PUBLIC
SAP Cloud for Customer
Document Version: CLOUD – 2024-03-01

SAP Cloud for Customer Analytics Guide

THE BEST RUN **SAP**

Content

1   Overview of Analytics

Analytics is integrated in the solution to support and monitor business processes, helping you to make informed decisions.

Using the extensive and flexible business analytics features, you can easily create custom reports using the guided procedures and then control the visibility of those reports by assigning them only to specific work centers as well as individual business roles. If you've defined custom fields in your solution, you can also add them to data sources or reports, your own or those delivered with the solution. In addition, you can join or combine heterogeneous data sources, again your own, or those delivered with the solution, as well as create custom calculated measures and comparison metrics.

Reports can be accessed from the *Reports* view of the *Analysis* work center and are also embedded on the home page. The Analytics data in the solution is real time. There's no persistency in a separate Business Warehouse layer. Analytics data in the solution is also access context sensitive. This means that data sources are associated with access contexts to ensure that data is directed to users who are allowed to view the data.

Before You Get Started

- Determine whether or not you want to be able to assign reports to business roles. This option provides you more flexibility than just work center assignment alone. You've to enable role assignment during the fine-tuning step of completing the activity list for your implementation. Refer to the guide for more information.
- If you want to see real data rather than just test data when you're creating and reviewing your custom reports, you must enable that option on the activity for *Administrator Analytics — Settings*.
- Also during *Administrator Analytics — Settings*, we recommend that you **don't** select the *Allow Extended Access* checkbox, as this can cause reports to include and display data even if a user isn't authorized to see that information.

Creating a Report

The following graphic represents the general process for creating a report:

For a detailed description of all the features and tasks available for business analytics, see the Individual sections in this guide.
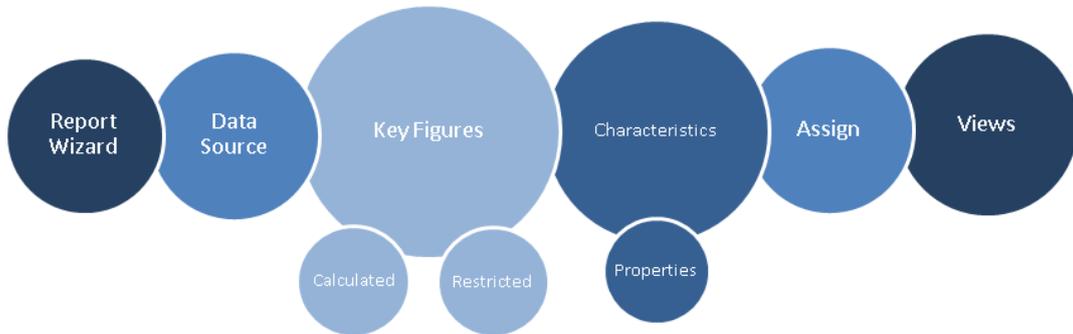
Creating a Report Using Business Analytics

1.1   Data Source

An object containing key figures and characteristics, which provides a multidimensional, analytical view of business data.

Data sources are associated with a specified access context or can be unrestricted.
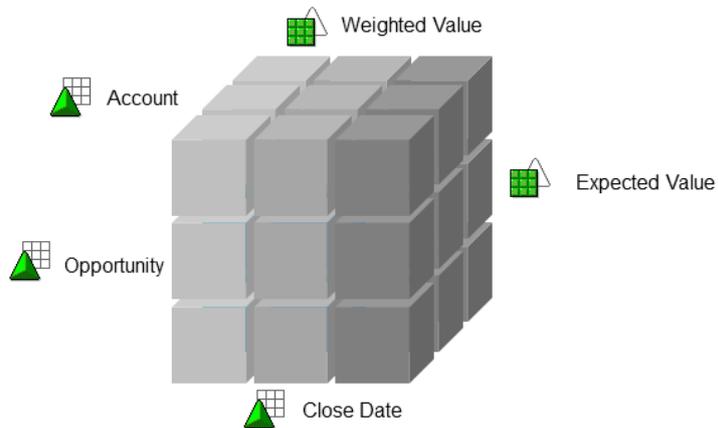
Example of a data source

When you start the report creation process with the Report Wizard the first step is to select a data source. The solution ships with several pre-defined data sources. You can create and edit your own data sources to suit your business requirements and processes and use your data sources for reporting. To create your data sources, you combine or join data sources to merge data into a new data source. You can also create a data source by importing external information, and this data source can be correlated with sales volume, or ticket processing.

1.2   Key Figure

A field according to which values are selected. Key figures are data items with numeric values and have an associated unit of measure or currency assigned. Some examples are pipeline value, Invoice Net Value, Purchase Order Quantity or tickets in queue.

1.2.1 Key Figure Grid

A group consisting of a key figure structure and a characteristic structure for reporting on two axes.

The access context of a key figure grid is that of the underlying data source.

Expected Value and Weighted Value: Close Date Quarter
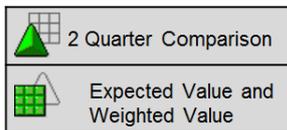
Quarter 1		Quarter 2	
Expected Value	Weighted Value	Expected Value	Weighted Value
1000000	800000	1200000	900000

Example of a key figure grid with data

1.2.2 Key Figure Structure

A group of predefined key figures for reporting on one axis. Key figures in the structure can be calculated or restricted.

The access context of a key figure structure is that of the underlying data source.

Opportunity Analysis Key Figures

Expected Value	Chance of Success	Weighted Value	Item Total Value	Number of Opportunities
1000000	80%	8000000	1000000	1

Example of a key figure structure with data

You can refine the data appearing in key figures by setting up restricted or calculated key figures.

- A restricted key figure is a key figure restricted to a specified characteristic value, and is often created for comparison metrics.
- A calculated key figure is a key figure determined using calculation rules or formulas. You can create a calculated key figure from existing key figures in the selected data source.

> ⓘ Note
>
> Sales
>
> - You choose an existing figure — revenue, and restrict to last year, in the US. When you run the report you can see total today compared to last year's US total revenue.
> - You want to find the incremental revenue per day invested in a sales cycle, if the opportunity is worth 100K, and the sales cycle starts on 1 January and ends 20 February. You create a calculation to divide the total revenue (100K) by the fifty-one days in the time period.

> **Service**
>
> Suppose you have created your own set of user statuses (for example, pending engineering review) The key figure, counter, shows how many tickets are in this status
>
> - Start from the existing key figure, counter. Restrict the new key figure to the status "pending engineering review". This restricted key figure can be used in your report that only shows the key figure, which can then be used as a dashboard tile.
> - You want to know new or in process percentage pending engineering review. You create a new key figure, and calculate the percentage.

1.3 Characteristic

A field according to which values are selected. Characteristics are alphanumeric, numeric, or text values. Examples include Product ID, Supplier, and Purchase Order Status. Variables are often associated with specified characteristics. Variables restrict characteristics to one or more specified value selections.

1.3.1 Characteristic Structure

A group of predefined characteristic elements in a key figure grid.

Characteristic elements are characteristics that can be calculated or restricted.

The access context of a characteristic structure is that of the underlying data source.

4 Year Comparison

Current Year	1 Year Ago	2 Years Ago	3 Years Ago
2015	2014	2013	2012
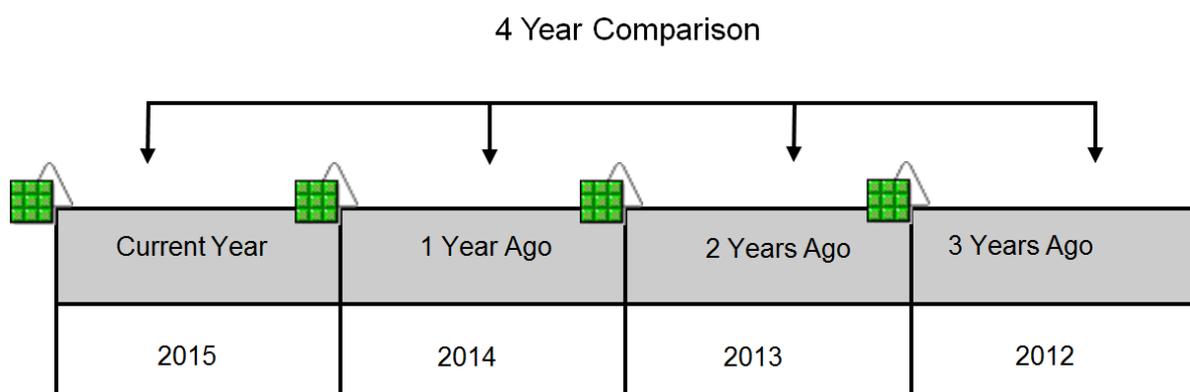
Example of a characteristic structure with data

Select characteristics for restricted key figures, for example: account, opportunity, country/region, or industry. You can also set properties to define additional behavior for a specific characteristic.

- **Display Settings**: Define how the characteristic appears and is used in the report.
- **Value Selections**: Add restrictions to the characteristic values that appears in the report.
- **Hierarchy Settings**: Define how any hierarchical data associated with the characteristic is used in the report. For example, display the customer characteristic by location.

1.4   Report

A compilation of data for analysis. Reports show values derived from key figures and characteristics in data sources, key figure structures, and key figure grids.
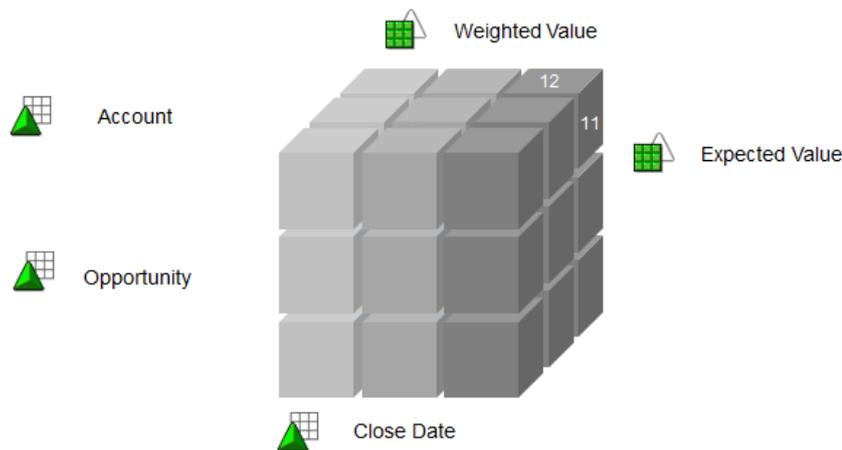
		Quarter 1		Quarter 2	
Account	**Opportunity**	**Expected Value**	**Weighted Value**	**Expected Value**	**Weighted Value**
Account A	Opportunity 1	1000000	800000		
	Opportunity 2			1200000	900000
Account B	Opportunity 3	800000	50000		

Example of a report

1.5   Views

Views enable you to set up one or more variations on which key figures and characteristics appear in the report, and the type of chart that appears for the report. Once you assign a report to a work center, you can select the view which appears in the end user reports list. You create a view by choosing key figures and characteristics for columns and rows in a table, then selecting a chart type to best represent that data. When you create a view you can also define conditions and exceptions for key figures that alter how your data is presented based on rules and thresholds.

- **Conditions**: Create a condition to limit the data shown to that which fits the defined rules.
- **Exceptions**: Set a threshold beyond which the data display is altered to display an alert indicator.

2 Scope and Configure Analytics

Administrators can configure Analytics using scoping, scoping questions, and fine-tuning activities.

Scoping questions and fine-tuning activities that are self-explanatory may not be included in this list.

2.1 Configure Settings for Analytics Administrator

Configure settings so that administrators can assign browser-based reports and Microsoft Excel® workbooks to work center views.

> ⚠ Caution
>
> This document contains details and instructions regarding configuration settings. Such settings are performed by an administrator. If you do not have the required authorization, contact your administrator.

To find this activity, go to the ▌▶ *Business Configuration* ❯ *Implementation Projects* ▌ view. Select your implementation project and click *Open Activity List*. Select the *Fine-Tune* phase, then select the activity from the activity list.

Administrators for Analytics can assign browser-based reports and Microsoft Excel® workbooks to work center views. Business users are thereby granted the access to the report and the authorizations to start the report. The system checks if the data source of the report and the work center view have a common access context. This ensures that business users can only access data in the report that they are authorized to view. When business users are assigned access rights for a work center view in the *User and Access Management* work center view, access rights for specified reports are also assigned.

By default, the *Allow Extended Access* indicator is not set. If you set the indicator, you have to put other controls for your administrator for Analytics in place to ensure controlled read access of data. These controls must meet your compliance criteria. Note that the system tracks report assignments with non matching access contexts for auditing reasons. You can view report assignments using the *Report Assignment Details* report.

By default, the *Show Real Data* indicator is not set. If you set the indicator, administrators for Analytics can view real data when they preview data sources in the *Design Data Sources* work center view. Real data is also then displayed when administrators for Analytics view reports in the *Design Reports* work center view.

By default, the *Allow Assignment* indicator is not set. If you set the indicator, administrators for Analytics can assign business roles to analytical objects. To be able to use this feature, maintain business roles for users before selecting this option. You must then assign all the reports to the business roles in the *Design Reports* work center view before they are available to the business users.

By default, the *Select E-mail Address* dropdown is set to **System**. This means that when you send a report, the receiver will get an e-mail from the default e-mail ID that is set up by the administrators. However, if you select the option as **Logged-in User**, you can e-mail a report using the e-mail ID that you are logged-in with. The receiver will be able to respond back to you on the same e-mail address.

Related Information

[Assign Reports to Business Roles [page 38]](#)
  Restrict access to certain reports by assigning them to specific business roles.

2.2 Configure E-Mail Encryption and Signature Check

Configure e-mail encryption and signature check for different e-mail scenarios.

> ⚠ Caution
>
> This document contains details and instructions regarding configuration settings. Such settings are normally performed by an administrator. If you do not have the required authorization, contact your administrator.

To find this activity, go to the ▌▶ *Business Configuration* ❯ *Implementation Projects* ▌ view. Select your implementation project and click *Open Activity List*. Select the *Fine-Tune* phase, then select the activity from the activity list.

In your solution, you can increase security in e-mails by decrypting incoming e-mails and checking them for trustworthy signatures, as well as by encrypting and signing outgoing e-mails. In this configuration activity, preconfigured e-mail scenarios are provided. You can specify e-mail encryption and signature check for each e-mail scenario as follows:

E-Mails	Encryption/Decryption	Signature
Incoming	Encrypted e-mails are decrypted automatically	Outgoing Specify encryption of e-mails
Outgoing	Specify encryption of e-mails	Specify signing of e-mails

Outgoing e-mails are encrypted using the Secure/Multipurpose Internet Mail Extensions (S/MIME) standard.

Your solution tries to decrypt encrypted incoming e-mails. If this fails, it sends an e-mail notification to the sender.

Prerequisites

The signature check is done using the list of certificates of the trusted Certification Authorities (CA) listed in your solution. You can find this list under ▌▶ *Administrator* ❯ *Common Tasks* ❯ *Configure S/MIME* ▌ or in the *Load Certificates and Activate Signing and Encryption for E-Mails* activity in *Business Configuration*, in the *Integrate and Extend* phase of the activity list. You can activate the settings that you have specified in this fine-tune activity.

Incoming E-Mail

In the *Signature* column you specify whether the signature should be checked.

> ⓘ Note
>
> Business partners send their e-mails to the e-mail addresses listed in this fine-tune activity, depending on the e-mail scenario. These e-mail addresses are provided by SAP. You cannot change the e-mail addresses in this fine-tune activity.

Outgoing E-Mail

In the *Encryption* column you specify whether the e-mails should be sent encrypted, and in the *Signature* column you specify whether the e-mail should be signed.

You can specify one of the following options for encryption of e-mails:

Encryption Options

Option	Description
Encrypt	The system encrypts e-mails before sending them. If it cannot encrypt an e-mail, the system displays an error message.
Encrypt if Possible	The system encrypts e-mails before sending them. If it cannot encrypt an e-mail, the system sends an unencrypted e-mail.
Do Not Encrypt	The system does not encrypt e-mails.

> ⓘ Note
>
> To send encrypted e-mails to your business partner, your system must store a certificate from your business partner.

2.3 Load Certificates and Activate Signing and Encryption for E-Mails

Your SAP solution enables you to encrypt outgoing e-mails and check the signature of incoming e-mails by using the Secure/Multipurpose Internet Mail Extensions (S/MIME) standard.

You can use this function for e-mail communication between your system and your employees, in e-mail scenarios provided by SAP (for example, self-service or approval scenarios).

> ⚠ **Caution**
>
> This document contains details and instructions regarding configuration settings. Such settings are normally performed by an administrator. If you do not have the required authorization, contact your administrator.

To find this activity, go to the ▐▶ *Business Configuration* ❭ *Implementation Projects* ❭ view. Select your implementation project and click *Open Activity List*. Select the *Integrate and Extend* phase, then select the activity from the activity list.

In this configuration activity, you can upload the certificate of your trusted Certification Authority (CA) and activate the signature check and encryption of e-mails.

Prerequisites

- All employees who are supposed to use S/MIME must have a workplace e-mail address and an e-mail certificate installed in their e-mail client.
- Your employees must use one of the following e-mail clients:
  - Microsoft® Outlook®
  - Mozilla® Thunderbird®
  - Apple® Mail
- The *Encryption and Signatures for E-Mails* and *Load Certificates and Activate Signing and Encryption for E-Mails* configuration activities are enabled in your solution.
  To find the related business option, go to the *Business Configuration* work center and choose the *Implementation Projects* view. Select your implementation project and click *Edit Project Scope*. In the *Scoping* step of the project, under *Built in Service and Support*, ensure that *System Management* is selected. In the *Questions* step, expand the *Built-in Service and Support* scoping element and select *System Management*. Select *Security* and answer the question related to *E-Mail Security*.
- You have completed the *Encryption and Signatures for E-Mails* activity.

  To find this activity, go to the ▐▶ *Business Configuration* ❭ *Implementation Projects* ❭ view. Select your implementation project and click *Open Activity List*. Select the *Fine-Tune* phase, then select the activity from the activity list.

Tasks

- **Upload Certificate of the Certification Authority**
  1. Choose *Manage CA Certificates*.
  2. Select the e-mail addresses for which you want to upload the CA certificate.
  3. Click *Upload CA Certificate* and select the certificate of your trusted CA.
- **Upload the Employee's S/MIME Certificate for E-Mail Encryption**
  You can upload the employee's S/MIME certificate by performing one of the following options:
  - Upload certificate automatically: The employee sends an e-mail to security@<system ID>.com. When the system receives the e-mail, the certificate is automatically uploaded.

- Upload certificate manually by administrator:

  1. Go to ▌▶ *Administrator* ❯ *General Settings* ❯ *Users* ❯ *Business Users* ▌ and select the business user for whom you want to upload the certificate
  2. Click *Manage Certificates*.
  3. Click *Upload S/MIME Certificate* and choose the relevant certificate file
  4. Save your changes.

- Upload certificate manually by employee:

  1. Choose ▌▶ *Personalize* ❯ *My Settings* ▌.
  2. Click *Manage Certificates*
  3. Click *Upload S/MIME Certificate* and choose the relevant certificate file.
  4. Save your changes.

- **Activate E-Mail Encryption and Signature Check**
  Once you have uploaded all employees' S/MIME certificates, you can activate the S/MIME functions either in this business configuration activity or in ▌▶ *Administrator* ❯ *Common Tasks* ❯ *Configure S/MIME* ▌ at a later point in time.

  1. Choose *Activate S/MIME*.
  2. To activate the signature check set the *Check Signature of Incoming E-Mails* checkbox.
  3. To activate E-Mail encryption set the *Encrypt Outgoing E-Mails* checkbox.
  4. Save your changes.

- **Renew S/MIME Certificate**

  1. Select the certificate to be renewed.
  2. Click *Renew S/MIME Certificate*.
  3. Click *Save*.

2.4 Enable Reporting on Fiscal Year

This configuring activity contains all settings for a fiscal year, such as the number of accounting periods.

You can also define a custom fiscal year variant, for example if your accounting periods are not calendar months. This is the case, for example, with the commonly used 4–4–5 calendar, which is permitted by U.S. GAAP. You can define as many separate fiscal year variants as needed, for example if different companies in your group require different calendars.

> ⓘ Note
>
> This document contains details and instructions regarding configuration settings. Such settings are normally performed by an administrator. If you do not have the required authorization, contact your administrator.

To find this activity, go to ▌▶ *Business Configuration* ❯ *Implementation Projects* ▌. Select your implementation project and click *Open Activity List*. Select the Fine-Tune phase, and then select *Enable Reporting on Fiscal Year* from the activity list.

Prerequisites

To be able to define a fiscal year variant, select the *Enable Fiscal Year for Reporting* option in Scoping in the *Questions* step.

Tasks

- **Activate Fiscal Year Variant**: Activating a fiscal year variant creates the fiscal year and accounting period data for ten fiscal years so that the variant can be used in analytical reports. The data is generated for five fiscal years in the past, the current fiscal year, and four future fiscal years. To do this, choose a fiscal year variant and click on the *Activate Fiscal Year* button.
- **Set Default Fiscal Year Variant**: The analytical reports show only the data of the default fiscal year variant. At any given point in time, there can be multiple fiscal year variants which are active, but only one can be the default. To set a variant as default, choose a fiscal year variant and click on the *Set as Default* button.
- **Generate Fiscal Year Data**: This allows you to create fiscal year and accounting period data for a fiscal year variant in addition to the data already created upon activation. This is possible only for active fiscal year variants. To do this, choose an active fiscal year variant and click on the *Generate Fiscal Year Data* button. This will open a dialog box where you can enter the fiscal years for which data should be generated.
- **Create New Fiscal Year Template**: You can define a custom fiscal year variant if your accounting periods are not calendar months, or if you want to create a variant that is already not delivered by SAP. You must specify the fiscal year variant details and define an accounting period template from which the actual fiscal year and accounting period data can be created. To create a fiscal year variant, follow these steps:
  1. Click ▶ *New* ❯ *Custom Fiscal Year Template* ❯. This opens up a new window where you can specify the following details of the new variant:
     - *Fiscal Year Variant*: A two-character code that starts with a letter.
     - *Number of Accounting Period*: The number of accounting periods that your fiscal year covers in a normal situation.
     - *Relationship of Fiscal Year to Calendar Year*: If you define a non-calendar fiscal year, specify whether the beginning or ending month is within the calendar year of a particular fiscal year.
  2. Click *Create Periods* to generate the default template accounting periods. You can specify which rules the system uses to determine the accounting periods for a particular fiscal year by entering the following details:
     - *Start Day*: Enter the calendar day on which the accounting period starts.
     - *Start Month*: Enter the calendar month on which the accounting period starts.
     - *Description*: You can enter a short and long description for the period. The descriptions are displayed when the periods are opened and closed.
     - *Fiscal Quarter*: Enter a single digit numeric value specifying the fiscal quarter to which the accounting the period belongs. For example: 1,2, 3,4.
     - *Fiscal Half*: Enter a single digit numeric value specifying the fiscal half to which the accounting the period belongs. For example: 1,2.

     You can also change the number of accounting periods after specifying the accounting period details. To do this, click on the *Delete Periods* button. This deletes all the existing periods and makes the *Number of Accounting Periods* fields editable once again.
  3. Save your fiscal variant.

Once this is done, you can go back to the previous screen to create the actual fiscal year and accounting period data for your new variant.

- **Create Year-Specific Variant**: You can also define a year-specific variant if your accounting periods are not calendar months, or if you want to create a variant that is already not delivered by SAP, or if the accounting period details vary for each fiscal year. You must specify the fiscal year variant details and define accounting periods and accounting period data for each fiscal year. To create a year-specific variant, follow these steps:

  1. Click ▌▶ *New* ❯ *Year Specific Variant* ▌. This opens a new window where you can specify the following details of the new variant:

     - *Fiscal Year Variant*: A two-character code that starts with a letter.
     - *Description*: To identify your variant, enter a small description .

  2. Click *OK* to create the variant. The system shows you the details of the fiscal year variant in the lower part of your screen.

  3. In the *Fiscal Year Details* tab, enter the number of accounting periods for each fiscal year of the year-specific fiscal year variant.

  4. In the *Period Details* tab, enter the following details:

     - *Start Date*: Enter the date on which the accounting period starts.
     - *End Date*: Enter the date on which the accounting period ends.
     - *Description*: You can enter a short and long description for the period. The descriptions are displayed when the periods are opened and closed.
     - *Fiscal Quarter* and *Fiscal Half*: Select the desired option from the dropdown.

  5. Save your entries..

> ⓘ Note
>
> - If you want to make any changes to the number of accounting periods for a fiscal year, you can make it in the *Fiscal Year Details* tab only. This is not possible in the *Period Details* tab.
> - The *Generate Fiscal Year Data* and *Activate Fiscal Year Variant* buttons will not be enabled for year-specific variants.

3 Reports

In the *Design Reports* view, administrators can create and edit their own reports to suit their business requirements and processes.

You can access the *Design Reports* view from the *Business Analytics* or *Administrator* work centers.

Background

You use Analytics objects in the system to create your reports. Data from key figures and characteristics in a data source or a key figure group serves as the basis for your reports.

> ⓘ Note
>
> You can decide whether report data sent by e-mail is to be encrypted. If you want to encrypt outgoing e-mails, you must make changes to your scoping. From the *E-mail Encryption and Signature Check* fine-tune activity, you can specify for the *Analytics - Send Report Data, Broadcasting* outgoing e-mail scenario whether outgoing e-mails are encrypted and whether they are signed.
>
> For more information, see Load Certificates and Activate Signing and Encryption for E-Mails [page 13] and Configuration: E-Mail Encryption and Signature Check [page 12].

Create and Edit a Report Using the Report Wizard [page 19]
Administrators can create and edit reports that they create using the Report Wizard.

Work with Reports and Plans in Microsoft Excel [page 23]
The SAP add-in for Microsoft Excel enables you to run ad-hoc analysis, create workbooks, create plan data, and define sales targets.

Create and Edit a Navigation Target [page 34]
From the *Design Reports* work center view, administrators can create navigation targets in a selected target report to which business users can navigate from a source report.

Assign Reports [page 37]
As an administrator, you can create and assign reports to work centers and work center views, making them available to business users. You can also restrict access to certain reports by additionally assigning them to specific business roles.

Reports View [page 40]
The solution delivers predefined content for reports that are defined in your scope. Reports can also be defined by administrators for business users. The *Reports* view is a central access point to reports associated with a work center.

Access and Run Reports [page 41]
Business users can access and run reports that have been assigned to them.

Work with Reports in a Web Browser [page 41]
Working with reports in a *Web Browser* allows you to execute ad hoc analyses. You can open reports from the reports list in the *Reports* view and from embedded reports.

3.1 Create and Edit a Report Using the Report Wizard

Administrators can create and edit reports that they create using the Report Wizard.

The Report Wizard guided activity is available from the following locations:

- From the *Design Reports* work center view by clicking *New*, and then choosing *Report* or *Report As Copy*.
- From the *Design Data Sources* work center view by clicking *New*, and then choosing *Report*.

After you've assigned reports to work center views, they're available in the *Reports* work center view of the *Analysis* work center. Business users can then create their own personal report views.

> ⓘ Note
>
> Administrators can create public report views and public selections, that is, a saved set of value selections for variables and filter values, in the *Business Analytics* work center. Administrators create public report views and public selections with the report in a web browser.
>
> The public report views and public selections are then available with the corresponding reports.

Procedure

1. **Define Report and Select Data Source.**
   Note that because the complexity of some SAP delivered Analytics content, not all data sources and the objects they include are available to administrators to create key figures, data sources, and reports.

   > ⓘ Note
   >
   > You don't have to complete all steps; only the first step is mandatory. This is indicated by an asterisk (*).
   >
   > You can create a report by entering a name, selecting a data source, and clicking *Finish*.

   1. Enter a name and description for the report.

We recommend providing a description for the report so that the business user can identify the use of the report after you've assigned the report to the relevant work center views and corresponding work centers.

2. Select a data source for the report. A data source provides the characteristics and key figures used in a report. It also serves as the basis for further reporting objects, such as key figure structures or grids. To select a data source, you can either enter the ID or select a data source from the value selection.

> ⓘ Note
>
> When you select a data source, one or more supported access contexts are displayed. When you assign the report to a work center or work center view, the access context of the report and the work center or work center view should match.

3. You can also set further properties for the report:

- *Enable for Mobile Device*
  By selecting the checkbox, the report type is set to Mobile Report. For more information, see Working with Mobile Reports [page 89].

- *Only for Master Data*
  By selecting the checkbox, you can create a report without any key figures. The system then skips step 2. This is useful if you want to create list reports, such as a list of customers.

- If the report you want to create is a copy of a report that has navigation targets, the Copy With Navigation checkbox is also available. By selecting the checkbox, the system also copies the navigation targets in the source report to your report. Note that UI-based navigation isn't copied. For information about how business users navigate in reports, see Analytical Navigation [page 53].

2. **Select Key Figures.**
   In this step, you select the key figures to be used in the report. From the Show dropdown list, you've the following options:

   - All
     All key figures and key figure groups available in a data source are displayed.

   - Customer Created Key Figures
     Key figures created by administrators are displayed.

   - Key Figure Group
     Using this selection option, you can choose either a key figure structure or a key figure grid.

   - Key Figures

   - Selected Key Figure Group / Key Figures

   You can also create calculated and restricted key figures by clicking *Create*.

3. **Select Characteristics**
   The characteristics that are available in the data source are listed. Dimensions, that is, the criterion by which characteristics are categorized, can assist you in selecting relevant characteristics. Characteristics may be selected by default.
   To determine whether the characteristic has a predefined restriction or if it has a variable associated with it, you can add the *Has Variable* and *Value Selection* columns.
   To add the columns, click *Personalize*, select *This Page* option, and then select the fields from the list.
   If the characteristic has *No Value Selection*, there are no predefined restrictions. You can create restrictions or add a variable in the next step.

4. **Define Characteristic Properties.**
   For each characteristic available, maintain the following properties.

- Display Settings
  - The *Display in Report* checkbox shows whether a characteristic is displayed in the *Not Currently Shown* list in the navigation pane when the report is displayed in a web browser. If the checkbox isn't selected, the characteristic can still be used in the *Selection* area in the report and for restricted key figures.
  - To change the name of characteristics that are displayed to business users in a report, you can rename characteristics. In the *Rename Characteristic To* field, enter the new name of the characteristic.
  - By selecting the *Show Master Data Value* checkbox, you can display the values of a characteristic in the report regardless of whether there are key figure values.

    > ⓘ Note
    >
    > By selecting the *Show Master Data Value* checkbox for the Customer characteristic, all customers are displayed in the report.

- Value Selections

  Any defined value selections are also listed. The following table describes the options available under *Value Selection*.

Value	Description
No Value Selection	The characteristic isn't restricted.
Using Variable	The characteristic can be restricted using a variable.
	If you select *Using Variable*, the characteristic can be restricted to one or more value selections using a variable. In the *Define Variables* step, you can maintain properties for the variable.
	On the variable screen, you can restrict the characteristic using a variable or save a set of value selections for the selection.
Fixed Value Selection	You can set fixed value selections for the selected characteristics.
	Note that if the characteristic is already restricted to one or more fixed value selections you can't change fixed value selections.
	If you select *Fixed Value Selection*, *Set Fixed Value Selections* is active.

Value	Description
Using Complex Restriction	The characteristic is restricted using one or more complex restriction rules that are defined in a key figure structure or key figure grid. You can't change the restriction.
	For example, the One Year Ago characteristic that is used in the key figure grid belonging to the data source is restricted using a relative selection.
Using Inherited Variable	The characteristic is restricted using an inherited variable. You can't change the restriction.
	For example, the characteristic is restricted using a variable from an underlying data source.

- **Hierarchy Settings**

  Any defined hierarchy settings are also listed. The following table describes the options available under *Hierarchy*.

Value	Description
No Hierarchy	No hierarchy is available for the characteristic.
Using Variable	The characteristic hierarchy can be restricted using a variable.
Fixed Hierarchy	The characteristic hierarchy is restricted to display the characteristic by an attribute. For example, to display the Customer characteristic by location.
Via Inherited Variable	The characteristic hierarchy is restricted using an inherited variable.
	You can't change the restriction.

5. **Define Variables.**

   For each variable available, maintain the selection type and any default values if necessary.
   The selection type indicates how values for the variable can be selected, such as single values, multiple values, interval, or any selection. You can also maintain default values.

6. **Review and Confirmation**

   Review the report. In the *Confirmation* step, you can display the report in a web browser to create a layout for the report, assign the report to a work center view, or create another report.

> ⓘ **Note**
>
> In the *Business Analytics* work center, when you view reports, generated test data is displayed regardless of whether the report is assigned to a work center view to which you have access rights as a business user.

> To view the report with real data, you must open the report from a *Reports* work center view in the *Analysis* work center.

3.2   Work with Reports and Plans in Microsoft Excel

The SAP add-in for Microsoft Excel enables you to run ad-hoc analysis, create workbooks, create plan data, and define sales targets.

- **Microsoft Excel-Based Reporting**
  You can open reports from the workbooks and reports list in the *Reports* work center view by clicking *View With* and choosing the *Microsoft Excel* option. You can also open reports directly in Microsoft Excel by logging on the SAP system.
  Administrators can create design workbooks and make them available for business users from the *Business Analytics* work center.
- **Microsoft Excel-Based Planning**
  To overcome the limitations of the conventional approach of planning in spreadsheets, business planning consists of features to enable planners to efficiently obtain and work with planning data in business environments.

> ⓘ Note
>
> The functions of the add-in for Microsoft Excel are restricted or not available when using the Microsoft object linking and embedding (OLE) feature. We therefore recommend not using this feature.

3.2.1 Analytic Features

The analytic features in the add-in tab enable you to save workbooks to the solution system.

You can also use available Microsoft Excel functions. Depending on your access rights, different workbooks and reports are available. Saved workbooks are then available from different work center views. Note that the functions available to you depend on your access rights and the work center view assignments; the reports you work with in a web browser are also available using the add-in for Microsoft Excel.

> ⓘ Note
>
> To view and work with Microsoft Excel-based reports and plans, ensure that the add-in for Microsoft Excel is installed.
>
> You can download the Microsoft Excel add-in by clicking *Download* option, on the top-right corner of the solution.

3.2.1.1 Administrators

Context

Administrators can create and edit public workbooks as follows:

Procedure

1. Open the public or personal workbook.
2. Switch to design mode by clicking Design Workbook.

   If you want to view the workbook with generated test data, refresh the workbook.
3. Make any relevant changes and save.
4. Assign the workbook to the relevant work center views to make it public.

   Note that if the workbook has already been assigned and is public, you do not need to assign the workbook again.

3.2.1.2 Workbook Group

The workbook group provides functions to open and save workbooks and reports. You can also copy, remove, and protect reports and worksheets.

- Open
  Downloads and opens a workbook from the solution system.
- Save
  Saves the workbook back to the solution system as a public workbook. You have the following options to save workbooks to the solution system.
- Save All
  The following options are available
  - Save All
  - Save Workbook
  - Save Plan Data
  - Save Workbook As New
- Switch Workbook Type
  The follow table provides an overview of the workbooks available.

Workbook Type	Description
Personal workbook	A workbook that is adapted to the individual business needs of a user. A personal workbook is only available to the user who creates it. Any change to a personal workbook is saved back to the solution system.
Public workbook	A workbook that can be consumed by all users who have the corresponding work center views assigned. Public workbooks are read-only and can be adapted with personalized views and selections to the business needs of the user. Note that before a created workbook can be made public, administrators must first save the workbook as a design workbook.
Design workbook	A workbook that only includes the layout without data and is only available from the *Business Analytics* work center. Since administrators in general are not allowed to view business data, the data is deleted whenever you store a design workbook. As soon as a design workbook is assigned to a work center view, business users can use it as a public workbook with real data.

- Insert Report
  Inserts a report into the worksheet starting in the active cell.

  > ⓘ Note
  >
  > By selecting the *Paging* checkbox, the system displays the first 50 rows of the report including the column headers. Paging down shows the next 50 lines. This is useful if you want to start a report that has large amounts of data.
  >
  > By limiting the number of rows displayed, the system can display the report more quickly. You can still filter or make value selections in order to display the data you want. Note that if you filter or make value selections, the system displays the first page with the specified number of rows.

- Copy Report
  Copies the report and any report views and variable values in order to paste it in a different location.
- Paste Report
  Pastes the report and any report views and variable values that was last cut or copied into the active cell.
- Remove Report
  Removes the report and any report views and variable values in order to paste it in a different location.
- Protect
  Uses the Microsoft Excel function to protect the worksheet to prevent changes to all cells containing data from the solution system.

3.2.1.3 Refresh Group

Refreshes the data in the report. You can also defer refreshing the report.

- Refresh
  Refreshes the data in the report.
  - Refresh Current Report
    Refreshes the data in the report that is currently selected.
  - Refresh Worksheet When Activated
    If this feature is active for a workbook, any reports on a sheet in the workbook are automatically refreshed when the sheet is activated.
  - Refresh Report
    You can select a report to refresh from the list.
  - Refresh All
- Defer Refresh
  Defers refreshing the report until you refresh it manually. This function is useful, for example, if you make multiple changes to a report, such as to the layout or you add another key figure or column.
- Paging
  You can enter the number of rows you want to display. For example, rows 10 to 40. If you click the down arrow, the system displays the next page with 30 rows, including the column headers.

3.2.1.4   View Group

Displays the report views that are available with a report. You can change the current report view.

In the view pane, you can save changes as a new report view. The view pane also enables you to select the characteristics and key figures that are shown in the report.

- Displaying Characteristics and Hierarchies
  For characteristics and hierarchies, you can specify in which format the individual characteristic values of the characteristic are displayed. You can display characteristics and hierarchies as name, ID, or a combination thereof.
- Sorting
  You can also specify how characteristic values are sorted. You can sort characteristics displayed in rows and columns according to the description or ID in ascending or descending order.
- Results Row
  Using the values from the dropdown list, you can decide how the result is to be displayed. You can decide if results are to be displayed or if results are to be displayed when there are at least two single values.
  You can also activate and deactivate conditions that are either delivered with a report or that have been defined for the report or report view in a Web browser. For more information, see Conditions [page 52].

3.2.1.5   Selection Group

You can display the set of value selections for variables that are available with a report. You can change the current set of value selections. In the *Selection* pane, you can save changes as a new set of value selections for variables.

You can also set filter values by selecting values in the report and clicking the Filter icon in the *Selection* group. To remove the filter, click the corresponding icon.

> ⓘ Note
>
> If you have multiple reports in a workbook and want to apply the same set of value selections, you can use values from dedicated cells.
>
> For example, you have multiple reports that all contain customers. You want to filter the data in the reports to show data related to customer 1001.
>
> On sheet 2, in cell D14, you enter `1001`. In the *Selection* pane of the report, in the Customer variable entry field, you enter `=Sheet2!D14`. After refreshing the report, data is filtered to customers 1001. Alternatively, using Microsoft Excel® functionality, you can define a name for the referenced cell, such as Customer, and enter the name instead of the address of the referenced cell in the Customer variable entry field; in this case, you enter `=Customer`.
>
> Note that this tip does not work for advanced restrictions, such as excluding a value or using intervals.
>
> Also note that data in the workbook is not automatically refreshed if you change the entry in the referenced cell.

3.2.1.6 Header Group

Enables you to insert a report header.

You can specify if the report name is to be displayed along with technical information about the report. The header can be inserted either as a range of cells above the report or as a text box.

3.2.1.7 Report Group

Enables you to make further display settings.

- Navigate
  Enables you to navigate to another report or to an overview document.
- Insert Chart
  Enables you to insert a chart using Microsoft Excel functions. For information about Microsoft Excel chart types and functions, see Microsoft Excel documentation.
- Switch Display Mode of Current Report
  - Grid Display
    Displays the report using the solution cell styles in the Microsoft Excel grid.
  - PivotTable Display
    Enables you to display the report as a PivotTable using Microsoft Excel functions. For information about Microsoft Excel PivotTable functions, see Microsoft Excel documentation.
  - Excel Table Display
    Enables you to display the report as a Microsoft Excel table. Note that if you select this display mode, the Microsoft Excel *Design* tab is displayed.
    This display mode is useful, for example, if you want to filter or to sort data using Microsoft Excel functions. For information, see Microsoft Excel documentation.

- Settings
    - Freeze Panes
      Uses the Microsoft Excel freeze pane function to fix the header columns and rows.
    - Format Report
      Formats the report using the default SAP Business solution cell styles as listed under the Microsoft Excel Home tab.
    - Adjust to Complete Column
      Adjusts the width of columns to the width of the longest value in each column.
    - Adjust to Report Result
      Adjusts the column width to the width of the longest value in the column.
    - Use Outline for Hierarchies
      Uses the Microsoft Excel outline function to group characteristic hierarchies by expansion level.
    - Expand Rows to Level
      You can choose the hierarchy level up to which the hierarchy is to be displayed when it is expanded.
    - Merge Repeated Cells
      You can specify whether every instance of a characteristic value is displayed in a row or column.
    - Show Results First
      You can specify how results are to be displayed. You can decide if they are to be displayed above rows or to the left of columns.
    - Arrange As Hierarchy
      The system arranges characteristics in rows and in columns as a hierarchy. The row or column further left serves as the tree structure into which characteristics to the right are inserted.
    - Invert Hierarchies
      The system inverts the hierarchy so that the hierarchy is displayed from bottom to top or from right to left. You can decide to invert a hierarchy in rows and in columns.
    - Suppress Zero Values
      You can suppress columns or rows that contain zeros in your report.
- Show / Hide
    - View
    - Variables
    - Planning
    - Header
    - Messages
      You can specify if all messages or only errors are displayed. You can also decide if messages are displayed on user request.

3.2.1.8 Assigning Workbooks

Administrators can assign workbooks to work center views, make them available to business users.

For more information, access the *Help Center* from the relevant screen.

3.2.2 Planning Features

The planning features of the add-in tab enables you to create and edit plan data. Cells that are enabled for input have a white background and become yellow when you change their value. Cells that are gray are read-only.

3.2.2.1   Refresh Group

- Refresh
  Refreshes the data in the plan.
  Depending on the planning application you are using, when you make entries in cells, the changes you make are sent either synchronously or asynchronously.

  - Upload Input (Asynchronous Sending including save)
    When you click *Upload Input*, the changes you make to the plan data are transferred to the system asynchronously, values are calculated, and the data is saved. You may need to wait before you can make further changes to the plan.
    While the system is calculating and saving, the related data in the cells is locked and is read only. Although you can still change values in the sheet, you cannot upload the new values.
    The only option is to refresh the data. If the system has completed the upload when you refresh, the system reads the data again and overwrites all values. In this case, cells are available again for entries. If the calculation is still in progress, a message about the progress of the upload is displayed.
    Note that if you want all read-only cells to be protected against changes, click *Protect* in the *Workbook* group.

    > ⓘ Note
    >
    > **Tips and Tricks When Uploading Input**
    >
    > - When you create a plan, reduce the amount of data to the relevant characteristic value combinations, for example, account and cost center, that are required from a business perspective.
    > - Before changing plan values, restrict the amount of data as much as possible by using selection criteria for characteristic values in the *Selection* pane.
    > - If when changing plan values, the system takes a long time to transfer the data, consider changing less data at one time. For example, you want to change the plan data in 500 cells; change the data of the first 250 cells, upload, and then change the next 250 cells.
    > - If not needed from business perspective, avoid changing rows containing the Not Assigned characteristic value. If the value is required, upload rows containing this value separately from the rest of the data.
    > - If not needed from business perspective, avoid entering data on different aggregation levels, such as subtotals and totals in *Result* rows.

  - Send Input (Synchronous Sending excluding Save)
    The changes you make to the plan data are sent to the system synchronously. You can continue to make changes to the plan as soon as the system has finished calculating and is ready for data entry again. Click *Save Plan Data* to save the data in the system.
  - Refresh Current Report
    Refreshes the data in the report that is currently selected.

- Refresh Worksheet When Activated
  If this feature is active for a workbook, reports on a sheet in the workbook are automatically refreshed when the sheet is activated.
  - Refresh Report
    You can select a report to refresh from the list.
  - Refresh All
- Defer Refresh
  Defers refreshing the report until you refresh it manually. This function is useful, for example, if you make multiple changes to a report, such as to the layout or you add another key figure or column.
- Paging
  You can enter the number of rows you want to display. For example, rows 10 to 40. If you click the down arrow, the system displays the next page with 30 rows, including the column headers.

3.2.2.2 Planning Group

Enables you to plan at different levels and adjust values accordingly.

- Mark Selected
  Marks cells that you select to be sent back to the system. By marking selected cells, you set the value for the cell. The value therefore does not change when you redistribute values by clicking *Refresh*.
- Unmark All
  Unmarks all selected cells.

The following example illustrates how values for sales and target planning can be distributed. Note that the characteristics available for financial planning may differ.

> ⓘ Note
>
> You want to project revenue for your products and create a plan that contains the characteristics "Product" and "Customer". Each product is sold to several different customers but you only want to see how much money you received for each product. You therefore choose a view that displays the aggregated revenue for your products. Any changes that you make to the product revenue on this aggregated view are distributed down to the individual customers for the relevant product.

The following figures are used to illustrate how the data is distributed.

- The estimated revenue for your Product 1 is USD 1000, for Product 2 USD 2000, and for Product 3 USD 3000. In the system, this information is distributed down to the customer level:

Aggregated view on product level

Sales and Target Planning			
Product	Revenue		
Product 1	1000 USD		
Product 2	2000 USD		
Product 3	3000 USD		
Result	6000 USD		

Distributed down to customer level

Sales and Target Planning			
Product	Customer	Revenue	
Product 1	Customer 1	200 USD	
	Customer 2	200 USD	
	Customer 3	600 USD	
	Result	1000 USD	
Product 2	Customer 1	600 USD	
	Customer 2	600 USD	
	Customer 3	800 USD	
	Result	2000 USD	
Product 3	Customer 1	1000 USD	
	Customer 2	1000 USD	
	Customer 3	1000 USD	
	Result	3000 USD	
Result		6000 USD	

- You then change the value for Product 1 from USD 1000 to USD 3000. The system recalculates the result and again distributes all the values down to customer level in the same proportions:

Aggregated view on product level

Sales and Target Planning	
Product	Revenue
Product 1	3000 USD
Product 2	2000 USD
Product 3	3000 USD
Result	8000 USD

Distributed down to customer level

Sales and Target Planning		
Product	Customer	Revenue
Product 1	Customer 1	600 USD
	Customer 2	600 USD
	Customer 3	1800 USD
	Result	3000 USD
Product 2	Customer 1	600 USD
	Customer 2	600 USD
	Customer 3	800 USD
	Result	2000 USD
Product 3	Customer 1	1000 USD
	Customer 2	1000 USD
	Customer 3	1000 USD
	Result	3000 USD
Result		8000 USD

- You then double the total revenue. The system distributes this over the three products in the same proportions as at the beginning and also distributes this information down to customer level:

Aggregated view on product level

Sales and Target Planning	
Product	Revenue
Product 1	6000 USD
Product 2	4000 USD
Product 3	6000 USD
Result	16,000 USD

Distributed down to customer level

Sales and Target Planning		
Product	Customer	Revenue
Product 1	Customer 1	1200 USD
	Customer 2	1200 USD
	Customer 3	3600 USD
	Result	6000 USD
Product 2	Customer 1	1200 USD
	Customer 2	1200 USD
	Customer 3	1600 USD
	Result	4000 USD
Product 3	Customer 1	2000 USD
	Customer 2	2000 USD
	Customer 3	2000 USD
	Result	6000 USD
Result		16,000 USD

> ⓘ Note
>
> Note that if you have a value for equal distribution on more than one level of a hierarchy, it may not appear to be distributed equally. The system distributes the value equally on the lowest level. The remainder is then distributed equally on the lowest level before the results are aggregated to the next highest level.

Example

For example, You have 11 items to be distributed equally (without decimal places) on multiple levels in a hierarchy.

The higher level has two nodes; one node has one branch; the other node has two branches. Thus, the lowest level has three nodes.

Equal distribution results in each lowest-level node having the value 3. The remainder is then distributed on the lowest level. This results in two lowest-level nodes having the value 4, and one lowest-level node having the value 3.

Once aggregated to a higher level, one higher-level node has the value 4. The other higher-level node has the value 7.

The result is displayed below.
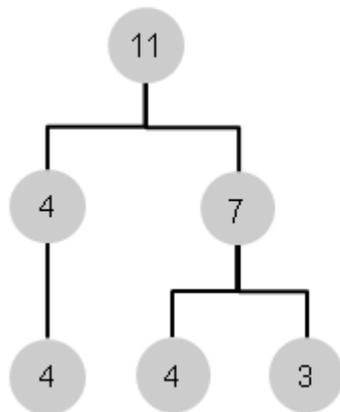
3.3 Create and Edit a Navigation Target

From the *Design Reports* work center view, administrators can create navigation targets in a selected target report to which business users can navigate from a source report.

Context

You can define how values are transferred to the corresponding characteristic or variable. Report-to-report navigation is useful for further analysis of report data. For example, a business user has the *Purchase Orders per Supplier* source report , containing purchase order IDs. When a business user clicks a purchase order ID in the report, such as 3141, the context menu displays the *Purchase Orders per Product* target report . The business user can then navigate to this report directly without returning to the *Reports* work center view. In this example, the business user can see what other purchase orders have the same product as in purchase order 3141.

Procedure

1. In the *Design Reports* object worklist, select the relevant target report and click ▌▶ *New* ❭ ❭ *Report Navigation*.

   In the following screen, the target report and the corresponding characteristics and variables appear.

   You can also decide if you want to create navigation targets for characteristics and variables in a report view.

   Note that you cannot create a UI based navigation.

2. To select a source report, click *Add Source Report*.

   To remove a source report, click *Remove Source Report*.

3. From the *Select Source Report* dropdown list, select the corresponding source report.

   The source report along with the corresponding characteristics and variables are added.

4. From the list of target characteristics and variables, select the relevant source characteristics and variables from the dropdown lists in the relevant columns.

   > ⓘ Note
   >
   > If you select a variable, you must change the transfer type to *Ranked Transfer*.

5. Define how value selections are to be transferred from the source report to the target report.

   Note that if you check the *Use Default Variable Value* checkbox, the default variable value in the target report is used if no value is available from the source report.

Source Report Variable	Target Report Variable
Variable is not filled	Default variable value is used, regardless of transfer type.
Variable is filled	Default variable value is not used.

The following table provides an overview of the available transfer types:

Transfer Type	Description
Not Transferred	The value selection of characteristic or variable of the source report is not transferred to the target report. Thus, the characteristic or variable of the target report is not restricted. For example, supplier IDs of the source report are not transferred to the target where no suppliers are listed.
	If you do not want a characteristic to be restricted, use this transfer type.

Transfer Type	Description
Transferred	The value selection of either the source characteristic or the source variable is transferred without modification to the target characteristic or target variable.
	You may transfer a source characteristic to a target variable. You may also transfer a source variable to a target characteristic.

> ⓘ Note
>
> - It is not necessary that the characteristics or variables have the same name, but they must be semantically correct. For example, in your company, it may be correct to transfer value selections from a sales unit to a cost center if they are one and the same.
> - The system cannot check an infinite selection.

Transfer Type	Description
Ranked Transfer	Value selections (characteristic and variable) of the source report are transferred to either a target variable or characteristic.
	The system first checks if the source characteristic has a value selection. If this is the case, the target is filled with the value selection. If the system cannot find any value selection for the source characteristic, the system checks if the source variable has a value selection. If this is the case, the target is filled with the value selection.
	We recommend using this transfer type if you have both a characteristic and a variable defined for the specified characteristic in the source report.

> ⓘ Note
>
> When deciding on how value selections are to be transferred for variables, you must also note the selection type for the variable.
>
> For example, in the source report, you have a variable called *Company* for which a single value is allowed. You want to transfer values from the variable to the following variables in the target report:
>
> - *Company*
>   The selection type is defined for the variable as *Single Value*. Therefore, we recommend selecting *Transferred* as the transfer type.
> - *Partner Company*
>   The selection type is defined for the variable as *Multiple Value*. Therefore, we recommend selecting *Not Transferred* as the transfer type.

3.4   Assign Reports

As an administrator, you can create and assign reports to work centers and work center views, making them available to business users. You can also restrict access to certain reports by additionally assigning them to specific business roles.

3.4.1 Assign Reports to Work Center Views

Assign reports to a work center view and make it available to business users.

Procedure

1. From the *Design Reports* work center view, select the relevant report with the status *Unassigned*.
2. Click *Assign*. This opens the *Work center view* tab.

   Note that the system checks whether the access context of the report and the access context of the work center view conflict. The *Conflict* column indicates whether a conflict exists.

   A check mark indicates that the access contexts match. An exclamation mark indicates that the access contexts conflict.

   If you want to assign reports to work center view regardless of conflicting access rights, you must make changes to your fine tuning in the *Business Configuration* work center using the optional activity *Administrator Analytics — Settings*. For more information, see Configuration: Administrator Analytics - Settings [page 11].
3. The system assigns the report categories from the underlying data source to the report. You can change the report category assignment by selecting the corresponding work center view and making changes to the report category assignment in list. To do so, select the report categories by which the report can be grouped in the *Reports* work center view.

   > ⓘ Note
   >
   > Some delivered content has the *Hidden* status by default. For example, reports that are only displayed as embedded reports. If you want to have the report displayed in the *Reports* work center view, deselect the *Hide in Reports View* indicator.

4. Select the check box to assign the report. Click *Save* to save the work center view- based assignment.

   > ⓘ Note
   >
   > When you assign Microsoft Excel®-based reports, that is, workbooks, ensure that the reports embedded in the workbook are also assigned to the same work centers and work center views as the workbook to ensure that business users can view all reports embedded in the workbook. For each embedded report, note the report name and ID in the Report Name dropdown list of the workbook header and compare its assignment against the reports used in the workbook.

For example, the administrator has assigned a Microsoft Excel-based report, that is, a workbook, to a work center view. The workbook is available to all users assigned to that work center view. A user executes the workbook but receives an error message, stating that she/he is not authorized to execute a report. The user received this error message because the report is not assigned to the same work center view as the workbook.

