different ways.

For example, you can analyze trends for your Sales Forecast analysis by creating a new view and selecting **Recommended Visualization** and the **Analyzing Trends** option.

1. Open the analysis for editing.
2. On the Results tab, click **New View** , and select a view type.
3. To format the container for the views in the analysis, click **Format Container**.
4. Complete the fields in the Format Container dialog to specify options such as alignment, colors, and borders.
5. Click **OK**.
6. Click **Save Analysis**.

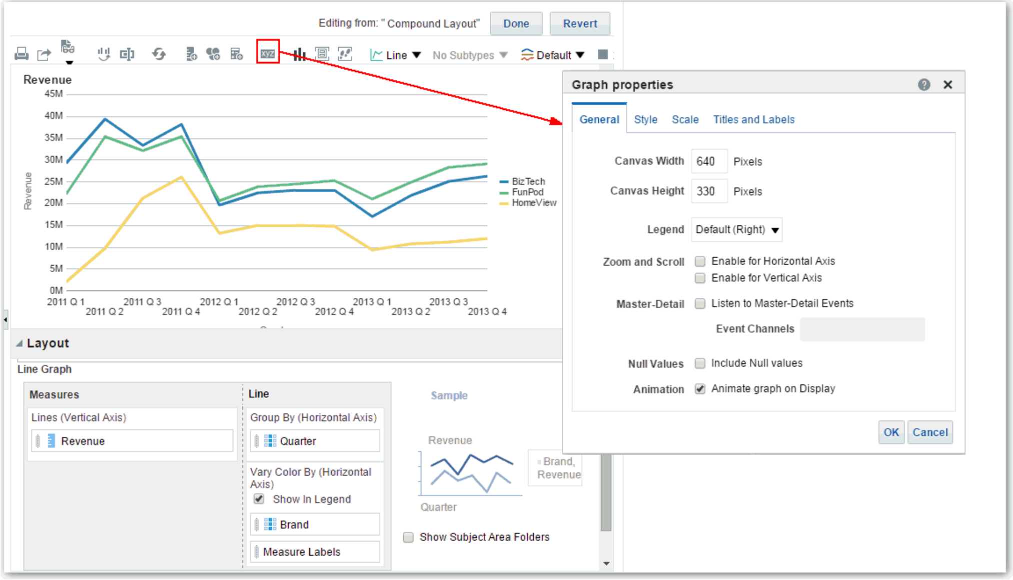
Edit Views

Each type of view has its own editor. The editors include both common functionality across views and view-specific functionality.

For example, you can edit a graph in a Brand Revenue analysis in the Graph editor to show the legend.

The following procedure provides general information on editing views.

1. Open the analysis for editing.
2. Click the Results tab.
3. To edit the view, click **Edit View**.
4. In the view editor (such as the Graph editor) make the appropriate edits, such as showing the legend.



Canvas Width 640 Pixels

Canvas Height 330 Pixels

Legend Default (Right)

Zoom and Scroll ☐ Enable for Horizontal Axis
☐ Enable for Vertical Axis

Master-Detail ☐ Listen to Master-Detail Events

Event Channels

Null Values ☐ Include Null values

Animation ☑ Animate graph on Display

5. Click **Done**.
6. Save the view. Click **Save Analysis** or **Save As** in the toolbar of the Results tab.

Edit Various Types of Views

This topic identifies additional information for editing various types of views.

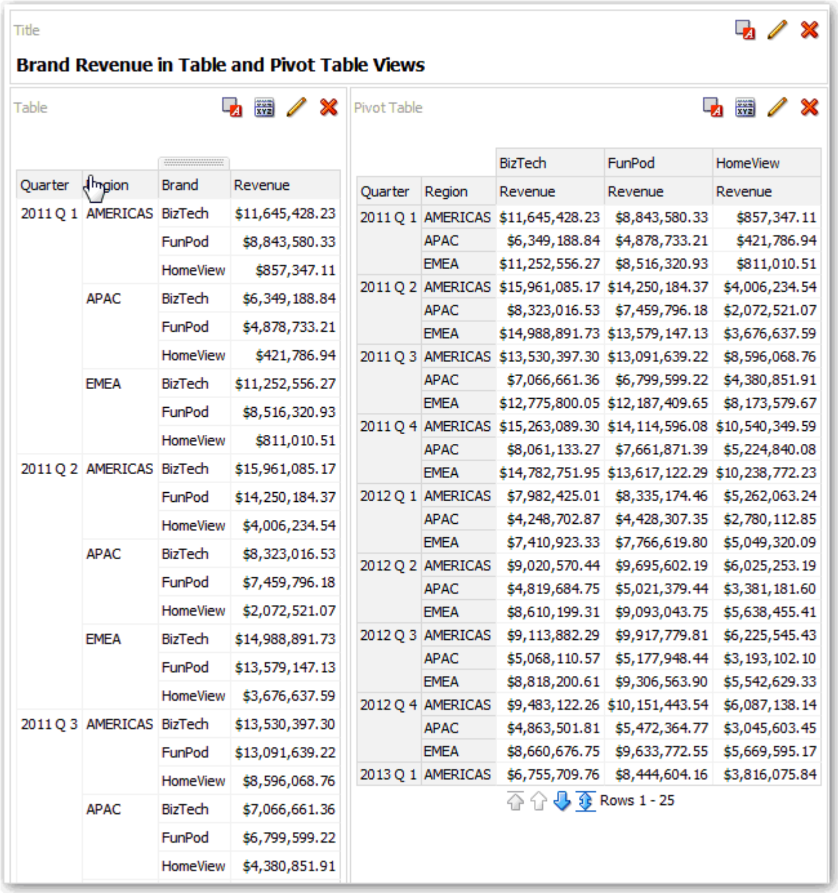
Topics:

- Edit Table and Pivot Table Views
- Edit Performance Tile Views
- Edit Treemap Views
- Edit Heat Matrix Views
- Edit Trellis Views
- Edit Gauge Views
- Edit Map Views
- Edit Narrative Views
- Edit Non-Data Views

Edit Table and Pivot Table Views

Tables and pivot tables are commonly used views, and you can edit them in similar ways to display data the way you want.

For example, you can edit a pivot table in an analysis by moving the Brand column to the row edge to display its corresponding Revenue data for each Quarter and Region. You could also display the same data in a more conventional way by adding a table next to the pivot table in a compound layout, as shown below.



Brand Revenue in Table and Pivot Table Views

Quarter	Region	Brand	Revenue
2011 Q 1	AMERICAS	BizTech	$11,645,428.23
		FunPod	$8,843,580.33
		HomeView	$857,347.11
	APAC	BizTech	$6,349,188.84
		FunPod	$4,878,733.21
		HomeView	$421,786.94
	EMEA	BizTech	$11,252,556.27
		FunPod	$8,516,320.93
		HomeView	$811,010.51
2011 Q 2	AMERICAS	BizTech	$15,961,085.17
		FunPod	$14,250,184.37
		HomeView	$4,006,234.54
	APAC	BizTech	$8,323,016.53
		FunPod	$7,459,796.18
		HomeView	$2,072,521.07
	EMEA	BizTech	$14,988,891.73
		FunPod	$13,579,147.13
		HomeView	$3,676,637.59
2011 Q 3	AMERICAS	BizTech	$13,530,397.30
		FunPod	$13,091,639.22
		HomeView	$8,596,068.76
	APAC	BizTech	$7,066,661.36
		FunPod	$6,799,599.22
		HomeView	$4,380,851.91

		BizTech	FunPod	HomeView
Quarter	Region	Revenue	Revenue	Revenue
2011 Q 1	AMERICAS	$11,645,428.23	$8,843,580.33	$857,347.11
	APAC	$6,349,188.84	$4,878,733.21	$421,786.94
	EMEA	$11,252,556.27	$8,516,320.93	$811,010.51
2011 Q 2	AMERICAS	$15,961,085.17	$14,250,184.37	$4,006,234.54
	APAC	$8,323,016.53	$7,459,796.18	$2,072,521.07
	EMEA	$14,988,891.73	$13,579,147.13	$3,676,637.59
2011 Q 3	AMERICAS	$13,530,397.30	$13,091,639.22	$8,596,068.76
	APAC	$7,066,661.36	$6,799,599.22	$4,380,851.91
	EMEA	$12,775,800.05	$12,187,409.65	$8,173,579.67
2011 Q 4	AMERICAS	$15,263,089.30	$14,114,596.08	$10,540,349.59
	APAC	$8,061,133.27	$7,661,871.39	$5,224,840.08
	EMEA	$14,782,751.95	$13,617,122.29	$10,238,772.23
2012 Q 1	AMERICAS	$7,982,425.01	$8,335,174.46	$5,262,063.24
	APAC	$4,248,702.87	$4,428,307.35	$2,780,112.85
	EMEA	$7,410,923.33	$7,766,619.80	$5,049,320.09
2012 Q 2	AMERICAS	$9,020,570.44	$9,695,602.19	$6,025,253.19
	APAC	$4,819,684.75	$5,021,379.44	$3,381,181.60
	EMEA	$8,610,199.31	$9,093,043.75	$5,638,455.41
2012 Q 3	AMERICAS	$9,113,882.29	$9,917,779.81	$6,225,545.43
	APAC	$5,068,110.57	$5,177,948.44	$3,193,102.10
	EMEA	$8,818,200.61	$9,306,563.90	$5,542,629.33
2012 Q 4	AMERICAS	$9,483,122.26	$10,151,443.54	$6,087,138.14
	APAC	$4,863,501.81	$5,472,364.77	$3,045,603.45
	EMEA	$8,660,676.75	$9,633,772.55	$5,669,595.17
2013 Q 1	AMERICAS	$6,755,709.76	$8,444,604.16	$3,816,075.84

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties** on the table you want to edit.
4. Edit the table properties.
5. Click **OK**.
6. Click **Edit View** to display the Table View editor.
7. For a pivot table view, click the **Graph Pivoted Results** button on the toolbar to display the results of the pivot table in a graph view, which is displayed alongside the pivot table.

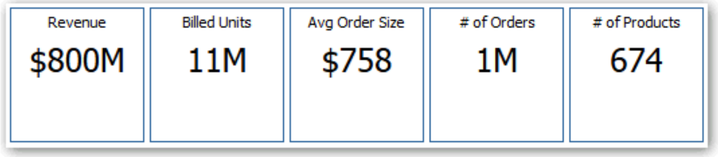
8. Click **Done**.

Edit Performance Tile Views

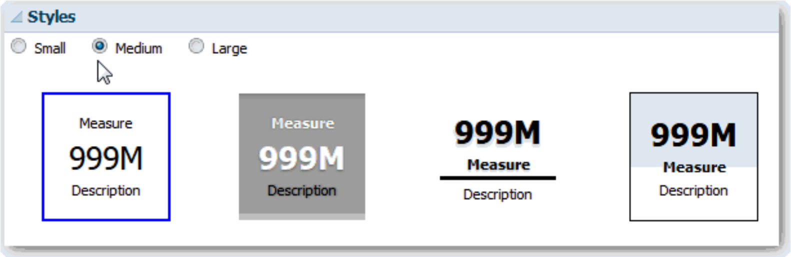
Performance tile views focus on a single piece of aggregate data. They use color, labels, and limited styles to show status and use conditional formatting of the background color or measure value to make the tile visually prominent.

By default, the first measure in the analysis on the Criteria tab is selected as the performance tile measure. To ensure the correct measure value is displayed in the tile, set up aggregation and filters on the Criteria tab. To include additional performance tile views for each measure in an analysis, add a separate view for each measure.

For example, you might want to edit a performance tile view to use Revenue as the measure. You can specify that the values and labels utilize the available space. This example shows performance tiles on a dashboard page.



1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties**. You can set the following properties:
    - The size of the tile — You can select predefined options **Small**, **Medium**, or **Large**, or you can select **Custom** and then set the height and weight in pixels. Other options allow you to autofit the tile to the value that is displayed.
    - The position of the tile — Options include **Fixed Position**, which sets (or “fixes”) the positions of the labels, meaning the label text is displayed in fixed positions (recommended for layouts with multiple performance tiles of the same size in a row) and **Utilize available space**, which evenly spaces the label text on the performance tile vertically. The label text utilizes all available space on the performance tile. Note that when you have multiple tiles placed beside each other, the labels might be displayed at different heights and look uneven based on the varying label content.
    - The use of abbreviated values — A performance tile can show a value using its measure's default formatting or the value can be abbreviated to the nearest thousand, million, and so on. For example, using abbreviated values, the default formatting of “123,456.50” would be displayed as “123K”.
    - The appearance of the tile, such as the background and border colors — Click the **Edit Conditional Formatting** link to apply conditional formatting to the tile.
4. Click **OK**.
5. Click **Edit View** to display the Performance Tile editor.
6. In the Styles pane, change the tile size to **Small**, **Medium**, or **Large**.

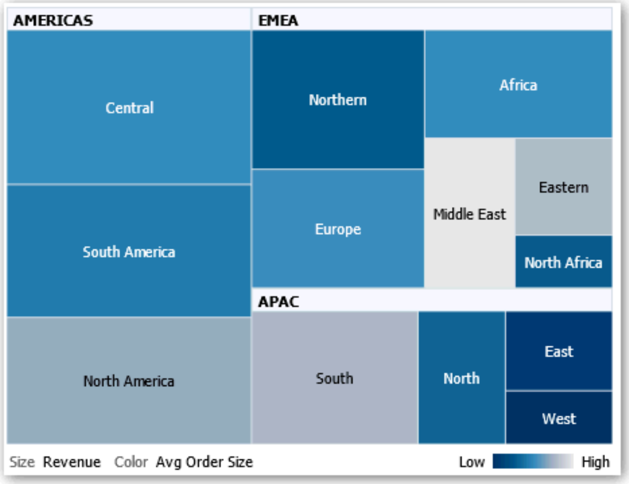


7. Select a themed (or stylized) tile located below the **Tile Size** option buttons to change the theme for the performance tile.
8. Click **Done**.

Edit Treemap Views

Treemaps organize hierarchical data by grouping the data into rectangles (known as tiles). Treemaps display tiles based on the size of one measure and the color of the second measure.

The following figure shows an example of a treemap view. The country names are grouped by region and area. This treemap shows the correlation of revenue for a country (based on average order size) across different regions for an area.



By default, the first measure of the analysis in the Criteria tab is selected as the Size By measure, and the second measure is selected as the Color By measure. If there is only one measure in the analysis, this measure is the default for both Size By and Color By options. Additionally, the Style element defaults to Percentile Binning with "quartile" as the value for the number of bins.

Treemaps have the following characteristics:

- Tiles are colored by percentile bins or continuously.
- First Group By dimension is displayed as the group (header) label.
- The order of the Group By dimensions implies the nesting order within the treemap. The last dimension in the Group By is the lowest level and this dimension

name is displayed as the tile label. If the label is too long to fit on the tile, then it’s truncated. Full values for the labels display in the tooltip.

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties**. You can set properties such as the following ones:
    - The size of the treemap.
    - Whether a legend is to be displayed to show the continuous color variations or binning for the treemap tiles.
    - The background color and fill of the legend.
    - The border colors of the groups and tiles.
4. Click **OK**.
5. Click **Edit View** to display the treemap view editor.
6. In the Layout pane, select the **Percentile Binning** or **Continuous Color Fill** options to change the color palette of the view.
    - Use **Percentile Binning** to specify that the color of the tiles within the treemap is displayed as a percentile bin. In the **Bins** list, select the number of bins to display in the treemap. You can select an integer, Quartile (4), or Decile (10). Values range from 2 to 12. The number of bins selected corresponds to the number of colors in the treemap. For example: You create a treemap for Region and Area. You specify Revenue as the Size By measure and Avg Order Size as the Color By measure. Then, you select Percentile Binning as the Style with 4 (Quartile) bins. The First Quartile represents those areas within the region that are under performing for the average order size by revenue. The **Binning Properties** area displays the percentage for the bin based on a total of 100% and is calculated based on the number of bins selected. Each percentage is color-coded and corresponds to the Color selection.
    - Use **Continuous Color Fill** to specify that the tiles within the treemap are displayed as a gradient color scheme. The low value gradient color is the minimum value for the selected Color By measure. The high value gradient color is the maximum value for the selected Color By measure.
7. Change the measures and attribute and hierarchal (excluding skip-level) columns to visualize the new data in more meaningful ways by using **Group By**, **Size By**, and **Color By** options.
8. Click **Done**.

Edit Heat Matrix Views

A heat matrix view visually represents the relationship between data values as a gradient of colors in a table format. You can edit properties such as view size, the display of header and data cells, and the display of a legend.

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties** on the heat matrix you want to edit.
4. Edit properties as needed.

- Use **Data Viewing** to control the size of the view in the layout. Options include scrolling with optional maximum width and height or paging with optional number of rows per page.
- Use **Legend** to display a legend showing the continuous color variations or binning for the heat matrix.
- Use Master-Detail to link the table to a master view. In the **Event Channels** field, enter the case-sensitive name of the channel the table listens to for master-detail events. Separate multiple channels with commas.
- Use **Display Folder & Column Headings** to specify how to display headings for the columns and the view. Select the Folder.Column option to display the fully qualified folder name from the Subject Area and column name as the row or column title (for example, Offices.D1 Offices).

5. Click **OK**.
6. Left-click to drill in a cell.

   When drilling in multiple-level hierarchies, all members from the lowest levels are displayed as cells, and the detail level data replaces the current data. For example, when you drill in a country name, such as United States, the heat matrix displays data for the state (or provinces) in that country, but not for the country itself.
7. Right-click the outer edges to display a context menu of options, such as **Drill**, invoke actions, **Keep Only**, **Remove**, or focus on a specific cell.
8. Click **Edit View** to display the Heat Matrix editor.
9. In the Layout pane:
   a. In the **Style** box, select **Percentile Binning** or **Continuous Color Fill** to change the color palette of the view.
   b. Change the measures and columns to visualize the data in more meaningful ways by using **Rows**, **Columns**, and **Color By** drop targets.
10. To specify sorting, right-click a cell in the view and click **Sort**. The interactions that are available in the Sort dialog depend on the location in which you right-click within the view.
11. Click **Done**.

About Heat Matrix Views

A heat matrix view shows you a two-dimensional depiction of data in which values are represented by a gradient of colors. A simple heat matrix provides an immediate visual summary of information that is well suited for analyzing large amounts of data and identifying outlier values.

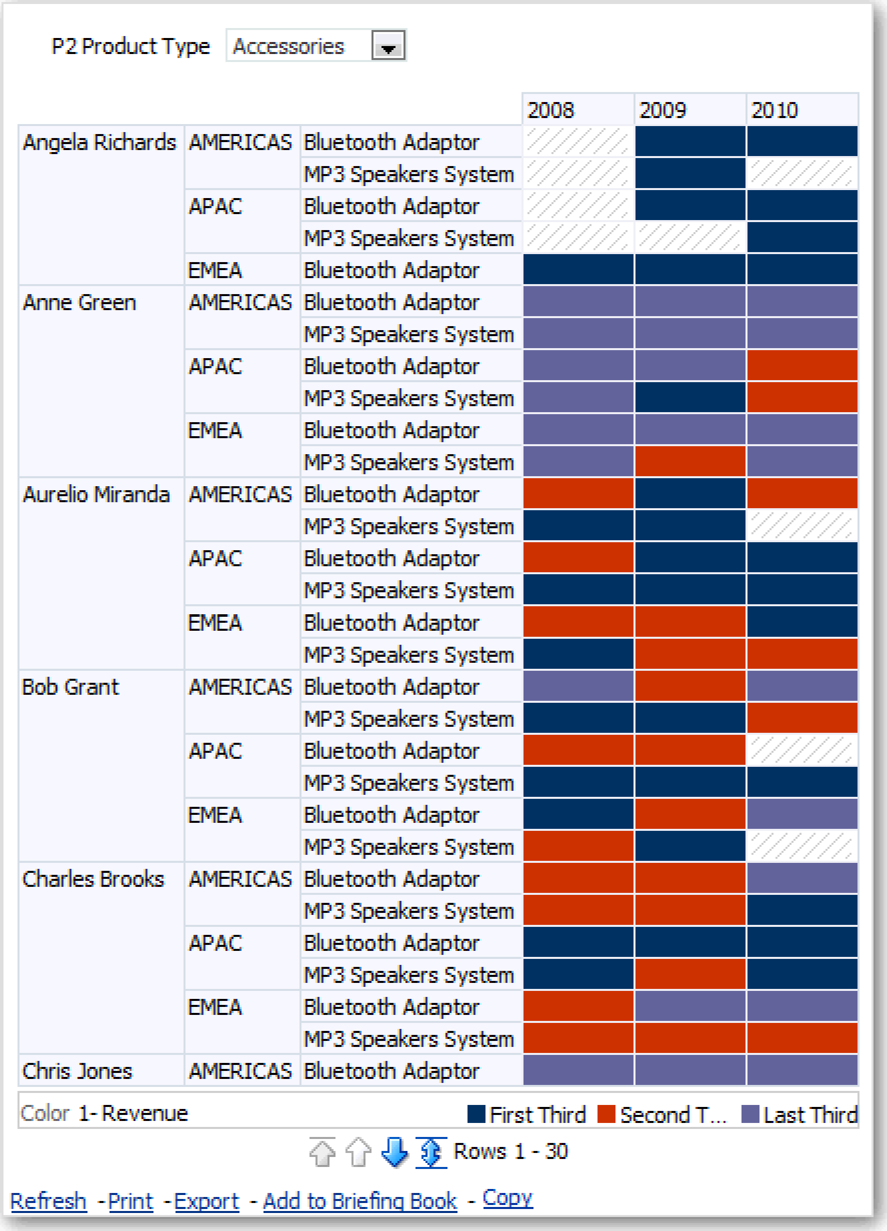
A heat matrix displays data from one measure. Colored cells are formed by the grouping and intersection of the columns and rows placed in the Prompts, Sections, Rows, Columns, and Color By drop targets. Cells are displayed as percentile bins or as a continuous color. You can hover over a cell to display its value or display values in cells all the time.

By default, the first measure of the analysis in the Criteria tab is selected as the Color By measure and represents the measure's value. The Style element defaults to Percentile Binning with "quartile" as the value for the number of bins. Cells display uniformly, in that each cell has the same width and the same height. Cell height and width don’t have to be the same. A "transparent" diagonal pattern of stripes indicates null values.

You can display a legend below the heat matrix that includes:

- One measure (selected in the Color By list) and its corresponding label.
- The number of specified bins (for example, quartile), color-coded and labeled, or a gradient bar that is displayed as a continuous color fill and is labeled "low" to "high."

Here is an example of a heat matrix view on a dashboard page. Each sales representative's revenue is displayed by region and product and prompted by product type. Sales revenue is binned by year. This heat matrix depicts the product revenue outliers for each sales representative (for example, in 2008, Angela Richards has no sales revenue for Bluetooth Adaptors or MP3 Speakers Systems for any region.)



P2 Product Type: Accessories

			2008	2009	2010
Angela Richards	AMERICAS	Bluetooth Adaptor	▨	🟦	🟦
		MP3 Speakers System	▨	🟦	▨
	APAC	Bluetooth Adaptor	▨	🟦	🟦
		MP3 Speakers System	▨	▨	🟦
	EMEA	Bluetooth Adaptor	🟦	🟦	🟦
Anne Green	AMERICAS	Bluetooth Adaptor	🟪	🟪	🟪
		MP3 Speakers System	🟪	🟪	🟪
	APAC	Bluetooth Adaptor	🟪	🟪	🟥
		MP3 Speakers System	🟪	🟦	🟥
	EMEA	Bluetooth Adaptor	🟪	🟪	🟪
		MP3 Speakers System	🟪	🟥	🟪
Aurelio Miranda	AMERICAS	Bluetooth Adaptor	🟥	🟦	🟥
		MP3 Speakers System	🟦	🟦	▨
	APAC	Bluetooth Adaptor	🟥	🟦	🟦
		MP3 Speakers System	🟦	🟦	🟦
	EMEA	Bluetooth Adaptor	🟥	🟥	🟦
		MP3 Speakers System	🟦	🟥	🟥
Bob Grant	AMERICAS	Bluetooth Adaptor	🟪	🟥	🟪
		MP3 Speakers System	🟦	🟦	🟥
	APAC	Bluetooth Adaptor	🟥	🟥	▨
		MP3 Speakers System	🟦	🟦	🟦
	EMEA	Bluetooth Adaptor	🟦	🟥	🟪
		MP3 Speakers System	🟥	🟦	▨
Charles Brooks	AMERICAS	Bluetooth Adaptor	🟥	🟥	🟪
		MP3 Speakers System	🟥	🟥	🟦
	APAC	Bluetooth Adaptor	🟦	🟦	🟦
		MP3 Speakers System	🟦	🟥	🟦
	EMEA	Bluetooth Adaptor	🟥	🟪	🟪
		MP3 Speakers System	🟥	🟥	🟥
Chris Jones	AMERICAS	Bluetooth Adaptor	🟪	🟪	🟪

Color 1- Revenue 🟦 First Third 🟥 Second T... 🟪 Last Third

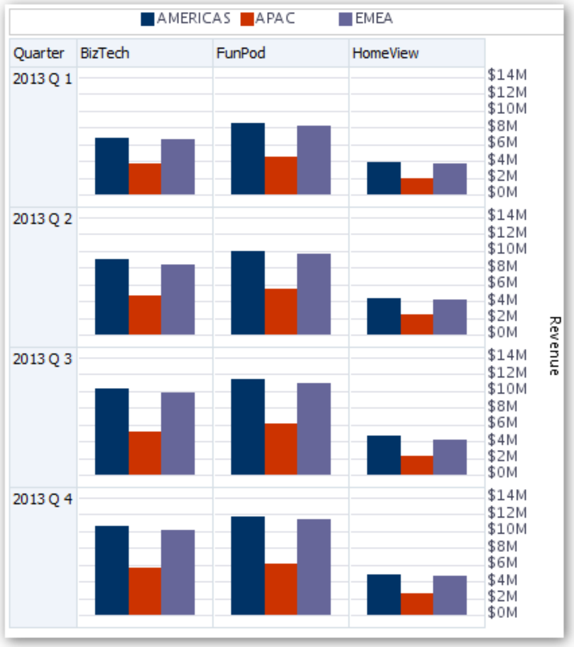
Rows 1 - 30

Edit Trellis Views

A trellis view is a type of graph view that displays a grid of multiple graphs, one in each data cell.

A trellis view can be simple or advanced. A simple trellis displays a core inner graph multiplied across row sets and column sets, displaying many small multiples that are ideal for comparing and contrasting. An advanced trellis displays a grid of small spark graphs that are ideal for monitoring trends and spotting patterns in a data set.

The following figure shows a simple trellis view:



The trellis view (also referred to as a trellis graph) is similar to a pivot table except that the data cells within the trellis contain graphs. Whereas a standalone graph type such as a single bar graph or a single scatter graph works on its own, the trellis graph works only by displaying a grid of nested graphs, known as inner graphs. So a bar graph trellis view is actually comprised of multiple bar graphs.

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties** to edit properties.

   You can set the following kinds of properties:

   - Related to the grid canvas, such as legend location (simple trellis views only).
   - Related to graph size for the visualizations that are included in the trellis.
   - That specify the method to be used to browse data — either scrolling or paging controls.
   - That control the appearance of the trellis's grid and its visualizations, such as various style choices and the way that legends are displayed.

   - That control the type of scale and the appearance of scale markers for each of the trellis's visualizations (simple trellis views only).
   - That control the display of titles and labels (simple trellis views only).

4. Click **OK**.
5. Click **Edit View** to display the Trellis editor.
6. In the Layout pane:
   a. Drag and drop columns into the Columns and Rows fields to specify how data is arranged in the trellis.
   b. Select the type of graph you want to display for each of the cells in the trellis.
   c. Drag and drop columns to indicate how to color the graphs.
7. Right-click a view heading, and click **Sort Column** to specify how values are sorted in the view.
8. Click **Done**.

About the Functions of Trellis Views

For the most part, a trellis view behaves like a pivot table. The main difference between a trellis and a pivot table is the way the data cells are displayed.

In the row and column label cells of a trellis, you can:

- Right-click to hide or move measure labels.
- Right-click to sort data.
- Drag to reposition rows and columns.

In the data cells of a trellis, you can hover the mouse pointer to display related contextual information. Numeric data cells in a trellis behave the same as numeric data cells in a pivot table. The ways in which the behavior of a trellis view differs from the behavior of a pivot table are the following:

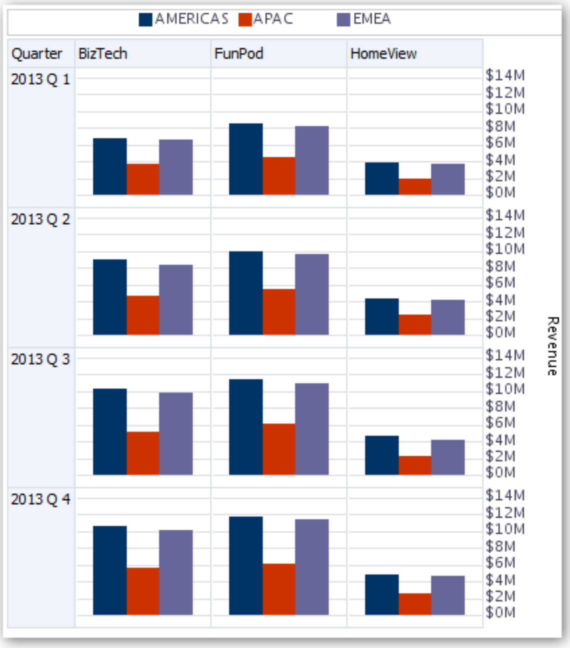
- Graph data cells — There is no right-click functionality for the data cells in simple trellises, nor drilling in trellis graph data cells (left-click functionality).
- Microchart data cells — When you hover the cursor over the data cells in spark graphs, you’re shown contextual information (such as first, last, minimum, and maximum values) that otherwise isn’t displayed as it’s in a pivot table view.

About Simple Trellis Versus Advanced Trellis

A trellis view has one of two types: Simple Trellis and Advanced Trellis.

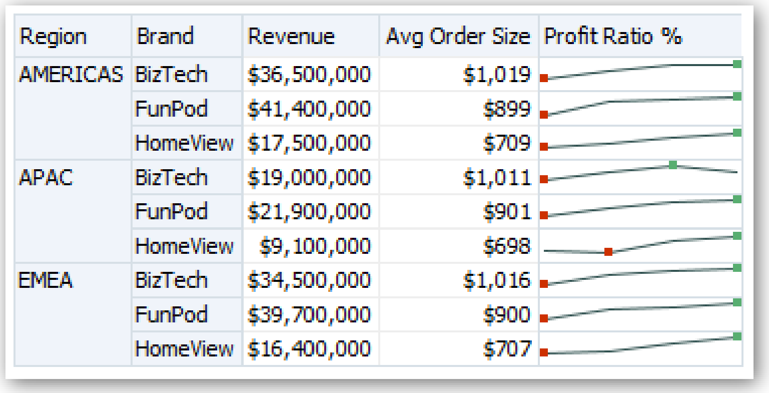
The Simple Trellis displays a single type of inner visualization, for example, all bar graphs. The inner visualization always uses a common axis, so that all inner graphs are viewed on the same scale. Having a common axis makes all graph markers easy to compare across rows and columns.

This figure shows a simple trellis view:



The Advanced Trellis accommodates the display of multiple visualization types within its grid. An advanced trellis that illustrates sales trends might show a grid that contains numbers in the cells of one column (revenue, for example). Another column alongside the numbers column displays Spark Line graphs in its cells. Next to that column, a different microchart might be displayed, such as a column of Spark Bar graphs that visualize a different measure, such as unit totals.

This figure shows an advanced trellis view:



Region	Brand	Revenue	Avg Order Size	Profit Ratio %
AMERICAS	BizTech	$36,500,000	$1,019	
	FunPod	$41,400,000	$899	
	HomeView	$17,500,000	$709	
APAC	BizTech	$19,000,000	$1,011	
	FunPod	$21,900,000	$901	
	HomeView	$9,100,000	$698	
EMEA	BizTech	$34,500,000	$1,016	
	FunPod	$39,700,000	$900	
	HomeView	$16,400,000	$707	

Each measure that is visualized is assigned a different inner graph type. Each cell of the grid is scaled independently.

Think of an advanced trellis as a pivot table with spark graphs inside its data cells. But, for each measure that you add, you can optionally associate a dimension and display it as a microchart visualization. This makes an advanced trellis very different from a simple trellis. In a simple trellis, all of the measures are displayed in the same visualization, along with additional dimensions.

Design Considerations for Trellis Views and Microcharts

This concept provides ideas to be considered when designing content displayed in trellis views.

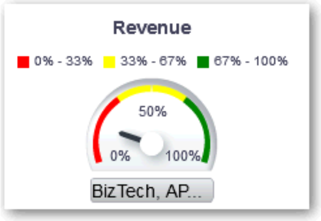
For all trellis views:

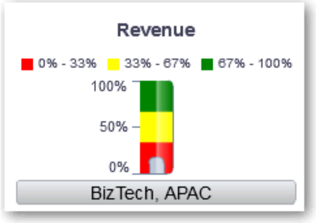
- For comparisons, select the Simple Trellis.
- For trend analysis, select the Advanced Trellis.
- Make the inner graphs that comprise a trellis readable and not too dense. A trellis view isn’t especially useful for displaying multiple series or multiple groups. If you can’t easily target a data point with the mouse (to display a tooltip), then the inner graph is likely too dense to be readable.
- For the Simple Trellis:
  - Designing a simple trellis is like designing a pivot table, except that the total number of cells that can be displayed is much less for a trellis.
  - The main difference between designing a simple trellis and designing a pivot table is that for a trellis, one or two of the dimensions can be associated with the visualization. You add many fewer dimensions to the outer edge.
  - Design the trellis with a small number of outer-edge dimensions. The entire graph series should be visible at once (for easy comparison of like to like) with no need to scroll. If you must show additional dimensionality, then consider adding the dimensions to the graph prompt.
  - When determining which data to show in column headers and which to show in row headers, ensure that the column headers show one or two dimensions (each dimension with a small number of members).
- For the Advanced Trellis:
  - A common use case for an advanced trellis is to show trend graphs alongside numeric values, in a compressed form. So a typical advanced trellis contains a combination of spark graphs alongside number representations of the same measure.
  - Ideally, include no dimensions in the column headers. Include the measure in the column headers.
  - The dimensionality typically associated with a spark graph is time. Because a spark graph includes no visible labels, it’s important that the data visualized is intrinsically ordered. For example, a spark graph that visualizes regions is meaningless, because the ordering of the regions (which would be the specific bars, in a Spark Bar graph) isn’t intuitive.
  - Just as when designing pivot tables, you generally display time on the horizontal axis, with the other dimensions displayed on the vertical axis. The eye then scans from left to right to see how the dimensionality changes over time.
- Hierarchical columns don’t work well with the Simple Trellis. When a hierarchical column is displayed on the outer edge, parents and children (such as Year and Quarter) are shown by default using a common axis scale. However, because Year and Quarter have different magnitudes, the markers in child graphs might be extremely small and hard to read against the parent scale. (Hierarchical columns do work well with the Advanced Trellis, because each data cell is a different scale.)

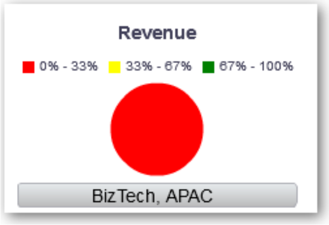
Edit Gauge Views

You use gauge views to compare performance to goals. Due to their compact size, gauges can be more effective than graphs for showing a single data value. Results show as a dial, bar, or bulb gauge. For example, you can use a gauge to see whether Actual Revenue falls within predefined limits for a brand.

The following figures show the same value in a dial, bar, and bulb gauge:







1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties** on the gauge you want to edit.
4. Edit the gauge properties.
   - Use **Gauges Per Row** to specify the number of rows of gauges to display and placement of labels.
   - Use **Listen to Master-Details Events** to link the gauge to a master view. In the **Event Channels** field, enter the case-sensitive name of the channel the gauge view listens to for master-detail events. Separate multiple channels with commas.
   - Use **Gauge Style** to change the width and height of gauges.
   - Use **Marker Type** to specify the marker type for a dial gauge, such as Needle, Line or Fill.

  - Use **Gauge Limits** to specify the scale of gauge limits. For example, you can specify a custom gauge limit. You can specify a static value such as 1000 as either an actual value or as a percentage. The value that you specify depends on the range of data points. You must ensure that the maximum gauge limit is more than the maximum data point. Do so to ensure that all data points are displayed on the gauge.
  - Use **Titles and Labels** to schange the appearance of titles and footers and the format of labels.

5. Click **OK**.
6. Click **Edit View**.
7. Click the **Gauge Type** button on the toolbar and select the type of gauge.
8. Optional: Define thresholds for the gauge.
9. Click **Done**.

Set Thresholds

You can set thresholds for display in gauges and funnel graphs.

Each threshold has a high and a low value and is associated with a color in which the range identified by the threshold is displayed in the gauge, such as green for acceptable, yellow for warning, and red for critical.

1. Click **Edit View** to display the view editor.
2. In the Settings pane, select either **High values are desirable** or **Low values are desirable**.

   For example, selecting **High values are desirable** lists the statuses in order from the most desirable indicator (such as Excellent) at the top to the least desirable indicator (such as Warning) at the bottom. Generally with columns such as Revenue, high values are desirable. With columns such as Expenses, low values are desirable.
3. In the Threshold list, specify the data values that highlight a particular range of values.

   The values must be between the minimum and maximum values set for the view's limits. The range that a threshold identifies is filled with a color that differs from the color of other ranges.

   To specify a data value, you can enter a static value directly in a Threshold field, or you can click **Threshold Options** to set the value based on a measure column, a variable expression, or the results of a SQL query. Select **Dynamic** to enable the system to determine the threshold value.
4. Enter the labels for the ranges in the Status area.
   - Select **Threshold Values** to use the current threshold values as the label for the range.
   - Select **Specify Label** to use text that you specify as the label for the range, such as Excellent.

Edit Map Views

Map views present data in spatial form and use location context to uncover trends and transactions across regions. For example, a map view can show a map of the United States with the states color-coded by sales performance.

You create a map view after selecting columns to display in that view. The administrator can specify multiple background maps. Initially, the map view is displayed with the first background map that has at least one layer associated with a column that you selected. You can edit a map view by selecting a different background map, applying layers to the background map, and formatting the layers.

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties**.
4. On the Canvas tab, specify the map size.
    - Use **Canvas Size** to specify the map size within its container. You can select either **Default**, **Custom**, or a predefined size. If you select **Default** or a predefined size, then no other options are available and the map is sized to fit its container. The container is whatever area is holding the map, such as the area in the Map editor or the section of a dashboard page.
    - Use **Map Wrap-Around** to specify a "wrap-around" feature when you include line formats on a map. Lines are the only format that cross map borders, such as an airplane flight from San Francisco to Tokyo. When this feature is turned on, you can pan the map so that lines aren’t broken.
5. On the Labels tab, specify whether to show labels for all layers or specific layers on the map view.

    The tab includes a box for each layer on the map view. The labels are displayed in the same order as that of the layers listed in the Map Formats area of the Map editor. Custom point layers have labels hidden by default.
6. On the Interaction tab, in the Initial Map View section, choose the initial center of the map and zoom level.
7. On the Tools tab, specify which tools are available with the map such as the zoom slider and the distance indicator.
8. Click **OK**.
9. Apply formats to the layers.
10. Click **Edit View**.
11. Modify formats and layers.
12. Click **Done**.
13. Drill in values.

About Map Views

You use map views to display data on maps in several different formats and to interact with the data.

When data is visualized on a map, relationships among data values that might not have been obvious previously can be displayed in a much more intuitive manner. For example, a map view can show a map of a city with the postal codes color-coded by sales performance, while an image marker displays the average discount given per order.

Map Components

A map consists of numerous components including a background or template map and a stack of layers that are displayed on top of each other in a window. A map has an associated coordinate system that all layers in the map must share. The map can be an image file, the object representation of an image file, or a URL that refers to an image file.

- **Main Content -** The main content is the background or template map, which provides the background geographic data and zoom levels. The main content can be an image such as the floor maps of office buildings or the appearance and presence of items such as countries, cities, and roads.
- **Layers** - One or more interactive or custom layers can overlay the main content.
- **Toolbar -** The toolbar is visible by default and you can click its buttons to manipulate map contents directly. The map view itself has a toolbar. The content designer specifies whether to display the toolbar for the map view on a dashboard page. On a dashboard page, the toolbar is displayed directly over the map and contains only the **Pan**, **Zoom Out**, and **Zoom In** buttons.
  The toolbar in the Map editor contains additional options for modifying the map view.
- **Zoom Controls -** These controls adjust the detail of the geographic data that is shown in the map view. For example, zooming in from a country might show state and city details. The administrator specifies which zoom levels each layer is visible for. You can have multiple zoom levels for one layer, and you can have a single zoom level associated with multiple layers. When you zoom, you change the map information at that zoom level, but you do not affect the display of BI data at that level. You affect the display of data by drilling.

  The zoom controls include a zoom slider that is displayed in the upper left-hand corner of the map view with a thumb for large scale zooming and buttons for zooming a single level. When the zoom control is zoomed-out all the way, the zoom level is set to 0 and the entire map view is displayed.

  You determine the visibility of the zoom control. When you create a map view, by default the map is initially zoomed into the highest zoom level that fits the entire contents of the top-most layer. For example, if the highest ordered layer contains data only in the state of California, then the map zooms to the highest zoom level that still shows all of California.
- **Scale Tool -** Also known as the Distance Indicator, this tool provides a key to distance interpretation of the map and consists of two horizontal bars that display in the lower left-hand corner of the map view below the information panel and above the copyright. The top bar represents miles (mi) and the bottom bar represents kilometers (km). Labels are displayed above the miles bar and below the kilometers bar in the format: [distance] [unit of measure]. The length and distance values of the bars change as the zoom level changes and as the map is panned.
- **Legend -** The legend is a semi-transparent area in the upper right-hand corner of the map view that you can display and hide. The legend shows the information that relates to the current zoom level. The legend provides a read-only visual key for symbols, layers, and formatting on the map and displays all visible formats that are applied to the map. If a format is turned off, then the corresponding legend item is hidden also. If a format is turned on but zoomed out of view, then it is not displayed in the legend. The legend

displays text such as "No formats defined for current zoom level" if you have no formats defined at the current zoom level.
When you select a format on the map, the corresponding legend item is highlighted. Highlights have varying granularity, depending on the selected formats (for example, a pie graph does not have the level of granularity that color fill has).

Use the **Expand Map Legend** and **Collapse Map Legend** buttons in the upper right-hand corner to control the display of the legend.

- **Overview Map** - The overview map consists of a miniature view of the main map that is shown in the lower right-hand corner of the main map. This overview map provides regional context.
  The reticule displays as a small window that you can move across a miniature view of the main map. The position of the reticule in the miniature map determines the viewable area of the main map. As you move the reticule, the main map is updated automatically. You can also pan in the overview map without using the reticule.

  The overview map is automatically hidden if the reticule cannot be shown. This hiding generally happens when the scale difference between successive zoom levels is too small to show the miniature view in the overview map.
- **Interactive Panel** - The top section of the interactive panel enables you to create and edit BI data formats in the analysis editor. If a format has editable thresholds, then a slider is displayed in the Map editor that enables you to edit thresholds by dragging the slider. The interactive panel enables you to rearrange formats within a geographic layer. For example, if the States layer has three formats, then you can select the order in which the formats are displayed.
  When displaying a tooltip by hovering the cursor over a map area, the corresponding detail is updated and highlighted in the interactive panel.

  Dashboard users can control the visibility of formats (by turning them on or off) and can adjust format thresholds if the content designer has allowed them to.

  The lower section of the panel includes the Feature Layer area, where you can select non-BI layers to add to the map. A non-BI layer is one that has not been associated with a BI column. You cannot apply formats to non-BI layers.

About Formats and Layers in Map Views

This topic describes how formats and layers interact in map views.

Topics:

- About Layers in Map Views
- About Formats in Map Views

About Formats in Map Views

A format defines display properties for a feature such as a point or a line that represents a city or a river.

For example, if the feature is a polygon that shows a county, then the format can define the fill color for the county or can define a pie graph to be drawn over the county. Formats are tied to a particular geographic level such as continent, country, region, state, or city.

About the Types of Formats

A map view uses columns of BI data. Each column has a set of properties that define its characteristics, such as for formatting and interaction. Any formatting that has been applied to a column isn’t applied to the map, except for the settings for interaction. Any formatting that originates from the map thresholds is applied.

You can apply various kinds of formats to map views and BI layers. You can’t apply formats to non-BI layers. You can define various formats to apply to BI layers.

Field	Description
Color Fill	Displays the Color Fill (*Layer*) dialog, which you use to display areas in fill colors that indicate that an area meets a particular condition. Color fill formats apply to regions or polygons. For example, a color fill format might identify a range of colors to represent the population in the states of a region or the popularity of a product in the states of a region. A map view can have multiple color formats visible at different zoom levels. For example, a color fill format for the layer at zoom levels 1-5 might represent the population of a state, and the county median income for the layer at zoom levels 6-10. You can also specify different colors to identify a range of data values.
Bar Graph	Displays the Bar Graph (*Layer*) dialog, which you use to display a series of data as a bar graph within an area. Graph formats can show statistics related to a given region such as states or counties. For example, a graph format can display the sales values for several products in a state. Even though you can create multiple graph formats for a particular layer, such creation isn’t recommend as the formats might overlap on the layer and the displayed results might be undesirable.
Pie Graph	Displays the Pie Graph (*Layer*) dialog, which you use to display a series of data as a pie graph within an area.
Shape	Displays the Variable Shape (*Layer*) dialog, which you use to display a measure column that is associated with an area by drawing markers or shapes within the region. You can also specify different colors for the shape to identify a range of data values.
Bubble	Displays the Bubble (*Layer*) dialog, which you use to display a bubble within an area, similar to the shape format.
Image	Displays the Image (*Layer*) dialog, which you use to display an image within an area, similar to the shape format. You can specify different images to identify a range of data values. You select images that have been specified by the administrator.
Line	Displays the Line (*Layer*) dialog, which you use to display a line on a map. You can include lines on maps to display paths such as highways, railway lines, and shipping routes. You can specify the width of lines and you can use the Map Wrap-Around feature on the Map Properties dialog to allow lines to be unbroken, such as when showing an airline flight path from San Francisco to Tokyo. You can vary the width of a line by each measure to accentuate a feature.
Custom Point	Displays the *Format* Custom Point (*Layer*) dialog, which you use to display a point format, such as a bubble, image, or shape in a layer. Custom points are displayed at all zoom levels and on top of all other map formatting. When you create a Custom Point format, you select columns to specify the latitude and longitude

About the Visibility of Formats

The visibility of a format depends on various factors.

The factors on which visibility of a format depends:

- The zoom level on the map and the "zoom range" of the format. For example, a Color Fill format for States is visible when state boundaries are visible and it’s turned on, but is no longer visible when the map is zoomed out to the Continent level.
- The data point limit. Formats are generally visible when they are zoomed into view and are turned on, but they might not be displayed if a particular layer has exceeded its maximum number of data points.

Custom point formats are unique in that they are displayed on the map always, for all zoom levels.

Format data is displayed in the legend only when the format is both turned on and zoomed into view. A format is turned on when the box beside its name is selected in the Map Formats area.

The map can’t display multiple non-point formats at a time (at a single zoom level) but can display multiple point formats simultaneously, if they don’t share the same latitude and longitude location. If multiple graph formats are specified at the same geographic layer, then they are displayed on top of each other.

About the Application of Formats

There are various guidelines which are applied to formats.

- The Color Fill, Bubble, Pie Graph, and Bar Graph formats apply to geographic areas such as polygons.
- The Bubble, Variable Shape, Image, and Custom Point formats are based on a single latitude and longitude location (a point).
- The line format is displayed only when a line geometry is present. Line formats are the only format that you can create for line geometries.
- When you define formats, you can specify that different formats apply to different measure columns in a layer.

About Layers in Map Views

A layer is any collection of features and formats that have a common set of attributes and a location.

For example, a layer that shows US states can include color coding of states by sales, and a pie graph that shows sales per brand for that state. In addition to the US states layer, you can use a layer that displays stores within a state as individual points, with popup notes that show sales for each store.

Layers are displayed on a background or template map. When you zoom in and out on the map, various layers are hidden or displayed. Some layers must be enabled for data, so you can display it in the map. Other layers, such as one that shows roads, aren’t related to data.

Layers can be either predefined or custom. A predefined layer is one whose geometry is defined in a spatial table in an Oracle Database. The administrator makes predefined layers available, as described in Configuring How Data Is Displayed on Maps. A custom point layer is one that you define while editing a map view.

Layers can be of different types. A polygon layer represents regions, such as states. An example is a New England layer for the United States that consists of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

A point layer represents specific points on a map, based on a coordinate system. For example, a point layer might identify the locations of warehouses on a map. The layer can use a different image for the type of inventory (electronics, housewares, garden supplies) in a set of warehouses to differentiate them from each other.

You can create a custom point layer that applies points to a map using longitude and latitude coordinates. For example, suppose that your company is headquartered in New York City. You can create a custom point layer that displays your company icon over New York City, and that icon is always displayed whenever a map that includes New York City is shown. The custom point layer is always on top of the other layers and isn’t affected by zoom levels. The custom point layer is used only by the current map view in the current analysis; it isn’t used by other map views, even for the same analysis.

You can select layers to be visible or hidden on a map, but you can’t modify predefined layers. You also create formats to apply to the layers, such as colored regions, bubbles, points, lines, or bar or pie graphs. Not all formats are available for all layer types. For example, point layers can’t have color fill formats.

Edit Formats and Layers in Map Views

You can edit the formats that are displayed on layers of a map view.

1. Open the map view for editing.
2. Click **Edit View** to display the Map editor.
3. Click **New**, select a format type, then select a layer to display the appropriate dialog for defining that format.
4. If no layers are specified in the map formats area, then click **New Map Format**. The map prompts you to import the geo-encoded columns for displaying a format for a particular geo-layer, if the columns aren’t part of the analysis.
5. Hover over a layer name in the list to display options for modifying the layer.
6. Hover over a format name under a layer name in the list to display options for reordering, editing, and deleting formats.
7. Click the box beside a format name to make the format visible or invisible on the map.
8. Click **Done**.

Apply Formats to Layers in Map Views

You can format a map view, including with colors, bar graphs, pie graphs, variably sized bubbles, images, lines, or colored shapes that help you to apply binning and other formatting options.

- Click the **Create a new map format** link, if no layers are specified in the Map Formats list.

- Click the **Add new map formats** button, either in the Map Formats title bar or beside a layer name.

Move Around in Map Views

This topic describes various techniques for moving around in map views.

Topics:

- Pan in Map Views
- Zoom in Map Views
- Modify Thresholds for Formats on a Map View
- Show or Hide Formats on a Map View

Pan in Map Views

You pan using the map's toolbar and can pan on the main map or on the overview map. You can also use the reticule in the overview map to move around.

Pan is the default mode for the map view, and the pan mode is indicated by a hand cursor. With the Pan tool selected, you can move in various ways:

- Click and drag on the map background.
- Hover over a region of the map to display an information window for that region for the data that is directly below the cursor.
- Click to display an information window. The information window can be used to drill or update a detail view.
- Double-click the map to zoom.

To pan in a map view, using the Pan tool, click the **Pan** button on the toolbar, then click the map background and drag and drop it to the appropriate location.

Zoom in Map Views

Zooming the map adjusts the detail of the geographic data that is shown on the map.

Zooming in from a country level might show state and city details. Zooming out from a street-level view might show cities but not street-level information. For master-detail linking, the map view focuses on the detail feature that was selected in the master view.

You can zoom in various ways:

- Click on the map background. To zoom by clicking, you must first select the zoom mode from the toolbar. The default mode is pan, which is indicated by a hand cursor. When you’re in zoom mode, the mouse pointer changes to a magnifying glass and you can click-zoom directly on the map itself.

  When you’re zooming in, you can either single-click or click and drag to use marquee zoom. You can draw a box that delineates the area in which you want to zoom.
- Hover over a region of the map to display an information window for that region for the data that is directly below the cursor.

- Click to zoom in and out. When you click, the map zooms in one "increment" using the click location as the center point.

Zooming and drilling aren’t synonymous. When you zoom, no drill is performed (that is, no new query is issued). However, if you drill on a map layer, that drill likely results in a new zoom level being displayed, if a new layer is added to the map. If a new layer isn’t added, then the zoom level doesn’t change.

You can zoom using either the buttons on the toolbar or the zoom slider. When you use the zoom slider, you zoom in or out of the map as it’s currently displayed. When you hover over the zoom slider, the names of the map layers are displayed beside their mid-range zoom level. Click the names to zoom the map to that level. When you zoom, a new query isn’t issued.

You can zoom in map views with toolbar buttons, or you can use the slider:

- To zoom using the tools, click the **Zoom In** or **Zoom Out** button on the toolbar, then click the map background to zoom in that spot.

  If you’re zooming in, then you can click and drag to draw a rectangle to specify the area in which to zoom.
- To zoom using the buttons on the slider, click the plus or minus sign on either end of the slider.

  You can also hover over the slider, then click the name of the level to zoom.

Modify Thresholds for Formats on a Map View

You can modify the thresholds that are used for displaying formats on the map view.

You know that you have this ability if you see a slider under a format name in the Map Formats pane. Modifying thresholds is sometimes referred to as "what-if analysis." Format ranges are displayed as color fills on the slider background, with a "thumb" for each threshold that you can edit.

- Hover over a thumb to display the value under that thumb.
- Drag the thumb to adjust the threshold.
- Click a section on the slider to move the thumb to that section.
- Right-click the slider to display a menu with various options.
  - **Edit Color** — Displays a dialog, in which you select a predefined or custom color for the threshold.
  - **Add Threshold** — Adds another threshold to the slider, including a thumb to indicate the threshold. This addition creates a new formatting bin with a new color. For example, if three bins exist (with colors red, yellow, and green) and you create a threshold, then four bins now exist. A maximum of 12 bins is allowed.
  - **Remove Threshold** — Removes the threshold above where you right-clicked, including removing the thumb from the slider and a formatting bin.
- Click on a slider thumb number value to display a text box in which you can edit the number that corresponds to the threshold value. Press Enter or click outside the box to update the threshold value and the thumb position.

Show or Hide Formats on a Map View

Content designers can superimpose multiple layers of information (sometimes known as themes) on a single map view. They can create formats to enhance the layers. You can display or hide the formats for a map.

- In the Map Formats pane, from the View menu, select either **View All Formats** or **View Visible Formats**.
- In the Map Formats pane, deselect the box beside a format's name.

Set the Initial View Ports for Map Views

You can set the initial view port (the initial center of the map and zoom level) when a map view is first loaded or refreshed in a browser.

1. Open the map view:
    a. Open the analysis for editing.
    b. Click the Results tab of the analysis editor.
    c. Click **View Properties**.
2. In the Initial Map View section of the Interaction tab, select the appropriate value:

Field	Description
Dynamic	Specifies that the map is zoomed or panned to the actual data on the map. This option focuses on the content that the user has added to the map view. This option is preferable for the initial displaying of the map view and for refreshing the map view, because it tries to display all BI content. This setting doesn’t affect the printing of maps, because the coordinates and zoom level control all WYSIWYG interaction. The map is zoomed to the maximum zoom-level that still allows the content to fit on the map. This zoom-level might exceed the minimum and maximum visible zoom-levels that are specified for this layer in the Edit Background Map dialog. If the minimum and maximum visible zoom-levels are exceeded, then the format is hidden.
Last Saved	Specifies that the map is displayed at the last saved map center and zoom level. This option focuses on the last map window that was viewed. The display is based on the X (longitude) and (Y) latitude center coordinates and on the zoom level. While you can select this option for the initial view port, this option is preferable and is always used for printing maps and other WYSIWYG interactions.

3. Click **OK**.

Edit Narrative Views

A narrative view displays data results as one or more paragraphs of text. You use a narrative view to provide information such as context, explanatory text, or extended descriptions along with column values.

You can perform various tasks in the narrative view editor:

- Type a sentence with placeholders for each column in the results.
- Specify how rows are separated.
- Apply cosmetic formatting to the fonts used in the narrative view, or import the font formatting from a previously saved view.
- Add references to variables.

1. Open the analysis for editing.
2. Click the Results tab.
3. Click **Edit View** to display the narrative view editor.
4. If you have administrator privileges and want to format content in the narrative view with valid HTML markup, including JavaScript, select **Contains HTML Markup**.
5. In the **Prefix** field, enter the header for the narrative.

   This text is displayed at the beginning of the narrative.
6. In the **Narrative** box, enter the narrative text that is displayed for each row in the results.

   You can include both text and column values. Include a line break code at the end of this field to force each line of text and values onto its own line.

   To include column values, use an at sign (@), optionally followed by a number. Use an at sign by itself to indicate the first column. If you include multiple at signs, then the first occurrence of the sign corresponds to the first column, the second occurrence corresponds to the second column, and so on.

   Use @*n* to include the results from the designated column in the narrative. For example, @1 inserts the results from the first column in the analysis, and @3 inserts the results of the third column.

   For example, for an analysis that returns the region name in the second column, specify `@2` to include the following values in the view: East Region and West Region.
7. In the **Row separator** field, enter a row separator for each line from the Narrative field that contains values. For example you might enter a string of plus signs (+) between each line.
8. In the **Rows to display** field, enter the number of rows from the column to return.

   For example, enter 5 to display values from the first 5 rows of the column. For a hierarchical column, you can use selection steps to display hierarchy levels with the hierarchical column. For example, create a step to select members based on hierarchy and add members of the specified level. A hierarchy level is considered a row.
9. In the **Postfix** field, enter the footer for the narrative. Ensure that the narrative ends in a line break, or that the footer begins with a line break.
10. Click **Done**

Edit Non-Data Views

You often edit views that display data, such as tables, graphs, and gauges. You can also edit views that don’t contain data.

You can include the following types of views in analyses and dashboards:

- Column Selector
- Filter
- Selection Step
- Static Text
- Title
- View Selector

About Column Selector Views

A column selector view is a set of drop-down lists that contain pre-selected columns. Users can dynamically select columns and change the data that is displayed in the views of the analysis.

One drop-down list can be attached to each column in the analysis, and multiple columns can be attached to each drop-down list. Updates that you make in the column selector view affect all the data views in the analysis.

You add columns to drop-down lists from the Subject Areas pane. When you add columns in this way, they aren’t added to the Criteria tab for the analysis. Instead, when you display the Criteria tab, you see that the column is now referred to as a "Column Group" with the default column for the list specified also. The default column is the one on which you created the drop-down list.

About View Selector Views

A view selector view enables users to select a specific view of the results from among the saved views for an analysis. When placed on a dashboard, the view selector is displayed as a list from which users can choose the view that they want to display below the selector.

Generally, you include views in the view selector that aren’t being displayed in the Compound Layout view. For example, you might create a table, graph, gauge, and view selector view for an analysis, but include only the table and view selector view on the Compound Layout view. When the analysis is displayed on a dashboard page, users can select the graph or gauge view from the view selector view.

About Filters Views

A filters view displays the filters in effect for an analysis.

Filters, like selection steps, allow you to constrain an analysis to obtain results that answer a particular question. Filters are applied before the query is aggregated. See Creating Filters for Columns.

About Selection Steps Views

A selection steps view displays the selection steps in effect for the analysis. Selection steps, like filters, enable you to obtain results that answer particular questions. Selection steps are applied after the query is aggregated.

You cannot modify selection steps from this view editor. To modify the selection steps, exit the Selection Steps editor and use the Selection Steps pane. See Refining Selections of Data.

About Static Text Views

A static text view adds static text to be displayed with the analysis results.

You can include variables in a static text view, as shown in the following example. See Advanced Techniques: Referencing Stored Values in Variables.

```
[u] Static Text View [/u][br/]
Region: @{variables.myFavoriteRegion} - Year:
@{variables.myFavoriteYear}[br/]
System Time: @{system.currentTime}[dddd,MMMM dd,yyyy][br/]
Product Version: @{system.productVersion}[br/]
[br/]
```

About Title Views

A title view displays a title, a subtitle, a logo, and timestamps to the results.

If you don’t specify a title, then the name of the saved analysis is used as the title. For unsaved analyses, the **Title** text box is blank. You can reference variables in the text fields of the Title editor.

Graph Data in Analyses

This topic identifies additional information for graphing data in analyses.

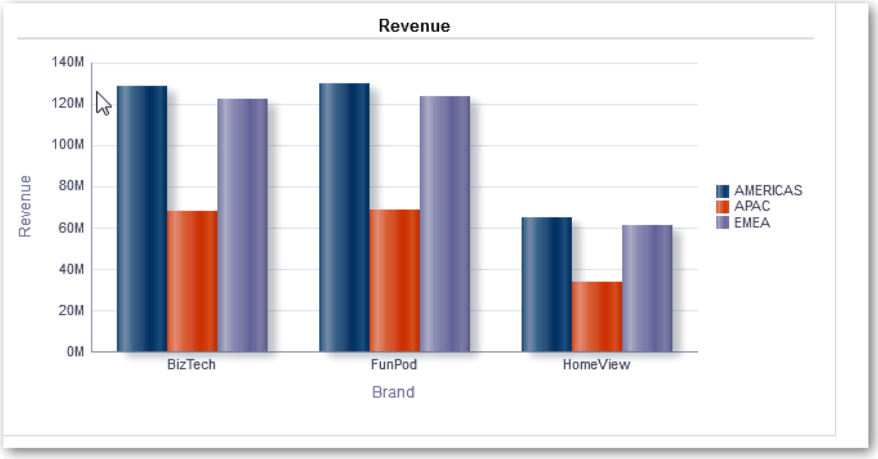
Topics:

- Edit Graph Views
- Zoom and Scroll in Graphs
- Format the Visual Appearance of Graphs
- Limit Data Displayed in Graphs and Gauges

Edit Graph Views

You can use graphs of various types for analyzing and displaying data.

For example, in the Brand Revenue analysis, you can edit a bar graph to compare the product revenue for three different regions, as shown below.



1. Open the analysis for editing.
2. Click the Results tab.
3. Click **View Properties** on the graph view you want to edit.
4. In the Graph Properties dialog, edit properties as needed.
5. On the Scale tab of the properties dialog, select **Click to edit Scale Markers** to display the Scale Markers dialog.

   Scale markers are accenting lines or shaded background ranges that mark key points, thresholds, ranges, and so on in a graph. Use a Line scale marker to draw a line across the graph at a specified position on the scale. Use Range to add a shaded background area behind the graph.

   You can apply line or range scale markers on one or more axes depending on the type of graph.
6. Click **OK**.
7. Click **Edit View** to display the Graph editor.
8. Use various toolbar buttons to affect the display of the graph.
9. Optional: Define thresholds for a funnel graph.
10. Optional: Drill in data in the view.
11. Click **Done**.

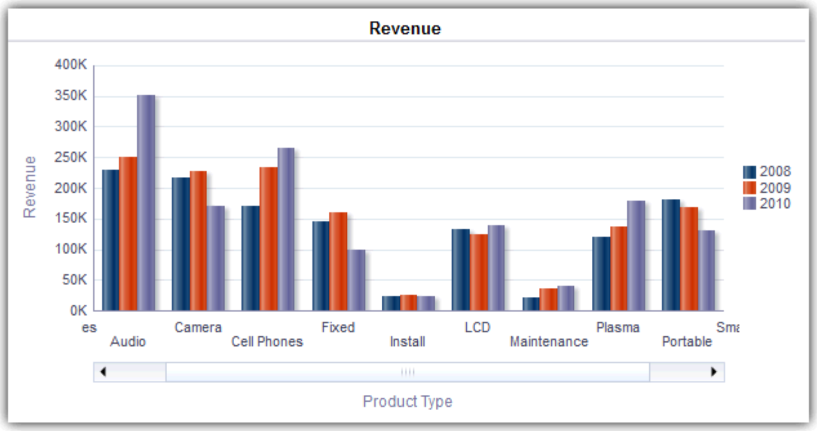
Zoom and Scroll in Graphs

If zooming and scrolling has been enabled for a graph, then the graph includes a Zoom icon. The Zoom icon enables you to zoom in and out of a graph's plot area using its axes.

After you zoom in on an axis, you can scroll the axis. Enable zooming and scrolling with the General tab of the Graph Properties dialog.

For example, while viewing a graph in results of a Brand Revenue analysis, you can zoom in on the Product Type axis. Doing so enables you to scroll the axis and view more data by product type.

To zoom and scroll in a graph, hover the cursor over the graph to reveal the **Zoom** button and click **Zoom**. If only one axis is enabled, select **Zoom In** or **Zoom Out**.



If both axes of the graph are enabled for zooming and scrolling:

- Select **Horizontal Axis**, then either **Zoom In** or **Zoom Out**.

  A zoom and scroll slider is displayed on the X axis.

  To unzoom the X axis, select **Actual Size**.
- Select **Vertical Axis**, then either **Zoom In** or **Zoom Out**.

  A zoom and scroll slider is displayed on the Y axis.

  To unzoom the Y axis, select **Actual Size**.
- To unzoom both the X and Y axes, select **Actual Size**.

Optionally, use other zoom features:

- Use **Zoom** to zoom in and out incrementally.
- Drag the scroll thumb on an axis to dynamically scroll the graph, revealing portions of the graph that are out of view.
- Click the scroll buttons on an axis to scroll left and right (on the X axis), or up and down (on the Y axis).
- Use the resize handles to zoom in and out on an axis.

Format the Visual Appearance of Graphs

You can format the visual appearance of graphs.

Formatting the visual appearance is based on two settings:

- The position of the graph elements (such as lines or bars in a line-bar graph or slices in a pie graph).
- Conditions applied to columns.

Format Graphs Based on Position

Positional formatting enables you to customize the appearance of a graph based on the position of graph elements; that is, the numeric sequence in which graph elements (for example, bars) are displayed in a group.

A group is determined by the attribute columns that are displayed in the Group By drop target area.

You can format the visual appearance of a graph based on position in terms of its color, line width, and line symbols. You can't use positional formatting with waterfall graphs.

Format Graphs Based on Columns

Conditional formatting enables you to customize the appearance of a graph based on conditions applied to columns. The formatting is applied to the column values that meet the condition.

You can specify a color in which to display graph data based upon a specific column value, or range of column values that meet the condition specified for the column. For example:

- Conditionally changing the color of a graph based on specific column values.

  You want to create a bar graph to compare sales between two beverages, Lemonade and Cola. When creating a bar graph, you specify two conditions, one where the bar representing Lemonade sales is yellow and another where the bar representing Cola sales is blue.

- Conditionally changing the color of a graph based on a range of column values.

  A sales manager wants to create a bar graph to compare sales for all representatives across two sales bands. When creating a bar graph the sales manager specifies two conditions, one where the bar is red for all sales representatives with sales less than $250,000, and another where the bar is green for all sales representatives with sales greater than $250,000.

1. Click **Edit Graph Properties** on the toolbar of the graph editor.
2. Click the Style tab of the Graph Properties dialog.
3. Click **Style and Conditional Formatting**.
4. Click the Style Formatting tab to format the appearance of a graph based on the position of the graph elements. To add a custom formatted position:
   a. Select the tab for the graph element (for example, bar) to which you want to add a custom formatted position.
   b. Click **Add new position**. A new position entry is displayed in the Custom Formatted Positions table.
   c. Specify the formatting. For example, to select the color to be applied to the position, click the down arrow next to the **Color** box to access the Color Selector dialog. (Note that the formatting options depend on the element.)

      If you specify 0 for the width of a line, then the legend marker changes from the default line marker to symbol markers for the line and for other lines in the graph. For example, the symbol markers are shown as the legend markers for all the lines in the graph.

5. Click the Conditional Formatting tab to format the appearance of a graph based on a condition that is applied to columns. To add a condition to a column:
    a. Click **Add Condition Format** and select the column to which you want to apply a condition.
    b. Select the operator and enter a column value, or a range of column values for this condition.
    c. Click **OK**.
    d. To select the color to be applied to column values when the condition is met, click the down arrow next to the **Color** box to display the Color Selector dialog.
6. Click **OK**.

Rules to Apply Conditional Formats in Graphs

Follow these rules when building and using conditions in graphs.

- You can create conditions only from columns that are being used by the graph.
- When format conditions conflict with each other, conflicting conditions are prioritized in the following order:
    1. Conditional formatting on attributes.
    2. Conditional formatting on measures
    3. Style formatting based on the positions of graph elements.
- When a user drills on a graph that has conditional formatting applied, the following rules apply:
    - A conditional format based on measures isn't carried to the next level. (It doesn't make sense to carry the conditional format to a different level; for example if, in a geographic hierarchy, from Region to City.)
    - A conditional format based on attributes is carried to the next graph if it hasn't been drilled on.

      For example, if you had the conditional format "Lemonade = Blue" and only drill on years, then "Lemonade = Blue" stays in place.
- Conditional formatting isn't supported on subtotals and totals for waterfall graphs.

Graph Exceptions for Conditional Formatting on Columns

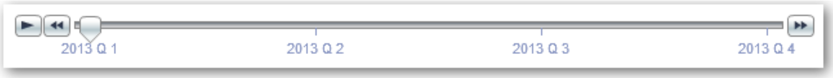
This reference lists the graph exceptions that apply to conditional formatting based on columns.

Graph Type	Exception
Line Line-Bar Radar Time Series Line	Only symbol formatting is allowed for the line.
Pareto	Formatting is applied only to the bars, not to the Pareto line.

Limit Data Displayed in Graphs and Gauges

You can limit the data that is shown in graphs or gauges using section sliders. A section slider displays members of one or more attribute or hierarchical columns as values on a rectangular bar.

The slider also provides mechanisms to select a value for that column such as increase and decrease buttons. The play button sequentially moves through the slider values.



Topics:

- Define Section Sliders in Graphs and Gauges
- Use Section Sliders in Graphs and Gauges

Define Section Sliders in Graphs and Gauges

You can define a section slider to limit the data that is shown in a graph or gauge.

For example, you can limit the data that is shown in a graph to a specific quarter in the year 2013.

1. Open the analysis for editing.
2. Click the Results tab.
3. Create the graph or gauge.
4. Click **Edit View** on the graph or gauge view.
5. In the Layout pane, drag columns to the Sections drop target.
6. Select **Display as Slider**.
7. Click **Section properties**.
8. Specify the maximum number of values to display in the section slider, and then click **OK**.
9. To close the editor, click **Done**.
10. To save the changes, click **Save Analysis**.

Use Section Sliders in Graphs and Gauges

You can use a section slider in a graph or gauge.

- Move the slider thumb to the desired value.
- Click the decrease button to move the slider thumb to the left.
- Click the increase button to move the slider thumb to the right.
- To sequentially move the slider through all the values, click the play button.

The play button changes to a pause button that enables you to stop on a particular value.

The data in the graph or gauge is limited by the current value indicated by the slider thumb.

Save Views

You can save a view that you’re working with at any time.

To save a view, you must save the new or existing analysis. For example, you can create a Brand Revenue analysis, edit its table view, and decide to save it for the first time.

Click **Save Analysis** or **Save As** in the toolbar of the Results tab of the analysis editor.

Rearrange Views

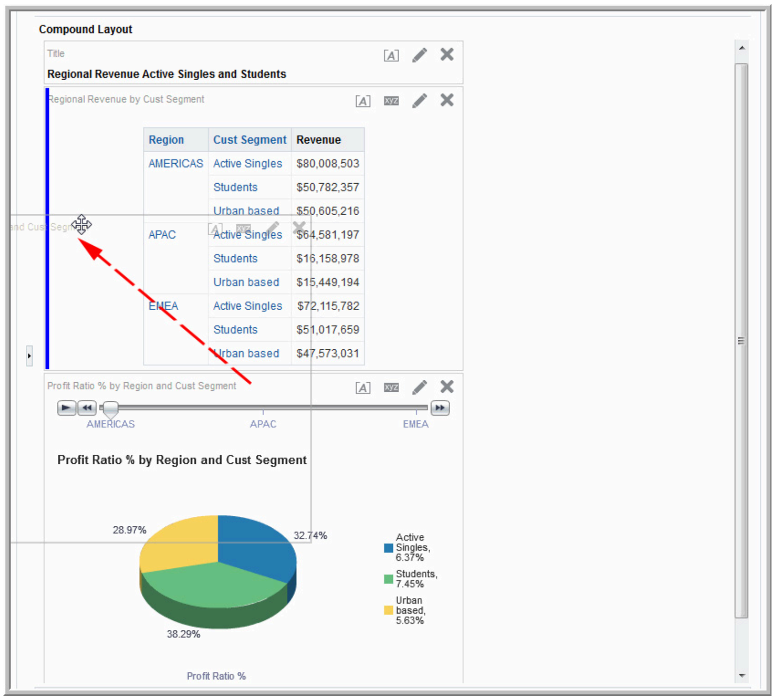
You can rearrange a view within a compound layout to be alongside the boundary of another view or to the outer boundary of the compound layout (where the view is displayed across the length or breadth of the compound layout).

For example, you can rearrange the views in the Brand Revenue analysis. You can arrange the bar graph of Projected Revenue to be displayed before the line graph of Actual Revenue.

1. Place the cursor just inside the top edge of the view that you want to rearrange.
2. Click and hold the left mouse button on the view.

   The view is displayed as a transparent, movable object.
3. Drag and drop the view to the position that you want.

   The view is displayed in a position marked by a blue bar (the drop target).



Compound Layout

Title

Regional Revenue Active Singles and Students

Regional Revenue by Cust Segment

Region	Cust Segment	Revenue
AMERICAS	Active Singles	$80,008,503
	Students	$50,782,357
	Urban based	$50,605,216
APAC	Active Singles	$64,581,197
	Students	$16,158,978
	Urban based	$15,449,194
EMEA	Active Singles	$72,115,782
	Students	$51,017,659
	Urban based	$47,573,031

Profit Ratio % by Region and Cust Segment

Refresh the Results in Views

When you work with views that show results data, such as the table and pivot table, you can refresh the results of the current analysis.

For example, you can add a filter in the Brand Revenue analysis. After doing so, you might want to see the effects of your change.

On the toolbar of the Results tab, click **Refresh the results of the current analysis**.

Print Views

You can print views using HTML or Adobe PDF (Portable Document Format).

For example, you can display and print the Brand Revenue analysis in a new browser window by selecting the **Printable HTML** option.

1. Print one or more views.
    - To print a single view, click **Print this analysis** on the toolbar of the view's editor.
    - To print a group of views that displayed in the Compound Layout, click **Print this analysis** on the toolbar of the Results tab.
2. Select **Printable HTML** or **Printable PDF**.
    - For HTML, a new browser window displays the view or views to print.

      From the File menu of the new browser window, select **Print**.
    - For PDF, an Adobe Acrobat window displays the view or views to print.

      Select the options in the window to save or print the file.

Change Print Options for Views

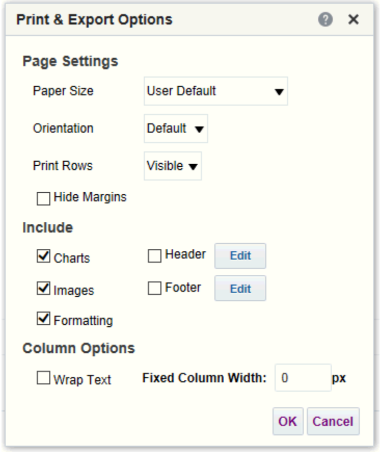
You can specify settings for printing dashboard pages and views.

For example, when printing the Revenue Dashboard that contains many views side-by-side on each page, you can set the Orientation to Landscape.

The print selections that you specify apply to PDF output only. If you then print the PDF file on a local or network printer, then the print selections specified in the browser are in effect. For example, the selection for paper size for the browser is in effect.

1. On the toolbar of the Results tab, click **Print & Export Options**.

   The Print & Export Options dialog is displayed.



Print & Export Options

Page Settings

Paper Size: User Default

Orientation: Default

Print Rows: Visible

☐ Hide Margins

Include

☑ Charts

☑ Images

☑ Formatting

☐ Header

☐ Footer

Column Options

☐ Wrap Text

Fixed Column Width: 0 px

2. Specify the appropriate options on the dialog. For example, specify the paper size and orientation and whether to include a header and footer.
3. Click **OK**.

Preview How Views Are Displayed on Dashboards

You can preview views to see how they are displayed on a dashboard page.

For example, you can select **Show how results will look on a dashboard**. Doing so previews how results from a group of views are displayed in a dashboard.

1. If you want to preview a single view:

   On the toolbar of the view's editor, click **Show how results will look on a dashboard**.
2. If you want to preview a group of views that is displayed in the Compound Layout:

   On the toolbar of the Results tab, click the **Show how results will look on a dashboard**.

   The dashboard preview is displayed in a new window. Prompts are displayed and applied in the preview.

Remove Views

You can remove a view from a compound layout or analysis.

For example, you might find that the trellis view isn’t the best way to show the results of the Brand Revenue analysis. You can remove that trellis view.

- To remove a view from a compound layout, click **Remove View from Compound Layout** on the view's toolbar. Removing a view from a compound layout doesn’t remove it from the analysis.
- To remove a view from an analysis, select the view, then click **Remove View from Analysis** in the Views pane on the Results tab. Removing a view from an analysis removes it from the analysis and any compound layout to which it was added.

Sort Values in Views

You can sort values in table, pivot table, graph, heat matrix, and trellis views. You can sort on members, measures, and rows (where you see sideways triangles). You can't sort on page or section edges.

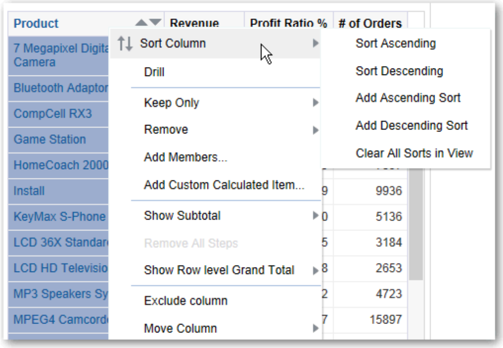
You can use many options to sort in views. For example, when you sort a column, you can select from the following options:

- **Sort Ascending** — Enables you to sort the values in the column by ascending order, as a first-level sort. For example, string values sort alphabetically A through Z, numbers sort lowest to highest, and dates sort earliest to latest.
- **Sort Descending** — Enables you to sort the values in the column by descending order, as a first-level sort.
- **Add Ascending Sort** — Specifies that an ascending sort for this column is added as another sort for the analysis.
- **Add Descending Sort** — Specifies that a descending sort for this column is added as another sort for the analysis.
- **Clear Sort** — Removes the sort specification for the specified column. This option works differently in the Selected Columns pane than in other places. If you make sort specifications in both the Selected Columns pane and in the view itself, then you return to the Selected Columns pane and click **Clear Sort**, only the sort that you specified in the Selected Columns pane is removed. A sort that you specified in the view remains.
- **Clear All Sorts in All Columns** — Removes all sort specifications that you have made. This option works differently in the Selected Columns pane than in other places, as described for **Clear Sort**.

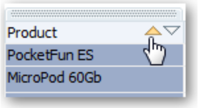
For example, in a table in the Brand Revenue analysis, you can select an ascending sort on the Revenue column. Doing so sorts revenue values from the lowest to highest.

You can sort values in the following ways:

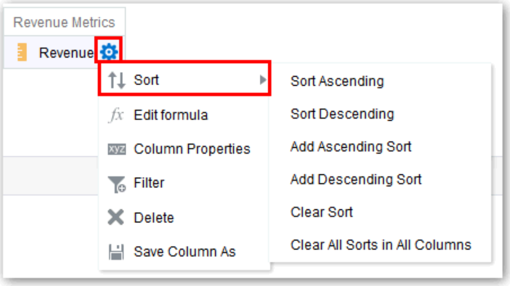
- Right-click in a view heading, click **Sort Column**, and select the appropriate option.



- Click the upwards and downward triangles that are found in column headings.



- Right-click a cell in a view and click **Sort** to display the Sort dialog. The interactions that are available in the Sort dialog depend on the type of data view (for example, graph or table) and the location in which you right-click within the view.
- From the Selected Columns pane of the Criteria tab, click **Options** beside a column, click **Sort**, and select the appropriate option.



Clear Sorts in Views

You can clear sorts that you have applied to columns in a view or analysis.

For example, you can clear all sorts in the Time column of the Brand Revenue analysis.

To clear sorts that you have applied in a pivot table, table, heat matrix, or trellis view, right-click in the view heading and click **Clear All Sorts in View**.

1. Display the Selected Columns pane of the Criteria tab.
2. Click **Options** beside the column.
3. Select **Sort**, then **Clear Sort**.

When you clear sorts from the Criteria tab, you clear only the sorts that were defined from the Column Options menu. You don't clear the sorting done within a specific view.

To remove the primary sort from the column to which it now applies and apply it to the column whose button you just clicked, click a sort button in an unsorted column.

Drill in Results

You can drill in results.

Topics:

- About Drilling
- Drill in Tables and Other Views
- Drill in Graphs
- Drill in Map Views

About Drilling

Many of the results that are displayed in views represent hierarchical data structures. The metadata specifies these hierarchies, and this enables you to access the different levels of detail within them. Drilling is a way to navigate through data in views quickly and easily.

- Drill down to display data in more detail, which displays more members.
- Drill up to display less data.

For example, in the results of the Brand Revenue analysis, you can drill for more data in the graph of Revenue by Product. To do this you can click on the MobilePhones data point. More data is displayed in the graph, such as the MobilePhones revenue per sales office for each of the last three years.

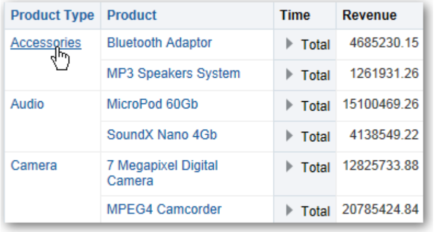
Drill in Tables and Other Views

When you drill down in a table, pivot table, heat matrix, or trellis, the detail level data is added to the current data.

For example, when you drill from a continent, the table displays data for the continent and for the countries in that continent.

1. Hover over a value in a view.

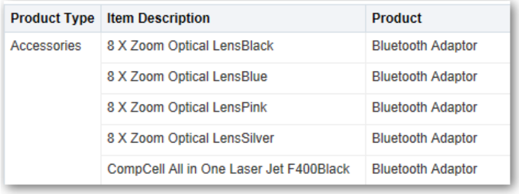
   The value is underlined.



Product Type	Product	Time	Revenue
Accessories	Bluetooth Adaptor	▸ Total	4685230.15
	MP3 Speakers System	▸ Total	1261931.26
Audio	MicroPod 60Gb	▸ Total	15100469.26
	SoundX Nano 4Gb	▸ Total	4138549.22
Camera	7 Megapixel Digital Camera	▸ Total	12825733.88
	MPEG4 Camcorder	▸ Total	20785424.84

2. Click the heading or member in which you want to drill.

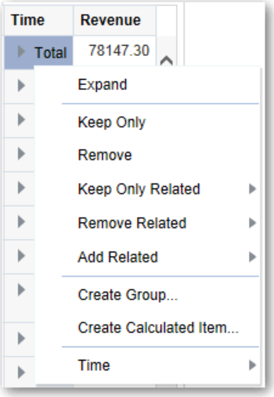
   More detail is added to the table or trellis.



Product Type	Item Description	Product
Accessories	8 X Zoom Optical LensBlack	Bluetooth Adaptor
	8 X Zoom Optical LensBlue	Bluetooth Adaptor
	8 X Zoom Optical LensPink	Bluetooth Adaptor
	8 X Zoom Optical LensSilver	Bluetooth Adaptor
	CompCell All in One Laser Jet F400Black	Bluetooth Adaptor

To drill in a hierarchical column in tables, pivot tables, and trellises, click the **Expand** or **Collapse** icon beside a member.

You can also use the right-click menu to expand and collapse columns.

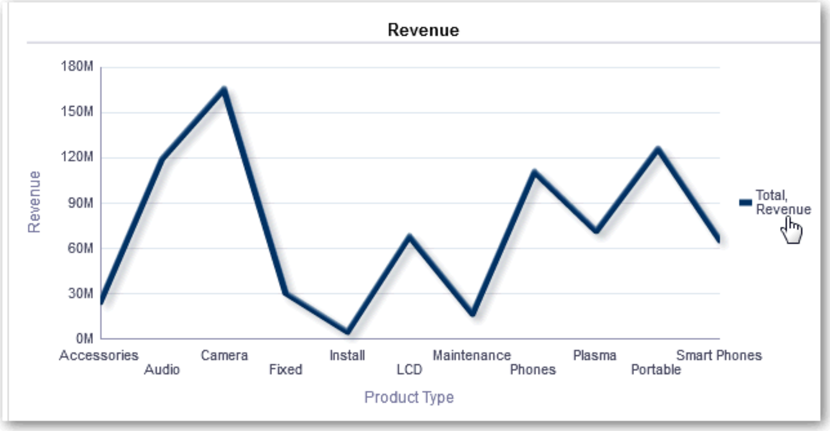


Drill in Graphs

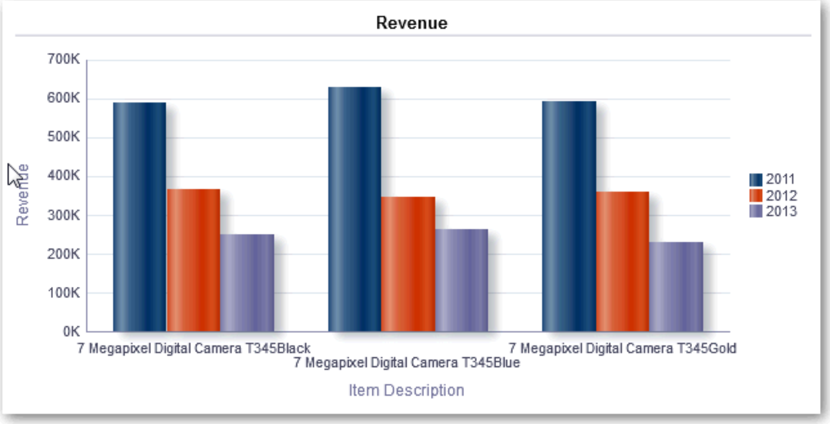
When you drill down in a graph, the detail level data replaces the current data.

For example, when you drill down from a continent, the graph displays data for the countries in that continent, but not for the continent itself.

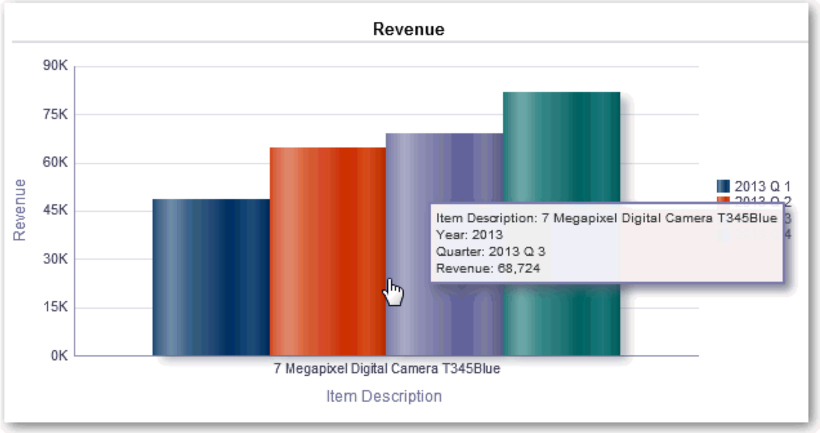
- Click a label on any axis or in the legend.



- Click on a data point.


Revenue
700K
600K
500K
400K
300K
200K
100K
0K
Revenue
7 Megapixel Digital Camera T345Black
7 Megapixel Digital Camera T345Blue
7 Megapixel Digital Camera T345Gold
Item Description
2011
2012
2013

- More detail is shown in the graph.



Drill in Map Views

Drilling in a map enables you to navigate through the data. Drilling is available when the Pan tool is selected, as indicated by a hand cursor. If you hover over map data, then an information window is displayed with various information about that location.

When you click a region or a point on the map:

- If the column is configured as a master for another view, then that view is updated with the latest information.
- If the column or map is configured to drill into a column or to perform a single action, then the drill or action is immediately initiated.
- If the column is configured to perform multiple actions or if multiple drills are possible, then the information window that is displayed contains a list of the actions or links for the multiple columns.

All columns in which you can drill are displayed in the information window as link text. When you click the link for a simple drill, you drill in the data, the map is redrawn with a different layer, and the information window is closed. If action links are defined, then you see a popup window that shows additional links.

Drilling updates map formatting to reflect the newly drilled data. For some drills (such as drilling on a State), the map zooms to the specified region while simultaneously updating the formatting. How you zoom and the formats and geographic levels that the map contains affect what is displayed. Formats have particular "zoom ranges" and are visible at different zoom levels. Zooming back up might display a new format, if you zoom out past the zoom level of the drilled format.

After you have drilled down, use the zoom slider to drill back up. Use the **Return** button on a dashboard page to display the original map view at the zoom or drill level that was in place before you started drilling.

Resize Rows and Columns in Views

You can resize the row and column edges of table, pivot table, and advanced trellis views.

For example, you can resize the Time column in a table of results of the Brand Revenue analysis.

Note that the resizing of rows and columns:

- Isn’t persisted if you resize rows and columns interactively. If you leave a table, then display it again, the interactive resizing is lost. If you set columns widths using properties, those widths are persisted.
- Is ignored if you export the view to PDF.

Topics:

- Configure to Resize in Views
- Resize in Views

Configure to Resize in Views

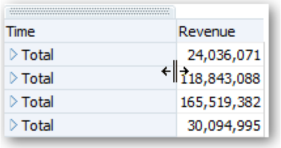
You must configure views to use scrolling as the method for browsing data before resizing can occur.

1. On the view's toolbar, click **View Properties**.
2. Select **Fixed headers with scrolling content** in the properties dialog.
3. Click **OK**. The scroll bar is displayed on the view, and rows and columns can be resized.