3.4.2 Assign Reports to Business Roles

Restrict access to certain reports by assigning them to specific business roles.

Context

ⓘ Note

- You can assign a report to a business role only if you've selected the option in the fine-tuning activities for your solution. For more information, see Role Based Access [page 90].
- You can **only** assign business roles to Browser- Based Reports.
- You can view details of business roles assigned to reports by creating a report, based on SAP pre-delivered *ANABRASGNV* data source.

Procedure

1. Select the report that you want to assign.
2. Click *Assign*. In the screen that opens, go to *Business Role* tab.

   A list shows all the business roles to which you can assign this report. This list is generated on the basis of the work centers and views that the selected report is assigned to. This allows you to make the report available to only selected users out of all the users that have access to a particular work center view.
3. Select the checkbox against the business roles for assigning the report.

   If the report is in status *Unassigned*, the business roles list is empty. Assign the report first to a work center view to be able to make assignments to business roles.
4. Save and close the screen once the assignment is complete.

3.4.3 View Report Assignments

View and report assignments by sorting, grouping, or filtering the list.

Procedure

- View assignments for all the reports

  In the *Business Analytics* work center, go to *Design Reports* view, and click *Assignment Overview*. The screen displays all the work center and view assignments for the report. To modify the displayed data, click

  the sort icon ![sort icon] and select from the available grouping option in the *Group by* drop down list.
- View work center and views assignments for a report

  In the *Design Reports* view, select a report. In the *Details* section *Assigned Work Centers* shows the work centers this report has been assigned to.
- View business role assignments for a report

  In the *Design Reports* view, select a report. In the *Details* section *Assigned Business Roles* shows the business roles this report has been assigned to.

3.4.4 Change Report Assignment

Unassign and reassign reports to work center views.

Procedure

1. Go to ▍ *Business Analytics* ❯ *Design Reports* ❯ and click *Assignment Overview*. The system opens the *Report Assignment Overview* screen.
2. Choose *Unassign All/Reassign All* to select all the reports that you want to reassign/unassign from work center views. In the *Change Assignment* column of the table, the system displays all the work center assignments accordingly.
3. Click *Save*. The system schedules a background job if you select more than 20 reports.

   Note that, if you unassign all reports, you can reassign only SAP reports. Customer-created reports cannot be reassigned.

3.5   Reports View

The solution delivers predefined content for reports that are defined in your scope. Reports can also be defined by administrators for business users. The *Reports* view is a central access point to reports associated with a work center.

The following report types are available.

- **Browser-Based Reports**
  Consists of a compilation of data for evaluation where analysis and drill-down is supported. You can open browser-based reports either in a Web browser or in Microsoft Excel.
- **Microsoft Excel-Based Reports**
  Using Microsoft Excel®, you can view and edit reports in spreadsheets.

  > ⓘ Note
  >
  > To view and work with Microsoft Excel-Based reports, ensure that the add-in for Microsoft Excel is installed.
  >
  > Depending on your authorization, you can download the add-in from the following locations:
  >
  > - From the top right corner of the screen by clicking *Download*.
  > - From the *Self-Services* work center view of the *Home* work center

- **Mobile Reports**
  Mobile reports are browser-based reports that are enabled for mobile devices.

Opening Reports

The report names are displayed as links. To open the report, click the relevant link . By clicking *View With*, you can open a report either in a Web browser or in Microsoft Excel®.

You can also open reports from the *Gallery* work center view in which you can browse reports.

Organizing Reports

By default, all reports associated with the work center are displayed and the *Advanced* find feature is closed.

From the *Show* dropdown list, you can choose whether to display reports by the following criteria:

- By Report Category
- My Priority Reports
  To include or remove a report from your priority list, select the report row, click *Priority*, and choose *Mark as Priority* or *Remove from Priority*.
- All Reports
- All Reports - Quick List
  Displays a list of reports, providing only the names and descriptions of reports.

By default, the system displays reports grouped by report category.

Details

In the *Details* section below the reports list, you can find additional information about the selected report. There are three tab pages in the *Details* area of the *Reports* view.

- Report Views
  A report view is a modified view of the data available with a report. The *Report Views* tab page displays all existing views associated with a report. These are divided into four categories: views created by you, views created by an administrator, views delivered by SAP, and views created by SAP partners. Report views are displayed as links and can be opened directly from this tab page by clicking the corresponding link.

  > ⓘ Note
  >
  > When you create a report view from the *Analysis* work center, it will be available to you only as a local view when you are logged in to the system. When a report view is created from the *Business Analytics* work center, it will be available to all users. If you are an administrator, and want to publish a report view, you must create it from the *Business Analytics* work center.

- Report Details
  Displays general information about a report, including creation and change data. Under *Report Categories*, all of the report categories to which a report is assigned are listed, for example, Supply Chain – Physical Inventory.

- Report Assignment
  Displays the work center views and subviews with which the selected report is associated. Note that the list can also include views and subviews from work centers other than the work center in which the report is currently displayed.

3.6 Access and Run Reports

Business users can access and run reports that have been assigned to them.

Business users can access and run reports from ▶ *Analysis* ❯ *Reports* ❯ workcenter view.

3.7 Work with Reports in a Web Browser

Working with reports in a *Web Browser* allows you to execute ad hoc analyses. You can open reports from the reports list in the *Reports* view and from embedded reports.

Administrators use a limited range of functions as described here to preview data sources.

Functions in the Content Area [page 43]

In the content area you can display data, personalize table column width, and use the context menu for further navigation and analysis.

Functions in the Navigation Pane [page 44]

In the navigation pane, you can find functions to make display settings. Analysis functions are also available to display certain values.

Working with the More Actions Menu [page 46]

You have a range of actions that help you work with reports.

Working with Selections [page 47]

When you open a report in a Web browser, the data displayed in the report is restricted to the value selections set using variables in the Selection area above the report and any saved filter values.

Working with Filters [page 50]

The value selections you make using variables for the selection also determine the characteristic value selections that can be further restricted using the filter function.

Exceptions [page 50]

When you work with reports, you can create exceptions for key figures.

Conditions [page 52]

When you work with reports, you can create conditions to restrict the results area of a report in accordance with certain criteria.

Analytical Navigation [page 53]

To analyze data further, the navigation functions for Analytics in the solution enable you navigate from a source to a target. You can navigate from one report to another or view documents related to a value in a cell, either in rows or columns, by clicking the value and then choosing an entry from the dropdown list.

Chart Settings [page 55]

When you work with reports, you can make a range of chart settings, such as providing a legend for the chart.

Table Settings [page 82]

When you work with reports in a web browser, you have a range of table settings, such as how tables are designed.

Result Settings [page 83]

When you work with reports in a web browser, you have a range of settings for results, such as how result rows are displayed.

Sort Settings [page 84]

When you work with reports, you can make a range of settings that help you sort key figures and characteristics.

Add a Field to a Report [page 85]

When working with reports in a Web browser, business users can add characteristic attributes to and remove them from reports by clicking *Add Fields*. On the following screen, fields are group by specified criteria. For example, characteristics are grouped by dimensions.

3.7.1 Functions in the Content Area

In the content area you can display data, personalize table column width, and use the context menu for further navigation and analysis.

Display

In the content area for the report, data is displayed in a table or chart depending on settings. You can switch the display format of the report. You can also undo a step or revert to the last saved state of the report.

You can also sort data in ascending or descending order.

Sorting works on every column but you need to consider the context (grouping /data set) of the column you want to sort. So, the sorting is done within each set of data, and a data set is determined by the precedent columns.

In the following example, the data set for **State** is sorted according to the **Country/Region, which** is the precedent column.(Fig 1). So, within US, IN, and DE, the states are sorted A ->Z. If you want to sort by **State** only, then you must move that column as the first one. In that case, the data is sorted by **State** as in Fig 2.

Fig.1

Country/Region	State
US	Alabama
	New York
	Texas
IN	Bangalore
	Delhi
	Mumbai
DE	Bavaria
	Berlin
	Hamburg

Fig.2

State	Country/Region
Alabama	US
Bangalore	IN
Bavaria	DE
Berlin	DE
Delhi	IN
Hamburg	DE
Mumbai	IN
New York	US
Texas	US

Personalize Table Column Width

You can adjust table column widths and personalize this setting. This action is available for both administrators and end users. As an administrator, you can define a format and share it with all the end users. However, the end users can override your format and save their personalization. To do this, follow these steps:

1. In the *Business Analytics* work center, navigate to ▌ *Design Reports* ❯ *Edit With* ❯ *Web Browser* ▐, to open a view.
2. Adjust the table column width.
3. Go to the **More Actions** icon, °°° and select ▌ *Save* ❯ *View* ▐.

If you make changes to the SAP-delivered views, or views created by the administrator, select ▶ *Save* ▶ *Personalization* ▶.

> ⓘ **Note**
>
> - Table column adjustment isn't supported when characteristics are added in the columns.
> - Table column adjustment isn't supported if the field is a hierarchical field.
> - Table column adjustment isn't supported if scaling is active in key figures.

Analytical Navigation

In cells of reports displayed in table format, you can use the context menu for further navigation and analysis. Using the context menu, you can view existing documents related to a value. When you double-click a cell, the documents and reports to which you can navigate are displayed. For example, you can navigate to a preceding document, such as a purchase request, an overview document that provides information about a customer, or to another report.

3.7.2 Functions in the Navigation Pane

In the navigation pane, you can find functions to make display settings. Analysis functions are also available to display certain values.

Key Figures	Characteristics
Display	Display
Hide	Hide
Decimals	Adding Attributes
Scaling	Displaying Hierarchies

Key Figures	Characteristics
Conditions	Conditions
Exceptions	Exceptions
Sorting	Sorting

Display Settings

By clicking *Settings*, you can determine how characteristics and key figures are displayed in the report along with making settings for charts and tables.

Creating Exceptions and Conditions

To create conditions and exceptions for the report, under *Columns*, click the dropdown list for *Key Figures*. You can create, edit, and delete exceptions and conditions by choosing *Manage Exceptions* or *Manage Conditions* accordingly.

Selecting Key Figures

To add additional key figures to the report from the available key figures or to remove them from the report, from *Settings*, choose *Key Figures*.

You can determine the order in which key figures appear as columns in your report by moving them up or down in the list accordingly.

You can also decide if you want to display technical IDs by clicking *Show ID*.

Displaying Characteristics and Key Figures

You can drag and drop characteristics and key figures in columns and rows to the *Not Currently Shown* list. To drag and drop, you use the Move function. This function is available from the dropdown list from the characteristics and key figures. If you select *Remove*, the characteristic or key figure is moved to the *Not Currently Shown* list.

> ⓘ Note
>
> You can add a maximum of 10 characteristics in a column drill down.

3.7.3 Working with the More Actions Menu

You have a range of actions that help you work with reports.

The More Actions (⚬⚬⚬) menu is available on the top right-hand corner of your screen if you are working in the Fiori Client UI.

Action Buttons	Tasks
Show Chart & Table	Allows you to display the report in both chart and table format together.
Save	Allows you to save your changes as a view if you have authorization to overwrite the existing view. Or else, use *Save as* to create a new view.
Download	Allows you to download the report to Microsoft Excel® in XML, XLSX, or CSV format. Note that the report opens in read only mode. You can also download data sources in CSV format, and reports in PDF. ⓘ **Note** • PDF download is only available in Chrome • PDF download is only available for charts The format and the available fields of the downloaded data source differ from a downloaded report. For example, in a downloaded report, the value and unit of measure are combined in one field whereas in the downloaded data source, the fields are separate. Another example is that there may be key figures only defined for the report, which are not available in the underlying data source. When you download data in an excel file (xlsx), the date, amount, and quantity fields are formatted according to their types. This helps you to filter the data accordingly. To perform ad hoc analyses, open the report in Microsoft Excel®. From the *Reports* work center view, click *View With*, and choose the Microsoft Excel option.
Start Options	Allows you to define the way your report opens.
Show Extended Text	Allows you to show or hide extended text when you are working with long texts such as notes. You can show up to 1024 characters. ⓘ **Note** If this option is enabled in a report, you cannot use characteristics of data type **string** to filter or use as parameter.
Open with Microsoft Excel	Gives you an option to open your report using the Microsoft excel add-in.

Action Buttons	Tasks
Send via E-mail	Allows you to perform the following functions in Fiori Client only:

- Select multiple e-mail IDs: You can enter multiple IDs from within and outside your organization.
- Copy other e-mail IDs: You can copy your e-mail to multiple IDs from within and outside your organization.
- Select attachment: You can select the following attachment types: after you have chosen it. For example, you have selected a word document as an attachment. But now you wish to add some more information to the attached document. You can do it. In addition, you can also attach an excel spreadsheet instead of the original document.
- Format text: You can format the text inside the e-mail. You can change the font size, color, and background color of a text, add hyperlink, and so on.

> ⓘ **Note**
>
> In the Edge browser if you apply font or background color to the text, for the first time it works fine. But when you try it the next time, instead of making the background blue (to show the text as selected) the system makes the text color blue. Click somewhere else in the editor for the changes to apply correctly.

Show Report Information	Shows the Header and Technical Details. When you choose this option, the system displays the access context, selection ID, and any filters set. If available, any information and warnings are also displayed. For example, if the display currency is set using key figure settings or variables.

3.7.4 Working with Selections

When you open a report in a Web browser, the data displayed in the report is restricted to the value selections set using variables in the Selection area above the report and any saved filter values.

Selection

A selection consists of the set of variables available for the report and any defined value selections. The selection you define determines the data to be displayed in the report. The value selections you make using variables for the selection also determine the characteristic value selections that can be further restricted using the filter function.

Note that you must specify a value for all mandatory variables. In the system, mandatory variables are indicated by an asterisk (*).

The *Access Context* variable is mandatory for all reports. This variable is defaulted to the access context to which the you are assigned. The system fills the variable with the access context available for the report. In this case, only one access context is assigned, and therefore the variable is not displayed.

> ⓘ Note
>
> For reports opened with Microsoft Excel®, the system also fills the variable with the initially saved access context.

Example

For example, you open the *Project Cost – Overview* report in two work centers and have saved the *Access Context* variable with different value selections in both work centers: in the first work center, you saved the access context as *Company*; in the second work center, you saved the access context as *Project*. The system proposes one of the two access contexts.

Making Value Selections

To display the descriptions of values that you have selected, in the *Selection* area, click .

> ⓘ Note
>
> If the field is of type hierarchy, then clicking the **Show Description** icon does not show the description, but only the IDs.

Note that if you want to enter values manually, the system supports manual entry of only the ID of variable or characteristic values.

For example, you know that you want to restrict the *Supplier* variable to 500001 (You cannot enter `Miller and Son`). You therefore enter `500001` in the *Supplier* variable field.

You can delete value selections by clicking the *x* icon. The delete function is always active.

Value Selection Help

By opening the value selection for a variable or for a characteristic, you can select single values, exclude values, set an interval, or a set of values, depending on how the content has been defined, or if you have set filter values.

The following options are available depending on the variable or characteristic selected:

- Basic Select
  Allows you to restrict a specified characteristic to available values.
- Advanced Select
  Allows you to restrict a specified characteristic using relational operators, such as greater than and less than. To do this, select the **Add Row** icon **+**. The system gives you an option to choose the relational operators, and a value.

Select *Add Fields* to add a new variable. In the new window, choose a variable and select the checkboxes under *Display in Report* and *Display in Selection*. Click *OK*. The variable will be available for selection.

- Relative Select
  Allows you to restrict a specified characteristic to a relative variable selection. Relative selections are based on basic characteristics, such as Date, Week, Month, Fiscal Period, and Company. When you start the report, the system fills the cells in the report with the corresponding values. The following table provides examples of relative selections.

Variable	Relative Selection	Description
Posting Date	Today	Shows today's date.
Invoice Creation Date	Last 7 Days	. The systemShows a time range of the last 7 days, including today.
Fiscal Month	Current Fiscal Period	Shows the current month.
Company	Multiple Default Companies	Derives multiple default companies based on the user's position.

> ⓘ Note
>
> Hierarchical value help is not available in the Fiori Client UI.

Saving Selections

If you often restrict data in a report to specific value selections, you can save the selection. The selection is then available for reuse. Note that any set filter values selections are also saved. Saved selections are only available to the user who saved the selection.

You can save selections by clicking *Selections*, and then choosing *Save As*.

1. Make value selections for the relevant variables and filters.

2. Navigate to the sprocket icon 🔧 and click *Save As* .
3. Enter a name for the selection.
4. Click *OK*.

The selection is then available from the *Selection* dropdown list.

The selection is also available for embedded reports.

Managing Selections

To manage selections, choose a Selection, navigate to the sprocket icon 🔧 , and then select *Rename* or *Delete*.

Note that you cannot rename or delete the *Initial* selection.

To save a selection as default, choose a selection and select the *Report Default* or *View Default* checkbox as required.

3.7.5 Working with Filters

The value selections you make using variables for the selection also determine the characteristic value selections that can be further restricted using the filter function.

Note that you can filter data for all characteristics available with the report regardless of whether they are shown in the report.

> ⓘ Note
>
> If you change the values selections set in the selection and start the report again by clicking *Go*, the system resets any filter value selections you have made. Changes you make to the value selections for variables in the selection affect the value selections available to be filtered for characteristic.

> ⸎ Example
>
> For the *Product* variable in the selection, select the following values: 10 , 20 , 30 , 40 , 50. These are the values available to be filtered with the *Product* characteristic after you start the report.
>
> Change the value selections set for the *Product* variable in the selection and make all values available. After clicking *Go*, you can now filter the *Product* characteristic to any available value selection.

When you save a selection, the filter value selections you set are also saved.

In the Fiori Client UI, open a report and click the **Add Filter** icon ▽₊ , the value help appears. Select the required value. Click *OK*. Either select *Run With Filter* to apply the filter immediately, or click *Later* to continue working on your current report.

3.7.6 Exceptions

When you work with reports, you can create exceptions for key figures.

An exception is a deviation from defined threshold values. You create exceptions by setting threshold values or intervals, for which you set an alert. Using exceptions, the system emphasizes key figure values that deviate from or adhere to threshold values or intervals. Key figure values that deviate from or adhere to the threshold are indicated using symbols or are highlighted in color. This enables you to identify immediately all relevant values.

You create, edit, and delete exceptions using the *Manage* dialog box. You can find it by clicking ▦ and then clicking *Exceptions*.

When you activate exceptions for a report, the system applies the exception to the data in the report.

You can define multiple exceptions for a report.

> ⓘ **Note**
>
> Any exceptions you define are only available with the report or report view in which you created the exception.

Defining Exceptions

To define an exception, you select a key figure, decide how the exception is to be displayed and how it is to be applied.

Key Figure

A dropdown list from where you select the key figure for which you want to define an exception.

Preview

A visual display of how the field will look like when the exception is applied.

> ⓘ **Note**
>
> This feature is available for Fiori Client only.

Alert Indicator

Options available for displaying exceptions in the report:

- *Arrow*: The alert level is represented as an arrow with five varying degrees of slant, corresponding to different levels of priority.
- *Background Color*: The alert level is represented by the value highlighted in various shades of green, yellow, and red. For each color, there are three shades, corresponding to different levels of priority.
- *Traffic Light*: The alert level is represented as a traffic light.

Apply To

Options available for applying exceptions to values that deviate from thresholds:

- *Data*: The exception is applied to key figure values but not result rows.
- *Data and Result*: The exception is applied to key figure values and result rows.
- *Result*: The exception is only applied to result rows.

Defining Thresholds

Options to restrict a specified key figure using relational operators, such as greater than, less than, and so on.

Example

You want to emphasize all products for which invoiced net value is greater than 100 EUR, which is a good value. You create an exception for the Invoiced Net Value key figure. As an operator, you select Greater than, and enter 100 as the From Value with an alert level as green. You have defined the alert indicator as background color. Result: The system highlights in green all values in the Invoiced Net Value column that are greater than 100 EUR.

3.7.7 Conditions

When you work with reports, you can create conditions to restrict the results area of a report in accordance with certain criteria.

For example, you can create a condition so that you only see products that have net sales above a certain threshold value. You can also create a condition to display the five lowest selling products. In other words, you can use conditions to restrict the results area of a report so that you only see a part of the result area for which you are interested.

You create, edit, and delete conditions using the *Manage* dialog box. You can find it by clicking ⊞ and then clicking *Conditions*.

You can also create conditions in chart by simply clicking a data point.

You can define the following ranked conditions: Top 5, Top 10, or custom. Click a data point and then click a ranked condition, such as Top 5 to see the top five items on your list based on your key figure.

You can also define simple conditions from a data point.

When you activate conditions for a report, you are not changing any values; you are just hiding the values that are not relevant for you. Conditions therefore have no effect on the values displayed in result rows. The result rows of a report with an active condition are the same as the result rows of a report without this condition.

You can define multiple conditions for a report.

> ⓘ Note
>
> Any conditions you define are only available with the report or report view in which you created the condition.

Simple Conditions

When you create a simple condition, you set thresholds for a specified key figure related to a characteristic using relational operators.

Example

You want to see all products for which invoiced net value is greater than 100 EUR. You set a condition on the Product characteristic for the Invoiced Net Value key figure. As an operator, you select Greater than, and enter 100 as the From Value. Result: The system returns a list of products for which invoiced net value is greater than 100 EUR and hides other values.

Ranked Conditions

The system compares all values for a specified key figure related to a characteristic that you set. All values that adhere to the rules that you define are displayed in a ranked list.

You use the following operators to define rules for ranked conditions:

- Bottom count / Top count
  The ranked list is arranged according to a specified number.

  > ❖ Example
  >
  > Top 5 Customers by Net Sales
  >
  > The system displays a ranked list of the 5 customers having the highest net sales.

- Bottom percent / Top percent
  The ranked list is arranged according to a specified percent.

  > ❖ Example
  >
  > Top 25% of Customers by Net Sales
  >
  > The system displays a ranked list of the highest net sales by customer until 25 percent of the total net sales is reached.

- Bottom sum / Top sum
  The ranked list is arranged according to a particular results value.

  > ❖ Example
  >
  > Customers - Top Total 20,000 EUR of Net Sales
  >
  > The system displays a ranked list of customers, sorted by net sales in descending order, until an aggregated net sales total greater than or equal to 20,000 EUR is reached. The result can be greater than 20,000 EUR if the system has to add another customer to the ranked list to reach the threshold value but whose net sales then makes the aggregated net sales result greater than 20,000 EUR.

3.7.8 Analytical Navigation

To analyze data further, the navigation functions for Analytics in the solution enable you navigate from a source to a target. You can navigate from one report to another or view documents related to a value in a cell, either in rows or columns, by clicking the value and then choosing an entry from the dropdown list.

> ⓘ Note
>
> Analytical navigation is only available for browser-based reports.

The following graphic illustrates navigating in a report.

Example of navigation

The following types of analytical navigation are available.

- Report-to-report navigation
  You can use report-to-report navigation to further analyze the details of a specific data point. The values of the target report will be filtered based on the selected data point of the current report. For example, you can navigate from an aggregated annual data report to a report with monthly breakup for a specific year by clicking the corresponding data point.
- Report-to-object navigation
  You can use this feature to navigate to an object directly from a report. For example, you can navigate to account details from account ID in a report.

> ⓘ Note
>
> The above features are available for embedded reports also.

Context for Analytical Navigation in Source

When you navigate from a source to a target, such as from one report to another, the system checks what targets are available for the specified cell along with the context of the source.

The context of the source includes information, such as:

- Row, that is, the characteristics to the left of the specified cell.
- Column, that is, the characteristics above the specified cell.
- Any filter values set in the source
- Any value selections for variables
- The report ID
- The access context of the report
- The report view ID, if the source is based on a report view.
- The selection ID, if the source uses a set a value selections for variables.

Calendar Quarter	Expected Value
Quarter 2	114,360.33 USD
Opportunity Item Report	75, 503.59 USD

Opportunity Item Report
View: Opportunity Item Details
Selection: Initial

Opportunity		Item Quantity in Sales ...	Item Quantity	Item Value
Opportunity 1	48014	3.00 ea	3.00 ea	2000.00 USD
Opportunity 2	44805	2.00 ea	2.00 ea	2170. 00 USD
Opportunity 3	46963	40.00 ea	40.00 ea	4918.00 USD
Opportunity 4	47681	9.00 ea	9.00 ea	891.00 USD

Example of report-to-report navigation

The context of the specified cell determines the targets to which you can navigate. Therefore, depending on which cell you click, you have different targets available.

For example, the targets in a *Results* row may be different than the targets for individual values in the column since targets are also based on rows. The result value may be a different row than the individual values. Likewise, a cell in the same row may have different targets because the system also checks the column of the specified cell.

The targets available also depend on the access rights granted to the user. The reports for which users have no access right are not displayed in the context menu.

The following explanatory graphic shows the targets for two different cells.

> ⓘ Note
>
> Note that you can only check the targets for one cell at a time.

Examples of targets

3.7.9 Chart Settings

When you work with reports, you can make a range of chart settings, such as providing a legend for the chart.

By default, all of the following indicators are not set:

Legend

You can show the legend as well as determine where in the content area the legend is to be displayed.

> ⓘ Note
>
> If you generate a hierarchical chart where the hierarchies are collapsed, the system does not display the dimension name of the collapsed parameters. For example, if the first dimension in your hierarchy is year, followed by month, and date, the legend will normally be displayed as Year/Month/Date. However, if the hierarchy is collapsed, the display will be Year//.

Axis

You can provide labels for the X and Y axes as well as descriptions. Note that descriptions are displayed as tool tips.

Values

- Show Results and Overall Results If Displayed in Table
  You use this indicator to specify whether the results and overall results are to be displayed. By default, these results are suppressed since the display of the chart may otherwise be adversely affected.
- Show Hierarchies If Displayed in Table
  You use this indicator to specify whether hierarchy nodes are to be displayed.

- Display Chart Values

  You use this indicator if you want to view the values on the chart. Note that you cannot save this setting. To enable it manually each time you open the report.

Zoom

You can now view zoomed in values in your chart. To do this, click *Enable Zoom* and select a section of the chart to view the zoomed in data. You can continue to zoom further down until there are just two data points.

Note that when the zoom feature is active, navigation is not possible. To activate navigation targets, toggle the zoom icon. The system retains the chart in the zoomed state and allows you to navigate.

To clear the zoomed data and go back to the original chart, click *Reset Zoom*.

> ⓘ Note
>
> Zooming is available for only the following types of charts:
>
> - Bar
> - Column
> - Line
> - Scatter
>
> Since the zoom function is supported for only the mentioned charts, all other chart types are disabled when the user is in zoom mode. Disable zoom to view data in other chart formats.

Personalize Key Figure Colors

You can change the color of key figures in charts.

To do this, open a report and click the sprocket icon. In the *Chart* tab, navigate to the *Change Chart Color Palette* section. Click anywhere on the key figure name to open the color selection dialog box. Select your color

and click *OK*. You can see the changes immediately. To reset, click   .

By default, the system applies sixteen colors in a predefined sequence to the key figures. Whether you add or remove a key figure, the sequence is retained. If you personalize a color for a key figure, only that particular key figure changes, the remaining retains the original color and sequence.

This feature is available for the following chart types:

- Bar
- Stacked Bar
- 100 Percent Stacked Bar
- Column
- 100 Percent Stacked Column
- Line
- Bullet
- Geo Map
- Combination Chart
- Dual-Axis Combination Chart

> ⓘ Note
>
> If a characteristic is part of the drill-down, along with the key figures, the system does not give you an option to personalize the key figure colors. It displays the default color palette.

Troubleshooting

Not all reports are suitable to be displayed as a chart. For example, if the report to be displayed as a chart contains large amounts of data with multiple key figures and characteristics, you may want to restrict the number of characteristics and key figures in the report so that the display of data in the chart is comprehensible.

There may be other reasons why a chart cannot be displayed. See the following list of possible issues:

- Chart not possible; hierarchy on characteristic is active.
  There is a characteristic in rows for which a display hierarchy is active.
  1. Check the characteristics under *Row Fields* by clicking the characteristics and choosing *Settings*.
  2. On the *General* tab page, from the *Display Hierarchy* dropdown list, select *Do Not Show*.
- Chart not possible; arrange as hierarchy is active.
  1. The table setting *Arrange As Hierarchy* is active. From the sprocket icon, select *Table Settings*.
  2. On the following screen, from the *Arrange As Hierarchy* dropdown list, select *None*.
- Chart not possible; multiple units of measure are used.
  The key figures displayed have different units of measure.
  - Check which units of measure are used and determine if all key figures are necessary for the chart. If all key figures are not necessary, remove the relevant key figures so that the units of measure match for the key figures displayed. For example, there are quantity and currency units of measure. You only really need the quantity key figures so you remove the currency key figures.
  - If you only have key figures with currencies, check if the currencies are the same. If the currencies are different, you can, for example, use the Display Currency variable. Click the pencil icon next to the Selection dropdown list, If the Display Currency variable is available, set the value accordingly.
- Chart not possible; key figures are in rows or characteristics are in columns.
  Ensure that the key figures are in columns and the characteristics are in rows. Under columns, you can have a characteristic, but only above the key figures.
- Chart not possible; no key figure selected.
  Ensure that you have at least one key figure in columns.
- Chart not possible; no characteristic selected.
  Ensure that you have at least one characteristic in rows.
- Chart not possible; minimum number of key figure not selected.
  For certain chart types, there is a minimum number of key figures required to generate a chart. For example, for **Scatter** charts, you need at least 2 key figures, and for **Bubble** charts, you require at least 3 key figures.

> ⓘ Note
>
> If you add both key figures and characteristics together in *Row Fields*, the system does not generate a chart. Instead it presents all the values in a table.

Chart Types [page 58]
> You can use different chart types to visualize your data.

Chart Gestures in Tablets [page 73]

Use gestures to perform chart operations on your tablets. (IOS, Android only)

Chart Gestures in Smartphones [page 74]
Use gestures to perform chart operations on your smartphones. (IOS, Android only)

3.7.9.1 Chart Types

You can use different chart types to visualize your data.

Area [page 59]
Shows trends of values over categories. The area between the axes and the values are filled in an area chart.

Bar [page 60]
Shows comparisons between individual elements shown in a bar chart. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values and not on displaying a change during a period of time

Stacked Bar [page 61]
Shows comparisons between individual elements in a category. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values in a category.

100 Percent Stacked Bar [page 62]
Shows comparisons between individual elements in a category as a percentage. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values in a category as a percentage of the whole.

Column [page 62]
Shows comparisons between individual elements. Categories are arranged horizontally and values are arranged vertically. The emphasis is on comparing a change in value during a period of time for individual elements.

Stacked Column [page 63]
Shows comparisons between individual elements in a category. Categories are arranged horizontally and values are arranged vertically. The emphasis is on the comparison of values in a category.

100 Percent Stacked Column [page 64]
Shows comparisons between individual elements in a category as a percentage. Categories are arranged horizontally and values are arranged vertically. The emphasis is on the comparison of values in a category as a percentage of the whole.

Line [page 65]
Shows trends in your data over time. The data is entered at regular intervals. Points in lines represent the intersection of the X and Y axes.

Doughnut [page 65]
The doughnut chart is similar to a pie chart in that it shows values as segments. The segments represent values in rows. The size of the segments represent the values in columns as a percent of the whole.

Heat Map [page 66]
Shows comparison between one or more dimensions. Based on the values of the categories the intensity of the color increases or decreases. The lower the density, the lower is the value. Similarly, the higher the density, the higher is the value.

3.7.9.1.1   Area

Shows trends of values over categories. The area between the axes and the values are filled in an area chart.

The examples in the chart type descriptions are based on the following set of hypothetical data:

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

The data as shown in table format is displayed in an area chart as follows:

- The X axis shows values in rows.
- The Y axis shows values in columns.
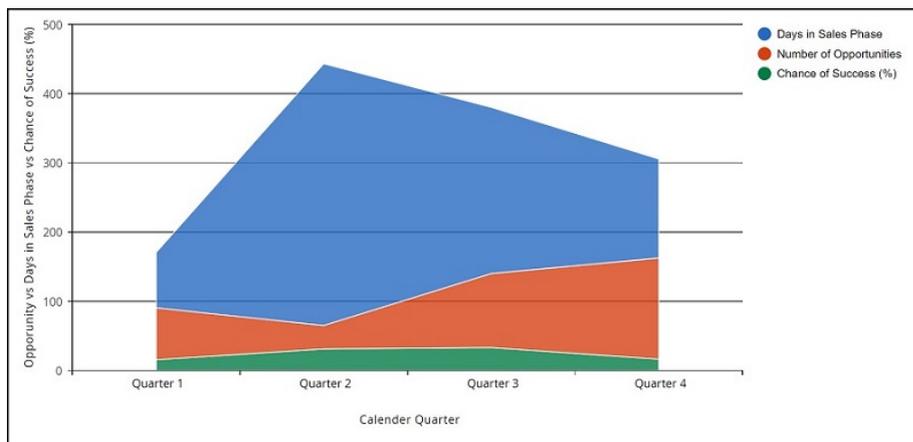
Example of an area chart

3.7.9.1.2 Bar

Shows comparisons between individual elements shown in a bar chart. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values and not on displaying a change during a period of time

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

The data as shown in table format is displayed in a bar chart as follows:

- The X axis shows the values in columns.
- The Y axis shows the values in rows.

Example of a bar chart

3.7.9.1.3   Stacked Bar

Shows comparisons between individual elements in a category. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values in a category.

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

Example of a stacked bar chart

3.7.9.1.4   100 Percent Stacked Bar

Shows comparisons between individual elements in a category as a percentage. Categories are arranged vertically and values are arranged horizontally. The emphasis is on the comparison of values in a category as a percentage of the whole.

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

Example of a 100 percent stacked bar chart

3.7.9.1.5   Column

Shows comparisons between individual elements. Categories are arranged horizontally and values are arranged vertically. The emphasis is on comparing a change in value during a period of time for individual elements.

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

The data as shown in table format is displayed in a column chart as follows:

- The X axis shows the values in rows.
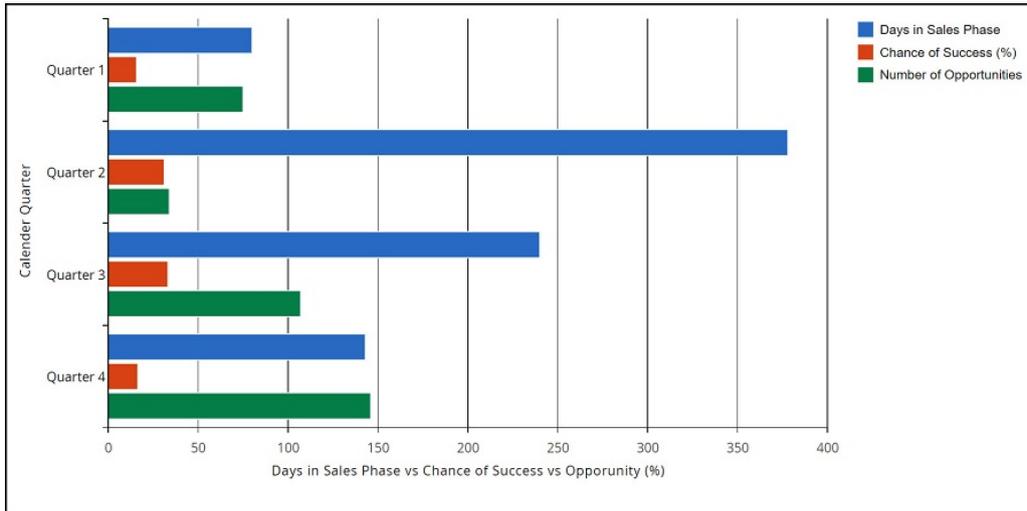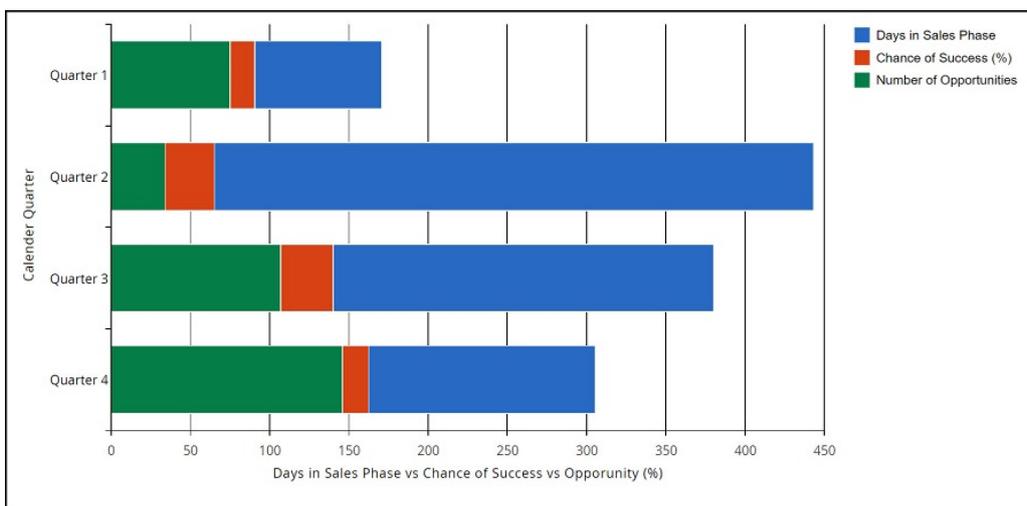- The Y axis shows the values in columns.
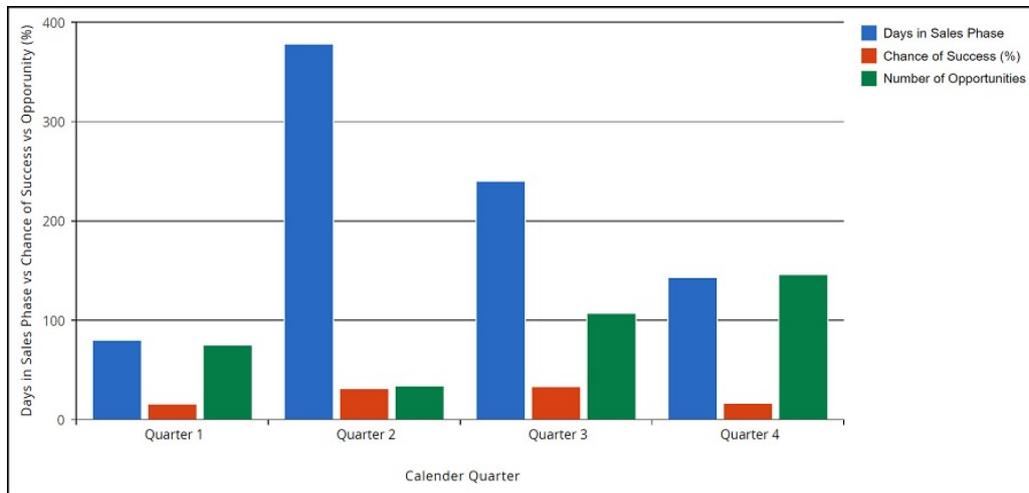
Example of a column chart

3.7.9.1.6 Stacked Column

Shows comparisons between individual elements in a category. Categories are arranged horizontally and values are arranged vertically. The emphasis is on the comparison of values in a category.

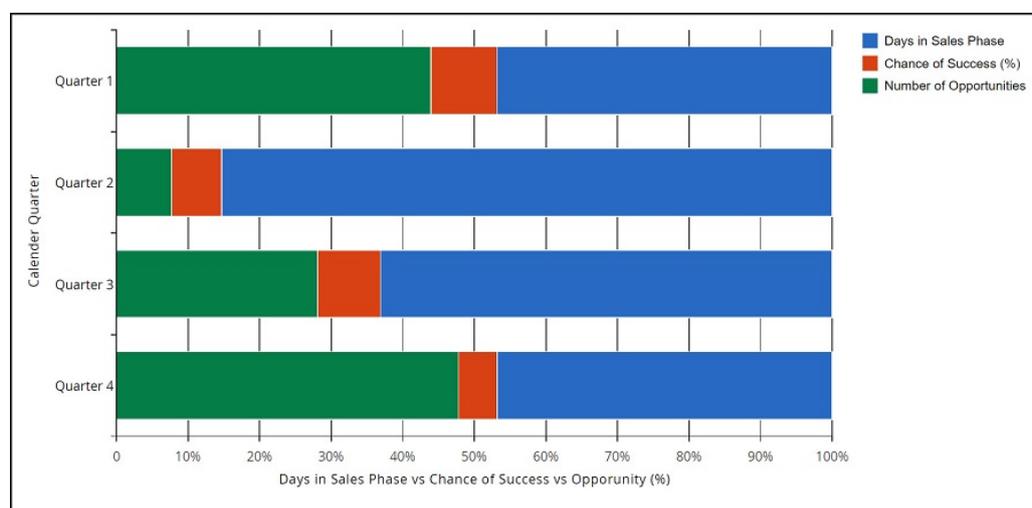| Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

Example of a stacked column chart

3.7.9.1.7 100 Percent Stacked Column

Shows comparisons between individual elements in a category as a percentage. Categories are arranged horizontally and values are arranged vertically. The emphasis is on the comparison of values in a category as a percentage of the whole.

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

Example of a 100 percent stacked column chart

3.7.9.1.8   Line

Shows trends in your data over time. The data is entered at regular intervals. Points in lines represent the intersection of the X and Y axes.

Calendar Quarter	Days in Sales Phase	Number of Opportunities	Chance of Success
Quarter 1	84,00	75,00	15,76 %
Quarter 2	382,00	34,00	31,21 %
Quarter 3	244,00	107,00	33,24 %
Quarter 4	147,00	146,00	16,51 %

The data as shown in table format is displayed in a line chart as follows:

- The X axis shows the values in rows.
- The Y axis shows the values in columns.

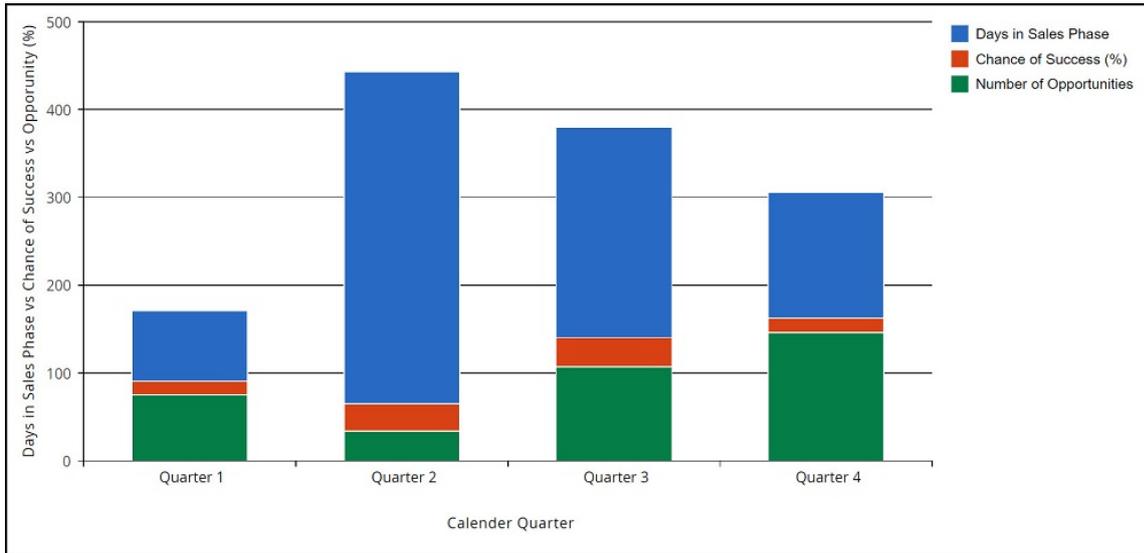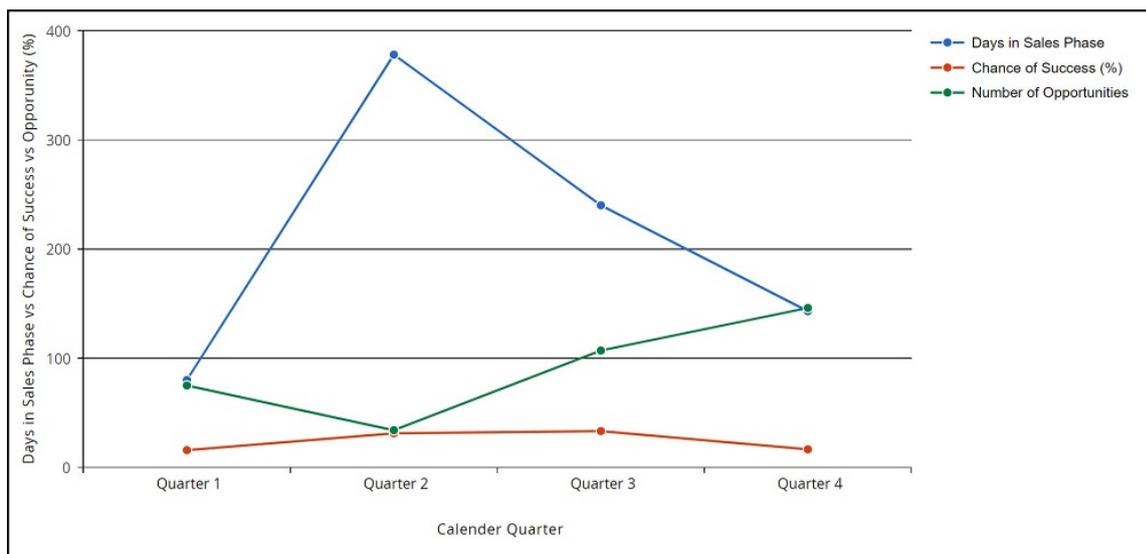Example of a line chart

3.7.9.1.9   Doughnut

The doughnut chart is similar to a pie chart in that it shows values as segments. The segments represent values in rows. The size of the segments represent the values in columns as a percent of the whole.

Invoiced Quantity 2002

- PC Software
- PC Hardware
- Office Supplies
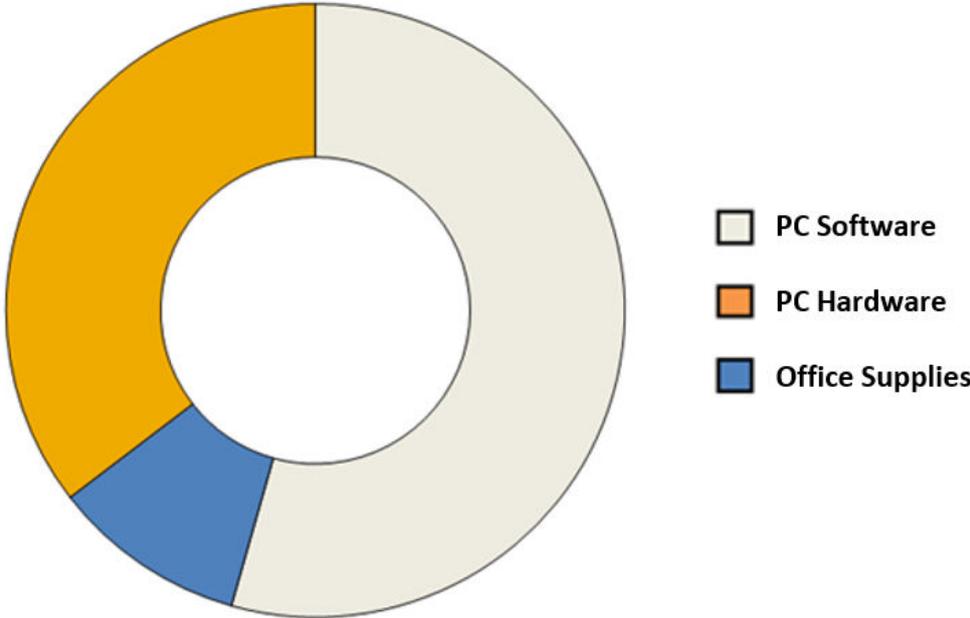
Example of a Doughnut chart

3.7.9.1.10 Heat Map

Shows comparison between one or more dimensions. Based on the values of the categories the intensity of the color increases or decreases. The lower the density, the lower is the value. Similarly, the higher the density, the higher is the value.

In the example each square denotes a row and the color intensity of the square denotes the value. The lower the intensity, the lower is the value, and vice versa. You can visualize the difference of days in sales phase between each country/region based on the following data:

Country/Region	Days in Sales Phase
Canada	69,00
Argentina	96,00
Switzerland	328,00
Ukraine	587,00
Belgium	721,00
Bermuda	784,00
Australia	943,00

Country/Region	Days in Sales Phase
Chile	1.133,00
Peru	1.946,00

Example of a Heat Map
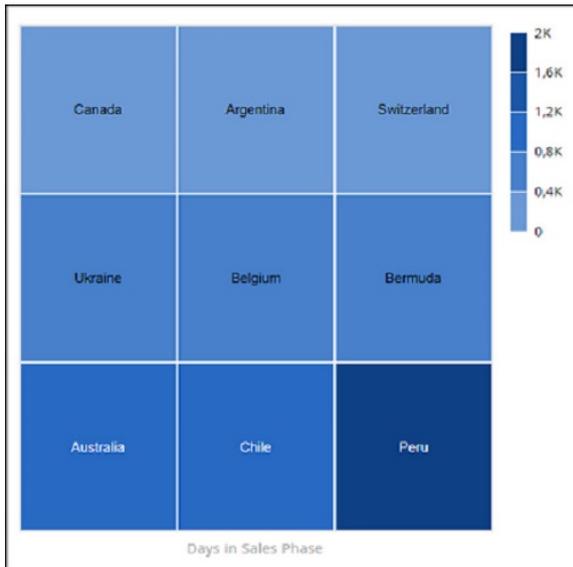
> ⓘ **Note**
>
> You cannot customize the color of the chart. It depends on the UI theme.

3.7.9.1.11 Bubble

Shows relationships between data set values by the size of the bubble.

In this example, the size legend bubbles denote the following:

- Smallest – Minimum value in the data set. Can be no data also.
- Intermediate – The median value of the data set range. This value is set by the vizframe library.
- Largest – Maximum value of the dataset.

> ⓘ **Note**
>
> - In the size legend, the key figure values are rounded off to two decimal points irrespective of the settings maintained.
> - The size legends are displayed based on the space available in the chart area irrespective of whether you have enabled legends.
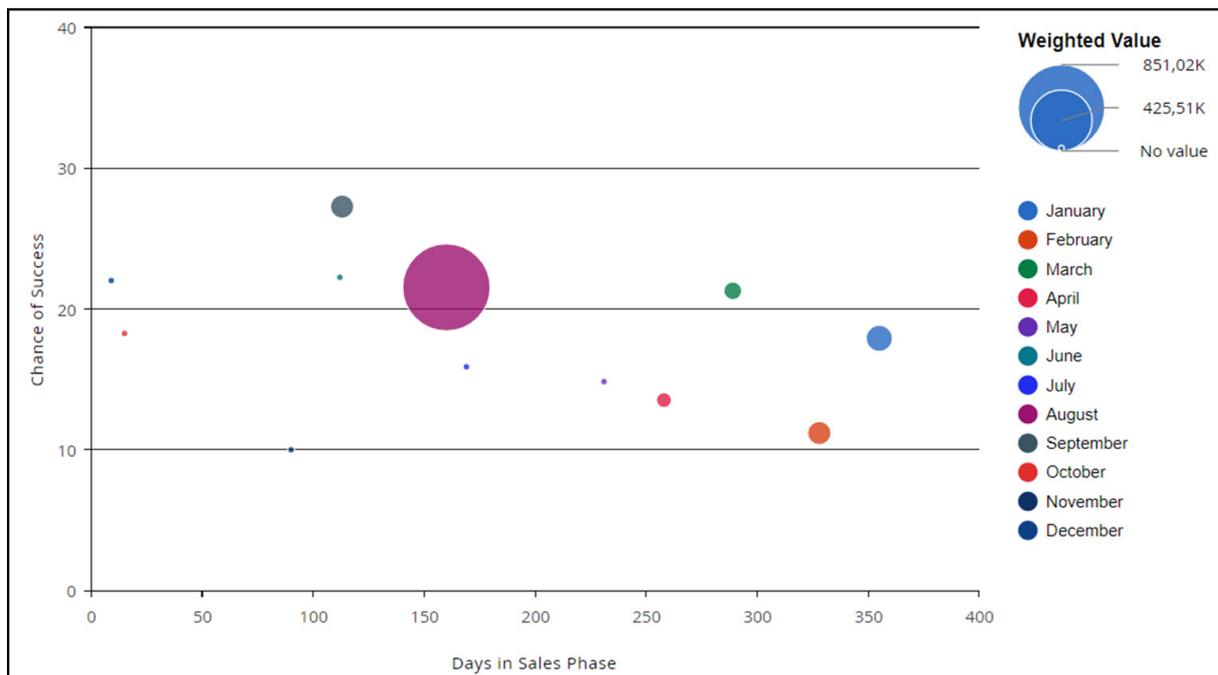
Example of a Bubble chart

3.7.9.1.12 Bullet

Shows comparisons between one or more measures. Characteristics are arranged vertically and key figure values are arranged horizontally. The emphasis is on the comparison of values and targets.

The sequence of key figure is fixed in the following order:

1. Actual
2. Target
3. Forecast
4. Additional Information

You can select a maximum of four key figures. Ensure that you follow the sequence when you add the values to the columns. If you select two key figures, the first one represents the **Actual**, the second one represents the **Target**. However, the legends might not appear in the same sequence.

> ⓘ Note
>
> We recommend that you select only one characteristic for a bullet chart.

3.7.9.1.13 Pie

You want to visualize the trend in invoiced quantity for your product categories. The X axis shows product categories. The Y axis shows invoiced quantities for 2002 and 2003.

The data as shown in table format is displayed in a line pie as follows:

- Segments represent values in rows.
- The size of the segments represent the values in columns as a percent.

> ⓘ Note
>
> **Example**
>
> You want to visualize the percent of total net sales value for each product category in 2002.