Resize in Views

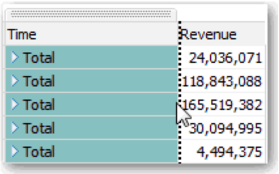
You can resize a row or column edge in a table view, pivot table view, or advanced trellis.

1. Hover the mouse pointer over the border of the column or row edge.



Time	Revenue
Total	24,036,071
Total	118,843,088
Total	165,519,382
Total	30,094,995

2. Click and hold the mouse button down.



Time	Revenue
Total	24,036,071
Total	118,843,088
Total	165,519,382
Total	30,094,995
Total	4,494,375

3. Drag the dotted line to the required size.
4. Release the mouse button.

Suppress Null Values in Views

You can select whether to include null values in an analysis when an entire row or column contains all null values. By default, null measure values are suppressed for all analyses.

For example, you might decide to display null values in the Revenue column of a Sales analysis.

1. Display the Results tab for the analysis that includes the view.
2. Click **View Properties**.
3. Select the appropriate **Include Null Values** options for the view.

   For example, suppose that you want to turn off null suppression for both rows and columns in a pivot table. Select **Include rows with only Null values** and **Include columns with only Null values**.

   This setting displays corresponding dimensions that have data, as well as null values. Note that if the view contains prompts or section edges, then they also inherit the null suppression value from either the row or column edge.

> **Note:**
>
> Turning null suppression off might increase the volume of the data returned and impact performance. Contact your administrator for additional information.
>
> If results for analyses that include null values aren’t as you expect, then contact your administrator. Verify that data in your sources is consistent.

Assemble Views for Display

You use a compound layout to assemble different views for display on a dashboard. The views are displayed in separate containers within a compound layout.

- You can create additional compound layouts to vary presentation of analyses. You can use different compound layouts for different dashboards or for different devices. For example, a Brand Revenue dashboard might have one compound layout that shows a table and a graph, and another that shows a pie chart.
- You can duplicate a compound layout as a shortcut to creating a new compound layout. Views from the original compound layout are preserved. You can add views in addition to views that are already there, and delete views you don’t want. For example, suppose you have a duplicate compound layout for the Brand Revenue analysis. You can keep the table, graph, pie chart, and gauge views, and add a performance tile view.
- You can rename a view so that the name is more meaningful to you. For example, for a Brand Revenue analysis, suppose a western region now consists only of California. You can rename the Western Region compound layout to California.

- You can delete compound layouts that are no longer useful for you. For example, for a Brand Revenue analysis, you might not need views for the Western region. You can delete the compound layout that contains those views.

1. Open the analysis for editing.
2. Click the Results tab, and use the toolbar options to assemble the view:
   - To create a compound layout, click on **Create Compound Layout**.
     A compound layout tab is displayed with only a title view. You can add views as needed.
   - To duplicate a compound layout, click on **Duplicate Compound Layout**.
     A compound layout tab that contains the same views as the selected compound layout is displayed. You can add or delete views as needed.
   - To rename a compound layout, click **Rename Compound Layout**.
     On the Rename dialog, type a new name for the compound layout and click **OK**.
   - To delete a compound layout, click on **Delete Compound Layout**.

Link Views in Master-Detail Relationships

You can link views such that one view drives changes in one or more other views.

For example, you can link two views so that when you click a particular Region in a table, your selection affects a graph. The Region on the section slider or prompt in a graph and the data in the graph changes to reflect the Region that you clicked on the table.

You must define the two types of views to link:

- Master view – Drives data changes in one or more detail views.

  The following types of views can be master views: funnel graph, gauge, graph, heat matrix, map, pivot table, table, and trellis. In a trellis view, only on the outer edges, can be master views, not the inner visualizations.

  A master view can be the same analysis as the detail view or in a different analysis. A master view can update the data in one or more detail views.

  A master view contains a master column, where you set up the interaction that sends master-detail events on a channel. A channel carries master-detail events to the detail view. The master column can’t display on the page edge or section slider. It must be displayed in the body of the view.
- Detail view – Responds to master-detail events such as clicking on a value in a master view table.

  The following types of views can be detail views: funnel graph, gauge, graph, heat matrix, map, pivot table, table, and trellis. In a trellis view, only the outer edge can be detail views, not the inner visualizations.

  A detail view:

  – Can listen for events from multiple master views

  – Can be in the same analysis as the master view or in a different analysis

  – Can’t act as a master view to another view

Topics

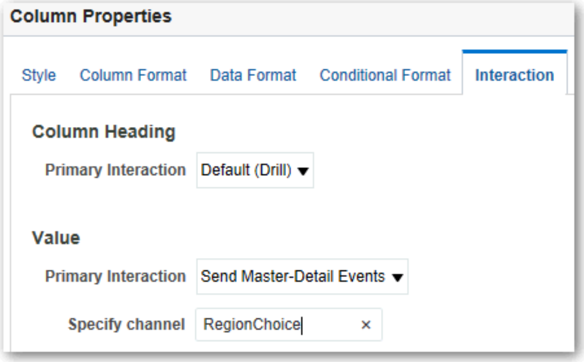
- Define Master Views

- Define Detail Views

Define Master Views

As part of the process of linking views in master-detail relationships, you define the master view that sends changes to the detail views.

1. Open the analysis for editing.
2. For the column that is to be the master column, in the Criteria tab, click the **Options** button and select **Column Properties**.
3. On the Column Properties dialog, click the Interaction tab.
4. In the **Primary Interaction** box in the **Value** area, select **Send Master-Detail Events**.
5. In the **Specify channel** field, enter a name for the channel on which the master view sends master-detail events.



Column Heading

Primary Interaction: Default (Drill)

Value

Primary Interaction: Send Master-Detail Events

Specify channel: RegionChoice

6. Click the Results tab to view the default table or pivot table view.
7. Optional: Create a different view to be the master view.
8. Click **OK**.

Define Detail Views

As part of the process of linking views in master-detail relationships, you define the detail views that receive changes from the master view.

1. Open the analysis for editing.
2. Click the Results tab.
3. Create the view that you want to use as the detail view.
4. Edit the view.
5. Click the **Property** button on the toolbar of the view's editor. The view's property dialog is displayed.
6. Select **Listen to Master-Detail Events** on one of the following dialogs:
   - Gauge Properties dialog: General tab
   - Graph Properties dialog: General tab (for a graph or funnel graph)

- Heat Matrix Properties dialog: General tab
- Map Properties dialog: Interaction tab
- Pivot Table Properties dialog: Style tab
- Table Properties dialog: Style tab

If a map view can’t find the detail feature with the master value, then a warning message, "No data to display for ID: *nnn*" is displayed.

7. In the **Event Channels** field, enter the name of the channel on which the detail view is to listen for master-detail events.

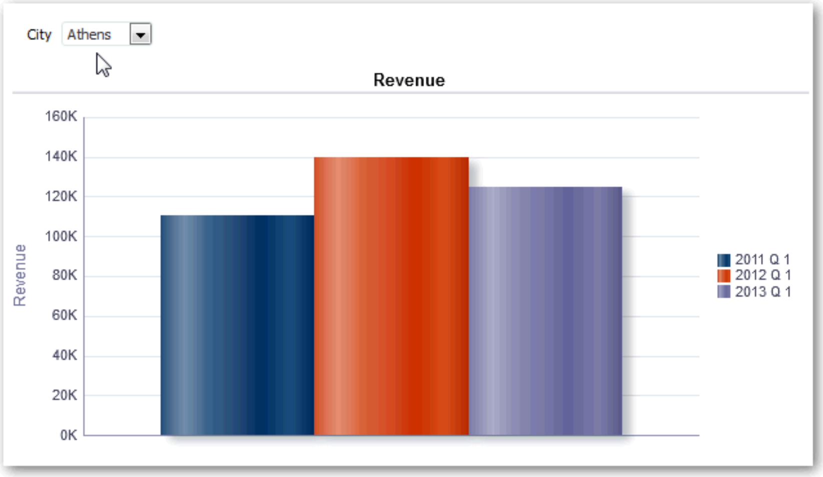
   The channel name is case-sensitive and must match exactly the channel name specified in the master view. Separate channels with commas, for example, channel a, channel b.

8. Click **OK**.

In the following example, a table view of a City Revenue analysis is linked to a bar graph through a master-detail relationship.

In the graph view, the City column is configured as the master view. The City column sends events to the graph view through the specified CityChoice channel.

The graph view has a prompt that enables users to choose a city. Data on the graph is displayed based on the city choice.



The graph is the detail view, with the City prompt listening for events from the table view on the specified CityChoice channel. Suppose the user clicks on a value in the City column in the table view. The prompt in the graph view is set to that city, and the graph is refreshed.

Modify the Layout of Data in Views

Use the Layout pane to modify the way that data is arranged in a view.

Perform tasks such as adding and rearranging columns and adding totals.

Topics:

- Add and Rearrange Columns in Views

- Set Properties for Sections of Data in Views
- Add Totals to Tables and Pivot Tables
- Display Running Sums and Relative Values in Pivot Tables

Add and Rearrange Columns in Views

You can add and rearrange columns in views.

Topics

- Add Columns to Views
- Remove Columns from Views
- Rearrange Columns in Views

Add Columns to Views

This topic explains how to add a column to a view.

- Drag the column from the Subject Areas pane to the appropriate location in the view editor.
- Drag the column from the Subject Areas pane and drop it on a drop target on the Layout pane of the view's editor.

For example, suppose you want to include the Office column in a table of the Brand Revenue analysis. You can drag the Office column from the Subject Areas pane to a drop target after the Product column.

Remove Columns from Views

You can remove columns from views.

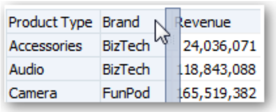
Removing a column from a particular view doesn’t remove it from the underlying analysis or remove it from other views. If you want to remove the column from the analysis and all views, remove it using the Criteria tab.

1. Open the view for editing.
2. In the Columns and Measures section of the Layout pane, click **More Options**.
3. Select **Remove Column**.

Rearrange Columns in Views

You can rearrange columns in views.

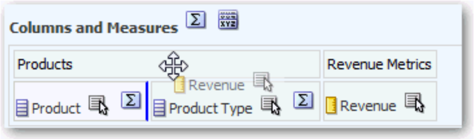
1. Open the view for editing.
2. Drag the column using the column handles and drop the column at a drop target.



Product Type	Brand	Revenue
Accessories	BizTech	24,036,071
Audio	BizTech	118,843,088
Camera	FunPod	165,519,382

To rearrange columns in the Layout pane:

1. Open the view for editing.
2. In the Layout pane, drag and drop the column to the required location.



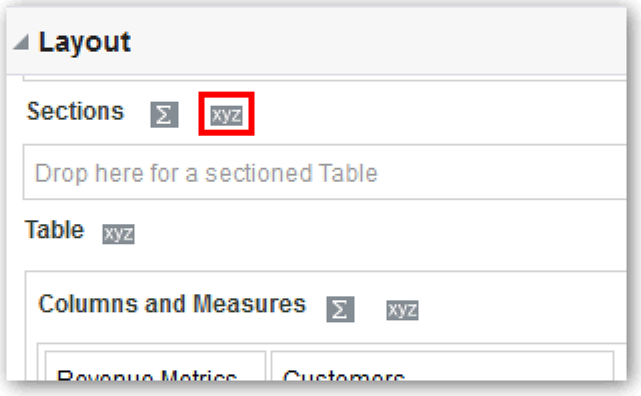
This procedure provides the most basic steps for using the Layout pane to rearrange columns. Many options are available for arranging columns in the Layout pane. See About Drop Targets in the Layout Pane.

Set Properties for Sections of Data in Views

You can specify properties for the view body (such as a pivot table) or drop target (such as a section).

For example, you can set the background color to light green and insert a page break in a long table of revenue values.

1. Open the view for editing.
2. In the view editor, display the Layout pane.
3. Click **Section Properties** next to the view body or drop target.



4. Set the appropriate properties.
   - Use **Insert Page Break** to specify whether to create a page break before the section, so that every time a value changes in the section drop target, the new section for that column is displayed on a new page. Page breaks are visible when you export an analysis to PDF. This is useful for data-driven detail analyses. Choose from:
   - – No Page Break — Don’t break pages.
     – Innermost Column — Break at the innermost column, which inserts a page break between every section.
     – Outermost Column — Break at the outermost column, which inserts a page break when the section label in the outermost column changes.
     When the value of an outermost column changes, the value of the inner column is also considered changed. Therefore, setting page breaks at the outermost column inserts manual page breaks between every section.

    - Folder.Column — For example, Markets.Region, or Products.Brand. Inserts a page break when the section label in the specified column changes. This option is available only when the Sections drop target contains a column.

  - Use **Show Blank Rows** to specify whether to display rows that have no data in the section. Select this option to display all rows, even if a row is an empty text string and contains no value. Deselect the option to hide rows when there are no results to display. This option might be useful for example, to hide empty address lines.
  - Use **Maximum number of section slider values** on graphs to specify the maximum number of values to display on a section slider bar, but not to exceed the system maximum. The administrator configures the system maximum. If you enter a number that exceeds the system maximum, then it's ignored.

5. Click **OK**.

Add Totals to Tables and Pivot Tables

In the Layout pane, you can add totals for columns in tables and pivot tables.

You can position the totals at various locations in the view. You can add totals for columns that are displayed on the various edges. For each measure, the total uses the aggregation rule for that measure.

If you specify a total in the Rows or Columns drop target of a pivot table, then the totals that are displayed are the result of the columns that are specified in the Measures drop target. Total values aren't displayed on the Columns or Rows edges of the pivot table but rather in the data in the center of the pivot table.

1. Display the Layout pane for the view.
2. To add grand totals to the entire table, in the Columns and Measures drop target, click the **Totals** button, then click the location such as **Before**.

   For an entire pivot table, in the Rows or the Columns drop target, click **Totals**, then the location.
3. To turn on and off the totals that apply to all the values in the drop target, click the **Totals** button beside the drop target name, such as Sections.

   Then select the location for the total, such as **Before** the data items. A totals area is added to the view.
4. To specify custom text to insert into a total heading in tables and pivot tables, enter text in the **Caption** box.
   - Use `@` to display the data value. Suppose a total is specified for the Region column, and you enter the following text into the **Caption** box for the total heading: `- All values in the @`. The total heading displays the following text for the Western Region: `- All values in the Western Region`.
   - Use "`@`" to display the @ symbol.
   - Use "`\`" to display double quote. The double quote syntax isn't limited to a single character. In general, you can use a backslash escaped string inside double quotes. For example: ``"1234567890\\abc\\d\"x\"yz!@#$%^&*()-+=_{} []; :'|?/><,.` ~"`` is display as ``1234567890\abc\d"x"yz!@#$%^&*()-+=_{} []; :'|?/><,.` ~``

- Use \ to display the \ symbol.

Display Running Sums and Relative Values in Pivot Tables

You can use the Layout pane to display running sums or the relative value of measure columns in pivot tables.

Topics

- Display Running Sums for Measure Columns in Pivot Tables
- Display Relative Values for Measure Columns in Pivot Tables

Display Running Sums for Measure Columns in Pivot Tables

In a pivot table, you can display numeric measures as running sums, where each consecutive cell for the measure displays the total of all previous cells for that measure. This option is a display feature only that has no effect on actual pivot table results.

Typically, running sums are displayed for duplicated attribute columns or for measure columns for which the option to show data as a percentage of the column has been selected, with the last value being 100 percent. For example, you can display a running sum and percentage, to view progress toward next year's revenue target of $2 million. Running sums apply to all totals. The running sum for each level of detail is computed separately.

Column headings aren't affected when the running sum option is selected. You can format the column heading if you want it to indicate that the running sum option is in effect.

The following usage rules are in effect for running sums:

- A running sum is incompatible with the SQL RSUM function (the effect would be a running sum of the running sum).
- All running sums are reset with each new section. A running sum doesn't reset at a break within a section or continued across sections.
- If a measure doesn't display in a single column or in a single row, then the measure is summed left to right and then top to bottom. (The lower right cell contains the grand total.) A running sum doesn't reset with each row or column.

1. Open the pivot table view in the view editor.
2. In the Layout pane, in the Measures area, click **More Options** for the row or column to be summed.
3. Select **Display as Running Sum**.

Display Relative Values for Measure Columns in Pivot Tables

In a pivot table, you can dynamically convert a stored or calculated measure into a percent or an index.

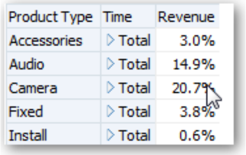
This shows the relative value of the item, compared to the total, without the need to explicitly create a calculated item for it. You can view the measure as a percentage between 0.00 and 100.00, or as an index between 0 and 1.

For example, if you're using a pivot table to examine sales by product, then you can duplicate the sales measure and view it as a percentage of the total. This enables you to see the actual sales, and the percentage of sales, that each product accounts for.

1. Open the pivot table in the view editor.
2. In the Layout pane, click **More Options** for the item that you want to show as a relative value.
3. Optional: To duplicate the measure column, select **Duplicate Layer**.

   The item is displayed in the pivot table, with the same name.
4. Select **Show Data As**.
5. Select **Percent of** or **Index of**.
6. Select the appropriate value such as **Column**, **Row**, or **Section**.

   The column is displayed in the pivot table view.



Product Type	Time	Revenue
Accessories	▷ Total	3.0%
Audio	▷ Total	14.9%
Camera	▷ Total	20.7%
Fixed	▷ Total	3.8%
Install	▷ Total	0.6%

7. To rename the column, click **More Options** then **Format Headings**.

   In the Edit Format dialog, enter a value in the **Caption** field.

About Drop Targets in the Layout Pane

Each editor for a data view contains the Layout pane. The Layout pane is displayed slightly differently for each view type, such as graphs, performance tiles, and pivot tables. The Layout pane shows how the data in a view is laid out.

In the Layout pane, the columns in a data view are displayed in drop targets. Drop targets indicate where you can insert, move, or drop a column. They represent a valid position for a column. Each drop target has properties that you can set. You use drop targets to modify the way data is arranged in a data view by dragging and dropping columns to different targets within the view.

Concepts

- About the Types of Drop Targets
- About the Excluded Drop Target
- About the Guidelines for Drop Targets for Various Views

About the Types of Drop Targets

This concept describes the types of drop targets.

A data view can contain one or more of the following drop targets, depending on the type of view:

Target	Description
<*view-type*> Prompts	Provides an interactive result set that enables you to select the data to view. The values from the columns that are displayed in this drop target are used as the initial criteria. In a view, these values are displayed in a drop-down list for selection, which is often referred to as the "page edge."
Sections	Populates the areas that divide the view into sections. If you select the **Display as Slider** option in this drop target, then the values of the columns that are dropped in the Sections drop target are displayed as a section slider rather than as unique views.
<*view-type*> area	Simulates the plot area or the body of the view itself and assists you in seeing what the view looks like. You can drag and drop columns to and from this area.

In addition to the drop targets explained in the table, the Layout pane shows excluded drop targets. The Layout pane includes other drop targets that are specific to the type of view. For example, the Layout pane for the radar graph includes a Radar Sections drop target that shows the columns values as points on each line along a radius of a circle.

About the Excluded Drop Target

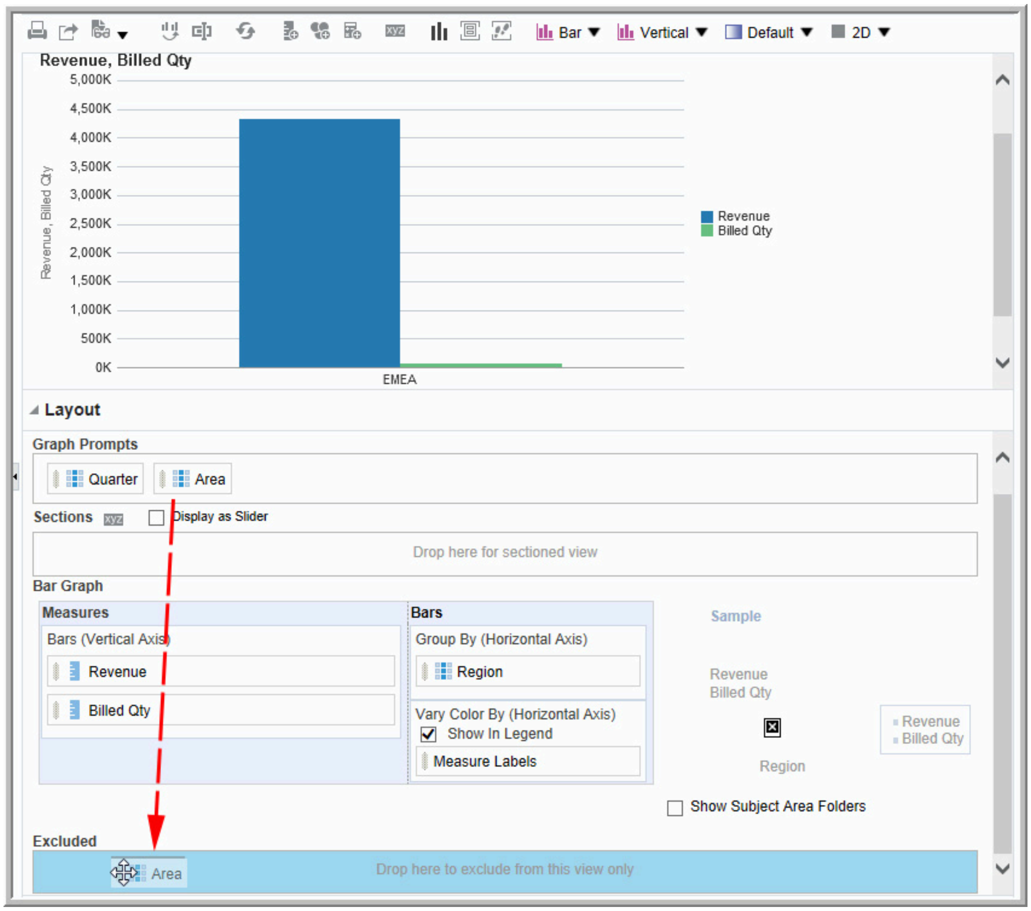
To modify the layout of data, you must understand the Excluded drop target. A column in the Excluded drop target isn’t included in the view results but still remains as part of the analysis.

A general rule is that a column is placed in the Excluded drop target for a view if it isn’t added explicitly to one or all views.

If you want a column that is in the Excluded drop target to be displayed in a view, then you can easily move it. Simply display the Layout pane for the view, and drag and drop the column from the Excluded drop target to the desired one.

Excluding columns differs from removing columns. You can use the **Remove Column** option from the **More Options** button in the Layout pane for a view to remove a column entirely from the analysis.

You place a column in the Excluded drop target after views have been created for the analysis in various ways. For example, you can select **Exclude Column** from the right-click menu of a view. Suppose that you’re editing a view in its editor and you add a column to that view from the Subject Areas pane. The column is placed in the Excluded drop target for all other views in the analysis.



About the Guidelines for Drop Targets for Various Views

As you modify the layout of views, there are guidelines that you need to bear in mind for drop targets in the Layout pane.

- Drop Target Guidelines for Graphs and Funnel Graphs
- Drop Target Guidelines for Heat Matrices
- Drop Target Guidelines for Trellises
- Drop Target Guidelines for Treemaps

Drop Target Guidelines for Graphs and Funnel Graphs

This reference describes the restrictions and guidelines that apply to dragging columns from one drop target and dropping them in another in graphs and funnel graphs.

- A bubble graph requires at least three measures. Plot one measure on the horizontal axis, another measure on the vertical axis, and a third measure on the bubble size axis.
- A pareto graph can have only one measure.

  If you drop another measure on the Measures drop target, then the measures are swapped; that is, the existing measure is replaced by the newly dropped measure and is moved automatically to the Excluded drop target.

- A time series line graph requires a single date or date-time data column to be selected on the horizontal axis. It has a single vertical axis, but supports multiple data series.
- A scatter graph requires at least two measures. For example, you can plot one measure column on the horizontal axis and another measure column on the vertical axis. These measures are plotted for values on the Group By axis.
- A funnel graph uses two measures but only one is required. If you don't select a second measure, then the first measure is used for the second measure. If you have selected two measures and then select a new measure, then the new measure replaces the measure currently in the Actual Measures drop target.
- A stacked bar graph requires at least two measures to allow comparison of values.

Drop Target Guidelines for Heat Matrixes

You use the Layout pane areas to visualize heat matrixes. You can quickly spot anomalies in large quantities of data and study individual values.

The Layout pane for heat matrixes is composed of various drop target areas:

Area	Guidelines
Prompts	Select an attribute or hierarchical column by which to filter the heat matrix. The Prompts area is initially empty. You can drag and drop one or more columns from the Sections, Rows, or Columns area or from the Subject Areas pane to the Prompts area.
Sections	Select an attribute or hierarchical column by which to section the heat matrix. The Sections area is initially empty. You can drag and drop one or more columns from the Prompts, Rows, or Columns area or from the Subject Areas pane to the Sections area.
Rows	Represents a column displayed in row alignment. All attribute and hierarchical columns defined on the Criteria tab are initially displayed in the Rows area in the order in which they were added to the Criteria tab. You can drag one or more attribute or hierarchical columns from the Subject Areas pane to the Rows drop target, or you can double-click one or more attribute or hierarchical columns to include in the Rows drop target. You can also drag and drop one or more attribute or hierarchical column from the Columns, Prompts, or Sections areas. If you add an attribute or hierarchical column to the heat matrix view after displaying the analysis results, then the new column is added as a subordinate column to the Rows drop target.
Columns	Represents a column displayed in column alignment. The Columns drop target is initially empty. You can drag one or more attribute or hierarchical column from the Subject Areas pane to the Columns drop target. You can also drag and drop one or more attribute or hierarchical column from the Rows, Prompts, or Sections areas.
Color By	See the next section for details.

Details of the Color By Area

The Color By area represents the measure value for the grouping and intersection of the row and column.

- The first measure added in the Criteria tab is displayed as the Color By measure.

- You can select a measure from the **Color By** list. This list initially contains all measures added to the analysis in the Criteria tab.
- You can drag and drop a measure column from the Subject Areas pane to the Color By drop target. The current Color By measure is replaced with the new measure, and the heat matrix redraws to reflect the new measure.
  If you add a measure column to the heat matrix view after displaying the analysis results, then the new column replaces the existing column in the view and in the Color By drop target.
- If you remove the Color By measure column in the Criteria tab, then it's removed from the Color By list. The new measure value for the Color By list defaults to the last measure value added to the analysis.
  The Color By drop target is divided into two options:
  - **Style**: Select the style for the heat matrix. Style contains two options: **Percentile Binning** and **Continuous Color Fill**. If you select Percentile Binning as an option, then you can enter the number of bins, choose a color palette, and enter a custom label for the bins. If you select Continuous Color Fill, then the heat matrix tiles are displayed as a gradient color scheme.
  - **Color**: Select the color palette for the heat matrix.

Drop Target Guidelines for Trellises

This reference describes the guidelines that apply to working with drop targets in trellises.

- In advanced trellis views, measures comprise the innermost column headers of the trellis.
- When moving measures from the Color By drop target to or from the Group By drop target:
  - Dragging a single measure moves all the measures along with it. (This is known as sticky behavior.)
  - Dragging a new measure into the view moves all existing measures to wherever you place the new measure.
- To place a measure on the non-measure edge of a visualization, or in the Rows target or Columns target, you must first convert the measure to an attribute column. For information, see Editing the Formula for a Column.
- Attribute columns can be dragged out of the Measures drop target without causing the drop target or the measures inside it to move with the attributes.

Drop Target Guidelines for Treemaps

You use the Layout pane areas to visualize treemaps, which are constrained, hierarchical data. You can quickly spot trends and anomalies in large quantities of data and study individual values.

The Layout pane for treemaps is composed of various drop-target areas:

Area	Guidelines
Prompts	Select an attribute or hierarchical column (excluding ragged and skip-level) by which to filter the treemap.

Area	Guidelines
Sections	Select an attribute or hierarchical column (excluding ragged and skip-level) by which to section the treemap. For example, region that is grouped by year might be the container to display a treemap that is sized by revenue and colored by year-ago revenue.
Group By	Represents the top level of the hierarchical data that is sliced to produce or describe a container of aggregated values. The aggregated values display as tiles. The group area creates a header or group for the measure columns that are specified in the Size By and Color By areas. If more than one column of data is represented in the treemap, then a title bar is displayed for the grouping. For example, region that is grouped by year might be the container to display a treemap that is sized by revenue and colored by year-ago revenue. Region displays in the title bar.
Size By	Represents the distribution of the tiles within their parent. The size of the children is always equal to the size of the parent. Each rectangle's area is the aggregated value for the associated measure based on the applied filters (for example, prompted or filtered by region).
Color By	Represents a distribution of values across all of the tiles at the same level and adds additional scope to the analysis providing a "qualitative" perspective to the treemap.

Visualize Data in an Analysis

You can visualize data in analyses.

From the Home page

1. In the Home page, locate the analysis you want to visualize.
   For example, click the **Projects and Reports** search tag below the Search bar , or click the Search bar and select **Analysis**.
2. Hover over the analysis, click the **Actions menu**, and select **Explore As Project**.
   You'll see the analysis displayed as a visualization. You can visualize the data, make changes, and save it as a visualization project.

From the Classic Home page

1. Navigate to the Classic Home page.
   If you're in the Home page, from the **Page Menu**, click **Open Classic Home**.
2. In the Recent pane or Catalog page, locate the analysis you want to visualize.
3. Click **More**, then **Explore As Project**.
   You'll see the analysis displayed as a visualization in a new browser tab or page. You can visualize the data, make changes, and save the project as a visualization.

14

Build Dashboards

This topic describes how to build dashboards to provide personalized views of corporate and external information.

Video

Topics:

- Typical Workflow to Build Dashboards
- Create Your First Dashboard
- Edit Dashboards
- Add and Delete Pages in Dashboards
- Create and Manage Layouts for Dashboards and Dashboard Pages
- Print Dashboards
- Organize Dashboard Pages in Briefing Books
- Improve the Time to Display Dashboard Pages with Default Selections
- Save and Restore Dashboard State
- Publish Dashboard Pages
- Link to Dashboard Pages

Typical Workflow to Build Dashboards

Here are the common tasks to start building dashboards.

Task	Description	More Information
Create multiple analyses	Build analyses on which you can create views that you display on a dashboard.	Create Your First Analysis
Create a dashboard	Create a dashboard to display data from analysis.	Create Your First Dashboard
Add content to a dashboard page	Add content to dashboard pages to display items such as views and prompts.	Add Content to Dashboard Pages
Add prompts to dashboard pages	Add prompts to dashboard pages to drive the content on the pages.	Add Prompts to Dashboard Pages
Add pages to a dashboard	Optionally add one or more pages to the dashboard to display the data in various ways.	Add Pages to Dashboards
Recall personal settings for dashboards	Create customizations that enable you to view pages in their current state or with your favorite choices already selected.	Save and Restore Dashboard State

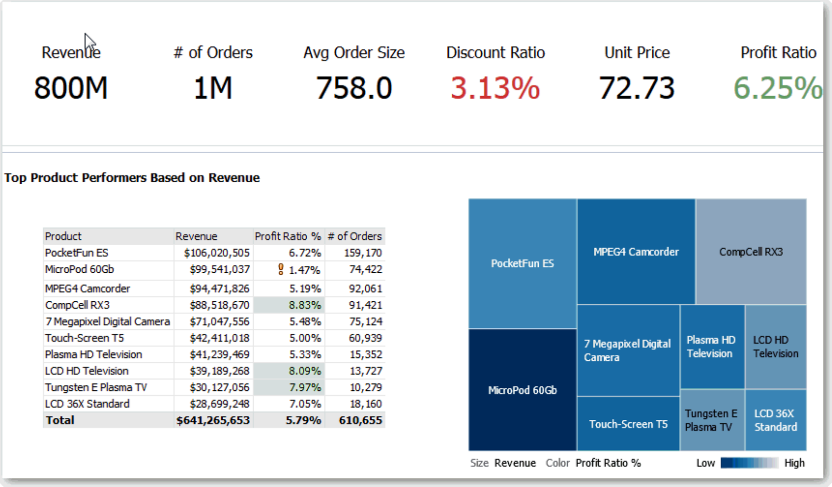
Task	Description	More Information
Run the dashboard	Try out the completed dashboard. Click **Run**.	

Create Your First Dashboard

You can create dashboards to provide personalized views of corporate and external information. A dashboard consists of one or more pages that display results of an analysis.

Video

For example, you can create a Sales Performance dashboard and add content to track your team's revenue. Suppose you create three views for an analysis: performance tile view, a table view, and treemap view. You can create a dashboard that displays these three views. You can include prompts on the dashboard to enable users to specify the values to display in the views.



Revenue	# of Orders	Avg Order Size	Discount Ratio	Unit Price	Profit Ratio
800M	1M	758.0	3.13%	72.73	6.25%

Top Product Performers Based on Revenue

Product	Revenue	Profit Ratio %	# of Orders
PocketFun ES	$106,020,505	6.72%	159,170
MicroPod 60Gb	$99,541,037	! 1.47%	74,422
MPEG4 Camcorder	$94,471,826	5.19%	92,061
CompCell RX3	$88,518,670	8.83%	91,421
7 Megapixel Digital Camera	$71,047,556	5.48%	75,124
Touch-Screen T5	$42,411,018	5.00%	60,939
Plasma HD Television	$41,239,469	5.33%	15,352
LCD HD Television	$39,189,268	8.09%	13,727
Tungsten E Plasma TV	$30,127,056	7.97%	10,279
LCD 36X Standard	$28,699,248	7.05%	18,160
Total	**$641,265,653**	**5.79%**	**610,655**

1. On the Classic Home page, in the **Create** pane, click **Dashboard**.
2. In the New Dashboard dialog, enter a short name and description for the dashboard.
3. Under **Location**, select where to save the dashboard. Where you save a dashboard determines whether the dashboard is private to you or shared with others.
   - To save for your personal use and private to you, save the dashboard in `/MyFolders`.
   - To share with others, save the dashboard in `/Shared Folders`.
     To share a dashboard with others and to not list the dashboard in the **Dashboard** menu in the global header, save the dashboard in any level (such as `/shared/Company/Sales/Eastern`).

To share a dashboard with others and to list the dashboard in the **Dashboard** menu in the global header, save the dashboard in the `/shared/`*first level subfolder*.

If you specify a shared folder in which no dashboards have been saved, then a new Dashboards sub-folder is created automatically in the folder.

For example, if you select a folder named /Shared Folders/Company/Sales in which no dashboards have been saved, a new Dashboards folder is created. The Location entry changes to `/shared/Sales/Dashboards`. (A new Dashboards folder isn’t automatically created if you choose a folder at any other level.)

4. Specify that you want to add content to the new dashboard now.
5. Click **OK**.

The new dashboard, which contains one blank page, is displayed in the Dashboard builder for editing.

Edit Dashboards

You can edit dashboards to which you have appropriate permissions and privileges. You can add or delete dashboard pages, add content such as columns and sections, and edit properties and settings such as print options.

For example, you can add content to a Sales Performance dashboard to track your team's progress by adding a Brand Revenue analysis from the catalog.

1. Open the dashboard.
2. Click **Page Options**, then select **Edit Dashboard**, and make your changes.

Add and Delete Pages in Dashboards

You can add and delete pages in dashboards.

Topics:

- Add Pages to Dashboards
- Add Content to Dashboard Pages
- Understand How Dashboard Pages and Publisher Reports Interact
- Change the Properties of a Dashboard and Its Pages
- Change the Properties of Objects Added to Dashboard Pages
- Delete Objects on Dashboard Pages
- Delete Dashboard Pages

Add Pages to Dashboards

You can add new pages to organize content of a dashboard.

For example, you can first add a new dashboard page that contains regional sales data in a table and in a bar graph. Then, you can add another that contains links to various competitors' web sites.

1. Open the dashboard for editing.

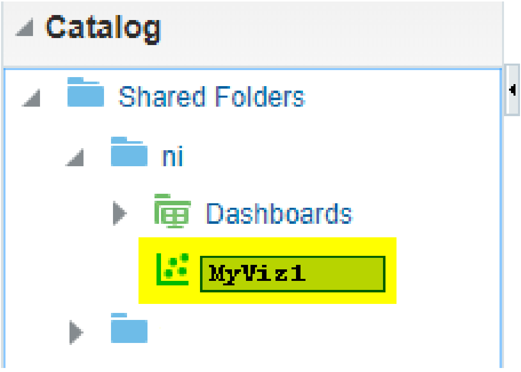
2. On the toolbar of the Dashboard builder, click **Add Dashboard Page**.
3. Follow the on-screen instructions.

Add Content to Dashboard Pages

You can add dashboard objects (any of the objects from the Dashboard objects pane) to dashboard pages. You can also add objects that you have saved in the catalog.

For example, you can add content to the newly created Sales Performance dashboard to track your team's progress. To do so, you can add a Brand Revenue analysis from the catalog.

1. Open the dashboard for editing.
2. Navigate to the page to which you want to add content.
3. In the Dashboard Builder, select the objects to analyze in the Dashboard Objects pane or the Catalog pane and drag and drop them to the Page Layout area.
   - Use **Column** to add a column to align content on a dashboard. You can create as many columns on a dashboard page as you need. You can place columns horizontally or vertically.
   - Use **Section** to add sections within columns to hold the content for the page, such as action links and analyses. You can include as many sections as you need for a column.
   - Use Oracle Analytics Publisher Report to add one or more reports to make them available to other users. You can use a report to add configured analyses to a dashboard page. You can add a report as embedded content for display on the dashboard page or as a link to open the report in Publisher. If you modify in Publisher a report you added to a dashboard page and save your changes, then you must refresh the dashboard page to see those modifications.
   - Use Visualizations to embed visualizations and insights in dashboards to share them with analysts. Drag the project onto the canvas, then choose which canvas or insight to display.



4. Set the properties of each object, as appropriate by clicking **Properties**.
5. Click **Save**.

Understand How Dashboard Pages and Publisher Reports Interact

You can run, view, and interact with a Publisher report on a dashboard page.

When you add a Publisher report to a dashboard page, the report includes a toolbar that provides these options:

- Analyze the data in the report.
- Select the layout template of the report.
- Change the output format of the report.
- Export the report.
- Send the report to an available destination such as a printer, fax, email, or FTP.
- Schedule the report.

When you configure an agent for a dashboard page that contains a Publisher report, be aware of these criteria:

- The output format of the Publisher report must be PDF.
- The agent must be set to deliver content in PDF format.

You can print a dashboard page or a briefing book that contains a Publisher report in certain formats.

If you want to print a dashboard page that contains a Publisher report or to include the page in a briefing book, then you must keep the following points in mind:

- If you print the briefing book as PDF and if the output format of the Publisher report is PDF, then the Publisher report is printed after the other objects on the page. If you print a dashboard page that contains a Publisher report as PDF, but the dashboard page isn’t part of a briefing book, then the Publisher report isn’t printed.
- If you print the dashboard page or briefing book as MHTML, then the Publisher report isn’t printed.

Change the Properties of a Dashboard and Its Pages

You can change the style and description of the dashboard or specify links to include at the dashboard level by setting dashboard properties.

For example, you can specify the options that your team members have when they view the Brand Revenue analysis on a dashboard page. You might give them options to export, refresh, and print the analysis.

1. Open the dashboard for editing.
2. Click **Tools** and select **Dashboard Properties**.
3. In the Dashboard Properties dialog, make the property changes that you want. For example:
   - **Style** shows a list of available dashboard styles, which change dashboard properties such as logo, branding, page color, and link color. Administrators create styles and make them available to dashboard builders and users. If you want to use a style that isn’t listed, ask your administrator to create a new style for you then start a new browser session and try again.
   - Use **Contains HTML Markup** if you have administrator privileges to format content with valid HTML markup, including JavaScript.
4. Click **OK**, and then **Save**.

Change the Properties of Objects Added to Dashboard Pages

You can change the properties of objects that have been added to a dashboard page.

For example, you can change the column properties of the Brand Revenue analysis to specify the heading display in 14-point bold Helvetica font.

1. Open the dashboard for editing.
2. Navigate to the page that contains the object.
3. Hover the mouse pointer over the object in the Page Layout area to display the object's toolbar and click **Properties**.

   Depending on the object type, you’ll either display a menu of editing options or a properties dialog.
4. Make the property changes that you want.

   For example, for a dashboard section, you might select **Rename** to change the default section name, or for a dashboard web link you might change the caption or target URL.
5. Save your changes.

Delete Objects on Dashboard Pages

If you add an object that you later decide that you don’t want, then you can delete it.

For example, you can delete last year's Brand Revenue analysis from the Sales Performance dashboard, to replace it with the current year's analysis.

1. Open the dashboard for editing.
2. Navigate to the page that contains the object to delete.
3. Hover the mouse pointer over the object in the Page Layout area to display the object's toolbar and click **Delete**.

Delete Dashboard Pages

You can delete the current dashboard page, or one or more dashboard pages.

For example, you can delete pages 2 and 3 from the Sales Performance dashboard. Doing so, you retain only the page with the most recent Brand Revenue analysis.

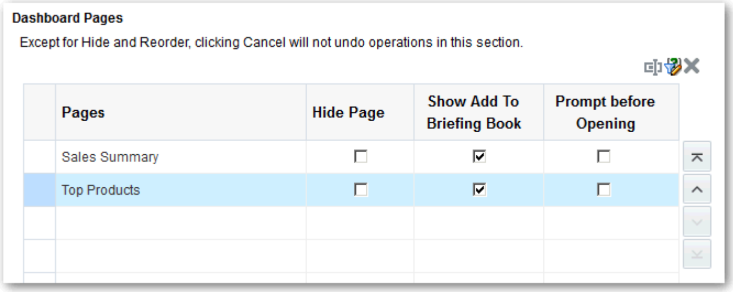
Delete the current dashboard page:

1. Open the dashboard for editing.
2. Navigate to the page to delete.
3. Click **Delete Current Page**.
4. Confirm the deletion.

Delete one or more dashboard pages:

1. Open the dashboard for editing.
2. Click **Tools** and select **Dashboard Properties**.

3. For each page to delete:
    a. In the **Dashboard Pages** area of the dialog, select the page.
    b. On the Dashboard Pages toolbar, click **Delete.**



Dashboard Pages

Except for Hide and Reorder, clicking Cancel will not undo operations in this section.

Pages	Hide Page	Show Add To Briefing Book	Prompt before Opening
Sales Summary	☐	☑	☐
Top Products	☐	☑	☐

    c. Confirm the deletion.

4. Click **OK**.

Create and Manage Layouts for Dashboards and Dashboard Pages

You can specify and manage the layouts of a dashboard for printing or exporting.

- About Custom Print and Export Layouts
- Create Custom Layouts
- Edit, Replace, or Remove Custom Layouts
- Items Not Supported for Custom Print Layouts in Publisher

About Custom Print and Export Layouts

You can create and define custom layouts for printing and exporting an entire dashboard or a single dashboard page.

Custom layouts allow you to:

- Produce high-quality printed dashboard content.
- Export dashboard content customized for Excel.

When you create a custom layout:

- The dashboard page is exported to Publisher, and the following items are auto-generated:
    - A Publisher report with a layout based on the exported dashboard layout.
    - A data model to retrieve data for the dashboard page components.
- The Publisher Report Editor opens in a new browser window with the auto-generated layout displayed as a thumbnail. The report editor allows you to edit, delete, or add a layout.

When you’re creating a print layout, Publisher doesn’t support some of the customizations and views such as hierarchical columns and map views.

After you've saved the custom layouts in Publisher, they're available for that dashboard and appear in the Custom Print & Export Layouts area of the Print & Export Options dialog.

If you delete the data model or the layouts manually from the Oracle BI Presentation Catalog, then the associated Publisher report won't work, and the layouts aren't available. If you delete an analysis, then the data model and layout are available but fail when run.

Create Custom Layouts

You can create one or more custom layouts for printing and exporting an entire dashboard or a single dashboard page.

The administrator can control the display of the Custom Print & Export Layouts component.

1. Open the dashboard or dashboard page that you want to print or export.
2. On the Dashboard page toolbar, click **Tools** and select **Print & Export Options**.
3. In the Custom Print & Export Layouts area, click the gear icon, then select **Create Layouts**.

   The Publisher Report Editor opens in a new browser window with the auto-generated layout displayed as a thumbnail.
4. Make your changes in Publisher, and save the changes.
5. Close Publisher and save the dashboard.
6. To make the custom layouts available to end users, do the following:
   a. Open the Print & Export Options dialog and go to the Custom Print & Export Layouts area.
   b. For each custom layout that you want to make available, select the following:
      - **PDF** - To make the layout available in the Print menu of a dashboard page.
      - **Excel** - To make the layout available in the Export to Excel menu of a dashboard page.
   c. Click **OK** to close the Print & Export Options dialog.
   d. Save the dashboard.

The analysis and dashboard font size is in pixels, but the Excel font size is in points. Therefore, when you export to Excel from an analysis or dashboard, the font size decreases to 75% of the analysis or dashboard font size.

Edit, Replace, or Remove Custom Layouts

You can edit, replace, or remove custom print and export layouts that you've created. For example, you might want to remove a custom print layout if the dashboard page to which the layout is associated has changed.

1. Open the dashboard or dashboard page.
2. On the Dashboard page toolbar, click **Tools** and select **Print & Export Options**.