Net Sales 2002

■ PC Software
■ PC Hardware
■ Office Supplies
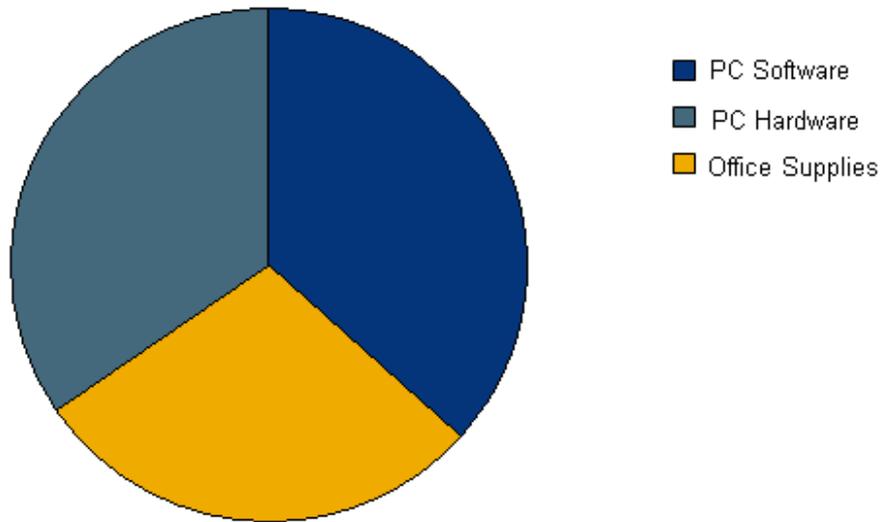
Example of a pie chart

3.7.9.1.14 Geo Map

Geo Maps provide a geographical visualization of density of measure (key figure in report).

The areas with higher values are displayed in darker shades as compared to areas with lower values.

Using the geo map widget, you can overlay multiple layers of business data on geo map with detailed geographic information to perform analyzes on your geographic data.

Required Settings:

* Country/Region or State is part of the drill-down
* Both ID and Description
* One Key Figure

Example of a Geo Map

In the image, you can view that the geographical areas such as the Unites States of America and India display darker shade compared to Canada, Mexico, and Germany. Accordingly, the density of measure is higher in regions shown in darker shades, lesser in less darker shades, and much lesser in areas represented by lighter shades.

3.7.9.1.15 Single Axis Combination Chart

A chart that combines the features of the column chart and the line chart.

Combination Charts are useful when you want to show the relationship between different data points using multiple visualizations in one chart. For example, you may want to view expected revenue and forecast data in the same chart. A combination chart displays expected revenue in columns and forecast as lines on top of these columns.
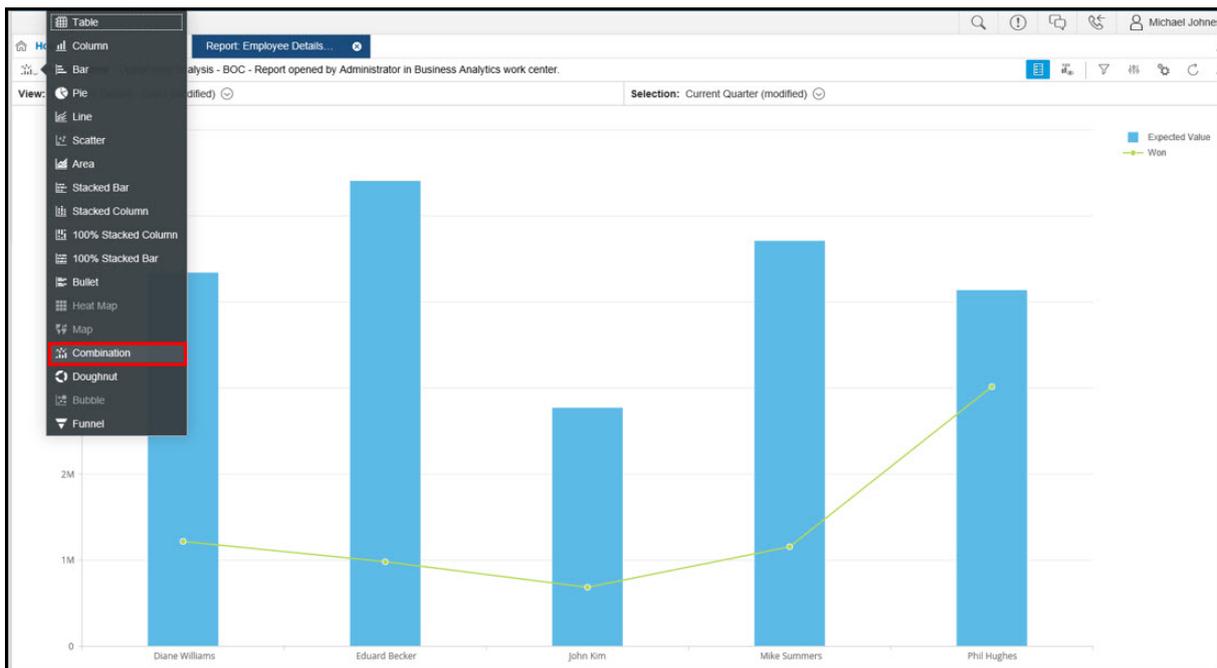
> ⓘ Note
>
> - Combination charts are available only in Fiori client.
> - Combination charts can be used only when you have two key figures in a view.

3.7.9.1.16 Dual-Axis Combination Charts

Visualize multiple measures with different scales in a single chart.

Dual axes are useful when you have two measures that have different scales. You can view the values of different scales and the relationship between the values. It also allows you to display a lot of information with limited space and discover trends you may have otherwise missed if you're switching between graphs.

Note that only the first key figure is depicted as columns. The remaining key figures are plotted as lines. The columns are associated with the first axis (Y) and the lines are associatied with the second axis (Y').

For example, if you want to view the number of opportunities with chance of success, and days of sales phase in each category, the dual-axis combination chart is helpful because you can see varied scales such as thousands against hundreds pitted against each other. On one axis, you can show the days in sales phase in thousands and on the other, you can show the number of opportunities in hundreds.
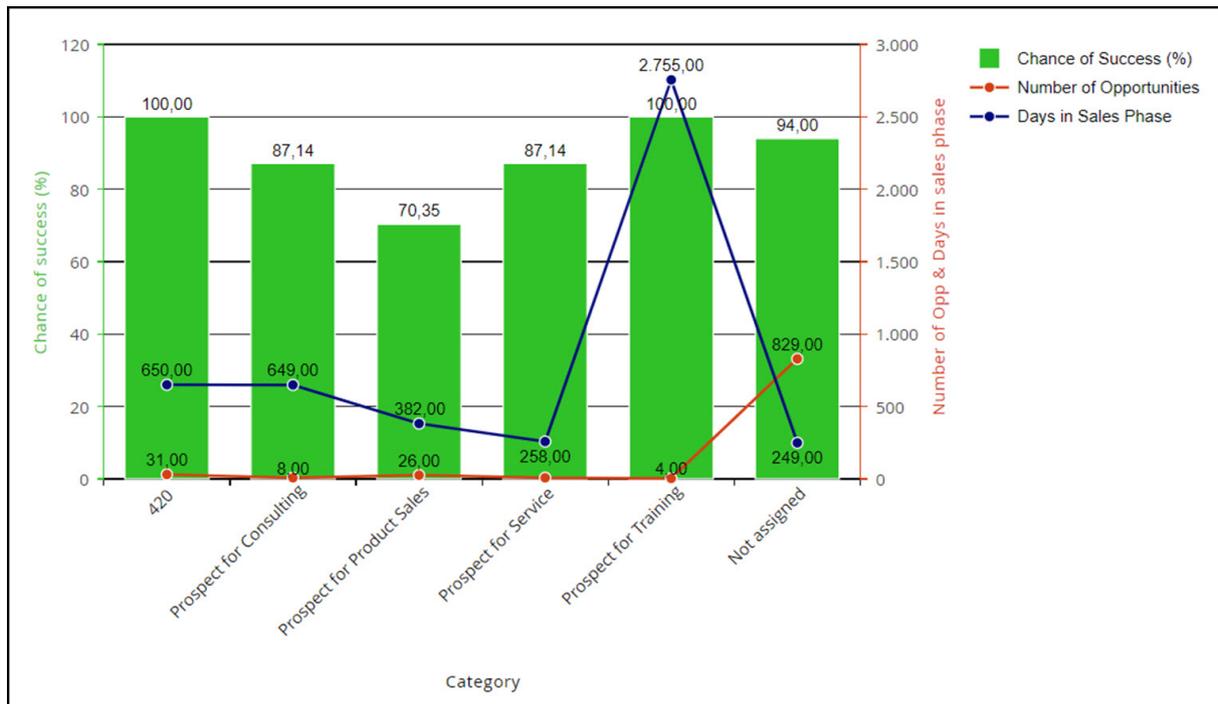
3.7.9.1.17 Scatter

Shows relationships between values as displayed in several columns. Scatter charts are suitable for large sets of data.
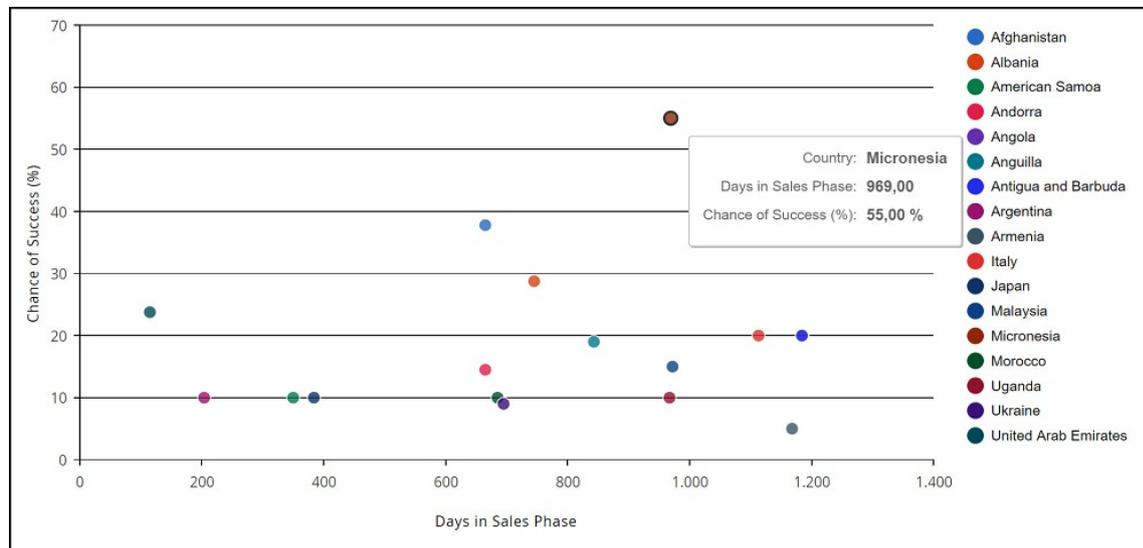
Example of a scatter chart

3.7.9.2   Chart Gestures in Tablets

Use gestures to perform chart operations on your tablets. (IOS, Android only)

- **Traverse to see values**
  Tap on any data point and traverse to see the values.
  Tap and continue rotating the pie to see the values of a specific slice against a fixed pointer. The corresponding legend is highlighted to allow easy understanding of the sliced data.

- **Swipe out to filter**
  Swipe out to filter data points in charts for progressive analysis. Drag a column upwards, or a bar to the right to exclude it from the displayed data set.
  For pies and doughnuts, drag a slice out along the radius to filter data.

- **Sort with directional swipes**
  Sort chart data by swiping up or right (for ascending) and down or left (for descending) along the desired axis.
  Note that sorting happens on the first key figure or characteristics as defned in the view.

- **Compare discrete points**
  Select any two data points to show the variance for a quick comparison. Double tap on a data point to start the compare mode. Single tap on another data point to show the difference, sum, and average of the selected points. In this mode, you can select or deselect a data point by single tapping the data point. At any point, if you have two selected data points, the system displays the comparison values. To exit the mode, single tap anywhere outside the chart.

- **Pinch zoom and scroll to see detailed values**
  Pinch to zoom a chart area and see detailed values. When you pinch out and zoom, a carousel appears at the bottom of the screen. Scroll through the carousel to see the desired chart area. To exit this mode, either pinch in, or double tap anywhere on the carousel.

The following table gives the support matrix for chart gestures for different chart types.

Gestures	Column	Bar	Stacked Bar	Stacked Column	Stacked 100% Bar	Stacked 100% Column	Combination Single Axis	Combination Dual Axis	Bullet	Line	Scatter	Area	Pie	Heatmap	Doughnut	Bubble	Map	Funnel
Show Values	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Sort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				Yes		
Zoom	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes		
Filter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					Yes	Yes			
Compare	Yes	Yes																

The following table gives the support matrix for chart gestures for different devices:

Gestures	Tablets			Smartphones		
	Reports	Dashboards	Embedded Reports	Reports	Dashboards	Embedded Reports
Show Values	Yes	Yes	Yes	Yes	Yes	
Sort	Yes		Yes	Yes		
Zoom	Yes	Yes	Yes	Yes	Yes	
Zoom with Carousel	Yes			Yes		
Filter	Yes	Yes	Yes	Yes		
Compare	Yes	Yes	Yes	Yes	Yes	
Highlight Legends in Pie				Yes	Yes	
Report Navigation				Yes	Yes	

3.7.9.3 Chart Gestures in Smartphones

Use gestures to perform chart operations on your smartphones. (IOS, Android only)

- **Show values**
  Tap on any data point and slide to see the values.
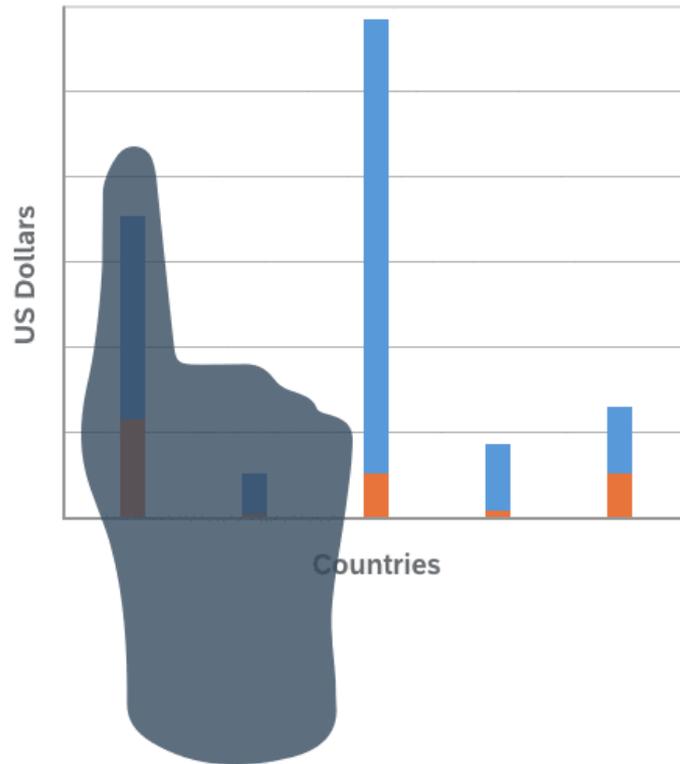
Tap and continue rotating the pie to see the values of a specific slice against a fixed pointer. The corresponding legend is highlighted to allow easy understanding of the sliced data.
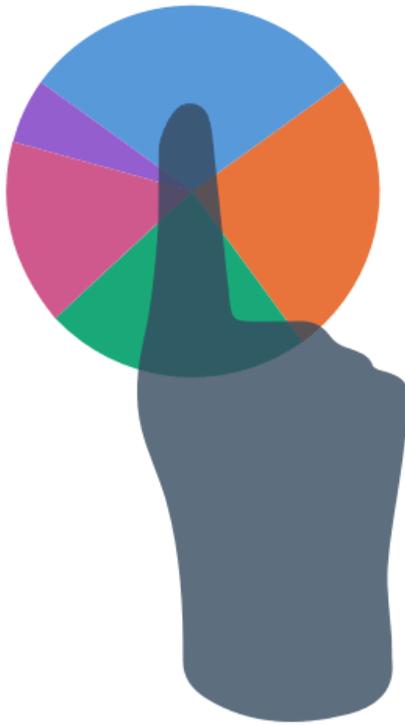
- **Filter**
  Swipe out to filter data points in charts for progressive analysis. Drag a column upwards, or a bar to the right to exclude it from the displayed data set.
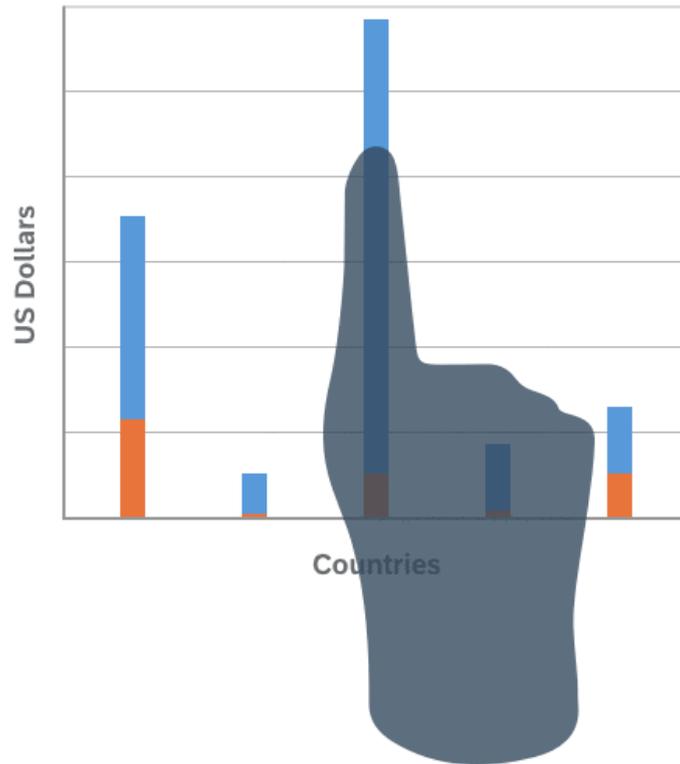
For pies and doughnuts, drag a slice out along the radius to filter data.

- **Sort**
Sort chart data by swiping up or right (for ascending) and down or left (for descending) along the desired axis.
Note that sorting happens on the first key figure or characteristics as defned in the view.
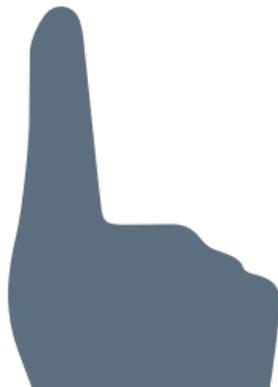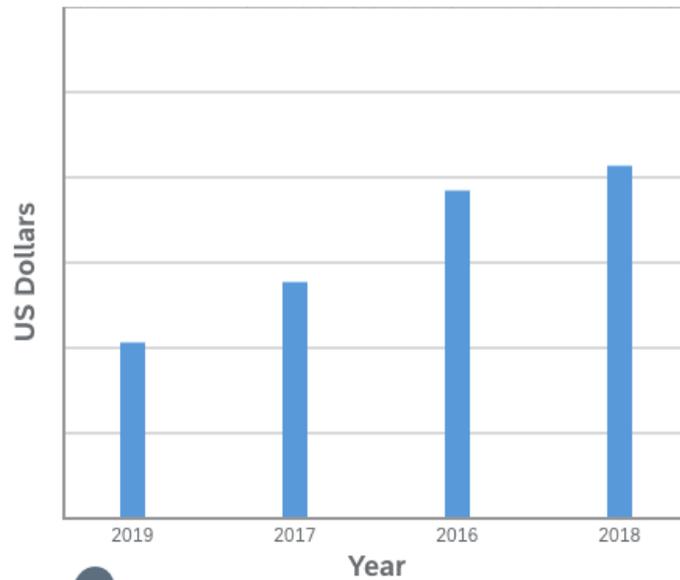
- **Compare**

  Select any two data points to show the variance for a quick comparison. Double tap on a data point to start the compare mode. Single tap on another data point to show the difference, sum, and average of the selected points. In this mode, you can select or deselect a data point by single tapping the data point. At any point, if you have two selected data points, the system displays the comparison values. To exit the mode, single tap anywhere outside the chart.
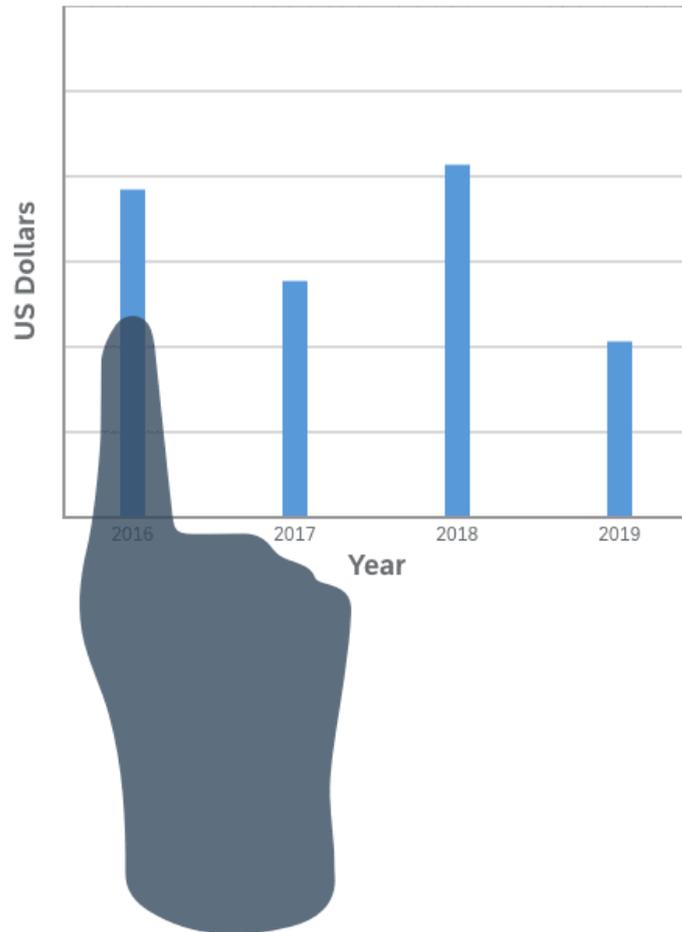
- **Zoom**
  Pinch to zoom a chart area and see detailed values.
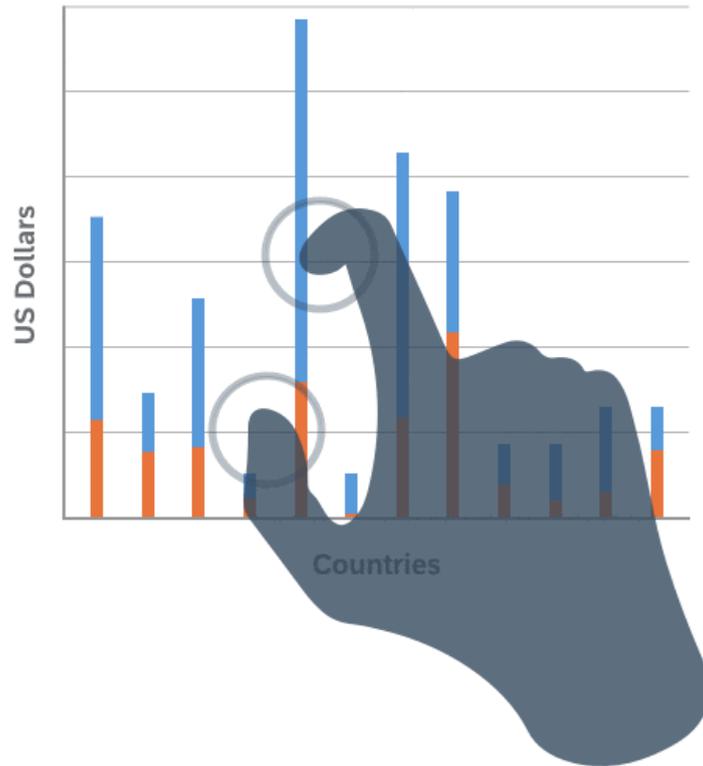
- **Report to report navigation**

  Tap on any data point and select *More Actions* to see possible navigation targets.
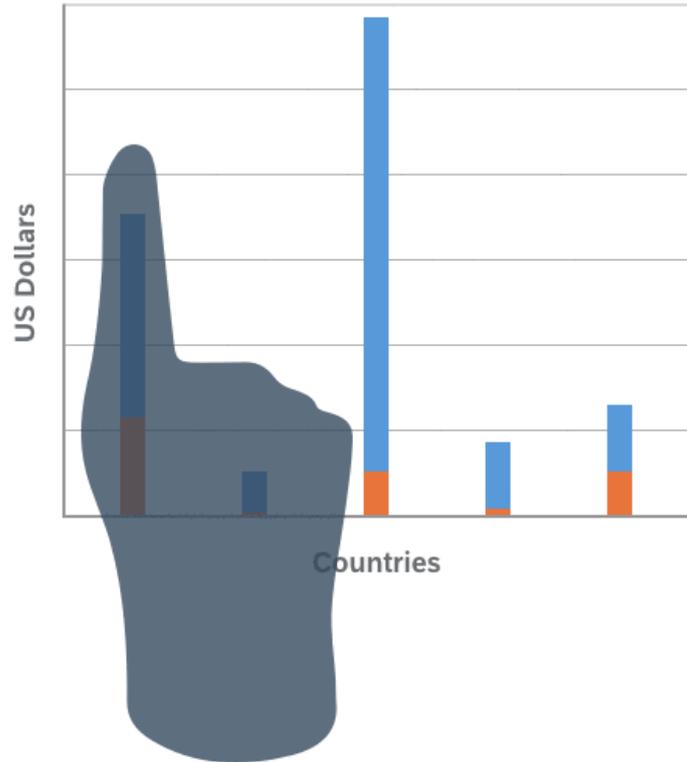
Smartphone enhancements are available on both dashboards as well as reports. Following are the details:

Feature	Report	Dashboard
Show Values	Yes	Yes
Sort	Yes	
Filter	Yes	
Compare	Yes	Yes
Zoom	Yes	Yes
Highlight Legends in Pie	Yes	Yes
Report Navigation	Yes	Yes

3.7.10 Table Settings

When you work with reports in a web browser, you have a range of table settings, such as how tables are designed.

Click the **Show Table/Chart Settings** icon ( ) to open the table settings. The available settings are as follows:

Freeze Characteristics in Rows

You can freeze the characteristics in a table so that you have a context when you are scrolling through different key figures.

Display Repeated Texts

By default, the table merges repeated texts for each column until there are unique values per row. When you select this option, you can enable repeated display of similar values.

This helps you to change the visualization of your table based on your preference. Also, when you download this report to excel, it helps you to filter the values faster.

Table Design

Value	Description
Standard	A different background color is assigned to columns, rows, and results: • Columns are white • Rows are gray • Results are yellow
Alternating	Columns are displays in white and blue alternative rows.

Grid Lines

Value	Description
Both	Horizontal and vertical lines are displayed.
Horizontal	Horizontal lines are displayed.
None	The table has no grid lines.
Vertical	Vertical lines are displayed.

Arrange As Hierarchy

The system arranges characteristics in rows and in columns as a hierarchy. The row or column further left serves as the tree structure into which characteristics to the right are inserted.

Limit Data

By default, the records of data displayed are limited to the value in the specified field. You can change this value. Note that this setting is only valid for reports displayed as a table.

3.7.11 Result Settings

When you work with reports in a web browser, you have a range of settings for results, such as how result rows are displayed.

Row Total

Select Characteristics

If you want to show the result for characteristics that are in the row fields, select the required characteristics.

Show Row Total

Value	Description
First Row	The values in a row are aggregated and displayed as the first entry for each row. If a row only has one entry, no result row is displayed.
Last Row	The values in a row are aggregated and displayed as the last entry for each row. If a row only has one entry, no result row is displayed.

Column Total

Select Characteristics

If you want to show the result for characteristics that are in the column fields, select the required characteristics.

Show Column Total

Value	Description
First Column	The column values are aggregated for a row and are displayed in the first column.
Last Column	The column values are aggregated for a row and are displayed in the last column.

Chart Total

Show Result in Chart

If you want to show the result in a chart, set this option to **Yes**.

3.7.12 Sort Settings

When you work with reports, you can make a range of settings that help you sort key figures and characteristics.

You can sort values in the report by a specified key figure in either ascending or descending order. From the *Sort By* dropdown list, choose the key figure. Under *Sort Order*, choose either Ascending or Descending.

The primary sorting sequence for characteristics is set by the drilldown displayed in the report.

You can sort characteristics displayed in rows and columns according to the description or ID in ascending or descending order.

If a characteristic has attributes, you can also sort the characteristic by attribute. The attribute specified does not have to be selected for display. Only if you set an attribute for a characteristic, and want to sort by the attribute, is sorting by attribute taken as sorting.

> **⁂ Example**
>
> You want to sort by the Cost Center characteristic using the Manager attribute. By default, the system sorts the Company characteristic by the ID of the manager.

Sorting works on every column but you need to consider the context (grouping /data set) of the column you want to sort. So the sorting is done within each set of data, and a data set is determined by the precedent columns.

In the following example, the data set for **State** is sorted according to the **Country/Region** which is the precedent column.(Fig 1). So, within US, IN, and DE, the states are sorted A ->Z. If you want to sort by **State** only, then you must move that column as the first one. In that case, the data will be sorted by **State** as in Fig 2.

Fig.1

Country/Region	State
US	Alabama
	New York
	Texas
IN	Bangalore
	Delhi
	Mumbai
DE	Bavaria
	Berlin
	Hamburg

Fig.2

State	Country/Region
Alabama	US
Bangalore	IN
Bavaria	DE
Berlin	DE
Delhi	IN
Hamburg	DE
Mumbai	IN
New York	US
Texas	US

3.7.13 Add a Field to a Report

When working with reports in a Web browser, business users can add characteristic attributes to and remove them from reports by clicking *Add Fields*. On the following screen, fields are group by specified criteria. For example, characteristics are grouped by dimensions.

> ⓘ Note
>
> - You cannot select all fields as characteristic or variable to add to or to remove from a report. Fields that you cannot select indicate that they are part of the report as it is defined, either as delivered content or as defined by administrators. Note that you also cannot override or extend any additions made by administrators. For example, business users cannot remove a characteristic that has been added by the administrator, nor can business users add a characteristic attribute to a variable that has been added by the administrator.
> - Hierarchies can only be added if available with the characteristic.

When you add and remove fields, the system modifies the current report. The characteristic attributes are then available from the *Not Currently Shown* list. You can then add the new fields to rows and columns and save the personalized report view.

Adding Date Fields

For characteristics that are based on calendar date, you can add fields to aggregate by quarter, month, and so on. This feature is also available for characteristics based on fiscal year, fiscal period, accounting period/year, or time. For more information on this, see Configuration: Enable Reporting on Fiscal Year [page 15]

Examples of using such date fields are as follows:

- Aggregate by quarter, if your fiscal year equals calendar year.

- From the table settings, if you arrange the characteristics in a hierarchy, you can drilldown in the hierarchy from quarter to month to date.

Note that non-cumulated key figures, such as opening balance, ending balance, or inventory stock quantity, should not be aggregated using such date fields since this leads to unexpected total results.

Example

You are working with the *Invoice Volume* report. Invoice date is available as a field, but you want to view the data by quarter. You click *Add Fields*. Under the *Customer Invoice* dimension, you expand the *Invoice Date* characteristic, and add *Quarter*.

Adding Fields Versus Characteristic Settings

Note that by clicking *Settings* and then choosing *Characteristics*, attributes of characteristics are only shown in the report; they are not added as fields. This means that you cannot filter the characteristic by characteristic attribute values. You can only filter data in the report by characteristic attribute values if you add the characteristic attribute as a field to the report.

Adding Fields As an Administrator

When administrators start a report from the *Design Reports* work center view and click *Add Fields*, they see more fields related to the data source which serves as the basis for the report than business users. This includes more characteristics, characteristic attributes, and key figures.

> ⓘ Note
>
> By adding fields to delivered reports and to your own reports you can thereby eliminate the need to copy a delivered report or edit your own report. The system automatically adds the field to the report; you do not have to save the report as a report view.

On the *Key Figures* tab page of the *Add Fields* screen, you can also add and remove key figures from reports, including your own restricted and calculated key figures. You can also create and edit your own key figures from the screen by clicking the corresponding button. For more information, see Create and Edit a Key Figure [page 121]. You can add any newly created key figures to the report.

The key figures that you have added are available from the *Select Key figures* dialog box of *Key Figures*.

By clicking *Check*, the system checks whether calculated and restricted key figures, for which the *Display in Report* checkbox is selected, are consistent. For example, the system checks if an extension field used as a basis for a calculated or restricted key figure has been deleted.

Extension Fields

You can also add extension fields as characteristics and key figures. The extension field must be added to the corresponding data source before it can be available using *Add Fields*. For more information, see Add an Extension Field to Data Resources and Reports [page 116].

Adding Fields Versus the Report Wizard

When you create a report using the Report Wizard, specified characteristics and key figures are always available with the report as you defined; business users cannot add or remove them using *Add Fields*. Note that by using *Add Fields* you are not changing the actual report as you defined it; any added fields are not visible when editing a report.

For more information, see Working with Reports Using the Report Wizard [page 19].

3.8   Work with Embedded Reports

As an administrator, you can select reports and embed them in the UI. You can also map the data between the UI fields and the embedded report fields so that the system filters the report data based on the supplied mapping.

Add a Report

1. Click your profile on the top right corner of your screen, and select *Start Adaptation*. The system opens in the *Adaptation Mode*.
2. Open an instance of an object where you want to embed a report. For example, an employee, lead, customer.
3. In the side pane, under *Overview*, click the back arrow to navigate to *View* and select the tab in which you want to embed the report.
4. Click ▌▶ *Add* ❯ *Embedded Report* ❯. The system opens a dialog box with a list of report views. Select a view from the list.
5. In the *Embedded Report Header* field, define a display name for your report.
6. Under *Selection*, choose a screen field from the drop down and assign it to an appropriate report parameter. Select the *Is Default* checkbox if you want the default report selection values to be used.
7. Under *Filter*, choose a screen field from the drop down and assign it to an appropriate report parameter.

> ⓘ Note
>
> - You can select, map, and embed multiple reports at a time.
> - If you don't provide any mapping, the system displays the report with all the data that you are authorized to view.

- For better performance, use the *Selection* option instead of the *Filter* option, if the characteristic is available on the selection tab.
- The selections added as *Add Fields* in report are also available for mapping.
- If a field is hidden in the header, it will be suffixed by (-) in the *Screen Field* drop down. For example, Customer (-)
- The key field is always suffixed by (*). For example, Lead (*)
- If a field is pulled from the header and dropped to one of the tabs, it will be suffixed by (>) in the *Screen Field* drop down.

8. Click *Apply* to add the report to your tab.
9. To save your settings, click your profile and select *End Adaptation*.

Edit an Embedded Report

To edit a report follow these steps:

1. Select the embedded report in adaptation mode.
2. In the side pane, click the back arrow to navigate to *Pane* and click *Edit*.
3. In the new pop-up window, make your changes such as renaming the report, or adding it to summary pdf.
4. Click *Apply* and end adaptation.

> ⓘ Note
>
> When you edit an embedded report, it moves to the end of the tab.

Delete an Embedded Report

To delete a report follow these steps:

1. Select the embedded report in adaptation mode.
2. In the side pane, click the back arrow to navigate to *Pane* and click *Remove*.
3. Click *Apply* and end adaptation.

3.8.1 Embedded Reports in Summary PDF

As an administrator, you can include embedded report data into a summary pdf.

As an end user you can include embedded report data into a summary pdf provided the summary is already enabled for a UI.

Procedure

1. Navigate to ▌▶ *Customers* ❭ *Accounts* ▐ and open an account where you want to embed a report.
2. Click your profile on the top right corner of your screen, and select *Start Adaptation*. The system opens in the *Adaptation Mode*.
3. In the side pane, under *Overview*, click the back arrow to navigate to *View* and select the tab in which you want to embed the report.
4. Click ▌▶ *Add* ❭ *Embedded Report* ▐. The system opens a dialog box with a list of report views. Select a view from the list.
5. Select the report, and then select the *For Summary* checkbox.

> ⓘ Note
>
> If the checkbox is disabled, hover over it to see the reason.

6. Click *Apply* to add the report to your tab.
7. To save your settings, click your profile and select *End Adaptation*.

To print the embedded data, click *Summary*. The system opens the summary PDF in a new window.

> ⓘ Note
>
> - You can select a maximum of **three** embedded reports for printing.
> - You can select a report with a maximum of **five** columns. While generating the summary pdf, if the system detects more than five columns in the report, it displays the data only for the first five columns.
> - If the selected report has more than **200** rows, no data is shown in the summary.

> → Remember

- The ID/Code and Description characteristics is merged into a single column by Analytics.
- Hierarchies in tables or characteristics are not supported. Such reports are not available for download.
- Charts are not supported. Chart data is displayed in the summary PDF in the form of a table.
- Background colors in exceptions and trend icons in conditions are not supported.
- Characteristics in columns and key figures in rows are not supported.
- Reports containing characteristics with rich text or extended text are not supported.
- UIs with summary functionality in the Cloud Applications Studio and ABSL codes that call print are not supported.

3.9   Work with Mobile Reports

Mobile reports are browser-based reports that you can enable for mobile devices.

Note that mobile reports are by default not displayed in the reports list. You can view mobile reports by choosing *Mobile Report* from the dropdown list.

Adapting Mobile Reports

You can either open the default of the mobile report on your mobile device, or you can adapt it to your own requirements.

1. Open the relevant mobile report.
2. In the *Selection* area, make any relevant value selections for variables.

> ⓘ **Note**
>
> To optimize using the report on your mobile device, we recommend setting the start option to *Hide Selection Area and Start Report*.

3. Save the set of value selections for variables.
4. When the report is displayed in the web browser, make any relevant changes to the layout and drilldown of the report.
5. Save the report view and set of value selections for Variables. To save the report view, from *View*, click *Save As*. To save the set of value selections for Variable, in the *Selection* area, select the *Edit* tab page, and click *Save As*.
6. Set both the report view and the Variables as default. To set the report view as default, from *View*, choose *Manage Views*. To set the variables as default, in the *Selection* area, select the *Manage* tab page.
7. In the web browser, from the toolbar, click *Set As Default*.
   The adapted report is now set as default for the mobile report.
   Note for Administrators
   To make a mobile report available to business users, administrators must assign the mobile report to a mobile-relevant work center and to a business-relevant work center.

3.10 Role Based Access

Restrict access to certain reports by assigning them to specific business roles.

As an administrator, after you have created an analytic object, you can assign it to work centers and work center views, making it available to business users. You can restrict the users who have access to certain analytical objects. This restriction is based on the business roles of the users.

Reports and dashboards are supported for role based assignment. However, you cannot assign excel based reports to a business role. KPIs and all other analytic objects are currently not supported.

Process Flow

1. **Select the option for assignment by business roles in fine tuning activities**
   To be able to assign business roles to analytic objects, maintain business roles for users before selecting the fine tuning option.

   To use the option of assigning analytic objects by business roles, navigate to ▐▶ *Business Configuration* ▶ *Activity List* ▶ *Fine-Tune* ▶ *Administrator Analytics- Settings* ▐ and select the *Business Role* check box.

> ⓘ Note
>
> If you turn off the option after you have used it, you will lose all the assignments based on business roles; and you will no longer see the option to assign analytic objects to business roles on your screens.
>
> If you select it again, you will have to do the manual assignments again.

2. **Assign users to business roles**

   1. Go to *Administrators* work center, *General Settings* view. Under *Users*, select *Business Roles*
   2. Select a business role. To edit or check users assigned to a business role, click *Edit*.
      To create a new business role, click *New*, select *Business Role*.
   3. *General* tab has the ID, name and description of the business role.
      Work Center And View Assignments shows the work centers and views. You can see which views the business role is assigned to. You can add or change this assignment by selecting the check box.

      > ⓘ Note
      >
      > Check if the access rights are consistent with the assignments you have made.
      >
      > To do so, click *Actions*, click *Check Access Rights Consistency*.

      Access Restrictions tab shows the read and write access to the assigned work center view for the selected business role.
      Fields & Actions tab shows the field restrictions for the particular business role.
      In *Assigned Business Users* tab, you can see the list of users that are assigned to the selected business role. To edit this assignment, go to *Administrator* work center, *General Settings* view. Under *Users*, click *Business Users*.
   4. Once completed, click *Actions* and select *Activate* the business role.

3. **Assign reports to business roles**
   You can assign reports to only those business roles that have access to the work center views where the report is assigned. For more information, see Assign A Report [page 37].

3.11 Example Report: Display the Last Logon Date and Timestamp for Active Users

Lists the steps involved in creating a report.

3.11.1 Create a Joined Data Source

Create a joined data source to suit your business requirements and processes.

Procedure

1. In the *Business Analytics* work center, choose ▍▶ *Design Data Sources* ❯ *New* ❯ *Joined Data Source* ▍. Enter an appropriate name and description for the data source.
2. On the *New Joined Data Source* screen, click *Add Data Source*.

    Note that a maximum of five data sources can be joined.
3. On the *Add Data Source* dialog, select the `User Logon Activity` data source from the dropdown list. You can then view which characteristics and key figures are available for the selected data source. Choose *Client Type*, *Last Logon Timestamp*, *Logon Date*, and *User* characteristics from the list, and click *OK*.
4. On the *Add Data Source* dialog screen, select the `Identity` data source from the dropdown list, and then select *User Account Inactive* characteristic from the list, and click *OK*.
5. On the *New Joined Data Source* screen, select the value help for the *Identity data* source in the *User* characteristic row.
6. Choose *User ID* characteristic under *Obsolete* column.
7. Click *Save and Close*.

Results

The joined data source is now available for reporting.

3.11.2 Create a Report Based on the Joined Data Source

Administrators can create reports based on data sources.

Procedure

1. Navigate to ▮▶ *Business Analytics* ❯ *Design Reports* ❯ *New Report* ❯. Enter an appropriate name and description for the report.
2. In the *Data Source* value help, select the joined data source that you created. Under the *Properties* section, set the *Only for Master Data* switch on, and click *Next*.
3. Select all the characteristics, and click *Next*.
4. Choose the value selection for *Client Type* and *Logon Date* characteristics as *Using Variable*, and click *Next*.
5. Choose the selection type for the *Client Type* characteristic as *Multiple Values*, and for the *Logon Date* as *Interval*, and click *Next*.
6. Review the data, and click *Finish*.

Results

The report is now available. To test the report, click *Create View for this Report in a Web Browser*.

4   Data Sources

The same data is often available in different data sources. For example, the characteristic Product is available in different data sources, depending on how products are involved in business processes. Thus, you can find the characteristic in reports of different business areas, such as Purchasing and Financials.

From the *Design Data Sources* work center view, administrators can create their own combined and joined data sources that merge data from different data sources.

Types of Data Sources [page 94]
> A brief description of the different types of data sources available.

Create and Edit a Combined Data Source [page 98]
> Create and edit combined data sources to suit your business requirements and processes.

Create and Edit a Joined Data Source [page 100]
> Create and edit joined data sources to suit your business requirements and processes.

Create and Edit a Cloud Data Source [page 102]
> Cloud data sources are useful if you want to upload analytical data from external sources into your solution for reporting purposes.

Preview a Data Source [page 115]
> Preview the data of data sources in a Web browser.

Add Extension Fields to Data Sources and Reports [page 116]
> As an administrator you can add an extension field to a data source that is based on the same business context as the extension field. You can then add the field to any report based on the data source.

4.1   Types of Data Sources

A brief description of the different types of data sources available.

SAP Delivered Data Sources

Data sources delivered by SAP serve as the basis for the content of created data sources. Administrators can select data sources from a range of business areas for their own data sources.

Combined Data Sources

A combined data source is a type of data source that combines two or more data sources. The data sources of which the combined data source consists usually have a set of common characteristics but semantically different key figures.

Depiction of a Combined Data Source

You usually combine data sources when the data sources that you want to combine have the semantically similar characteristics but key figures that are unique to each data source. Alternatively, you can combine data sources when the characteristics you require for a report are not available in one data source.

When you build a report using a combined data source, all characteristic values are displayed along with any key figure values. Combined data sources are therefore useful if you want to filter large amounts of data in a report. The following example shows a result set of a combined data source.

Data Source

Product ID	Employee Responsible	Opportunity ID
MCD-0001	1000010	100375
MCD-0002	1000011	100376
MCD-0022	1000012	100377
MCD-0024	1000013	140025
MCD-0005	1000014	100378

Data Source

Product ID	Product Category	Employee Responsible
MCD-0001	Service	1000010
MCD-0002	Service	1000011
MCD-0022	IT Equipment	1000012
MCD-0024	IT Equipment	1000013
MCD-0005	Service	1000014
MCD-0046	Office Supplies	1000215
MCD-0049	Office Supplies	1000215

Combined Data Source

Product ID	Employee Responsible	Product Category	Opportunity ID
MCD-0001	1000010	#	100375
MCD-0001	1000010	Service	#
MCD-0002	1000011	#	100376
MCD-0002	1000011	Service	#
MCD-0005	1000014	#	100378
MCD-0005	1000013	Service	#
MCD-0022	1000012	#	100377
MCD-0022	1000012	IT Equipment	#
MCD-0024	1000013	#	140025
MCD-0024	1000012	IT Equipment	#
MCD-0046	1000215	Office Supplies	#
MCD-0049	1000215	Office Supplies	#

Example of a Result Set of a Combined Data Source

Joined Data Sources
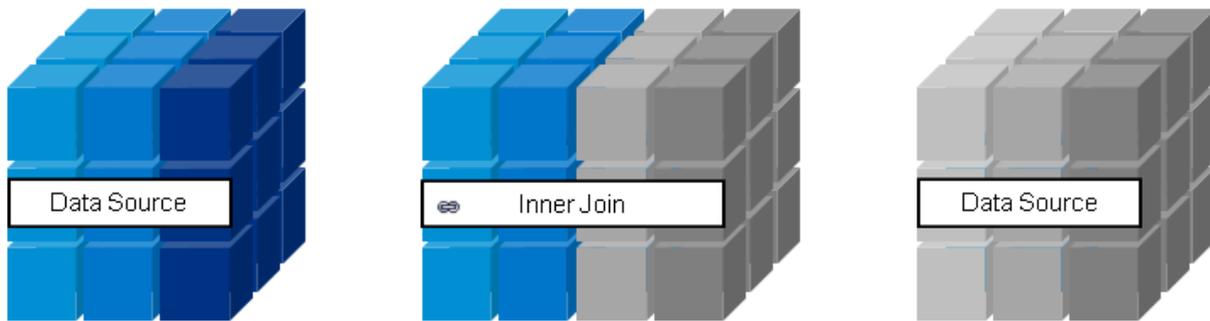
A joined data source is a type of data source that contains characteristic values that match from the data sources to be joined along with any key figure values. You can have more than one join, that is, the characteristic that joins the data sources, in your joined data source. The more joins there are in a joined data source, the more restricted the data that is available for reports.

When you build a report using a joined data source, characteristic values that match in the joined characteristics in the data sources are displayed along with values that are in the same row. Joined data sources are therefore useful if you want to restrict the amount of data available for a report.

Depending on your business requirements, you can select from the following join types. Note that the anchor is displayed for both join types in the system but only affects the data in a joined data source that uses a left outer join.

Inner Join

An inner join is a join that selects only those characteristic values from the data sources to be joined that match in the joined data source field along with any key figure values. Characteristic values in the joined data source fields that do not appear in both data sources are excluded.

Depiction of an Inner Join

The following example shows a result set of a joined data source that uses an inner join.

Data Source

Account ID	Last Name	First Name	City
1	Adams	Oliver	Chicago
2	Menson	Bob	Miami
3	Jacob	Kate	Boston

Data Source

Account ID	Opportunity ID
3	55234
3	55233
1	55199
1	54987
7	55340

Inner Join

Account ID	Last Name	First Name	City	Opportunity ID
1	Adams	Oliver	Chicago	55199
1	Adams	Oliver	Chicago	54987
3	Jacob	Kate	Boston	55234
3	Jacob	Kate	Boston	55233

Example of a Result Set of a Joined Data Source That Uses an Inner Join

Left Outer Join

A left outer join is a join that selects all characteristics values from the data source that is selected as the anchor and those characteristic values that match in the data sources that are added along with any key figure values. By default, the first data source that you select is the anchor.
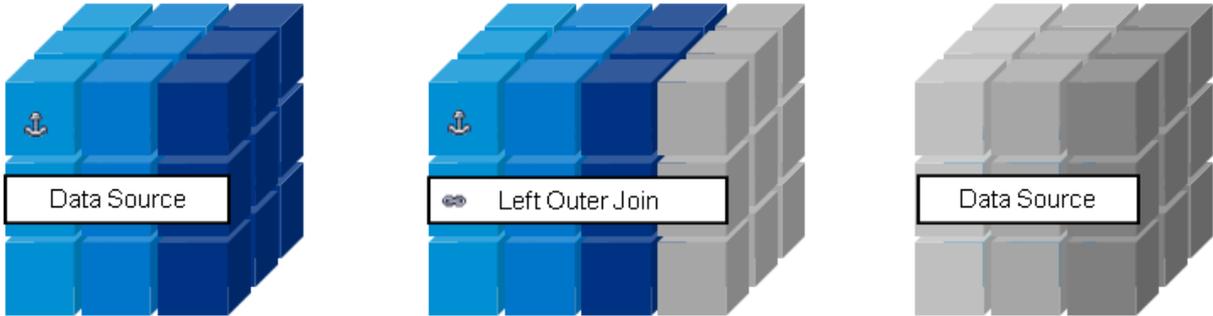
Depiction of a Left Outer Join

> ⓘ Note
>
> Note that setting the anchor to a different data source affects the values available since the joined data source fields may also change.Example of a Result Set of a Joined Data Source That Uses a Left Outer Join
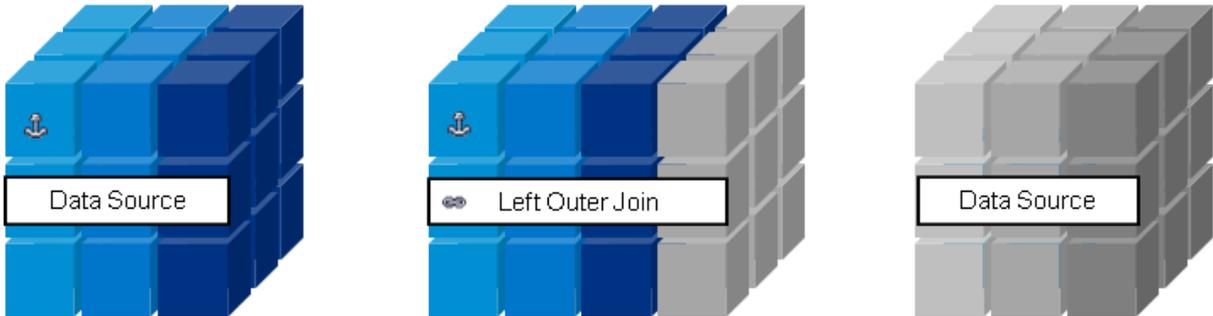
Depiction of an Anchor Change

The following example shows a result set of a joined data source that uses a left outer join.

Data Source			
Account ID	Last Name	First Name	City
1	Adams	Oliver	Chicago
2	Menson	Bob	Miami
3	Jacob	Kate	Boston

Data Source	
Account ID	Opportunity ID
3	55234
3	55233
1	55199
1	54987
7	55340

Left Outer Join

Account ID	Last Name	First Name	City	Opportunity ID
1	Adams	Oliver	Chicago	55199
1	Adams	Oliver	Chicago	54987
2	Menson	Bob	Miami	-
3	Jacob	Kate	Boston	55234
3	Jacob	Kate	Boston	55233

Example of a Result Set of a Joined Data Source That Uses a Left Outer Join

4.2   Create and Edit a Combined Data Source

Create and edit combined data sources to suit your business requirements and processes.

Procedure

1. In the *Design Data Source* work center view, from *New*, choose the *Combined Data Source* option.
   By default, the combined data source contains the Counter key figure. The Counter key figure counts the number of instances of a specified object.
2. On the *New Combined Data Source* screen, click *Add Data Source*.
3. On the *Add Data Source* dialog screen, select a data source from the dropdown list. You can then view which characteristics and key figures are available in the selected data source. The initial selections serve as a basis for the combined data source. The characteristics and key figures are then displayed in the *Combined Data Source Fields* column.

> ⓘ Note
>
> Only data sources that have compatible access contexts can be added to the combined data source. For example, a data source can be added if the data source and the combined data source have a common access context. Data sources that have unrestricted as an access context can always be added.
>
> Thereby the number of available data sources to be combined may be reduced.

4. Select one or more additional data sources for the combined data source and add the data sources accordingly.

> ⓘ Note
>
> When you add data sources to the combined data source, the system checks whether the characteristics and key figures in the additional data sources are also available in the data source that you selected as a basis for the combined data source.
>
> If the characteristic or key figure is already available in the combined data source, the system maps the characteristic or key figure and positions the characteristic or key figure in the same row across all data sources.
>
> If the characteristic or key figure is not already available in the combined data source, the system adds the characteristic or key figure to the combined data source.

Other Functions

Remove Data Source	The *Remove Data Source* dialog screen appears, showing the data sources that you have added. You can remove data sources by clicking the relevant checkbox.
Add Row	Adds a row to be defined by you. Once you have added a characteristic or key figure, the system adds the characteristic or key figure to the relevant field type group.
Remove Row	Deletes the selected row. Note that the selected characteristic or key figure is only removed from the combined data source.
Check Mapping	Checks whether characteristics and key figures semantically match in the selected data sources. Note you can change the mapping. It is not necessary characteristics have the same name, but they must match semantically. For example, in your company, sales units and cost centers are one and the same.

Result

The combined data source is available for reporting. You can create reports using data from the combined data source. For information about creating reports, see Working with Reports Using the Report Wizard [page 19].

4.3 Create and Edit a Joined Data Source

Create and edit joined data sources to suit your business requirements and processes.

Procedure

1. In the *Design Data Source* work center view, from *New*, choose the *Joined Data Source* option.
   By default, the joined data source contains the Counter key figure. The Counter key figure counts the number of instances of a specified object.
2. On the *New Joined Data Source* screen, click *Add Data Source*.
   Note that a maximum of 5 data sources can be joined.
3. On the *Add Data Source* dialog screen, select a data source from the dropdown list. You can then view which characteristics and key figures are available in the selected data source. The initial selections serve as a basis for the joined data source. The characteristics and key figures are then displayed in the *Joined Data Source Fields* column.
4. Select one or more additional data sources for the joined data source and add the data sources accordingly.

   > ⓘ Note
   >
   > When you add data sources to the joined data source, the system checks whether the characteristics and key figures in the additional data sources are also available in the data source that you selected as a basis for the joined data source.
   >
   > If the characteristic or key figure is already available in the joined data source, the system positions the characteristic or key figure in the same row across all data sources.
   >
   > If the characteristic or key figure is not already available in the joined data source, the system adds the characteristic or key figure to the joined data source.
   >
   > If you are joining a cloud data source with any other data source, ensure that the characteristics involved in join conditions are not compound characteristics.
   >
   > Note that if the characteristic is already available in the data source that is the anchor, the system creates a join. The more joins there are in a joined data source, the more restricted the data that is available for reports.

Other Functions

Remove Data Source	The *Remove Data Source* dialog screen appears, showing the data sources that you have added. You can remove data sources by clicking the relevant checkbox.
Add Row	Adds a row to be defined by you. Once you have added a characteristic or key figure, the system adds the characteristic or key figure to the relevant field type group.

Remove Row	Deletes the selected row. Note that the selected characteristic or key figure is only removed from the joined data source
Check	Checks whether the joined data source is consistent.
Set Anchor	Sets the anchor to the selected data source.
	The data source that is the anchor is the basis for any joins. Depending on the type of join, changing the anchor to a different data source can change the joined data source fields.
Set Access Context	Sets the access context to the access context of the selected data source.

Result

The joined data source is available for reporting. You can create reports using data from the joined data source. For information about creating reports, see Working with Reports Using the Report Wizard [page 19].

By default, all fields in the joined data source are visible. Note that you can further influence the visibility of characteristics and key figures. Under ▌ *Personalize* ❯ *This Screen* ▌, you can add the *Visibility* column to the table.

Value	Description
Visible for End User Personalization	Business users can add characteristics along with their attributes as well as key figures when working with reports in a Web browser using *Add Fields*.
Visible for Report Modeling	Only administrators can view characteristics along with their attributes as well as key figures. Characteristics and key figures for which this value is set are visible in the Report Wizard guided activity and when working with the report in a Web browser.
Always Hidden	Fields are not visible when creating or working with reports. This value is useful if you have a field in a joined data source that is only used to join two data sources; you are not interested in the actual data.

4.4 Create and Edit a Cloud Data Source

Cloud data sources are useful if you want to upload analytical data from external sources into your solution for reporting purposes.

Context

From the *Design Data Sources* work center view, depending on whether you want to create or edit, choose the relevant option. To create a cloud data source, click *New*, and choose *Cloud Data Source*. To edit a cloud data source, select the relevant data source and click *Edit*.

> ⓘ Note
>
> - The total number of fields that you can upload in a cloud data source is 150.
> - When you edit and save a cloud data source, the data in the data source is deleted. You must reload the data based on the changes you make to the cloud data source.

Procedure

1. Enter an ID and name.

   > ⓘ Note
   >
   > Note that the Data Source ID must begin with the letter **z**.

2. Select a usage from the dropdown list. The usage of the cloud data source depends on whether you want the cloud data source to be referenced by other data sources or whether you want to have a description field available for the corresponding characteristic.

   Data Types for Cloud Data Source Fields

Usage	Explanation
Master Data with Description	You can use the data source as a reference and can reference other data sources.
	A description field is generated for the corresponding characteristic field. You can then create and upload text descriptions for master data that is available.
	When previewing the data source or report based on the data source, you can then decide to show the description using the display settings for characteristics.

Usage	Explanation
Master Data without Description	You can use the data source as a reference and can reference other data sources.
	You do not require additional text descriptions for master data.
Transactional Data	You want to use the data source primarily for transactional data and can reference other data sources.

3. Optional: Select the *Manual Data Upload* checkbox if you want to upload external file formats such as CSV.
4. Click *Add Row* to enter the data source fields. The following table gives you an overview of all the available fields.

Settings for Data Source Fields

Name	Description
Primary Key	A field or group of fields that uniquely identifies data records in a data source.
	ⓘ Note • The maximum number of fields that you can mark as primary key is 15. • The sum total of the length of all primary keys should not exceed 300 characters.
Field ID	The technical ID of the field. Only upper case letters (A, B, ... Z), numbers (0, 1, ... 9) and the underscore character (_) are allowed. The maximum number of fields that you can mark as primary key is 15.
Field Name	The semantic name of the field.
	Note that the maximum size of the field name is limited to 30 characters.
Data Type	See the Data Types for Cloud Data Source Fields [page 112] section.
Length	The maximum number of fields that you can mark The length of the field. Depending on the data type you select, you can define the length of the field.

Name	Description
Upper Case	An indicator that allows you to convert entries in the fields to upper case letters. Note that the field name is not affected.
	If this indicator is set, then the system differentiates between lower and upper case letters. If this indicator is not set, then the system converts all the letters into upper case.
	If you use letters in lower case, then you must be aware of what happens when you enter a string for a variable defined in a report based on the data source. Specifically, if you use the characteristic in a variable, then the system only can find the values for the characteristic if the lower and upper case letters are entered accurately in the input field for the variable.
Alpha Conversion	An indicator that presets the format of characteristics of the Char data type. Alpha conversion is often used, for example, with account numbers or document numbers.
	If you set this indicator, when converting from an external to an internal format, the system checks if the entry in the input field is numerical or alphanumerical with blank spaces before and/or after the string of digits.
	If the string is numerical, then the string is copied to the output field, right-aligned, and the space on the left is filled with zeros.
	If the string is alphanumerical, then the string is copied to the output field from the left to right and the space to the right remains blank.
	Input and output fields are each 8 characters long: • '1234 ' –> '00001234' • 'ABCD ' –> 'ABCD '
Referencing Data Source	Data source from which a characteristic is referenced as a key field ⓘ Note The field is editable only if you choose the data type as *char*.

Name	Description
Referencing Data Source Key Field	Referenced characteristic used as a foreign key. Foreign keys are usually not available for entry, because the value is taken from the referenced characteristic in the data source. This ensures that the characteristic values are consistent.
	The system automatically fills the data type and length of referencing data source and referencing data source key fields.
	ⓘ Note The field is editable only if you choose the data type as *char*.
Key for Master Data	A key that enables you to add text descriptions to fields that have the Char data type. It also enables the corresponding field to be referenced by other data sources.
Parent Characteristic for Hierarchy	Arranges the characteristics as a hierarchy, with the characteristic you enter as the parent node of the hierarchy.
Aggregation Type Code	Gives you an option to select the required aggregation type for the key figure. The available options are: Maximum, Minimum, Summation.

5. Click *Save*.

Access Context [page 106]
> Data that originates in the solution is access context sensitive. This means that SAP-delivered data sources are associated with access contexts to ensure that data is directed to users who are allowed to view it.

Upload Options [page 106]
> You can upload data manually or through a web service.

Upload/Download Cloud Data Source [page 112]
> When you download a cloud data source and upload it to a tenant where the same cloud data source already exists, the data in the existing data source gets deleted.

Data Types for Cloud Data Source Fields [page 112]
> When creating a Cloud data source, you need to decide how the data source is to be modeled. Depending on whether you want to create characteristics or key figures, set the data type accordingly.

Examples [page 114]
> The following examples illustrate how data from defined Cloud data sources may appear when previewed either directly in the data source or in a report.

4.4.1 Access Context

Data that originates in the solution is access context sensitive. This means that SAP-delivered data sources are associated with access contexts to ensure that data is directed to users who are allowed to view it.

Since the data for a Cloud data source originates from an external source, Cloud data sources have no access context assigned. This means that the data is unrestricted. You should therefore ensure that the data is suitable for all users if you build reports using only Cloud data sources as a basis.

> ⓘ Note
>
> If you use a Cloud data source in a joined or combined data source with SAP-delivered data sources, then the access context of the corresponding SAP-delivered data source serves as the access context of the joined or combined data source.

4.4.2 Upload Options

You can upload data manually or through a web service.

> ⓘ Note
>
> SAP provides the Cloud Data Source feature to upload aggregated data to SAP Cloud for Customer for integrated reporting purpose.
>
> You can add a maximum of 100,000 records per upload. However, it is recommended that you use this feature sparingly, and do not upload huge volume of data to Cloud Data Source. At any given point of time you should not have more than **five** million records in Cloud Data Source.

4.4.2.1   Manual Upload

To upload data manually to your solution, when creating or editing a Cloud data source, ensure that the *Manual Data Upload* checkbox is selected. The data to be uploaded must be saved as a CSV file.

> ⓘ Note
>
> While uploading CSV files, ensure the following:
>
> * The maximum limit of entries per upload is 100,000.
> * The maximum limit of entries overall is 5,000,000.
> * The decimal separator is a period (.) and the field delimiter is a semicolon (;). Thousand separators are not supported.
> * Enter the same delimiter that is used in the CSV file.
> * The CSV file is encoded using UTF-8. You may have to change the encoding option of the file. For information about changing the encoding option, see the help documentation of the product you use to edit the CSV file. Encoding options may be available from a *Save As* dialog window, for example.

You have three options available when uploading data:

- *Merge*: Modifies existing data records (with the same key) and inserts data records with the new key.
- *Overwrite*: Deletes the existing data records and inserts new data records.
- *Delete*: Deletes existing data based on your selection.

The following graphic provides an example of the two options.

Old Data

Account (*)	Product (*)	Month/ Year (*)	Quantity
123456	PC	11/2012	22
456789	Laptop	11/2012	34
444444	PC	11/2012	34

New Data

Account (*)	Product (*)	Month/ Year (*)	Quantity
123456	PC	11/2012	20
456789	Laptop	11/2012	25
235689	PC	11/2012	5

Upload

Overwrite

Account (*)	Product (*)	Month/ Year (*)	Quantity
123456	PC	11/2012	20
456789	Laptop	11/2012	25
235689	PC	11/2012	5

* = Key

Merge

Account (*)	Product (*)	Month/ Year (*)	Quantity
123456	PC	11/2012	20
456789	Laptop	11/2012	25
235689	PC	11/2012	5
444444	PC	11/2012	34

Upload options

You must also ensure that the field names in the first row of the file match the field IDs of the data source.

4.4.2.2 Upload Using a Web Service

Context

To create and edit Cloud data sources using a Web service, you must set up a communication and system and arrangement, and use the service URL to pull the data into your solution.

Procedure

1. Create a communication system.

   a. Navigate to ▶ *Administrator* ❯ *General Settings* ❯ *Integration* ❯ *Communication Systems* ❯ .

   b. In the *Communication Systems* view, click *New*.

   c. In the *Communication System* section, enter the details of the communication system, as follows:

      - *ID* is used as the template for the technical user in the communication arrangement.
      - *Host Name* has to be supplied, but is not used.
      - For the *System Access Type*, select *Internet*.

   d. When you have entered all the details, click *Save and Close* to return to the *Communication Systems* view. The communication system you just created has the status *In Preparation*.

   e. In the *Communication Systems* view, select the communication system you have created and click *Actions*, then choose *Set to Active*.

      If the status changes to *Active*, the configuration is ready to be used.

2. Create a communication arrangement.

   a. Navigate to ▶ *Administrator* ❯ *General Settings* ❯ *Integration* ❯ *Communication Arrangements* ❯ .

   b. To open the *New Communication Arrangement* guided activity, in the *Communication Arrangements* view, click *New*.

   c. In the *Select Scenario* step, select *Analytics Data Upload* and click *Next*.

   d. In the *Define Business Data* step, enter business data.

      - In the *System Instance ID* field, choose or enter the communication system ID that you created.

   e. In the *Define Technical Data* step, define the technical settings for inbound communication.

      - For a communication method, select *Direct Connection*.
      - For an application protocol, select *Web Service*.
      - For an authentication method, select *User ID and Password*.
      - Next to the *User ID* field, click *Edit Credentials*.
        The user ID is automatically predefined, but you must create a password, as follows:
        - Choose *Change Password*.
        - Enter a password and confirm it.
      - Click *Edit Advanced Settings* and note the service URL, which you require to upload data.

3. Download a Web Services Description Language (WSDL) file. The WSDL file is used to set up a Web service in the target system.

   a. Navigate to ▶ *Administrator* ❯ *General Settings* ❯ *Integration* ❯ *Communication Arrangements* ❯ .

   b. Choose the relevant communication arrangement and click *Edit*.

   c. Click the *Technical Data* tab page.

   d. Click *Edit Advanced Settings*.

   e. Click Download WSDL.

   f. Name and save the WSDL file; the file is required for setting up communication.

4. Ensure that the solution URL is a trusted site.

   You can do so, for example, by checking either the security report or the list of trusted sites of the Web browser.

5. Export the relevant certificates from the Web browser.

   The certificates are required to create a secure connection.

   You can often find export functions under the tool options of the Web browser. Depending on the Web browser, you might need to run the browser as an administrator to export the certificate. You might also need to import the certificate before exporting it. For information about importing and exporting certificates, see the documentation of the Web browser.

   You need to export the following certificates from the Web browser, regardless of the authentication method you have chosen:
   - the GTE CyberTrust Global Root certificate
   - the GTE CyberTrust SureServer Standard Validation CA certificate

6. Use the Web Service URL.

   The following section describes the structure of the service.

   Service: `/sap/bc/srt/scs/sap/analyticsdatauploadin`

   Example Structure

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
<soap:Header/>
<soap:Body>
<n0:AnalyticsDataUploadRequest xmlns:n0="http://sap.com/xi/SAPGlobal20/
Global">
<BusinessDocumentBasicMessageHeader>
<ID schemeID="Token 1" schemeAgencyID="Token 2"
schemeAgencySchemeAgencyID="Tok">Token 4</ID>
<UUID schemeID="Token 5" schemeAgencyID="Token 6">12345678-90AB-
CDEF-0123-456789ABCDEF</UUID>
<ReferenceID schemeID="Token 7" schemeAgencyID="Token 8"
schemeAgencySchemeAgencyID="Tok">Token 10</ReferenceID>
<ReferenceUUID schemeID="Token 11" schemeAgencyID="Token 12">12345678-90AB-
CDEF-0123-456789ABCDEF</ReferenceUUID>
<BusinessDocumentBasicMessageHeader>
<AnalyticsDataUploadRequestContent>
<MDAVName>Token 13</MDAVDefinitionNName>
<AnalyticsImportMethod>Token 14</AnalyticsImportMethod>
<Data>String 15</Data>
<AnalyticsDataUploadRequestContent>
</n0:AnalyticsDataUploadRequest>
</soap:Body>
</soap:Envelope>
```

   The mandatory tokens (strings in green) must be populated with the following information.

MDAVName (Token 13)	ID of the data source	
AnalyticsImportMethod (Token 14)	MERGE	Modifies existing data records (with the same key) and inserts data records with the new key.
	OVERWRITE	Deletes the existing data records and inserts new data records.
	DELETE	Deletes the existing data records.
	DELETESEL	Deletes selected records on web service.

MDAVName (Token 13)	ID of the data source
Data (String 15)	The first line contains the field IDs to be loaded and defines the order. All other lines contain the data. Use semicolons, as shown below, for separation.

```
<DATA>
REGION;PRODUCT;KF1;
US;MC1000;9456;
DE;MC2000;1255;
DE;MC2200;3654;
</DATA>
```

> ⓘ **Note**
>
> If you have a text that contains symbols such as semicolon (;) or quotation mark ("), then you will get an error. To avoid this, ensure that you do the following:
>
> - Include the entire text containing symbols in a double quote to indicate that it's a special case. E.g., ["Boiler 6" handle"] instead of [Boiler 6" handle]
>
> - For each quote within the text containing symbols, add another double quote. [""Factory""] instead of ["Factory"]
>
> - Enclose the symbol with double quotes. E.g, [";"] instead of [;]

Example:

Incorrect data:

```
<DATA>
REGION;PRODUCT;P
RODUCT_NAME;KF1;
US;MC1000;Boiler
 6" handle;9456;
DE;MC2000;Pipeli
ne;Cylinder
shape;1255;
DE;MC2200;Boiler
"Factory";3654;
</DATA>
```

Correct data:

```
<DATA>
REGION;PRODUCT;P
RODUCT_NAME;KF1;
US;MC1000;"Boile
r 6""
handle";9456;
DE;MC2000;"Pipel
ine";"Cylinder
shape";1255;
DE;MC2200;"Boile
r""Factory""";36
54; </DATA>
```

7. Consume Cloud data source using a Web service

   The SAP Cloud platform uses SOAP Web services as its core method of integration. It is a simple, thin client and you need to load the XML as your payload to retrieve records or do inserts and updates to records.

   To consume Cloud data sources using a Web service, you are required to have downloaded the WSDL to your local system, as explained in Step 3 of "Upload using a Web service".

> ⓘ Note
>
> SOAP UI is an open-source, diagnostic tool that can be used to test calling Web services in any SAP Cloud solution. It is **not** a production tool that can be used to perform the actual integration. With SOAP UI, you can diagnose issues — regardless of your environment, the network, and so on — that block your integration using the SAP Web service. SAP does not provide support for the tool, nor pay for the license. If you require support for the tool, then you must purchase the paid version. Please refer to the documentation available within the tool to help you carry out the necessary steps.

4.4.3 Upload/Download Cloud Data Source

When you download a cloud data source and upload it to a tenant where the same cloud data source already exists, the data in the existing data source gets deleted.

An existing cloud data source gets deleted in the following use cases:

- If an embedded report uses cloud data source, during a layout export and import, the cloud data source is regenerated at the target, thereby deleting the data.
- During key user analytical objects download and upload, if a cloud data source is moved, the existing data source is regenerated at the target, thereby deleting the data.

> ⓘ Note
>
> If the cloud data source is part of a joined or combined data source, the upload/download function does not work.

4.4.4 Data Types for Cloud Data Source Fields

When creating a Cloud data source, you need to decide how the data source is to be modeled. Depending on whether you want to create characteristics or key figures, set the data type accordingly.

Data Types for Key Figures

Name	Description
Amount	A monetary sum with a currency unit.
	28 integer places are allowed.
	6 decimal places are allowed.
	If the uploaded value has more than 6 decimal places, then the sixth decimal place value is rounded to the nearest number.

Name	Description
Quantity	A definite amount of an item with a unit of measure. Note that you are allowed to enter only ISO codes as units of measure. For example, KGM (Kilogram), GRM (Gram), BG (Bag), BO (Bottle), EA (Each), and so on.
	28 integer places are allowed.
	6 decimal places are allowed.
	If the uploaded value has more than 6 decimal places, then the sixth decimal place value is rounded to the nearest number.
Integer	4 byte integer, whole number with +/- sign.
	Only values between -2147483648 and 2147483647 are allowed.
Decimal Number	Numeric value without a currency unit or unit of measure.
	28 integer places are allowed.
	6 decimal places are allowed.
	If the uploaded value has more than 6 decimal places, then the sixth decimal place value is rounded to the nearest number.

Data Types for Characteristics

Name	Description
Char	Alphanumerical string with a character length between 1 and 60.
Date	Date field in YYYYMMDD format.
Time	Time field in HHMMSS format.
Week	Date field as calendar week in WW format.
Month	Date field in MM format.
Quarter	Date field in Q format.
Year	Date field in YYYY format.
Year Month	Date field in YYYY-MM format.
Year Quarter	Date field in YYYY-Q-# format.
Year Week	Date field in YYYY-W-# format.

4.4.5 Examples

The following examples illustrate how data from defined Cloud data sources may appear when previewed either directly in the data source or in a report.

> ⓘ Note
>
> Note that the examples do not contain all fields that can be used to define a Cloud data source.

Master Data with Description

ACCOUNT

Primary Key	Field ID	Field Name	Data Type	Length	Key for Master Data
☑	ACCOUNTID	ACCOUNT	Char	10	☑
☐	DESCRIPTION		Description	Description	
	COUNTRYID	Country	Char	10	

As Previewed

Account	Description	Country
123456	Account1	US
456789	Account2	DE
235689	Account3	DE
784512	Account4	US

Usage: Master data with Description

You can reference fields in other data sources in a Cloud data source. In the following example, the PRODUCTS Cloud data sources reference the description of the ACCOUNTID field from the ACCOUNT Cloud data source. As previewed, the description is displayed, rather than the ID.

Master Data without Description

PRODUCTS

Primary Key	Field ID	Field Name	Data Type	Length	Referencing Data Source	Referencing Data Source Key Field
☑	ACCOUNT_ID	Accounts	Char	10	ACCOUNT	ACCOUNTID
☑	PRODUCTS	Products	Char	10		
☑	MONTHYEAR	Month/Year	Year Month			
	QUANTITY	Quantity				
☐			Unit			

As Previewed

Account	Products	Month/Year	Quantity
Account 4	PC	11/2012	20
Account 2	Laptop	11/2012	25
Account 2	PC	11/2012	5
Account 3	PC	10/2012	13
Account 1	PC	11/2012	14
Account 3	Laptop	10/2012	26
Account 4	Laptop	10/2012	35

Referencing data source and key field

Master Data with Hierarchy
Org Structure

Primary Key	Field ID	Field Name	Data Type	Length	Key for Master Data	Parent Characteristic for Hierarchy
☑	Employee	Employee	Char	30	☑	Manager
☐	Manager	Manager	Char	30		

Data in CSV File

Employee	Manager
Gruber	Gilmore
Watson	Gilmore
Singh	Hancock
Gilmore	Hancock
Hancock	Morgan
Menson	Morgan
Wang	Morgan
Morgan	

Usage: Master data without description, characteristic hierarchy

You can create Cloud data sources that contain a characteristic hierarchy.

> ⓘ Note
>
> Note that you must set the *Key for Master Data* indicator for the characteristic that is the child node and indicate which characteristic is the parent node.

You must also ensure that all characteristic values in the hierarchy are uploaded with the child characteristic.

4.5   Preview a Data Source

Preview the data of data sources in a Web browser.

In the preview mode, administrators can view the data similar to how end users view the data in a report. From the preview mode, administrators can then navigate to the Report Wizard from which they can create a report based on the data source.

By default, key figures available with a data source are displayed in columns, rows are empty, and characteristics available with the data source are listed in the *Not Currently Shown* list.

Since you preview the data similar to how end users view the data in a report, the functions available are the same as those available when working with a report in a Web browser; the range of functions available however are limited to those required to preview data in the data source. For example, when previewing a data source, the functions available for saving and managing report views are not available. For more information, see Viewing Reports with the Web Browser Option [page 41].

4.6 Add Extension Fields to Data Sources and Reports

As an administrator you can add an extension field to a data source that is based on the same business context as the extension field. You can then add the field to any report based on the data source.

The following table shows whether an extension field can be used as a key figure or characteristic.

Analytics Usage for Extension Fields

Extension Field Type	Analytics Usage
Amount	Key Figure
Quantity	Key Figure
Decimal Number	Key Figure
E-Mail Address	Characteristic
Indicator	Characteristic
List	Characteristic
Text	Characteristic
Time	Characteristic
Date	Characteristic
Web Address	Characteristic
Multivalue List	Characteristic
Formatted Text	Characteristic
Global Data Type	Sub-Type: • IntegerValue: Key Figure • Percent: Key Figure • CountryCode: Characteristic • CurencyCode: Characteristic • REGIONDEPENDENT_LanguageCode: Characteristic • MeasueUnitCode: Characteristic • PhoneNumber: Characteristic

Prerequisites

• You are an administrator and are assigned to the *Business Analytics* work center.

- You have created an extension field in the relevant business context.

> **ⓘ Note**
>
> Since data in data sources might contain data from multiple business contexts, you may want to add the same extension field to screens in additional business contexts.

Example

You have created an extension field as a characteristic in the *Customer Return - General Information* business context and want to add this extension field to the *Customer Returns* data source. Since this data source contains data from sales orders, the *Sales Order - General Information* business context is also available as an additional business context.

To avoid reporting twice on the same business data, add the extension field as a characteristic in the relevant additional business context. If you create another field with the same business logic in the *Sales Order - General Information* business context, and also add this field to the data source, two separate fields as characteristics appear in the data source.

Procedure

1. Click your profile on the top right corner of your screen, and select *Start Adaptation*.
2. Navigate to the screen where the extension field exists and click 🖉 to select the relevant section. The system highlights the section with a red box.
3. In the side pane, click ❯ next to *Header* to see the list of available fields.
4. Navigate to the extension field and click ❯ next to it. The system highlights the extension field with a red box to indicate that it is editable.
5. Click *Edit*. The system opens the details for the field.
6. Navigate to the *Reporting* tab. The system displays the *Data Sources* and *Reports* tables with the list of available data sources and reports.
7. Click the **Edit** icon 🖉 and the *Action* column appears in the tables.
8. Under *Action*, click the **Add Field** icon ╋ next to the report or data source where you want to add the extension field. The system indicates that it has been added with a check sign in the *Field Added* column.
9. Click *Save*.
10. Click your profile and select *End Adaptation*.

Note that if you want to make further changes to the report, such as changing the layout, you must create a new report view.

To create a new report based on the data source, navigate to the *Business Analytics* work center, *Design Reports* view and create a new report that uses this extension field.

Result

The extension field as a characteristic is added to the data source or report.

The extension field as a key figure is only added to the data source or report if the aggregation of the extension field as a key figure and of the data source or report match.

Work with Multivalue Lists [page 118]
As an administrator, you can create extension fields of type *Multivalue List*. This allows you to select multiple values from the drop down option of that particular field. You can also search with multiple values in the advanced filter option.

4.6.1 Work with Multivalue Lists

As an administrator, you can create extension fields of type *Multivalue List*. This allows you to select multiple values from the drop down option of that particular field. You can also search with multiple values in the advanced filter option.

This document shows how to work with a multivalue list. To do that, follow the steps below:

Create an extension field and apply it to a business object

1. Open an instance of a business object where you want to add an extension field. For example, an Employee, Lead, Customer.
2. Select an area, for example, the overview area, header area, and so on, where you would like to add the extension.
3. Go to your user profile, and from the dropdown list select *Start Adaptation*. The system opens in the *Adaptation Mode*.
4. Select the UI component and the underlying section where you want to create the extension field. The system highlights the section with a red box.
5. Click ▶ *Add* ❭ *Field* ❭ to open the list of available fields.
6. Select *Create Fields*. The *New Field* dialog box opens.
   1. The system displays the business context to which you have chosen to add the field. The business context is determined based on the screen section that you selected.
   If you have tried to create an extension field in a screen section that is based on two different business contexts then you can choose which one better suits your purpose. For example, you may have to choose between adding an extension field at header level of a business document or at item level.
   The business context is used to determine which other screens you can add the field to and, in addition, the form templates, analytical data sources and reports, enterprise search categories, and extension scenarios that the field can be added to.
   2. Enter a label.
   The label is the text that will appear next to the field on the screen.
   3. The system sets the label name as the technical name. You can change the technical name later if you want.

4. Select the field type as *Multivalued List*.
5. Select *Add Row* and define your values. For example, Football, baseball, basketball, Golf, tennis.
6. Save your changes.
   The dialog box closes and the new field is visible in the list of available fields.
7. Select the checkbox next to the field and click *Apply*. The field is now added to the master layout and is now available for all users.
8. To save your settings, click your profile and select *End Adaptation*.

Create or Maintain Instances for the Business Object

1. Go to the object, and click on the newly added extension field, in this example, Employee > Sports. The system displays the values that you added earlier.
2. Select one or more values (for example, Football, Tennis) from the multivalued dropdown list and click *Save*.

Repeat the steps for all the required employees.

> ⓘ Note
>
> To edit or maintain values, please add the extension field through the business object and Quick Create.

Add the extension field to the Advanced Filter section of the Object Work List (OWL)

> ⓘ Note
>
> To use it as a filter parameter, add it under the advanced query of the OWL. To view it as read-only, add it under quick view or OWL.

1. Click on the *Show Advanced Filter* icon in the OWL.
2. Get into the adaptation mode.
3. Hover over any field and select the *Add Items >Add Fields* option.
4. In the pop-up, select the newly created multivalue list and click *Apply*. You can see the field in the *Advanced Filter* section.
5. Exit the adaptation mode.

Search values in the Advanced Filter field.

1. Click on the *Show Advanced Filter* icon. The system displays the new field, Sports, in this example.
2. Click on the drop down to see the values. Select the values that you require, for example, Football, Tennis, and click *Go*.

The system displays all the employee records that have listed Football or Tennis under Sports.

Note that the values searched are based on the OR search.

5   Key Figures

Key figures are data items with numeric values and have an associated unit of measure or currency assigned. Some examples are pipeline value, Invoice Net Value, Purchase Order Quantity or tickets in queue.

In the *Design Key Figures* work center view, administrators have an overview of calculated and restricted key figures and key figure structures available in data sources.

An overview of calculated and restricted key figures in the system enables administrators to determine which data sources suit the business requirements for reports. It also enables administrators to determine whether they need to create any restricted or calculated key figures.

Create and Edit a Key Figure [page 121]
> You can create your own calculated and restricted key figures for use in reports.

Create Dynamic UI Labels for Restricted Key Figures [page 124]
> Configure a UI label for restricted key figures so that when you run a report, the system dynamically changes the column header to reflect the values that you have defined in the system. This is relevant for time-based labels. For example, if you run a report for the current year, the system shows the column label as the actual year, 2014 or 2015, instead of **current year**.

Add Extension Fields as Key Figures [page 124]
> As an administrator, you can add an extension field as a key figure to data sources.

Formulas [page 125]
> Using the formula editor, create calculated key figures derived from existing key figures, such as basic key figures, restricted key figures, and calculated key figures using the available operands, operators, and a numeric keypad.

Aggregation [page 131]
> To enable the calculation of key figures, the system has to aggregate key figure values from the data source, and formulas may also need to be calculated.

Cumulate [page 132]
> Use this function to cumulate the individual cells in an area.

Local Calculation [page 133]
> Recalculate single values and results of a report based on certain criteria. For example, you can create ranked lists, or you can calculate the total for a Top 10 product list locally.

Conversion [page 135]
> Define conversion for calculated key figures that you create.

5.1   Create and Edit a Key Figure

You can create your own calculated and restricted key figures for use in reports.

You can access this task from one of the following:

- Under *Common Tasks*
- From the *Design Reports* work center view, in the *Select Key Figures* step of the *Report Wizard*
- From the *Design Key Figures* work center view

Procedure

1. **Define Key Figure and Select Data Source**
   We recommend providing a name and description for the key figure so that the business user can identify its use in reports.
   Select a data source from which the key figure is to be selected. Note that if you have navigated to this activity from the *Report Wizard*, the data source is prefilled with the selection you made.
   Depending on the type of key figure you want to create, make the appropriate selection.

2. **Restrict/Calculate Key Figure**

   - **Create a Restricted Key Figure**
     A restricted key figure is a key figure that is restricted to a specified characteristic value.
     For the key figure you have selected to restrict, make settings for the relevant characteristics. Different restriction settings are available depending on the restriction type you choose for the selected characteristic. The following restriction types are available:

     - Variable
       Restricts the selected characteristic using the variable you have specified.

Restriction Setting	Description
Variable Name	You must select the variable with which the specified characteristic can be restricted.
Hierarchy	For the specified variable, you can choose if hierarchy values are available using the More option to the left the variable entry field on the variables screen.
Selection Type	If you have decided that hierarchy value can be displayed, you can choose whether single or multiple hierarchy nodes can be selected. If you choose no hierarchy, the following options are available for value selections: • Any Selection • Interval • Multiple Values • Single Value
Mandatory	You can choose whether the business user has to make a value selection for the specified variable.

Restriction Setting	Description
Default Value	You can make default value selections using variables that business users can change.

- Fixed
  Restricts the selected characteristic to a fixed value selection.
  You make fixed restrictions using the *Restriction* field.

  > ⓘ Note
  >
  > You can configure a UI label for restricted key figures so that when you run a report, the system dynamically changes the column header to reflect the values that you have defined in the system. For more information, see Create a Dynamic UI Label for Restricted Key figures [page 124].

- **Create a Calculated Key Figure**
  A calculated key figure is a key figure that is determined using calculation rules or formulas.
  You can create a calculated key figure derived from existing key figures in the data source you have selected.
  For example, you can create a formula to determine the number of customers for which zero activity has been recorded: EQ(Number of Customers, 0)
  For more information, see Formulas [page 125].

3. **Define Properties**

   > ⓘ Note
   >
   > This is an optional step for advanced business cases.

   For information about the functions available in this step, see the following:
   - Local Calculation [page 133]
   - Conversion [page 135]
   - Cumulate [page 132]
   - Exception Aggregation [page 131]

4. **Review**
   Review your details. If you need to make any changes, you can go back to one of the previous steps. Click *Finish* to save your key figure.

5. **Confirmation**
   The system gives you a message that the key figure has been saved. Create a new key figure or click *Close* to go back to the *Design Key Figures* overview screen.

> ⓘ Note
>
> You do not have to complete all steps in the *New Key Figure* task: only the first two steps are mandatory. This is indicated by an asterisk (*).
>
> You can create a key figure by entering a name, selecting a data source, defining a restriction or calculation, and clicking *Finish*.

5.2 Create Dynamic UI Labels for Restricted Key Figures

Configure a UI label for restricted key figures so that when you run a report, the system dynamically changes the column header to reflect the values that you have defined in the system. This is relevant for time-based labels. For example, if you run a report for the current year, the system shows the column label as the actual year, 2014 or 2015, instead of **current year**.

Procedure

1. Navigate to ▌▶ *Business Analytics* ❯ *Design Figures* ❯ and click *New*. The system opens a *New Key Figure* guided activity.
2. Under *Key Figure*, provide a **Name** and **Description**.
3. Under *Data Source*, select a **Name** from the dropdown list.
4. Under *Type*, choose *Restricted Key Figure*, and then select a key figure from the dropdown list.
5. Click *Next* to go to the *Restrict/Calculate Key Figure* activity.
6. Click *Add Row* and under *Characteristic*, select a value.

   > ⓘ Note
   >
   > You can select only a time-based characteristic.

7. Under *Restriction Type*, select *Fixed*.
8. To open a new dialog box click *Set Fixed Value Selection* and then click the *More* icon.
9. Choose the *Relative Select* radio button and select your desired relative value from the dropdown. Click *OK*.

   Example: If you choose, "Current year as YYYY", when you run a report, the system shows the column label as 2014 or 2015, whatever is the actual year, instead of "current year".
10. Click *Next* to move to *Properties*.
11. Under the heading *Key Figure Label*, select the *Variable Label* checkbox. The system displays the *Relative Select* field.
12. Select the label you require and click *Next*.
13. Review your details and click *Finish* to save your label.

5.3 Add Extension Fields as Key Figures

As an administrator, you can add an extension field as a key figure to data sources.

On the *Data Sources and Reports* tab of the *Further Usage* screen, you may not have any data sources or reports when you want to add an extension field as a key figure to data sources.

The system only allows you to add an extension field as a key figure to a data source and to corresponding reports when the aggregation of the key figure and data source match. The system thereby prevents incorrect results from being displayed in reports.

Adding extension fields as a characteristic or as a key figure is done in the same manner. The system automatically determines whether the added extension field is a characteristic or key figure while adding it to a data source.

The following example provides a scenario of why the system might not allow you to add key figures to every report.

> ⚙ Example
>
> The following example shows why the system does **not** allow you to add key figures to every report.
>
> While in adaptation mode, you add the *Freight Cost* field to the sales order. Freight costs are due for the entire sales order and not for individual sales order items.
>
> For Analytics usage, this extension field is a key figure since it displays an amount with a currency.
>
> You now want to add the key figure to a report.
>
> The first table shows what would be the expected result (1100 EUR).
>
> The second table shows what would be the actual result (3300 EUR).
>
> The reason why the actual result would be 3300 EUR is because the aggregation of the key figure and that of the report is different. Since you added the key figure to the sales order, it is aggregated on header level. The report is aggregated on item level.
>
> If the system were to allow you to add the key figure to the report, the system would aggregate the results for the *Freight Cost* key figure on item level. The result is that the key figure would be aggregated incorrectly.

Order ID	Freight Cost	Net Value
4711	1100 EUR	4800 EUR

Order ID	Sales Order Item	ID	Freight Cost	Net Value
4711	Training	10	1100 EUR	1200 EUR
	Boiler Installation	20	1100 EUR	1300 EUR
	Gas Boiler	30	1100 EUR	2300 EUR
	Result		3300 EUR	4800 EUR

Example of incorrect aggregation

5.4 Formulas

Using the formula editor, create calculated key figures derived from existing key figures, such as basic key figures, restricted key figures, and calculated key figures using the available operands, operators, and a numeric keypad.

Only numerical values are compared without taking units into account.

> ⓘ Note
>
> The system only checks the syntactic correctness of the formula. The system does not check whether the formula makes sense semantically.

5.4.1 Basic Functions

Learn about the basic functions.

Functions	Explanations
Add (+)	Calculates the sum of operand 1 and operand 2.
Subtract (-)	Subtracts operand 2 from operand 1.
Multiply (*)	Calculates the product of operand 1 and operand 2.
Divide (/)	Divides operand 1 by operand 2.
Power (^)	Returns the value of operand 1 raised to the power operand 2.
Percentage Deviation (%) also known as (%S)	Calculates the percentage deviation between operand 1 and operand 2. > ⓘ Note > > **Plan Sales % Actual Sales** shows the difference between the plan sales and the actual sales expressed as a percentage.
Percentage Share (%A)	Calculates the percentage share of operand 1 and operand 2. > ⓘ Note > > **Fixed Costs %A Costs** shows fixed costs as a percentage share of total costs.
Parentheses	Groups and sets the order of operators.
Comma	Denotes a series in a list.

5.4.2 Boolean Operators

A boolean value is one that can be either true or false. No other values are allowed.

For relational operators, such as *Greater Than*, the result is 1 if the relationship denoted by operator between operand 1 and operand 2 is true. Otherwise, the result is 0.

> ⓘ Note
>
> **Costs < Sales** returns 1 if sales are greater than costs, and returns 0 if costs are greater than or equal to sales.

Operators	Explanations
EQ	Equal To
GE	Greater Than or Equal To
GT	Greater Than
LE	Less Than or Equal To
LT	Less Than
NE	Not Equal To
AND	Logical AND The result is 1 if both operand 1 and operand 2 do not equal 0. Otherwise, the result is 0.
NOT	Logical NOT The result is 1 if the operand is 0. Otherwise, the result is 0.
OR	Logical OR The result is 1 if operand 1 or operand 2 does not equal 0. Otherwise, the result is 0.
XOR	Logical Exclusive OR The result is 1 if either operand 1 or operand 2 (but not both) does not equal 0. Otherwise, the result is 0.
LEAF	Values in Hierarchy The result is 0 for results rows or real (inner) nodes of a hierarchy, and the value 1 for elementary rows or the leaves of a hierarchy. This operator allows you to carry out various calculations on results rows and elementary rows.

5.4.3 Mathematical Functions

Functions	Explanations
ABS	Absolute Value
	Returns the value of the operand irrespective of its sign (+/-).
SIGN	Sign of Operand
	Returns the value of the operand along with its sign (+/-).
CEIL	Ceiling
	Returns the next smallest integer value that is greater than the operand.
DIV	Division
	Integer division operator: for example, 6 DIV 4 returns 1.
EXP	Exponential
	An operand is raised to a variable power.
FLOOR	Floor
	Returns the next greatest integer value that is less than the operand.
FRAC	Fraction
	Returns decimal part of the X.
LOG	Logarithm
	Returns the natural logarithm of X.
LOG10	Base 10 Logarithm
	Returns the logarithm to the base 10 of X .
MAX	Maximum
	Returns the greatest value in a range.
MAX0	Maximum of 0 and the Operand.
MIN	Minimum
	Returns the smallest value in a range.

Functions	Explanations
MOD	Remainder
	Integer remainder operator: for example, 6 MOD 4 returns 0.5.
SQRT	Square Root
	Returns the square root.
TRUNC	Truncate
	Returns the integer part of X.

5.4.4 Data Functions

Functions	Explanations
COUNTER	Count
	If operand equals 0, value equals 1. Otherwise, the result is 0
NDIV0	Divide by Zero
	Equals 0 when divided by 0. Otherwise, the result is the value of the operand.
NOERR	Zero If Error
	Equals 0 if the calculation of operand leads to an arithmetical error. Otherwise, the result is the value of the operand.
%CT	Percentage Share of Result
	Shows results as a percentage share of the overall result.
%GT	Percentage Share of Report Result
	Calculates a result similar to (%GT).
DATE	Value as Date
	Returns the integer value in date format.
DELTA	Delta
	Returns the value 1 if the expression is 0, else 0.

Functions	Explanations
NODIM	No Unit or Currency
	Returns numeric values of the operand and suppresses units and currencies.
SUMCT	Sum of Result
	Returns the result of the operands to all rows or columns.
SUMGT	Sum of Overall Result
	Returns the overall results of the operands.
SUMRT	Sum of Report Result
	Returns the report result of the operand.
TIME	Value As Time
	Returns the integer value in time format.
	The system cuts off the decimal places, interprets the value as seconds, and displays the value in the form +-hh:mm:ss. For example, 4812 is displayed as 1:20:12.

5.4.5 Trigonometric Functions

Learn about the trigonometric functions.

Functions	Explanations
ACOS	Arc Cosine
ASIN	Arc Sine
ATAN	Arc Tangent
COS	Cosine
COSH	Hyperbolic Cosine
SIN	Sine
SINH	Hyperbolic Sine
TAN	Tangent
TANH	Hyperbolic Tangent

5.5 Aggregation

To enable the calculation of key figures, the system has to aggregate key figure values from the data source, and formulas may also need to be calculated.

The system aggregates key figure values for multiple characteristics. The system can also aggregate key figure values for a specified characteristic; this is referred to as exception aggregation.

The system aggregates key figure values according to a specified order.

1. Standard aggregation is executed. Possible aggregation behaviors are summation, minimum, and maximum. Minimum and maximum can, for example, be used for date key figures.
2. Exception aggregation using a selected characteristic. Cases for exception aggregation include warehouse stock, for example, that cannot be totaled over time, or counters that count the number of characteristic values for a certain characteristic.
3. Aggregation using currencies and units is executed. The system outputs * when two numbers that are not equal to zero are aggregated with different currencies or units.

5.5.1 Exception Aggregation

As an administrator, you can define exception aggregation behavior for key figure values when you create a calculated key figure.

The deviation to the standard aggregation behavior is only valid in combination with a specified characteristic.

Value	Description
Average	The average of all values is displayed.
Average of Detailed Values That Are Not Zero, Null, or Error	The average of the column value not equal to zero is displayed in the results row.
Average Weighted with Calendar Days	The average of the column value weighted with the number of days is displayed in the results row
Average Weighted with Working Days	The average of the column value weighted with the number of workdays is displayed in the results row.
Counter for All Detailed Values	The number of existing values is displayed in the results row.
Counter for All Detailed Values That Are Not Zero, Null, or Error	The number of values <> zero is displayed in the results row.
Exception If More Than One Record Occurs	No aggregation
Exception If More Than One Value <> Occurs	No aggregation
Exception If More Than One Value Occurs	No aggregation

Value	Description
First Value	The first value in relation to the reference characteristic is displayed in the results row.
Last Value	The last value in relation to the reference characteristic is displayed in the results row.
Maximum	The maximum value of all values displayed in this column is displayed in the results row.
Minimum	The minimum value of all values displayed in this column is displayed in the results row.
No Aggregation Along Hierarchy	
No Aggregation of Posted Nodes Along Hierarchy	
Standard Deviation	The standard deviation of the displayed values is displayed in the results row.
Total	The sum of all values displayed in this column is displayed in the results row.
Variance	The variance of the displayed values is displayed in the results row.

The following table provides some examples of when you could use exception aggregation.

Use Case	How to Define		Result
You want to display, for example, the minimum, maximum, or average net value by product.	Key Figure:	Net Value	Minimum Net Value by Product
	Exception Aggregation:	Minimum	
	Characteristic:	Product	
You want to know how many customers you have.	Key Figure:	Count	Number of Customers
	Exception Aggregation:	Total	
	Characteristic:	Customer	

5.6 Cumulate

Use this function to cumulate the individual cells in an area.

The first value is added to the second value, and the result is added to the third value, and so on. In columns, cells are cumulated from top to bottom. In rows, cells are cumulated from left to right. With blocks of single

values, that is, a drilldown in both the rows and the columns, values are cumulated from top to bottom and from left to right.

5.7 Local Calculation

Recalculate single values and results of a report based on certain criteria. For example, you can create ranked lists, or you can calculate the total for a Top 10 product list locally.

Calculate Results and Single Values As

You use the following functions to recalculate results rows and single values.

Value	Description
Counting All Detailed Values	All values for a characteristic are counted and numbered.
Counting All Detailed Values That Are Not Zero, Null, or Error	Excluding the values that are equal to zero, all values for a characteristic are counted and numbered.
First Value	The highest value or the value furthest to the left of the corresponding area is displayed as the result. *
Hide	The result is not displayed.
Last Value	The lowest value or the value furthest to the right of the corresponding area is displayed as the result. *
Maximum	The largest value for the corresponding area is displayed as the result.
Minimum	The smallest value for the corresponding area is displayed as the result.
Moving Average	The system calculates the average of all values.
Moving Average For All Values That Are Not Zero, Null, or Error	Excluding the values that are equal to zero, the system calculates the average of all values.
Normalize According to Next Group Level Result	The data is displayed as a percentage of the result of the next group level. The values of the results row and the overall results row are not displayed as percentages but as absolute values. If there is only one characteristic in the drilldown, the result of a group level is the same as the overall result. **

Value	Description
Normalize According to Overall Result	The data is displayed as a percentage of the overall result. The values of the results row and the overall results row are not displayed as percentages but as absolute values.
	If there are multiple characteristics in the drilldown, there are different results, which are combined to form an overall result. **
Olympic Rank Number	The olympic ranked list differs from the basic ranked list as follows: In the olympic ranked list, when a value occurs more than once, the next smallest value is not assigned the rank incremented by one, but the rank that corresponds to the number of previous characteristic values (including the current value).
	For example, there are three products with a higher rank than product D, therefore D has rank 4 and rank 3 is not assigned since B and C have the same rank (2). **
Rank Number	The characteristic values are sorted according to the selected structure element and are given a ranking. The order of the ranked list is based on the size of the value for the structure element, where the largest value has rank 1 and the smallest value has the last rank.
	If a value occurs more than once, the corresponding characteristic values are assigned the same rank. In a basic ranked list, the next smallest value is assigned this rank incremented by one. **
Standard Deviation	Statistical deviation is a measure of the distribution of the values with respect to the mean value (average). Statistical deviation = root from the variance: SQRT (variance). *
Summation of Rounded Values	If you have set a scaling factor, it is useful to calculate the total sum of rounded values locally since the total sums can differ considerably (in particular with high scaling factors). *
Total	The sum total of the values for the corresponding area is displayed as the result. *
Variance	Variance is a measure of the distribution of the values with respect to the mean value (average). *

* Denotes the options that are valid only for **Calculate Results**.

- First Value
- Last Value
- Variance
- Standard Deviation

- Summation of Rounded Values
- Total

** Denotes the options that are valid only for **Single Values As**.

- Normalize According to Next Group Level Result
- Normalize According to Overall Result
- Olympic Rank Number
- Rank Number

5.8 Conversion

Define conversion for calculated key figures that you create.

To create a key figure, see Create and Edit a Key Figure [page 121].

5.8.1 Unit Conversion

Unit conversion allows you to convert the quantity unit of key figure values that represent a quantity to another unit.

You apply unit conversion when you define the key figure.

To do this follow the steps below:

1. Navigate to ▶ *Business Analytics* ❯ *Design Key Figure* ❯ and click *New*.
2. In the *Define Key Figure* tab, enter a name and description.
3. Select a Data Source.
4. Select the *Type* as *Calculated Key Figure* and click *Next*.
5. In the *Restrict/Calculated Key Figure* tab, enter a calculation and click *Next*.
6. In the *Properties* tab, select *Unit Conversion* as the conversion type. Select a *Target Unit* and click *Next*
7. Review your key figure and click *Finish*.
8. Add this new key figure to your report.

Any report that uses this calculated key figure will automatically add *Display Unit* for selection.

Example

You have a key figure, representing ordered stock quantities.

You require this function, for example, if you want to report on key figures, such as ordered stock that use quantities in units common to different countries or industries. By converting the quantity unit to a common unit, such as kilograms for weight, you can compare ordered stock.

5.8.2 Currency Conversion

Currency conversion allows you to convert the currency unit of key figure values.

You do not apply currency conversion when creating the calculated key figure but rather define that currency conversion can be applied to the key figure if the key figure is used in reports.

To do this follow the steps below:

1. Navigate to ▌▶ *Business Analytics* ❯ *Design Key Figure* ❭ and click *New*.
2. In the *Define Key Figure* tab, enter a name and description.
3. Select a Data Source.
4. Select the *Type* as *Calculated Key Figure* and click *Next*.
5. In the *Restrict/Calculated Key Figure* tab, enter a calculation and click *Next*.
6. In the *Properties* tab, select *Currency Conversion* as the conversion type and click *Next*.
7. Review your key figure and click *Finish*.
8. Add this new key figure to your report.

When you define the currency conversion for a key figure, the system creates variables that are available with reports in which the key figure is used.

The variables are as follows:

* *Display Currency*
  Depending on how the underlying data is defined, the variable may be defaulted to the company currency.
* *Display Currency - Conversion Date*

Example

For example, you want to report on key figures, such as net sales that balance in a different currency. By converting the currency unit to a common currency, such as the company currency, you can compare net sales.

6 Key Performance Indicators (KPIs)

Key performance indicators (KPIs) are selected key figures from reports that have been restricted using specified selections for which you can define reference and target values along with thresholds.

Companies often use KPIs to evaluate a certain measure of their performance toward a goal or target. In order to determine what constitutes an improvement, the KPI value is often evaluated against reference or a target value. Depending on business requirements, you may not necessarily require a reference or target value to evaluate the KPI.

Some examples of Sales KPI include: Monthly sales growth, Monthly customers per sales rep, Quarterly sales bookings, and Average conversion time.

6.1 Create and Edit a KPI

From the *Design KPIs* work center view, depending on whether you want to create, edit, or copy a key performance indicator (KPI), select the relevant option.

When you create a KPI, you set values and thresholds that are used to evaluate the status of the KPI and determine to what degree the strategic goal of the KPI has been fulfilled. The KPI that you create is only available in the language with which you logged on to the system.

Most reports can serve as a basis for the values used in a KPI. Exceptions are master data reports (reports without key figures) and reports in which the key figures are in a key figure grid.

To know more about the different tabs, see the following sections:

- General [page 138]
- Values and Thresholds [page 140]
- **Additional Contexts**: You can make additional context reports available when viewing the details of the KPI. You can also select multiple additional context reports for the KPI and view the details. You see the context reports according to your business role.
- **Drill Characteristics**: You can select the characteristics on which you want to define a headline.
- Rules [page 141]

6.1.1 General

Enter general information about the KPI and make display settings on the *General* tab page.

Information

You can enter a name, description, along with information about how the KPI is to be interpreted and about how it is calculated.

> ⓘ Note
>
> The description, interpretation, and calculation formula are displayed to business users when they view the details of the KPI and click the information icon.

Current Value

The current value is the basis for calculating the KPI and represents the key figure value to be improved. It is a key figure from a report that is restricted using a specified selection.

Steps

1. Select a report and then the relevant key figure.
2. Restrict the current value by choosing a selection.

When you select a report for the current value, under *Context Report*, the *Report* field is filled with the same report that you selected for the current value.

Value Setting

You can determine how the value is to be displayed.

- *Decimal Places*
  You use this dropdown list to specify the number of decimal places to be displayed, from 0 to 9.
- *Scale (Deprecated)*
  Use the dropdown list to set a scaling factor of 1 to ten billion (10,000,000,000). For example, if you set a scaling factor of 1,000, the value 3,000 is displayed as 3.

  > ⓘ Note
  >
  > This feature has been deprecated as of February 2017. By default, the *Scale* field is hidden. If you want to use it, you must personalize it.
  >
  > A new default number formatting has been introduced that makes scaling redundant. Scaling is no longer supported.

- *Sign Presentation*

  Use this function to specify how to display negative values that appear in your results.
- *Reverse Sign*

  By selecting the *Reverse Sign* checkbox for a specified key figure, the value is displayed accordingly.

  > ⓘ Note
  >
  > In some areas (for example, financial management), you may want to select whether the sign for a key figure should be reversed. For example, you have a report based on receipts and expenditure. According to accountancy logic, income is displayed with a negative sign and expenses are shown with positive sign. Adding these values produces the profit. Under certain circumstances, for example if income is to be displayed from a managerial point of view, it may be advisable to circumvent accountancy logic and display the report income with a positive sign.

- *Representation Type*

  The representation type determines how the KPI is represented on the mobile device.
  - Absolute

    The current value is displayed.
  - Delta

    Delta refers to the reference value.

    The result of the following calculation is displayed: current value - reference value.
  - Delta Relative

    Delta refers to the delta to the reference value.

    The result of the following calculation is displayed: (current value - reference value) / reference value x 100%.
- *Unit* and *Currency*

  If the KPI current value has a unit or currency, you can determine which unit or currency is used to visualize the KPI.

Context Report

You can determine which report view and selection is displayed when users open the details of the KPI. For example, you may want to select different report view or a different selection to compare the KPI to other key figures, values, or time ranges.

> ⓘ Note
>
> - For a Fiori client, a carousel is available to navigate between multiple reports.
> - On a touch device, when you scroll a table horizontally inside a carousel, the carousel moves to the next page.

Context Dashboard

You can determine which dashboard is displayed when users open the details of the KPI.

Example

You have the Net Order Volume KPI; the KPI current value is 10 million. Without a reference or target value, you may not necessarily know how to interpret this value. You may need a means of comparison, such as net order volume from last year or last month, or, a target value of 100 million, in order to evaluate this KPI value correctly.

Depending on your business requirements, you may not necessarily need to set a reference or target value. For example, if you define a KPI to monitor the liquidity of your company, you would want to keep the liquidity in a certain range.

6.1.2 Values and Thresholds

Determine how the KPI is to be interpreted on the *Values and Thresholds* tab page.

A KPI must have a current value and can have a reference value, target value, and thresholds, depending on business requirements.

> ⓘ Note
>
> Note that a KPI key figure value is the key figure value that is displayed when you start the corresponding report in a web browser in the solution and remove all characteristics from rows and columns; the resulting key figure value is the relevant value.

Values

Depending on your business requirements, you can set reference and target values for your KPI. Reference and target values are compared to the current KPI value.

- Current Value
  The current value is the basis for calculating the KPI and represents the key figure value to be improved. It is a key figure from a report that is restricted using a specified selection. You can select the value selection for variables in the selection as your business requirements state.
- Reference Value
  A reference value is a key figure value, which serves as a benchmark against which a change to the KPI current value can be interpreted as positive or negative.
  The reference value is used to determine the delta of the current value to the reference value. If you decide to set a reference value, you can get the value from a report or provide a fixed value.
  You must also specify to what degree deviation from the reference value is tolerated. The tolerance you specify determines how the change in the KPI current value is to be interpreted.
- Target Value
  The target value represents a goal to be reached and enables you to quantify an improvement of the current value.
  Target values are used to determine status; the relation of the target value to the current value determines the status.
  If you decide to set a target value, you can get the value from a report or provide a fixed value.

> ⓘ **Note**
>
> If your business requirements state that you compare values between two time periods, such as last year and current year, we recommend using relative selections when you set values for the variables in your selection. Relative selections are based on basic characteristics, such as Date, Week, Month, Fiscal Period, and Company. Examples of relative selections include Last Year, Last 7 Days, and Current Year to Date.

Thresholds

Thresholds are used to determine the status of the KPI value. There are three statuses: alert, warning, and on track, represented by the colors, red, yellow, and green. The status is used to visualize and monitor the KPI.

If you set a threshold, you have to determine the source of the threshold value along with what constitutes an improvement of the KPI. Note that you can determine what constitutes an improvement of a KPI independent of whether you set a threshold value source.

- *Direction of Improvement*
  The direction of improvement indicates in which direction a change to the KPI value can be interpreted as positive.
  - Maximize
    The KPI value should increase.
  - Minimize
    The KPI value should decrease.
  - Keep in Range
    The KPI value should stay within a specified value range.
    If you select *Keep In Range*, warning and alert points are available on both sides of the track point.
- *Value Source*
  Depending on what you choose as the direction of improvement, the alert and warning points change accordingly for the threshold.
  - Not Used
  - Fixed Value Is Provided
  - Value is Percentage of Target Value

    > ⓘ **Note**
    >
    > This entry is only available if you have set a target value.

6.1.3 Rules

Define the rules for creation of headlines

Rule types depend on the decomposition of a KPI along a drill characteristic. So, to be able to define rules, you must select at least one drill characteristic.

Rule ID

Create a Rule ID.

Drill Characteristic

Select a drill characteristic from the dropdown list.

Direction

Define which headlines do you want to display from the dropdown list.

- *Both*
  Shows headlines from top and bottom of all the headlines that are created based on the selections.
- *Bottom*
  Shows the headlines at bottom of all the headlines that are created based on the selections.
- *Top*
  Shows the headlines at top of all the headlines that are created based on the selections.

Priority

Define the order of priority of the headlines when they are displayed by the system.

Maximum

Determine how many headlines you want to display.

> ⓘ Note
>
> If you enter 5 in this field, and have selected *Both* in the *Direction* field, the system shows 5 headlines from top, and 5 headlines from bottom.

Contribution Base

Define the contribution base, based on which the values are calculated, and included in a headline.

- *Current Value*
  The headlines are created based on current values of the selected characteristic.

- *Delta between Current and Reference Value*
  The headlines are displayed based on the difference between the current and reference value.
- *Delta between Current and Target Value*
  The headlines are displayed based on the difference between the current and target value.

> ⚙ Example
>
> You have selected Country/Region as the characteristic to create headlines.
>
> | Country/Region | Current Value | Reference Value | Target Value |
> | --- | --- | --- | --- |
> | US | 2000 | 3000 | 12000 |
> | DE | 5000 | 10000 | 8000 |
> | FR | 1000 | 5000 | 15000 |
>
> Now, if you want to display 2 top values, as selected in fields *Direction* and *Maximum*, the following are the results:
>
> | Selected Contribution Base | Countries selected for creating headlines |
> | --- | --- |
> | Current Value | DE, US |
> | Delta between Current and Reference Value | DE, FR |
> | Delta between Current and Target Value | FR, US |

Threshold Type

Define the threshold value for displaying headlines. You can choose to select a fixed value or a percentage as the threshold type. If you do not want to define a threshold, select *No Threshold*.

> ⓘ Note
>
> If you have selected *Fix Value* as the threshold type, the percentage is not used to create headlines. Enter a value in the field *Fix Threshold*.

Fix Threshold

Define the value to be used as threshold to create headlines.

> ⓘ Note
>
> If you have selected *Percentage* as the threshold type, the fixed value you define is not used to create headlines. Enter a value in the field *Threshold Percentage*.

Headline Template Language

You can maintain headlines in multiple languages.

To do so, select a language from the available list, and create text in *Headline Template Text* area. You can create independent texts for each available language.

The users see the headline maintained in the language with which they have logged into the system. If no headline is maintained for their language, the system displays the headline maintained for English language.

In case there is no headline maintained for English, the user sees another existing headline template maintained in the system.

Headline Template Text

Once you have defined all the parameters, the system collects a set of available text variables and formatting tags based on the selections. You can use these variables and tags to define how you would like to display the headlines.

6.2 Configure a Headline KPI

Use dynamic headline capabilities with the option of monitoring a list of KPIs of your choice.

Context

You can set thresholds for these KPIs based on report dimensions such as country/region and product category. Based on the threshold set, the analytics framework calculates and displays the strongest deviations as headlines.

To configure a headline in KPI, follow these steps:

Procedure

1. Log on to the system as the administrator.
2. Go to ▌ *Business Analytics* ❯ *Design KPI* ▐.
3. Select a KPI which you would like to configure the headline for and click *Copy*. The system opens a new window.
4. Under *General*, enter all required information for the KPI based on the following parameters:

   - Name — name of the KPI
   - Description — text explaining the purpose of the KPI
   - KPI Category — displays work centers the KPI is assigned to
     Current value — determines the current value from the report. For example, sales revenue for the current quarter.
   - Value settings — allows you to configure the display settings for the value to be displayed
   - Context report — allows you to configure the displayed report when you open the KPI details

5. Next, go to *Values and Thresholds* to set the threshold which would be compared against the current value to predict trends. Set the threshold based on the following parameters:

   - Target value — defines the value to be compared with current value
   - Reference value — defines the value to define trends
   - Thresholds — defines limits set for measuring value

6. Go to *Drill Characteristics* to drill down into a report based on certain characteristics of a report. Click *Add Row* to add the technical name for the data source behind the current value report.

   > ⓘ Note
   >
   > This characteristic is used for exception reporting for the headline. It will alert you if the sales revenue in a specific region is deviating from the threshold.

7. Now go to *Rules* to create rules for generating a headline for a selected KPI. To add a rule, click *Add Row* and fill in information for the displayed columns to generate a headline for the KPI.

8. Once the headline is generated for a rule, you have the option of applying formatting tags which would be replaced with the actual values during runtime.

   > ⓘ Note
   >
   > Sales in **\<CharText\>** is excellent would be displayed as: "Sales in **US Region Midwest** is excellent".

6.3   Configure KPI on the Headline Tile in the Homepage

Configure KPI on the headline tile in the Homepage.

Procedure

1. Log on to the system as a an administrator and launch the *Homepage*.
2. Click on the gear icon to switch to the *Adapt* mode.
3. Next, select the role for which you would like to configure the headline.

   > ⓘ Note
   >
   > If you do not see the headline in the adaptation screen, then click *Edit*.

4. Choose *Score Cards* and add the headline score card to the role. To display this tile, choose *Publish*.
5. Hover over the headline tile and click on the gear icon. This will launch a list of KPIs that have been configured for your headlines. Click on *Show* to view a specific KPI.
6. On the headline tile, you can now see the reports if the data matches the KPI drill down definitions.
7. You will also see the navigation arrows at the bottom of the headline tile to navigate between reports. When you click on a report headline, the corresponding KPI details screen displays.

6.4   Preview KPIs

Preview how your KPI design looks when you select the KPI tile on the home page.

You can preview customer-created KPIs. To view the context report in one of the web browser options, select the KPI and click ▷ *Preview* 〉 *Web Browser* 〉. The system shows all the details of the KPI. You can also preview the results of the designed KPIs.

6.5   Define Life Cycle Status

Track the KPIs that you create.

The life cycle status of KPIs helps you track the KPIs you create. Note that the life cycle status of a KPI does not affect the visibility on the *Overview* work center view. When you set the status of a KPI to maintenance or obsolete, you can write a message that is displayed on the system. The maximum length of the message is 120 characters.

7   Broadcasts

Broadcasting reports and dashboards by e-mail enables business users to frequently analyze report data without necessarily having to log on to the system and navigate to the report.

You can access the *Broadcasts* work center view from the *Business Analytics* work center.

There are two scenarios:

Periodic Scheduling	Periodic scheduling is useful if you want to broadcast a report or dashboard on a regular basis.
	For example, a sales manager wants to send sales reports to his field sales representatives on a monthly basis. He informs his administrator to set up a schedule by which the report is broadcast each month.
Ad-Hoc Broadcasting	Ad-hoc broadcasting is useful if a specific report or dashboard requires the attention of multiple users.

> ⓘ Note
>
> Note that you can decide if report data sent by e-mail is to be encrypted. If you want to encrypt outgoing e-mails, you must make changes to your scoping. From the *E-mail Encryption and Signature Check* fine-tune activity, you can specify for the *Analytics - Send Report Data*, *Broadcasting* outgoing e-mail scenario whether outgoing e-mails are encrypted and whether they are signed.
>
> For more information, see the following documents: Load Certificates and Activate Signing and Encryption for E-Mails [page 13] and Configuration: E-Mail Encryption and Signature Check [page 12].

7.1   Create a Broadcast

Broadcast reports and dashboards by e-mail and create schedules for when you want them to be broadcast.

Procedure

1. From the *Broadcasts* work center view, click *New*.
2. On the following screen, enter a name for the broadcast and select the relevant report or dashboard.
3. Add recipients.

   > ⓘ Note
   >
   > **Broadcasting User Specific Data**

You can decide if the recipients are to receive data according to their authorizations. To do this, select the *User specific* checkbox. This field is visible only when the object type is a report, and the recepient is a Business User in the system.

Note that when the checkbox is unselected, the data is broadcast using the authorizations of the user who creates the broadcast. Ensure that the user has access rights to the work center views to which the report is assigned in order to start the report.

ⓘ Note

Using Broadcast Bursting

Bursting feature allows you to broadcast reports to multiple recipients by e-mail. If you have maintained the addresses of the recipients in the master data, you can select a characteristic in which the e-mail addresses are maintained. The system can determine the recipients from this information.

When you select the checkbox *Use Broadcast Bursting*, the section to add e-mail addresses of the recipients is hidden. For the new field *Attribute For Email*, select a characteristic, in which you have maintained the email address. Now, the report will be automatically sent to all the relevant recipients, without you having to add each individual e-mail addresses separately.

Unlike a normal broadcast, entire data is not sent to all recipients. The report data is filtered for each recipient based on their e-mail addresses, which is identified by the values of the attribute you select. This ensures that every recipient only receives the data filtered for their e-mail address.

If you wish to send the entire data to all the recipients, create a regular broadcast.

4. Under *Format and Content*, select if the report or the dashboard is to be broadcast as an attachment or as a link.

   - If you want to broadcast the report as an attachment, note that reports broadcast in XML and CSV format open by default using Microsoft Excel®. If you want to broadcast the dashboard as an attachment, note that dashboards broadcast only in HTML format.
   - If you want to broadcast the report as a URL, you must also specify how the report is to be viewed. Reports can viewed in one of the Web browser options or using Microsoft Excel®.
   - If the broadcast report is to be viewed on a mobile device, we recommend the HTML format.

   ⓘ Note

   Broadcast report is always sent as a table. Even if you broadcast a chart, the data will be converted to a table.

5. Decide if the report or dashboard is to be broadcast now or if it is to be broadcast periodically.

   - If you want to broadcast the report or dashborad ad-hoc, select *No Schedule*.
   - If you want to schedule the broadcast for the report or dashboard, select *Periodically*, and set how frequently the report is to be broadcast along with the start and end date for the schedule.

   ⓘ Note

   Example of a Broadcast Schedule:

   If you schedule the frequency of broacasat to execute once a month on the 31st day on weekday only, the broadcast is executed on the last weekday day of the month. If the month has 28 or 29

> or 30 days, the broadcast is execute on the last day instead of the 31st day. If the last day is a weekend, the broadcast is executed on the last Friday of that month.

The system saves the broadcast or schedule. You can then view the broadcast or schedule from the *Broadcasts* work center view.

7.2   Manage Broadcasts and Schedules

From the *Broadcasts* work center view, under *Actions*, you can edit, delete, or change the status of a schedule.

You can start, pause, or resume broadcasts and schedules.

You can also edit broadcasts and schedules by clicking *Edit*. In addition, you can click *View Logs* and check all the logs related to a selected broadcast.

8 Dashboards

Dashboards offer a visual representation of important information on one screen serving one or few tasks and providing interaction and UI navigation.

A dashboard emphasizes visual compared to textual representation. The meaning or the qualitative implications of graphics can often be captured more efficiently (for example, value comparison by column heights) and also transport more semantics (for example, alerts by colors). To achieve the desired effects, dashboards typically have to be designed thoroughly, including the choice of layout, chart types, and other controls.

Tips

- Visualize how your dashboard should look like. Define what types of charts you would like to use to represent your data. Determine how different reports in a dashboard are related and define connections accordingly. Once you have designed the Dashboard review existing reports and view. Create or modify view as per the design. You would also need to specify what selections will be used in the dashboard, e.g., if the dashboard is for the Current Quarter then you would need to specify this selection in your dashboard. Review and create selections accordingly.
- You can also use dashboards for KPI drill down. From a business case perspective, it often makes sense if the dashboard and KPI are based on the same data. For example, you use the same report as a basis for both.
- The Dashboard layout is a 3x3 matrix. We recommend that you use 2-3 reports in one row. If you use only one report the dashboard will contain a lot of white space. However for tables larger than 3 columns we recommend utilizing 1x2 space so that the table can be viewed properly. You can also view exceptions in the Dashboard. To do so select a report view where you have already defined exceptions.

Create Dashboards [page 151]
Create customized interactive dashboards that you publish to users.

Use Interactive Dashboards [page 153]
Interactive dashboards allow you to define connections, transfer filters between reports, and look at all the relevant business information in one place.

8.1 Create Dashboards

Create customized interactive dashboards that you publish to users.

Prerequisites

You are assigned to the *Design Dashboards* work center.

Create a Dashboard

Follow these steps to create a dashboard:

1. Navigate to ▌▶ *Business Analytics* ❯ *Design Dashboards* ▐ , and then click *New*.
   The system opens the *Dashboard Details* dialog box in Fiori Client in a separate window.

   > ⓘ Note
   >
   > You can also click *Copy* to copy an existing dashboard. You can then modify it and save as a new one.

2. Enter a name and optional description for your new dashboard.
3. Define who will be able to access the dashboard in *Authorization* field. To make the dashboard accessible to all the users, select *Public*. You can restrict the users who have access to this dashboard. This restriction is based on the business roles of the users. To do so, select *Custom*. You get a list of all the business roles for your company. Select all the business roles which should be able to access this dashboard.

   > ⓘ Note
   >
   > • You can assign a dashboard to a business role only if you have selected the option in the fine tuning activities for your solution. For more information, see Role Based Access [page 90].
   > • You cannot assign **standard dashboard**s to a business role. Any user who has access to reports available in a standard dashboard will be able to view it in the dashboard
   > • You can view details of business roles assigned to dashboards by creating a report based on the SAP pre-delivered ANABRASGNV data source.

4. Click *OK*.
5. Drag and drop report views to include in the dashboard. Use the search box to find a specific report. Choose *All* to show all available reports, and *Selected* to show only selected reports. You can select only 9 report views for a dashboard

   > ⓘ Note
   >
   > If you have selected *Custom* in the first step, you will only see reports that are assigned to the selected business roles.
   >
   > In case you have selected multiple business roles, the list will have an intersection of the reports. This means you will only see reports that are assigned to all of the selected business roles.

> If there are no common reports for the selected business roles, the list will be empty.

6. When you drag and drop a report on a tile, the system gives you a list of Selections to choose from. Click the one you need and click *OK*.
   You can change the layout for better visualization. Click the tile and drag to expand it, or swap two tiles to interchange positions. You also have an option to change the display name of the report tile. This is useful in scenarios where the same view is used with multiple selections.

Create Connections Between Reports

Follow these steps to create a connection between reports:

1. Click the **Define Connections** icon on the top right of your screen. The system displays the tiles in light orange shade to indicate that they are ready to be connected. Select a tile and drop it on the tile with which you want to create a connection. The system opens the *Manage Connections* dialog box where you choose source attributes and corresponding target attributes to define the mapping. Your target tile can also be the source tile for another connection. You can continue to make subsequent connections to other existing tiles or between any two or more tiles. If you select a tile that is connected to a source and a target, the system displays the source tile with the icon, the predecessor with the icon, and the target tile with the icon.

   > ⓘ Note
   >
   > We recommend that you do not create cyclic connections for dashboards (for example, report 1 connected to report 2 and vice versa). Such connections can give inconsistent results as they depend the way data is transferred from one report to another.

2. Drag a source attribute from the left column and drop it in the *Define Connections* column in the middle. Similarly drag a corresponding target attribute from the right column and drop it in the middle column. You can choose to create as many connections as you want. To delete a connection, click the trash icon next to it. To delete all connections, choose *Clear Connections* on the top right of your screen.

3. Click *OK*. The connections are defined. View the data flow by clicking on any tile. The system highlights the predecessor as well as the target tiles.

4. Optional: Click the preview icon to see how the dashboard will appear in the browser.

5. Click *Save and Close*.
   Once saved, your new dashboard is available to select from the menu on the *Dashboard* tab.

> ⓘ Note
>
> Right-to-left languages (Arabic script and the Hebrew alphabet are written from right to left) are not supported for Dashboard Design in Fiori Client.

Define Dashboard Filters

Define dashboard filters by mapping attributes from different report views.

To define a dashboard filter, follow these steps:

1. Click the pencil icon on a filter field to make it editable. The sytem shows an add filter<icon> on each report tile.
2. Click the icon to view the list of attributes in a popup. Select an attribute.
3. Click Ok.
   The filter name is suffixed with a number in brackets representing the count of the tiles to which the filter is applied.
4. Optional: By clicking the pencil icon on a filter field you can rename or remove an attribute in the filter.
   You can also set a tile as default for providing value help for this filter. During run time the system displays values from this tile as value help. Note that the filters display only master data values.
5. Optional:In the Translation field, you can manually enter a text in the text for your end users.

8.2 Use Interactive Dashboards

Interactive dashboards allow you to define connections, transfer filters between reports, and look at all the relevant business information in one place.

When you open the *Dashboard* workcenter, you can view the list of all the available dashboards on the landing page along with their description and origin type. You can search and sort the list by name and origin type. You can also use filters and save the list as a query.

8.2.1 Configure Charts

Control how the chart data appears on screen.

- Select a chart type from the Settings menu.
- Show or hide the chart legend. Find this option in the Settings menu on the browser, and choose the small icon at the upper left of the chart.
- Choose a data element on a chart and linked reports update to reflect your selection. For example, choose a specific bar in a bar chart, and linked reports on the dashboard update to show data from the selected element.

> ⓘ Note
>
> - You cannot personalize and save these visualization changes in the dashboard.
> - Only the following charts are available in the dashboard:
>   - Bar
>   - Pie
>   - Line

- Area
- Donut
- Column
- Stacked Column
- 100 Percent Stacked Column
- 100 Percent Stacked Bar
- Funnel
- If your report is used in the dashboard, it's good practice to avoid adding characteristics to columns, because this can lead to inaccurate results.
- Under *Table Settings*, if you select *First Row* in the *Show Result Row As* field, the chart visualization may be inconsistent.

8.2.2 Drill Down Data

Drill down data to view the information most relevant to you.

1. Open the drill down pane for a report by choosing the **Drill Down** icon .
2. Select the desired characteristics or key figures. The report updates immediately to reflect your changes.

> ⓘ Note
>
> Linked reports do not update when the drill down pane is open.

Choose the **Reset** icon to go back to the original state. This removes drill down characteristics and filters from all charts on the current dashboard.

Choose the **Refresh** icon to get the updated data in Dashboard.
If you choose a data element on a chart (by clicking in the browser or by selecting an area in the app), the filter is automatically transferred to the linked reports and they update to reflect your selection. For example, if you choose a bar showing data for Quarter 1 in a bar chart, all the linked reports will now show the data relevant for Quarter 1.

8.2.3 Add Annotations and E-Mail Dashboards

Add annotations and send an image of the annotated dashboard as an attachment via e-mail, if you are viewing the dashboard on the SAP Cloud for Customer.

Procedure

1. Choose *Annotation* from the Action menu.
2. Select a color for freehand markup, or select the note icon to enter a text note.
3. Draw your markup or enter text.
4. Choose *Send as E-Mail* from the Actions menu to send an image of the annotated dashboard as an attachment.
5. Choose *Cancel* to exit annotation mode.

8.2.4 Use Report Connections

Establish connections between reports while creating dashboards.

You can use these connections to pass filters between reports when you are interacting with the dashboard. To work with interactivity, select the relevant area of the chart which you want to pass as filter to connected reports. As soon as the area is selected all the related reports will get filtered. These filters become visible when you click the funnel icon next to the reports. The system also allows you to delete a filter from a report if required. For example, If you want to analyze your forecast details for a region, you can select a region from the first report which can further filter other reports to show you details for this region. One report can be connected to all the reports or else you can establish one by one connections. For example, Report 1 connected to report 2; report 2 connected to report 3; report 3 connected to report 4 and so on. This way multiple filters can be passed from one report to the other.

> ⓘ Note
>
> You cannot pass interactive filters from a table, funnel, or map view to a target tile. However, there are no restrictions for these views to receive any filter from the source tile.

8.2.5 Navigate through Dashboards

To analyze data further, navigate from a source to a target. You can navigate from one report to another or to an object directly from a report.

The following types of analytical navigation are available for dashboard.

- Report-to-report navigation: You can use report-to-report navigation to further analyze the details of a specific data point. The values of the target report will be filtered based on the selected data point of

the current report. For example, you can navigate from an aggregated annual data report to a report with monthly breakup for a specific year by clicking the corresponding data point.

- Report-to-object navigation: You can use this feature to navigate to an object directly from a report. For example, you can navigate to account details from account ID in a report.

> ⓘ Note
>
> To use this feature you must be in inspect mode.

9 Common Tasks

View the list of common tasks that you can perform in the *Business Analytics* work center.

9.1 Configure Business User Actions in a Report

As an administrator, you can configure what actions business users can perform while viewing data in reports.

Configure Actions

Prerequisite

In the *Business Configuration* workcenter, under ▌▶ *Built-in Services and Support* ❯ *System Management* ❯ *Analytics* ❯, you have checked the question, *Do you want to configure what actions end users can perform while viewing data in reports?*

Tasks

- **Hide actions for business users**: Navigate to ▌▶ *Business Analytics* ❯ *Common Task* ❯ *Configure Actions* ❯ to open the *Configure Action* screen. The system gives you a list of all the action that can be configured. Unless you hide any of these actions, no restriction is applied. Select the action, for example, download, and click *Hide* to set restrictions for a user. The system hides the download button for all users irrespective of their business roles.

- **Allow specific business roles to use actions**: If you want to unhide the actions for specific business roles, select the check box against each of those roles and click *Save and Close*. The users assigned to the selected business roles will be able to see and use the functionality. For example, if you have restricted the **Download** action, the system hides this button for all the users irrespective of their business roles. When

you allow the action to be available to specific business roles, the users assigned to these roles can use the download functionality.

> ⓘ Note
>
> - If you hide the *Add Fields* button, the system automatically restricts the users to add attribites also. Under the header *Business Roles*, you can allow specific business roles to add fields as well as add attributes. Select the checkbox under *Show* against a business role to enable the users of that role to add fields. If you want to allow the users to be able to add attributes also, you have to specifically select the checkbox under *Show Attributes*. Note that this checkbox is available only if the *Add Fields* action is allowed.
>   If you deselect it, the *Show Attributes* checkbox is automatically deselected.
> - If you hide the *Send* button, the system restricts all the available options except one. When business users open a report, they can still send it via email under ▶ *Send* 〉 *As E-mail Link (Web Browser)* 〉.

If you wish to revert the process, select the action and click *Show*.

Configure Settings

As an administrator, you can configure a setting so that values are repeated whenever a business user downloads the data. Once changed, this is applicable for all the users.

To do this, navigate to ▶ *Business Analytics* 〉 *Common Tasks* 〉 *Business User Configuration* 〉 *Configure Settings* 〉 and set the *Download Repeated Text in xlsx /Download Repeated Text in csv* toggle button to *Yes*.

> ⓘ Note
>
> This feature is not available for broadcasts.

9.2 Buffer Hierarchies

You can enable buffering to improve the performance of hierarchical based reporting. You can either schedule it periodically by specifying the frequency or opt for ad-hoc schedule to run it as required.

This function is useful, for example, if you've large hierarchies and extensive hierarchical reporting. On running this job, the system buffers the hierarchies and keeps the hierarchical data ready for quick reference during report processing and helps you improve the report processing performance.

Procedure

1. Go to ▶ *Business Analytics* 〉 *Common Tasks* 〉 and click on *Buffer Hierarchies* to open a new window. The system shows you a list of all the hierarchies for which buffering is supported.

2. Select a hierarchy, and click *Schedule Buffering*. Here you can enable the *Display Hierarchical Accounts Only* switch to display only those accounts that have a hierarchy. You've an option to schedule buffering in one of the following ways:

   - *Ad hoc*: This option allows you to buffer the hierarchy as and when required by manually clicking the *Start Now* button on the *Buffer Hierarchies* screen.
   - *Periodically*: This option enables you to specify the frequency at which you would like to buffer the hierarchy.

   > ⓘ Note
   >
   > *Display Hierarchical Accounts Only* switch is available for *Accounts* hierarchy only.

3. Select your option and click *Save and Close*. Based on the settings, the system runs the job periodically, or you can run it manually when required.
   In the *Buffer Hierarchies* screen, you can stop, start, or pause the buffering anytime you want.
   The *Execution Status* column shows you the last run status. If you want to see more details, refer to the *Last Run Logs* tab on your screen.

Special Handling for Account Hierarchy

- Displaying hierarchical information is possible for *Accounts* hierarchy only. You can view hierarchical accounts (top-level only) using the *Display Hierarchical Accounts Only* switch.
- This feature works with report data as well as hierarchy-enabled value help in the report.
- This feature works only if:
  - Accounts hierarchy is buffered with the *Hierarchy-Only* flag enabled.
  - Accounts characteristic is a part of the report and has hierarchy set to be displayed and in all other cases, all accounts are displayed in the reports.

9.3   Work with Relative Selections

Create relative selections for reports.

Relative selections are useful if you do not always want to change your selection values every time business users start a report.

There are two types of relative selections: SAP-delivered and admin-created, both of which are available from the value help of fields in the *Selection* area of reports under *Relative Select*.

- **SAP-delivered**:
  SAP-delivered relative selections are useful if you do not want to always change your filter or selection values every time business users start a report. The values are calculated and filtered according to specified criteria.
  Let's take the example of relative selection *Last Week*.
  It is calendar week 27; last week is therefore 26. If it were in calendar week 26, last week would be 25.
  In a report, for *Calendar Week*, a user chooses the relative selection *Last Week*, the system therefore filters data accordingly, depending on the current calendar week.

- **Admin-created**

  Admin-created relative selections are created by you and can be of two types:

  - **Absolute Values**: These are useful if you want to make a specific value or range of values available and want to be able to change them centrally. Let's take the example of the relative selection *Currency*. If there is a specific currency you use for reporting, you can create a relative selection for that currency. This can then be used by all users to convert amount values in reports to the desired currency. You can also change this currency by changing the value in the relative selection. The change will then automatically be reflected in all reports that use this relative selection.

  - **Dynamic Values**: These are custom relative selections that changes dynamically based on the current date. All date-type fields, such as date, month, quarter and so on are available to create dynamic relative selections. This functionality allows you to create relative selections such as *Year to the Last Day of Last Month*, *Year to Current Date for Previous Year*, *Current and Next 2 Months*, *Running 4 Months*, *3 Days Ago* and so on.

    > ⓘ **Note**
    >
    > To handle complex use cases, you can also include absolute values while creating dynamic relative selections. With this, it is possible to create relative selections such as **June of Previous Year**, **Week 30 of Current Year**, **All Days in the Past/Future**, **1-10 of Current Month** and so on.

> ⓘ **Note**
>
> Creation of relative selections for fiscal year reporting is not supported.

Design Relative Selections

1. Navigate to ▐▶ *Business Analytics* ❯ *Common Tasks* ❯ *Relative Selections* ❯ *Design Relative Selections* ❯ and click *New* to create one of the following:

   - *Absolute Values*
     1. Enter a name and description for the relative selection.
     2. Select an appropriate type.
        The type determines in which basic time characteristic the relative selection is available.

        > ⓘ **Note**
        >
        > The relative selection is available in all data sources in which the time characteristic or currency variable is available.
        >
        > If you select *Data Source* as type, you make the relative selection only available with data sources that you specify.
        >
        > Under *Data Sources*, the first data source you choose is the primary data source. If you choose to add the relative selection to further data sources, the data type of the characteristics in the further data sources must match that of the primary data source.
        >
        > The characteristic of primary data source also determines the values that are available for the relative selection.

     3. Select a value entry.

The value entry type determines how the user can make the value selections.

4. Under *Absolute Values*, select the relevant value entries to make available to business users.

- *Dynamic Values*

  1. Enter a name and description for the relative selection.
  2. Select an appropriate data type.
     The type determines in which basic time characteristic the relative selection is available.
  3. Select a value entry.
     The value entry type determines how the user can make the value selections.
  4. Under *Dynamic Values*, click *Add* to open a pop-up window and select the relevant dynamic value entries to make available to business users. The basic idea when selecting these dynamic values is to replicate the name/description of the relative selection. These values are made of the following components:

     - *From*: Specifies the start value of a range. If the relative selection is a *Single Value*, you can select only this column.

     - *Shift By*: This column is useful for two purposes. You can use it to shift current, previous, or next values entered in the *From* column to another period. For example, Current Day in Previous Year. Here, Current Day is defined under *From*, and Previous Year is defined in *Shift By*. The second use would be to qualify values such as like first/last, which have been entered in *From*. For example, First Day of Current Year. Here, First Day will be defined under From, and Current Year will be defined in Shift By.

     - *To*: Specifies the end value of a range. The values defined here are similar to those in the *From* column.

     - *Shift By*: Specifies the shift by values in relation to the *To* column.
       The values defined here are similar to those in the second point.