3. In the Print & Export Options dialog, go to the Custom Print & Export Layouts area and click the gear icon, then select one of the following:
    - **Create and Edit Layouts** - A warning message is displayed indicating that the existing print layouts may not work properly if the dashboard page has been modified. Select one of the following and click **OK**:
        - **Keep existing layouts** - The Publisher Report Editor opens in a new browser window, where you can edit the existing layouts.
        - **Remove existing layouts and create new layouts** - The Publisher Report Editor opens in a new browser window, where you can create new layouts.
    - **Replace Layouts** - A warning message is displayed indicating that all the existing layouts will be replaced. Click **OK** to delete the associated Publisher report and data model, and auto-generate new layouts. The Publisher Report Editor opens in a new browser window, where you can create new layouts.
    - **Remove Layouts** - A warning message is displayed indicating that all the existing layouts will be removed. Click **OK** to remove the layouts and the associated Publisher report and data model.
4. When you’ve finished editing, replacing, or removing layouts, click **OK** to close the Print & Export Options dialog.
5. Save the dashboard.

Items Not Supported for Custom Print Layouts in Publisher

Custom print layouts support a limited set of items.

If Publisher doesn’t support an item, that item is removed from the layout and you see a message that indicates the reason for the unsupported item.

Print Dashboards

You typically view dashboards in electronic form. You can easily print a dashboard if you want to see its pages in PDF or HTML format.

For example, you can print a Stock Control dashboard page so you can refer to it during a visit to a supplier's factory. At this location, no external computing devices are permitted.

1. Open the dashboard.
2. Navigate to the dashboard page to print.
3. Click **Page Options**, then select **Print**.
4. Select **Printable PDF** or **Printable HTML**.
5. Open Adobe Acrobat or a browser window and print from there.

Organize Dashboard Pages in Briefing Books

You can organize dashboard pages in briefing books.

Topics:

- Add Content to New or Existing Briefing Books

- Edit the Content of Briefing Books
- Download Briefing Books
- Add a List of Briefing Books to a Dashboard Page

Add Content to New or Existing Briefing Books

You can add the content of dashboard pages or individual analyses to new or existing briefing books. A briefing book is a collection of static or updatable snapshots of dashboard pages and individual analyses.

For example, you might add the contents of a Regional Revenue analysis to a briefing book each quarter so that you can review quarterly revenue.

1. Open the dashboard for editing.
2. Navigate to the page to add or that contains the analysis to add.
3. To add the results of an individual analysis to a briefing book:
   a. Edit the dashboard, and select **Tools**, then **Page Report Links**.
   b. Select the **Customize** option and click **Add to Briefing Book**.
   c. Click **OK**.
4. To add the contents of the dashboard page to a briefing book:
   a. Click **Page Options** and select **Add To Briefing Book**.
   b. In the Save Briefing Book Content dialog, click **Browse**.
   c. In the Save As dialog, choose where to save content, then click OK.

Edit the Content of Briefing Books

You can edit briefing books to reorder content, delete content, and change the content type, navigation link properties, and content description.

For example, you can edit a briefing book to change the content description to reflect the periods of Brand Revenue analysis data.

1. In the global header, click **Catalog** to display the Catalog page.
2. Navigate to the briefing book to edit and click **Edit**.
3. In the Edit Briefing Book dialog, change the content:
   a. Select the content.
   b. Click **Edit Page** and change the content type, the number of navigation links to follow for updatable content, or the content description.
   c. Click **OK**.
4. Click **OK**.

Download Briefing Books

You can download briefing books.

You can:

- Download briefing books to your computer in MHTML format and then share them for offline viewing.
- Download briefing books in PDF format and print them (you'll need Adobe Reader). The PDF version of a briefing book contains an automatically generated table of contents.

For example, you can download a briefing book that contains all the Brand Revenue analyses for the year. After downloading, you can view the briefing book in Adobe Reader and print it in preparation for a sales presentation.

1. In the global header, click **Catalog** to display the Catalog page.
2. Navigate to the briefing book to download.
3. Perform one of the following actions:
   - To download the briefing book in PDF format, click **PDF** and open or save the file.
   - To download the briefing book in MHTML format, click **Web Archive (.mht)** and open or save the file.
     Downloaded briefing books are saved with an .mht file extension and can be opened in a browser. You can then email or share the briefing book.

Add a List of Briefing Books to a Dashboard Page

You can add a list of briefing books to a dashboard page.

For example, you can add a list of briefing books that contain Brand Revenue analyses to a Sales Performance dashboard page.

1. Open the dashboard for editing.
2. Navigate to the page to which you want to add a list of briefing books.
3. From the Dashboard Objects pane, drag and drop a folder object into a section.
4. Hover the mouse pointer over the folder object in the Page Layout area to display the object's toolbar and click **Properties**.
5. In the Folder Properties dialog, in the **Folder** field, enter the folder that contains the briefing books to list.
6. In the **Expand** box, specify whether to show an expanded view of the folder.
7. Click **OK** and click **Save** to save the dashboard.

Improve the Time to Display Dashboard Pages with Default Selections

You can improve the time that it takes to display dashboard pages.

Under certain circumstances, dashboard pages might take several moments to display in a browser. When the pages are displayed, they might show the values that users had wanted to see in analyses based on the selection of prompts. You can enable users to specify prompt values (rather than using default prompt values) before analyses content is displayed on dashboard pages. This confirmation in displaying content initially improves the wait time for displaying the page with default prompt selections. The content of analyses isn’t displayed on the page until the user responds to prompts. Other objects (such as dashboard prompts, text, and so on) are displayed

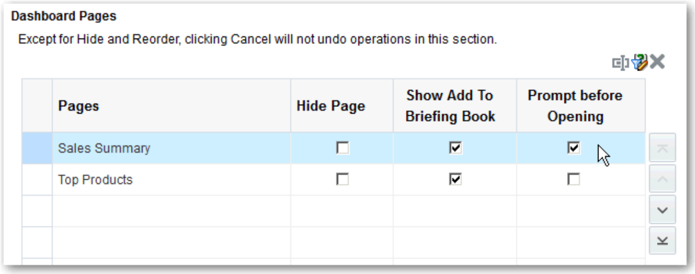
For example, you can prompt for which regions to include before displaying the Brand Revenue analysis on the Sales Performance dashboard page.

When you prompt users for values before displaying analyses, the following occurs:

- A message is displayed at the top of the page, which indicates that the page isn't fully loaded. The message also instructs the user to select prompt values and click **Continue**. Clicking **Continue** displays the content on the page using the prompt values that the user specifies. If the user doesn't specify any prompt values, then the analysis is displayed with default prompt values.
- The page displays static information about the objects that haven't yet been displayed. The information includes the object name, an icon that represents the object view, the view name, and the object description (if available).
- On the Page Options menu (displayed from **Page Options** on the Dashboard page toolbar), all options except **Edit Dashboard** are disabled.
- The **Apply** button on dashboard prompts isn't displayed. Instead any prompt values are applied automatically when the user clicks **Continue**.

1. Open the dashboard for editing.
2. Click **Tools** and select **Dashboard Properties**.

   The Dashboard Properties dialog is displayed.
3. Locate the page in the Dashboard Pages area and select **Prompt before Opening**.



Dashboard Pages

Except for Hide and Reorder, clicking Cancel will not undo operations in this section.

Pages	Hide Page	Show Add To Briefing Book	Prompt before Opening
Sales Summary	☐	☑	☑
Top Products	☐	☑	☐

4. Click **OK**.
5. Click **Save**.

Save and Restore Dashboard State

You can save personalized settings that you make for a dashboard page and later apply these settings to any dashboard.

As you work with dashboard pages, you frequently make the following types of settings:

- Filters
- Prompts
- Column sorts
- Drills in analyses
- Section expansion and collapse

If you save the settings as a customization, you don’t have to make these choices manually each time you access the dashboard page.

Topics:

- Save Customizations of Dashboard Pages
- Apply Saved Customizations
- Edit Saved Customizations
- Clear the Current Customization

Save Customizations of Dashboard Pages

You can save customization for use by you or by others who have author, but not a consumer, role. You can also specify whether the customization is to be the default customization for a dashboard page, for you or for others.

For example, you can save a customization of the Sales Performance dashboard. The customization enables sales managers with permission to see a customized view of the Brand Revenue analysis.

1. Open the dashboard.
2. Navigate to the page on which you want to save a customization.
3. Make your personalized settings.
4. Click **Page Options** and select **Save Current Customization**.
5. Enter a descriptive name for the customization and specify for whom the customization is to be saved.
6. Click **OK**.

Apply Saved Customizations

You can apply customizations that you have saved for your own personal use. You can also apply customizations that have been saved by someone else for your use.

For example, you can apply a shared Sales Team customization that was created for customized viewing of a Brand Revenue analysis by members of the sales team.

1. Open the dashboard.
2. Navigate to the page that contains the customization to apply.
3. Click **Page Options** and select **Apply Saved Customization**.

   Your personal saved customizations are shown, followed by shared saved customizations.
4. Click a saved customization in the list to apply it to the dashboard page.

Edit Saved Customizations

You can rename and delete customizations and change which customization to use as your default.

For example, you can change your default customization to one that you just saved for the Sales Performance dashboard.

1. Open the dashboard.
2. Navigate to the page that contains the customization to edit.
3. Click **Page Options** and select **Edit Saved Customizations**.
4. Rename or delete customizations or change the default customization, as appropriate.
5. Click **OK**.

Clear the Current Customization

You can clear the current customization if you decide that the choices for items such as filters, prompts, column sorts, drills in analyses, and section expansion and collapse aren't what you want.

For example, you can clear a customization that collapses the display of the Brand Revenue analysis.

To clear the current customization, click **Page Options** and select **Clear My Customization**. The current customization is cleared.

Publish Dashboard Pages

You can publish your dashboard pages to a shared dashboard and make them available to other users.

When you publish a dashboard page:

- Contents on the dashboard page are copied to the destination dashboard, and their references are updated.
- References to the shared content are retained.
- Unsaved contents on the dashboard page are published with the saved contents.
- Ensure that other users who might display the published dashboard have the appropriate privileges for the objects on those pages. For example, if a page contains a Publisher report, then users must have privileges to view that report.

1. Open the dashboard for editing and navigate to the page you want to publish.
2. Click **Tools** and select **Publish Page to Dashboard**.

   A message is displayed if you have unsaved contents on the dashboard page. Click **OK** to publish them.
3. In the Publish Page to Dashboard dialog, specify the destination dashboard in the Dashboard field.

   A message is displayed if contents such as a page, analyses, and prompts exist in the destination dashboard. Click **OK** to replace the existing content in the destination dashboard.
4. 5. Click **OK** to publish the page to the destination dashboard.

Link to Dashboard Pages

You can create links to dashboard pages so that you can easily enable other users to display those pages.

For example, you can create a link to the Sales Performance dashboard and send the link to team members in an email.

Topics:

- About Bookmark Links
- Create Links to Dashboard Pages

About Bookmark Links

A bookmark link is a URL that captures the path to a dashboard page and all aspects of the page state.

After you create a bookmark link, you can:

- Save the link as a bookmark so that you can return to the exact same page content at a later time.
- Copy and send the link to other users who then can view the exact same content that you're viewing. They can do this providing they have the same permissions as you and have access to the page.

When you create a bookmark link, the state of a dashboard page is saved in the catalog as a hidden bookmark object. The default number of days to save the object is 30.

Create Links to Dashboard Pages

You can create links to dashboard pages.

1. Open the dashboard.
2. Navigate to the page for which you want to create the link.
3. From the Page Options menu, select **Create Bookmark Link**.

The link is displayed in the Address Bar of the browser. If the link is a bookmark link, then you can save it as a bookmark or copy and send it to other users.

You can drill in an analysis that has been set to replace the dashboard with the new results. You can do the replacement rather than showing the new results directly on the dashboard. In this case, the **Create Bookmark Link** option is displayed as a link below the new results. This option isn't displayed on the Page Options menu.

15

Filter and Select Data for Analyses

This topic describes how to filter and select data for analyses.

Topics:

Typical Workflow to Filter and Select Data

Here are the common tasks to start filtering and selecting data to display in analyses.

Task	Description	More Information
Create an analysis	Select and arrange columns that you want to use in an analysis.	Create Your First Analysis
Create a filter	Limit the results that are displayed when an analysis runs.	Create Filters for Columns
Edit a filter	Change the operator and values in a filter.	Edit Filters for Columns
Save a filter	Save filters in the catalog or with the analysis.	Save Filters
Create a selection step	Select members, new groups, existing groups, new calculated items and conditions for displaying data.	Create Selection Steps
Create a group	Group column values for display in an analysis.	Create Groups and Calculated Items
Create a calculated item	Apply a function to column values to calculate a new value.	Create Groups and Calculated Items

About Filters and Selection Steps

You use both filters and selection steps to limit the results in an analysis. For example, you might list the top ten sales performers, or the most profitable customers. A filter is applied to a column before selection steps are applied.

- Filters are applied directly to columns before the query is aggregated. Filters affect the query and thus the resulting values for measures. For example, suppose that you have a list of members in which the aggregate sums to 100. Over time, more members meet the filter criteria and are filtered in, which increases the aggregate sum to 200.
- Selection steps are applied after the query is aggregated and affect only the members displayed, not the resulting aggregate values. For example, suppose that you have a list of members in which the aggregate sums to 100. If you remove one of the members using a selection step, then the aggregate sum remains at 100.

About Prompted Filters

A prompted filter is a filter whose operator is set to **is prompted**. This operator is valid for a column that contains text, numbers, or dates.

When you select the **is prompted** operator for a filter's column, you flag the column as ready to be filtered by a prompt. When a prompt is used, results include only records where the data in the column that is prompted matches the user's choices.

The **is prompted** operator is required for columns that are included in prompts where no prefiltered values are wanted.

Create Filters for Columns

You can create filters for columns.

Video

Topics:

- Create Inline and Named Filters
- Specify Values for Filters
- Embed an EVALUATE_PREDICATE Function in a Filter
- Combine and Group Filters
- Save Filters

A filter limits the results that are displayed when an analysis is run. Together with the columns that you select for the analysis, filters determine what the results contain. You specify filter criteria to display only the results that you want to show.

Create Inline and Named Filters

In most cases, you create and include a filter "inline" for use in only one analysis. You can also create a named filter to reuse the filter across all analyses and dashboards. Unless you want to reuse the filter, create an inline filter.

For example, as a sales consultant, you can analyze revenue for only those brands for which you're responsible.

Create an inline filter from the Selected Columns pane on the Criteria tab

1. Open the analysis for editing.
2. On the Selected Columns pane of the Criteria tab, click **Options** beside the column name and select **Filter**.

Create an inline filter from the Filters pane on the Criteria tab

1. Open the analysis for editing.
2. On the Filters pane of the Criteria tab, click **Create a filter for the current Subject Area**.
3. Select a column name from the menu.

Create a named filter from the Home page

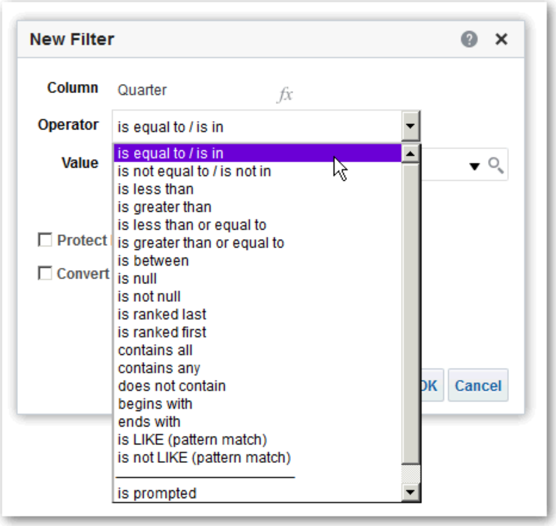
1. From the Classic Home page, in the **Create** pane, click **More** under **Analysis and Interactive Reporting**, then click **Filter**.
2. In the Select Subject Area dialog, select the data source that you want to filter. The New Filters dialog is displayed.

Specify Values for Filters

You can specify the values for a filter that displays in an analysis only those values in which you're interested.

For example, in the Brand Revenue analysis, a filter can limit the analysis results to only the first quarter values in three years. As a result, you can discover how revenue performed year-to-year in these quarters.

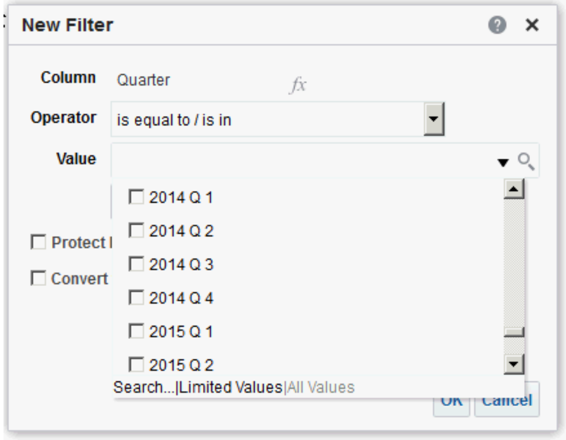
1. In the New Filter dialog, select the appropriate operator such as **is equal to / is in**.



Column: Quarter

Operator: is equal to / is in

2. Select values from the list or click the **Search** icon to find more values from which to select.

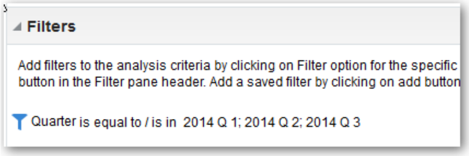


Column: Quarter

Operator: is equal to / is in

3. Optional: Select **Protect Filter** to prevent prompts from overwriting the filter.
4. Optional: Select **Convert this Filter to SQL**.
5. Click **OK**.

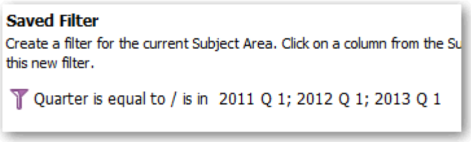
- For inline filters, the filter is displayed in the Filters pane on the Criteria tab.



Add filters to the analysis criteria by clicking on Filter option for the specific button in the Filter pane header. Add a saved filter by clicking on add button

Quarter is equal to / is in 2014 Q 1; 2014 Q 2; 2014 Q 3

- For named filters, the filter is displayed in the Saved Filters pane.



Create a filter for the current Subject Area. Click on a column from the Su this new filter.

Quarter is equal to / is in 2011 Q 1; 2012 Q 1; 2013 Q 1

After specifying values, save the filter as named or inline.

Embed an EVALUATE_PREDICATE Function in a Filter

You can add an EVALUATE_PREDICATE function as an inline filter clause.

You can use this function when you can't create the required inline filter clause with filter operators. Use this function only for SQL functions and for database functions with a return type of Boolean. You can't use this function with hierarchical columns, XML data sources, and all multidimensional data sources. You need the Add EVALUATE_PREDICATE Function privilege granted by an administrator to embed this function in a filter.

1. Open the analysis for editing.
2. On the Filters pane of the Criteria tab, click **More options** and select **Add EVALUATE_PREDICATE Function**.
3. Enter the function's formula in the New EVALUATE_PREDICATE Function dialog.
4. Click **OK** to add the EVALUATE_PREDICATE function in the Filters pane.

For example, you can add the following filter clause using an EVALUATE_PREDICATE function to exclude values with less than six letters in the Products.P4 Brand column.

```
SELECT
0 s_0,
"A - Sample Sales"."Products"."P3 LOB s_1,
"A - Sample Sales"."Products"."P4 Brand" s_2,
"A - Sample Sales"."Base Facts"."1- Revenue" s_3
FROM "A - Sample Sales"
Where EVALUATE_PREDICATE('length(%1)>6',"A - Sample Sales"."Products"."P4
Brand").
ORDER BY 1,2,3
```

Combine and Group Filters

You can combine and group multiple inline filters to create complex filters without using SQL statements.

You group or combine filters to establish the precedence in which data in an analysis is filtered. When you add two or more inline filters to an analysis or named filters, by default, the inline filters are combined using the **AND** Boolean operator. The **AND** operator indicates that the criteria specified in all the inline filters must be met to determine the results when an analysis is run.

You use the **OR** Boolean operator to indicate that the criteria specified in at least one of the filters must be met to determine the results of the analysis. The **OR** operator helps you to create a group of multiple filters using alternate criteria.

1. Open for editing a named filter or an analysis that contains inline filters.
2. On the Filters pane of the Criteria tab, confirm that the analysis contains two or more inline filters. Alternatively, on the Saved Filter pane, confirm that the named filter contains two or more inline filters.
3. On the Saved Filter pane or in the Filters pane of the Criteria tab, notice how the inline filters are combined using **AND** or **OR** operators.

4. Click the word **AND** before an inline filter to change an **AND** operator to an **OR** operator. You can toggle between the **AND** and **OR** operator in this way.
5. Change the **AND** and **OR** operators for other inline filters to create the required filter combinations. Alternatively, create more inline filters and change the **AND** and **OR** operators.
6. Click **Save Analysis** or **Save Filter** to save the filter combinations.

Save Filters

You can save inline filters and named filters.

When you create an inline filter in the Filters pane, you can optionally save the inline filter as a named filter. When you save an inline filter as a named filter, other people on your team can use this filter in a new analysis. You can also create a named filter as a standalone object from the global header.

For example, you can save a filter for the Quarter column in a shared folder in the catalog. As a result, your manager has access to that filter. Suppose that you save the filter that limits quarters to 2011 Q1, 2012 Q1, and 2013 Q1. Your manager can use this filter in a Product Revenue analysis to find how products performed only during these quarters.

To save a named filter, simply click **Save As** on the toolbar, specify folder in the catalog, and click **OK**.

To save an inline filter as a named filter, do the following:

1. On the Filters pane on the Criteria tab, click **More options** and select **Save Filters**.
2. Specify a folder in the Oracle BI Presentation Catalog.
3. Click **OK**.

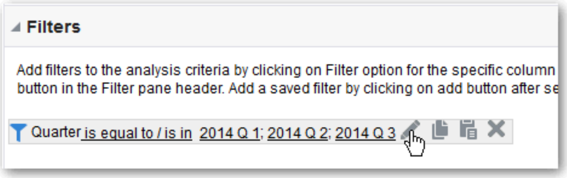
Edit Filters for Columns

You can edit an inline filter when you need to make changes to it. When you edit and save a named filter, the changes that you make to the filter propagate to wherever the filter is used.

For example, you can edit the filter for the Quarter column to include data for the "2010 Q1" quarter. This data is propagated to every analysis where the filter is applied.

1. Display the Edit Filter dialog.

   For example, on the Saved Filter pane or in the Filters pane of the Criteria tab, hover the cursor over the filter, then click **Edit Filter**.

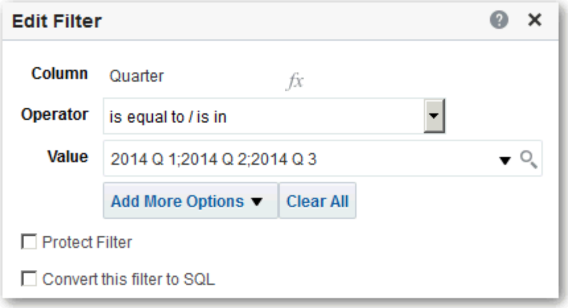


Add filters to the analysis criteria by clicking on Filter option for the specific column
button in the Filter pane header. Add a saved filter by clicking on add button after se

Quarter is equal to / is in 2014 Q 1; 2014 Q 2; 2014 Q 3

2. In the Edit Filter dialog, change the selection for any of the options that are described in the following table:

Option	Description
Operator	Select an operator to apply to the values that are specified in the **Value** field. The **Operator** list is populated based on the function that you're performing (such as creating a filter or creating a dashboard prompt). It's also populated based on the type of column that you selected. For example, you can choose **is greater than** to use only values greater than the value that you select in the **Value** list. If you select 100,000 from the **Value** list, then the filter uses values from the column that are greater than 100,000. You can use this information in an analysis to focus on products that are performing best.
Value	Specify a value or values from the list that contains members of the column that you select. You can also enter the value into the field manually or search. For example, suppose that you want to edit a filter that you have created for the Products column of an analysis. The **Value** field contains a list of products from the column. Depending on the operator that you chose, you can select one or more products to include in the analysis.
Protect Filter	Select this option to prevent prompts from overwriting the filter.
Convert this Filter to SQL	Select this option to convert the filter to a SQL WHERE clause that you can edit manually. After you convert a filter to SQL code, you can no longer view and edit the filter in the Edit Filter dialog.



Edit Filter

Column Quarter

Operator is equal to / is in

Value 2014 Q 1;2014 Q 2;2014 Q 3

☐ Protect Filter

☐ Convert this filter to SQL

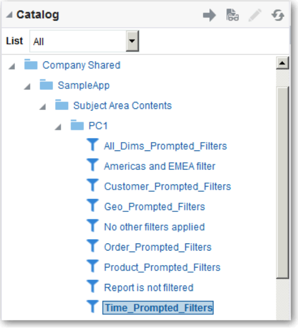
3. Click **OK**.

Reuse Filters

You can reuse a filter that you have saved as a named filter in the catalog. You can apply a saved filter to an existing analysis.

For example, you can apply a filter for the Quarter column to the Brand Revenue analysis.

1. On the Catalog pane on the Criteria tab, select a named filter.

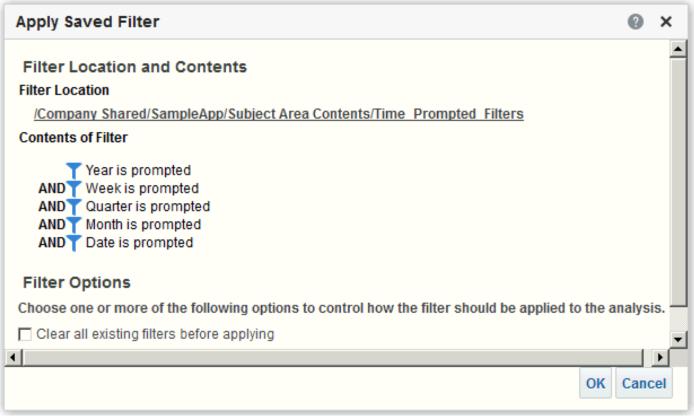


Catalog

List All

- Company Shared
  - SampleApp
    - Subject Area Contents
      - PC1
        - All_Dims_Prompted_Filters
        - Americas and EMEA filter
        - Customer_Prompted_Filters
        - Geo_Prompted_Filters
        - No other filters applied
        - Order_Prompted_Filters
        - Product_Prompted_Filters
        - Report is not filtered
        - Time_Prompted_Filters

2. Click **Add More Options**.



Filter Location and Contents

Filter Location

/Company Shared/SampleApp/Subject Area Contents/Time_Prompted_Filters

Contents of Filter

Year is prompted
AND Week is prompted
AND Quarter is prompted
AND Month is prompted
AND Date is prompted

Filter Options

Choose one or more of the following options to control how the filter should be applied to the analysis.

☐ Clear all existing filters before applying

3. Click **OK**.

Use a Saved Analysis as a Filter

You can create a filter based on the values that are returned by another analysis. You can use any saved analysis that returns a column of values to filter the matching column in an analysis.

For example, you can create a filter that is based on the results of the Brand Revenue analysis.

1. Create or open a named filter or analysis to which you want to apply an inline filter.
2. Find the filter.
   - If you're working with a named filter, then locate the Saved Filter pane. From the Subject Areas pane, select the column for which you want to create a filter.
   - If you're working with an inline filter, then locate the Filters Pane. From the Filters Pane toolbar, click **Create a filter for the current Subject Area**. Select the column for which you want to create the filter.
3. In the **Operator** field of the New Filter dialog, select **is based on the results of another analysis**.
4. In the **Saved Analysis** field, enter the path to the analysis or click **Browse** to locate it.
5. Select a column name from the **Use Values in Column** menu.
6. In the **Relationship** field, select the appropriate relationship between the results and the column to be filtered.
7. Click **OK**.

Advanced Techniques: How Dashboard Prompts and Analysis Prompts Interact

You can combine dashboard prompts and analysis prompts to quickly display precise, meaningful data.

There are various ways that you can combine prompts.

Wiring Method	Description
Auto wiring	Auto wiring assumes that you intended to create a functioning prompt for the column and, therefore, activates and applies the prompt. Auto wiring is applied when you create an analysis and add a column prompt. This method doesn’t require the **is prompted** filter operator. Any unprotected filter can be used. Setting the filter operator to **is prompted** provides a more precise level of control between prompts and filters than the auto wiring method. See the "Filter operator is set to **is prompted**" row in this table.
Constrained prompts	Use this method with several columns in a prompt to constrain the user's prompt choice based on subsequent choices. Constrained prompts can be set up on the Prompt options dialog to specify which prompt narrows the choices. For example, suppose one column filters on region and the next column filters on city. Then, the city column can be constrained to show only cities in the selected region.
Filter operator is set to **is Prompted**.	Use this method to build complex prompts that interact with filters. When you use this method, you have full control over how the dashboard prompts, inline prompts, and filters apply to the embedded analysis. See About Prompted Filters.
Selection Steps Override with Prompts Option	Use this method to use an analysis or dashboard column prompt to provide the data choices for a specific member selection step. Because you can’t use filters with hierarchical columns, selection steps are the only way that you can use prompts with hierarchical columns. Only one selection step per column selection step set can be overridden with a prompt. All selection steps before and after the overridden step are processed as specified. See Refining Selections of Data and Overriding a Selection Step with a Prompt.
Protected versus Unprotected filters	Use this method to determine whether the dashboard prompt can supply the inline prompt's value when the corresponding column's filter value is set to something other than **Is prompted**. The unprotected and protected filter settings can be used when a dashboard prompt and inline prompt reside on the same dashboard. Also, both prompts must have been created for the same column. When the column's filter value is unprotected, the dashboard prompt value determines the analysis' results. Suppose the filter value is set to something other than **Is prompted** (for example, **Is equal to/is in**) and the filter is set to protected filter. Then, the dashboard prompt can’t determine the report results.

Refine Selections of Data

As you specify which data members to include in an analysis, you create selections of data from the data source. Each selection specifies the criteria for a set of members for a particular column, such as Product or Geography.

Each selection consists of one or more steps. A step is an instruction that affects the selection, such as add Product members whose values contain the text "ABC." The order in which steps are performed affects the selection of data. Each step acts incrementally on the results from previous steps, rather than acting on all the members for that column.

Topics:

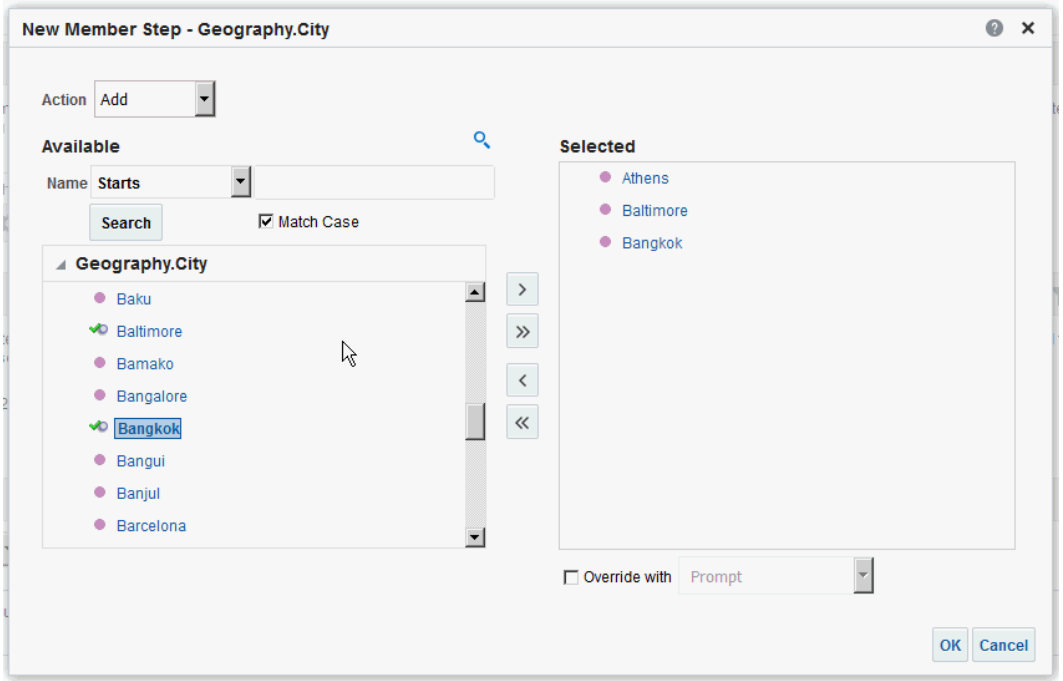
- Create Selection Steps
- Edit Selection Steps
- Save Selection Steps for Reuse
- Advanced Techniques: Create Condition Steps

Create Selection Steps

Selection steps help users display the data they want to analyze. When you add a column to an analysis, an implicit "Start with all members" step is added. The "all" implies all the members of the column after filters are applied.

For example, you can create a selection step to specify criteria for the following members in an Office column: Baltimore, Austin, and Athens.

1. Open the analysis for editing.
2. Select the Criteria tab.
3. Display the Selection Steps pane by clicking **Show Selection Steps Pane** on the toolbar.
4. Click **Then, New Step**, and select the kind of step to create. For example, you can specify a list of selected members for the step.
5. For a member step, select **Add**, **Keep Only**, or **Remove** from the **Action** list.
6. If you’re creating a member step, then move the members to include in the step from the Available area to the Selected area.



7. Specify the appropriate values for the condition such as the action, measure, and operator to use for the values of the column.
8. Click **OK**.

Edit Selection Steps

You can edit a selection step for an analysis or a selection step that has been saved as a group object.

For example, you can edit a member step for the Offices column in the Brand Revenue analysis. You can add then add another city to the list of cities.

1. Open the analysis for editing.
2. Click on the Results tab.
3. On the Selection Steps pane, hover the mouse pointer over the selection step that you want to edit.
4. Click the pencil icon on the toolbar.
5. Perform the appropriate edits. For example, add one or more members from the column to the step.
6. Click **OK**.

Save Selection Steps for Reuse

If you have created a set of selection steps, then you can reuse them if you save them as a group in the catalog.

For example, you can reuse the selection steps for the Offices column as a group object. Doing this enables the set to be used inline with the Brand Revenue analysis.

1. Open the analysis for editing.

2. On the Results tab, display the Selection Steps pane.
3. Click **Save Selection Steps** to the far right of the column name.
4. In the **Save In** field, save it in /My Folders/*subfolder* (for personal use) or /shared/*subfolder* to share it with other users.
5. Enter a name for the saved selection steps.
6. Click **OK**.

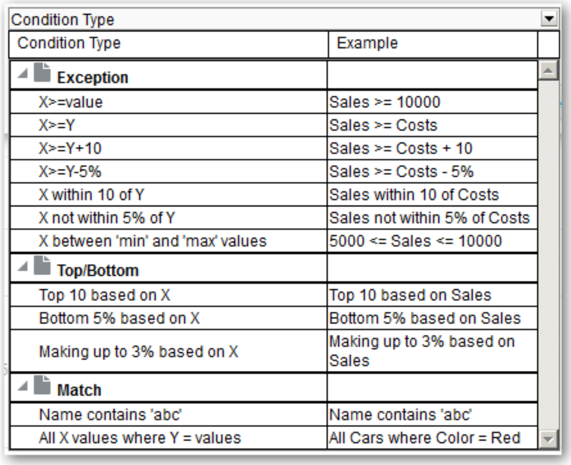
Advanced Techniques: Create Condition Steps

One type of selection step that you can create is a condition step. Most people don't need to perform this task.

You specify that members are selected from a column based on a condition. The condition can be one of various types including based on measures or on top/bottom values. This member list is dynamic and determined at runtime. For example, you can select the top 5% of members based on Brand Revenue.

1. Open the analysis for editing.
2. Select the Criteria tab.
3. Display the Selection Steps pane by clicking **Show Selection Steps Pane** on the toolbar.
4. Click **Then, New Step**, then select **Apply a Condition**.
5. In the New Condition Step dialog, select the type of condition to create, as described in the following table.

Type	Description
Exception	Select members using comparison values for measure columns. A sample condition is "Sales > Cost +10%."
Top/Bottom	Select the specified number of members after ranking the members by the specified measure column. You can specify an exact number of members or a percentage of the total members. Sample conditions are "Top 10 based on Sales" and "Top 5% based on cost.
Match	Select members based on matches with text strings and attribute values. A sample condition is "Name contains abc." This type is available only for columns that have a data type of string.
Time/Ordinal	Select members based on ranges of time and on hierarchical levels. A sample condition is "From July 2012 to December 2012." This type is available only for columns with a data type that relates to time.



Condition Type

Condition Type	Example
Exception	
X>=value	Sales >= 10000
X>=Y	Sales >= Costs
X>=Y+10	Sales >= Costs + 10
X>=Y-5%	Sales >= Costs - 5%
X within 10 of Y	Sales within 10 of Costs
X not within 5% of Y	Sales not within 5% of Costs
X between 'min' and 'max' values	5000 <= Sales <= 10000
Top/Bottom	
Top 10 based on X	Top 10 based on Sales
Bottom 5% based on X	Bottom 5% based on Sales
Making up to 3% based on X	Making up to 3% based on Sales
Match	
Name contains 'abc'	Name contains 'abc'
All X values where Y = values	All Cars where Color = Red

The components in this dialog differ slightly, depending on which type you select.

6. In the **Action** box, select the type of action to create for the members. You can select to add the selected members to the selection, keep only the selected members and remove all others. Or, you can select to remove the selected members from the selection.

7. In the box beside the action type, select the column for whose members you're creating the condition step.

8. Enter the appropriate values for the various fields of the dialog.

   For example, select the **Operator** based on the type of condition. For example, select Within for the Exception type.

9. Use the **Override with** box to specify whether an analysis prompt, a dashboard prompt, or a variable can override the values that you specify in this condition.

   Depending on what you're overriding, you can override certain values with a prompt, a presentation variable, a session variable, or a repository variable.

   If you select a variable type, then enter the name of the variable in the field. For example, suppose that you have a column called EMPLOYEE_ID. You can specify USER as the session variable with which to override the value of that column. When a user signs in, the column value is set to his user name. See Advanced Techniques: Reference Stored Values in Variables.

   In a list of steps, specify that only one step in the list can be overridden by a prompt or presentation variable.

10. In the **For** area, qualify all of the dimensions of the analysis other than the dimension whose members you want to select.

    Do this when creating condition steps of type Exception or Top/Bottom. For each dimension, you select which of its members to include. You can select specific members, or All, which specifies to aggregate the members when creating the condition. For example, suppose that you're qualifying the Region dimension. You can select a specific region, such as East, whose value is used in the New Condition Step dialog condition. If you select All, then the values of all regions are aggregated and used in the condition.

    You can use the **For** area to create a qualified data reference (QDR). A QDR is a qualifier that limits one or more of the dimensions to retrieve a single value for a measure column. A QDR is useful when you want to temporarily reference a measure column value without affecting the current status of the dimensions. The following is an example of a QDR:

```
Add members of Total Products (Rgd Sk Lvl) where "A - Sample
Sales"."Base Facts"."1- Revenue", For: Cust Segments Hier: 'Active
Singles', 'Baby Boomers' is greater than "A - Sample Sales"."Base
Facts"."1- Revenue", For: Cust Segments"
```

When you specify a QDR, you can specify multiple members for limiting the dimensions. When you specify multiple members, the measure column value is aggregated using the default aggregation. For example, suppose that you want to create a condition for displaying those Regions in which Units is greater than 100. Suppose that you create a QDR for the Year dimension that specifies 2010 and 2011 and that the default aggregation is Sum. If the values for 2010 and 2011 for the Central region are 50 and 60 respectively, then both those years are displayed. Their sum exceeds the 100 units that were indicated.

11. Click **OK**.

Manipulate Members with Groups and Calculated Items

You can manipulate members using groups and calculated items.

Topics:

- About Groups and Calculated Items
- Create Groups and Calculated Items
- Edit Groups and Calculated Items
- View Group Contents
- Save Groups and Calculated Items
- Reuse a Group or Calculated Item in an Analysis
- Delete Groups and Calculated Items

About Groups and Calculated Items

You can create a group or calculated item as a way to display data in a table, pivot table, trellis, heat matrix, or graph.

Groups and calculated items enable you to add new "members" to a column, when those members don’t exist in the data source. These members are also known as "custom members."

Use a group to define members of a column, as a list of members or a set of selection steps that generate a list of members. A group is represented as a member.

A calculated item is a computation between members, which is represented as a single member that can’t be drilled. When you create a calculated item, you add a new member in which you have selected how to aggregate the item. You can aggregate using Sum or Average or custom formula.

Create Groups and Calculated Items

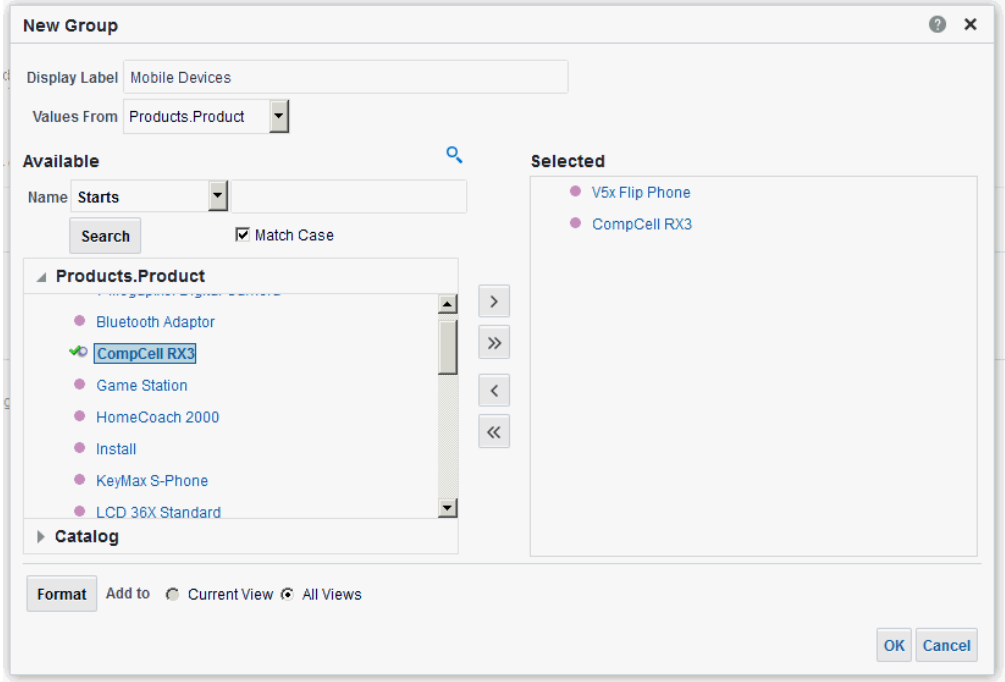
Use a group or calculated item to add new "members" to a column.

For example, you can review how much revenue was generated for mobile devices and compare that number to other product types. You can create a group called Mobile Devices for the Product column that includes Flip Phones and Smart Phones.

Video

1. Open the analysis for editing.
2. On the toolbar of the Results tab, click **New Group** or **New Calculated Item**.

   The New Group or New Calculated Item dialog is displayed.
3. Enter a value for **Display Label** for the group or calculated item when it’s displayed in a view.
4. In the **Values From** list, select the column whose values you want to include in the group or calculated item.
5. If you’re creating a calculated item, select the function for the calculated item.
6. Move the appropriate column values from the Available area to the Selected area.



New Group

Display Label: Mobile Devices

Values From: Products.Product

Name: Starts

☑ Match Case

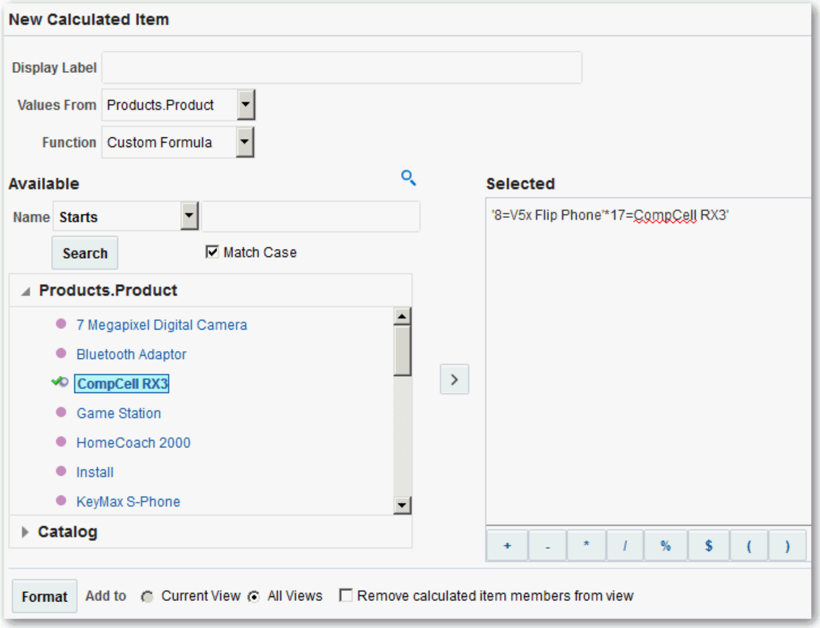
Selected:
- V5x Flip Phone
- CompCell RX3

Add to ○ Current View ● All Views

7. For a calculated item with **Custom Formula** selected as the function, select mathematical operators to include in the function using the toolbar. You can also use these functions: Absolute, Ceiling, Floor, Round, and Sqrt.