       > ⓘ Note
       >
       > - Values under *From* and *To* consists of three parts: The first part has the following options: First, Last, Previous, Next, and Current. The second part is a number, which you can leave left blank, or always define as > 0. The third part has the following options: Date, Week, Month, Quarter, and Year. Using these parts, you can define values such as Current Year, Next 3 Days and so on.
       >
       > - *Previous* is different from *Last*. *Previous* is used here as an antonym of *Next*, while *Last* is used as an antonym of *First*. Previous means something in the past, while last means the last of a period. For example, if we're in June, Previous Month would mean April, while Last Month would mean December of the last year.
       >
       > - While you can select values such as previous, next, or current in the *From* and *To* columns, in the *Shift By* column you must enter the value as a number. For example, define current Year as 0 Year, Previous Year is defined as -1 Year, and Next Year is defined as 1 Year.
       >
       > - To use absolute values while creating dynamic relative selections, you can set the *Use Absolute Values* toggle button to *Yes* in both the *From* and *To* sections. You can then select the absolute value type, and enter any combination of Day/Week/Month/Quarter/Year as desired.
       >
       > - *Shift By* works in the same manner for absolute values in dynamic relative selections as for dynamic values.
       >
       > The following examples, for the relative selection *Date*, illustrate how you can enter dynamic values.

You can create similar relative selections for other types such as *Month*, *Quarter* and so on.

Relative Select	Value Entry	Derived Value as on 15.11.2019	From Absolute Value	From Value			Shift By		To Absolute Value	To Value			Shift By	
Last 2 Quarters	Interval	01.04.2019...30.09.2019	No	Previous	2	Quarter								
Next 18 Days	Interval	15.11.2019...03.12.2019	No	Current		Day			No	Next	18	Day		
Last Year to Current Day in Last Year	Interval	01.01.2018...15.11.2018	No	First		Day	-1	Year	No	Current		Day	-1	Year
Current Month and Next Month	Interval	01.11.2019...31.12.2019	No	Current		Month			No	Next		Month		
Running 4 Months	Interval	01.11.2019...29.02.2020	No	Current		Month			No	Next	3	Month		
3 Days Ago	Single Value	12.11.2019	No	Previous	3	Day								
Current Year	Interval	01.01.2019...31.12.2019	No	Current		Year								
Next 3 Weeks	Interval	18.11.2019...08.12.2019	No	Next	3	Week								
Last 3 Years	Interval	01.01.2017...31.12.2019	No	Previous	3	Year								
Last 3 Years from Today	Interval	16.11.2017...15.11.2019	No	Current		Day	-3	Year	No	Current		Day		
Current Month to Go	Interval	15.11.2019...30.11.2019	No	Current		Day			No	Last		Day	0	Month
		01.11.2018...30.11.2018	No	Current		Month	-1	Year						
Current Month of Last Year vs Current Month	Multiple Values	01.11.2019...30.11.2019	No	Current		Month								
Year to Last Day of Last Month	Interval	01.01.2019...31.10.2019	No	Current		Year			No	Previous		Month		
Date Less Than of Equal to Today	Interval	01.01.1900...15.11.2019	Yes	01	January	1900			No	Current		Day		
Today and All Days in the Future	Interval	15.11.2019...31.12.9999	No	Current		Day			Yes	31	December	9999		
Last Day of First Quarter in Current Year	Single Value	31.03.2019	Yes	31	March									
Next Year - May	Interval	01.05.2020...31.05.2020	Yes		May		1	Year						
1st - 15th of Current Month	Interval	01.11.2019...15.11.2019	No	First		Day	0	Month	Yes	15			0	Month
Previous Year - Quarter 2	Interval	01.04.2018...30.06.2018	Yes		Quarter 2		-1	Year						

     5. Optional: Click *Calculate Derived Value* to preview the result.

     6. Click *OK*.

2. Click *Save and Close*.

Configure Relative Selections

To hide any relative selection, navigate to ▶ *Business Analytics* ▶ *Common Tasks* ▶ *Relative Selections* ▶ *Configure Relative Selections* ▮ and deselect the *Show* checkbox against it. Note that once hidden, it will not be visible to business users irrespective of their roles.

Tips and Tricks

You want to add a relative selection to a specific report.

In the *Selection* area of a report, you have a specific field for which you want to create a relative selection.

1. Note the data source that serves as a basis for the report.
2. Decide if you want to add the relative selection only to the data source or if you want the relative selection to be added to all applicable data sources.
3. Once you've created the relative selection, go to the report and start it. From *Add Fields*, select the corresponding characteristic and click *Display in Selection Area*. The field is added to the *Selection* area.
4. Open the value selection help of the field. Click *Relative Select*. Your relative selection is available from the *Select* dropdown list box.

You want to find out if your relative selection might be available in a specific data source

1. From the *Design Data Sources* work center view, check the documentation of the specific data source.
2. In the documentation, check whether one or more characteristics with an appropriate data type are available.
3. Start a report that uses the data source.
   If you do not know of a report, you can find a report from the *Design Reports* work center view. You can see the name of the underlying data source in the *Data Source* column.
4. From *Add Fields*, select the corresponding characteristic and click *Display in Selection Area*.
   The field is added to the *Selection* area.

5. Open the value selection help of the field. Click *Relative Select*. Your relative selection is available from the *Select* dropdown list box.

9.4 Restrict Edit Rights to analytical objects based on an Org Unit or Business Role

You can restrict edit rights by assigning analytical objects such as, reports, key figures, data sources, KPIs, and relative selections, to one or more Org Units/Business Roles. To do this, follow the steps below:

1. In the *Business Analytics* workcenter view, navigate to a relevant view, such as, *Design Report*, *Data Sources*, *Design KPIs*, *Design Key Figures*, *Broadcasts*, select the analytical object and click *Set Access* to open a new window.
2. Under the *Allow Access* field, select the checkbox against one or more Org Units/Business Roles to assign editing rights to all administrators of those org units. Alternately, click *Locate* to find the org unit level that you require.
   If you want to provide access to a selected org unit and its immediate subordinates, click *Grant Access*. To remove access of a selected org unit and its immediate subordinates, click *Remove Access*.
3. Click *Save* to save your changes.

> ⓘ Note
>
> - This functionality only restricts the edit rights for administrators. It does not restrict end user functionalities such as, viewing reports, creating new views, or editing existing views.
> - If you want to restrict edit rights to analytical objects in an Org Unit/Business Role, you must make changes to your scoping. Go to ▌► *Business Implementation* ❯ *Edit Project Scope* ❯ *Questions* ❯ *Built-in Support* ❯ *System Management* ❯ *Analytics* ▌ and select the checkbox for *Enable Global and Local Administrator for Analytics?*
> - You cannot restrict edit rights for Excel-based reports that are based on an org unit.
> - Once a report is restricted you cannot create new views unless you have edit rights.

9.5 Translate Analytical Report Texts

In the Language Adaptation tool, you can translate analytical report texts.

You can translate the following analytical objects:

- Reports
- Dashboards
- KPI
- Data Sources
- Report-to-Report Navigation (RRN)

To do this, follow the steps below:

1. Go to ▌▶ *Administrator* ❯ *Language Adaptations* ◗.
2. From the *Language Adaptations* view click *New* to create a translation or adaptation.
3. From the *New Language Adaptation* screen complete the following fields:
   - ID
   - Name
   - Select a language from the Source Language drop-down list.
   - Select a language from the Target Language drop-down list.
4. Click *Save* or *Save and Open*.
5. For all report texts, select the workcenter to which the report is assigned to. For KPI, Dashboard, and RRN select the *Business Analytics* work center.
6. Under *Text Pool Selection*, select the *Get Analytical Report Texts* checkbox.
7. Click *Collect Texts*. The system fills the *Target Text* column with the existing texts as delivered by or any overrides you (or other administrators in your solution) may have made.
8. Define your required texts in the *Target Text* field under the *Report Texts* tab.

> ⓘ Note
>
> - Fields are only translated on a report level, not in data sources. In a data source, you can only translate the header, not the characteristics and key figures.
> - For KPIs, you can only translate the header. The remaining information is translated while translating the context reports.
> - For dashboards, you can only translate the header, global filters, and custom tile titles. The remaining information is translated while translating the context reports.
> - When you rename a report, it does not impact the translation via language adaptation.
> - If you copy analytical content and change it afterwards it may not be translated correctly as they may have the same key as the original.
> - Master data reference fields (i.e. fields that were added via Add Fields > drill down into an object) are not translated by default. They are only translated if there is a report on the data source from which the master reference fields are taken, and if that report is also collected and translated.
> - The parent node (i.e. the label in brackets) cannot be translated, if this field was renamed in the report wizard.
> - If you rename a field in the report wizard and then translate this field via the language adaptation, the translation currently does not apply to the column label in the value help, when you add this field to the selection.

10 Home Page

See relevant information and activities, and plan your day with the home page. And get a high-level visual overview of your sales data.
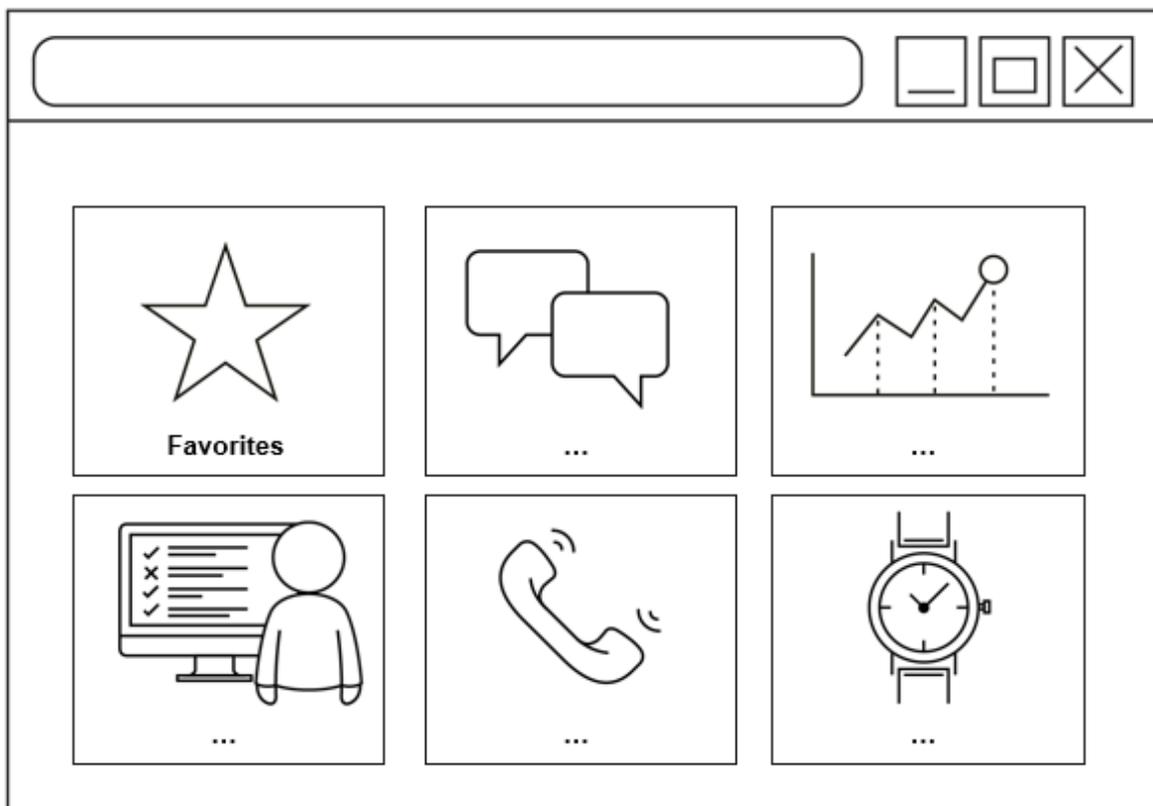
Home page displays preconfigured business cards based on your business role. You can click a card to see its details. For example, you can click *Today's Activities* to see the details of your schedule and activities for today. You can work with the different cards types, view report details, and also personalize the cards you want to see on the Home page.

The news section on the home page helps you prepare for appointments and phone calls, by displaying stories about the accounts related to your scheduled activities. The Feeds card shows the feed updates. Use the dashboard cards to drill down and view details and increase your visibility into transactional data, KPIs, and reports. You can also do mark ups, add notes, and send e-mails right from the home page.

Home page content is cached to improve the sign-in experience. Content caching loads the home page cards faster and retrieves the home page content efficiently, keeping the user experience interactive. You can access the home page cards with no updates immediately and don't have to wait for the home page to load completely before using it. A visual transition shows the information being updated in the background. You can see the cached information in gray. he cached data is shown immediately and any updates to the home page cards automatically occurs in the background. You can see the previous information while the system updates the cards with latest information. This transition takes no more than 5 to 10 seconds.

> ⓘ Note
>
> Content caching is only available on sign-in.

10.1 Scope and Configure the Home Page

Administrators can configure and adapt the home page for each user and business role.

When you log on as the administrator and go to the home page to manage the make changes, you have two options- *Adapt* and *Personalize*. With *Adapt*, you first choose the user role and then make changes for that user role. *Personalize* allows you to make individual changes that you want for yourself and are also available for every user to personalize their home page.

Log on as the administrator and go to the home page.

Select the pencil icon and then Adapt.

> → Remember
>
> - Adapt feature isn't available in smartphones and in offline mode.
> - Card navigation in offline is limited to *Today's Activities*, *Visits*, and *Custom report Floorplan* cards in browser and tablet.
> - For an optimal performance experience, you get a warning message when you exceed the recommended number of KPI and Report cards on the home page. The recommended maximum number of KPI cards supported is 10 and the maximum number of Report-based cards (Custom pattern cards like Bar Chart cards) supported is 4. You have the option to add additional cards, but it impacts the performance.
> - There's no limit on recommended number of List cards, Tool cards, and Custom cards.
> - Scorecard tab while selecting cards isn't available.
> - Using *Search*, you can find a report but you can't open that report.

10.1.1 Select User Role

The administrator can define the home page for each role.

Context

If the administrator does not define a home page for a role, the default home page layout is maintained. To select a role and start defining the home page for all users with that role, do the following:

Procedure

1. Log on as the administrator and go to the home page.
2. Select the pencil icon and then *Adapt*.
3. The list of roles that appears are the business roles that you created when you set up your system.
4. Select a role whose home page you want to define and select *Go*.

10.1.2 Define Home Page Settings

The administrator can access home page setting as a gear icon on the home page.

As an administrator, under home page settings you can enable the users or roles to group cards on their home page. To do so, check the checkbox *Show cards in Groups* under settings. You can also change the home page to show as the default start page when the user logs in. To do so, you can uncheck the checkbox *Set Home page as the Start Page* under settings.

10.1.3 Define Cards for a User Role

The administrator can define the cards for each role under adapt mode.

Procedure

1. In adapt mode, select a role and the different card types (KPI, custom, report, filter, and tools card) for the user role.
2. To add cards, click, or tap the+ icon, located at the end of each card. As the administrator you have two options for adding different cards-
   1. **Add Existing card**: Select the different cards you want for the user or business role from the catalog.

2. **Create Custom card**: You can create the following type of custom cards:

- **URL card**: You can launch any URL directly from the URL card. The URL opens in a new tab.

- **Floorplan card**: With floorplan card option, you can create a card that launches any screen for a work center or detail view in the solution that the user wants. Custom card also includes custom screens the user has defined.

- **Ticket Creation card**: With the ticket creation card, you can create a new service ticket. Clicking the card launches a guided activity floorplan (GAF). Once you've created the ticket, you can view it under ▏▶ *Service* ❯ *Tickets* ❯ ▏ worklist.

- **URL Mashup card**: With the URL mashup card, you can open URL mashups from the home page. While configuring the card, you can choose the mashup to configure from the mashup value help.

- **HTML Mashup card**: With the HTML mashup card, you can open HTML mashups from the home page. While configuring the card, you can choose the mashup to configure from the mashup value help.

- **Message card**: The message card can be used by the administrator to publish messages for business users. As a part of the configuration, the administrator can set the message title, message description, informational icon text, and the background color of the message card.
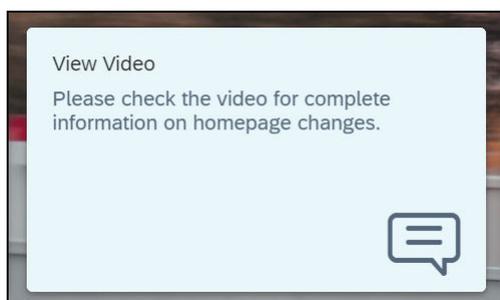
- **Video card**: Video card can be used by the administrator to configure video links for the users. When you click the video link, it launches in a separate window. As a part of the configuration, the administrator can set the title, description, and time frame for the video card.

> ⓘ **Note**
>
> Videos aren't stored as part of SAP Sales & Service cloud.
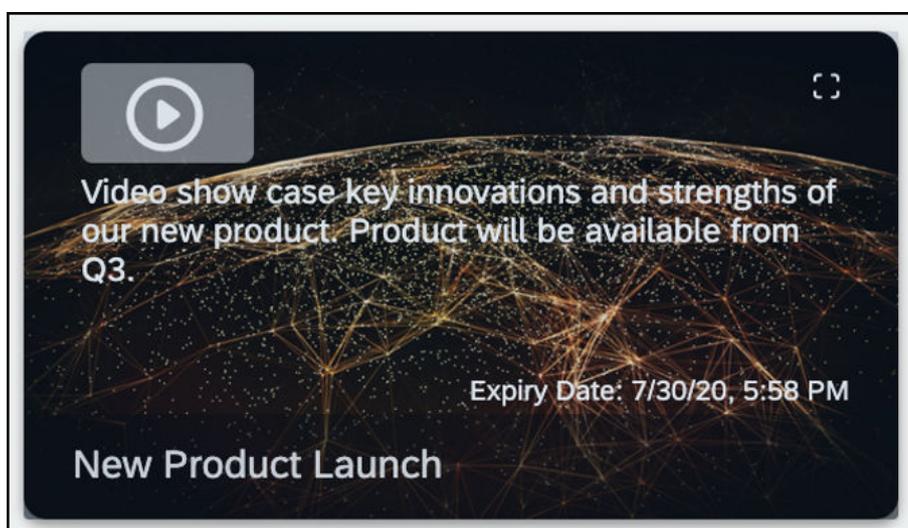
- **Kanban Card**: You can configure Kanban card on the home page via adaptation. As a part of the configuration, the administrator can create a Kanban card for an object. Based on the object selection, the following information can be added sequentially -
  - Data set query.
  - Attribute (used for grouping on Kanban board and is restricted to attributes with only code list).
  - Visualization (Detailed or Vertical view in expanded or collapsed mode).
  - Value (You can add values and set color for each value.)
  - Display field and set the order in which the display fields should show.

The Kanban card helps teams manage and prioritize workflows effectively. Your administrator can create new Kanban cards as part of creating new custom card.

> ⓘ **Note**
>
> Kanban board visualization supports 2 columns, 3 columns, 4 Columns & 5 Columns.

The Kanban card layout on the home page is available only on the desktop. When you click the title, you navigate to the ticket list view for the query. When you click a subheading, you navigate to the list view for the subheading query. For example, if you click Customer Action, you navigate to the list view for the query Customer Action. When you click an object under the subheading, you navigate to the object's detail view. You can view the Kanban card in collapsed and expanded mode.
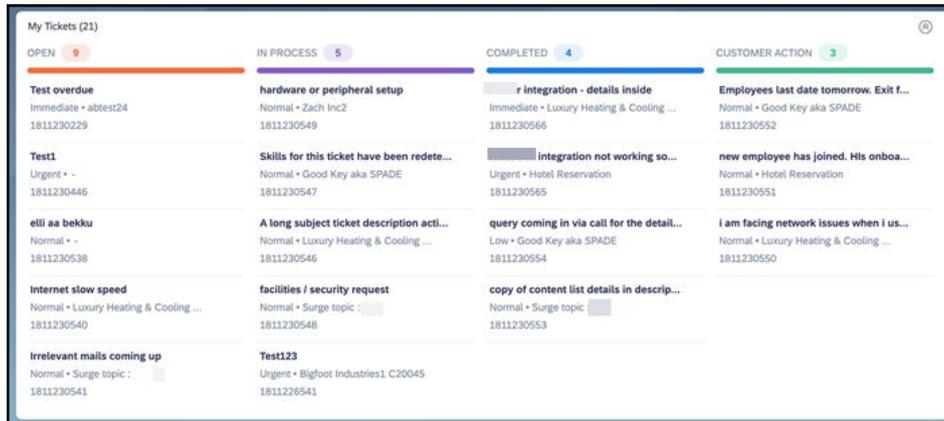
> ⓘ **Note**
>
> - Kanban board can be created only on editable data set queries.
> - You can't edit and delete a Kanban card.

As a prerequisite, the administrator must create the Kanban custom card via adaptation on the home page and publish to make the Kanban card available for the users.

> ⓘ **Note**
>
> URL Mashup and HTML Mashup custom cards are only available in Fiori client.

Do the following steps to create a custom card:

- Choose the custom card you want to create.
- Add the required fields and click *Save*. Custom card created is stored in the card Catalog.

3. If you want the changes, select *Publish,* and if you don't like the changes you made, select *Revert*.
4. To go back, select *Leave Adaptation Mode.*

10.1.4 Define Settings for Each Card

As an administrator, learn how to define the setting for each card.

When you are in adapt mode, you can change the appearance of a card by selecting it. You can set the following attributes for a card:

- card Visualization
- Available
- Visible
- Specify a group for the card, if grouping is available for the role.

Then, save the changes.

10.1.5 Configure News Card

As an administrator, learn how to configure the News card.

Context

Configure the news card by either selecting the news source or by selecting the url for RSS feeds to show up on the user's news card.

The Google News API is deprecated and gives errors on the current news card. See the **Related Links** for more information. Therefore, the administrator can set up Bing News for all users and roles as the news card. You can buy Bing News APIs and enable it in the solution. See the **Related Links** for more information.

> ⓘ Note
>
> Bing News has different markets based on country/region and language. Right now, in the solution the market is preset only to US English for Bing news. This means that the business news is in English and from US.

Depending on what is the user's current news source, there are two use cases to change the news card to Bing News-

- If the user currently has Google news set up for the news card.
- If the user currently has URL for RSS Feeds selected for the news card.

> ⓘ Note
>
> If you opted for Bing news or opted for RSS feed or already on RSS feed as new source, switching back to Google news isn't possible.

Follow the steps to set Bing News as the news source:

Procedure

1. On the home page, select the edit icon at the bottom-right corner.
2. From the pop-up select *Adapt*.
3. Select the user role.
4. Select the news card.
5. Select the link *Switch to Bing New* under *Select News Source* if Google news is set up as the news card. Select API Key for Bing News if URL for RSS Feeds is set up as the news card.
6. Enter the API key and *Save*.

   - If the news source is Bing News, no news is shown on the news card in offline mode.
   - Bing news V7 is supported.

Related Information

[Build anything with Google](#) ↗
[Microsoft Azure Cognitive Services](#) ↗

10.2   Work with Card Types

You have five different card types (KPI, Report, Tools, Filter, and Custom card) available in the solution.

> ⓘ Note
>
> Table view isn't supported on the home page.

Based on the KPIs defined by your administrator, you can launch an interactive dashboard or KPI overview. KPI cards provide a snapshot of the key metrics. You can select the KPI card, to view additional details.

A report card displays a graphical representation of a report.

Tools card is available online and enhances your daily productivity.

Filter card is a place where you can keep your custom queries as a list item to be run by the user on the home page.

You can choose to create personalized cards to launch information from the home page.

10.2.1   KPI Card

Based on the KPIs defined by your administrator, you can launch an interactive dashboard or KPI overview. KPI cards provide a snapshot of the key metrics. You can select the KPI card, to view additional details.

The system uses this pattern for KPI views with a threshold value defined. The following KPI cards are supported:

- **Gauge Pattern**
  The system uses this pattern for KPI views with a threshold value defined.
  In Fiori Client, gauge helps extract complex information and gives a graphical view of how you're doing towards a goal. It shows KPI views with a threshold value defined and requires either target or threshold or both to be maintained. It requires at least one of the two (Target or Threshold) to be maintained. Odometer shouldn't be used as a pattern for minimize.
  There are three options here:

1. When the target and thresholds are maintained-
   1. When the current value is less than target value, the odometer split into three sections. Red section indicates alert, yellow section indicates warning, and the green section indicates on track or better.
   2. When the current value is greater than target value, the odometer displays shades of green, indicating on track and exceeded by how much.
2. When the target is maintained but threshold isn't maintained-
   1. When the current value is less than target value, the odometer is split into two sections. Yellow section indicating warning and the green section indicating on track or better. The current value is displayed in the shade of yellow or neutral color.
   2. When the current value is greater than target value, the odometer is split into yellow and green sections. The current value is displayed in green.
3. When the threshold is maintained but the target isn't maintained-
   1. Odometer is split into three equal sections with red, yellow, and green color. The value is displayed in a shade of the color where the current value falls.
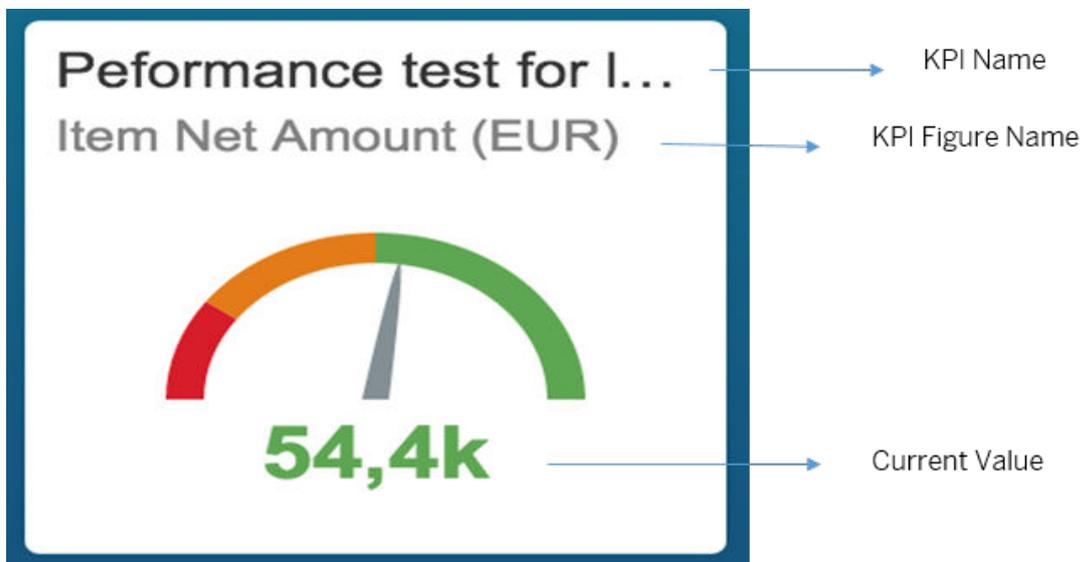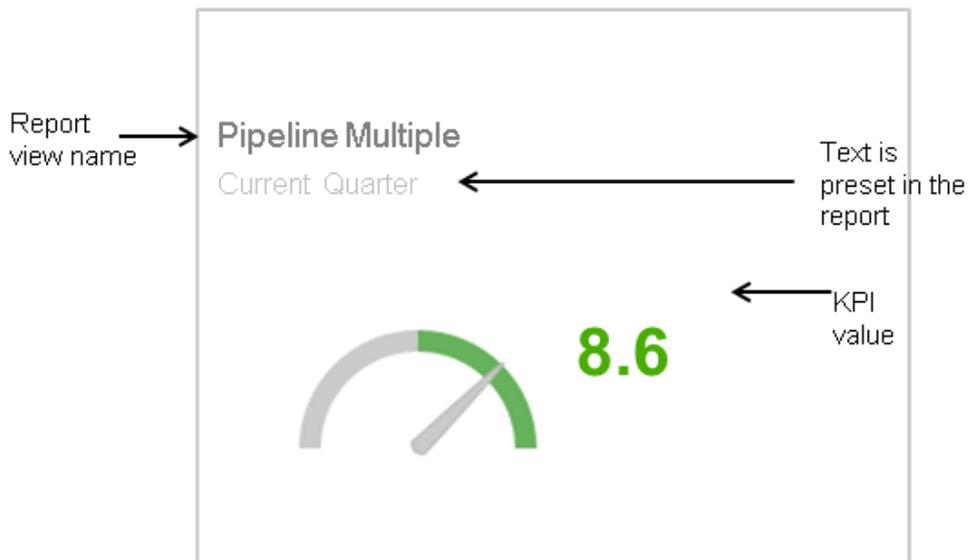
card appearance for gauge report pattern.

- **Progress Bar Pattern**

  This pattern is valid for KPIs and requires the target to be maintained. Only one color is displayed depending on what the current value is and whether the threshold has been maintained or not.

  In Fiori client, there are two options-

  - No threshold maintained: When the current value is greater than target, you see that the color of the progress bar is green.

  - Threshold maintained: Depending on the current value vs target value, there can be a maximum, minimum and in range value showing the progress bar in green, yellow, or red color.
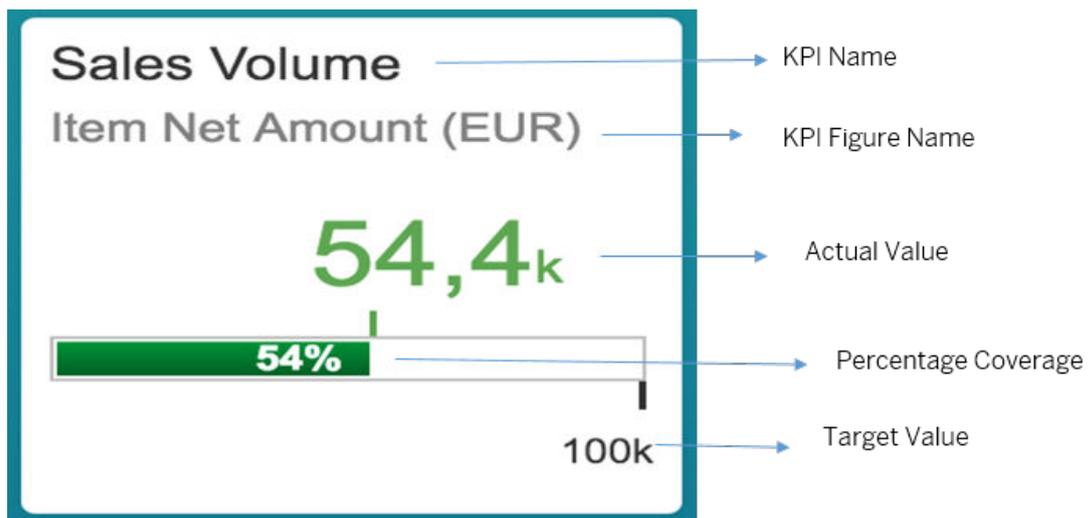
Card Appearance for Progress bar Report Pattern
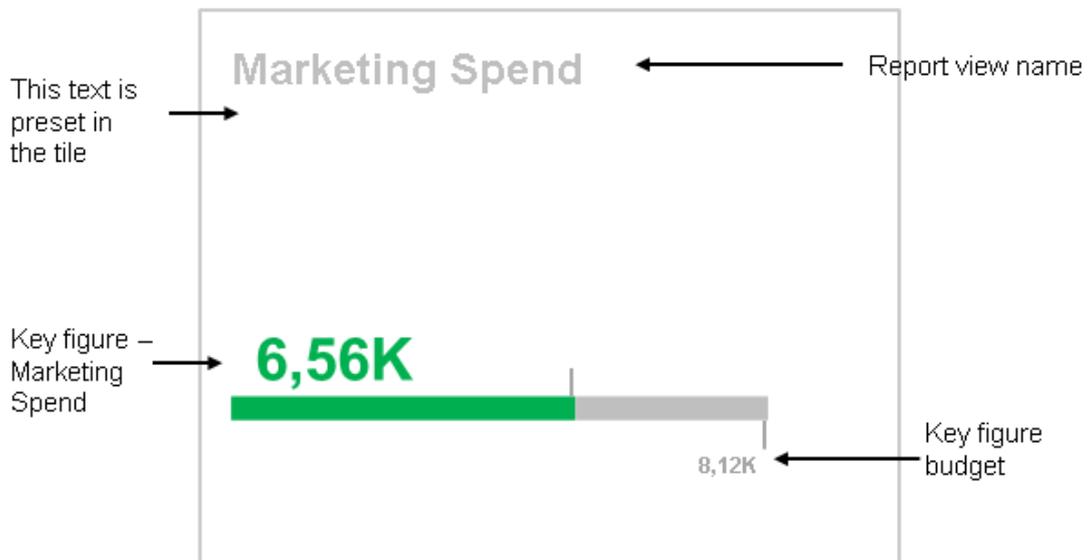
Card Appearance for Progress bar Report Pattern A
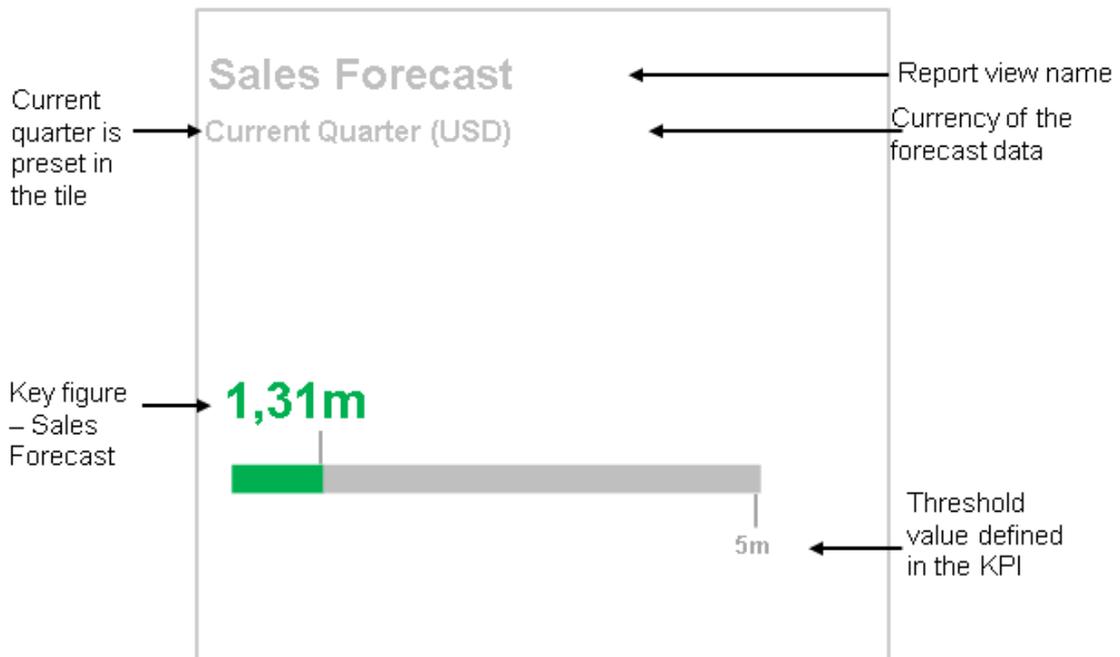
Card Appearance for Progress bar Report Pattern B

- **Percentage Coverage Pattern**

  This pattern is applicable for reports and KPIs, where KPI requires the target to be maintained and report should have two key figures.

  In Fiori client, in this card pattern you can see, the percentage deviation that is, how much percentage above or below target.

- In a maximize scenario, when the current value is greater than target, you see the complete circle in light green indicating that the current value exceeds target. The dark green color indicates by how much percentage it exceeds.
- When the current value is lesser than the target value, you see the percentage for the current value in neutral color or based on defined thresholds.
- In the minimum scenario, the color pattern is reversed.
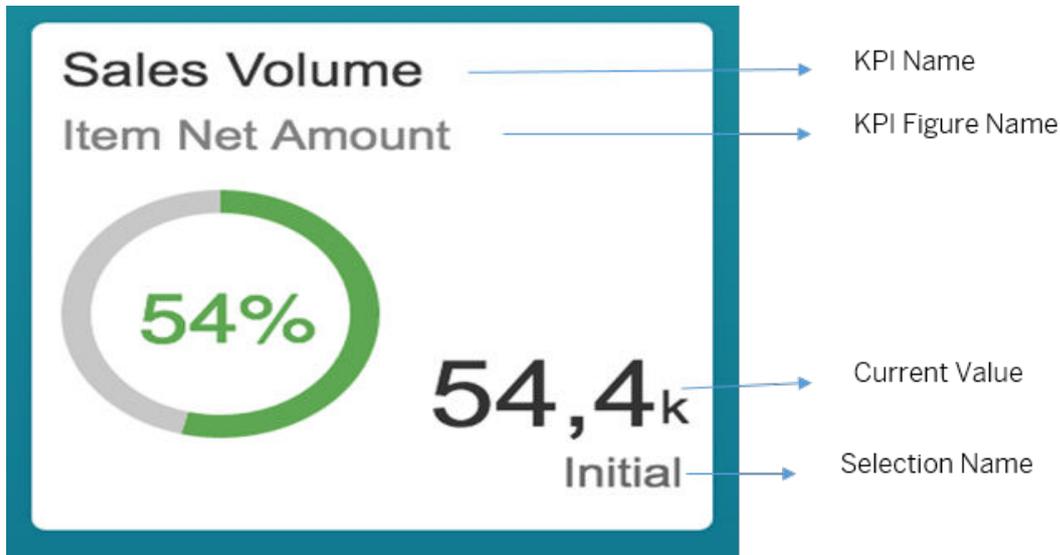
Card Appearance for Percentage Coverage Report Pattern in Fiori Client

Related Information

Personalize Your Home Page [page 199]
Learn how you can personalize your home page.

10.2.2 Report Card

A report card displays a graphical representation of a report.

You can select the report card, for detailed analysis of the report. For optimal performance, we recommend not to add more than 4 reports on the home page. Reports with table aren't supported. The following report cards are supported:

- **Absolute Value Pattern**
  The system applies this pattern to report views with one key figure. The key figure header appears as text at the lower right of the card.
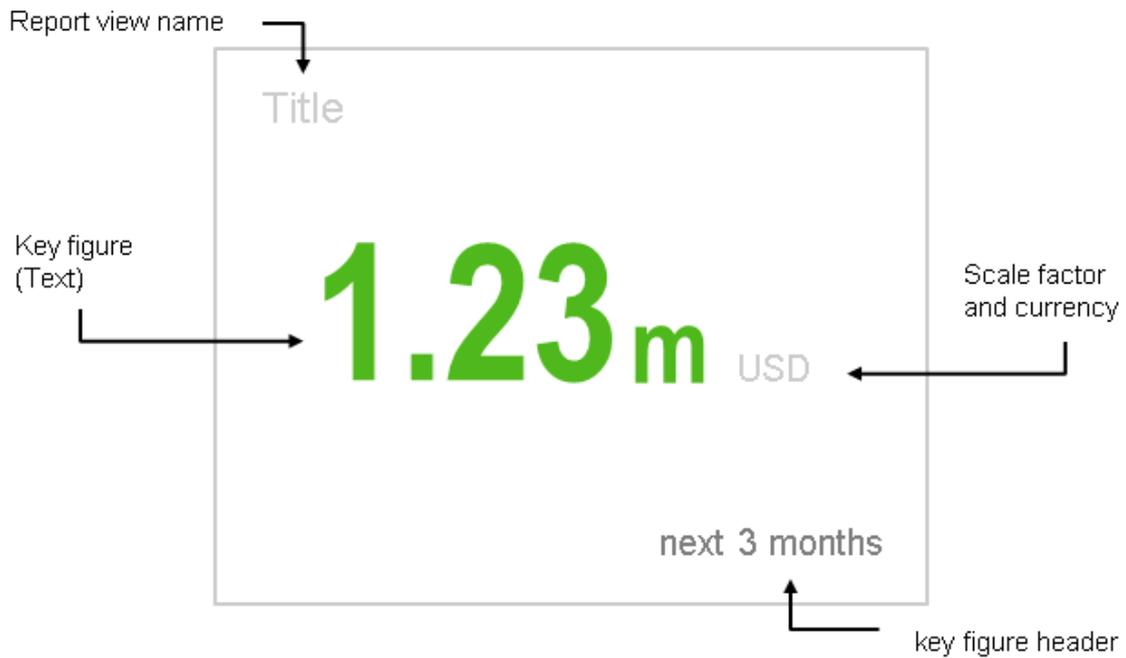
Card Appearance for Absolute Value Report Pattern

- **Percentage Coverage Pattern**

  This pattern is applicable for reports and KPIs, where KPI requires the target to be maintained and report should have 2 key figures.

  In Fiori client, in this card pattern you can see, the percentage deviation that is, how much percentage above or below target.

  - In a maximize scenario, when the current value is greater than target, you see the complete circle in light green indicating that the current value exceeds target. The dark green color indicates by how much percentage it exceeds.

  - When the current value is lesser than the target value, you see the percentage for the current value in neutral color or based on defined thresholds.

  - In the minimum scenario, the color pattern is reversed.
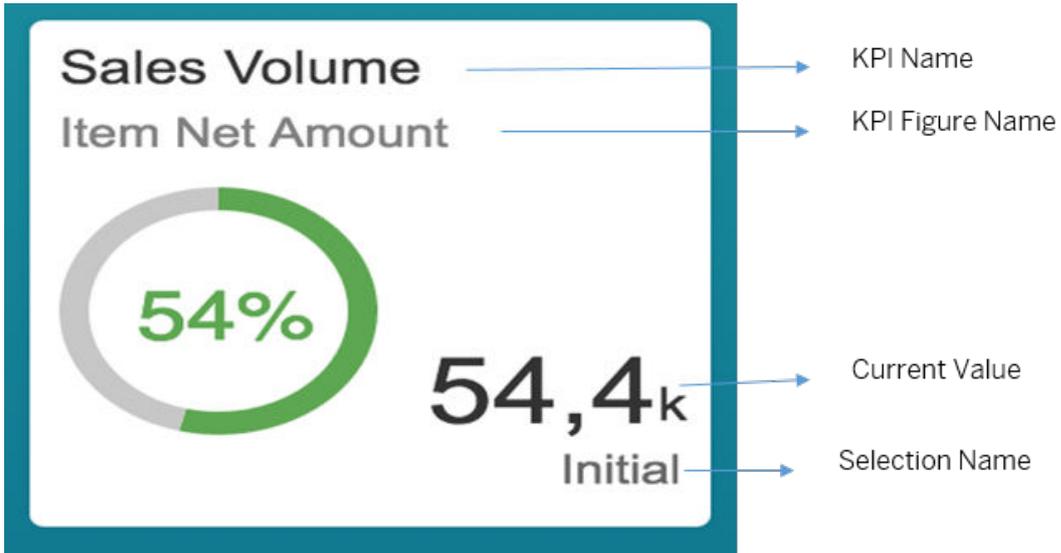
Card Appearance for Percentage Coverage Report Pattern in Fiori Client

- **Top Three Pattern**

  The system applies this pattern to report views with one key figure (without a total) and one characteristic. This pattern shows the top key figure values.

  In Fiori client, the data is represented as a comparison chart.
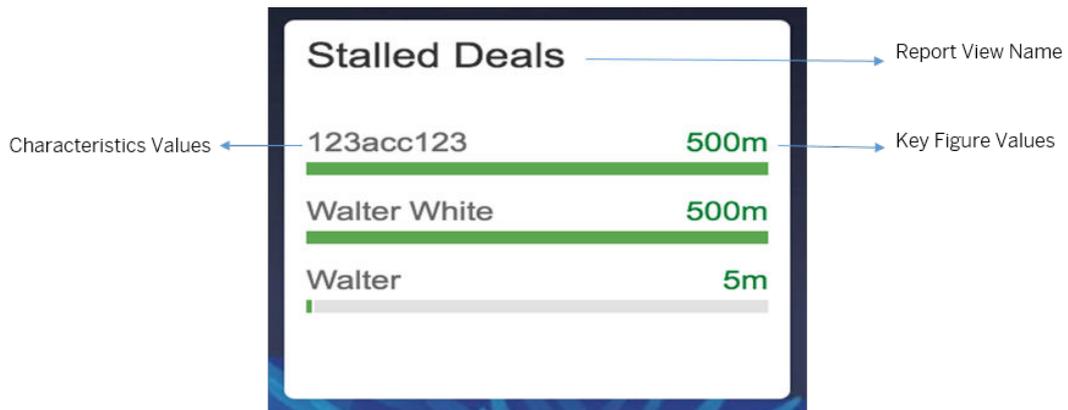
Card Appearance for Top Three Report Pattern
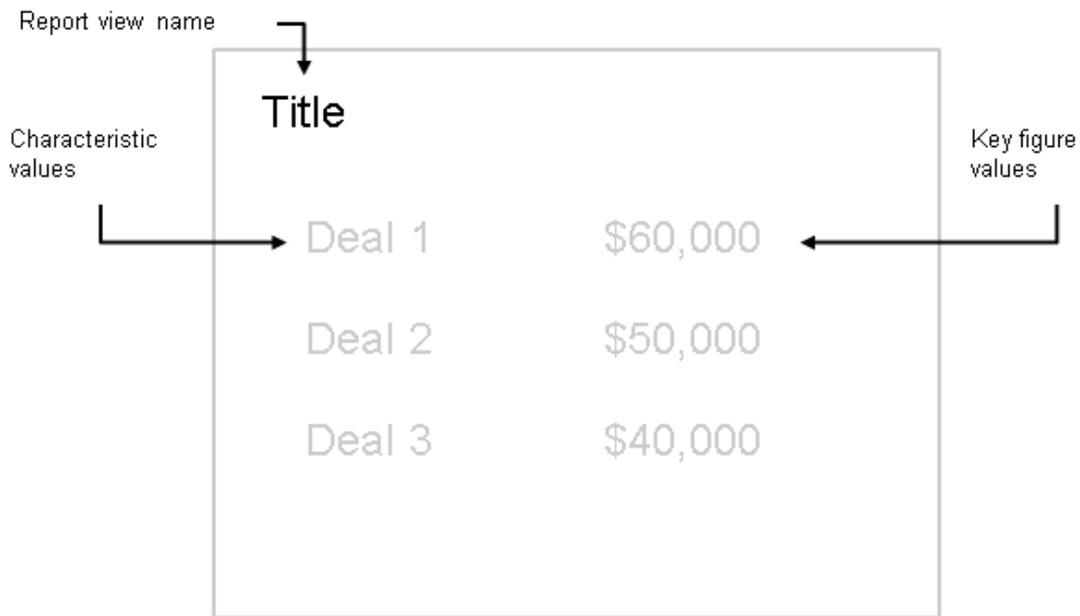
Card Appearance for Top Three Report Pattern

- **Aggregated Value Pattern**
  The system applies pattern four to reports similar to reports represented by pattern 3 (one key figure and one characteristic), which also include a result.
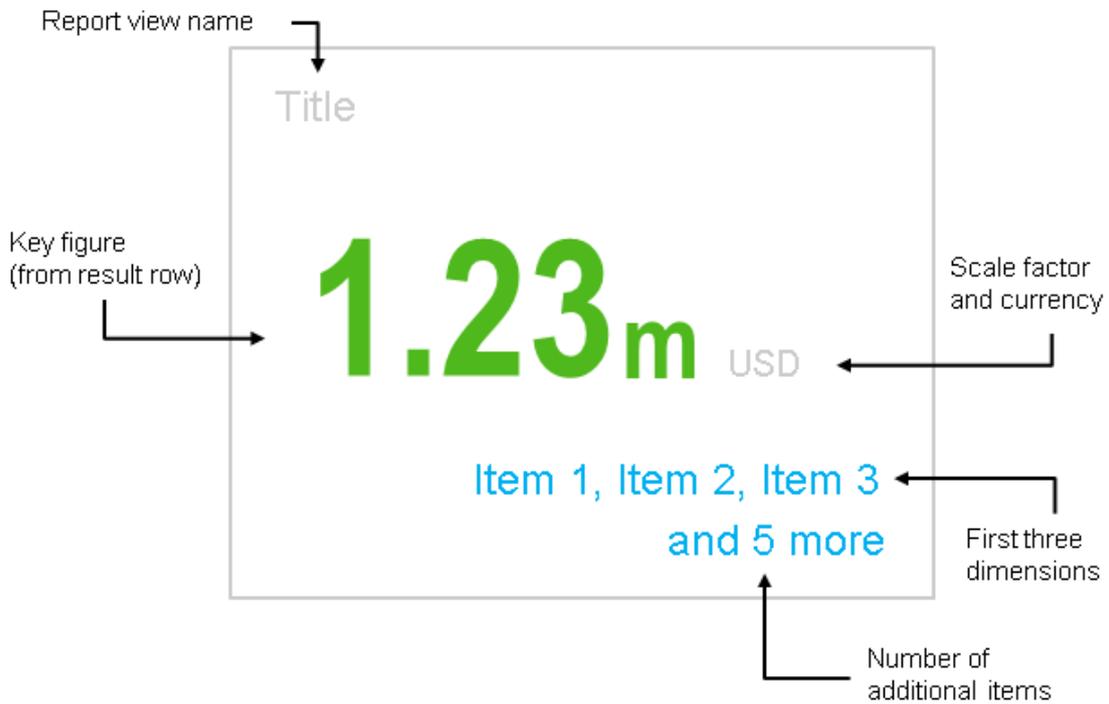
Card Appearance for Aggregated Value Report Pattern

- **Double Progress Bar Pattern**
  The system applies this pattern to report views with two key figures.

> ⓘ **Note**
>
> This pattern isn't available in Fiori client.
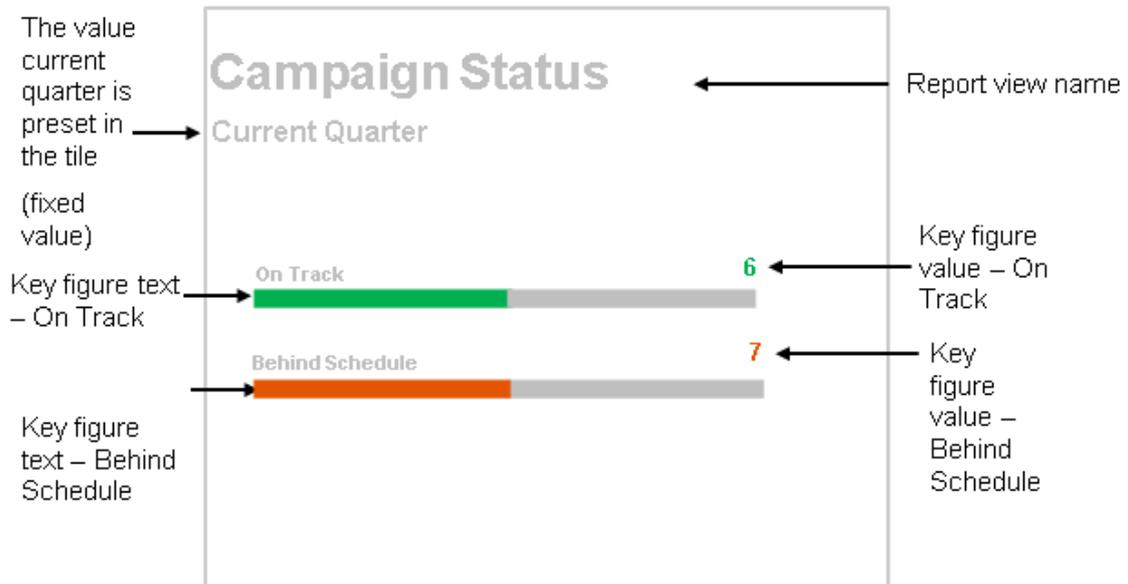
Card Appearance for Double Progress bar Report Pattern

- **Headline Pattern**
  The system uses this pattern for highlighting KPIs that have values outside the defined threshold parameters. (If above or below threshold, then text appears highlighted and as header). This card is ideal for use to display exceptional trending metrics.
  You have the option of choosing from any one of the two patterns.

> ⓘ **Note**
>
> This pattern isn't available in Fiori client.
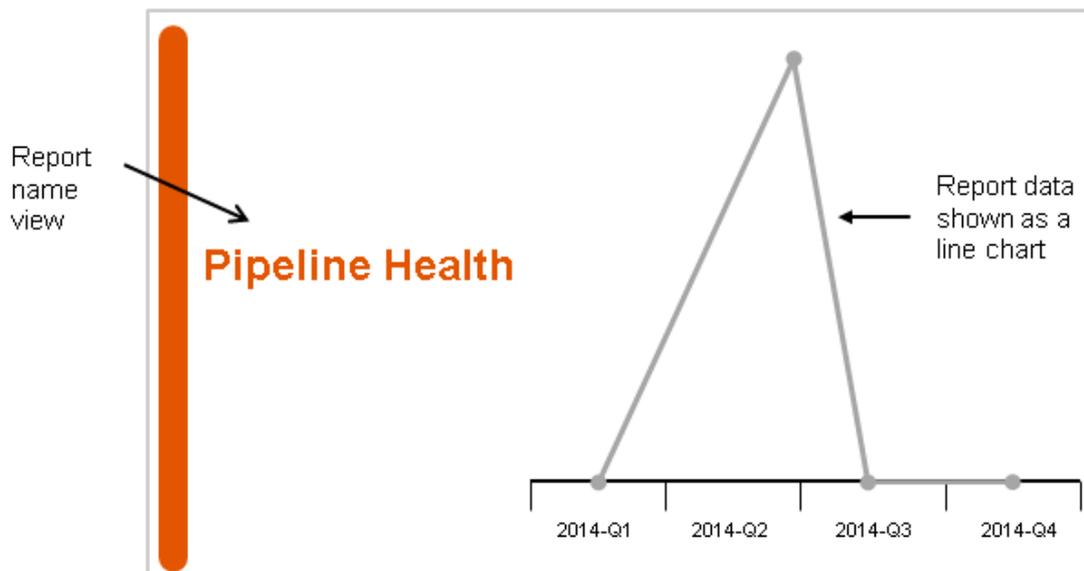
Card Appearance for Headline Report Pattern A

Card Appearance for Headline Report Pattern B

- **Trendline Pattern**

  The Trendline pattern is based on a report with 2 key figures and no dimensions. The system uses this pattern to visualize report output as a trendline.

  > ⓘ Note
  >
  > This pattern isn't available in Fiori client.
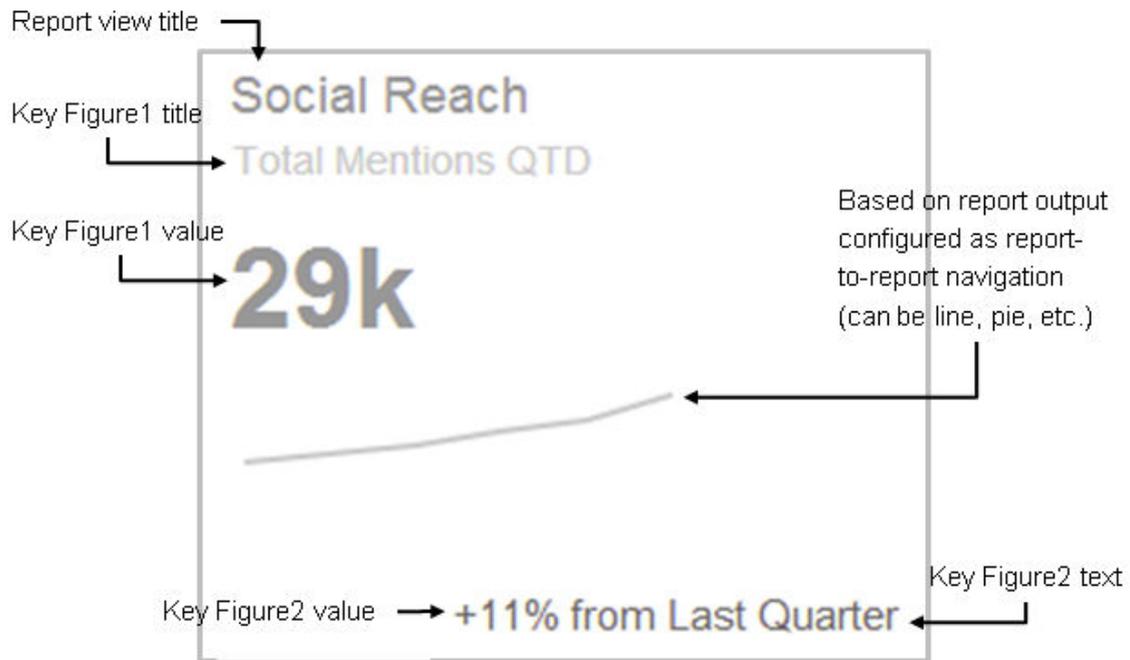
Card Appearance for Trendline Report Pattern

Related Information

[Personalize Your Home Page [page 199]](#)
　　　Learn how you can personalize your home page.

10.2.3 Tools Card

Tools card is available online and enhances your daily productivity.

Tools cards include the following:

- **News card**: News card displays contextual news and RSS feeds.
- **My Upcoming Activities card**: My upcoming activity card displays a live tile with the upcoming events from your calendar. You can manage your events and calendars with the card.
- **My Tasks card**: My task card displays the optimized view of your tasks and clicking on the card allows you to quickly navigate to the task work center. The number of overdue tasks, if present, are displayed in a red font. Otherwise, tasks displayed are prioritized by Today, This Week, This Month, or as Open Tasks.
- **My Team Tickets card**: In my team tickets card, you see the information about your top 5 team members with the maximum number of active tickets, and a priority-based breakdown. When you click *My Team Tickets*, you navigate to the ticket list view for the query *Team Queue*. And, when you click a team member, you again navigate to the ticket list view for the query *Team Queue* but only see tickets for the team member.

> ⓘ Note
>
> If there are less than 5 assigned agents in the ticket list, then you see the fifth entry in the My Ticket Card as *Others*. *Others* category shows all the unassigned tickets in the ticket list.
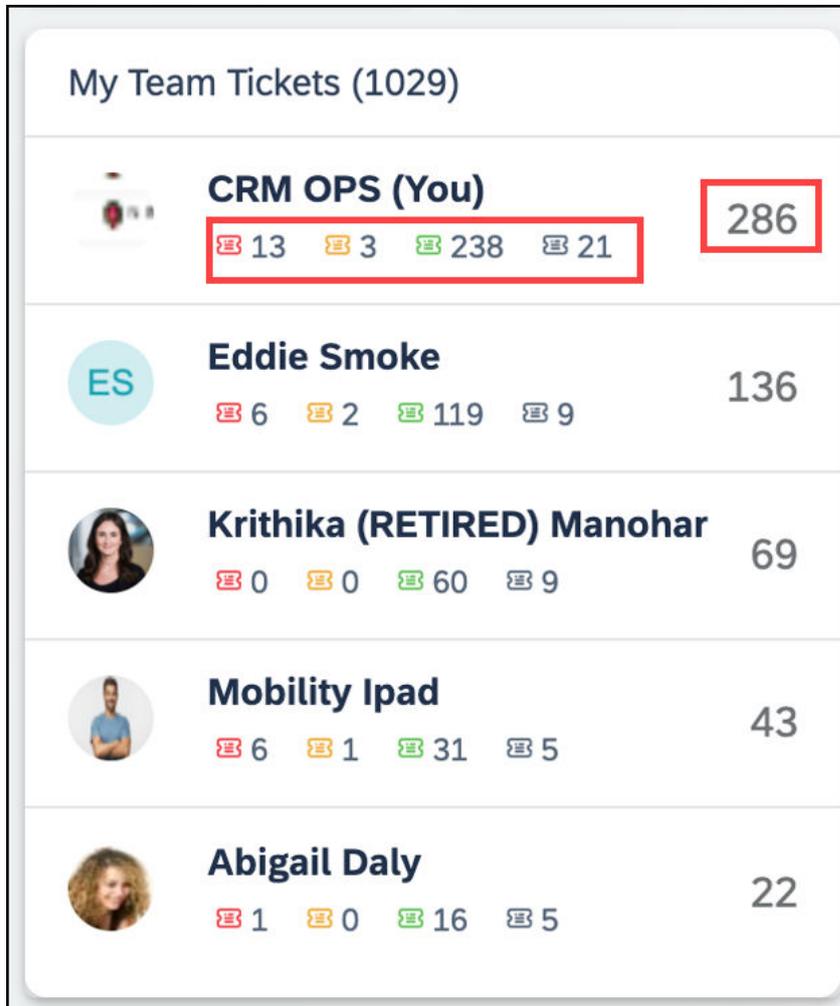

- **Quick Links card**: Quick links card launches the quick create screen for an object. In the 2008 release, the quick links card is predelivered by SAP and not configurable. Based on the number of entries visible in card, quick link card supports two card sizes.

> ⓘ Note
>
> In upcoming releases, configuration options will be available, and you'll be able to configure different types of links like reports, filters, dashboards, KPI & external links in the quick links card.
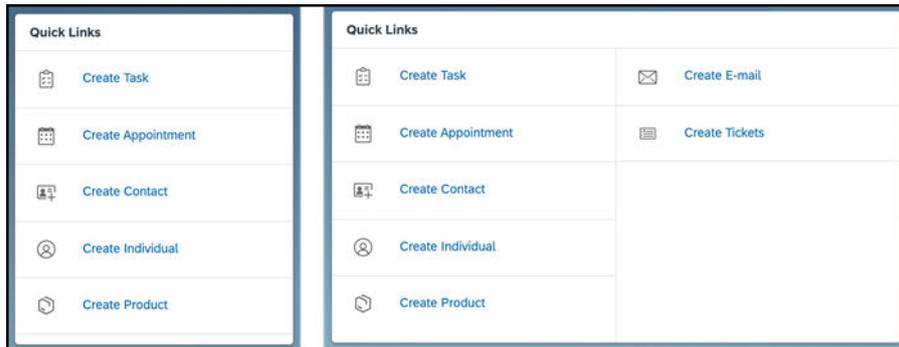
- **My Tickets card**: My tickets card displays a summary of your tickets in kanban board layout. In the 2008 release, the kanban board layout is predelivered by SAP and not configurable. The kanban board layout on the home page is available only on the desktop. When you click *My Tickets*, you navigate to the ticket list view for the query *My Tickets*. When you click a subheading under *My Tickets*, you navigate to the list view for the subheading query. For example, if you click *Customer Action*, you navigate to the list view for the query *Customer Action*. When you click an object under the subheading, you navigate to the ticket's object detail view. You can view the *My Tickets* card in collapsed and expanded mode. By default, the ticket card opens in expanded mode, and if there's no data (the All ticket query is 0), then it opens in collapsed mode. You can see a maximum of 4 ticket statuses, and for each status, a maximum of 5 records are available that are sorted based on Last change datetime in descending order.
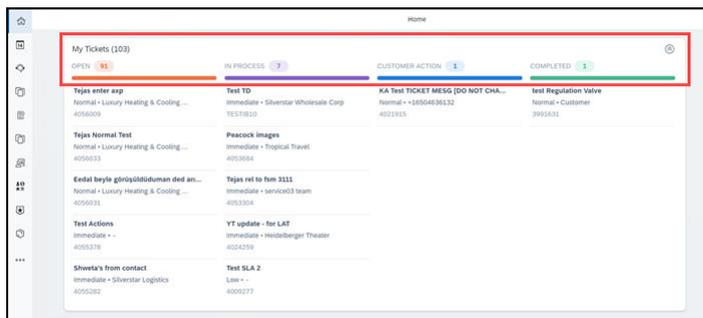
> ⓘ **Note**
>
> - In upcoming releases, configuration options will be available for the kanban board layout.
> - Ticket kanban board layout isn't supported in tablets and smartphones.

The administrator can add the *My Tickets* card to the home page via *Add Existing Card* option under adaptation. Currently, administrator can only control the visibility of kanban board but can't create new kanban boards or change the configuration of the predelivered kanban board.

Prerequisites to add my tickets card:

- The following fields are available in the list view:
  - Subject
  - Priority
  - Status
  - Customer
  - Changed on Field
- The user should be authorized to view *My Tickets* as the default set query.
- The list is always sorted on *Changed on* field in descending order.

- For the kanban board to function properly, and display data, all the standard fields, including status should be available in the ticket list view. Currently, there are 4 standard fields added to the ticket card:
  - Ticket subject that is a link and navigates to ticket new quick view or the ticket detail view
  - Ticket priority
  - Customer name
  - Ticket ID

Limitations

- In the 2008 release, the ticket card isn't configurable. The administrator can't add or remove any field or change the sorting order.
- Kanban board is read-only, and you can't perform actions on the ticket list in kanban board.
- Ticket card is available only on the desktop.

Related Information

Personalize Your Home Page [page 199]
     Learn how you can personalize your home page.

10.2.4 Filter Card

Filter card is a place where you can keep your custom queries as a list item to be run by the user on the home page.

Filter cards provide quick access to your saved queries. You can select the filter card to go to the saved query. You see the custom queries as list items on the filter card. When you select a query, you directly navigate to the list. Thus, improving the usability and reducing the number of clicks. To see the filter card on the home page, ask your administrator to make the card visible and available for your role. Once you adapt or personalize the home page to show the filter card, the solution adds your saved queries automatically.

Related Information

Personalize Your Home Page [page 199]
     Learn how you can personalize your home page.

10.2.5 Custom Cards

You can choose to create personalized cards to launch information from the home page.

You can maintain text for multiple languages in the custom cards.

> ⓘ Note
>
> For custom cards on the home page, English is the default language, and the English text shows up for all the different languages until changed to a specific language. For example, you only see the English text when you log in to German if the language isn't changed. However, the administrator can always change and maintain the German language under adaptation.

Custom cards display an icon, and can be set to launch the following:

- **URL card**: You can launch any URL directly from the URL card. The URL opens in a new tab.
- **Floor plan card**: With floor plan card option, you can create a card that launches any screen for a work center or detail view in the solution that the user wants. Custom card also includes user-defined custom screens.
- **Ticket creation card**: With the ticket creation card, you can create a new service ticket. Clicking the card launches a guided activity floor plan (GAF). Once you've created the ticket, you can view it under ▶ *Service* ▶ *Tickets* ▶ worklist.
- **URL mashup card**: With the URL mashup card, you can open URL mashups from the home page. While configuring the card, you can choose the mashup to configure from the mashup value help.
- **HTML mashup card**: With the HTML mashup card, you can open HTML mashups from the home page. While configuring the card, you can choose the mashup to configure from the mashup value help.
- **Video card**: Video card can be used by the administrator to configure video links for the users. When you click the video link, it launches in a separate window. As a part of the configuration, the administrator can set the title, description, and time frame for the video card. As a prerequisite, your administrator must create the video custom card via adaptation on the home page and publish to make the video card available for the users.

> ⓘ Note
>
> Videos aren't stored as part of SAP Sales & Service cloud.
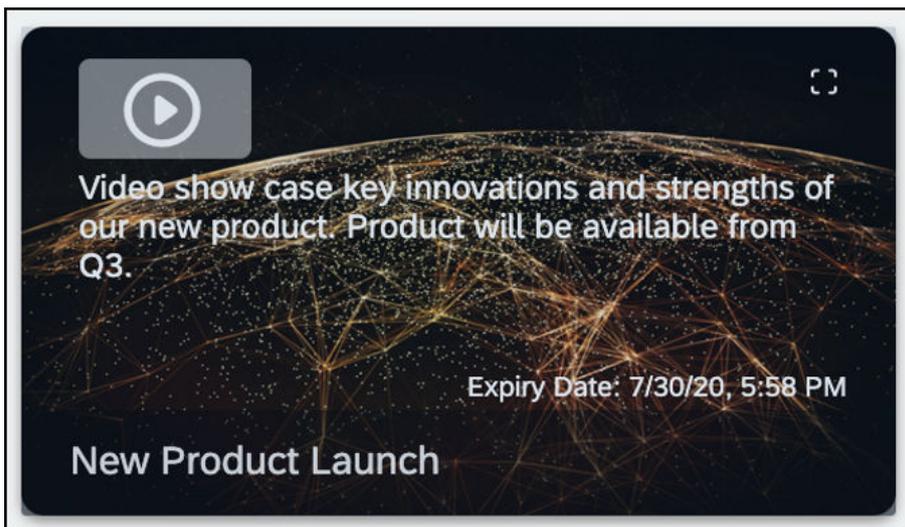
- **Message card**: The message card can be used by the administrator to publish messages for business users. As a part of the configuration, the administrator can set the message title, message description, informational icon text, and the background color of the message card. As a prerequisite, your

administrator must create the message custom card via adaptation on the home page and publish to make the message card available for the users.
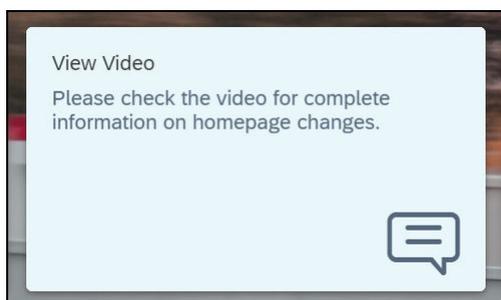
- **Quick Links card**: A quick links card serves as a launch pad tile for different source within Cloud for Customer or for external links. Quick links card on home page shows the object icons and the query names that help you to navigate. As a part of configuration, your administrator can create up to 10 links using different link types. Configure quick links card on the home page via adaptation.
- **Kanban card**: A kanban card is a visual representation of work items with the ability to navigate. You can configure kanban card on the home page via adaptation. As a part of configuration, your administrator can create a kanban card for an object for any role.

10.2.5.1 Create Custom Cards

Your administrator can create a custom card as follows:

1. Go to home page.
2. Click the pencil icon (✐) on the right side and select *Adapt*.
3. Search and select the user role and click *Go*.
4. Click the add icon (⊡) on the right side to open the *Add Cards* window.
5. Select *Create Custom Card* to open a new popup window.
6. Choose one of the following from the *Type* dropdown.
   - URL
   - Floorplan
   - Ticket Creation
   - URL Mashup
   - HTML Mashup
   - Video
   - Message
   - Quick Links
   - Kanban
7. Add the required details and click *Save*.

Create Quick Links Card

1. Follow the steps (1 to 5) in the *Create Custom Cards* topic.
2. From the *Type* dropdown, select *Quick Links*. The corresponding fields for the *Quick Links* configuration show up with the selection.
3. Select the language from the dropdown and enter a name.
4. Go to *Link 1* and select any of the following from the *Link Type* dropdown:
   - Filter
   - Create
   - Report
   - KPI
   - External Link

   > ⓘ **Note**
   >
   > You can't customize a *Dashboard* link type.

5. If you choose *Filter* as *Link Type*, you must select an object first, and based on the selection you must select a query.

   > ⓘ **Note**
   >
   > - You can't see the hidden queries from the master layout in the dropdown.
   > - You can't see any queries from the page layout.

6. Choose any other *Link Type* and update the necessary fields based on your requirements.
   Similarly, you can add up to 10 links.
7. Click *Save* when you finish.

Edit Quick Links Card

1. Go to adaptation mode.
2. Click the quick links card that you want to edit.
   A new window opens with the edit functionality.
3. To edit the existing links, you can either reset each links by clicking the icon (↺) or you can choose a different *Link Type*.

   > ⓘ **Note**
   >
   > You can't edit the existing sub fields without changing the *Link Type*.

4. Click *Save* once you finish.

Create Kanban Card

1. Follow the steps (1 to 5) in the *Create Custom Cards* topic.
2. From the *Type* dropdown, select Kanban. The corresponding fields for Kanban card configuration show up with the selection.

3. The administrator can then select an object (like Accounts, Appointments, Tasks, Tickets, and so on) for which Kanban needs to be configured.

> ⓘ Note
>
> Objects are predefined by SAP. Objects shown in dropdown are based on the role chosen during adapt. For example, if the administrator chooses a role with authorization for only the opportunity work center view, then you see only the opportunity object to create Kanban and not the other objects.
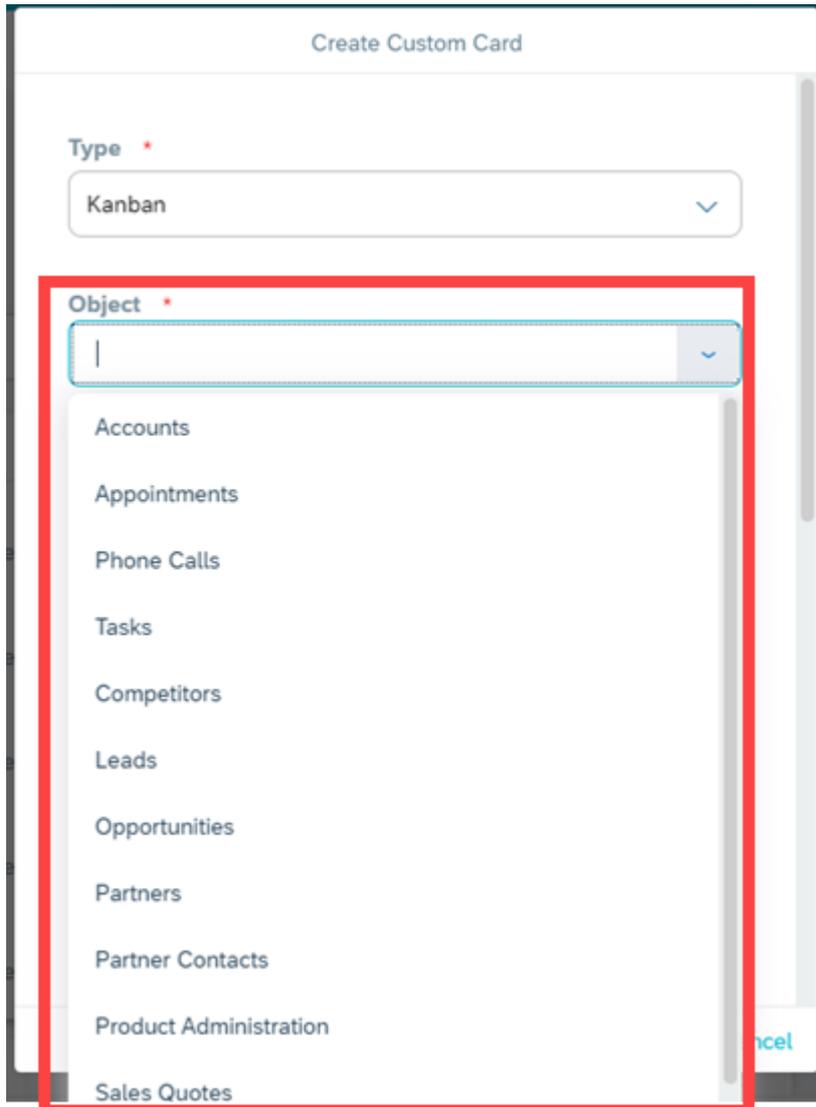
List of objects supported for Kanban card:

- Accounts
- Opportunities
- Phone call
- Tasks
- Competitors
- Competitors Products
- Leads
- Appointments
- Partners
- Partner Contacts
- Product Administration
- Product Lists
- Promotions
- Sales Quotes

- Sales Orders
- Visits
- Tickets
- Work Tickets
- Contracts
- Installation Points
- Individual Customers
- Registered Products
- Time Entries
- Time Reports

4. Select the Data Set Query.

> ⓘ Note
>
> Data set query dropdown shows only adaptation mode queries and standard queries. The data set query doesn't check the role-based authorization of any default query set. It doesn't check if the default set query is hidden for the role. Admin selects the relevant query for the role.

5. Select Attribute. Attributes are the fields seen as columns in a data set. For example, if you have chosen My Tickets as the date set query, the fields that are available in the dataset (status, priority, and so on) are available for selection as attribute.

6. Select the visualization option. By default, detailed visualization is selected, and the Kanban card information shows in a collapsed mode on the home page. You can expand it to see full Kanban card. Visualization card size may vary depending on values selected in Kanban configuration.

> ⓘ Note
>
> - In vertical Kanban card visualization, the collapsed state checkbox, display fields and sort order fields are disabled. You can only select values, as vertical Kanban only shows values along with count.
> - In detailed Kanban card, you can select a maximum of 5 values and a minimum 2 values. Add value button will be disabled after adding 5 values.
> - In vertical Kanban card, you can select a maximum of 8 values and minimum of 2 values. Add value button will be disabled after adding 8 values.
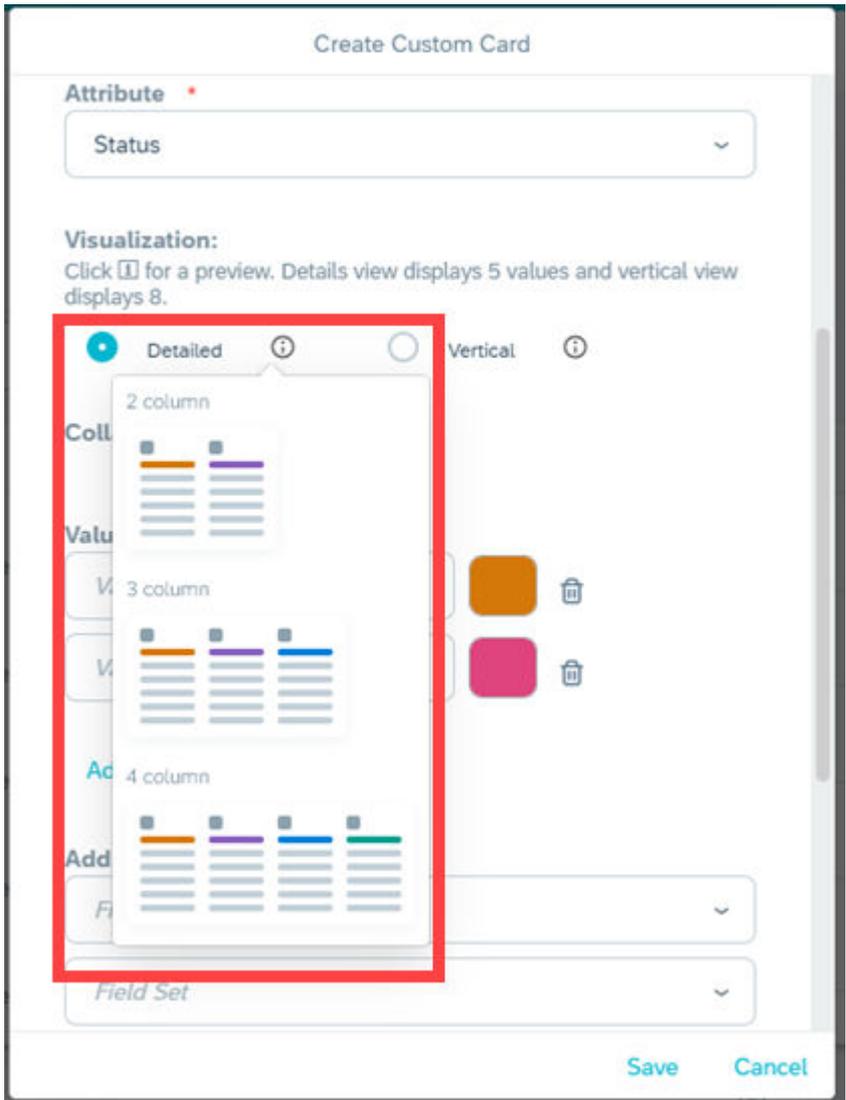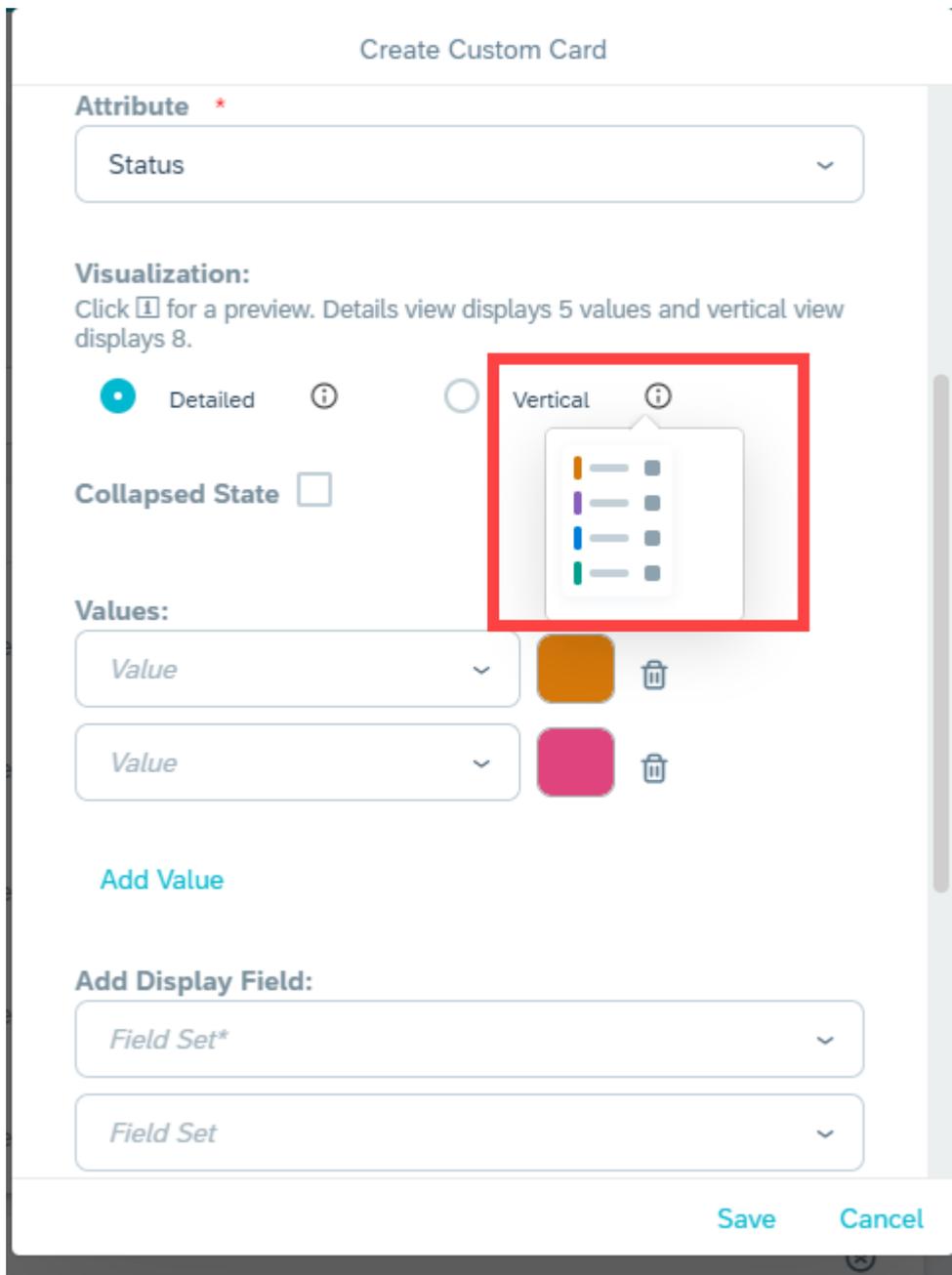
7. Select Value. Values are based on the attribute selection. For example, for the attribute **Status**, the values can be in process, open, complete and so on.
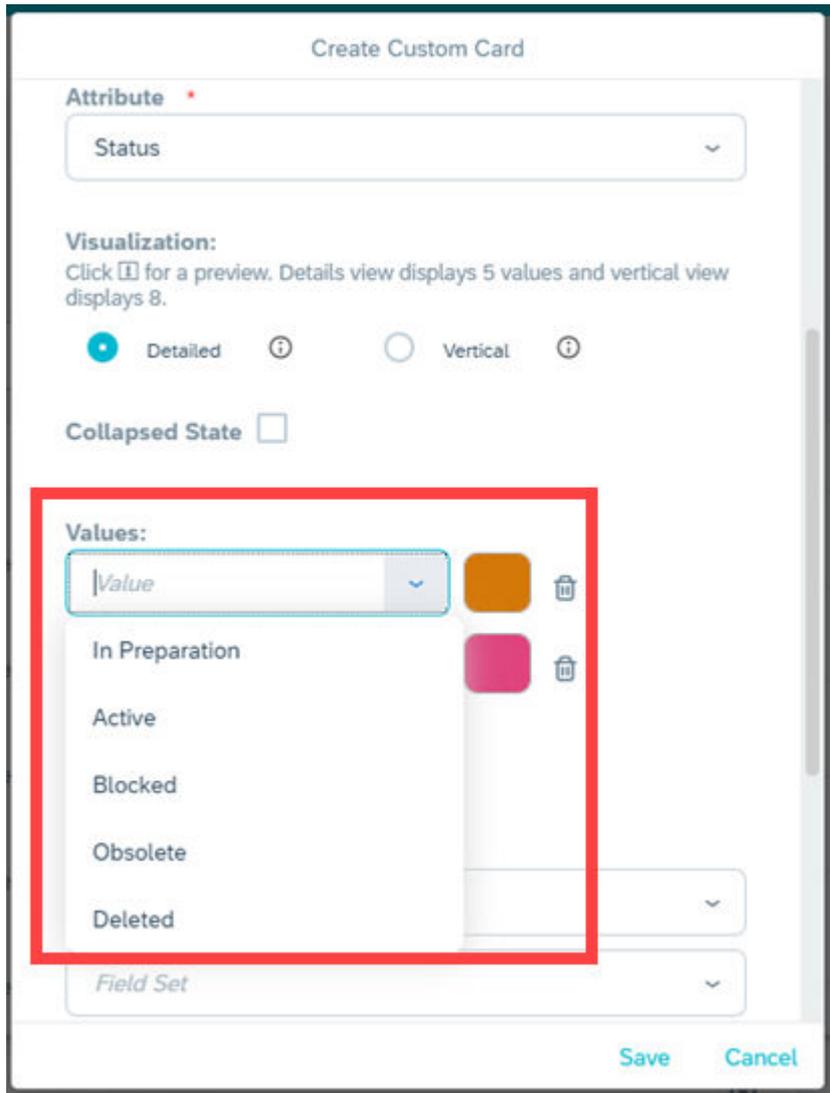
8. Add Display fields, pick the Sort order and then click *Save*.

Display field is the other field of the data set query that you can choose to see in the Kanban card. For example, if **Status** is selected, you can view additional details of a ticket like name, ID, priority, etc. These additional details are the display fields.

Data of display fields in Kanban card is shown based on sort order selection. You can select the sort order based on one of the display fields.

> ⓘ Note
>
> By default, a newly created Kanban card is not visible on the home page. To make the Kanban card visible, go to Add Existing Card and select Custom tab in adaptation, to see all the configured Kanban cards. Change the visibility of the created Kanban to see it on the home page. You can set the visibility of up to two Kanban cards on the home page for a role.

Navigation from Kanban Card:

- **Navigation from title**: By clicking the title, you navigate to the configured object's list view and the configured data set query view is displayed.
- **Navigation from value count**: By clicking the number count, you navigate to the configured object's list view and configured data set query is displayed.
- **Navigation from First Link (applicable for Detailed view)**: By clicking the first link, you navigate to the object's detail view. Navigation is only possible to the object that you have configured the Kanban card on. For example, you choose the object **Task** and configure the field Customer as the first field. Even if you click on the customer field, it opens the **Tasks** object.
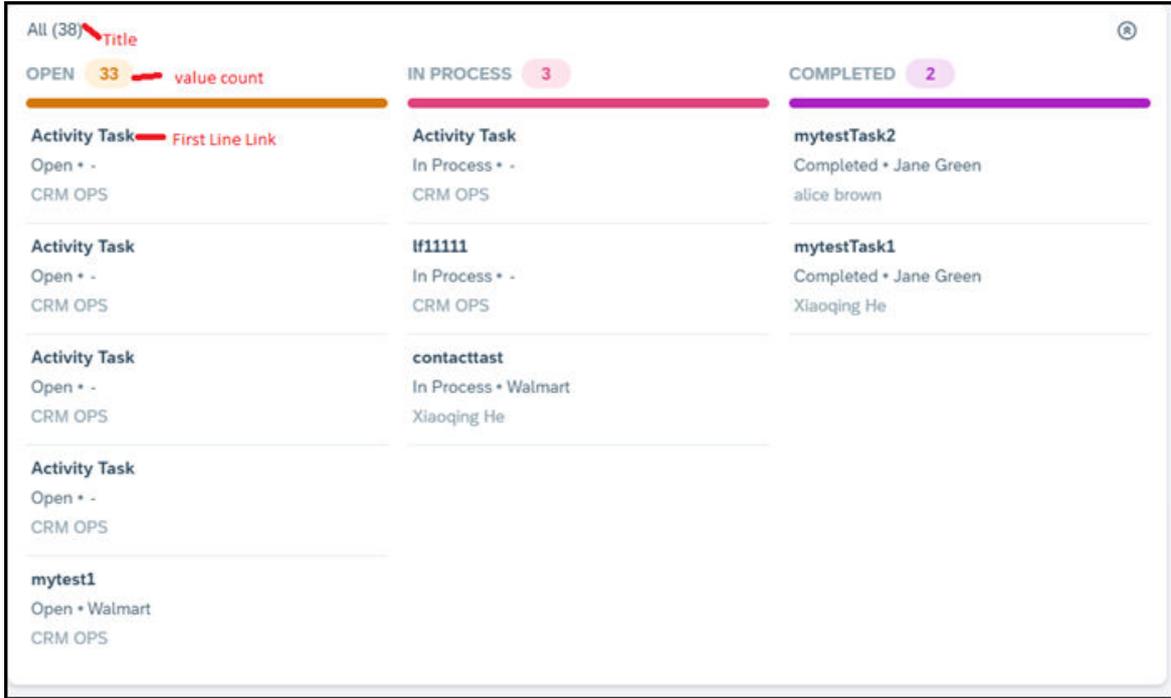
- **Navigation from vertical kanban card** - In the vertical Kanban card, both the title and number count are clickable, and you navigate to the configured object's list view and the configured data set query view is displayed.
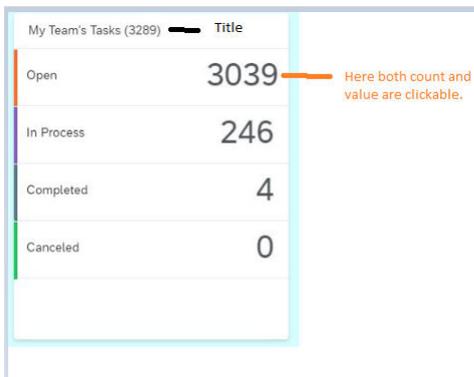
ⓘ Note

You can edit or delete only the custom kanban cards not the SAP-delivered kanban cards.

Limitations to Kanban Card:

- Kanban board card is not available in offline and on mobile devices.
- Only a maximum of 5 values for detailed visualization and a maximum of 8 values for vertical visualization can be added, after that the add button is disabled.
- Context based drop downs are not supported. For example, state (Dependency on Country/Region).
- When the Kanban card is set as visible on home page, it shows as an empty card. Only after publishing, data shows on the Kanban card.
- The administrator can create multiple Kanban cards, but only two Kanban cards are visible for a role.

- In the vertical Kanban card visualization, the collapsed state checkbox, display fields and sort order fields are disabled. You can select only values, as vertical Kanban only shows values along with count.
- If you are assigned to multiple roles and for each role, the administrator had configured one visible custom Kanban card, then only the first created Kanban card is seen on the home page. However, you can make any other Kanban card visible or invisible through personalization.
- If you are assigned to multiple roles, and for one of the roles, for example, the standard My Tickets Kanban card is visible, and for another role any custom Kanban is visible, then preference is given to standard Kanban.
- If you rearrange the existing work center views, you cannot navigate from the kanban card to the work center views.

Related Information

Learn how you can personalize your home page.

10.3 Personalize Your Home Page

Learn how you can personalize your home page.

> ⓘ Note
> - Personalization capability is not available in smartphones.
> - card Navigation in offline is limited to Today's Activities, Visits, Custom report and Floorplan cards.
> - Personalization is not available in offline mode.

You can personalize your home page screen with your preferences. To personalize your home page, you enter the personalization mode by clicking the edit icon located inside the footer toolbar. Once you are in the personalization mode, you can hover over the content area and see that editable areas are highlighted and marked by a frame. You can select the icons which allows you to make the corresponding personalized changes.

In the personalize mode, you can make various changes to the current screen such as rearranging the cards and groups by dragging and dropping them, adding and deleting card and groups, renaming groups etc. You can make hidden items visible again by turning on the visible switch. All hidden and available items will appear in the list and you can add them again.

After completing the personalization of your home page screen, you can exit the personalization mode by saving the changes you made. Or if you want to remove the changes, press cancel.

10.3.1 Disable Home Page as the Default Landing Page

If you are not actively using the home page, you can disable it from being the default landing page.

> **→ Remember**
>
> Home Page Settings icon (gear icon) is located on the top right when you are in personalization mode.

With this setting, the first work center view defined for the user or role in becomes the default landing page for the Fiori client.

In the personalization mode on home page, you can uncheck the checkbox *Set Home page as the Start Page* under settings.

10.3.2 Add and Edit Cards

Learn how to add and edit cards on the home page. You can rearranging these cards by dragging and dropping them and also move them to different groups.

> **ⓘ Note**
>
> For an optimal performance experience, you'll get a warning message when you exceed the recommended number of KPI and Report cards on the home page. The recommended maximum number of KPI cards supported is 10 and the maximum number of Report-based cards (Custom pattern cards like Bar Chart cards) supported is 4. You still have the option to add additional cards, but it impacts the performance. There's no limit on recommended number of List cards, Tool cards, and Custom cards.

- **Add card**
  There's a + icon to add a new card at the end of each card. To add cards, click the + icon. You can also remove a card that you don't need by turning off the visible switch and making it invisible. If the card preview shows a card as visible, then card is shown on the home page.
- **Edit Existing cards**
  Click on a card to open the settings screen for the respective card. Turning off the switch removes the card from the home page, and automatically turns off the *Visbile* switch. You can change the group of the card, for example, move the card to a different group and then save your changes. card visualization can also be changed.
- **Edit Custom card**
  Once a custom card is created, it's placed on the user interface as available and visible. To edit custom cards, click the card and open the edit dialog as you would usually edit other cards. The dialog includes details such as Click/ Tap on a card to open the settings screen for the respective card. Turning off the *Title*, *Path*, and *Description* that are editable. However, the type of the card (URL vs. Floorplan can't be changed).

10.3.3 Launch Mashups from Home Page cards

Launch a URL or HTML mashup from a home page card.

On the home page, you can view the content of the mashup card. You can also click to launch the same mashup shown in the card or you can launch a different mashup that shows more details of the HTML mashup card.

Note that mashups which do not have a port binding are also allowed in the home page card mashups

10.3.4 Add and Delete Group

Based on your requirement and preference, you have the option to cluster the cards into a logical group.

- **Add Group**
  You have the option to cluster cards by creating new groups. There is a + icon to add at the end of each group. To add new groups, click/tap the + icon. You can also rename the supported groups.
- **Delete Group**
  You can also delete groups created by you besides rearranging groups by dragging and dropping them. A group created by you shows a *Delete* button. Delete will simply remove the group permanently so that it will not be visible on the user interface any longer. You will get a warning message before removing the group.

10.3.5 Define Home Page Settings

The administrator can access home page setting as a gear icon on the home page.

As an administrator, under home page settings you can enable the users or roles to group cards on their home page. To do so, check the checkbox *Show cards in Groups* under settings. You can also change the home page to show as the default start page when the user logs in. To do so, you can uncheck the checkbox *Set Home page as the Start Page* under settings.

11 Integration with Central Analytics

This section gives you an overview of all the documents that describes how administrators can integrate, replicate, and monitor data from the SAP Cloud for Customer system to external systems such as SAP NetWeaver Business Warehouse (BW) and other third party systems.

You can integrate data through the following analytical objects:

- Reports
  - Extract Report Data Using OData [page 227]
  - Configure URL Mashup for Third-Party Systems [page 205]
- Data Sources
  - Extract Data from Data Sources Using OData [page 230]
  - Integrate Analytics with an SAP NetWeaver Business Warehouse System [page 209]

11.1 Integrate Data Using Reports

Learn more about the different ways in which you can integrate data using reports.

Extract Report Data Using OData [page 202]
> This OData service returns highly aggregated and preprocessed analytics data for the logged on user.

Configure URL Mashup for Third-Party Systems [page 205]
> View SAP Cloud for Customer reports as a mashup in any third party system using this functionality. To achieve this you need to configure a URL that can be called from the third party system.

11.1.1 Extract Report Data Using OData

This OData service returns highly aggregated and preprocessed analytics data for the logged on user.

You can retrieve reports that are available in the *Reports* work center view of the work centers assigned to the logged on user. You can also retrieve the characteristics and key figures of reports.

SAPData

SAPData is an extra metadata that can be found in the metadata of the service. SAPData contains labels, annotations, and so on. You can access it via SAP proxy generators.

Examples

> **⟨·⟩ Sample Code**
>
> ```
> -<Entity Type
> Name="RPMATERIAL_Q0001QueryResult" sap:semantics="aggregate"sap:label="New
> Materials"xmls:sap="http://www.sap.com/Protocols/SAPData">
> <Property
> Name="CCRTA_DATE" Type="Edm.DataTime" Nullable="true" sap:label="Created On
> ID" sap:aggregation-role="dimension" sap:filterable="true" />
> ```

Conventions for Building OData Services for the SAP Solution

You can expand the URL depending on the data you want to retrieve.

- **Available OData Services**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata` returns a list of SAP data protocol services, representing the work centers assigned to the logged on user.
  Analytics data is available for services with the convention <shortened name of work center>_analytics.svc.
  Note the following information for the specified services:

  - `cc_home_analytics.svc`returns all reports available to the logon user as a business user, including reports that have been personalized.

  - `ana_businessanalytics_analytics.svc` returns all reports available to the logon user as an administrator, excluding reports that have been personalized.

  > **ⓘ Note**
  >
  > OData Services are **only accessible for the business users**, and not technical users.

- **Metadata Document of an Analytics Service**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/ <shortened name of work center>_analytics.svc/$metadata` returns the reports assigned to the specified work center along with the corresponding fields in the reports.

  > **ⓘ Note**
  >
  > If you are unable to retrieve a specific report via OData, check if the report is assigned to a work center.
  >
  > You can check the report assignment status either by looking into the report list of the specific work center or from the Design reports view on the Business Analytics work center.

- **Data of a Report**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/ <shortened name of work center>_analytics.svc/RP<report ID>QueryResults` returns the first 50 lines of data of the specified report

  > **ⓘ Note**
  >
  > - Due to technical limitation, only up to 50 key figures and characteristics can be selected. We recommend that you select data explicitly for the needed fields.

This approach has the following benefits:

- Better performance
- Controlled Memory Consumption (a maximum of 2GB data can be downloaded and this limit may get exhausted if non-relevant fields are also selected in the data, hence consuming memory)

- Report execution through OData requests always gets executed only for initial selection, that is, the parameters, which are maintained in the report metadata. You cannot pass views and variants.
- Using OData filters (for example: `$filter=CDPY_MAINPROSPCT_ID eq '1001145'`), you cannot overrule the parameter values in the initial selection. You can apply filters on the data retrieved based on the initial selection.
- You have an option to pass OData parameter values (for example: `$filter=PAR_SEL_DPY_MAINPROSPCT_ID eq '1001140'`). These overrule the existing parameter values in the initial selection. The remaining parameter values, if any, in initial selection, would still apply.
- Personalized fields that have been added through the *Add Fields* option are supported as selection drill down, as well as filters. This includes master data attributes.
- You cannot pass relative selects as values for OData parameters and filters.
- Personalized parameters and parameters of hierarchy type are not supported.

- **Supported Query Options**

  For the following supported query options, the example base of the URI is the same:

  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/ <shortened name of work center>_analytics.svc/RP<report ID>QueryResults?`

  - $select

    Expansion: $select=<one or more specified characteristics separated by commas>
  - $orderby (ascending)

    Expansion: $orderby=<one or more specified characteristics followed by **asc**, separated by commas>
  - $orderby (descending)

    Expansion: $orderby=<one or more specified characteristics followed by **desc**, separated by commas>
  - totals

    Expansion: $totals=<one or more specified characteristics separated by commas>
  - $filter

    Expansion: $filter=<specified characteristic> **eq** '<filter value>'
  - $top

    Expansion: $top=<specified number>
  - $inlinecount

    Expansion: $ inlinecount = <Flag>

    This query provides the total number of results rows for ODATA. It may be different that the count key figure seen on the report.

Limitations

The following analytical features are not supported with OData:

- Variables and variants
- Unit/currency determination for metadata when formulas or nested reuse key figure composite are used
- Master data for unit/currency, associations to unit/currency
- Hierarchies
- Characteristic structure

> ⓘ **Note**
>
> Only the following use cases are supported for characteristics structure:
>
> - In metadata: Characteristic structure is exposed as a characteristic which needs to be filtered to a single value.
> - In data retrieval: Characteristic structure is either filtered to a single value or is among the requested fields.

11.1.2 Configure URL Mashup for Third-Party Systems

View SAP Cloud for Customer reports as a mashup in any third party system using this functionality. To achieve this you need to configure a URL that can be called from the third party system.

The system enables you to transfer parameters while calling a SAP Cloud for Customer report from a third party system. For example, if you want a contextual report based on city, then the city ID can be transferred as a parameter. For an application X, where you have stored some cities and you want to see all the contacts from C4C which reside in that city. To build a bridge between the two applications, you can create a URL, save the parameters for the values that you want to see, and run the report when necessary.

Procedure

1. Logon to the SAP Cloud for Customer system and navigate to the *Analysis* work center.
2. Open the report which you want to use as a mashup, for example, *Account Contact Data*.
3. Navigate to ▐▶ *Report Header* ❯ *Technical Information* ❯, and record the following details for future use:
   - Report ID
   - View ID
   - Selection ID

   You will need these IDs when you create the URL.
4. Choose *Selection* , click the wheel icon and then click *Show Technical ID*. The system displays the technical IDs along with the labels inside a parenthesis. Record the technical IDs so that you can use them while creating the URL.

You can create the URLs using the following structure:

https://system-url]/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?app.component=/
SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=[ReportId]&param.Rep
ortType=RP&param.SelectedVariantId=[Selection ID]&param.SelectedViewId=[View
ID]&param.Scenario=AP&param.Selection.[Parameter Technical ID]='[value]'&param.Selection.[Prameter
Technical ID]='[value]'&param.Selec...

Where

Parameters	Stands for
[system-url]	The URL which you click to open C4C system.
[ReportId]	The ID of the Report which you want to use as a mashup
[Selection ID]	The technical ID of the Selection of the above report
[View ID]	The technical ID for the View of the above report
[Parameter Technical ID]	The technical ID of the parameter that you want to pass as a context to above report
[value]	The actual value of the parameter, for example: Palo Alto

Example

In the following examples, we are using the parameters listed below:

Parameters	Stands for
[system-url]	qxl-cust233.dev.sapbydesign.com
[ReportId]	BPCSCONTB_Q0001
[Selection ID]	ZAALD4BSVD4POHPOCANJSX3LQ2M
[View ID]	ZAALD4BSVD4POHPOCANJSX3LQ2M
[Parameter Technical ID]	P_CITY
[value]	Palo Alto

Example for Single value

https://qxl-cust233.dev.sapbydesign.com/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?
app.component=/SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=BPCSCONTB_Q0001&
param.ReportType=RP&param.SelectedVariantId=ZAALD4BSVD4POHPOCANJSX3LQ2M&param.SelectedVie
wId=ZAALD4BSVD4POHPOCANJSX3LQ2M&param.Scenario=AP&param.Selection.P_CITY='Palo Alto'

Example for Multiple values

https://qxl-cust233.dev.sapbydesign.com/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?
app.component=/SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=BPCSCONTB_Q0001&
param.ReportType=RP&param.SelectedVariantId=ZAALD4BSVD4POHPOCANJSX3LQ2M&param.SelectedVie
wId=ZAALD4BSVD4POHPOCANJSX3LQ2M&param.Scenario=AP&param.Selection.P_CITY='Palo
Alto'&param.Selection.P_STATUS='3;2'

Example for Relative selection

https://qxl-cust233.dev.sapbydesign.com/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?
app.component=/SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=CODLEFJ_Q0001&para
m.ReportType=RP&param.SelectedVariantId=&BYD_CURRENT&param.SelectedViewId=CODLEFJ_Q0001_V0
1&param.Scenario=AP&param.Selection.PARAM_START_DATE='Last 365 Days'

Example for Intervals

https://qxl-cust233.dev.sapbydesign.com/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?
app.component=/SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=CODOACTU_Q0001&pa
ram.ReportType=RP&param.SelectedVariantId=&BYD_CURRENT&param.SelectedViewId=ZAALD4C6QUMP
NLG6LYK3RFXXCWY&param.Scenario=AP&param.Selection.PARAM_CLOSING_DATE='[01.12.2015 ..
23.12.2015]'

Example for Greater than queries

https://qxl-cust233.dev.sapbydesign.com/sap/public/ap/ui/repository/SAP_UI/HTML5/client.html?
app.component=/SAP_BYD_TF/Analytics/AnalysisPattern/
ANA_AP_Standalone.QA.uicomponent&app.inport=AnalysisPattern&param.ReportId=CODOACTU_Q0001&pa
ram.ReportType=RP&param.SelectedVariantId=&BYD_CURRENT&param.SelectedViewId=ZAALD4C6QUMP
NLG6LYK3RFXXCWY&param.Scenario=AP&param.Selection.1FCFL64T37BTWV0FT0ERXJ40VY='>2012'

11.2   Integrate Data Using Data Sources

Learn more about the different ways in which you can integrate data using data sources.

Extract Data from Data Sources Using OData [page 208]
    This OData service returns analytics raw data on data source level for a technical user.

Integrate Analytics with an SAP NetWeaver Business Warehouse System [page 209]
    Replicate data from the solution to an existing SAP NetWeaver Business Warehouse (BW) system.

Monitoring Quick Guide [page 225]
    Monitor data sources that have been exposed for data replication to an external SAP NetWeaver
    Business Warehouse (BW) system.

11.2.1 Extract Data from Data Sources Using OData

This OData service returns analytics raw data on data source level for a technical user.

The technical user is generated and managed via a communication arrangement. The main purpose is to replicate SAP Cloud for Customer data to an external system and consume the replicated data there.

> ⓘ Note
>
> Only the data sources, which are exposed to OData can be retrieved by the technical user. The data is limited to raw data.

Steps to Use OData Service:

1. Enable the OData API for Data Sources.
   1. In the *Business Configuration* work center, select your implementation project and click *Edit Project Scope*.
   2. In the questions step, go to ❚▶ *Built-in Services and Support* ❯ *System Management* ❯ *Analytics* ❚.
   3. Under *Analytics Integration*, select the checkbox next to the following question: *Do you want to enable analytical OData services for data sources?*
2. Create a communication arrangement and generate the technical user.
   1. Create a communication arrangement for the communication scenario *Analytics Data Sources ODATA* in the *Communication Arrangements* view of the *Administrator* work center.
   2. Set password for your technical user.

   For more information on how to create a communication arrangement see Create a Communication Arrangement.
3. Expose your data sources.
   1. Navigate to ❚▶ *Business Analytics* ❯ *Design Data Sources* ❚ and choose your data source.
   2. Click *Expose* and select the *Expose for OData* checkbox.
      Note that the *Expose* button is available only if you've followed step 1.
4. Test the OData URL in a new private browser session.
   1. In the *Design Data Sources* view, click *Build OData Queries*.
   2. In the new window, select the attributes and filters for your query.
   3. Click *Generate Metadata Query* or *Generate Data Query* as you require. The system generates and displays a new query in the *OData Query* field.
   4. Log in with your technical user credentials and open the query in a new private browser session to preview your query.

   > ⓘ Note
   >
   > You can also select the data source and click 🔍 to open the related documentation. You'll find the OData URL under *Integration Information*.
5. Replicate raw data to your target system with a technical user.

To replicate the data, you typically need transactional data source and related multiple master data sources. Check the *Referenced Data Sources* tab in the *Design Data Sources* view for a comprehensive view on the related data sources.

Since this service delivers raw data, you must also replicate the needed master data in a separate system and join the transactional sources with master data sources in your target system.

The metadata document contains the necessary information, which is required to rebuild the data model in the target system. This information includes:

- Data-Type information
- Unit/Currency mapping
- ID/Text relationships
- Compounded fields

Conventions Regarding the Exposed OData Service

You can expand the URL depending on the data you want to retrieve.

Metadata Document of an Analytics Service

`https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/Crmsloib.svc/$metadata` returns the metadata of your service.

You can also retrieve a list of all services using the following URL: `https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/`

Example Request Showing the Data

`https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/Crmsloib.svc/Crmsloib?$top=10` returns the first 10 records of your service.

> ⓘ Note
>
> - Allow $Skip only for nonaggregated data.
> - For data replication, add the key fields to the request. Paging is possible only when key fields are requested.
> - Extract data using selection conditions for delta, as full load may not work always. This depends on the data volume and data source design.

11.2.2 Integrate Analytics with an SAP NetWeaver Business Warehouse System

Replicate data from the solution to an existing SAP NetWeaver Business Warehouse (BW) system.

The following documentation describes the series of process steps across two different systems based on preconfigured communication scenarios between the solution and SAP NetWeaver BW. The data replication is done using operational data provisioning (ODP).

Prerequisites

- Relevant SAP Netweaver BW license
- SAP Business Warehouse 7.30, SP8, SAP Business Warehouse 7.40, or SAP Business Warehouse 7.50
- Authorization to use common BW transactions, such as RSA1 and STRUST
  For more information, see Authorizations.

When configuring the integration of your solution with SAP NetWeaver BW, there are dependencies between the activities in the different systems. Perform the procedures in the sequence outlined below.

1. Source System: Implementation Sequence in the Solution [page 210]
2. Target System: Implementation Sequence in the SAP NetWeaver Business Warehouse [page 215]
3. Source System: Expose Data Sources in the Solution [page 218]
4. Target System: Extraction, Transformation and Loading (ETL) Process in the SAP NetWeaver Business Warehouse [page 219]
5. Source System: Monitor Data Replication [page 222]

> ⓘ Note
>
> The Cloud for Customer system supports a maximum of 3 concurrent info package extraction requests. To avoid rejection, ensure that the extraction requests from your BW systems are scheduled accordingly.

11.2.2.1 Source System: Implementation Sequence in the Solution

Procedure

1. Ensure that the *Integration with Central Analytics* business option is included in your solution scope.
   a. To find this business option, open the *Business Configuration* work center and choose the *Implementation Projects* view.
   b. Select your implementation project and click *Edit Project Scope*. The system will open a guided procedure to lead you through the scoping steps.
   c. On the *Country/Region* screen, review the settings and choose *Next*.
   d. On the *Implementation Focus* screen, choose *Next*.
   e. On the *Scoping* screen, choose ▯▶ *Communication and Information Exchange* ❭ *Integration with External Applications and Solutions* ❭ *Integration with Central Analytics* ❭, select the checkbox to set this option in scope, then choose *Next*.
   f. On the *Questions* screen, choose ▯▶ *Communication and Information Exchange* ❭ *Integration with External Applications and Solutions* ❭ *Integration with Central Analytics* ❭, and select the *Do you want to make analytics data from the SAP NetWeaver Business Warehouse system available to your solution?* scoping question.

g. After you have reviewed and confirmed your entries, choose *Finish*.

> ⓘ **Note**
>
> You have defined the scoping of the solution. However, you have not yet deployed the scoping. To deploy the scoping, make sure that you confirm the *Design Accepted* milestone in the activity list of the project. You generally do this after you have completed all your activities. The system will display a message once the deployment is finished. If the milestone was completed earlier, the deployment will be done automatically.

Results:

- The *Analytics Integration* communication scenario is available for creating communication arrangements.
- The *Monitoring* work center view is available as an entry on the *Access Rights* screen when editing the access rights of business users.
- The *Monitoring* work center view is available in the *Business Analytics* work center.
- In the *Design Data Sources* work center view, the *Exposed* column appears in the table. You can expose or not expose data sources accordingly by clicking *Expose*.
  By exposing data sources, you make them available to a SAP NetWeaver BW system for data replication.
- In the *Design Data Sources* work center view, under *Details*, the *Referenced Data Sources* tab page appears. The tab page shows data sources containing master data that is referenced by the selected data source.

2. Create a communication system.

   a. Navigate to ▶ *Administrator* ❯ *General Settings* ❯ *Integration* ❯ and click *Communication Systems*.
   b. In the *Communication Systems* view, click *New*.
   c. In the *Communication System* section, enter the details of the communication system:

   - *ID* is used as the template for the technical user in the communication arrangement.
   - *Host Name* has to be supplied, but is not used.
   - For the *System Access Type*, select *Internet*.

   d. When you have entered all the details, click *Save and Close* to return to the Communication Systems view. The communication system you just created has the status *In Preparation*.
   e. In the *Communication Systems* view, select the communication system you have created and click *Actions*, then choose *Set to Active*.

   If the status changes to *Active*, the configuration is ready to be used.

3. Create a communication arrangement.

   a. Navigate to ▶ *Administrator* ❯ *General Settings* ❯ *Integration* ❯ and click *Communication Arrangements*.
   b. To open the *New Communication Arrangement* guided activity, in the *Communication Arrangements* view, click *New*.
   c. In the *Select Scenario* step, select *Analytics Integration* and click *Next*.
   d. In the *Define Business Data* step, enter business data.

   In the *System Instance ID* field, choose or enter the communication system ID that you created.

e. In the *Define Technical Data* step, define the technical settings for inbound and outbound communication.

- In the *Application Protocol* field, choose *Web Service*.
- Choose the relevant entry from the *Authentication Method* field.
  Depending on the authentication method that you have agreed on with the SAP NetWeaver BW administrator, you need to define the credentials of the communication user as described in the following table. The user ID of the communication user is created automatically.
  Using user ID and password as an authentication method is in general less secure than SSL client certificates since the information must be shared in order to create a communication arrangement.
  If you choose to use PKCS#12 key pair file as SSL client certificate authentication method, you must download a new PKCS#12 key pair file once the existing one expires after a specified period of time, The BW administrator must import the new PKCS#12 key pair file and override the existing imported one.
  If you decide to use user ID and password as the authentication method, ensure that it is accordance with the security requirements of your company. Note that in order to avoid downtime, you must update the passwords in both systems at the same time.
  Next to the *User ID* field, click *Edit Credentials*.

Authentication Method	Settings
SSL Client Certificate	If you use this authentication method, you need to upload the public key certificate that has been provided by your SAP NetWeaver BW administrator.

To **upload a public key certificate**, perform the following steps:

1. Choose *Certificate*.
2. Click *Upload Certificate* and choose the relevant certificate.

If your SAP NetWeaver BW administrator cannot provide a certificate, you can create and download a PKCS#12 key pair file. The PKCS#12 file is password encrypted and contains a public key certificate and a private key.

> ⓘ Note
>
> Note that you have to provide your SAP NetWeaver BW administrator with the PKCS#12 file and the corresponding password.

To create a PKCS#12 key pair file, perform the following steps:

1. Choose *Certificate*.
2. Click *Create and Download Key Pair*.
3. Define a name for the PKCS#12 file and save it.
4. Define a password for the PKCS#12 file and click *OK*. |
| *User ID and Password* | If you use this authentication method, you need to define a password. The user ID is automatically predefined.

Perform the following steps:

1. Choose *Change Password*.
2. Enter a password and confirm it.

Note that you have to provide your SAP NetWeaver BW administrator with the user ID and password. |

    f. Note the authentication method and corresponding information for reference; they are required for setting up communication between SAP NetWeaver BW and the solution; the SAP NetWeaver BW administrator requires the information.

4. Download a Web Services Description Language (WSDL) file.

    The WSDL file is used to set up a Web service in the SOA Manager of the target BW system.

a. Navigate to ▐ *Administrator* ❯ *General Settings* ❯ *Integration* ▐ and click *Communication Arrangements*.

b. Choose the relevant communication arrangement and click *Edit*.

c. Click the *Technical Data* tab page.

d. Click *Edit Advanced Settings*.

e. Click *Download WSDL*.

f. Name and save the WSDL file; the file is required for setting up communication between SAP NetWeaver BW and the solution; the SAP NetWeaver BW administrator requires the file.

5. Ensure that the solution URL is a trusted site.

   You can check whether the solution URL is a trusted site by, for example, checking the security report or by checking the list of trusted sites of the Web browser.

6. Export the relevant certificates from the Web browser.

   The certificates are required to create a secure connection between the SAP NetWeaver BW system and the solution; the SAP NetWeaver BW administrator requires the certificates.

   You can often find export functions under the tool options of the Web browser. Depending on the Web browser, you might need to run the browser as an administrator to export the certificate. You might also need to import the certificate before exporting it. .

   Export the root certificates from the Web browser independent of the authentication method you have chosen. To do this, follow the steps below:

   > ⊙ Note
   >
   > The steps mentioned below may vary depending on your browser. For detailed information about importing and exporting certificates for your specific web browser, see the documentation of the browser that you are using.

   1. Go to your browser and click the lock sign
   2. Click *Details* and then click *View Certificates* Note that depending on the browser you are using, you might get the *View Certificates* option directly.
   3. Select the *Certification Path* tab.
   4. Select the root and click V*iew Certificate*.
   5. Go to the *Details* tab, click *Copy to File* and then click *Next*.
   6. Select *Base-64 Encoded X-509 (.CER)*
   7. Click Next
   8. Provide a file name and save it on your local system.
      You will receive a message that your file is exported.
      Click *Finish*.

   You must now import the certificate file to the BW system. To do this, follow the steps in

7. Assign the *Monitoring* work center view to the relevant administrators.

   a. Navigate to ▐ *Administrator* ❯ *General Settings* ❯ *Users* ▐ and choose *Business Users*.

   b. Select the relevant business users, then click *Edit*, and choose *Access Rights*.

   c. Select the *Monitoring* view of the *Business Analytics* work center and save your changes.

      Note that the user must log on again to view the changes in the authorization.

11.2.2.2 Checklist of Information for SAP NetWeaver BW Administrator

The administrator of the solution must provide the following information, as created from the steps above, to the SAP NetWeaver BW administrator:

- If you have chosen to use SSL client certificate as the authentication method:
  - WSDL file
  - Global Root certificate
  - Cybertrust SureServer Standard Validation CA certificate
  - PKCS#12 key pair (if your SAP Netweaver BW administrator cannot provide a certificate)
- If you have chosen user ID and password as the authentication method:
  - Technical user ID and password
  - WSDL file
  - Global Root certificate
  - Cybertrust SureServer Standard Validation CA certificate

11.2.2.3 Target System: Implementation Sequence in the SAP NetWeaver Business Warehouse

Context

> ⓘ Note
>
> Before importing the certificates to the SAP NetWeaver system, determine whether the release of your SAP NetWeaver BW system supports `.p12` as a Personal Security Environment (PSE) file type.
>
> If it does not, you must download the SAPGENPSE cryptography tool as part of SAP cryptographic software in order to convert the file type of the certificates to `.pse`.
>
> For more information, see Downloading the SAP Cryptographic Library and Configuring SAPGENPSE for Use.

Use the following procedure if the target system is SAP Business Warehouse 7.30, SP8.

Procedure

1. Import certificates to the SAP NetWeaver BW system. Call transaction STRUST.

- Under SSL client certificate, if you are using **public key certificate** as the authentication method:
    1. You have the *SSLC/DFAULT* identity available, import the Global Root certificate and the Cybertrust SureServer Standard Validation CA certificates to the identity folder.
    If the identity folder, is not available, we recommend creating a new identity SSL client identity. From *Environment*, choose the *SSL Client Identity* entry.
    From the PSE status frame (left frame), double-click the relevant identity folder.
    2. Under *Certificate*, click the import certificate icon.
    3. Add the Global Root certificate and the Cybertrust SureServer Standard Validation CA certificate that you exported from the solution to the certificate list.
    4. Save your changes.
- Under SSL client certificate, if you are using **PKCS#12** as the authentication method:
    1. From *PSE*, choose *Import*.
    2. Select the relevant key pair file.
    3. From *PSE*, choose *Save As*.
    4. Select the relevant PSE, for example, SSLC/DFAULT.
    5. Save your changes.
    Result: The key pair file certificate is displayed in the *Own Certificates* pane.
- If you have chosen **user ID and password** as authentication method
    1. You have the *SSLC/ANONYM* identity available, import the Global Root certificate and the Cybertrust SureServer Standard Validation CA certificates to the identity folder. If the identity folder, is not available, we recommend creating a new identity SSL client identity. From *Environment*, choose the *SSL Client Identity* entry.
    2. Under *Certificate*, click the import certificate icon.
    3. Add the Global Root certificate that you exported from the solution to the certificate list.
    4. Save your changes.

2. Ensure that the application SOAP management service is activated.

   To ensure that ODP can be activated in SOA Manager, you must ensure that the corresponding Web service for SOA Manager is activated. For more information, see Internet Communication Framework .

   a. Call transaction SICF.
   b. Ensure that SERVICE is entry in the *Hierarchy Type* field.
   c. Click the execute icon.
   d. In the Service field, enter `APPL_SOAP_MANAGEMENT`.
   e. Click *Apply*.

      The service appears in the *Virtual Hosts / Services* hierarchy.
   f. Ensure that the service is activated. For more information, see Activating and Deactivating ICF Services.

3. Add Operational Data Provisioning (ODP) as a source system.

   Using the ODP framework, you can replicate data from SAP repositories to a SAP NetWeaver BW system.

   > ⓘ **Note**
   >
   > Note that ODP does not support real-time data acquisition, hierarchies, nor VirtualProviders based on a data transfer process.

   a. Call transaction rsa1 and check if ODP is available as a source system under *Source Systems* in the *Modeling* view.

If ODP does not appear as a source system, complete the following steps:

1. Call transaction se38.
2. Run report SAP_RSADMIN_MAINTAIN.
3. In the *Object* field, enter `ODP`.
4. In the *Value* field, enter `x`.
5. Click the execute icon.
   In *Modeling* view of the *Data Warehousing Workbench*, the system creates ODP under *Source Systems*.

4. Create an ODP source system.

   a. Call transaction rsa1.
   b. Click ▶ *Modeling* ▶ *Source Systems* ▮, and from the context menu of *ODP*, click *Create*.
   c. In the *Logical System Name* field, enter a technical name for the source system.
   d. In the *Source System Name* field, enter a name for the source system.
   e. Click the continue icon.
   f. On the *Select Communication Channel* screen, click *HTTP/SOAP*.
   g. On the *Web Service Configuration* screen, click *SOA Manager*.
   h. On the following logon screen, enter your SAP NetWeaver BW user ID and password.

5. Configure logical port for the consumer proxy in SOA Manager.

   For each source system, a consumer proxy is generated, for example, CO_RSDSPX_ODP_IN .

   To configure a consumer proxy to access the Web service of the solution, you need to create and configure one or more logical ports. A logical port references an endpoint, which is available at a unique location in the solution system. You can create one or more logical ports for the same consumer proxy.

   For more information about the SOA Manager, see Working with SOA Manager.

   a. In the SOA Manager, select the relevant consumer proxy and click *Apply Selection*.
   b. Go to the *Configurations* tab page.
   c. Click *Create*.
   d. On the SOA Management screen, enter the logical port name in the *Logical Port Name* field.

   > ⓘ Note
   >
   > Note that the logical port name must be the same as you entered for the ODP source system in the Data Warehousing Workbench.

   e. For the configuration type, choose *WSDL Based Configuration*.
   f. For the WSDL base, choose *Via File*.
   g. Load the WSDL file that you downloaded from the solution and click *Apply Settings*.
   h. On the following screen click *Apply Settings*.
   i. Under *Configuration of Logical Port*, on the *Consumer Security* tab page, enter the user name and password that have been created in the solution for the technical user in the communication arrangement.
   j. On the *Transport Settings* tab page, ensure if the proxy settings are correct. Check whether there are entries in the *Name of Proxy Host* and *Port Number of Proxy Host* fields.
   k. Ensure that the for the *Maximum Wait for WS Consumer* field, the value is set to `900`. For more information see Configuring a Consumer Proxy .
   l. Click *Save*.

m. To check whether the settings you made are correct, on the *Configurations* tab page, click *Ping Web Service*.

The SAP NetWeaver BW system calls the Web service of the solution.

If unsuccessful, the following errors might occur. Possible solutions to the corresponding error are provided.

- `Error when calling SOAP Runtime functions: SRT: HTTP-Code 500: ("SRT: Unexpected failure in SOAP processing occurred: ("No Web service)`
  The password of the technical user for the solution might no longer be valid.
- `Error when calling SOAP Runtime functions: SRT: Unsupported xstream found: ("HTTP Code 401 : Unauthorized")`
  The technical user of the solution might be locked.
- `SRT Framework exception. Service Ping ERROR: Error when calling SOAP Runtime functions: SRT: Processing error in Internet Communication Framework: ("ICF Error when receiving the response: ICM_HTTP_SSL_ERROR")`
  The Global Root certificate has not been imported.
- `SRT Framework exception: Service Ping ERROR: Error when calling SOAP Runtime functions: SRT: Processing error in Internet Communication Framework: ("ICF Error when receiving the response: ICM_HTTP_CONNECTION_FAILED")`
  The proxy may not be valid or not entered. Check your proxy settings.

n. If successful, go back to the SAP NetWeaver BW system and for the ODP source system, right mouse click the ODP source system, and click *Check*.

The system checks and saves the ODP source system.

o. Close the SOA Manager.

If your target system is SAP Business Warehouse 7.40, then refer to the following documentation: Creating an ODP Source System. Please note that the ODP folder decision made in this document needs to be "ODP-SAP Business ByDesign."

11.2.2.4 Source System: Expose Data Sources in the Solution

In the *Design Data Sources* work center view, administrators for Analytics can expose or not expose data sources for data replication accordingly. To expose or hide data sources for data replication, click *Expose* and choose the relevant entry.

Expose as transactional data or master data

On the screen that appears, you can choose whether to expose the data source as a master data, as a transaction data source, or both in the SAP NetWeaver BW system. Your choice only affects how the data source is maintained in the BW system and how the data source is called by the Web service.

> ⓘ Note
>
> **Example**

The following is an example of the Web service.

P is for master data.

F is for transactional data.

If exposed as master data:

> {·} Sample Code

```
<NodeStructure>
<NodeID>/MOM/JOB$P </NodeID>
<Description>Job Master Data</Description>
<SemanticsCode>P </SemanticsCode>
<DisplayID>/MOM/JOB</DisplayID>
</NodeStructure>
```

If exposed as master data and as transactional data:

> {·} Sample Code

```
<NodeStructure>
<NodeID>/MOM/JOB$P</NodeID>
<Description>Job Master Data</Description>
<SemanticsCode>P</SemanticsCode>
<DisplayID>/MOM/JOB</DisplayID>
</NodeStructure>
<NodeStructure>
<NodeID>/MOM/JOB$F</NodeID>
<Description>Job Master Data</Description>
<SemanticsCode>F</SemanticsCode>
<DisplayID>/MOM/JOB</DisplayID>
</NodeStructure>
```

For data sources that you expose, ensure that you also expose data sources that contain master data that is referenced by the selected data source.

You can find a list of referenced data sources for the data source to be exposed under *Details* on the *Referenced Data Sources* tab page.

11.2.2.5 Target System: Extraction, Transformation and Loading (ETL) Process in the SAP NetWeaver Business Warehouse

Context

In the SAP NetWeaver BW system, you prepare the system to use the replicated data from the solution source system.

The SAP NetWeaver BW administrator can define the objects and data flow modeling to support company reporting requirements. Note that the steps outlined below are meant as an example.

Procedure

1. Create an InfoArea for objects containing source system data.

   You can create an InfoArea for the InfoCubes, DataStore objects and InfoObjects by which the objects can be grouped.

2. Create an application component.

   Create application component to group your data sources, for example, ByD_Data_Sources_01.

3. Create a DataSource

   We recommend creating a DataSource for each solution system and solution data source. For example, BPARTNER_QLCCLNT901.

   The DataSource type is transactional data even in the case of SAP NetWeaver master data.

   For more information, see DataSource .

   a. Maintain *GeneralInfo*. tab page.
   b. Maintain *Extraction* tab page.

      Ensure that the following values are set for the corresponding fields.

Field	Value
Delta Process	*Delta Only Via Full Upload (ODS or InfoPackage Selection)*
Direct Access	*No DTP Allowed for Direct Access*
	ODP source systems do not support direct access using the data transfer process (DTP) for data replication.
Real-Time	*Real-Time Data Acquisition Is Not Supported*
	The field is read-only.
	ODP source systems do not support real-time data acquisition.
Adapter	*Extraction from SAP System by Operational Data Provisioning*
Operational Data Provider	Exposed data sources from the solution system that is connected to the ODP source system are displayed as operational data providers.
	Choose the relevant exposed data source.

   c. Maintain *Proposal* tab page.

This tab page shows you the data structure of the source data source. Decide which fields you require in the data target and how the data target is to be set up to fulfil reporting requirements. Clarify whether the data source contains the required fields.

> ⓘ Note
>
> On the *Fields* tab page, in the *Transfer* column, the relevant fields of the data source can be selected when creating or changing the data source.

Take note of the *Key Field* column. You choose the corresponding fields and/or their corresponding UUID in rows as primary keys in the data targets. Note that data targets of type InfoObject (required for master data) may only have one primary key only whereas DataStore Objects (DSO), which mainly correspond to source data sources based on transactional documents, may have multiple primary keys.

d. Preview the data.

On the *Preview* tab page, you can view the data as available from the solution source system. Note that you have to activate the data source to preview the data; you can ignore yellow warning messages.

4. Check, maintain, and create InfoObjects.

For more information, see Creating Information Objects in the Info Object List.

Each field in the solution data source has to be mapped to an InfoObject of an InfoCube, DataStore Object, or SAP NetWeaver master data table. Check whether the target InfoObjects exist in the SAP NetWeaver BW system and whether the data type formats match.

> ⓘ Note
>
> Data extraction often fails, for example, because the *lowercase letters* indicator is not set in the target characteristic.

Note that you can also use *Generate Data Flow* to create InfoObjects, but you should have a convention for naming the InfoObjects. It might be necessary to adapt the automatically generated InfoObjects; for example, you may still have to set the *lowercase letters* indicator.

5. Generate data flow for transactional data sources from the source system.

Transactional data sources from the source system refer to business documents, such as sales orders. They usually contain UUIDs of underlying master data, such as the UUIDs of products or business partners. For transaction data sources, the preliminary data target in SAP NetWeaver BW is the DataStore Object (DSO). The *Generate Data Flow* function enables you to create a draft of the transformation and data transfer process. You can make changes accordingly.

When you manually create a data transfer process for DataSources note that the extraction mode must be full and the *Do not extract from PSA* indicator must be set.

> ⓘ Note
>
> When you create the data transfer process by generating the data flow automatically note that these are not the default settings. You must change and reactivate the data transfer process accordingly in case of automated generation.

You can also extract data from multiple solution systems into the same DataStore object.

Example of Data Flow

The following figure provides an example of how the data flow can be set up in the SAP NetWeaver BW system. Note that the example is meant to depict a possible data flow and possible modeling.
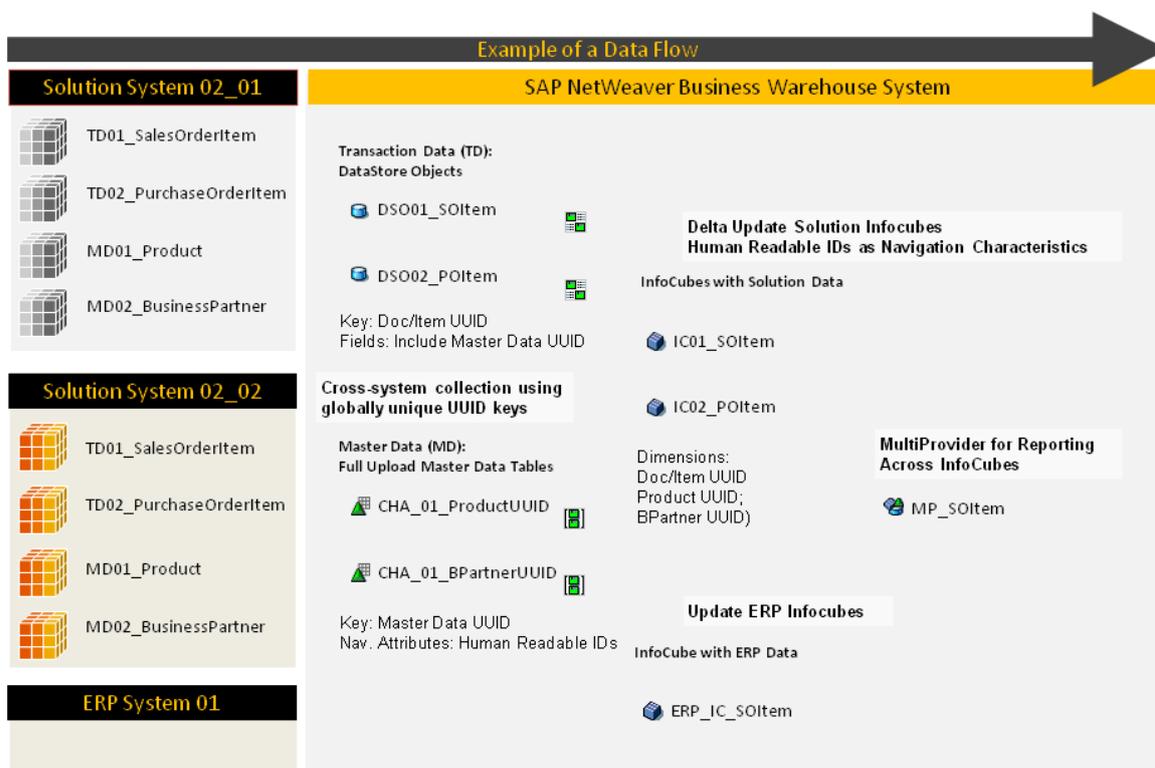
Example of a data flow

11.2.2.6 Source System: Monitor Data Replication

Administrators for Analytics can monitor the status of the data replication runs from the SAP NetWeaver BW system against data sources that are exposed in the solution.

When the SAP NetWeaver BW administrator initiates a data replication run against the exposed data sources in the solution, the solution system creates an entry in the table of the *Monitoring* work center view in the *Business Analytics* work center.

For more information, see Monitoring Quick Guide [page 225].

> ⓘ Note
>
> For example, the solution system creates an entry when the SAP NetWeaver BW administrator executes the following actions:
>
> - Previews data of a DataSource in the SAP NetWeaver BW system by clicking *Read Preview Data* on the *Preview* tab page of a DataSource.
> - Executes a data transfer process for a target object.

Note that the system not does recognize the SAP NetWeaver BW administrator as the creator of the replication run in the *Replicated By* field, but rather the technical user that is created for the communication arrangement that is used to communicate with the SAP NetWeaver BW system.

11.2.2.7 Pagination During ETL Process in Operational Data Provisioning

Apply pagination and extract data in packages using the Open-Fetch-Close-Pattern. This helps to avoid memory dumps while extracting large amount of data.

To enable pagination, you must do the following:

- Apply SAP Note Number 2346390 in your SAP Netweaver BW system.
- Reactivate the communication arrangement in your SAP Cloud for Customer system. To do this, navigate to ▌ *Administrator* ❯ *Communication Arrangements* ❯, select an arrangement, and click *Reactivate*.

> ⓘ Note
>
> - When you enable the pagination method, the system applies it automatically to all data sources. It is not possible to apply this method at an individual data source level.
> - Cloud for Customer does not support pagination for Join, Virtual, and Cloud types of data source, either directly, or as an underlying member. These data sources are extracted as before.
> - Using pagination, you can extract up to 2 million records with a single call from the SAP Netweaver BW system. The maximum number of records extracted might increase or decrease depending on the number of characteristics and key figures in a data source. If there are more records in your data source, you can pass selections to restrict the amount of data.
> - Extraction using pagination takes longer than the direct method because this method executes a background job (to collect and pass data) in the source system.
> - You can revert to the direct method of extraction using the steps mentioned in SAP Note 2346390.
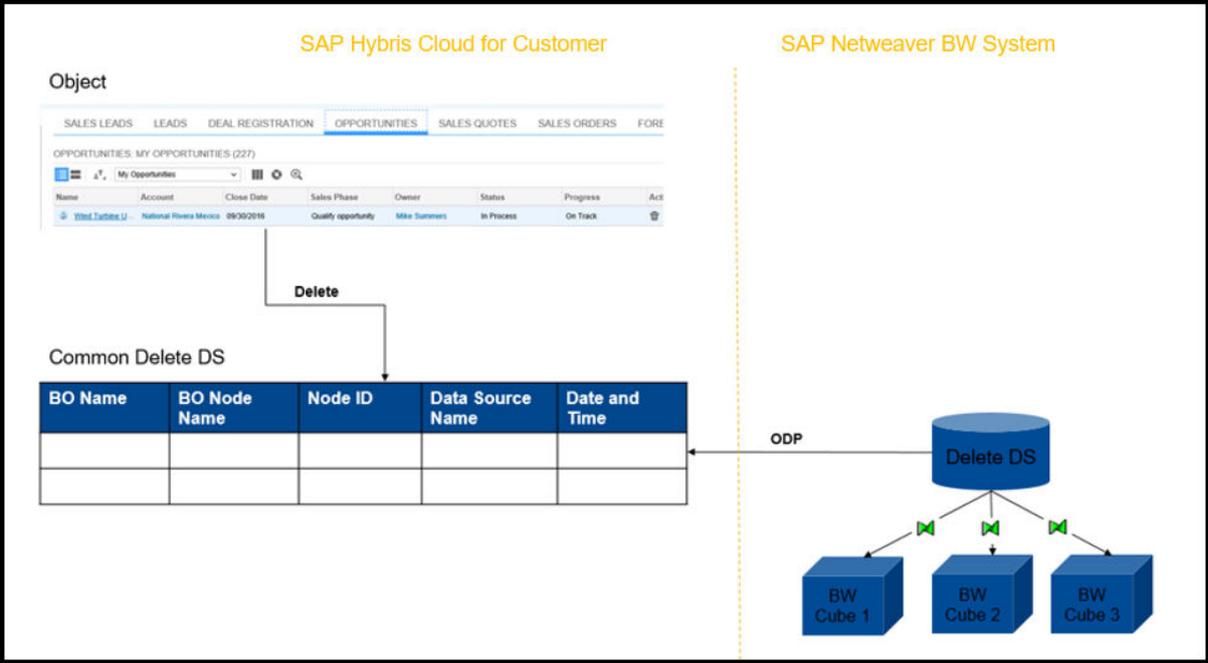
Related Information

Target System: Extraction, Transformation and Loading (ETL) Process in the SAP NetWeaver Business Warehouse [page 219]

11.2.2.8 Deletion of Records Using Operational Data Provisioning

Analytics in SAP Cloud for Customer system run on real-time data, which can be replicated in the SAP NetWeaver BW system through ODP integration. Therefore, deletion of any data in the SAP Cloud for Customer system can lead to inconsistencies in the already extracted data in SAP NetWeaver BW system. You can extract details about records that are deleted in theSAP Cloud for Customer system from the *Deleted Data (ODP*

Integration) data source, and use it to clean-up your data sources in the SAP NetWeaver BW system so that the reports are consistent in both the systems.

The following figure illustrates how this scenario works:

Procedure

Perform the following steps to extract data from this data source:

1. In the source system, expose data source *Deleted Data (ODP Integration)* by following the steps mentioned in Source System: Expose Data Sources in the Solution [page 218]
2. In the target system, extract data from this data source by following the steps mentioned in Target System: Extraction, Transformation and Loading (ETL) Process in the SAP NetWeaver Business Warehouse [page 219]

> ⓘ Note
>
> - SAP Cloud for Customer system makes deleted records available for extraction through this data source. Customer's BW administrator is responsible for transferring this data to BW to maintain data consistency.
> - The data source contains deleted records of only those data sources that are exposed through Operational Data Provisioning (ODP).
> - Capturing deleted records details are not supported for data source of type Join, Virtual, and Cloud. This is true even in scenarios where one of the underlying data source is of these type.
> - SAP Cloud for Customersystem stores the deleted data for 45 days only. You must extract this data before the stipulated time frame, post which the information will get lost.

Deleted Data Source Fields Overview

The following tables gives an overview of the fields in the data source *Deleted Data (ODP Integration)*

Field Name	Field ID	Field Type	Comments
Data Source	MDAV_NAME	Characteristic	Deleted Data (ODP Integration) Data Source ID i.e. ANAODPDELV
Data Source ODP Alias	ODP_ALIAS	Characteristic	Data Source ODP ID (as shown in the SAP NetWeaver BW system) of the Data Source for which deleted records detail are captured.
Involved Data Source	REF_0MDAV	Characteristic	Underlying Basic Data Source ID of a Union Data Source. This will be empty if the exposed Data Source is a Basic Data Source
BO Name	BO_NAME	Characteristic	BO Name from which the record is deleted in the SAP Cloud for Customer system
BO Node Name	BO_NODE_NAME	Characteristic	BO Node from which the record is deleted in theSAP Cloud for Customer system
Deleted Node ID	BO_NODE_ID	Characteristic	Node ID of the record which was deleted in the SAP Cloud for Customer system
Deletion Date/Time	DEL_DAT_TIM	Characteristic	Timestamp when the record was deleted in the SAP Cloud for Customersystem
Counter	0COUNT	Characteristic	

11.2.3 Monitoring Quick Guide

Monitor data sources that have been exposed for data replication to an external SAP NetWeaver Business Warehouse (BW) system.

You can access the *Monitoring* view from the *Business Analytics* work center.

Exposing data sources for data replication to an external SAP NetWeaver BW system is useful, for example, when a parent company, which runs an SAP ERP system, wants to create and run reports on the data gathered

from its subsidiary companies, which run the solution. The data from data sources in the solution is replicated to the SAP NetWeaver BW system of the parent company.

Tasks

You can perform the following tasks in this view:

- **Expose Data Sources in the Design Data Sources Work Center View**
  In the *Design Data Sources* work center view, administrators can expose or not expose data sources for data replication accordingly. To expose or hide data sources for data replication, click *Expose* and choose the relevant entry.

  > ⓘ Note
  >
  > - The *Expose* button is disabled for **Cloud Data Sources** and **Joined Data Sources**. For joined data sources, you should expose the underlined join members
  > - For data sources that you expose, ensure that you also expose data sources that contain master data that is referenced by the selected data source.
  >   You can find a list of any referenced data sources for the data source to be exposed under *Details* on the *Referenced Data Sources* tab page.

- **Monitor the Replication of Data of Exposed Data Sources**
  You can monitor the status of the data replication runs from the SAP NetWeaver BW system against data sources that are exposed in the solution.
  When the SAP NetWeaver BW administrator initiates a data replication run against the exposed data sources in the solution, the solution system creates an entry in the table of the *Monitoring* work center view.

  > ⓘ Note
  >
  > For example, the SAP NetWeaver BW administrator previews data of a DataSource in the SAP NetWeaver BW system by clicking *Read Preview Data* on the *Preview* tab page of a DataSource. The solution system creates an entry accordingly.
  >
  > Note that the system not does recognize the SAP NetWeaver BW administrator as the creator of the replication run in the *Replicated By* field, but rather the technical user that is created for the communication arrangement that is used to communicate with the SAP NetWeaver BW system.

  When you monitor the status of replication runs against data sources that are exposed in the solution, the following statuses are possible:

Status	Description
OK	The run is successful.
Open	The run is not yet complete.

Status	Description
Errors	The run cannot be completed. You can check the log of the run by selecting the relevant entry and clicking *Details*.

Possible reasons for errors are:

- The relevant data source is no longer exposed. Check in the *Design Data Sources* work center view if the data source is still exposed.
- The SAP NetWeaver BW administrator stopped the run.
- A technical error has occurred either in the SAP NetWeaver BW system.
- The fine-tune activity for the function is no longer in scope for the solution.

11.3 Retrieve Analytics Data Using OData

Use the Open Data Protocol (OData) service (/sap/c4c/odata) for SAP Cloud for Customer to retrieve the available analytics data.

There are two different APIs to retrieve the analytics data:

- OData API for Reports
- OData API for Data Sources

For information about OData, see http://www.odata.org ↗ .

    This OData service returns highly aggregated and preprocessed analytics data for the logged on user.

    This OData service returns analytics raw data on data source level for a technical user.

11.3.1 Extract Report Data Using OData

This OData service returns highly aggregated and preprocessed analytics data for the logged on user.

You can retrieve reports that are available in the *Reports* work center view of the work centers assigned to the logged on user. You can also retrieve the characteristics and key figures of reports.

SAPData

SAPData is an extra metadata that can be found in the metadata of the service. SAPData contains labels, annotations, and so on. You can access it via SAP proxy generators.

Examples