   A formula creates a dynamic custom grouping within the view. All measures referenced in a formula must be from the same column and must be present in the results. Formulas can be inserted into, or combined with, other calculated items.

   Instead of specifying a named item for columns, you can specify $n or $-n. Here, *n* is an integer that indicates the item's row position. If you specify $n, then the measure is taken from the *n*th row. If you specify $-n, then the measure is taken from the *n*th to the last row.



New Calculated Item

Display Label

Values From: Products.Product

Function: Custom Formula

Name: Starts

☑ Match Case

Selected: '8=V5x Flip Phone'*17=CompCell RX3'

Add to ○ Current View ● All Views

☐ Remove calculated item members from view

8. Optional: If you’re creating a calculated item, select **Remove calculated item members from view**.

   Use this box to suppress the display of members that you have included in the calculated item in the view.

9. Click **OK**.

   By default, the new group or calculated item is created for all views in the analysis.

Edit Groups and Calculated Items

You can edit groups and calculated items through the Selection Steps pane or from the catalog pane. You can also edit groups and calculated items in a table, pivot table, heat matrix, or trellis.

For example, you can edit a group to include the Game Station and Plasma Television members.

Use one the following methods to edit a group or calculated item:

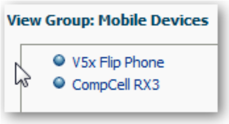
- In the Selection Steps pane, click the link to the group or calculated item, and then click **Edit**.
- In the Catalog pane (if you saved it in the Catalog), select the object, and click **Edit**.
- In a table, pivot table, heat matrix, or trellis (on an outside edge), right-click the group or calculated item and select **Edit Group** or **Edit Calculated Item**.

View Group Contents

You can view the contents of a group to verify that it contains the members that you want.

For example, suppose you created a group of categories in a Product Category column. You can view the group contents to verify that it contains the appropriate categories.

1. Open the analysis for editing.
2. Click on the Results tab.
3. In the table view, right-click on the cell that contains the group.
4. Select **View Group Definition**.



View Group: Mobile Devices

- V5x Flip Phone
- CompCell RX3

5. Click **Close**.

Save Groups and Calculated Items

You can save a group or calculated item as either an inline object (with an analysis) or as a named object (a standalone object).

For example, you can save the Mobile Devices group as a named object in the catalog, for reuse in the Brand Revenue analysis.

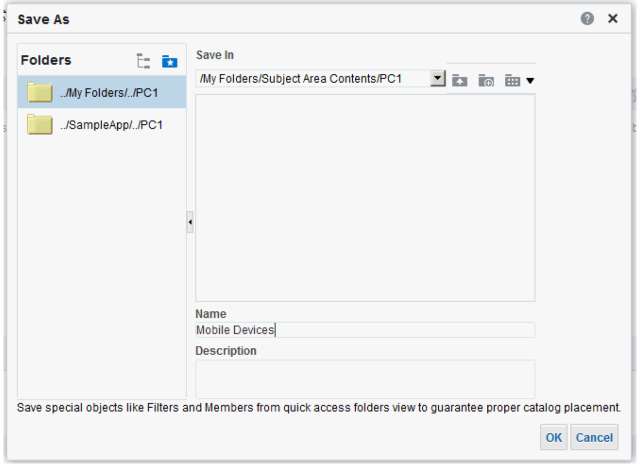
Save a group or calculated item as an inline object

- To save the analysis and the group or calculated item that it contains, click **Save Analysis**.

  The group or calculated item is saved as a part of the analysis.

Save a group or calculated item as a named object

1. On the Results tab, display the Selection Steps pane.
2. Click the link for the group or calculated item.
3. Select **Save Group As** or **Save Calc Item As**.



Save In: /My Folders/Subject Area Contents/PC1

Name: Mobile Devices

Description:

Save special objects like Filters and Members from quick access folders view to guarantee proper catalog placement.

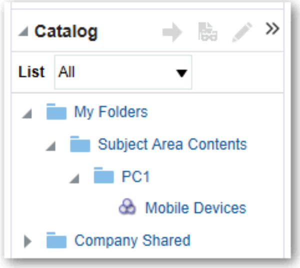
4. Enter a folder in the **Save In** field.
5. Click **OK**.

Reuse a Group or Calculated Item in an Analysis

You can add a group or calculated item to the same column on which it was created in another analysis. The group or calculated item can be either a list of members or a set of selection steps.

For example, you can display the Brand Revenue analysis and add the group members from the Mobile Devices group. The members of the Mobile Devices group are included as an "Add" step in the Selection Steps pane.

1. On the Results tab, display an analysis containing the same column to which you want to apply the selections from a group or calculated item.
2. In the Catalog pane, select the group or calculated item.



List: All

3. On the toolbar of the Catalog pane, click **Add More Options**.
4. Select **Add** to add the group or calculated item itself. Select **Add Members** to add only the group or calculated item members.

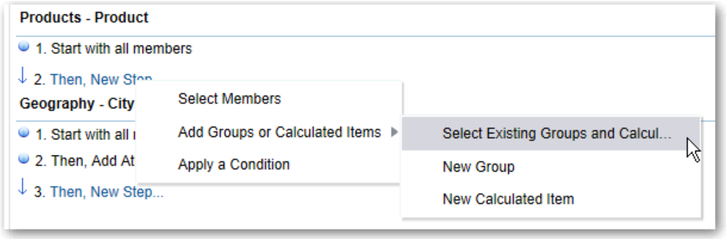
Reuse a group or calculated item from the Edit Member Step dialog:

1. On the Results tab, display an analysis containing the same column to which you want to apply the selections from a group or calculated item.
2. Display the Selection Steps pane.
3. In the entry for the column you want, click the pencil icon.

4. From the Action menu, select **Start with Group or Calculated Item**.
5. Move the saved group or calculated item from the Available area to the Selected area.
6. Click **OK**.

Reuse a group or calculated item from the Selection Steps pane:

1. On the Results tab, display an analysis containing the same column to which you want to apply the selections from a group or calculated item.
2. On the Selection Steps pane select **Then, New Step** for the appropriate column.
3. Select **Add Groups or Calculated Items**.
4. Select **Select Existing Groups and Calculated Items**.



5. On the resulting dialog, select the group or calculated item from the Available area and move it to the Selected area.
6. Click **OK**.

Delete Groups and Calculated Items

You can delete inline and named groups and calculated items.

For example, suppose you no longer need the combination of Flip Phones and Smart Phones in the analysis. You can delete the Mobile Devices group.

Delete an inline group or calculated item:

1. On the Results tab, right-click on the cell that contains the group or calculated item that you want to delete.
2. Click **Remove**.

Delete a named group or calculated item:

1. On the global toolbar, click **Catalog**.
2. Locate the group or calculated item in the Catalog page.
3. Click **More** on the group or calculated item.
4. Select **Delete**.

16

Prompt in Analyses and Dashboards

This topic describes how to create prompts for soliciting values to display in analyses and dashboards.

Topics:

- Typical Workflow to Prompt in Analyses and Dashboards
- Create Prompts
- Edit Prompts
- Add Prompts to Dashboard Pages
- Add Hidden Prompts to Dashboard Pages

Typical Workflow to Prompt in Analyses and Dashboards

Here are the common tasks to start creating prompts for soliciting values to display in analyses and dashboards.

Tasks	Description	More Information
Create an analysis	Select and arrange columns that you want to use in an analysis.	Create Your First Analysis
Create a column prompt	Create a prompt to filter the data that you see displayed.	Create Column Prompts
Edit a prompt	Edit the prompt to change it in every place where it's used.	Edit Prompts
Add a column prompt to a dashboard page	Add a prompt to a new or existing dashboard.	Add Prompts to Dashboard Pages
Create a currency prompt	Create a prompt to display money data in a different currency.	Create Currency Prompts

Create Prompts

You create prompts to enable analysts to display the data they're interested in.

Topics:

- Create Column Prompts
- Create Variable Prompts
- Override a Selection Step with a Prompt
- Create Currency Prompts

Create Column Prompts

A prompt enables you to filter the data that you see. A column prompt enables users viewing a dashboard to select a value for a column that affects what they see on the dashboard.

Video

Use the following procedure to create:

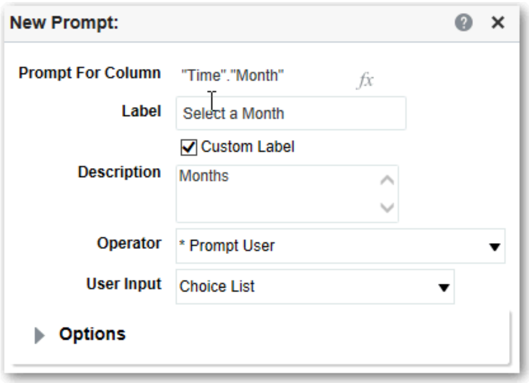
- A named column prompt that you can apply to one or more dashboards.
- An inline column prompt that is embedded in an analysis. For example, you can add a prompt to the Brand Revenue analysis so that the analysis can be reviewed for specific brands. You add a prompt directly to a column in the analysis (an inline prompt).

1. Open the analysis for editing.
2. On the Definition pane of the Prompts tab, click **New** to access the prompt type selection list. Select **Column Prompt** and select the appropriate column.
3. Click **Custom Label** and enter a caption for the column filter prompt. The caption displays as the field label for the prompt.

   For example, "Select a currency."
4. In the **Description** field, enter a short description for the prompt.

   This description becomes tooltip text, which is displayed when the user hovers the mouse pointer over the prompt's label in the dashboard or analysis.
5. From the **Operator** list, select the operator to use, such as "is greater than." If you want the user to select the operator at runtime, then select the ***Prompt User** operator.

   If you’re creating a prompt that includes a group in the prompt's value selection list, then you must set the Operator to either **is equal to/is in** or **is not equal to/is not in**. See About Groups and Calculated Items.
6. In the **User Input** field, select how you want the prompt interface to ask the user for input. For example, prompt the user with a radio button to select only one prompt value.

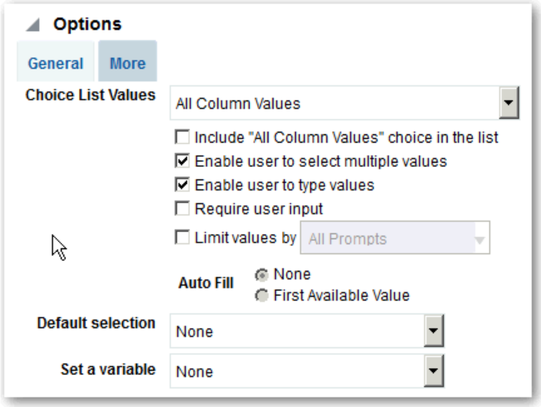


Prompt For Column "Time"."Month"
Label Select a Month
☑ Custom Label
Description Months
Operator * Prompt User
User Input Choice List

7. Depending on the type of user input that you specified, enter the appropriate values in the **User Input** field.

For example, select **Custom Values** to indicate that users can select from a list of prompt values that you created rather than the values supplied by the column.

8. Within the Options section, select prompt options to specify the display of list values and user interaction with the prompt. The prompt options vary depending on the user input type and list values type that you selected.



Choice List Values: All Column Values

☐ Include "All Column Values" choice in the list
☑ Enable user to select multiple values
☑ Enable user to type values
☐ Require user input
☐ Limit values by All Prompts

Auto Fill: ● None ○ First Available Value

Default selection: None

Set a variable: None

9. In the **Default selection** field, select the prompt value or values that users see initially.

   If you select a default type, then a field is displayed where you can either select specific values, or specify how you want the default values to be determined. For example, if you select SQL Results, you must then supply a SQL statement to generate the list of values.

10. Click **OK**.
11. Click **Save Prompt** in the editor or save the analysis.
12. Use the arrow buttons in the Definition pane to reorder the selected prompt. Reordering the prompts controls the order in which the choices are displayed to users at runtime.
13. Select the type of layout you want on the prompts page by clicking **New Row** or **New Column** in the Definition pane.

    A row-based layout saves space because it organizes prompts horizontally. A column-based layout aligns prompts into neat columns. Click the boxes in the New Column or New Row column in the Definition table that correspond to where you want to add a new column or row to the prompts page.

14. Preview the prompt with sample data using the Display pane, or click **Preview** (if available) in the Definition pane toolbar to view the prompt with actual prompt values.

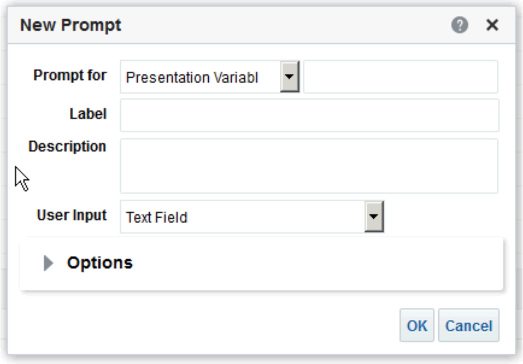
Create Variable Prompts

A variable prompt enables the user to select a value that is specified in the variable prompt to display on the dashboard.

A variable prompt isn’t dependent upon a column, but can still use a column. You can use variable prompts to enable the user to specify existing data to perform sales projections.

For example, you can create a variable prompt called Sales Projections and specify the variable prompt values as 10, 20, and 30 percent. Then you create an analysis that contains the Region and Dollars columns. Within the Dollars column formula, you select the multiply operator and insert the Sales Projection variable. When users run this analysis, they can select a percentage by which to recalculate the Dollars column.

1. Open the analysis for editing.
2. Display the Prompts tab.
3. On the Definition pane of the Prompts tab, click **New** then **Variable Prompt** to display the New Prompt dialog.



Prompt for: Presentation Variabl

User Input: Text Field

4. In the **Prompt for** field, select the variable type that you're creating and then enter the name of the variable.

   This variable name is the name that you add to the analysis or dashboard where you want the variable prompt's value specified by the user to display. Currently, you can create only presentation variables.
5. In the **Label** field, enter a caption for the variable filter prompt. The caption is displayed as the prompt's field label.
6. In the **Description** field, enter a short description for the prompt. This description is displayed as tooltip text, which is displayed when the user hovers the mouse pointer over the prompt's label in the dashboard or analysis.
7. In the **User Input** field, select how you want the prompt interface to ask the user for input. For example, prompt the user with a radio button to select only one prompt value.
8. If you selected either the **Choice List**, **Check boxes**, **Radio buttons**, and **List box** user input type, then you must also specify the prompt's list of values.
9. Within the Options section, select the prompt options. The prompt options vary depending on the user input type that you selected.

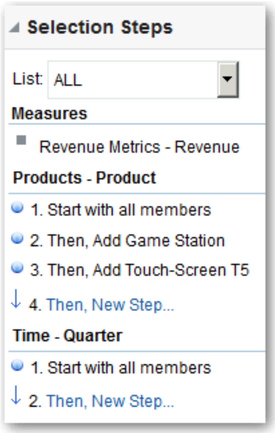
   The prompt options enable you to further specify how you want the user to interact with the prompt. For example, whether user input is required.
10. In the **Default selection** field, select the prompt value that users see initially. If you select a specific value, then the **Default Value** field is displayed in which you can enter a value.
11. Click **OK** to display the prompt is displayed in the Definition pane.
12. Save your changes.

Override a Selection Step with a Prompt

You can override a selection step with either a dashboard prompt or an inline prompt.

For example, you can specify that the Products.Brand selection step be overridden with a column prompt specifying the BizTech and FunPod members.

1. Open the analysis for editing.
2. In Results tab, select the columns for the analysis and then navigate to the Selection Steps pane by selecting **Show/Hide Selection Steps Pane**.
3. Specify the selection steps for the analysis.



Selection Steps

List: ALL

Measures

Revenue Metrics - Revenue

Products - Product

1. Start with all members
2. Then, Add Game Station
3. Then, Add Touch-Screen T5
4. Then, New Step...

Time - Quarter

1. Start with all members
2. Then, New Step...

4. Determine which selection step you want to override with a column prompt and click **Edit**.
5. In the dialog, select **Override with prompt**, if it’s available for that type of step.
6. Click **OK** and save the analysis.

Create Currency Prompts

A currency prompt enables users to change the currency type that is displayed in a dashboard or analysis.

Use this procedure to create a currency prompt that you can apply to one or more dashboards, or to create a currency prompt that's embedded in an analysis.

1. Open the analysis for editing.
2. Display the Prompts tab.
3. In the Definition pane, click the **New** button and select **Currency Prompt**.
4. In the **Label** field, enter a caption.
5. In the **Description** field, enter a short description. This description is displayed as tooltip text, which is displayed when the user hovers the mouse pointer over the prompt's label in the dashboard or analysis.
6. Click **OK**.
7. Save the prompt.
    - If you’re creating a dashboard prompt, then click the **Save** button in the prompt's editor, specify the folder in which you want to save the prompt, and give the prompt a descriptive name. Dashboard prompts that are saved in personal folders are available only to you. Dashboard prompts that are saved in shared folders are available to other users that have permission to access the object.
    - If you’re creating an inline prompt, then save the analysis.

8. Use the arrow buttons in the Definition pane to reorder the selected prompt. Reordering the prompts controls the order in which the choices are displayed to users at runtime, so ensure that the order is logical, especially if you're creating constrained prompts.
9. If you want to add a new row or column to the prompts page, then click the **New Row** button or **New Column** button in the toolbar. In the Definition table, click the check box corresponding to the prompt that you want to display in a new row or column.
10. To preview how the prompt is displayed on the dashboard, either use the Display pane to preview the prompt with sample data, or click the **Preview** button in the toolbar to view the prompt with actual prompt values.

Edit Prompts

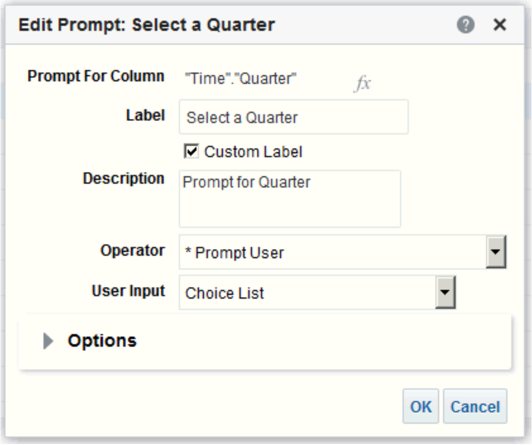
You can edit a saved dashboard prompt or inline prompt, to propagate its changes to wherever the prompt is used.

For example, you can edit the prompt for the Brand column to change the user input to a choice list. This change is propagated to the Brand Revenue analysis where the prompt is used.

1. In the Definition pane on the Prompts tab, double-click to open the appropriate prompt.

   Alternatively, in the Definition pane on the Prompts tab, select the appropriate prompt and click **Edit**.
2. Make the appropriate changes in the Edit Prompt window.

   For example, change the label for the prompt or change the user input to a choice list.



Prompt For Column "Time"."Quarter"
Label Select a Quarter
☑ Custom Label
Description Prompt for Quarter
Operator * Prompt User
User Input Choice List

3. Click **OK**.
4. Click **Save Prompt**.

   The changes are propagated to wherever the prompt is used.

Add Prompts to Dashboard Pages

You can add a prompt to a dashboard or dashboard page.

Video

For example, you can create a dashboard prompt for the Brand column. You add the prompt to the Sales Performance dashboard, to drive the content on the dashboard page. You add a filter for Brand that uses the "is prompted" operator to flag the column as ready to be filtered by a prompt. When the prompt is used, the results include only records where the data in the column that is prompted matches the user's choices.

1. Open the dashboard for editing.
2. In the Dashboard builder's Catalog pane, locate and drag and drop an object such as an analysis onto a section in the dashboard page.
3. Add a new or pre-created prompt:
   - To add a new prompt, click **New**, then **Dashboard Prompt**, and follow the on-screen instructions.
   - To add a pre-created prompt, in the Dashboard builder's Catalog pane, locate and drag and drop the dashboard prompt onto a section in the dashboard page.

   The dashboard prompt is added to the dashboard page.
4. To specify whether to include the prompt's **Apply** and **Reset** buttons on the dashboard page, in the toolbar of the Dashboard builder, click **Tools**. Then select **Prompts Buttons on Current Page** and either **Apply Buttons** or **Reset Buttons**.
5. Click **Save** in the dashboard toolbar.
6. To preview the dashboard page, click **Preview** in the dashboard toolbar.

Add Hidden Prompts to Dashboard Pages

You can add a hidden prompt to a dashboard or dashboard page.

1. Create and save a prompt to use as a hidden prompt.
2. Open a dashboard for editing.
3. On the Dashboard page toolbar, click **Tools** and select **Dashboard Properties**.
4. In the Dashboard Properties dialog, click the **Filters and Variables** pencil icon to add a hidden prompt to the entire dashboard.

   Alternatively, to add a hidden prompt to a page, locate the page in the Dashboard Pages area and click **Select a prompt to capture default filters and variables** icon.
5. In the Dashboard Filters and Variables dialog, click the **Embed new hidden dashboard prompt** plus icon to browse for and select the prompt. Click **OK** to add the hidden prompt.
6. Click **OK** to save the dashboard properties.
7. Click **Save** in the dashboard toolbar.
8. To preview the dashboard page, click **Preview** in the dashboard toolbar.

17

Make Analyses Interactive

Make your analyses and dashboards more interactive. Embed hyperlinks to some related business intelligence content or add links to other web pages.

▶ Video

Topics:

Typical Workflow to Make Analyses Interactive

Here are the common tasks to start making analyses more interactive.

Task	Description	More Information
Create an analysis	Select and arrange columns that you want to use in an analysis.	Create Analyses
Create a named action	Create an action and save it to the catalog.	Create Named Actions for Reuse
Create an inline action	Create an action and save it with an analysis.	Create Inline Actions
Add an action to an analysis	Add an action to a column value in an analysis.	Add Actions to Analyses
Add an action to a dashboard	Add an action or an action menu to a dashboard.	Add Actions to Dashboard Pages

Create Named Actions for Reuse

Create action links so users can navigate to related BI content such as websites and reports, or perform business tasks. You save named actions to the catalog to that they’re available to your analysts and business users.

Users can click an analysis that is embedded within column headings and column values. Users can also click links in views such as graphs, and on grand totals within tables and pivot tables.

1. From the Classic Home page, go to **Create** and click **Action** under **Actionable Intelligence**.
2. Click the option for the type of action you want to create.
3. Optional: Change the default parameters to change the information that is displayed when the action executes.
    - **Navigate to BI Content** - Display an analysis or dashboard stored in the My Folders or the shared folder area.
    - **Navigate to a Web Page** - Display a web page.
    - **Invoke a Web Service** - Invoke a web service operation or any Service-Oriented Architecture (SOA) service that is exposed as a Web Service (for example, a Business Process Execution Language (BPEL).
    - **Invoke a HTTP Request** - Invoke an external system command that is exposed by a URL API. This sends a HTTP request through the server to a target URL.
    - **Invoke a Server Script** - Execute a custom script when the current agent completes. The custom script type can be either Javascript or VBScript. This action supports custom script actions when the server is running on Microsoft Windows. For other platforms (including Windows), consider using the Invoke Java Method (EJB) or Invoke Web Services action.
    - **Invoke a Browser Script** - Invokes a JavaScript function that the administrator has made available to you. Click **Browse** to see a list of functions that the administrator has made available, or type the name of a function in the **Function Name** field. For example, you might specify `USERSCRIPT.mycurrencyconversion`.
    - **Invoke a Java Method** - Invokes a Java method in an Enterprise Java Bean (EJB). See **Invoke a Java Method (EJB)**.
4. Click **Save Action** and choose where to save the action.
5. Verify that the action runs properly:
    1. Navigate to the named action in the catalog.
    2. Click **Execute**.
    3. Respond to any request for more information or any confirmation prompt that is displayed.

Create Inline Actions

An inline action is an action that you define for a particular analysis or dashboard and don't save by name in the catalog.

For example, in the Brand Revenue analysis, you might decide to create a link to an Opportunity Detail web site.

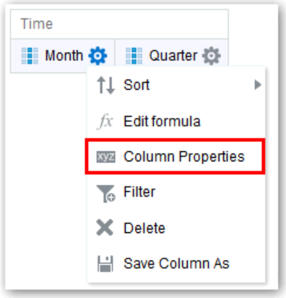
- Analyses – Add actions to column headings, column values, or hierarchy level values using an action link. See Add Actions to Analyses.
- Dashboard page - Add action links or action link menus to the page. See Add Actions to Dashboard Pages.

Add Actions to Analyses

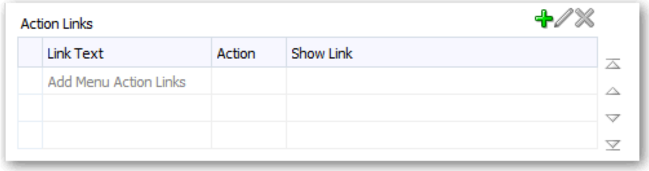
You can use an action link to add actions to a column heading, column value, or hierarchy level value in an analysis.

For example, in the Brand Revenue analysis, you can include an action that contains an action link to an Opportunity Detail web site. Sale consultants can query the site for an opportunity by responding to a prompt for Opportunity Name or Opportunity ID.

1. Open the analysis for editing.
2. On the Criteria tab, open the **Options** menu for a column and select **Column Properties**.



3. Click the **Interaction** tab.
4. In the Primary Interaction box in the Column Heading area or the Value area, select **Action Links**.



5. Click **Add Action Link**.
6. In the **Link Text** field, enter the text you want the link to display.
7. To create a new action, click **Create New Action**, select the type of action you want, and specify the settings for the action.

See Create Named Actions for Reuse.

Alternatively, click **Select existing action** , select the action you want, and specify any associated parameters in the Edit Parameter Mapping dialog.

8. Save your changes.

Add Actions to Dashboard Pages

You can add actions to dashboard pages using action links and action link menus.

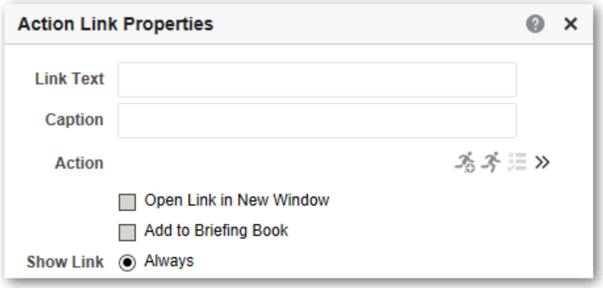
Topics

- Add Actions to Dashboard Pages with Action Links
- Add Actions to Dashboard Pages with Action Link Menus

Add Actions to Dashboard Pages with Action Links

Link a related report or a useful web site to your dashboard. For example, give sales consultants a direct link to an Opportunity web site from the Sales Performance dashboard so they can query opportunities by responding to a prompt for Opportunity Name or Opportunity ID.

1. Open the dashboard page for editing.
2. From the Dashboard Objects pane, drag and drop an Action Link object on the dashboard page.
3. Click **Properties** for the new link.



Action Link Properties

Link Text
Caption
Action
☐ Open Link in New Window
☐ Add to Briefing Book
Show Link ● Always

4. Complete the fields in the dialog.
5. Click **OK**.
6. In Dashboard builder, click **Save**.

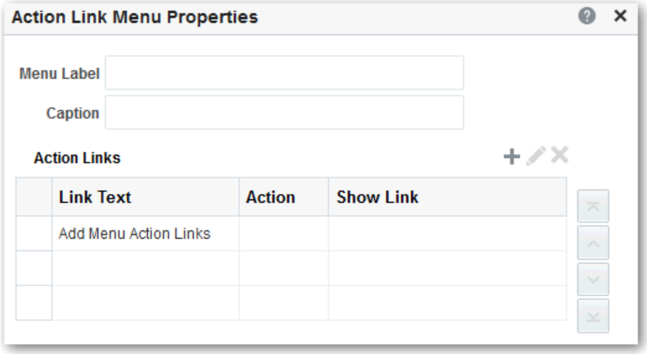
Add Actions to Dashboard Pages with Action Link Menus

You may want to offer several action links on your dashboards. Use menus to group your links together and keep things organized.

For example, you can give sales consultants a Related Information menu on the Sales Performance dashboard with useful links, such as an external Opportunity web site or a related Brand Revenue dashboard.

1. Open the dashboard for editing.

2. From the Dashboard Objects pane, drag and drop an Action Link Menu object on the dashboard page.
3. Click **Properties** for the new menu.

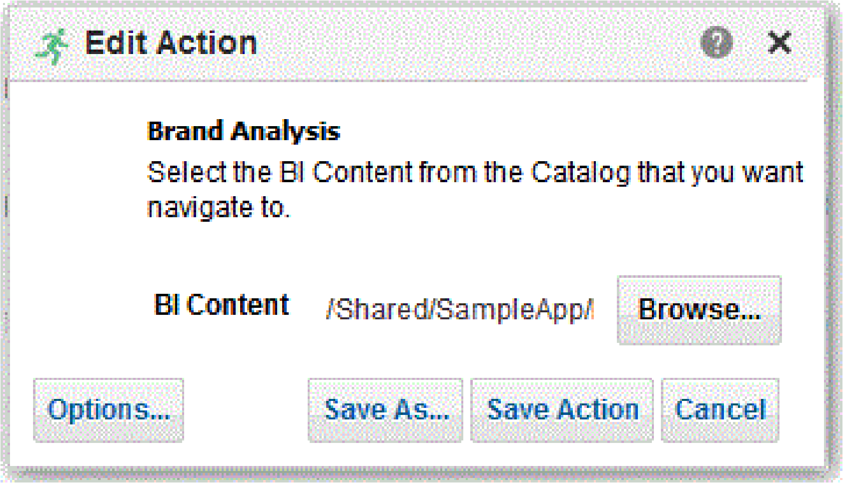


4. Add the action links to the menu.
5. Click **OK**.
6. In Dashboard builder, click **Save**.

Edit Named Actions

You can edit existing named actions. For example, you can edit the Brand Analysis action in the Sales Performance dashboard to navigate to a newly created analysis.

1. Navigate to the action in the catalog.
2. Click **Edit**.



Brand Analysis

Select the BI Content from the Catalog that you want navigate to.

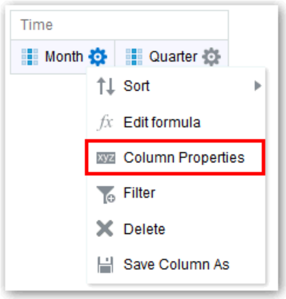
BI Content /Shared/SampleApp/

3. Edit the action and click **OK**.
4. Click **Save Action**.

Edit and Delete Action Links in Analyses

You can edit action links or delete action links you don't want any more. So, if an action link navigates to an obsolete analysis or web site you can point somewhere new or remove the link.

1. Open the analysis for editing.
2. On the Criteria tab, open the **Options** menu for a column and select **Column Properties**.



3. Click the **Interaction** tab.
4. To edit an action or action link:
    a. In the Action Links area, select the action to edit and click **Edit Action Link**.
    b. Make the changes you want.
    c. To edit the associated action, click **More** and select **Edit Action**.
    d. Make the changes you want.
5. To delete an action link:
    a. In the Action Links area, select the action link that you want to delete.
    b. Click **Delete**.
6. Click **OK**.
7. Click **Save Analysis** in the Criteria tab.

Edit and Delete Action Links in Dashboard Pages

You can edit action links or delete those you don't want any more. For example, if the URL to an "Opportunity" site changes you can point to the new URL.

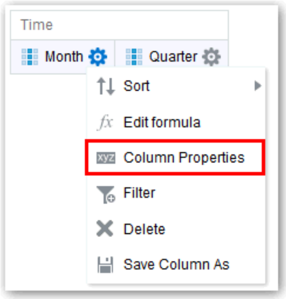
1. Open the dashboard for editing.
2. If the action and action link are associated with an action link menu:
    a. Click **Properties** for the action link menu.
    b. Make the appropriate changes to the menu label and caption.
    c. In the Action Links area, select the action you want and click **Edit**.
3. To edit an action that isn’t part of a menu, click **Properties** for the action link.

4. Update the action link.
5. Click **More** and select **Edit Action** to edit the action.
6. Edit the action and click **OK**.
7. Click **OK** in the Action Link Properties dialog, and in the Action Link Menu Properties dialog (if displayed).
8. Click **Save**.
9. Click **Delete** on the action link (or action link menu) toolbar to remove actions you don't want any more.

Save Inline Actions in Analyses to the Catalog

You can save useful inline actions to the catalog and reuse them in other analyses and dashboards.

1. Open the analysis for editing.
2. On the Criteria tab, open the **Options** menu for a column and select **Column Properties**.

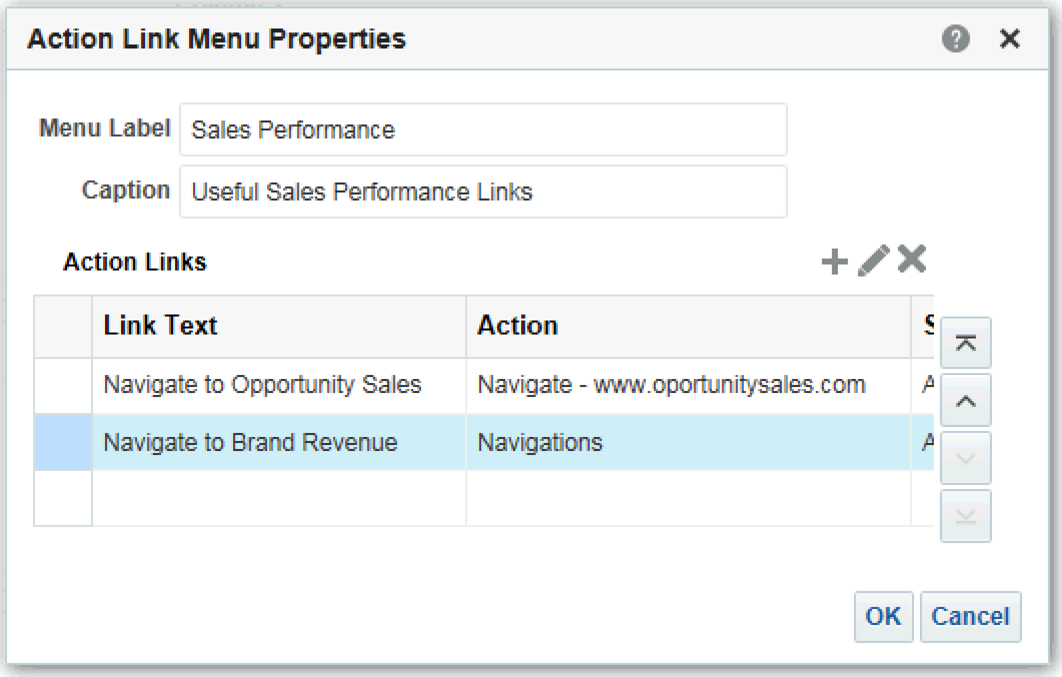


3. Click the **Interaction** tab.
4. In the Action Links area, select the action you want and click **Edit Action Link**.
5. Click **More** and select **Save Action As**.
6. Specify how the action appears in the catalog, then click **OK** to save it.

Save Inline Actions in Dashboards to the Catalog

You can save useful inline actions to the catalog and reuse them in other analyses and dashboards.

1. Open the dashboard for editing.
2. If the action and action link are associated with an action link menu:
   a. Click **Properties** for the action link menu.



Menu Label: Sales Performance

Caption: Useful Sales Performance Links

Action Links

Link Text	Action
Navigate to Opportunity Sales	Navigate - www.oportunitysales.com
Navigate to Brand Revenue	Navigations

   b. Make the appropriate changes to the menu label and caption.
   c. In the Action area, select the action you want to save to the catalog.
3. To save an action that isn’t part of a menu, click **Properties** for the action link.
4. Click **More** and select **Save Action As**.
5. Specify how the action appears in the catalog and click **OK**.
6. Click **Save**.

18

Manage Content

This topic describes how to manage your content in the catalog.

Topics:

- Typical Workflow to Manage Content
- Rename Content
- Access Favorites Easily
- Access Properties
- Assign Access Permissions
- Send Email Reports and Track Deliveries
- Automate Business Processes With Agents
- Migrate Content to Other Catalogs
- Assign Ownership of Items
- Assume Ownership of Items
- Embed External Images and Other External Resources in Your Content
- **Access Your Reporting Content in Smart View**
- Perform Advanced Catalog Management

Typical Workflow to Manage Content

Here are some common tasks that you perform to access and organize content in the catalog.

Task	Description	For More Information
Find and explore your content	Exploring your content, including searching for items that you need to edit.	Find and Explore Your Content
Rename content	Improve or update the naming of your content.	Rename Content
View or set content properties	Display information about your content or change various content options and properties.	Access Properties
Give access to others	Assign permissions so that others can access your content	Assign Access Permissions
Email reports and track deliveries	Email reports to anyone inside or outside the organization. Keep everyone up to date with daily or weekly reports.	Send Email Reports and Track Deliveries

Task	Description	For More Information
Automate business processes	Create agents that deliver analyses, dashboards, and briefing books to targeted audiences on-demand or on a regular schedule.	Automate Business Processes With Agents
Configure devices and delivery profiles	Configure the devices and delivery profiles to be used to reach you when an alert is generated by an agent.	Configure Your Devices and Delivery Profile
Change content ownership	Assign another user as the content owner.	Assign Ownership of Items
Analyze using Smart View	Analyze reporting content in Smart View.	**Access Your Reporting Content in Smart View**
Perform advanced catalog management	Generate advanced reports about your catalog, review the underlying XML for individual items, and more.	Perform Advanced Catalog Management

Rename Content

You can rename items and views to make their names more meaningful to you.

Topics:

- Rename Items
- Rename Views

Rename Items

You can rename items to make their names more meaningful to you. For example, you can change the name of the "High Products" filter to "Top 3 Products."

1. On the Classic Home page, click **Catalog**.
2. In the Catalog page, search for the item that you want to rename.
3. In the search results for the item, click **More**, and then **Rename**.
4. Give the item a new name.
5. Optional: Click **Preserve references to the old name of the item**, if the option is available for the item.

   Use this option to specify that existing references to the previous name of the item are maintained. This creates a shortcut with the old name that points to the renamed item in the catalog. If you don’t select this option, then existing references break.
6. Click **OK**.

Rename Views

You can rename views to make their names more meaningful to you. For example, you can change the name of a view from "Sales Forecast 2014" to "Forecast 2014."

1. Open the analysis for editing.

2. On the Results tab, click **Edit View**.
3. In the view editor toolbar, click **Rename View**.
4. In the Rename View dialog, give the view a new name.
5. Click **OK**.

Access Favorites Easily

You can access favorites easily using the **Favorites** option on the Home page.

Topics:

- Add Favorites from Catalog Page
- Remove Favorites from Catalog Page
- Add or Remove Favorites from Other Pages

Add Favorites from Catalog Page

You can bookmark as favorites the content that you work with the most. Your favorites are displayed with a gold star, and you can view all of your favorites by clicking **Favorites** on the Home page.

For example, you might regularly view the "Box Plot & Bar" project. You can flag the project as a favorite to help you quickly access it.

1. From the Classic Home page, click **Catalog**.
2. In the Catalog page, search for the content that you want to mark as a favorite.
3. In the search results for the item, click **More**, and then **Add to Favorites**.

Remove Favorites from Catalog Page

You can remove content from your favorites list that you no longer need to access as often. For example, you might remove the "Box Plot & Bar" project from your favorites because it’s now out-of-date.

1. From the Classic Home page, click **Catalog**.
2. In the Catalog page, search for the favorite to remove.
3. In the search results for the item, click **More**, and then **Remove from Favorites**.

Add or Remove Favorites from Other Pages

You can add or remove content from your favorites list from other pages.

For example, you might want to flag an analysis in the Recent, or Others list on the Home page, or Shared Folder as a favorite to help you quickly access it.

1. Go to the page or folder and search for the content you want to add or remove from the favorites list.
2. Select the item and click **More** or right-click.
3. From the Action menu of the item, click **Add to Favorites** or **Remove from Favorites**.

Access Properties

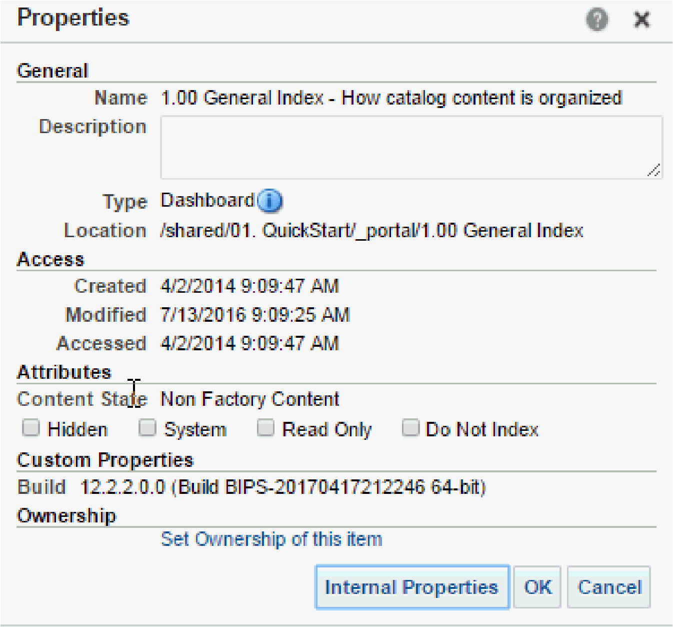
Administrators can access the properties of any item or folder to perform tasks such as view system information or change access levels. All other users can access and modify the properties for only those items that they create or own.

For example, you might want to change the Brand Revenue analysis to be read-only so that other users can’t modify it.

1. On the Classic Home page, click **Catalog**.
2. In the Home page or Catalog page, locate the catalog item that you want to edit.

   You can locate a catalog item in the Recent or Others list on the Home page, or use the Search tool to locate a catalog item. For example, you might locate an analysis named ‘Revenue by Region’.
3. Click **More**, then **Properties**.
4. Review or change the settings in the Properties dialog.

   For example, you can set an item as read-only or take ownership of an item.



General

Name 1.00 General Index - How catalog content is organized

Description

Type Dashboard

Location /shared/01. QuickStart/_portal/1.00 General Index

Access

Created 4/2/2014 9:09:47 AM

Modified 7/13/2016 9:09:25 AM

Accessed 4/2/2014 9:09:47 AM

Attributes

Content State Non Factory Content

☐ Hidden ☐ System ☐ Read Only ☐ Do Not Index

Custom Properties

Build 12.2.2.0.0 (Build BIPS-20170417212246 64-bit)

Ownership

5. Click **OK** to save changes or click **Cancel**.

Assign Access Permissions

You can give others access to items in the catalog and to dashboard sections. This helps you to control the content that users can view or edit.

Topics:

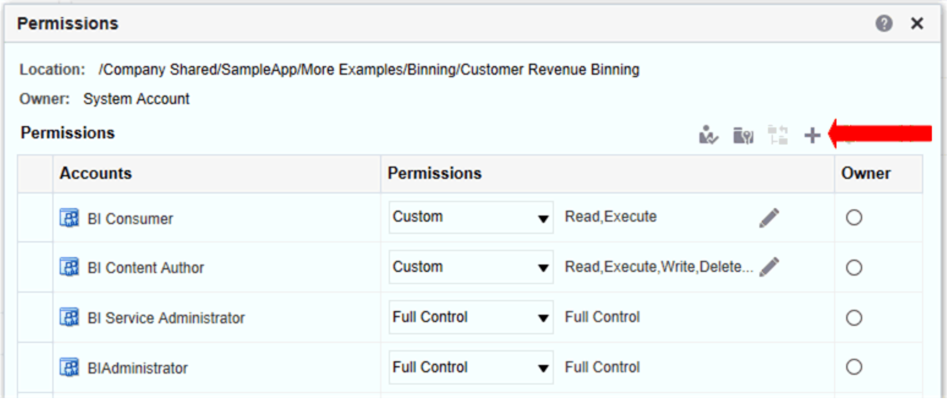
- Add or Update Item Permissions
- Add or Update Dashboard Section Permissions

Add or Update Item Permissions

You must give users permissions to access items.

The permissions that you can assign to others vary depending on the type of content. To change permissions, you must have the Change Permission privilege. For example, you might want to grant the Change Permission privilege to another sales consultant. This enables the user to assign permissions to the Sales Forecast analysis.

1. On the Classic Home page, click **Catalog**.
2. In the Catalog page, search for the content to which you want to assign permissions.
3. In the search results for the item, click **More** and **Permissions**.



Location: /Company Shared/SampleApp/More Examples/Binning/Customer Revenue Binning

Owner: System Account

Permissions

Accounts	Permissions		Owner
BI Consumer	Custom	Read,Execute	○
BI Content Author	Custom	Read,Execute,Write,Delete...	○
BI Service Administrator	Full Control	Full Control	○
BIAdministrator	Full Control	Full Control	○

4. In the Permissions dialog, click **Add users/roles** to access the Add Application Roles and Users dialog to add any required accounts.

   The roles and users inherit permissions from the roles of which they are members. For example, you can grant Full Control permission to the BIServiceAdministrator application role on the Sales Revenue analysis. This enables any user or application role with that role to have Full Control on the item. You can see the permissions that users and roles have on items (either granted directly or inherited). Click the **Click to see effective permissions** button in the Add Application Roles and Users dialog.

5. In the Permissions dialog, click the **Permissions** list. Most of the items in the list are parent permissions and contain several child permissions.
6. Optional: To build a specific list of permissions, click **Custom**. This option gives the user authority to bypass any permissions set on the folder that prevent the user from accessing the item from the Catalog or a dashboard. This option doesn’t change the folder permissions.

   For example, you can grant users the Traverse permission for the Test folder in the shared folder area. Then, they *can* access items embedded in dashboards stored in this folder. Also, they can access embedded items in dashboards stored in sub-folders, such as /<*shared folder area*>/Test/Guest folder. However, users can’t access (meaning view, expand, or browse) the folder and sub-folders from the Catalog.

7. Click **OK** twice.

Add or Update Dashboard Section Permissions

You can give others access to dashboard sections, thereby controlling which users have access to those sections. To grant access, you assign permissions to users of the dashboard.

For example, you assign permissions for the Project Costs section of the dashboard to the BI administrator. You can restrict access to BI consumers to prevent unwanted changes.

1. Open a dashboard for editing.
2. Select **Properties** in the section toolbar.
3. Select **Permissions**.
4. In the Permissions dialog, click the **Permissions** list to select permissions.
5. Click **OK**.

Send Email Reports and Track Deliveries

Send Email reports to anyone inside or outside the organization or use agents to send reports to a range of other devices. Keep everyone up-to-date with regular daily or weekly reports.

Topics

- Send Email Reports Once, Weekly, or Daily
- Track the Reports You Distribute By Email or Through Agents
- Email Security Alert

Send Email Reports Once, Weekly, or Daily

Send Email reports to one or more recipients directly from the catalog. It's easy to distribute reports this way and quicker than downloading a report and mailing it from your email client. To keep everyone up-to-date, schedule daily or weekly emails.

1. On the Classic Home page, click **Catalog**.
2. Navigate to the item you want to email, click the **More** action menu, and select **Email**.
3. Enter the email address for one or more recipients.

   Separate multiple email addresses with a comma. For example: `jane.white@abc.com, steve.brown@abc.com`.
4. Customize the **Subject** line.
5. Send the email **Now** or click **Later** to set a date and time in the future.
6. To email report updates on a daily or weekly basis, click **Repeat** and then select **Daily** or **Weekly**.

You can check the status of email deliveries from the Console.

Track the Reports You Distribute By Email or Through Agents

Track the reports you’ve chosen to send to people by email from the Console. Quickly see when reports were sent and which items are pending. Review, change, or delete your deliveries (scheduled or completed) from the same page.

Any agents that you set up to deliver content are displayed in the Console too. This way, all your delivery information is in one place.

You can filter the deliveries by their status to track deliveries most important to you. The various status messages are explained here.

Delivery Status	Description
Canceled	Someone canceled the delivery. Users can cancel any delivery that they own.
Completed	Delivery ran successfully.
Disabled	Users can temporarily disable any delivery or agent that they own through the catalog. For example, you might stop a job running on its defined schedule if you want to edit the report or change who sees the report.
Failed	Delivery ran as scheduled but it didn't complete successfully. Click the error icon to find out what went wrong so you can fix it.
Not Scheduled	No one has set up a schedule for the delivery or the scheduled run date is for a date in the past (rather than a future date).
Pending	Delivery is scheduled to run. For example, you might have a delivery scheduled to run every day at 9am. If you look at the delivery the night before or at 8am, it shows as pending to indicate it's due to run soon.
Running	Delivery is in progress.
Suspended	Administrators can temporarily suspend deliveries that other users set up. For example, before you migrate from a test environment to a production environment, your administrator might suspend deliveries in the test environment, and resume them in the production environment.
Timed out	Delivery timed out because it took too long to complete.
Try Again	Something went wrong. Try to run the delivery again.
Warning	Delivery ran as scheduled but it wasn't 100% successful. For example, the delivery specifies 10 recipients but only 9 of them received it because 1 of the email addresses was incorrect. Click the error icon to find out more.

To track deliveries from the Console:

1. Go to the Home Page, click **Navigator**, and then click **Console**.
2. Click **Monitor Deliveries**.

   Initially, minimal historical information is displayed to prevent clutter. To see more detail, click the Action menu for the page and select **History Level**.
3. To filter deliveries by name, start typing the name of the delivery you're looking for in the search box.

   Or click **Today**, to quickly navigate down the list to the first report scheduled for delivery today.

   You can also filter by delivery status. Click the **Filter** icon and select one or more from: **Failed, Warning, Completed, Canceled, Timed Out, Try Again, Running, Pending, Disabled, Suspended, Not Scheduled**.
4. To preview the content, click the Actions menu for the delivery, and select **View Report**.

   This option isn't available if the delivery is generated by an agent.
5. To edit a delivery, click the Actions menu for the delivery, and select **Edit Delivery**.
   - Email deliveries — Update the email options.
   - Agent deliveries — Edit the agent associated with the delivery.
6. To disable a delivery, click the Actions menu for the delivery, and select **Disable Delivery**.

   If you want to enable the delivery later on, click the Actions menu for the delivery, and select **Edit Delivery**.
7. To delete a delivery and all future scheduled deliveries, select **Delete Delivery**, then **OK** to confirm.
8. To delete delivery information only, select **Delete Delivery History** from the Actions menu.

   Use this option to remove historical information that you don't want to see any more.

Email Security Alert

Content that you send by email isn't encrypted. It's your responsibility to safeguard any sensitive data that you send.

See Send Reports by Email and Track Deliveries.

Suspend and Resume Deliveries

Administrators can temporarily suspend any delivery, at any time.

1. In the Oracle Analytics Home page, click the **Navigator**, and then click **Console**.
2. Click **Monitor Deliveries**.
3. To access everyone's deliveries in addition to your own, click the Action menu for the page, and select **Admin View**.

4. To suspend a delivery, click the Action menu for the delivery and select **Suspend Delivery**.

   To suspend multiple deliveries at once, select **Shift** + click or **Ctrl** + click to select all the deliveries you want to suspend, and then click the Action menu and select **Suspend Delivery**.

5. To resume a delivery, click the Action menu for the delivery and select **Resume Delivery**.

Restore and Enable Delivery Schedules

When you restore content from a snapshot or migrate content from a different environment, delivery information is restored but it isn't activated right away. Initially, restored deliveries are disabled. Click the **Edit Delivery** option to re-activate them.

1. In the Oracle Analytics Home page, click the **Navigator**, and then click **Console**.
2. Click **Monitor Deliveries**.
3. To restore deliveries, click the **Action** menu for the page and select **Restore Deliveries**.

   Click **OK** to confirm. Recently restored deliveries display ⚠ **Disabled**.
4. To activate a delivery, click the Action menu for the delivery, and select **Edit Delivery**.

   Enable, and if necessary, redefine the delivery schedule.
5. To prevent clutter, delete any history or deliveries you don't want anymore. Click the Action menu for the delivery:
   - **Delete History** — Removes historical information that you don't want to see any more.
   - **Delete Delivery** — Deletes the delivery and all its history.

Automate Business Processes With Agents

Content authors can create agents that deliver analyses, dashboards, and briefing books to targeted audiences on-demand or on a regular schedule.

Topics:

- Create Agents to Deliver Content
- Schedule an Agent to Deliver Content Directly from an Analysis
- Disable and Enable the Schedule for an Agent
- Subscribe to Agents
- List Agents You Subscribe To or Own
- Access and Manage Your Alerts

Create Agents to Deliver Content

You can create agents that deliver analyses, dashboards, and briefing books to specific recipients and subscribers. These agents can deliver content on-demand or on a regular schedule.

To create an agent to deliver an analysis, dashboard, or briefing book:

1. On the Classic Home page, click **Create** and select **Agent**.
2. Optional: Set some general options for the agent.
   1. Set a priority level for the agent.

      Consider the importance of the content you want to deliver.
   2. Define how you want to generate the content, that is, which user do you want to run report queries as.
3. Set up a delivery schedule.
   1. Click the **Schedule** tab.
   2. Select whether you want the agent to run on a schedule, how often it runs, when to start, and when to stop.

      When you select the date and time, for time zones where daylight savings applies, the time zone reflects the daylight savings time. For example, if, during the summer months, you select **(GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London**, this means BST (British Summer Time).

      The minimum frequency for daily run by delivery agent is 15 minutes.
4. Optional: Click the **Condition** tab, and select **Use a condition** if you want the agent to only run under certain conditions.
   - Click **Create** to define the condition.
   - Click **Browse** to select an existing condition from the catalog.

   Keep the default (**Do not use a condition**), if you want the agent always deliver its content.
5. Select the content you want to deliver, such as a dashboard page or analysis.
   1. Click the **Delivery Content** tab.
   2. Select the content you want to deliver and the format you want to send.
6. Specify who you want the content to be delivered to and who else is allowed to subscribe to this agent.
   1. Click the **Recipients** tab.
   2. Click **Add Recipient** to add users individually or add users by their application role.
   3. Click **Add Email Recipient** to enter the email address of one or more recipient.
   4. To allow other people to subscribe to this agent, select **Publish Agent for Subscription** and then define who can subscribe, by selecting their user name or an application role.
7. Specify how you want content to be delivered to the recipients. You can send deliveries to Oracle Analytics, by email, and to devices such as mobile phones and pagers.
   1. Click the **Destinations** tab.
   2. Click **Home Page and Dashboard** to deliver content through Oracle Analytics. Users receive alerts in Oracle Analytics whenever deliveries are sent to them.
   3. Click **Devices** to deliver the content in other ways.

- To let users decide how they receive deliveries, select **Active Delivery Profile**.
- To restrict the types of devices that deliveries can be sent to, select **Specific Devices** and select only the device types you want.

Users set up their deliveries profile through **Delivery Options** preferences (My Account).

8. Save the agent.

   If you want other people to subscribe to the agent, you must save it in a subfolder under `/Shared Folders` so they can find it. For example, `/Shared Folders/MySharedAgents/Sales/MonthlySalesTarget_Agent`.

   After saving the agent, you can run the agent by clicking the **Run Agent Now** button. This is helpful, for example, if you want to test the agent.

The Actions tab is reserved for future use.

Schedule an Agent to Deliver Content Directly from an Analysis

You can set up an agent to deliver content directly from an analysis. When you create an agent in this way, Oracle Analytics sets the **Content** property for you and creates a delivery condition for the agent to help you get started.

1. Navigate to the analysis in the catalog.
2. Click the **More** action menu, and select **Schedule**.
3. Further define the agent, as required.

Disable and Enable the Schedule for an Agent

You can temporarily disable (and then enable) an agent's schedule.

Disabling an agent's schedule stops the agent from running on its defined schedule. It doesn’t stop you from running it by other means, for example, by the **Run Agent Now** button in the agent editor.

1. On the Classic Home page, click **Catalog** and navigate to the agent whose schedule you want to disable or enable.
2. Click the **More** action menu, and select **Disable Schedule** to disable the agent's schedule.
3. Click the **More** action menu, and select **Enable Schedule** to run the agent on schedule again.

You also can disable and enable an agent's schedule by using the **Enabled** box in the Schedule tab of the agent editor.

Subscribe to Agents

Subscribe to an agent if you want to receive the most up-to-date information generated by the agent. You can only subscribe to agents if the owner allows you to do so.

1. On the Classic Home page, click **Catalog**.
2. Navigate to the agent you want to subscribe to.

3. Click the **More** action menu, and select **Subscribe**.

   To make an agent available for subscription, the owner must select **Publish Agent for Subscription** (**Recipients** tab) and identify who's allowed to subscribe.

4. To unsubscribe at any time, click the **More** action menu, and select **Unsubscribe**.

List Agents You Subscribe To or Own

You can display a list of agents that you subscribe to and any agents that you own.

1. On the Classic Home page, click **Catalog**.
2. Click **Search**.
3. To find all the agents, enter ***** (asterisk) in the Search box, select **All** from the Location list, and then select **Agent** from the Type list.

   Alternatively, enter the name or part of the name of an agent in the **Search** field, select a specific **Location**, and then select **Agent** from the Type list.

4. Click **Search**.

Access and Manage Your Alerts

Alerts notify you when content arrives from an agent.

1. On the Classic Home page, click **Alerts!**
2. View and manage your alerts.
   - View the content for an alert.
   - Clear an alert and all its occurrences.
   - Edit the agent that generated the alert, if you have permission to do so.
   - Run the agent that generated the alert, if you have permission to do so.
   - Subscribe to the alert.
   - Clear all your alerts and all their occurrences.

Configure Your Devices and Delivery Profile

You use the Delivery Options tab of the My Account dialog to configure the devices and delivery profiles to be used to reach you when an alert is generated by an agent.

- About Devices and Delivery Profiles
- Configure Your Devices
- Configure Your Delivery Profiles

About Devices and Delivery Profiles

Devices and delivery profiles control how best to reach you when an alert is generated by an agent and on which devices you want to receive the content.

- **Device** — A device is the medium used to deliver content to you. The content of an agent can be delivered to you in different ways, such as, an email or SMS message.
- **Delivery profile** — A delivery profile specifies which devices to use to deliver content to you, based on the priority of the content. You can define several delivery profiles to meet your needs, and switch among them. However, only one profile can be active at any given time.

  For example, you might have an **In the Office** delivery profile that delivers content to an office email, and an **On the Road** profile that delivers content to your cell phone, depending on the priority of the information.

You configure your devices and your delivery profiles from the Delivery Options tab of the My Account dialog.

Your administrator manages the types of devices that are available to you. See Managing the Types of Devices That Deliver Content in *Configuring Oracle Analytics Cloud*.

Depending on the destinations that are specified for an agent, content can be delivered to the:

- Home page and dashboard (Alerts section).
- Active delivery profile or specific devices.

  When the destinations are specific devices, content is delivered to the devices that you have configured rather than to the devices in your active delivery profile. For example, if an agent is defined to be delivered by email devices, then the default email device that you configured is used rather than any email devices that you configured in your active delivery profile.

Delivery content is assigned a specific priority. The default priority is normal. When you select devices for your active profile, you can indicate what priority content should be sent to that device. For example, if you have added a cell phone to your delivery profile, then you might associate it with high priority content only.

Configure Your Devices

You can configure one or more devices where you want alerts to be delivered.

1. On the Classic Home page, click **Signed In As *Your_Username*** and then select **My Account**.
2. Click the **Delivery Options** tab.
3. In the **Devices** area, click **Create Device** to add a device.

   Some agents are set up to deliver alerts according to your active delivery profile but some agents only deliver to specific devices and you define those here. For example, if an agent is set up to deliver to email devices, then the email device that you specify here is used rather than any email devices that you specify in your active delivery profile.
4. For **Name**, enter a name for the device that’s easy to recognize. For example, **My Work Email** or **My Work Mobile**.
5. Select the device category. For example, **Email**.
6. For **Device Type**, specify the type that describes your device.
7. For **Address/Number**, enter the address or number associated with your device. For example, your work email address or work mobile phone number.

Don’t use punctuation such as spaces, dashes, or parentheses when you enter a number.

8. Click **OK** to return to the Deliver Options tab of the My Account dialog.

   The device is displayed in the Devices list for the appropriate category (for example, **Email**).

9. If you want this device to be the default device, then select the **Default** option to the right of the device name.
10. To edit a device, perform the following steps:
    1. Select the device in the list.
    2. Click the **Edit Device** button to display the Edit Device dialog.
    3. Make your edits and click **OK** to return to the Deliver Options tab of the My Account dialog.
11. Click **OK**.

Configure Your Delivery Profiles

You can set up one or more delivery profiles to say where you want alerts to be delivered.

1. On the Classic Home page, click **Signed In As *Your_Username***, and then select **My Account**.
2. Click the **Delivery Options** tab.
3. In the **Delivery Profile** area, click **Create Delivery Profile**.
4. For **Name**, enter a name for the delivery profile that’s easy to recognize. For example, **In the Office** or **On the Road**.
5. For each delivery device you want to use when this is the active profile, select one or more priority options — **High**, **Normal**, or **Low**.

   These priorities are used together with the priority of the delivery content to determine which device the content is delivered to.

   Don’t set the priority for devices that you don’t want to use. Devices that don’t have a priority selected aren’t used by the profile.

6. Click **OK**.
7. If you want this delivery profile to be your active profile, select the **Active** option.

Migrate Content to Other Catalogs

You can copy catalog content from one environment to another using the catalog archive/unarchive options. Archiving saves your content to a `.catalog` file on your local file system. Unarchiving uploads content from catalog files to another catalog location.

Topics

- Save Content to a Catalog Archive
- Upload Content from a Catalog Archive

Save Content to a Catalog Archive

You can copy or move content you create in one environment to another environment using the catalog archive/unarchive feature. Archiving saves a single object or a folder containing multiple objects to a `.catalog` file on your local file system.

You can upload the `.catalog` file at a different location.

1. On the Classic Home page, click **Catalog**.
2. Navigate to the folder or object you want to copy or move to another catalog.

   If you select a folder, all the content in that folder is included in the catalog archive, including any subfolders.
3. Select **More** and then select **Archive**.
4. Select **Keep Permissions** to save the permission settings, if any.

   If you don’t select this option, permissions are excluded. This can be useful if you're migrating content from a test environment and none of the permissions you assigned to test users are required in the production system. When you unarchive, the content inherits permissions from the parent folder on the target system.
5. Select **Keep Timestamps** to save information such as time created, last modified, and last accessed.

   When you unarchive, timestamp information is retained and you can choose to only overwrite items that are older than those in the catalog archive.

   If you don’t select **Keep Timestamps**, the original age of content isn’t saved or considered when you unarchive the content.
6. Click **OK**.
7. Select **Save File**.

   If you want to, change the name of the catalog file.
8. Select a folder and click **Save**.

Upload Content from a Catalog Archive

You can upload content from Oracle Analytics and Oracle BI Enterprise Edition 11.1.1.9.0 or later. Select the catalog folder where you want the content to go, and , if you have BI Consumer permissions, you'll see an **Unarchive** option. Point to a catalog archive, any valid `.catalog` file, to copy its content to this folder.

1. On the Classic Home page, click **Catalog**.
2. Navigate to the folder where you want to unarchive the content of your file.
3. Select **Unarchive**.
4. Click **Browse**. to find the catalog file.
5. New content is always uploaded but you can decide what happens when matching content exists in the target catalog.

   For **Replace**, select one from:

   - **None:** Never overwrite existing content. This is the default setting.
   - **All:** Overwrite existing content, except for content marked Read-Only.

  - **Old:** Overwrite existing content if it's older than the content in the file.
  - **Force:** Overwrite all content, even newer content and content marked Read-Only.
6. Click **OK**.

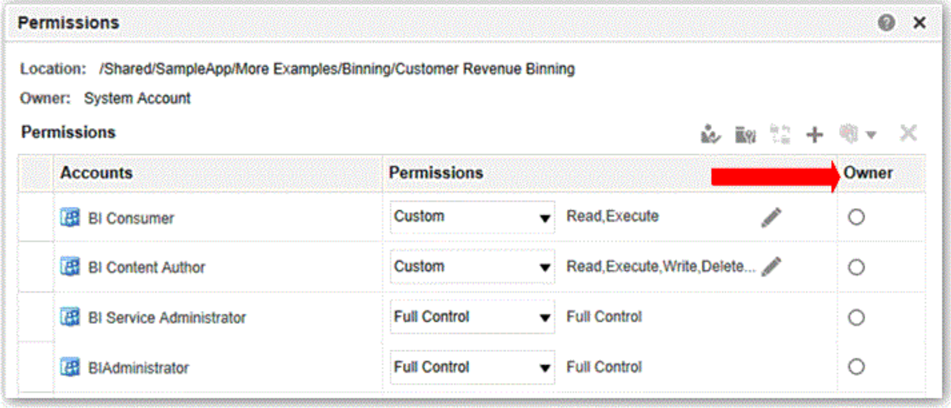
Assign Ownership of Items

When you create content in the catalog, you can grant ownership of the content to others. Also, a user who has been granted the proper privileges can take ownership of content.

For example, you can create a Brand Revenue analysis and grant ownership to a Regional Sales Analyst tasked with maintaining the analysis going forward.

1. On the Classic Home page, click **Catalog**.

   If you're not on the Classic Home page, first click **Open Classic Home** on the toolbar or navigator bar.
2. In the Catalog page, search for the content to which you want to assign ownership.
3. In the search results for the item, click **More** and **Permissions**.
4. In the Permissions table, click the **Owner** column to specify the new owner.



Location: /Shared/SampleApp/More Examples/Binning/Customer Revenue Binning

Owner: System Account

Permissions

Accounts	Permissions		Owner
BI Consumer	Custom	Read,Execute	○
BI Content Author	Custom	Read,Execute,Write,Delete...	○
BI Service Administrator	Full Control	Full Control	○
BIAdministrator	Full Control	Full Control	○

5. Click **OK**.

Assume Ownership of Items

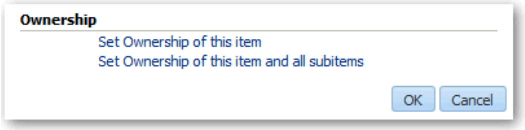
As a user or a member of a role, you can take ownership of shared folder content if you're assigned the BIServiceAdministrator role.

For example, if you're a user of the Sales group, you can assign properties to the Sales Forecast analysis to mark yourself as an owner.

1. On the Classic Home page, click **Catalog**.

   If you're not on the Classic Home page, first click **Open Classic Home** on the toolbar or navigator bar.
2. In the Catalog page, search for the content that you want to own.

3. In the search results for the item, click **More** and **Properties**.


Ownership
Set Ownership of this item
Set Ownership of this item and all subitems
OK
Cancel

4. In the Ownership area, select whether to take ownership of just the item or of the item and its child items.
5. Click **OK**.

Embed External Images and Other External Resources in Your Content

You can embed external images in reports if your administrator considers it safe to do so. If you try to add an image from an unapproved source, an error like this prompts you to contact your administrator.

Your administrator maintains a list of safe domains. For example, if you want embed images from *.example.org, ask your administrator to add this domain to the safe list. See Register Safe Domains.

In addition to images, your administrator can authorize or restrict access to other web resources, such as frames, scripts, fonts, stylesheets, audio, video, connections.

Access Your Reporting Content in Smart View

Oracle Smart View for Office (Smart View) provides a common Microsoft Office interface designed specifically for Oracle's Enterprise Performance Management (EPM) and Business Intelligence (BI).

Using Smart View, you can view, import, manipulate, distribute and share data in Microsoft Excel, Word and PowerPoint interfaces. It’s a comprehensive tool for accessing and integrating EPM and BI content from Microsoft Office products.

Perform Advanced Catalog Management

You can use the Catalog page in Classic view in Oracle Analytics to perform most management tasks for your catalog.

If you want to perform advanced tasks, you can deploy Catalog Manager on a local Windows machine. For example, Catalog Manager enables you to create advanced catalog reports and diagnose catalog issues by viewing the underlying XML code of catalog objects.

Topics:

- Deploy Catalog Manager
- Create Reports to Display Catalog Data Using Catalog Manager
- View Catalog Objects in XML
- Edit Catalog Objects in XML

Deploy Catalog Manager

You deploy Catalog Manager on a local Windows machine.

If you've already downloaded and installed the Developer Client Tool, you can skip Step 1.

1. Download Oracle Analytics Developer Client Tool from Oracle Technology Network. See Download and Install Analytics Client Tools for Oracle Analytics.
2. In your Oracle Analytics instance, navigate to the Catalog page in the Classic view, and copy the URL. For example, `https://biupg12345oac-oacp1ccm12345-analytics.ocp.oc-test.com/analytics/saw.dll?catalog`.

   You'll use part of this URL when you log into Catalog Manager.
3. On the machine where you installed the Developer Client Tool, from the Windows Start menu click **Oracle Business Intelligence Client**, the **<Name of Oracle Home>**, then **Catalog Manager**.
4. In Catalog Manager, click **File**, then **Open Catalog**.
5. Specify the following:
   - **Type** - Choose **Online**.
   - **URL** - Paste in the URL that you copied in Step 2 with `?catalog` removed from the end.
     For example, if your URL is `https://biupg12345oac-oacp1ccm12345-analytics.ocp.com/analytics/saw.dll?catalog`, change it to `https://biupg12345oac-oacp1ccm12345-analytics.ocp.com/analytics/saw.dll`.
   - **User** and **Password** - enter the credentials of a user with admininstrator privileges.
   - **View Only Mode** - we recommend that you click this option to avoid making changes to the catalog. If you want to make changes, we recommend that you archive the catalog first so that you can restore it if necessary.

Download and Install Analytics Client Tools for Oracle Analytics

Download and install Analytics Client Tools if you want to manage and develop your data models, or enable remote connections from reporting dashboards and analyses. You install Analytics Client Tools on a Windows machine on the same network as your database. The software pack installs Model Administration Tool, Catalog Manager, and Job Manager.

1. Download the latest Analytics Client Tools for Oracle Analytics.
   a. Navigate to:

      Download page for Analytics Client Tools for Oracle Analytics Cloud.
   b. To start the download, click the **Oracle Analytics Client Tools** link for the version that matches your Oracle Analytics version.
   c. Accept the Oracle license agreement if prompted, and click the download link to download the software to your local machine.
2. Install Analytics Client Tools.

   a. From the downloaded ZIP file, extract the `setup_bi_client-<version number>-win64.exe` file.
   b. In the local download area, double-click the `setup_bi_client-<version number>-win64.exe` file to start the installer.
   c. Follow the on-screen instructions.

To start the applications, from the Windows Start menu, click **Oracle Analytics Client Tools**, then select the application name. For example, to start the Developer Client Tool, click **Model Administration Tool**.

Create Reports to Display Catalog Data Using Catalog Manager

You can create reports to display catalog data for catalog objects. You can either display the report on the screen or save it to a file. For example, you might create a report that shows the SQL statement that is sent to Oracle Analytics for each object.

When you create a report, a blank or empty field is exported as a tab character. If you create a report with the default of a tab as the field separator, then two tab characters in the report file indicate a blank field.

1. In Catalog Manager, select the top folder for the catalog.
2. From the **Tools** menu, select **Create Report**.
3. Select the catalog object type for which you want to create a report.
4. To eliminate any rows that are the same from the report, select the **Distinct** box.
5. Specify the columns to be displayed in the report in the Columns in Report list. Use the left and right-arrow buttons (< and >) to move the columns between the Available Columns list and the Columns in Report list, and the plus and minus buttons (+ and -) to set the order in which columns are displayed in the report.
6. Click **OK**.
7. Repeat Steps 4 through 7 until the report contains the appropriate columns.
8. To save the report to a file, in the **Save report to** field, specify the path name of the file. Click the **Browse** button to display the Save As dialog for selecting the path name (if the file does not exist, then it is created).
9. Select **Excel Format** to create a file with a .tab extension that can be imported into Microsoft Excel.
10. Click **OK**.

When you create a report and export it, blank or empty fields are exported as a tab character. If you also use a tab character as the field separator, blank fields display as two tab characters.

Sample Uses for Reports

You can use reports from Catalog Manager to maintain data within the instance and to identify issues before they become problematic.

For example, you can:

- Find out which dashboards are using an analysis. Create a Dashboard report including analyses, and search that report for the analysis.

- Find out which analyses are affected by a changed column in a repository table. Create an Analysis report that includes all columns and formulas, and then search the report for the items that must then be replaced in Catalog Manager.
- Find out which dashboard prompts and related fields (such as column, formula, and subject area) are used in dashboards. Create a report of analyses and extract the filters that are used within those analyses. The following is an example of extracting filters in which the formula is derived using a saved filter that is prompted:

  Example: "Markets"."Region" [Filter, prompted]
- Find out the ACLs for objects. By reviewing the ACLs in the report, you can verify that access to objects is granted to the proper roles with the proper permissions, such as Read/Write. For example, to show ACLs, specify:

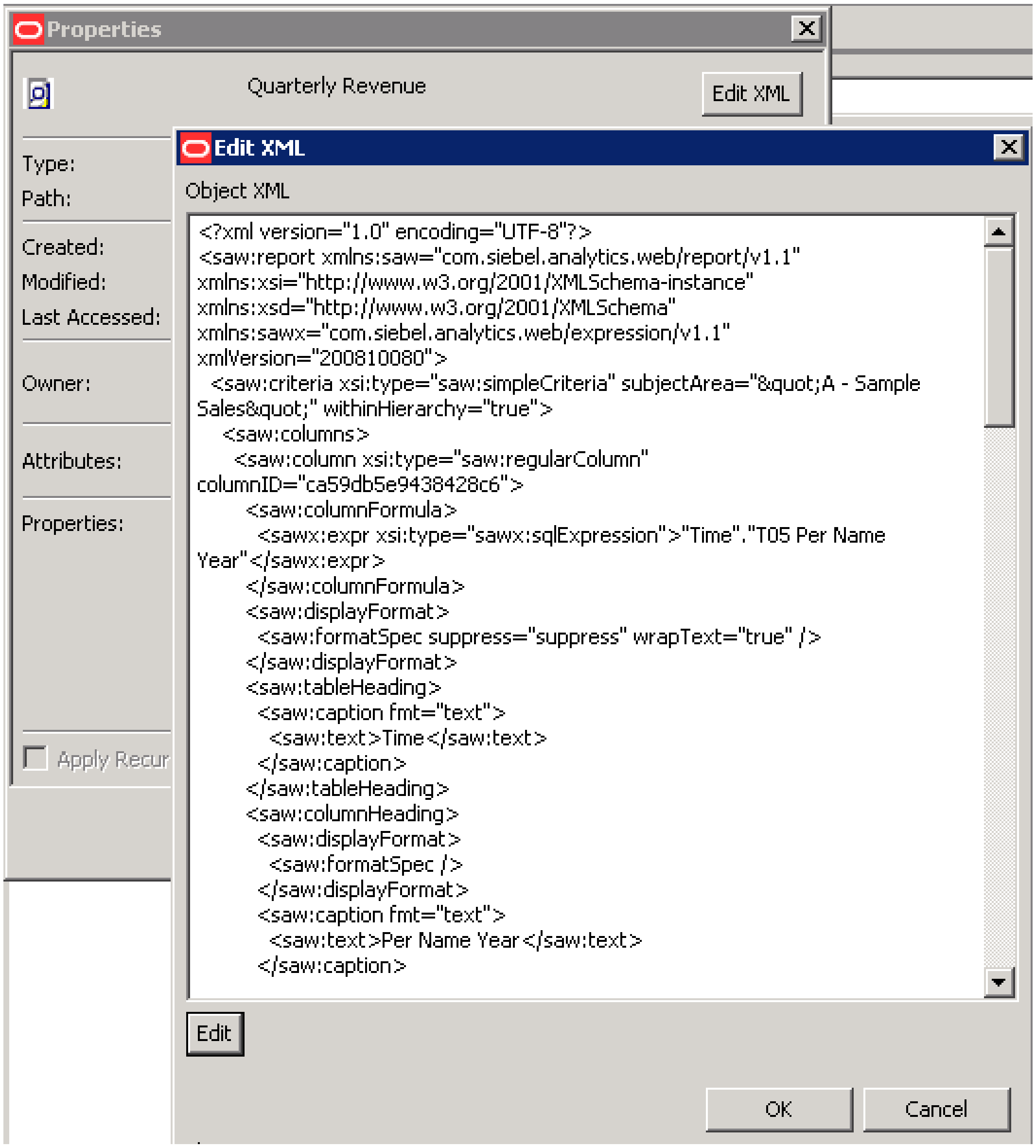
  `^biconsumer=RX:steve=F`, where the caret (^) indicates an application role.

View Catalog Objects in XML

In Catalog Manager, you can view the XML description of catalog objects such as analyses, dashboards, filters, and so on.

1. In Catalog Manager, navigate to the object.
2. Right-click the object in the Name column and select **Properties**.
3. Click **Edit XML**.
4. When you have finished viewing the XML definition, click **Cancel**.
5. Click **OK** in the Properties dialog.

The illustration shows sample XML code in Catalog Manager for an object.



```
<?xml version="1.0" encoding="UTF-8"?>
<saw:report xmlns:saw="com.siebel.analytics.web/report/v1.1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:sawx="com.siebel.analytics.web/expression/v1.1"
xmlVersion="200810080">
  <saw:criteria xsi:type="saw:simpleCriteria" subjectArea="&quot;A - Sample
Sales&quot;" withinHierarchy="true">
    <saw:columns>
      <saw:column xsi:type="saw:regularColumn"
columnID="ca59db5e9438428c6">
        <saw:columnFormula>
          <sawx:expr xsi:type="sawx:sqlExpression">"Time"."T05 Per Name
Year"</sawx:expr>
        </saw:columnFormula>
        <saw:displayFormat>
          <saw:formatSpec suppress="suppress" wrapText="true" />
        </saw:displayFormat>
        <saw:tableHeading>
          <saw:caption fmt="text">
            <saw:text>Time</saw:text>
          </saw:caption>
        </saw:tableHeading>
        <saw:columnHeading>
          <saw:displayFormat>
            <saw:formatSpec />
          </saw:displayFormat>
          <saw:caption fmt="text">
            <saw:text>Per Name Year</saw:text>
          </saw:caption>
```

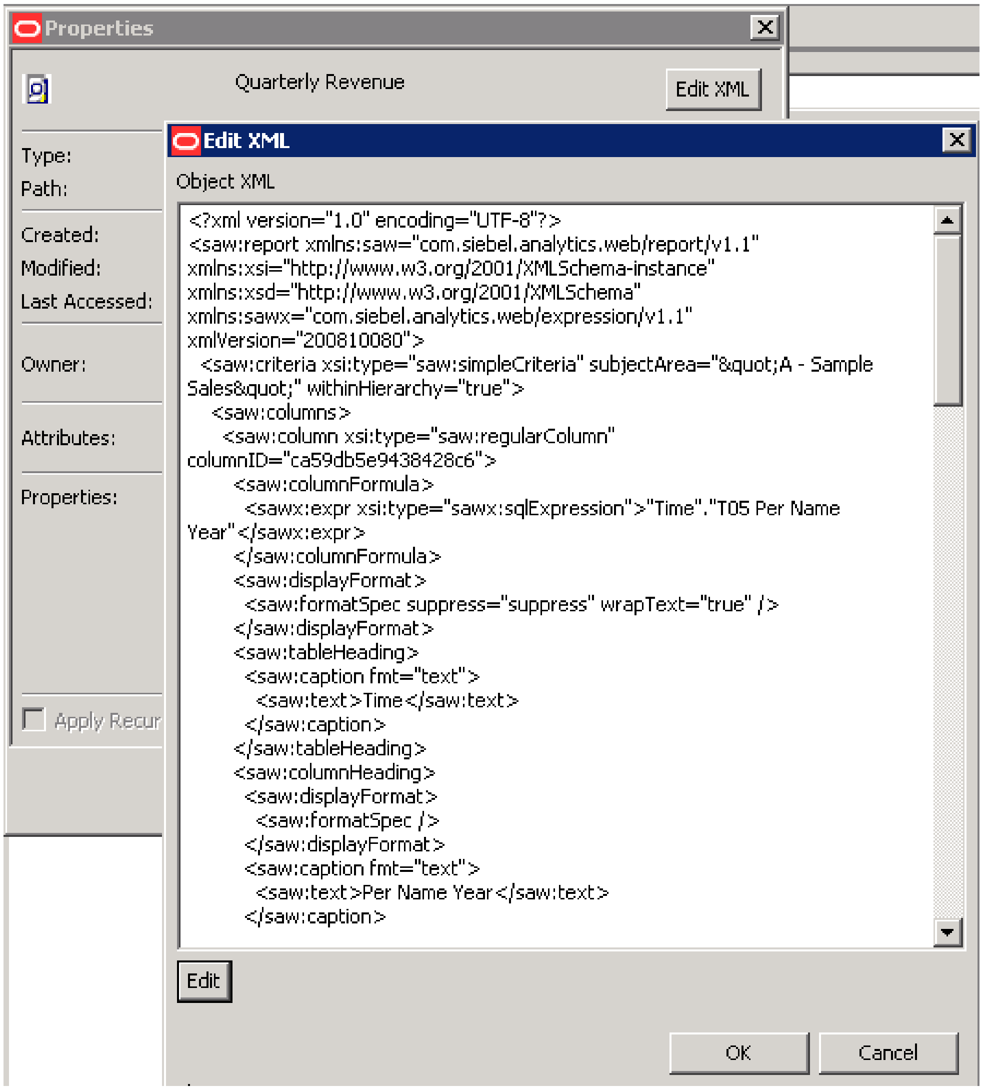
Edit Catalog Objects in XML

In Catalog Manager you can edit the XML description of catalog objects such as analyses, dashboards, filters, and so on.

When you edit the XML description of an object, Catalog Manager checks that the XML is well-formed, but it doesn't validate the content. Before you start, backup your catalog so that you can restore it if necessary.

1. In Catalog Manager, navigate to the object that you want to edit.

2. Right-click the object in the Name column and select **Properties**.



```
<?xml version="1.0" encoding="UTF-8"?>
<saw:report xmlns:saw="com.siebel.analytics.web/report/v1.1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:sawx="com.siebel.analytics.web/expression/v1.1"
xmlVersion="200810080">
  <saw:criteria xsi:type="saw:simpleCriteria" subjectArea="&quot;A - Sample
Sales&quot;" withinHierarchy="true">
    <saw:columns>
      <saw:column xsi:type="saw:regularColumn"
columnID="ca59db5e9438428c6">
        <saw:columnFormula>
          <sawx:expr xsi:type="sawx:sqlExpression">"Time"."T05 Per Name
Year"</sawx:expr>
        </saw:columnFormula>
        <saw:displayFormat>
          <saw:formatSpec suppress="suppress" wrapText="true" />
        </saw:displayFormat>
        <saw:tableHeading>
          <saw:caption fmt="text">
            <saw:text>Time</saw:text>
          </saw:caption>
        </saw:tableHeading>
        <saw:columnHeading>
          <saw:displayFormat>
            <saw:formatSpec />
          </saw:displayFormat>
          <saw:caption fmt="text">
            <saw:text>Per Name Year</saw:text>
          </saw:caption>
```

3. Click **Edit XML**, then **Edit**.
4. Make the changes in the **Object XML** area.
5. Click **OK** in the Edit XML dialog.
6. Click **OK** in the Properties dialog.

19

Use BI Composer to Analyze Your Data

This chapter describes how to use BI Composer to quickly and easily create, edit, and view analyses.

Topics:

- What Is BI Composer?
- Where Is BI Composer Available?
- Compare the Analysis Editor and BI Composer
- Create or Edit an Analysis in BI Composer
- Create Analyses Using BI Composer
- Edit Analyses Using BI Composer
- View Analyses in BI Composer
- Edit Analyses Created in Analysis Editor

What Is BI Composer?

BI Composer is a simple-to-use wizard that allows you to create, edit, or view analyses without the complexities of the Analysis editor.

There are two modes in which BI Composer is available — regular mode and accessibility mode. Accessibility mode has the same functionality as regular mode but is optimized for use with screen reader applications such as JAWS. It makes it easier for users with accessibility needs to create, edit, and view analyses.

> **Note:**
>
> Visual cues, such as icons or check boxes, displayed on a wizard page in accessibility mode are the same as displayed in regular mode. Even though the list of text-based wizard page links is not displayed on a wizard page in accessibility mode, screen reader applications such as JAWS are able to read them.

The main components of the BI Composer wizard are:

- At the top of the wizard is the BI Composer train, which contains buttons for each step in the wizard.
- On the left are the Catalog and Subject Areas tabs. These tabs are available only when BI Composer is part of an ADF application or Oracle WebCenter Portal Framework application or WebCenter Portal.
- To the right of the tabs is the panel area, where the components for each step are displayed.
- To the far right are the **Back**, **Next**, **Finish**, and **Cancel** buttons.

Create or Edit an Analysis in BI Composer

Set up or update an analysis in BI Composer using these steps.

- **Select Columns** — Select the columns to include in the analysis. You can also:
  - Specify column interactions
  - Specify a column formula
  - Rename a column
  - Hide a column

  See BI Composer wizard -- Create Analysis: Select Columns panel for additional information.
- **Select Views** — Select the views to include in the analysis, such as a title, table, pivot table, bar graph, and so on. (Not all views available in Oracle Analytics Server are supported in BI Composer.) You can also preview the results and display the associated XML code.
- **Edit Table** — Edit the layout of the tabular view (if you have included a tabular view). For example, you can create prompts, use a column to section the analysis, and exclude certain columns from the tabular view. You can also preview the results.
- **Edit Graph** — Edit the properties and layout of the graph (if you have included a graph view). For example, you can create prompts, use a column to section the analysis, and exclude certain columns from the graph. You can also preview the results.
- **Sort and Filter** — Apply sorting and filters to the views. You can also preview the results.
- **Highlight** — Apply conditional formatting to the tabular view (if you have included a tabular view). You can also preview the results.

Create Analyses Using BI Composer

You can access BI Composer in multiple ways.

1. In Oracle Analytics:
   a. In the global header, click **New**, then **Analysis**.
   b. Select a subject area. The BI Composer wizard is displayed in a new window.
2. In other applications (such as an ADF application):
   a. Click the **Subject Areas** tab.
   b. Select a subject area.
   c. Click **Create**.
3. In the Select Columns panel, select the columns to include in the analysis. For each column that you want to add:
   a. Select the column in the Subject Areas list.
   b. Click **Add** to move it to the Selected Columns list.

If you want to add or remove subject areas from which to select columns, click the **Add** button in the Subject Area: *Subject_Area_Name* area to display the Add/Remove Subject Areas dialog.

4. Click the **Select Views** button in the BI Composer train at the top of the wizard.
5. In the BI Composer wizard -- Create Analysis: Select Views panel, specify the views to include.
6. Click the **Save** button in the BI Composer train.
7. In the BI Composer wizard -- Create Analysis: Save panel, save the analysis with the same name or with a different name by specifying the save criteria and then clicking **Submit**.

Oracle WebLogic Scripting Tool

Edit Analyses Using BI Composer

BI Composer is a simple-to-use wizard that allows you to create, edit, or view analyses.

You edit an analysis using BI Composer when you:

- Edit an analysis from the Catalog page or from the **Recent** section or the **Most Popular** section of the Home page
- Edit an analysis from within a dashboard

In other applications (such as an ADF application), you select an analysis to edit directly from the BI Composer wizard.

1. Edit the analysis in one of the following ways:
    - From the Catalog or Home page, navigate to the analysis and click **Edit**. The BI Composer wizard is displayed.
    - From the BI Composer wizard, click the **Catalog** tab, select the analysis, and click **Edit**.
2. Make the changes to the analysis by navigating the steps of the wizard using the buttons in the BI Composer train at the top of the wizard, and save your changes.

View Analyses in BI Composer

You can format analyses so they are optimized for BI Composer.

If you are working in BI Composer in an application other than Oracle Analytics (such as an ADF application), then you can display an analysis for viewing in BI Composer. In Oracle Analytics, simply use the Analysis editor.

1. Click the **Catalog** tab.
2. Select the analysis.
3. Click **View**. The analysis is displayed for viewing to the right of the Catalog tab.

Edit Analyses Created in Analysis Editor

The analysis editor enables you to use more powerful analytics features that aren't in BI Composer, such as:

- Conditional format
- Excluded columns
- Filters
- Prompts
- Sections
- Slices for pie graphs
- Sorts
- Title
- Vary measure by color and points for scatter graphs

If you edit an analyses in BI Composer, you might receive an error message stating that there are incompatible elements in the analysis.

This message can occur for a variety of reasons. For example:

- Green bar formatting has been applied to the analysis.
- An incompatible graph view such as, gauge or performance tile, is part of the analysis.
- An incompatible view such as, selection step or filter, is part of the analysis.
- Duplicate view type exists. For example, if the analysis contains a table, pivot table, pie graph, and bar graph, only one table and one graph are converted in BI Composer. The table or pivot table is converted as a summary table and the graph defaults to the first compatible graph type in the analysis.

To edit an analysis using BI Composer when you have received an incompatibility error message:

1. Click **Show details** to view the messages.
2. Examine the messages.
3. When you are sure that you want to proceed, click **Yes.** The BI Composer wizard -- Create Analysis: Edit Graph panel displays.

Where Is BI Composer Available?

You can access BI Composer in several areas

BI Composer is available in:

- Oracle Analytics Server (if your organization has installed and configured it).
- Any ADF application that has been modified to integrate with Oracle Analytics Server.
- Oracle WebCenter Portal Framework application or WebCenter Portal that has been modified to integrate with Oracle Analytics Server.

Availability of BI Composer in Oracle Analytics Server

When users work with analyses in Oracle Analytics Server, BI Composer may be displayed in place of the Analysis editor, depending on the preferences users make as follows:

- BI Composer is displayed in regular mode in place of the Analysis editor, when users have specified that they want to use the BI Composer wizard as the analysis editor and have turned off accessibility mode in Oracle Analytics Server.
- BI Composer is displayed in accessibility mode in place of the Analysis editor, when users have turned on accessibility mode in Oracle Analytics Server.

Users:

- Specify that they want to use the BI Composer wizard as the analysis editor by selecting the **Wizard (limited functionality)** option for the **Analysis editor** component in the Preferences tab of the My Account dialog.
- Turn accessibility mode on or off by selecting or deselecting the **Accessibility Mode** box in the Sign In page or by selecting **On** or **Off** for the **Accessibility Mode** component in the Preferences tab of the My Account dialog.

Compare the Analysis Editor and BI Composer

The Analysis editor provides additional editorial tools compared to BI Composer’s more simple analysis features.

The Analysis editor and BI Composer share a similar purpose, in that both are analytical components that power intelligent business process decision making. Collaboration fueled through exploration, analysis, sharing, and visualizations, allows business users at all levels to glean insight into data. BI Composer and the Analysis editor differ however, in that BI Composer is more suitable for simple analyses that do not contain advanced analytic functions such as calculated items, selection steps, and multiple conditions. Sophisticated and highly structured analyses should be edited by using the Analysis editor.

What Types of Views Can I Work with in BI Composer?

BI Composer allows you to quickly and simply create or edit analyses.

The table describes the views with which you can work and the options available in BI Composer to enhance the analyses.

View or Option	Description
Table	You can have a table, summary table, pivot table, or summary pivot table. A table can have prompts and sections.

View or Option	Description
Graph	You can have various types of graphs: • Bar - Vertical, horizontal, vertical stacked, horizontal stacked, 100% vertical stacked, or 100% horizontal stacked • Line • Scatter • Pie • Line-Bar A graph can have various sections: • Prompts • Sections • Group By • Vary Color By • Slices (for a pie graph) • Points (for a scatter graph)
Conditional formatting	See the BI Composer wizard -- Create Analysis: Highlight panel for information.
Column formula	See the BI Composer wizard -- Create Analysis: Select Columns panel for information.
Filter	See the BI Composer wizard -- Create Analysis: Sort and Filter panel for information.
Interaction	Allows you to specify what happens when you click a value. You can drill, navigate to a transaction, or do nothing by specifying None.
Sort	See the BI Composer wizard -- Create Analysis: Sort and Filter panel for information.

Part IV

Reference

This part provides reference information.

Topics:

- Frequently Asked Questions
- Troubleshoot
- Data Preparation Reference
- Expression Editor Reference
- Embed Analytics Content into Applications and Web Pages

20

Frequently Asked Questions

This reference provides answers to frequently asked questions about visualizing and reporting data.

Topics:

- What's the maximum size map layer file that I can upload?
- When I want to save an object, where does the default location come from?
- Can I enable other users to access my analyses, dashboards, and projects?
- Can I make analyses and dashboards interact with prompts and other analyses?
- I have interacted with a dashboard drilling and applying filters. How do I save the state of my dashboard and share the dashboard with others?
- How do I remove the Diagnose link displayed on my analyses and dashboards?
- Can I migrate analyses between different environments?
- Can I change default logo and dashboard style?
- Why are background map images not included in exported images in PDF, PPT, PNG, and print?
- Why do some users have permissions that I didn't assign?

FAQs to Explore and Report

This topic provides frequently asked questions about exploring and reporting data.

What are the display limits for prompts?

Prompt Limits	Limit	More Information
Maximum number of choice values	1000	Applies to: • Choice lists, check boxes, list boxes, and radio buttons in prompts. • List of values displayed in the Select Values dialog when you select the Search option in a prompt values list.
Maximum number of default values	1000	Applies to dashboard prompts.

What's the maximum size map layer file that I can upload?

The maximum file size that you can upload is 25MB.

When I want to save an object, where does the default location come from?

You can save any object in any location. However, the **Save In** field in the Save dialog sometimes recommends the best location based on the object type that you’re saving. For example, you should save filters, groups, and calculated items within a subject area folder so that these items are available when you build an analysis for the same subject area. If a subject area folder doesn’t exist in your `/My Folders` or within `/Shared Folders`, then a subject area folder is created automatically. The **Save In** field defaults a save path to `/My Folders/Subject Area Contents/<subject area>`; however, the dialog's Folders area displays all instances of the subject area folder in the catalog.

You can save other objects such as analyses and prompts in any folder. Bear in mind the distinctions between shared and personal folders, when deciding whether to share the object that you’re saving with others.

Can I enable other users to access my analyses, dashboards, and projects?

Yes. To enable other users to access your analyses, dashboards, and projects, move or save the analysis, dashboard, or project to a shared folder and then give other users the required access permissions. See Assign Access Permissions and Assign Shared Folder and Project Permissions.

Can I make analyses and dashboards interact with prompts and other analyses?

Yes, analyses and dashboards interact with prompts. See Advanced Techniques: How Dashboard Prompts and Analysis Prompts Interact. You can link views such that one view drives changes in one or more other views. See Linking Views in Master-Detail Relationships.

I have interacted with a dashboard drilling and applying filters. How do I save the state of my dashboard and share the dashboard with others?

You can save and get back the settings that you make on a dashboard. See Save and Restore Dashboard State. You can share dashboard pages with other users by sharing links to those pages. See Link to Dashboard Pages.

How do I remove the Diagnose link displayed on my analyses and dashboards?

In Classic view, sign in as a user with the BI Service Administrator role and set the value of the configuration setting **Diagnose BI Server Query** to **Denied**. You can find this setting under **Administration\ Security - Manage Privileges\Admin: General**.

Tip: To access the Administration page you click the *user* **My Profile** icon, then **Administration**.

Can I migrate analyses between different environments?

Yes. You can migrate analyses between service environments by copying and pasting the XML code for the analyses using the Advanced tab of the analysis editor. See Advanced Techniques: Examining the Logical SQL Statements for Analyses.

Can I change default logo and dashboard style?

Yes. On the Dashboard Properties page, choose a predefined theme that includes a custom logo from the **Style** list. Administrators create these themes and make them available to dashboard builders.

Why don't I see images from background maps when I print pages or when I export images in formats such as PDF, PPT, and PNG?

You or a visualization builder might have added an image to a background map by referencing that image with a URL. For the image to print or be exported in various formats, the external website hosting that image must have the Access-Control-Allow-Origin header from the host server. If a map background includes an image reference that's taken from an external website that doesn't have this header, you won't see the image.

For more information about this header, see `https://www.w3.org/wiki/CORS_Enabled`

Why do some users have read permissions that I didn't assign?

If you save or move a report, dashboard, or project containing an artifact (for example, a data set) to a shared folder, and when prompted you share the related artifacts, then Oracle Analytics assigns the artifacts read permissions for the users who can access the report, dashboard, or project in the shared folder.

Without the read permission, users won't be able to access the correct content when they open the report, dashboard, or project.

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Troubleshoot

This topic describes common problems and how to solve them.

Topics:

- Troubleshoot General Issues
- Troubleshoot Issues with Projects, Analyses, and Dashboards
- Troubleshoot Visualization Issues

Troubleshoot General Issues

This topic describes common problems that you might encounter and explains how to solve them.

I can’t access certain options from the Home page

Check with your administrator to ensure that you have the correct permissions to access the options that you need.

I see a performance decrease when using Mozilla Firefox

If you use Mozilla Firefox and notice a decrease in the performance of the cloud service, then ensure that the **Remember History** option is enabled. When Firefox is set to not remember the history of visited pages, then web content caching is also disabled, which greatly affects the performance of the service. See Firefox documentation for details on setting this option.

I'm having trouble uploading data from a spreadsheet (XLSX) exported from Microsoft Access

Open your spreadsheet in Microsoft Excel and resave it as an Excel Workbook (*.xlsx).

When you export spreadsheets from other tools the file format can vary slightly. Saving your data again from Microsoft Excel can fix this.

My analysis or project times out

You attempt to run an analysis or project and find that it times out. You see a message similar to this:

```
[nQSError: 60009] The user request exceeded the maximum query governing
execution time.
```

This message is displayed when an Oracle Analytics query spends more than the allotted time communicating with the data source. For performance reasons, the limit for a single query to run is 10 minutes.

Try running the query again. To prevent this error, avoid long running queries.

> **Note:**
>
> For direct connections to Oracle Database, the query limit automatically extends to 60 minutes to accommodate occasional, longer running queries. To avoid excessive loads on the database, Oracle Analytics restricts the number of queries that are allowed to automatically extend at any one time. If your analysis or project connects to any other data source or connects to an Oracle Database indirectly through Data Gateway, the query limit is *always* 10 minutes; the limit doesn't extend beyond 10 minutes.

Troubleshoot Issues with Projects, Analyses, and Dashboards

This topic describes common problems that you might encounter when using projects, analyses and dashboards, and explains how to solve them.

I can’t see data in an analysis or project

You open an analysis or project, but you don’t see any data in it.

There might be some temporary issue with the database. Contact your administrator for assistance.

You might not have the permissions needed to access the data. Contact the object's owner or administer and ask them to check your access permissions. You'll need read permissions to the analysis or project and any artifacts included in the analysis or project (for example, a data set).

I can’t access a particular analysis, dashboard, or project

You attempt to display an analysis, dashboard, or project and find that you don’t have access.

Typically you can’t access an analysis, dashboard, or project if you lack the appropriate permissions or application role for accessing it. Contact the owner of the analysis, dashboard, or project or your administrator for assistance in obtaining the proper permissions or application role.

I can’t find an analysis, dashboard, or project

Try searching the catalog. You can search for analyses, dashboards, or projects by name (full or partial) and by folder location. The search isn’t case-sensitive. Searches of the catalog return only those objects that you have permission to see.

Contact your administrator if you still can’t find an analysis, dashboard, or project and you suspect that it was deleted by mistake. Your administrator can restore earlier versions of the catalog from recent snapshots, if required.

The analysis or project is running very slowly

You attempt to run an analysis or project and find that it takes a long time.

Various underlying circumstances can cause an analysis or project to run slowly. Contact your administrator and ask that he review log files associated with the analysis or project. After reviewing the log files with the administrator, make the appropriate adjustments in the analysis or project.

The analysis or project returned data that I didn’t expect

Various underlying circumstances can cause an analysis or project to return unexpected results. For an analysis, in the Subject Areas pane of the Criteria tab, click **Refresh** to ensure that you’re seeing the most recent information. For a project, refresh the source data.

I don’t understand why my analysis or project shows a view display error

When you display an analysis or project, you might see a message such as the following: "View Display Error. Exceed configured maximum number of allowed input records." This message indicates that you've selected more data than can be displayed in a view of that type. Add one or more filters to the analysis or project to reduce the amount of data. For example, add a filter that specifies a date range of only a few years.

The matched Year columns for a subject area and external data source don’t work properly

This mismatch is generic to a column that contains numbers but that should be handled as if it contains characters. Microsoft Excel typically sets the data type of a column that contains only numbers to numeric. Numbers are then prefixed with a single quote that creates the problem of an added space at the start of the number. In the case of matches and filters, this leading space causes the match to fail.

To work around this issue, create a formula that concatenates a zero-length string (single quotes with nothing between them) to the column with the number. For example, if the column with numbers is in column A, you create a string equivalent by adding a column for each cell with the formula `=concatenate(A2,’’), =concatenate(A3,’’).`

Troubleshoot Visualization Issues

This topic describes common problems that you might encounter when working with visualizations and explains how to solve them.

When I import a project, I get an error saying something went wrong and I'm unable to import my .dva file

This message displays because one or more data sources use a connection with the same name as a connection you're trying to import. Delete these data sources.

When I import a project, I get an error stating that the project, data source, or connection already exists

When you’re trying to import a project, you might receive the following error message:

“There is already a project, data source or connection with the same name as something you’re trying to import. Do you want to continue the import and replace the existing content?”

This error message is displayed because one or more of the components exported with the project is already on your system. When a project is exported, the outputted .DVA file includes the project’s associated data sources and connection string. To resolve this error, you can either click **OK** to replace the components on your system, or you can click **Cancel** and go into your system and manually delete the components.

This error message is also displayed when the project you're trying to import contains no data. When you export a project without data, the project's and data sources' metadata are included in the .DVA. To resolve this issue, you can click **OK** to replace the components on your system, or you can click **Cancel** and go into your system and manually delete the data source or connection that's causing the error.

I have issues when I try to refresh data for file-based data sources

Keep in mind the following requirements when you refresh data for Microsoft Excel, CSV, or TXT data sources:

- To refresh an Excel file, ensure that the newer spreadsheet file contains a sheet with the same name as the original file you uploaded. If a sheet is missing, then you must fix the file to match the sheets in the original uploaded file.
- If the Excel, CSV, or TXT file that you reload is missing some columns, then you'll get an error stating that your data reload has failed. If this happens, then you must fix the file to match the columns in the original uploaded file.
- If the Excel, CSV, or TXT file you used to create the data source was moved or deleted, then the connection path is crossed out in the Data Source dialog. You can reconnect the data source to its original source file, or connect it to a replacement file, by right-clicking the data source in the Display pane and in the Options menu select **Reload Data**. You can then browse for and select the file to load.
- If you reloaded an Excel, CSV, or TXT file with new columns, then the new columns are marked as hidden and don't display in the Data Panel for existing projects using the data set. To unhide these columns, click the **Hidden** option.

Your Excel spreadsheets must have a specific structure. See About Adding Spreadsheets or Other Data Files.

I can't refresh data from a MongoDB data source

The first time you connect to MongoDB, the MongoDB driver creates a cache file. If the MongoDB schema was renamed and you try to reload a MongoDB data source or use the data source in a project, then you might get an error or Oracle Analytics doesn't respond.

To correct this error, ask your administrator to clear the MongoDB cache.

The visualizations that I embedded into a custom application or web page don't render correctly

If the visualizations aren't rendering correctly, then view or open the application or web page's HTML page and confirm that the DOCTYPE declaration exists and is set to <!DOCTYPE html>. See Prepare the HTML Page.

22

Data Preparation Reference

This topic describes the set and types of recommendation and options you can use to perform data transform changes to a data set.

Topics:

- Transform Recommendation Reference
- Column Menu Options for Quick Data Transformations

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.
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.

Option	Description
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.

Options	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.
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. Oracle 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.

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Expression Editor Reference

This section describes the expression elements that you can use in the Expression Editor.

Topics:

- SQL Operators
- Conditional Expressions
- Functions
- Constants
- Types

Data Model Objects

You can use data model objects in expressions, like time levels, dimension columns, and fact columns.

To reference a data model object, use the syntax:

`"Fact/Dimension Table Name"."Column Name"`

For example: `"Order Metrics"."Booked Amount"-"Order Metrics"."Fulfilled Amount"`

The Expression Elements section includes only items that are relevant for your task, so not all fact tables and dimension tables might be listed. Similarly, time hierarchies are included only if the Time fact table is joined to the current table.

SQL Operators

SQL operators are used to specify comparisons between expressions.

You can use various types of SQL operators.

Operator	Example	Description	Syntax
BETWEEN	`"COSTS"."UNIT_COST" BETWEEN 100.0 AND 5000.0`	Determines if a value is between two non-inclusive bounds. `BETWEEN` can be preceded with `NOT` to negate the condition.	`BETWEEN [LowerBound] AND [UpperBound]`
IN	`"COSTS"."UNIT_COST" IN(200, 600, 'A')`	Determines if a value is present in a set of values.	`IN ([Comma Separated List])`
IS NULL	`"PRODUCTS"."PROD_NAME" IS NULL`	Determines if a value is null.	`IS NULL`

Operator	**Example**	**Description**	**Syntax**
LIKE	`"PRODUCTS"."PROD_NAME" LIKE 'prod%'`	Determines if a value matches all or part of a string. Often used with wildcard characters to indicate any character string match of zero or more characters (%) or any single character match (_).	`LIKE`
+	`(FEDERAL_REVENUE + LOCAL_REVENUE) - TOTAL_EXPENDITURE`	Plus sign for addition.	`+`
-	`(FEDERAL_REVENUE + LOCAL_REVENUE) - TOTAL_EXPENDITURE`	Minus sign for subtraction.	`-`
* *or* X	`SUPPORT_SERVICES_EXPENDITURE * 1.5`	Multiply sign for multiplication.	`*` `X`
/	`CAPITAL_OUTLAY_EXPENDITURE/ 1.05`	Divide by sign for division.	`/`
%		Percentage	`%`
||	`STATE|| CAST(YEAR AS CHAR(4))`	Character string concatenation.	`||`
(	`(FEDERAL_REVENUE + LOCAL_REVENUE) - TOTAL_EXPENDITURE`	Open parenthesis.	`(`
)	`(FEDERAL_REVENUE + LOCAL_REVENUE) - TOTAL_EXPENDITURE`	Close parenthesis.	`)`
>	`YEAR > 2000 and YEAR < 2016 and YEAR <> 2013`	Greater than sign, indicating values higher than the comparison.	`>`
<	`YEAR > 2000 and YEAR < 2016 and YEAR <> 2013`	Less than sign, indicating values lower than the comparison.	`<`
=		Equal sign, indicating the same value.	`=`

Operator	Example	Description	Syntax
>=		Greater than or equal to sign, indicating values the same or higher than the comparison.	>=
<=		Less than or equal to sign, indicating values the same or lower than the comparison.	<=
<>	`YEAR > 2000 and YEAR < 2016 and YEAR <> 2013`	Not equal to, indicating values higher or lower, but different.	<>
,	`STATE in ('ALABAMA','CALIFORNIA')`	Comma, used to separate elements in a list.	`,`

Conditional Expressions

You use conditional expressions to create expressions that convert values.

The conditional expressions described in this section are building blocks for creating expressions that convert a value from one form to another.

Follow these rules:

- In `CASE` statements, `AND` has precedence over `OR`.
- Strings must be in single quotes.

Expression	Example	Description	Syntax

CASE (If)	`CASE`
	`WHEN score-par < 0 THEN 'Under Par'`
	`WHEN score-par = 0 THEN 'Par'`
	`WHEN score-par = 1 THEN 'Bogey'`
	`WHEN score-par = 2 THEN 'Double Bogey'`
	`ELSE 'Triple Bogey or Worse'`
	`END`
		Evaluates each `WHEN` condition and if satisfied, assigns the value in the corresponding `THEN` expression.
		If none of the `WHEN` conditions are satisfied, it assigns the default value specified in the `ELSE` expression. If no `ELSE` expression is specified, the system automatically adds an `ELSE NULL`.
		Note: See *Best Practices for using CASE statements in Analyses and Visualizations*.
			`CASE WHEN request_condition1 THEN expr1 ELSE expr2 END`

Expression	Example	Description	Syntax

CASE (Switch)	`CASE Score-par`
	`WHEN -5 THEN 'Birdie on Par 6'`
	`WHEN -4 THEN 'Must be Tiger'`
	`WHEN -3 THEN 'Three under par'`
	`WHEN -2 THEN 'Two under par'`
	`WHEN -1 THEN 'Birdie'`
	`WHEN 0 THEN 'Par'`
	`WHEN 1 THEN 'Bogey'`
	`WHEN 2 THEN 'Double Bogey'`
	`ELSE 'Triple Bogey or Worse'`
	`END`
		Also referred to as `CASE (Lookup)`. The value of the first expression is examined, then the `WHEN` expressions. If the first expression matches any `WHEN` expression, it assigns the value in the corresponding `THEN` expression.
		If none of the `WHEN` expressions match, it assigns the default value specified in the `ELSE` expression. If no `ELSE` expression is specified, the system automatically adds an `ELSE NULL`.
		If the first expression matches an expression in multiple `WHEN` clauses, only the expression following the first match is assigned.
		Note See *Best Practices for using CASE statements in Analyses and Visualizations*.
			`CASE expr1 WHEN expr2 THEN expr3 ELSE expr4 END`

IfCase > ELSE	-	-	`ELSE [expr]`
IfCase > IFNULL	-	-	`IFNULL([expr], [value])`
IfCase > NULLIF	-	-	`NULLIF([expr], [expr])`
IfCase > WHEN	-	-	`WHEN [Condition] THEN [expr]`
IfCase > CASE	-	-	`CASE WHEN [Condition] THEN [expr] END`
SwitchCase > ELSE	-	-	`ELSE [expr]`
SwitchCase >IFNULL	-	-	`IFNULL([expr], [value])`
SwitchCase > NULLIF	-	-	`NULLIF([expr], [expr])`
SwitchCase > WHEN	-	-	`WHEN [Condition] THEN [expr]`

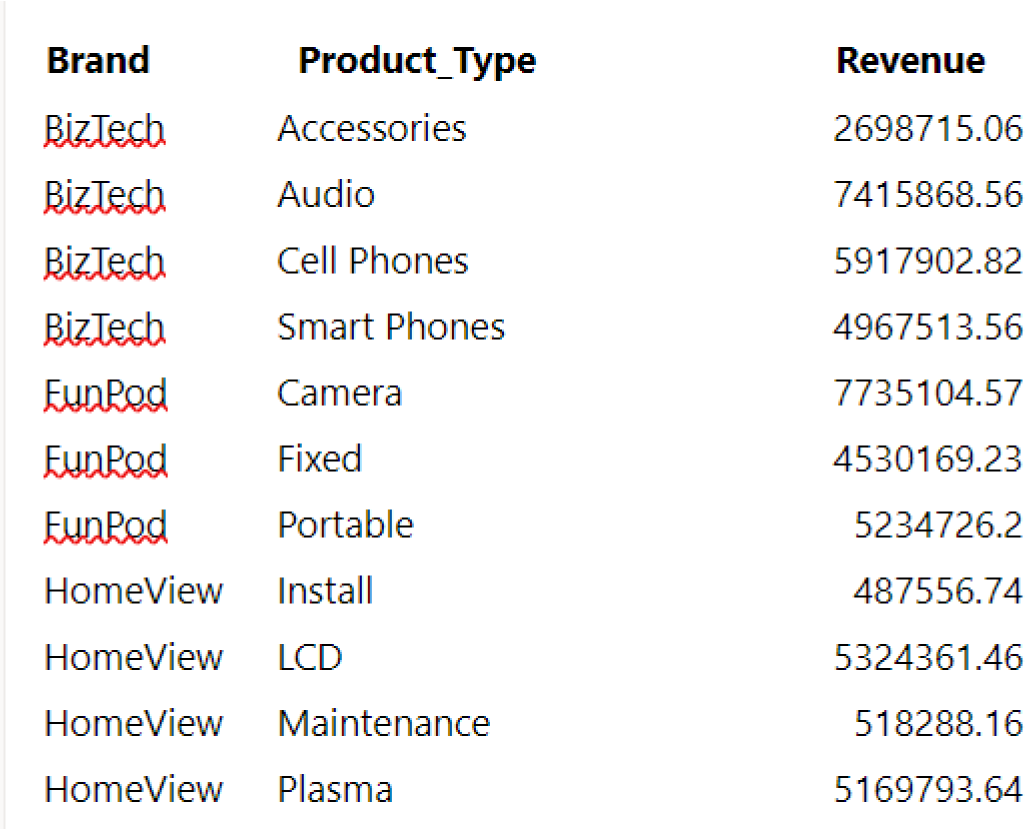
Best Practices for using CASE statements in Analyses and Visualizations

When using CASE statements in Analysis Reports and Visualization Projects, you should consider the report columns and the order of aggregation, as these affect how expressions and sub-totals are calculated.

- In general, when using CASE expressions, make sure that any columns used in the expression are included in the report.
- If the order of aggregation is important, then change the report aggregation rule from Default to Sum.
- If a condition has to be evaluated before the aggregation is computed (for example, if the column filtered is not also displayed in the report), then use the FILTER function.

Example

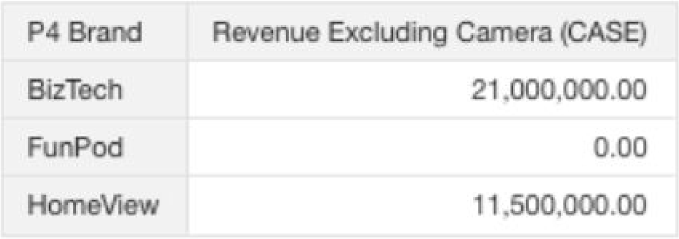
In this example, we have data for Brand, Product Type, and Revenue.



Brand	Product_Type	Revenue
BizTech	Accessories	2698715.06
BizTech	Audio	7415868.56
BizTech	Cell Phones	5917902.82
BizTech	Smart Phones	4967513.56
FunPod	Camera	7735104.57
FunPod	Fixed	4530169.23
FunPod	Portable	5234726.2
HomeView	Install	487556.74
HomeView	LCD	5324361.46
HomeView	Maintenance	518288.16
HomeView	Plasma	5169793.64

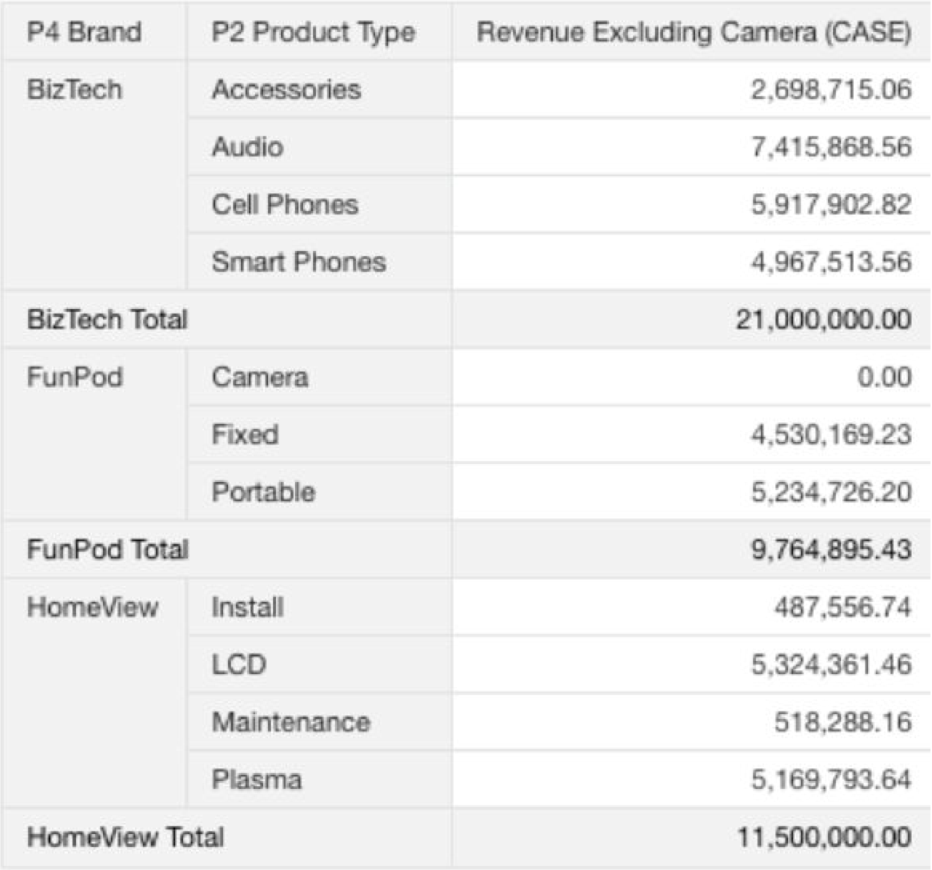
To apply a condition to set Camera revenue to 0, we create the following conditional expression: `CASE WHEN Product_Type = ‘Camera’ THEN 0 ELSE Revenue END`.

When Product_Type is excluded from the report, data is not available to completely evaluate the expression because it contains Product_Type, and the results are:



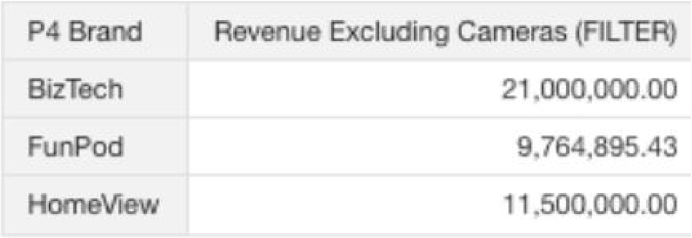
P4 Brand	Revenue Excluding Camera (CASE)
BizTech	21,000,000.00
FunPod	0.00
HomeView	11,500,000.00

By adding PRODUCT_TYPE to the report and setting report aggregation to SUM, the result aggregates after the base level values are calculated:



P4 Brand	P2 Product Type	Revenue Excluding Camera (CASE)
BizTech	Accessories	2,698,715.06
	Audio	7,415,868.56
	Cell Phones	5,917,902.82
	Smart Phones	4,967,513.56
BizTech Total		21,000,000.00
FunPod	Camera	0.00
	Fixed	4,530,169.23
	Portable	5,234,726.20
FunPod Total		9,764,895.43
HomeView	Install	487,556.74
	LCD	5,324,361.46
	Maintenance	518,288.16
	Plasma	5,169,793.64
HomeView Total		11,500,000.00

An alternative to using CASE is to use a filter expression: FILTER(Revenue using Product_Type != ‘Camera’). The expression is calculated independently of report columns, and aggregations are applied after calculation:



P4 Brand	Revenue Excluding Cameras (FILTER)
BizTech	21,000,000.00
FunPod	9,764,895.43
HomeView	11,500,000.00

Functions

There are various types of functions that you can use in expressions.

Topics:

- Aggregate Functions
- Analytics Functions
- Calendar Functions
- Conversion Functions
- Display Functions
- Evaluate Functions
- Mathematical Functions
- Running Aggregate Functions
- Spatial Functions
- String Functions
- System Functions
- Time Series Functions

Aggregate Functions

Aggregate functions perform operations on multiple values to create summary results.

The following list describes the aggregation rules that are available for columns and measure columns. The list also includes functions that you can use when creating calculated items for analyses.

- **Default** — Applies the default aggregation rule as in the Oracle BI Repository or by the original author of the analysis. Not available for calculated items in analyses.
- **Server Determined** — Applies the aggregation rule that's determined by the Oracle BI Server (such as the rule that is defined in the Oracle BI Repository). The aggregation is performed within Oracle BI Server for simple rules such as Sum, Min, and Max. Not available for measure columns in the Layout pane or for calculated items in analyses.
- **Sum** — Calculates the sum obtained by adding up all values in the result set. Use this for items that have numeric values.
- **Min** — Calculates the minimum value (lowest numeric value) of the rows in the result set. Use this for items that have numeric values.
- **Max** — Calculates the maximum value (highest numeric value) of the rows in the result set. Use this for items that have numeric values.
- **Average** — Calculates the average (mean) value of an item in the result set. Use this for items that have numeric values. Averages on tables and pivot tables are rounded to the nearest whole number.
- **First** — In the result set, selects the first occurrence of the item for measures. For calculated items, selects the first member according to the display in the Selected list. Not available in the Edit Column Formula dialog.

- **Last** — In the result set, selects the last occurrence of the item. For calculated items, selects the last member according to the display in the Selected list. Not available in the Edit Column Formula dialog.
- **Count** — Calculates the number of rows in the result set that have a non-null value for the item. The item is typically a column name, in which case the number of rows with non-null values for that column are returned.
- **Count Distinct** — Adds distinct processing to the Count function, which means that each distinct occurrence of the item is counted only once.
- **None** — Applies no aggregation. Not available for calculated items in analyses.
- **Server Complex Aggregate** — Applies the aggregation rule that is determined by the Oracle BI Server (such as the rule that is defined in the Oracle BI Repository). The aggregation is performed by the Oracle BI Server, rather than within Presentation Services. Not available for calculated items in analyses.
- **Report-Based Total (when applicable)** — If not selected, specifies that the Oracle BI Server should calculate the total based on the entire result set, before applying any filters to the measures. Not available in the Edit Column Formula dialog or for calculated items in analyses. Only available for attribute columns.

Function	Example	Description	Syntax
AGGREGATE AT	`AGGREGATE(sales AT month, region)`	Aggregates columns based on the level or levels you specify. *measure* is the name of a measure column. level is the level at which you want to aggregate. You can optionally specify more than one level. You can't specify a level from a dimension that contains levels that are being used as the measure level for the measure you specified in the first argument. For example, you can't write the function as AGGREGATE(yearly_sales AT month) because *month* is from the same time dimension that's being used as the measure level for *yearly_sales*.	`AGGREGATE(measure AT level [, level1, levelN])`
AVG	`Avg(Sales)`	Calculates the average (mean) of a numeric set of values.	`AVG(expr)`
AVGDISTINCT		Calculates the average (mean) of all distinct values of an expression.	`AVG(DISTINCT expr)`

Function	Example	Description	Syntax
BIN	`BIN(revenue BY productid, year WHERE productid > 2 INTO 4 BINS RETURNING RANGE_LOW)`	Classifies a given numeric expression into a specified number of equal width buckets. The function can return either the bin number or one of the two end points of the bin interval. numeric_expr is the measure or numeric attribute to bin. BY grain_expr1,…, grain_exprN is a list of expressions that define the grain at which the numeric_expr is calculated. BY is required for measure expressions and is optional for attribute expressions. WHERE a filter to apply to the numeric_expr before the numeric values are assigned to bins INTO number_of_bins BINS is the number of bins to return BETWEEN min_value AND max_value is the min and max values used for the end points of the outermost bins RETURNING NUMBER indicates that the return value should be the bin number (1, 2, 3, 4, etc.). This is the default. RETURNING RANGE_LOW indicates the lower value of the bin interval RETURNING RANGE_HIGH indicates the higher value of the bin interval	`BIN(numeric_expr [BY grain_expr1, ..., grain_exprN] [WHERE condition] INTO number_of_bins BINS [BETWEEN min_value AND max_value] [RETURNING {NUMBER | RANGE_LOW | RANGE_HIGH}])`
BottomN		Ranks the lowest n values of the expression argument from 1 to n, 1 corresponding to the lowest numerical value. *expr* is any expression that evaluates to a numerical value. integer is any positive integer. Represents the bottom number of rankings displayed in the result set, 1 being the lowest rank.	`BottomN(expr, integer)`
COUNT	`COUNT(Products)`	Determines the number of items with a non-null value.	`COUNT(expr)`
COUNTDISTINCT		Adds distinct processing to the COUNT function. *expr* is any expression.	`COUNT(DISTINCT expr)`
COUNT*	`SELECT COUNT(*) FROM Facts`	Counts the number of rows.	`COUNT(*)`
First	`First(Sales)`	Selects the first non-null returned value of the expression argument. The `First` function operates at the most detailed level specified in your explicitly defined dimension.	`First([NumericExpression)]`
Last	`Last(Sales)`	Selects the last non-null returned value of the expression.	`Last([NumericExpression)]`
MAVG		Calculates a moving average (mean) for the last n rows of data in the result set, inclusive of the current row. *expr* is any expression that evaluates to a numerical value. integer is any positive integer. Represents the average of the last n rows of data.	`MAVG(expr, integer)`

Function	Example	Description	Syntax
MAX	`MAX(Revenue)`	Calculates the maximum value (highest numeric value) of the rows satisfying the numeric expression argument.	`MAX(expr)`
MEDIAN	`MEDIAN(Sales)`	Calculates the median (middle) value of the rows satisfying the numeric expression argument. When there are an even number of rows, the median is the mean of the two middle rows. This function always returns a double.	`MEDIAN(expr)`
MIN	`MIN(Revenue)`	Calculates the minimum value (lowest numeric value) of the rows satisfying the numeric expression argument.	`MIN(expr)`
NTILE		Determines the rank of a value in terms of a user-specified range. It returns integers to represent any range of ranks. NTILE with numTiles=100 returns what is commonly called the "percentile" (with numbers ranging from 1 to 100, with 100 representing the high end of the sort). *expr* is any expression that evaluates to a numerical value. numTiles is a positive, nonnull integer that represents the number of tiles.	`NTILE(expr, numTiles)`
PERCENTILE		Calculates a percentile rank for each value satisfying the numeric expression argument. The percentile rank ranges are between 0 (0th percentile) to 1 (100th percentile). *expr* is any expression that evaluates to a numerical value.	`PERCENTILE(expr)`
RANK	`RANK(chronological_key, null, year_key_columns)`	Calculates the rank for each value satisfying the numeric expression argument. The highest number is assigned a rank of 1, and each successive rank is assigned the next consecutive integer (2, 3, 4,...). If certain values are equal, they'reare assigned the same rank (for example, 1, 1, 1, 4, 5, 5, 7...). *expr* is any expression that evaluates to a numerical value.	`RANK(expr)`

STDDEV	`STDDEV(Sales)`
	`STDDEV(DISTINCT Sales)`
		Returns the standard deviation for a set of values. The return type is always a double.	`STDDEV(expr)`

STDDEV_POP	`STDDEV_POP(Sales)`
	`STDDEV_POP(DISTINCT Sales)`
		Returns the standard deviation for a set of values using the computational formula for population variance and standard deviation.	`STDDEV_POP([NumericExpression])`

SUM	`SUM(Revenue)`	Calculates the sum obtained by adding up all values satisfying the numeric expression argument.	`SUM(expr)`

Function	Example	Description	Syntax
SUMDISTINCT		Calculates the sum obtained by adding all of the distinct values satisfying the numeric expression argument. *expr* is any expression that evaluates to a numerical value.	`SUM(DISTINCT expr)`
TOPN		Ranks the highest n values of the expression argument from 1 to n, 1 corresponding to the highest numerical value. *expr* is any expression that evaluates to a numerical value. integer is any positive integer. Represents the top number of rankings displayed in the result set, 1 being the highest rank.	`TOPN(expr, integer)`

Analytics Functions

Analytics functions allow you to explore data using models such as trendline and cluster.

Function	Example	Description	Syntax
TRENDLINE	`TRENDLINE(revenue, (calendar_year, calendar_quarter, calendar_month) BY (product), 'LINEAR', 'VALUE')`	Oracle recommends that you apply a Trendline using the **Add Statistics** property when viewing a visualization. See Adjust Visualization Properties. Fits a linear, polynomial, or exponential model, and returns the fitted values or model. The *numeric_expr* represents the Y value for the trend and the *series* (time columns) represent the X value.	`TRENDLINE(numeric_expr, ([series]) BY ([partitionBy]), model_type, result_type)`
CLUSTER	`CLUSTER((product, company), (billed_quantity, revenue), 'clusterName', 'algorithm=k-means;numClusters=%1;maxIter=%2;useRandomSeed=FALSE;enablePartitioning=TRUE', 5, 10)`	Collects a set of records into groups based on one or more input expressions using K-Means or Hierarchical Clustering.	`CLUSTER((dimension_expr1 , ... dimension_exprN), (expr1, ... exprN), output_column_name, options, [runtime_binded_options])`
OUTLIER	`OUTLIER((product, company), (billed_quantity, revenue), 'isOutlier', 'algorithm=kmeans')`	Classifies a record as Outlier based on one or more input expressions using K-Means or Hierarchical Clustering or Multi-Variate Outlier detection Algorithms.	`OUTLIER((dimension_expr1 , ... dimension_exprN), (expr1, ... exprN), output_column_name, options, [runtime_binded_options])`

Function	Example	Description	Syntax
REGR	`REGR(revenue, (discount_amount), (product_type, brand), 'fitted', '')`	Fits a linear model and returns the fitted values or model. This function can be used to fit a linear curve on two measures.	`REGR(y_axis_measure_expr, (x_axis_expr), (category_expr1, ..., category_exprN), output_column_name, options, [runtime_binded_options])`

Calendar Functions

Calendar functions manipulate data of the data types `DATE` and `DATETIME` based on a calendar year.

Function	Example	Description	Syntax
CURRENT_Date	`CURRENT_DATE`	Returns the current date. The date is determined by the system in which the Oracle BI is running.	`CURRENT_DATE`
CURRENT_TIME	`CURRENT_TIME(3)`	Returns the current time to the specified number of digits of precision, for example: HH:MM:SS.SSS If no argument is specified, the function returns the default precision.	`CURRENT_TIME(expr)`
CURRENT_TIMESTAMP	`CURRENT_TIMESTAMP(3)`	Returns the current date/timestamp to the specified number of digits of precision.	`CURRENT_TIMESTAMP(expr)`
DAYNAME	`DAYNAME(Order_Date)`	Returns the name of the day of the week for a specified date expression.	`DAYNAME(expr)`
DAYOFMONTH	`DAYOFMONTH(Order_Date)`	Returns the number corresponding to the day of the month for a specified date expression.	`DAYOFMONTH(expr)`
DAYOFWEEK	`DAYOFWEEK(Order_Date)`	Returns a number between 1 and 7 corresponding to the day of the week for a specified date expression. For example, 1 always corresponds to Sunday, 2 corresponds to Monday, and so on through to Saturday which returns 7.	`DAYOFWEEK(expr)`
DAYOFYEAR	`DAYOFYEAR(Order_Date)`	Returns the number (between 1 and 366) corresponding to the day of the year for a specified date expression.	`DAYOFYEAR(expr)`
DAY_OF_QUARTER	`DAY_OF_QUARTER(Order_Date)`	Returns a number (between 1 and 92) corresponding to the day of the quarter for the specified date expression.	`DAY_OF_QUARTER(expr)`
HOUR	`HOUR(Order_Time)`	Returns a number (between 0 and 23) corresponding to the hour for a specified time expression. For example, 0 corresponds to 12 a.m. and 23 corresponds to 11 p.m.	`HOUR(expr)`
MINUTE	`MINUTE(Order_Time)`	Returns a number (between 0 and 59) corresponding to the minute for a specified time expression.	`MINUTE(expr)`

Function	Example	Description	Syntax
MONTH	`MONTH(Order_Time)`	Returns the number (between 1 and 12) corresponding to the month for a specified date expression.	`MONTH(expr)`
MONTHNAME	`MONTHNAME(Order_Time)`	Returns the name of the month for a specified date expression.	`MONTHNAME(expr)`
MONTH_OF_QUARTER	`MONTH_OF_QUARTER(Order_Date)`	Returns the number (between 1 and 3) corresponding to the month in the quarter for a specified date expression.	`MONTH_OF_QUARTER(expr)`
NOW	`NOW()`	Returns the current timestamp. The `NOW` function is equivalent to the `CURRENT_TIMESTAMP` function.	`NOW()`
QUARTER_OF_YEAR	`QUARTER_OF_YEAR(Order_Date)`	Returns the number (between 1 and 4) corresponding to the quarter of the year for a specified date expression.	`QUARTER_OF_YEAR(expr)`
SECOND	`SECOND(Order_Time)`	Returns the number (between 0 and 59) corresponding to the seconds for a specified time expression.	`SECOND(expr)`
TIMESTAMPADD	`TIMESTAMPADD(SQL_TSI_MONTH, 12,Time."Order Date")`	Adds a specified number of intervals to a timestamp, and returns a single timestamp. Interval options are: *SQL_TSI_SECOND*, *SQL_TSI_MINUTE*, *SQL_TSI_HOUR*, *SQL_TSI_DAY*, *SQL_TSI_WEEK*, *SQL_TSI_MONTH*, *SQL_TSI_QUARTER*, *SQL_TSI_YEAR*	`TIMESTAMPADD(interval, expr, timestamp)`
TIMESTAMPDIFF	`TIMESTAMPDIFF(SQL_TSI_MONTH, Time."Order Date",CURRENT_DATE)`	Returns the total number of specified intervals between two timestamps. Use the same intervals as TIMESTAMPADD.	`TIMESTAMPDIFF(interval, expr, timestamp2)`
WEEK_OF_QUARTER	`WEEK_OF_QUARTER(Order_Date)`	Returns a number (between 1 and 13) corresponding to the week of the quarter for the specified date expression.	`WEEK_OF_QUARTER(expr)`
WEEK_OF_YEAR	`WEEK_OF_YEAR(Order_Date)`	Returns a number (between 1 and 53) corresponding to the week of the year for the specified date expression.	`WEEK_OF_YEAR(expr)`
YEAR	`YEAR(Order_Date)`	Returns the year for the specified date expression.	`YEAR(expr)`

Conversion Functions

Conversion functions convert a value from one form to another.

Function	Example	Description	Syntax
CAST	`CAST(hiredate AS CHAR(40)) FROM employee`	Changes the data type of an expression or a null literal to another data type. For example, you can cast a *customer_name* (a data type of `CHAR` or `VARCHAR`) or *birthdate* (a datetime literal). Use `CAST` to change to a *Date* data type. Don't use `TODATE`.	`CAST(expr AS type)`
IFNULL	`IFNULL(Sales, 0)`	Tests if an expression evaluates to a null value, and if it does, assigns the specified value to the expression.	`IFNULL(expr, value)`
INDEXCOL	`SELECT INDEXCOL(VALUEOF (NQ_SESSION.GEOGRAPHY_LEVEL), Country, State, City), Revenue FROM Sales`	Uses external information to return the appropriate column for the signed-in user to see.	`INDEXCOL([integer literal], [expr1] [, [expr2], ?-])`
NULLIF	`SELECT e.last_name, NULLIF(e.job_id, j.job_id) "Old Job ID" FROM employees e, job_history j WHERE e.employee_id = j.employee_id ORDER BY last_name, "Old Job ID";`	Compares two expressions. If they're equal, then the function returns NULL. If they're not equal, then the function returns the first expression. You can't specify the literal NULL for the first expression.	`NULLIF([expression], [expression])`
To_DateTime	`SELECT To_DateTime ('2009-03-0301:01:00' , 'yyyy-mm-dd hh:mi:ss') FROM sales`	Converts string literals of *DateTime* format to a *DateTime* data type.	`To_DateTime([expression], [literal])`
VALUEOF	`SalesSubjectArea.Customer.Region = VALUEOF("Region Security"."REGION")`	References the value of an Oracle BI repository variable in a filter. Use *expr* variables as arguments of the `VALUEOF` function. Refer to static repository variables by name.	`VALUEOF(expr)`

Display Functions

Display functions operate on the result set of a query.

Function	Example	Description	Syntax
BottomN	`BottomN(Sales, 10)`	Returns the *n* lowest values of expression, ranked from lowest to highest.	`BottomN([NumericExpression], [integer])`
FILTER	`FILTER(Sales USING Product = 'widget')`	Computes the expression using the given preaggregate filter.	`FILTER(measure USING filter_expr)`

Function	Example	Description	Syntax
MAVG	`MAVG(Sales, 10)`	Calculates a moving average (mean) for the last *n* rows of data in the result set, inclusive of the current row.	`MAVG([NumericExpression], [integer])`
MSUM	`SELECT Month, Revenue, MSUM(Revenue, 3) as 3_MO_SUM FROM Sales`	Calculates a moving sum for the last *n* rows of data, inclusive of the current row. The sum for the first row is equal to the numeric expression for the first row. The sum for the second row is calculated by taking the sum of the first two rows of data, and so on. When the *n* th row is reached, the sum is calculated based on the last *n* rows of data.	`MSUM([NumericExpression], [integer])`
NTILE	`NTILE(Sales, 100)`	Determines the rank of a value in terms of a user-specified range. It returns integers to represent any range of ranks. The example shows a range from 1 to 100, with the lowest sale = 1 and the highest sale = 100.	`NTILE([NumericExpression], [integer])`
PERCENTILE	`PERCENTILE(Sales)`	Calculates a percent rank for each value satisfying the numeric expression argument. The percentile rank ranges are from 0 (1st percentile) to 1 (100th percentile), inclusive.	`PERCENTILE([NumericExpression])`
RANK	`RANK(Sales)`	Calculates the rank for each value satisfying the numeric expression argument. The highest number is assigned a rank of 1, and each successive rank is assigned the next consecutive integer (2, 3, 4,...). If certain values are equal, they're assigned the same rank (for example, 1, 1, 1, 4, 5, 5, 7...).	`RANK([NumericExpression])`
RCOUNT	`SELECT month, profit, RCOUNT(profit) FROM sales WHERE profit > 200`	Takes a set of records as input and counts the number of records encountered so far.	`RCOUNT([NumericExpression])`
RMAX	`SELECT month, profit, RMAX(profit) FROM sales`	Takes a set of records as input and shows the maximum value based on records encountered so far. The specified data type must be one that can be ordered.	`RMAX([NumericExpression])`
RMIN	`SELECT month, profit, RMIN(profit) FROM sales`	Takes a set of records as input and shows the minimum value based on records encountered so far. The specified data type must be one that can be ordered.	`RMIN([NumericExpression])`
RSUM	`SELECT month, revenue, RSUM(revenue) as RUNNING_SUM FROM sales`	Calculates a running sum based on records encountered so far. The sum for the first row is equal to the numeric expression for the first row. The sum for the second row is calculated by taking the sum of the first two rows of data, and so on.	`RSUM([NumericExpression])`
TOPN	`TOPN(Sales, 10)`	Returns the *n* highest values of expression, ranked from highest to lowest.	`TOPN([NumericExpression], [integer])`

Evaluate Functions

Evaluate functions are database functions that can be used to pass through expressions to get advanced calculations.

Embedded database functions can require one or more columns. These columns are referenced by %1 ... %N within the function. The actual columns must be listed after the function.

Function	Example	Description	Syntax
EVALUATE	`SELECT EVALUATE('instr(%1, %2)', address, 'Foster City') FROM employees`	Passes the specified database function with optional referenced columns as parameters to the database for evaluation.	`EVALUATE([string expression], [comma separated expressions])`
EVALUATE_AGGR	`EVALUATE_AGGR('REGR_SLOPE(%1, %2)', sales.quantity, market.marketkey)`	Passes the specified database function with optional referenced columns as parameters to the database for evaluation. This function is intended for aggregate functions with a `GROUP BY` clause.	`EVALUATE_AGGR('db_agg_function(%1...%N)' [AS datatype] [, column1, columnN])`

Mathematical Functions

The mathematical functions described in this section perform mathematical operations.

Function	Example	Description	Syntax
ABS	`ABS(Profit)`	Calculates the absolute value of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`ABS(expr)`
ACOS	`ACOS(1)`	Calculates the arc cosine of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`ACOS(expr)`
ASIN	`ASIN(1)`	Calculates the arc sine of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`ASIN(expr)`
ATAN	`ATAN(1)`	Calculates the arc tangent of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`ATAN(expr)`
ATAN2	`ATAN2(1, 2)`	Calculates the arc tangent of *y* /*x*, where *y* is the first numeric expression and *x* is the second numeric expression.	`ATAN2(expr1, expr2)`

Function	Example	Description	Syntax
CEILING	`CEILING(Profit)`	Rounds a non-integer numeric expression to the next highest integer. If the numeric expression evaluates to an integer, the `CEILING` function returns that integer.	`CEILING(expr)`
COS	`COS(1)`	Calculates the cosine of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`COS(expr)`
COT	`COT(1)`	Calculates the cotangent of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`COT(expr)`
DEGREES	`DEGREES(1)`	Converts an expression from radians to degrees. *expr* is any expression that evaluates to a numerical value.	`DEGREES(expr)`
EXP	`EXP(4)`	Sends the value to the power specified. Calculates *e* raised to the n-th power, where *e* is the base of the natural logarithm.	`EXP(expr)`
ExtractBit	`Int ExtractBit(1, 5)`	Retrieves a bit at a particular position in an integer. It returns an integer of either 0 or 1 corresponding to the position of the bit.	`ExtractBit([Source Number], [Digits])`
FLOOR	`FLOOR(Profit)`	Rounds a non-integer numeric expression to the next lowest integer. If the numeric expression evaluates to an integer, the `FLOOR` function returns that integer.	`FLOOR(expr)`
LOG	`LOG(1)`	Calculates the natural logarithm of an expression. *expr* is any expression that evaluates to a numerical value.	`LOG(expr)`
LOG10	`LOG10(1)`	Calculates the base 10 logarithm of an expression. *expr* is any expression that evaluates to a numerical value.	`LOG10(expr)`
MOD	`MOD(10, 3)`	Divides the first numeric expression by the second numeric expression and returns the remainder portion of the quotient.	`MOD(expr1, expr2)`
PI	`PI()`	Returns the constant value of pi.	`PI()`
POWER	`POWER(Profit, 2)`	Takes the first numeric expression and raises it to the power specified in the second numeric expression.	`POWER(expr1, expr2)`
RADIANS	`RADIANS(30)`	Converts an expression from degrees to radians. *expr* is any expression that evaluates to a numerical value.	`RADIANS(expr)`
RAND	`RAND()`	Returns a pseudo-random number between 0 and 1.	`RAND()`

Function	Example	Description	Syntax
RANDFromSeed	`RAND(2)`	Returns a pseudo-random number based on a seed value. For a given seed value, the same set of random numbers are generated.	`RAND(expr)`
ROUND	`ROUND(2.166000, 2)`	Rounds a numeric expression to *n* digits of precision. *expr* is any expression that evaluates to a numerical value. *integer* is any positive integer that represents the number of digits of precision.	`ROUND(expr, integer)`
SIGN	`SIGN(Profit)`	Returns the following: • 1 if the numeric expression evaluates to a positive number • -1 if the numeric expression evaluates to a negative number • 0 if the numeric expression evaluates to zero	`SIGN(expr)`
SIN	`SIN(1)`	Calculates the sine of a numeric expression.	`SIN(expr)`
SQRT	`SQRT(7)`	Calculates the square root of the numeric expression argument. The numeric expression must evaluate to a nonnegative number.	`SQRT(expr)`
TAN	`TAN(1)`	Calculates the tangent of a numeric expression. *expr* is any expression that evaluates to a numerical value.	`TAN(expr)`
TRUNCATE	`TRUNCATE(45.12345, 2)`	Truncates a decimal number to return a specified number of places from the decimal point. *expr* is any expression that evaluates to a numerical value. *integer* is any positive integer that represents the number of characters to the right of the decimal place to return.	`TRUNCATE(expr, integer)`

Running Aggregate Functions

Running aggregate functions perform operations on multiple values to create summary results.

Function	Example	Description	Syntax
MAVG		Calculates a moving average (mean) for the last *n* rows of data in the result set, inclusive of the current row. *expr* is any expression that evaluates to a numerical value. *integer* is any positive integer. Represents the average of the last *n* rows of data.	`MAVG(expr, integer)`

Function	Example	Description	Syntax
MSUM	`select month, revenue, MSUM(revenue, 3) as 3_MO_SUM from sales_subject_area`	Calculates a moving sum for the last n rows of data, inclusive of the current row. *expr* is any expression that evaluates to a numerical value. *integer* is any positive integer. Represents the sum of the last n rows of data.	`MSUM(expr, integer)`
RSUM	`SELECT month, revenue, RSUM(revenue) as RUNNING_SUM from sales_subject_area`	Calculates a running sum based on records encountered so far. *expr* is any expression that evaluates to a numerical value.	`RSUM(expr)`
RCOUNT	`select month, profit, RCOUNT(profit) from sales_subject_area where profit > 200`	Takes a set of records as input and counts the number of records encountered so far. *expr* is an expression of any datatype.	`RCOUNT(expr)`
RMAX	`SELECT month, profit,RMAX(profit) from sales_subject_area`	Takes a set of records as input and shows the maximum value based on records encountered so far. *expr* is an expression of any datatype.	`RMAX(expr)`
RMIN	`select month, profit,RMIN(profit) from sales_subject_area`	Takes a set of records as input and shows the minimum value based on records encountered so far. *expr* is an expression of any datatype.	`RMIN(expr)`

Spatial Functions

Spatial functions enable you to perform geographical analysis when you model data using Administration Tool. For example, you might calculate the distance between two geographical areas (known as shapes or polygons).

> **Note:**
>
> You can't use these spatial functions in custom calculations for visualization projects.

Function	Example	Description	Syntax
GeometryArea	`GeometryArea(Shape)`	Calculates the area that a shape occupies.	`GeometryArea(Shape)`
GeometryDistance	`GeometryDistance(TRIP_START, TRIP_END)`	Calculates the distance between two shapes.	`GeometryDistance(Shape 1, Shape 2)`

Function	Example	Description	Syntax
GeometryLength	`GeometryLength(Shape)`	Calculates the circumference of a shape.	`GeometryLength(Shape)`
GeometryRelate	`GeometryRelate(TRIP_START, TRIP_END)`	Determines whether one shape is inside another shape. Returns 'TRUE' or 'FALSE' as a string (varchar).	`GeometryRelate(Shape 1, Shape 2)`
GeometryWithinDistance	`GeometryWithinDistance(TRIP_START, TRIP_END, 500)`	Determines whether two shapes are within a specified distance of each other. Returns 'TRUE' or 'FALSE' as a string (varchar).	`GeometryWithinDistance(Shape1, Shape2, DistanceInFloat)`

String Functions

String functions perform various character manipulations. They operate on character strings.

Function	Example	Description	Syntax
ASCII	`ASCII('a')`	Converts a single character string to its corresponding ASCII code, between 0 and 255. If the character expression evaluates to multiple characters, the ASCII code corresponding to the first character in the expression is returned. *expr* is any expression that evaluates to a character string.	`ASCII(expr)`
BIT_LENGTH	`BIT_LENGTH('abcdef')`	Returns the length, in bits, of a specified string. Each Unicode character is 2 bytes in length (equal to 16 bits). *expr* is any expression that evaluates to a character string.	`BIT_LENGTH(expr)`
CHAR	`CHAR(35)`	Converts a numeric value between 0 and 255 to the character value corresponding to the ASCII code. *expr* is any expression that evaluates to a numerical value between 0 and 255.	`CHAR(expr)`
CHAR_LENGTH	`CHAR_LENGTH(Customer_Name)`	Returns the length, in number of characters, of a specified string. Leading and trailing blanks aren’t counted in the length of the string. *expr* is any expression that evaluates to a character string.	`CHAR_LENGTH(expr)`
CONCAT	`SELECT DISTINCT CONCAT ('abc', 'def') FROM employee`	Concatenates two character strings. *exprs* are expressions that evaluate to character strings, separated by commas. You must use raw data, not formatted data, with `CONCAT`.	`CONCAT(expr1, expr2)`

Function	Example	Description	Syntax
INSERT	`SELECT INSERT('123456', 2, 3, 'abcd') FROM table`	Inserts a specified character string into a specified location in another character string. *expr1* is any expression that evaluates to a character string. Identifies the target character string. *integer1* is any positive integer that represents the number of characters from the beginning of the target string where the second string is to be inserted. *integer2* is any positive integer that represents the number of characters in the target string to be replaced by the second string. *expr2* is any expression that evaluates to a character string. Identifies the character string to be inserted into the target string.	`INSERT(expr1, integer1, integer2, expr2)`
LEFT	`SELECT LEFT('123456', 3) FROM table`	Returns a specified number of characters from the left of a string. *expr* is any expression that evaluates to a character string *integer* is any positive integer that represents the number of characters from the left of the string to return.	`LEFT(expr, integer)`
LENGTH	`LENGTH(Customer_Name)`	Returns the length, in number of characters, of a specified string. The length is returned excluding any trailing blank characters. *expr* is any expression that evaluates to a character string.	`LENGTH(expr)`
LOCATE	`LOCATE('d' 'abcdef')`	Returns the numeric position of a character string in another character string. If the character string isn't found in the string being searched, the function returns a value of 0. *expr1* is any expression that evaluates to a character string. Identifies the string for which to search. *expr2* is any expression that evaluates to a character string. Identifies the string to be searched.	`LOCATE(expr1, expr2)`
LOCATEN	`LOCATEN('d' 'abcdef', 3)`	Like LOCATE, returns the numeric position of a character string in another character string. LOCATEN includes an integer argument that enables you to specify a starting position to begin the search. *expr1* is any expression that evaluates to a character string. Identifies the string for which to search. *expr2* is any expression that evaluates to a character string. Identifies the string to be searched. *integer* is any positive (nonzero) integer that represents the starting position to begin to look for the character string.	`LOCATEN(expr1, expr2, integer)`

Function	**Example**	**Description**	**Syntax**
LOWER	`LOWER(Customer_Name)`	Converts a character string to lowercase. *expr* is any expression that evaluates to a character string.	`LOWER(expr)`
OCTET_LENGTH	`OCTET_LENGTH('abcdef')`	Returns the number of bytes of a specified string. *expr* is any expression that evaluates to a character string.	`OCTET_LENGTH(expr)`
POSITION	`POSITION('d', 'abcdef')`	Returns the numeric position of *strExpr1* in a character expression. If *strExpr1* isn't found, the function returns 0. *expr1* is any expression that evaluates to a character string. Identifies the string to search for in the target string. *expr2* is any expression that evaluates to a character string. Identifies the target string to be searched.	`POSITION(expr1 IN expr2)`
REPEAT	`REPEAT('abc', 4)`	Repeats a specified expression *n* times. *expr* is any expression that evaluates to a character string *integer* is any positive integer that represents the number of times to repeat the character string.	`REPEAT(expr, integer)`
REPLACE	`REPLACE('abcd1234', '123', 'zz')`	Replaces one or more characters from a specified character expression with one or more other characters. *expr1* is any expression that evaluates to a character string. This is the string in which characters are to be replaced. *expr2* is any expression that evaluates to a character string. This second string identifies the characters from the first string that are to be replaced. *expr3* is any expression that evaluates to a character string. This third string specifies the characters to substitute into the first string.	`REPLACE(expr1, expr2, expr3)`
RIGHT	`SELECT RIGHT('123456', 3) FROM table`	Returns a specified number of characters from the right of a string. *expr* is any expression that evaluates to a character string. *integer* is any positive integer that represents the number of characters from the right of the string to return.	`RIGHT(expr, integer)`
SPACE	`SPACE(2)`	Inserts blank spaces. *integer* is any positive integer that indicates the number of spaces to insert.	`SPACE(expr)`

Function	**Example**	**Description**	**Syntax**
SUBSTRING	`SUBSTRING('abcdef' FROM 2)`	Creates a new string starting from a fixed number of characters into the original string. *expr* is any expression that evaluates to a character string. *startPos* is any positive integer that represents the number of characters from the start of the left side of the string where the result is to begin.	`SUBSTRING([SourceString] FROM [StartPostition])`
SUBSTRINGN	`SUBSTRING('abcdef' FROM 2 FOR 3)`	Like SUBSTRING, creates a new string starting from a fixed number of characters into the original string. *SUBSTRINGN* includes an integer argument that enables you to specify the length of the new string, in number of characters. *expr* is any expression that evaluates to a character string. *startPos* is any positive integer that represents the number of characters from the start of the left side of the string where the result is to begin.	`SUBSTRING(expr FROM startPos FOR length)`
TrimBoth	`Trim(BOTH '_' FROM '_abcdef_')`	Strips specified leading and trailing characters from a character string. *char* is any single character. If you omit this specification (and the required single quotes), a blank character is used as the default. *expr* is any expression that evaluates to a character string.	`TRIM(BOTH char FROM expr)`
TRIMLEADING	`TRIM(LEADING '_' FROM '_abcdef')`	Strips specified leading characters from a character string. *char* is any single character. If you omit this specification (and the required single quotes), a blank character is used as the default. *expr* is any expression that evaluates to a character string.	`TRIM(LEADING char FROM expr)`
TRIMTRAILING	`TRIM(TRAILING '_' FROM 'abcdef_')`	Strips specified trailing characters from a character string. *char* is any single character. If you omit this specification (and the required single quotes), a blank character is used as the default. *expr* is any expression that evaluates to a character string.	`TRIM(TRAILING char FROM expr)`
UPPER	`UPPER(Customer_Name)`	Converts a character string to uppercase. *expr* is any expression that evaluates to a character string.	`UPPER(expr)`

System Functions

The `USER` system function returns values relating to the session.

It returns the user name you signed in with.

Function	Example	Description	Syntax
DATABASE		Returns the name of the Oracle BI subject area to which you're logged on.	`DATABASE()`
USER		Returns the user name for the Oracle BI Repository to which you're logged on.	`USER()`

Time Series Functions

Time series functions are aggregate functions that operate on time dimensions.

Time dimension members must be at or below the level of the function. Because of this, one or more columns that uniquely identify members at or below the given level must be projected in the query.

Function	Example	Description	Syntax
AGO	`SELECT Year_ID, AGO(sales, year, 1)`	Calculates the aggregated value of a measure from the current time to a specified time period in the past. For example, `AGO` can produce sales for every month of the current quarter and the corresponding quarter-ago sales.	`AGO(expr, time_level, offset)`
PERIODROLLING	`SELECT Month_ID, PERIODROLLING (monthly_sales, -1, 1)`	Computes the aggregate of a measure over the period starting *x* units of time and ending *y* units of time from the current time. For example, `PERIODROLLING` can compute sales for a period that starts at a quarter before and ends at a quarter after the current quarter. *measure* is the name of a measure column. *x* is an integer that specifies the offset from the current time. *y* specifies the number of time units over which the function computes. *hierarchy* is an optional argument that specifies the name of a hierarchy in a time dimension, such as *yr*, *mon*, *day*, that you want to use to compute the time window.	`PERIODROLLING(measure, x [,y])`
TODATE	`SELECT Year_ID, Month_ID, TODATE (sales, year)`	Aggregates a measure from the beginning of a specified time period to the currently displayed time. For example, this function can calculate Year to Date sales. *expr* is an expression that references at least one measure column. *time_level* is the type of time period, such as quarter, month, or year.	`TODATE(expr, time_level)`

FORECAST Function

Creates a time-series model of the specified measure over the series using Exponential Smoothing (ETS) or Seasonal ARIMA or ARIMA, and outputs a forecast for a set of periods as specified by *numPeriods*.

Syntax `FORECAST(numeric_expr, ([series]), output_column_name, options, [runtime_binded_options])])`

Where:

- *numeric_expr* indicates the measure to forecast, for example, revenue data to forecast.
- *series* indicates the time grain at which the forecast model is built. This is a list of one or more time dimension columns. If you omit series, then the time grain is determined from the query.
- *output_column_name* indicates the output column. The valid values are *forecast*, *low*, *high*, and *predictionInterval*.
- *options* indicates a string list of name/value pairs separated by a semi-colon (;). The value can include *%1 ... %N* specified in `runtime_binded_options`.
- *runtime_binded_options* indicates a comma separated list of runtime-binded columns and options.

FORECAST Function Options The following table list available options to use with the `FORECAST` function.

Option Name	Values	Description
numPeriods	Integer	The number of periods to forecast
predictionInterval	0 to 100, where higher values specify higher confidence	The confidence level for the prediction.
modelType	ETS SeasonalArima ARIMA	The model to use for forecasting.
useBoxCox	TRUE FALSE	If *TRUE*, then use Box-Cox transformation.
lambdaValue	Not applicable	The Box-Cox transformation parameter. Ignore if NULL or when `useBoxCox` is *FALSE*. Otherwise the data is transformed before the model is estimated.
trendDamp	TRUE FALSE	This is a parameter for ETS model. If *TRUE*, then use damped trend. If FALSE or NULL, then use non-damped trend.
errorType	Not applicable	This is a parameter for ETS model.

trendType	none("N")
	additive("A")
	multiplicative("M")
	automatically selected("Z")
		This is a parameter for ETS model.

Option Name	Values	Description

seasonType	none("N")
	additive("A")
	multiplicative("M")
	automatically selected("Z")
		This is a parameter for ETS model.

modelParamIC	ic_auto ic_aicc ic_bic ic_auto (this is the default)	The information criterion (IC) used in the model selection.

Revenue Forecast by Day Example

This example selects revenue forecast by day.

```
FORECAST("A - Sample Sales"."Base Facts"."1- Revenue" Target,
("A - Sample Sales"."Time"."T00 Calendar Date"),'forecast',
'numPeriods=30;predictionInterval=70;') ForecastedRevenue
```

Revenue Forecast by Year and Quarter Example

This example selects revenue forecast by year and quarter.

```
FORECAST("A - Sample Sales"."Base Facts"."1- Revenue",
("A - Sample Sales"."Time"."T01 Year" timeYear, "A - Sample Sales"."Time"."T02
Quarter" TimeQuarter),'forecast', 'numPeriods=30;predictionInterval=70;')
ForecastedRevenue
```

Constants

You can use constants to include specific dates and times in expressions.

Available constants include Date, Time, and Timestamp.

Constant	Example	Description	Syntax
DATE	`DATE [2014-04-09]`	Inserts a specific date.	`DATE [yyyy-mm-dd]`
TIME	`TIME [12:00:00]`	Inserts a specific time.	`TIME [hh:mi:ss]`
TIMESTAMP	`TIMESTAMP [2014-04-09 12:00:00]`	Inserts a specific timestamp.	`TIMESTAMP [yyyy-mm-dd hh:mi:ss]`

Types

You can use data types, such as `CHAR`, `INT`, and `NUMERIC` in expressions.

For example, you use types when creating `CAST` expressions that change the data type of an expression or a null literal to another data type.

Variables

Variables are used in expressions.

You can use a variable in an expression.

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Embed Analytics Content into Applications and Web Pages

You can embed Oracle Analytics content into an application, custom application, or portal web page.

- About Embedding Analytics Content
- Register the Embedding Environment as a Safe Domain
- Embed with iFrames
- Embed with the JavaScript Embedding Framework

About Embedding Analytics Content

There are two ways that you can embed your analytics content into applications and web pages.

You can embed content using the content item's URL. Typically this method uses an iFrame. See Embed Analytics Content into Applications and Web Pages.

If you need an integrated way to embed content, then use the JavaScript embedding framework. This method provides greater flexibility than the iFrame embedding method. For example, use this method when you want to embed visualizations into a custom web application. See Typical Workflow to Use the JavaScript Embedding Framework.

Register the Embedding Environment as a Safe Domain

For security reasons, you’re not allowed to embed content into another application unless you've registered its domain as safe.

See Register Safe Domains.

Use this information if you're using JavaScript to embed content:

- Due to CORS safeguarding, you can't open your HTML file containing embedded content directly in a browser. To work around this issue you must register the web server (either localhost or another web server) as a safe domain.
- If you use a localhost web server for testing, then you may need to add references to http://localhost:<port> and http://127.0.0.1:<port>.

You must be an administrator to perform this task.

1. Go to Oracle Analytics, click **Navigator**, and click **Console**.
2. Click **Safe Domains**.
3. Click **Add Domain** and enter the domain.
4. Select **Embedding**.

Embed with iFrames

The topics in this section explain how to use iFrames to embed Oracle Analytics content into applications and web pages.

Topics:

- Considerations for Embedding Content with iFrame
- Use iFrame to Embed Content

Considerations for Embedding Content with iFrame

This topic describes issues that you might encounter when you use iFrame to embed content.

Typically when users open embedded content from an application, they'll be prompted to log into Oracle Analytics. To avoid this issue, set up Single Sign On (SSO) or user federation between Oracle Analytics and the application hosting the embedded content.

If you're using the Safari browser and the embedded content doesn't display as expected, then try disabling Safari's **Prevent cross-site tracking** preference.

Use iFrame to Embed Content

You can embed your analytics content by pasting the target content's URL into an application or portal's iFrame. For example, you can use this method to embed content into Microsoft Teams.

> **Note:**
>
> If you need an integrated way to embed content, then use the JavaScript embedding framework. This method provides greater flexibility than the iFrame embedding method. See Typical Workflow to Use the JavaScript Embedding Framework.

Before you perform this task, confirm that you've registered the domain that you want to embed your content into as a safe domain. See Register the Embedding Environment as a Safe Domain.

1. On the Home page, click **Navigator**, and then click **Catalog**.
2. Locate the item that you want to embed and click its **Actions menu**. Click **Open**.
3. Go to the browser's address bar and copy the item's URL. These are examples of URLs:
   - **Report -** `http://example.com/analytics/saw.dll?PortalGo&`**`path=`**`%2Fshared%2F`**`Revenue`**`http://example.com/analytics/saw.dll?PortalGo&Action=prompt&`**`path=`**`%2Fshared%2FSaled%2F`**`Sales%20by%20Brand`**

- **Dashboard** - `http://example.com/analytics/saw.dll?Dashboard&PortalPath=%2Fshared%2FSales%2F_portal%2FQuickStart&page=Top%20 Products`
- **Visualization project** - `http://example.com/va/project.jsp?pageid=visualAnalyzer&reportmode=full&reportpath=%2Fshared%2FMySalesProject`

4. Open the target application or portal, locate an iFrame, and paste the content's URL into it.

Embed with the JavaScript Embedding Framework

The topics in this section explain how to use the JavaScript embedding framework to embed Oracle Analytics content into applications and web pages.

Topics:

- Typical Workflow to Use the JavaScript Embedding Framework
- Get Started Embedding Content With the JavaScript Embedding Framework
- Embed into a Custom Application that Doesn’t Use Oracle JET
- Embed into a Custom Application that Uses Oracle JET
- Use Login Prompt Authentication

Typical Workflow to Use the JavaScript Embedding Framework

If you're embedding analytics content into an application or web page, then follow these tasks as a guide.

> **Note:**
>
> You can also embed content using the content item's URL. Typically this method uses an iFrame. See Embed Analytics Content into Applications and Web Pages.

Task	Description	More Information
Add safe domains	Use the Console to register as safe the development, production, and test environments domains.	Register the Embedding Environment as a Safe Domain
Create the HTML page	Create the HTML page where you'll embed analytics content. Steps include: reference the embedding.js JavaScript source and the embedded project's URL, specify filters, and specify how to refresh data.	Prepare the HTML Page Pass Filters to the HTML Page Refresh Data in the HTML Page
Specify the embedding mode	Your application uses JET or another technology to embed content.	Embed into a Custom Application that Uses Oracle JET Embed into a Custom Application that Doesn’t Use Oracle JET

Task	Description	More Information
Understand authentication	Learn about login prompt authentication and how to customize the login message that users see.	Use Login Prompt Authentication

Get Started Embedding Content With the JavaScript Embedding Framework

Use the topics in this section to gather required information, perform prerequisite tasks, and begin creating the HTML page.

Note:

Before you perform the tasks in this section, confirm that you've registered the development, production, and test environments as safe domains. See Register the Embedding Environment as a Safe Domain.

Topics:

- Find the Content's Javascript and HTML
- Prepare the HTML Page
- Pass Filters to the HTML Page
- Refresh Data in the HTML Page

Find the Content's Javascript and HTML

Oracle Analytics generates the <script> tag and HTML for you to copy and paste in to your custom application or portal web page's HTML page.

1. Go to Oracle Analytics and open the project containing the content you want to embed.
2. Click **Options** and then click **Developer**.
3. Click the Embed tab.
4. Locate the **Embedding Script to Include** field and click **Copy** to copy the <script> tag to paste in to the HTML page.
5. Optional: If you want the embedded project to show the project's default view, then locate the **Default** field, click **Copy** to copy the HTML, and paste it in to the HTML page.
6. Optional: If you want the embedded project to show an item such as a specific canvas, then locate the item's field, click **Copy** to copy the HTML, and paste it in to the HTML page.

Prepare the HTML Page

To embed analytics content, you must create or update the HTML page to include the required DOCTYPE declaration, dir global attribute, reference the embedding.js JavaScript source and the embedded project's URL, specify the embedding mode (JET or standalone), specify an authentication method, and add any attributes.

This topic contains the following information:

- DOCTYPE Declaration
- Dir Global Attribute
- <script> Tag and JavaScript Source Reference
- Authentication
- <oracle-dv> Element
- Example

Doctype Declaration

Set the doctype declaration to `<!DOCTYPE html>`. Unpredictable behavior such as the page not rendering properly results if you use a doctype declaration other than `<!DOCTYPE html>`, or if you forget to include a doctype declaration.

Dir Global Attribute

Set the `dir` global attribute as required by the web page's locale. The `dir` global attribute indicates the embedded content's layout direction.

> **Note:**
>
> If you need to support multiple locales, then use JavaScript to set the attribute.

The attribute's value options are:

- `rtl` - Use for right to left layout direction.
- `ltr` - Use for left to right layout direction.
- `auto` - Don't use. This value isn't supported by Oracle Analytics.

<script> Tag and JavaScript Source Reference

> **Note:**
>
> Oracle Analytics generates the `<script>` tag and JavaScript source's URL that you need to include.

Add a `<script>` tag that references embedding.js to your HTML page.

Depending upon your version of Oracle Analytics, the JavaScript source's URL structure could be either of the following:

- For the most recent versions: ″`https://<instance>/public/dv/v1/embedding/<embeddingMode>/embedding.js`″. The examples in this document use this URL.
- For older versions: "`http://<instance>/ui/dv/v1/embedding/<embeddingMode>/embedding.js`".

Where `<embeddingMode>` must be either `jet` or `standalone`:

- Use `jet` if you're embedding content within an existing Oracle JET application. If you use `jet`, then the version of Oracle JET that's used by the application must match the version of Oracle JET used by Oracle Analytics.

  If the embedding application uses JET, Oracle Analytics extends the application with the components it needs. See Embed into a Custom Application that Uses Oracle JET.

  Oracle JET is a set of Javascript-based libraries used for the Oracle Analytics user interface.
- Use `standalone` when embedding visualization content in a generic application that doesn't use Oracle JET.

  If the embedding application doesn't use JET, then Oracle Analytics brings its JET distribution to the page with additional components. See Embed into a Custom Application that Doesn't Use Oracle JET.

Authentication

You need an authenticated session to view the embedded content. See Use Login Prompt Authentication.

<oracle-dv> Element

To embed a project, you must add the following HTML snippet with attribute values inside an appropriately sized element. Oracle Analytics generates the HTML that you need to include.

```
<oracle-dv project-path="" active-page="" active-tab-id="" filters=""></
oracle–dv>
```

Supported attributes — These attributes support static strings and properties defined within a Knockout model. Knockout is a technology used in Oracle JET.

> **Note:**
>
> See Embed into a Custom Application that Doesn't Use Oracle JET for an example of binding these attributes to a Knockout model.

- `project-path`: Specifies the repository path of the project that you want to render.
- `active-page`: (Optional) Specifies whether a canvas or insight other than the default is rendered. When you specify `active-page`, you also use `active-tab-id` to specify the exact canvas or story page that you're showing. Valid values are `canvas` and `insight`.
- `active-tab-id`: (Optional) Specifies the ID of the canvas or the story page that you're showing.

- `filters`: (Optional) Allows the programmatic passing of filter values to an embedded project.
- `project-options`: (Optional) Allows you to pass these options:
  - `bDisableMobileLayout`: Disables or enables the mobile layout. Mobile layout refers to the summary card layout available only on phone devices. Value should be `true` or `false`.
  - `bShowFilterBar`: Shows or hides the filter bar. Value should be `true` or `false`.

  For example, `<oracle-dv project-path="{{projectPath}}" active-page="canvas" active-tab-id="1" filters="{{filters}}" project-options='{"bDisableMobileLayout":true, "bShowFilterBar":false}'></oracle-dv>`
- `brushing-type`: Controls how brushing works. The value you specify overrides all other settings, including system defaults and settings in the saved project. Value should be the string `on`, `off`, or `auto`.
  - `on`: Use to issue brushing queries with normal priority. Brushing queries and visualization queries are mixed and run at the same time.
  - `auto`: Default. Use to issue brushing queries with low priority. When a user interacts with a visualization, there may be a delay showing marks in other visualizations until the brushing queries complete.

Example

```
<!DOCTYPE html>
<html dir="ltr">
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
        <title>Embeded Oracle Analytics Project Example</title>
        <script src="https://<instance>/public/dv/v1/embedding/<embedding
mode>/embedding.js" type="application/javascript">
        </script>

    </head>
    <body>
        <h1>Embeded Oracle Analytics Project</h1>
        <div style="border:1px solid black;position: absolute; width:
calc(100% - 40px); height: calc(100% - 120px)" >
            <!--
            The following tag is the tag that will embed the specified
project.
            Veryfy the project-path is the same as the server you are
hosting this project on.
            -->
            <oracle-dv
               project-path="<project path>"
               active-page="canvas"
               active-tab-id="1">
            </oracle-dv>
        </div>
        <!--
        Apply Knockout bindings after DV project is fully loaded.  This
should be executed in a body onload handler or in a <script> tag after the
<oracle-dv> tag.
```

```
        -->
        <script>
        requirejs(['knockout', 'ojs/ojcore', 'ojs/ojknockout', 'ojs/
ojcomposite', 'jet-composites/oracle-dv/loader'], function(ko) {
        ko.applyBindings();
        });
        </script>
    </body>
</html>
```

Pass Filters to the HTML Page

You can pass numeric and list filters to the HTML page. You can filter any type of data with these filter types.

The filters payload is a Javascript array containing one filter Javascript object per array item.

Rendering a project while applying filters looks like this:

```
<oracle-dv project-path="{{projectPath}}" filters="{{filters}}">
</oracle-dv>

<script>
requirejs(['knockout', 'ojs/ojcore', 'ojs/ojknockout', 'ojs/
ojcomposite', 'jet-composites/oracle-dv/loader'], function(ko) {
   function MyProject() {
      var self = this;
      self.projectPath =  ko.observable("/users/weblogic/
EmbeddingStory");
      self.filters = ko.observableArray([{
         "sColFormula": "\"A - Sample Sales\".\"Products\".\"P2
Product Type\"",
         "sColName": "P2  Product Type",
         "sOperator": "in", /* One of in, notIn, between, less,
lessOrEqual, greater, greaterOrEqual */
         "isNumericCol": false,
         "bIsDoubleColumn": false,
         "aCodeValues": [],
         "aDisplayValues": ['Audio', 'Camera', 'LCD']
      },{
         "sColFormula": "\"A - Sample Sales\".\"Base Facts\".\"1-
Revenue\"",
         "sColName": "Rev",
         "sOperator": "between", /* One of in, notIn, between, less,
lessOrEqual, greater, greaterOrEqual */
         "isNumericCol": true,
         "bIsDoubleColumn": false,
         "aCodeValues": [],
         "aDisplayValues": [0, 2400000] /* Because the operator is
"between", this results in values between 0 and 2400000 *
/
  }]);
}
   ko.applyBindings(MyProject);
});
</script>
```

Supported attributes — Each filter object within the filters payload must contain the following attributes:

- `sColFormula`: Specifies the three-part formula of the column to filter. The column formula must include three parts.

  If you're unsure of the formula, create a project that uses that column, and then in the Visualize tab, go to **Menu** and select **Developer**. In the Developer page, click the JSON tab to view the column's expression. For example, `sColFormula": "\"A - Sample Sales\".\"Base Facts\".\"1- Revenue\""` .
- `sColName`: (Required) Specifies a unique name for this column.
- `sOperator`: Use `in`, `notIn`, `between`, `less`, `lessOrEqual`, `greater`, or `greaterOrEqual`.
  - `in` and `notIn` - Apply to list filters.
  - `between`, `less`, `lessOrEqual`, `greater`, and `greaterOrEqual` - Apply to numeric filters.
- `isNumericCol`: Specifies if the filter is numeric or list. Value should be `true` or `false`.
- `isDateCol`: (Required) Indicates whether the column is a date column. Value should be `true` or `false`. Use `true` if the column is a date, but not for year, month, quarter, and so on. If set to `true`, then specify date or dates in the `aDisplayValues` attribute.
- `bIsDoubleColumn`: Specifies if the column has double column values behind the display values. Value should be `true` or `false`.
- `aCodeValues`: When `bIsDoubleColumn` is `true`, this array is used.
- `bHonorEmptyFilter`: (Optional) Indicates whether an empty filter is honored (for example, empty `aCodeValues/aDisplayValues` based on the `bIsDoubleColumn` flag). This attribute applies to all column filters: list filters, number range filters, and date range filters. Value should be `true` or `false`.
  - If set to `true` and the user passes empty `aCodeValues/aDisplayValues`, then all values are part of the filter.
  - If set to `false` and user passes empty `aCodeValues/aDisplayValues`, then the attribute won't be applied and there is no change in filter values.
  - If this attribute isn't present, then the default value is `false`.
- `aDisplayValues`: When `bIsDoubleColumn` is `false`, then this array is used to filter and to display values within the user interface.

  When `bIsDoubleColumn` is `true`, then the values in this array are used for display in the user interface while the values in `aCodeValues` are used for filtering. When `bIsDoubleColumn` is `true`, there must be the same number of entries in this array as there are in the `aCodeValues` array and the values must line up. For example, suppose `aCodeValues` has two values `1` and `2`, then `aDisplayValues` must have two values `a` and `b`, where `1` is the code value for `a`, and `2` is the code value for `b`.

  If `isDateCol` attribute is set to `true`, then specify the `aDisplayValues` array with dates. If either no time zone in the time stamp or no time stamp is provided, then time is set with the local time zone. Use any of the following formats:
  - mm/dd/yyyy (For example, 12/31/2011.)
  - yyyy-mm-dd (For example, 2011-12-31.)

  - yyyy/mm/dd (For example, 2011/12/31.)
  - mm/dd/yyyy or yyyy/mm/dd, hh:mm:ss (For example, 12/31/2011 or 2011/12/31, 23:23:00.)
    Note: Use a 24 hour format. You can use a space as the separator.
  - mm/dd/yyyy or yyyy/mm/dd, hh:mm:ss AM/PM (For example, 12/31/2011 or 2011/12/31, 11:23:00 PM.)
    Note: Use a 12 hour format. You can use a space as the separator.
  - <3 letter month name> dd yyyy (For example, Mar 25 2015.)
  - dd <3 letter month name> yyyy (For example, 25 Mar 2015.)
  - Fri Sep 30 2011 05:30:00 GMT+0530 (India Standard Time)
  - ISO Date Format - 2011-10-05T14:48:00.000Z

Refresh Data in the HTML Page

You can configure how to refresh the embedded project's data.

To refresh data without reloading a project, the `refreshData` function is attached to all `<oracle-dv>` elements. Invoking it forces all visualizations under that element to refresh.

This is the code to refresh data for a single embedded project.

```
<oracle-dv id="project1" project-path="{{projectPath}}">
</oracle-dv>

<script>
   function refreshProject() {
      $('#project1')
  [0].refreshData();
}
</script>
```

This is the code to refresh data for multiple embedded projects.

```
<script>
   function refreshProject()
   {
      $('oracle-dv').each(function() {
         this.refreshData();
         });
}
</script>
```

Embed into a Custom Application that Uses Oracle JET

If the custom application uses Oracle JET, then the embedded content extends the application with the component it needs.

For information about creating an Oracle JET quick start application where you'll embed content, see Oracle JET Get Started.

This procedure uses an example embedding application named OACJETAPP.

1. Follow the instructions to install the Oracle JET quickstart application and name the embedding application OACJETAPP using `--template=navdrawer`.
2. Edit the index.HTML file of the embedding application (for example, `OACJETAPP/src/index.html`) and include embedding.js.

   ```
   <script src="https://<instance>/public/dv/v1/embedding/jet/embedding.js"
   type="text/javascript">
   </script>
   ```

3. Include `<oracle-dv>` in the appropriate section (for example `OACJETAPP/src/js/views/dashboard.html`).

   ```
   <div class="oj-hybrid-padding" style="position: absolute; width:
   calc(100% - 40px); height: calc(100% - 120px)">
    <h3Dashboard Content Area</h3>
     <oracle-dv id="oracle-dv" project-path="/shared/embed/test-embed">
     </oracle-dv>
   </div>
   ```

4. Run the quick start application using these commands.

   ```
   ojet build
   ojet serve
   ```

Embed into a Custom Application that Doesn’t Use Oracle JET

If the custom application uses a technology other than Oracle JET, then the embedded content adds its Oracle JET distribution and all additional components into the page.

1. Include the standalone version of embedding.js.

   ```
   <script src=https://<instance>/public/dv/v1/embedding/standalone/
   embedding.js type="text/javascript"> </script>
   ```

2. Find and include `<oracle-dv>` under an appropriately sized `<div>`. To find this tag:
   a. Go to Oracle Analytics and open the project containing the content you want to embed.
   b. Click **Menu** and then click **Developer**.
   c. Click the Embed tab.
   d. Locate the item you want to embed and click **Copy** to copy it.

   For example:

   ```
   <div style="position: absolute; width: calc(100% - 40px); height:
   calc(100% - 120px)">
       <oracle-dv project-path="/@Catalog/users/admin/project_name">
       </oracle-dv>
   </div>
   ```

3. Apply Knockout bindings after the visualization is fully loaded. This should be placed inside of a `<script>` tag after the `<oracle-dv>` tag, or executed in an onload body handler.

   ```
   requirejs(['knockout', 'ojs/ojcore', 'ojs/ojknockout', 'ojs/
   ojcomposite', 'jet-composites/oracle-dv/loader'], function(ko) {
       ko.applyBindings();
   });
   ```

Complete Example

```
<!DOCTYPE html>
<html dir="ltr">
   <head>
      <title>AJAX Standalone Demo</title>
      <script src="https://<instance>/public/dv/v1/embedding/standalone/
embedding.js""
type="text/javascript">
      </script>
   </head>
   <body>
      <h1>AJAX Standalone Demo</h1>

      <div style="position: absolute; width: calc(100% - 40px); height:
calc(100% -
120px)" >
         <oracle-dv project-path="/shared/embed/test-embed">
         </oracle-dv>
      </div>

   <script>
requirejs(['knockout', 'ojs/ojcore', 'ojs/ojknockout', 'ojs/
ojcomposite', 'jet-composites/oracle-dv/loader'], function(ko)
{   ko.applyBindings();
});
      </script
   </body
</html
```

Use Login Prompt Authentication

Login prompt authentication is the default authentication method for content embedded in a web application or portal web page.

When users access embedded content, they're presented with a login screen where they enter login name and password before they can view data. If there is no common identity management between Oracle Analytics and the web application or portal web page, then users are presented with this login screen, even if they've already logged in to the web application or portal web page containing the embedded content

Customize the Login Prompt Authentication Message

Add attributes to the `<oracle-dv>` tag to customize the login prompt authentication messages. The following attributes are supported:

- `auth-message-prefix`: Specifies the prefix text for the login message. The default value is `"Oracle Analytics"`.
- `auth-message-link`: Specifies the text for the login link. The default value is `"Login"`.
- `auth-message-suffix`: Specifies the suffix text for the login message. The default value is `"Required"`.
- `auth-needed-message`: Specifies the text for the authentication needed message. The default value is `"Requires Authentication"`.
- `auth-message-prefix-small`: Specifies the prefix text for the login message. The default value is `"Oracle Analytics"`. Applicable only if the embedded container size is smaller than 215 pixels.
- `auth-message-link-small`: Specifies the text for the login link. The default value is `"Login"`. Applicable only if the embedded container size is smaller than 215 pixels.
- `auth-message-suffix-small` - Specifies the suffix text for the login message. The default value is the empty string. Applicable only if the embedded container size is smaller than 215 pixels.
- `auth-needed-message-small`: Specifies the text for the authentication needed message. The default value is `"Requires Authentication"`. Applicable only if the embedded container size is smaller than 160 pixels.