```
-<Entity Type
Name="RPMATERIAL_Q0001QueryResult" sap:semantics="aggregate"sap:label="New
Materials"xmls:sap="http://www.sap.com/Protocols/SAPData">
<Property
Name="CCRTA_DATE" Type="Edm.DataTime" Nullable="true" sap:label="Created On
ID" sap:aggregation-role="dimension" sap:filterable="true" />
```

Conventions for Building OData Services for the SAP Solution

You can expand the URL depending on the data you want to retrieve.

- **Available OData Services**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata` returns a list of SAP data protocol services, representing the work centers assigned to the logged on user.
  Analytics data is available for services with the convention <shortened name of work center>_analytics.svc.
  Note the following information for the specified services:

  - `cc_home_analytics.svc`returns all reports available to the logon user as a business user, including reports that have been personalized.

  - `ana_businessanalytics_analytics.svc` returns all reports available to the logon user as an administrator, excluding reports that have been personalized.

  > ⓘ Note
  >
  > OData Services are **only accessible for the business users**, and not technical users.

- **Metadata Document of an Analytics Service**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/ <shortened name of work center>_analytics.svc/$metadata` returns the reports assigned to the specified work center along with the corresponding fields in the reports.

  > ⓘ Note
  >
  > If you are unable to retrieve a specific report via OData, check if the report is assigned to a work center.
  >
  > You can check the report assignment status either by looking into the report list of the specific work center or from the Design reports view on the Business Analytics work center.

- **Data of a Report**
  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/ <shortened name of work center>_analytics.svc/RP<report ID>QueryResults` returns the first 50 lines of data of the specified report

  > ⓘ Note
  >
  > - Due to technical limitation, only up to 50 key figures and characteristics can be selected. We recommend that you select data explicitly for the needed fields.

This approach has the following benefits:
- Better performance
- Controlled Memory Consumption (a maximum of 2GB data can be downloaded and this limit may get exhausted if non-relevant fields are also selected in the data, hence consuming memory)

- Report execution through OData requests always gets executed only for initial selection, that is, the parameters, which are maintained in the report metadata. You cannot pass views and variants.
- Using OData filters (for example: `$filter=CDPY_MAINPROSPCT_ID eq '1001145'`), you cannot overrule the parameter values in the initial selection. You can apply filters on the data retrieved based on the initial selection.
- You have an option to pass OData parameter values (for example: `$filter=PAR_SEL_DPY_MAINPROSPCT_ID eq '1001140'`). These overrule the existing parameter values in the initial selection. The remaining parameter values, if any, in initial selection, would still apply.
- Personalized fields that have been added through the *Add Fields* option are supported as selection drill down, as well as filters. This includes master data attributes.
- You cannot pass relative selects as values for OData parameters and filters.
- Personalized parameters and parameters of hierarchy type are not supported.

- **Supported Query Options**

  For the following supported query options, the example base of the URI is the same:

  Example: `https://<your system information>.sapbydesign.com/sap/c4c/odata/<shortened name of work center>_analytics.svc/RP<report ID>QueryResults?`

  - $select

    Expansion: $select=<one or more specified characteristics separated by commas>

  - $orderby (ascending)

    Expansion: $orderby=<one or more specified characteristics followed by **asc**, separated by commas>

  - $orderby (descending)

    Expansion: $orderby=<one or more specified characteristics followed by **desc**, separated by commas>

  - totals

    Expansion: $totals=<one or more specified characteristics separated by commas>

  - $filter

    Expansion: $filter=<specified characteristic> **eq** '<filter value>'

  - $top

    Expansion: $top=<specified number>

  - $inlinecount

    Expansion: $ inlinecount = <Flag>

    This query provides the total number of results rows for ODATA. It may be different that the count key figure seen on the report.

Limitations

The following analytical features are not supported with OData:

- Variables and variants
- Unit/currency determination for metadata when formulas or nested reuse key figure composite are used
- Master data for unit/currency, associations to unit/currency
- Hierarchies
- Characteristic structure

> ⓘ Note
>
> Only the following use cases are supported for characteristics structure:
>
> - In metadata: Characteristic structure is exposed as a characteristic which needs to be filtered to a single value.
> - In data retrieval: Characteristic structure is either filtered to a single value or is among the requested fields.

11.3.2 Extract Data from Data Sources Using OData

This OData service returns analytics raw data on data source level for a technical user.

The technical user is generated and managed via a communication arrangement. The main purpose is to replicate SAP Cloud for Customer data to an external system and consume the replicated data there.

> ⓘ Note
>
> Only the data sources, which are exposed to OData can be retrieved by the technical user. The data is limited to raw data.

Steps to Use OData Service:

1. Enable the OData API for Data Sources.
   1. In the *Business Configuration* work center, select your implementation project and click *Edit Project Scope*.
   2. In the questions step, go to ▶ *Built-in Services and Support* ❯ *System Management* ❯ *Analytics* ❯.
   3. Under *Analytics Integration*, select the checkbox next to the following question: *Do you want to enable analytical OData services for data sources?*
2. Create a communication arrangement and generate the technical user.
   1. Create a communication arrangement for the communication scenario *Analytics Data Sources ODATA* in the *Communication Arrangements* view of the *Administrator* work center.
   2. Set password for your technical user.

   For more information on how to create a communication arrangement see Create a Communication Arrangement.

3. Expose your data sources.
   1. Navigate to ▌▶ *Business Analytics* ❯ *Design Data Sources* ▌ and choose your data source.
   2. Click *Expose* and select the *Expose for OData* checkbox.
      Note that the *Expose* button is available only if you've followed step 1.
4. Test the OData URL in a new private browser session.
   1. In the *Design Data Sources* view, click *Build OData Queries*.
   2. In the new window, select the attributes and filters for your query.
   3. Click *Generate Metadata Query* or *Generate Data Query* as you require. The system generates and displays a new query in the *OData Query* field.
   4. Log in with your technical user credentials and open the query in a new private browser session to preview your query.

> ⓘ Note
>
> You can also select the data source and click 🔍 to open the related documentation. You'll find the OData URL under *Integration Information*.

5. Replicate raw data to your target system with a technical user.
   To replicate the data, you typically need transactional data source and related multiple master data sources. Check the *Referenced Data Sources* tab in the *Design Data Sources* view for a comprehensive view on the related data sources.
   Since this service delivers raw data, you must also replicate the needed master data in a separate system and join the transactional sources with master data sources in your target system.
   The metadata document contains the necessary information, which is required to rebuild the data model in the target system. This information includes:
   - Data-Type information
   - Unit/Currency mapping
   - ID/Text relationships
   - Compounded fields

Conventions Regarding the Exposed OData Service

You can expand the URL depending on the data you want to retrieve.

Metadata Document of an Analytics Service

```
https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/
Crmsloib.svc/$metadata
```
returns the metadata of your service.

You can also retrieve a list of all services using the following URL: `https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/`

Example Request Showing the Data

```
https://<your system information>.sapbydesign.com/sap/c4c/odata/analytics/ds/
Crmsloib.svc/Crmsloib?$top=10
```
returns the first 10 records of your service.

> ⓘ Note
>
> - Allow $Skip only for nonaggregated data.
> - For data replication, add the key fields to the request. Paging is possible only when key fields are requested.
> - Extract data using selection conditions for delta, as full load may not work always. This depends on the data volume and data source design.

12 Integration with SAP Analytics Cloud

This section provides you an overview of the different methods of integration with SAP Analytics Cloud.

You can integrate SAP Cloud for Customer with SAP Analytics Cloud in the following ways:

- Integration Using ODATA Services [page 233]
- Integration with SAP Analytics Cloud, Embedded Edition [page 233]

12.1 Integration Using ODATA Services

Integrate SAP Cloud for Customer with SAP Analytics Cloud.

You can integrate the following ODATA services provided by SAP Cloud for Customer:

- **SAP Cloud for Customer Analytics**: Use this service to access all the SAP Cloud for Customer reports directly for the corresponding business user in SAP Analytics Cloud. For more information, see Retrieve Analytics Data Using OData [page 227].
  To set up an integration between SAP Cloud for Customer and SAP Analytics Cloud, see Import Data Connection to SAP Cloud for Customer.
- **SAP Cloud for Customer**: Use this service to integrate all non analytical models. For more information, see SAP Cloud for Customer OData API.

> ⓘ Note
>
> You can import only acquired data with SAP Analytics Cloud.

12.2 Integration with SAP Analytics Cloud, Embedded Edition

The real-time integration between SAP Cloud for Customer and SAP Analytics Cloud (SAC) enables you to use the analytical features that SAC provides when embedded in the Cloud for Customer solution.

> ⓘ Note
>
> SAC tenants aren't provisioned automatically. You must request for activation by raising an incident on the `AP-RC-ANA-SAC` component.

Enable SAC Features in SAP Cloud for Customer

To enable the usage of embedded SAC features in SAP Cloud for Customer:

1. In the *Business Configuration* work center, select your implementation project and click *Edit Project Scope*.

2. In the questions step, go to ▶ *Built-in Services and Support* ❯ *System Management* ❯ *Analytics* ◗.

3. Under *Analytics Integration*, select the checkbox next to the following question: *Do you want to use embedded SAP Analytics Cloud (SAC) features in SAP Cloud for Customer?*

Enable Single Sign-On for SAC

To enable Single Sign-On for SAC, you've to connect the identity provider to SAC tenant. To do so, download the metadata of the SAC tenant and upload it to your identity provider. Afterwards, choose the identity provider, and create the identity provider in the SAC tenant to start using SAC.

Download the Metadata of the SAC Tenant

1. Navigate to ▶ *Business Analytics* ❯ *Common Tasks* ❯ *SAP Analytics Cloud (SAC) Configuration* ◗
2. Click *Configure Single Sign-On for SAC* to open a new window.
3. Click *Download Metadata as XML*. The XML file is downloaded to your local drive.

Configure SAC Service Provider Metadata in Your Identity Provider (IdP)

1. Log on to the *SAP Cloud Identity Services* as an administrator. You can also use an external identity provider.

   > ⓘ Note
   >
   > Ensure that you use the same identity provider service for both single sign-on (SSO) and also for SAP Cloud for Customer tenant.

2. On the *SAP Cloud Identity Services* screen, navigate to ▶ *Applications & Resources* ❯ *Applications* ◗, and click *Add* to create a new application for the SAC Service Provider.

3. In the *Add Application* pop-up window, enter a name and click *Save*. The system opens and displays the new application.

4. Under ▶ *Trust* ❯ *Single Sign-On* ◗, configure the following settings:
   - Click *Type*, and select SAML 2.0
   - Click *SAML 2.0 Configuration*, and upload the SAC metadata XML from your local drive.
   - Click *Subject Name Identifier*, and configure the attribute, which the application uses to identify the users.
     Ensure that you use the same attribute that is maintained in the Cloud for Customer tenant. For example, if the Cloud for Customer tenant-specific application in the IdP is configured as **Login Name**, then use the same value in SAC-specific application as well.
   - Click ▶ *Assertion Attributes* ❯ *+ Add* ◗ and maintain the following user attributes and assertion attributes and then click *Save*.

User Attribute	Assertion Attribute
Language	preferredLanguage
Display Name	displayName
Last Name	familyName
First Name	givenName
E-mail	email

5. Navigate to *Tenant Settings*, and click *SAML 2.0 Configuration* to open a new screen.
6. Click *Download Metadata File* to download the IdP metadata.

> ⓘ Note
>
> Use this procedure to configure IdP provided by SAP. You can follow similar steps to configure external IdPs.

Upload IdP Metadata to the SAP Cloud for Customer Tenant

1. Navigate to ▐▶ *Business Analytics* ❭ *Common Tasks* ❭ *SAP Analytics Cloud (SAC) Configuration* ❭.
2. Click *Configure Single Sign-On for SAC* to open a new window.
3. Under the *Upload IdP Metadata* header, choose either User ID or email for *IdP Subject Name Identifier*, depending on how your users are configured in your IdP.
4. Click *Upload* to upload the XML metadata file.
5. Click *Save* or *Save and Close*.
   You've now configured Single Sign-On to the SAP Analytics Cloud tenant.

Reset IdP Metadata

You can use the *Reset IdP Metadata* button to clear existing IdP metadata settings. After resetting, when you upload again, all existing users are modified to reflect the correct subject name identifier, if the value chosen is different from the previous one. Depending on the number of users in the system, this action can take a few minutes to a couple of hours.

Optional: Manage Users for SAC

To view the users that are replicated from Cloud for Customer to SAC, click *Manage Users for SAC*. The system replicates the users daily. However, if you want to activate a user ad-hoc, you can use this screen.

Select a user ID and click *Activate*.

Create Stories

A story is a presentation-style document that uses charts, visualizations, text, images, and pictograms to describe data. Once you create or open a story, you can add and edit pages, sections, and elements as you like.

Follow these steps to create a story:

1. Navigate to ▌▶ *Business Analytics* ❯ *Design Stories* ❚, and then click *New*.
   The System connects and opens SAP Analytics Cloud within the Cloud for customer system in a new tab. All the data sources exposed from Cloud for customer are loaded and displayed in a list.
2. Under *Available Data*, select a datasource and drag and drop it to add it to the *Query Designer*.
3. Optional: Click the table icon to select columns/fields from the data source that you want to include in the model.
4. Optional: Click the data source node to see the list of master data attributes.
5. Click *Preview Query* to view the structure.
6. Click *Finish*. In the popup window, enter a name for your new SAC model.
   The system opens the story designer where you can add charts, tables, and so on.
   For more information, see Creating a New Story
7. Click the Save icon. In the popup window, enter a name and description for your new story.
   The story is now available in the *Design Stories* work center view.
8. Navigate to the *Design Stories* work center view, and click *Assign* to share the story with one or more business roles. The users assigned to these business roles can now view these stories in ▌▶ *Analysis* ❯ *Stories* ❚.

> ⓘ Note
>
> You can access these stories only through the SAP Cloud for Customer system.

Analyze Data

For more information on how your business users can run and analyze the stories that you've created, see Explore Your Data.

Limitations

- You can build stories only on standard and cloud data sources for SAP Cloud for Customer. You can't create them using joined, combined, or virtual data sources. Also, you can't create stories from data sources from any other SAP products apart from SAP Cloud for Customer.
- The embedded stories aren't available in the mobile application.
- The following features aren't supported:
  - Embed tiles on home page or other UIs on SAP Cloud for Customer.
  - Hierarchical data view, such as, in Accounts or Territories.
  - Reuse of models across multiple stories.
  - Transport stories across tenants.
  - Individual widget support for embedded tiles.
  - Intent-based navigation.
  - User timezone conversion.

- Calculate date or time difference.
- ID-based sorting in SAC stories.
- Currency and unit conversion.
- Support for themes.
- SAP Cloud for Customer lifecycle management scenarios such as, tenant copy, tenant refresh, and so on.
- Compounded fields.

12.2.1 SAP Analytics Cloud FAQ

This section answers commonly asked questions about SAP Analytics Cloud.

12.2.1.1 Why Does the 'User Active' Status Displays No and When Trying to Activate An Error Message Is Thrown?

Probable Reason: If the same E-mail ID is provided for multiple users in Cloud for Customer even though the User ID is different and subject name identifier that is selected at the time of IdP upload is User ID.

Solution: If there are multiple users with the same E-mail ID, then only one user gets created in SAC, and the creation of the other users fails. Change the E-mail address of the other users and activate the user again.

12.2.1.2 Why Is the User Account Inactive at the Time of Creating or Viewing SAC?

1. *Probable Reason:* The user isn't created in SAC for the logged in user.
   Solution: After the IdP upload is successful, a job is scheduled to replicate the users in SAP Cloud for Customer to be created in SAC. Verify if the user is created in SAC by navigating to ▌ *Business Analytics* ❯ *Common Tasks* ❯ *Manage Users for SAC* ❭. The user for which the error message displays must be in active status. An active status indicates that the user is successfully replicated in SAC. If Active column displays status No, as an administrative user, you can activate this user.
2. *Probable Reason:* The user is created in SAC, but there's a mismatch between IdP User ID/E-mail and User ID/E-mail created in SAC.
   Solution:

   - Check if the SAC user is active by navigating to ▌ *Business Analytics* ❯ *Common Tasks* ❯ *Manage Users for SAC* ❭. If the user is active, then check the User ID of the user (if user is selected while

uploading IdP) or check the user's E-mail (if email is selected). The User ID or E-mail must match with the IdP user's User ID or E-mail, including the case-sensitivity. If your identity authentication is:

- SAP IAS: Complete the following steps:

  1. Log on to SAP Identity Authentication Service (IAS) as an administrator.

  2. On the IAS login screen, navigate to ❘▶ *Applications & Resources* ❭ *Applications* ❭.

  3. Search and select the SAC application that was created from the metadata, uploaded earlier.

  4. Select the *Subject Name Identifier* option, and view if the Login Name or E-mail selected is uppercase or lowercase. If the Login Name or E-mail case differs from the SAC user name casing, choose *Apply Function to Subject Name Identifier* to modify the subject name identifier to match the user name case, and then click *Save*.

- Microsoft Active Directory Federation Services (AD FS): Complete the steps listed in the KBA☁ (from Step 2 onwards).

  > ⓘ Note
  >
  > All steps performed on Azure AD are out scope of SAP Support and any reference links provided are for informative purposes only. Check with your AD administrators and confirm if the User ID or E-mail that would be authenticated with SAC is same as User ID and E-mail as mentioned in Manage Users for SAC screen.

- Microsoft Azure Directory: Complete the steps listed in the KBA☁ (from Step 2 onwards).

  > ⓘ Note
  >
  > All steps performed on Azure AD are out scope of SAP Support and any reference links provided are for informative purposes only. Check with your AD administrators and confirm if the User ID or E-mail that would be authenticated with SAC is same as User ID and E-mail as mentioned in Manage Users for SAC screen.

- Any other IdP service: Ensure that correct subject name identifier for SAC application is selected. Check with your SSO administrator that the User ID or E-mail for a specific user is matching with the user provided on the *Manage Users for SAC* screen.

12.2.1.3 Why Is the User Account Inactive or I'm Unable to Activate an Existing User?

Probable Reason: If the Email ID of the existing user was previously used for any other user or changed to an already used Email ID. For example: If a user1 had provided test101@test.com and after successful user activation in SAC, it was changed to test102@test.com, now another user2 is created with test101@test.com then creating the user2 fails.

Solution: Update the Assertion Attributes of the SAC tenant in the IdP system also update the Email ID of the user1 in IdP to test102@test.com and then the user1 must log in to C4C and access any of the existing stories. After a successful login is done by user1, create a user2 with test101@test.com and try to activate the user.

13 Analytics for Business Users

Learn how you can visually map, validate, analyze, and blend any data, big and small, on premise and in the cloud.
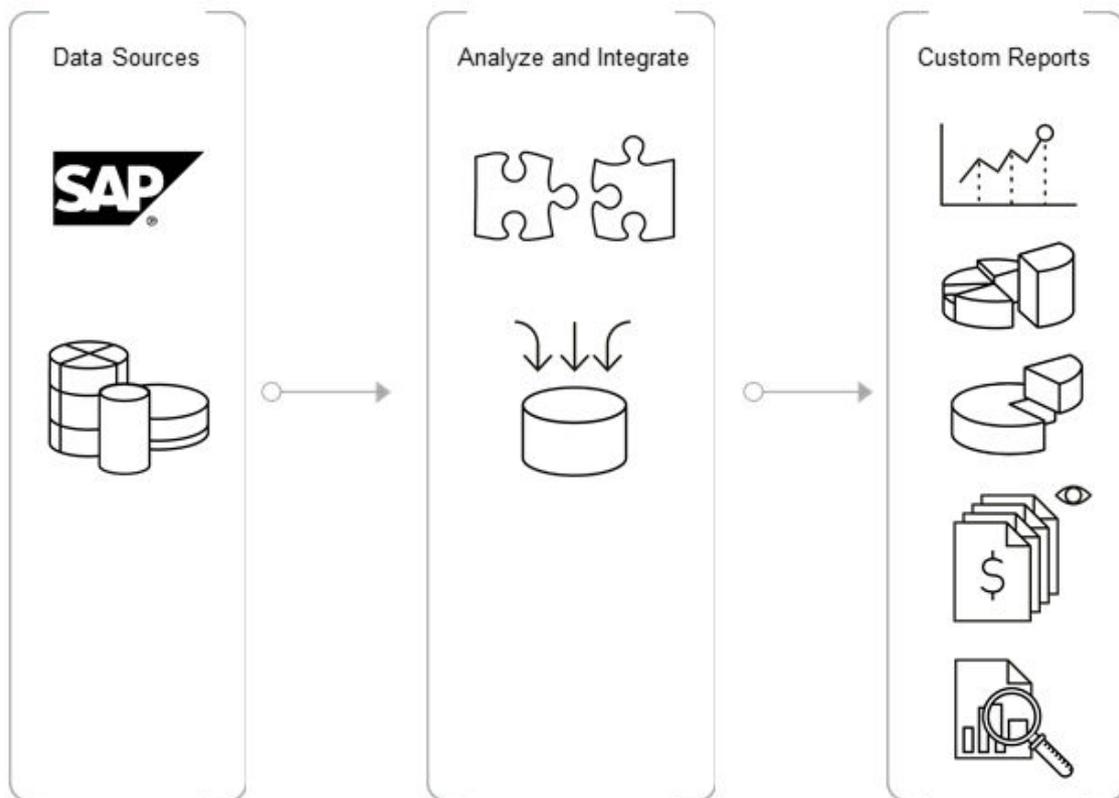
You can create custom reports using the guided procedures and then control the visibility of those reports by assigning them to specific work centers and individual business roles. If you have defined custom fields in your solution, you can add them to data sources or reports that you have created, or those delivered within the solution. You can also join or combine heterogeneous data sources, and create custom calculated measures and comparison metrics.

13.1 Use Interactive Dashboards

Interactive dashboards allow you to define connections, transfer filters between reports, and look at all the relevant business information in one place.

When you open the *Dashboard* workcenter, you can view the list of all the available dashboards on the landing page along with their description and origin type. You can search and sort the list by name and origin type. You can also use filters and save the list as a query.

13.1.1 Configure Charts

Control how the chart data appears on screen.

- Select a chart type from the Settings menu.
- Show or hide the chart legend. Find this option in the Settings menu on the browser, and choose the small icon at the upper left of the chart.
- Choose a data element on a chart and linked reports update to reflect your selection. For example, choose a specific bar in a bar chart, and linked reports on the dashboard update to show data from the selected element.

> ⓘ Note
>
> - You cannot personalize and save these visualization changes in the dashboard.
> - Only the following charts are available in the dashboard:
>   - Bar
>   - Pie
>   - Line
>   - Area
>   - Donut
>   - Column
>   - Stacked Column
>   - 100 Percent Stacked Column
>   - 100 Percent Stacked Bar
>   - Funnel
> - If your report is used in the dashboard, it's good practice to avoid adding characteristics to columns, because this can lead to inaccurate results.
> - Under *Table Settings*, if you select *First Row* in the *Show Result Row As* field, the chart visualization may be inconsistent.

13.1.2 Drill Down Data

Drill down data to view the information most relevant to you.

1. Open the drill down pane for a report by choosing the **Drill Down** icon [icon] .
2. Select the desired characteristics or key figures. The report updates immediately to reflect your changes.

> ⓘ Note
>
> Linked reports do not update when the drill down pane is open.

Choose the **Reset** icon [icon] to go back to the original state. This removes drill down characteristics and filters from all charts on the current dashboard.

Choose the **Refresh** icon [icon] to get the updated data in Dashboard.
If you choose a data element on a chart (by clicking in the browser or by selecting an area in the app), the filter is automatically transferred to the linked reports and they update to reflect your selection. For example, if you choose a bar showing data for Quarter 1 in a bar chart, all the linked reports will now show the data relevant for Quarter 1.

13.1.3 Add Annotations and E-Mail Dashboards

Add annotations and send an image of the annotated dashboard as an attachment via e-mail, if you are viewing the dashboard on the SAP Cloud for Customer.

Procedure

1. Choose *Annotation* from the Action menu.
2. Select a color for freehand markup, or select the note icon to enter a text note.
3. Draw your markup or enter text.
4. Choose *Send as E-Mail* from the Actions menu to send an image of the annotated dashboard as an attachment.
5. Choose *Cancel* to exit annotation mode.

13.1.4 View Dashboard Connections

You can view mapping metadata for dashboard filters and interactive connections.

Click ⦁⟨ to open the *View All Connections* popup. The *Interactive* tab displays a list of source and target report views along with the selected attributes for the corresponding tiles. The *Dashboard* tab displays a list of all filters, selected report views, and the associated attributes.

> ⓘ Note
>
> You can only see the metadata of those report views which you have authorization to view.
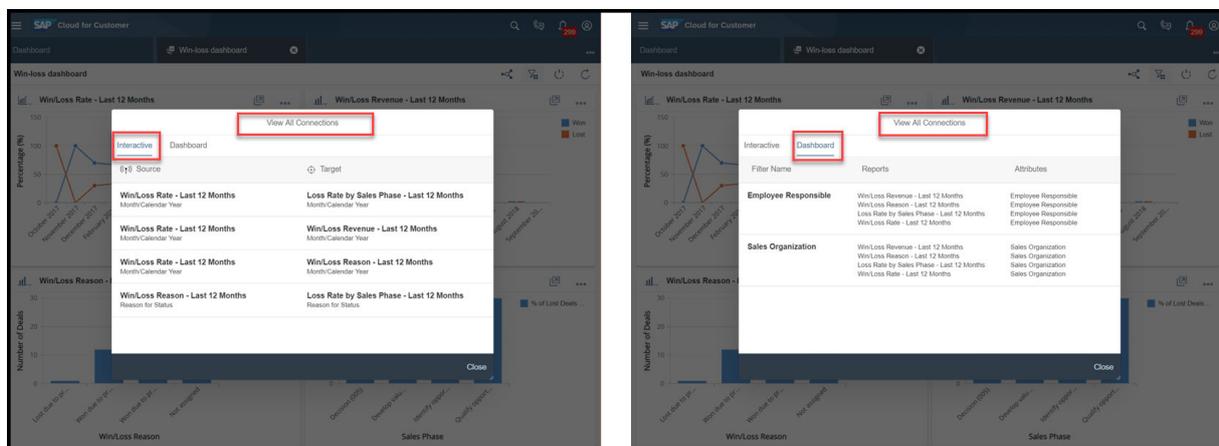
13.1.5 Apply Dashboard Filters

While designing a dashboard, your administrators can define filters. The system displays the filters on your dashboard. You can select values for each filter and save it. After successful save, when the dashboard is opened again the filters are applied automatically.

To apply new filters, select the value from the value help and click *Go*. Click the interaction icon inside an

individual tile to see the applied filter values for both interactive and dashboard filter. Use the filter icon 🔽 to toggle the dashboard filter bar. The red dot on the filter icon indicates that some filters have been applied.

> ⓘ Note
>
> - If you are modifying any filter, the save button is disabled. It is enabled after you press *Go*.
> - If you enter an incorrect value in the filter, the system allows you to save it. However, when you click *Go*, the system displays the error on the respective tiles.
> - After you have saved the filter value, if the administrator changes the filter in the dashboard, the system still shows the saved values. You must update the values according to the new filter and save it again.

13.1.6 Use Filters to Personalize Your Dashboards

Apply multiple filters on a dashboard and save them as **Selections**.

While designing a dashboard, your administrators can define filters. The system displays the filters on your dashboard. You can select values for multiple filters and save it. When the dashboard is opened again, the selections that you mark as default are applied automatically. If you do not apply filters and select a default, the system opens in the standard *Initial* selection without any filter.
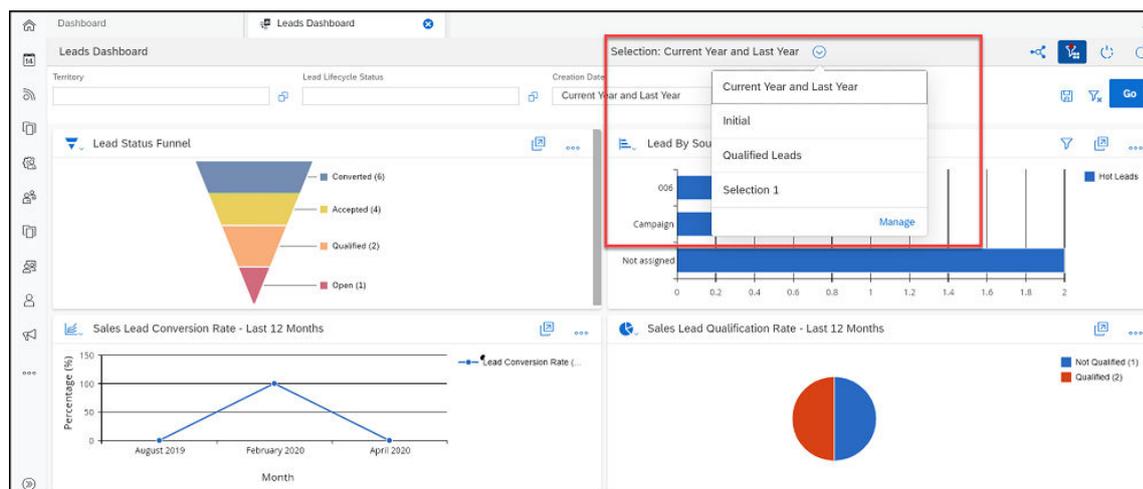
> ⓘ Note
>
> After you have saved the filter values, if the administrator changes the filter in the dashboard, the system still shows the saved values. You must update the values according to the new filter and save it again.

13.1.7 Edit Report View Descriptions

Maintain descriptions for report views.

To access this screen, select the report view, and from the **Choose View** dropdown, select *Manage*. In the *Manage* screen, you can add or edit the report view description.
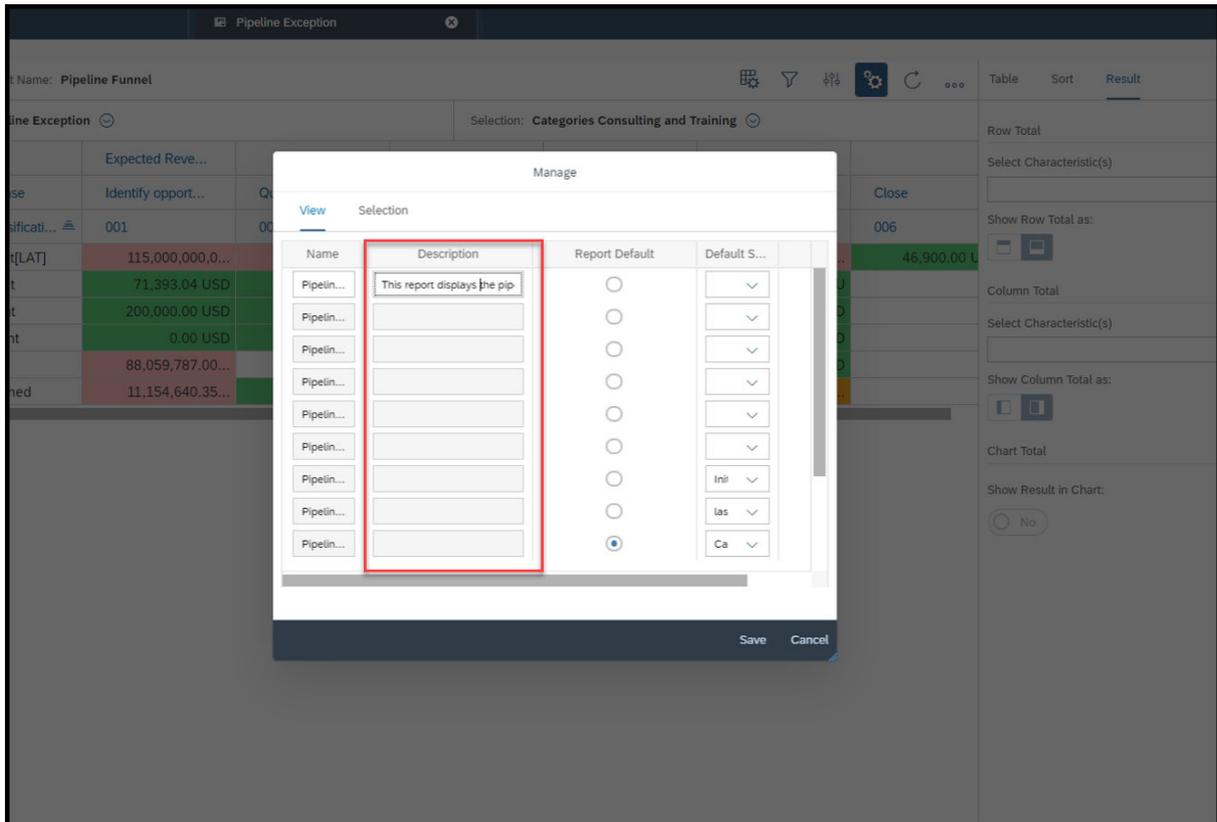
13.2   Analyzing Reports

Learn how to access everyday reporting functions, such as, selecting and filtering data, working with tables and charts, or adding and removing characteristics and key figures.

13.2.1 Toolbar Functions

Learn about working with the different toolbar functions available on your screen.

- *View*
  Shows the report view that is displayed in the Web browser. The dropdown list displays the report views that are available with the corresponding report. A report view is a modified view of the data available with a report.

To view and edit the report view, click the pencil icon next to the dropdown list. The following table provides an overview of the available functions:

Functions available in Report View

Function	Description
View dropdown list	Enables you to select a report view.
Report Default	Makes the current report view the default when opening the report.
Rename	Renames the current report view.
Delete	Deletes report views created by you. Note that you cannot delete report views delivered by SAP or report views created by your administrator.
Save	Save the report view .
Save As	Saves the current report view as a new report view.
Defer Refresh	If you want to make several changes to the report layout, we recommend deferring the refresh of the layout. When you click *Defer Refresh*, all other functions are inactive until you switch off *Defer Refresh*.
Add Fields	Add characteristic attributes to and remove them from the report view by clicking *Add Fields*. On the following screen, fields are group by specified criteria. For example, characteristics are grouped by dimensions. Note that you cannot select all fields to add to or to remove from the report view. Fields that you cannot select indicate that they are part of the report as it is defined, either as delivered content or as defined by administrators. When you add and remove fields, the system modifies the current report view. The characteristic attributes are then available. You can then add the new fields to rows and columns and save the personalized report view.
Available Fields	Shows the characteristics and key figures that are available with the report view. By clicking an available characteristic, a check is displayed next to the characteristic, and the characteristic is added to rows.
Row Fields	By clicking a characteristic under *Row Fields*, you can move the characteristic to *Column Fields* or back to *Available Fields*. You can also make settings for the characteristic.
Column Fields	By clicking *Key Figure*, you can move the key figures to *Column Fields* or back to *Available Fields*. You can also make settings for the characteristic.
	You can also create exceptions and conditions. If you have an active condition, a filter icon appears next to the name of the report view.

- *Selection*
  Shows the set of variables available for the report and any defined value selections currently used. The dropdown list shows the selection available with the corresponding report.

To view and edit the selection, click the pencil icon next to the dropdown list. The following table provides an overview of the available functions:

Function	Description
Selection drop-down list	Enables you to choose a selection.
Report Default	Makes the current selection the default when opening the report.
View Default	Makes the current selection the default when opening the report view.
Rename	Renames the current selection.
Delete	Deletes the selection created by you. Note that you cannot delete selections delivered by SAP or created by your administrator.
Save	Save the current selection.
Save As	When you save a new selection, you have the option of saving the time characteristics of the selection as relative. By clicking *Save Time Characteristics as Relative*, the new values for time variables are calculated depending on the date when you saved the selection and when you next open the selection. The following graphic provides an example: **Selection Opened On** - **Selection Saved On** = **Difference** | **Selection Opened On**	**Selection Saved On**	**Difference**	**Value Saved**	**New Value**
---	---	---	---	---
Dec 01	Nov 29	2 Days	Nov 28	Nov 30	 **Difference** + **Valued Saved** = **New Value** Example of saving time characteristics as relative
Show Description	You can also decide if you want to display text descriptions for values. For example, if your *Status* description is **Z9**, you may not know what exactly it stands for. By clicking *Show Description*, under the entry field, the description **Active** is displayed. This helps you understand your report better. When you double-click the button, a pop-up appears that allows you to delete the selection from this window. This is possible on desktops only. In touch devices, this pop-up is not available.
Add Fields	Add characteristic attributes to and remove them from the report view by clicking *Add Fields*. On the following screen, fields are group by specified criteria. For example, characteristics are grouped by dimensions. Note that you cannot select all fields to add to or to remove from the report view. Fields that you cannot select indicate that they are part of the report as it is defined, either as delivered content or as defined by administrators. When you add and remove fields, the system modifies the current report view. The characteristic attributes are then available. You can then add the new fields to rows and columns and save the personalized report view.

- Refresh
  By clicking the icon to the right of the *Selection* dropdown list, you can refresh the data and display of the report.
- Display Format

You can switch formats between table and chart. Note that in some cases, you cannot switch the display format, for example, if your report contains a hierarchy.

- Further functions
  By clicking the sprocket icon, the following functions are available.

Setting	Description
Report Header	Displays values that have been set for variables in the selection. If available, any information and warnings are also displayed. For example, if the display currency is set using key figure settings or variables.
	By clicking *Technical Information*, you can also view further information, such as the access context of the report and the data source that serves as a basis for the report data.
Download	Exports the report data to Microsoft Excel® in XML format in read only mode. The export is useful if you want to use Microsoft Excel® functions to analyze report data.
	Note that when you open the export, there is no longer a connection to the system, even if you view the report data on the SAP add-in for Microsoft Excel® ribbon.
	You can also download data sources and reports in CSV format. The format and the available fields of the downloaded data source differ from a downloaded report. For example, in a downloaded report, the value and unit of measure are combined in one field whereas in the downloaded data source, the fields are separate. Another example is that there may be key figures only defined for the report, which are not available in the underlying data source.
Start Options	You can decide if you want to show the *Selection* area and if you want to start the report.

Setting	Description
Table Settings	• Table Design You can choose between a standard white background or alternating between white and blue. • Grid lines You can decide if you want horizontal or vertical grid lines, both, or none. • Result Rows and Columns You can decide if you want result rows or columns displayed as the first or last entry in a row and/or displayed in the first or last column. • Display Repeated Texts You can specify whether every instance of a characteristic value is displayed in a row or column. • Display Scaling Factors Use the dropdown list to set a scaling factor of 1 to ten billion (10,000,000,000). • Arrange As Hierarchy The system arranges characteristics in rows and in columns as a hierarchy. The row or column further left serves as the tree structure into which characteristics to the right are inserted. • Hierarchy Design You can decide between standard and cascading. If you choose standard, characteristics are arranged in a hierarchy; any characteristic attributes are arranged in rows or columns. If you choose cascading, characteristics are arranged in a hierarchy; any characteristic attributes are arranged individual columns or rows. • Hierarchy Initial Expansion The hierarchy level up to which the hierarchy is to be displayed when it is expanded. • Invert Hierarchy The system inverts the hierarchy so that the hierarchy is displayed from bottom to top or from right to left. You can decide to invert a hierarchy in rows, columns, or both. • Limit Data By default, the records of data displayed are limited to the value in the specified field. You can change this value. Note that this setting is only valid for reports displayed as a table.
Chart Types	You can choose from a range of charts to display data.
Send	You can send the report as an e-mail attachment or as a link.
Microsoft Excel®	You can view and edit the report using the SAP add-in for Microsoft Excel®.

13.2.2 Working with Selections

A selection consists of the set of variables available for the report and any defined value selections.

The selection you define determines the data to be displayed in the report.

When you open a report, the data displayed in the report is restricted to the value selections set using variables in the *Selections* area. You can display the *Selections* area by clicking the pencil icon next to the Selection dropdown list box.

Making Value Selections

Note that you must specify a value for all mandatory variables. In the system, mandatory variables are indicated by an asterisk (*).

The *Access Context* variable is mandatory for all reports. This variable is defaulted to the access context to which the you are assigned. The system fills the variable with the access context available for the report. In this case, only one access context is assigned, and therefore the variable is not displayed.

If the report supports multiple access contexts, you must specify which access context is to be used to select data.

You can either enter values manually, the system supports manual entry of only the ID of variable or characteristic values.

For example, you know that you want to restrict the *Supplier* variable to `500001` (You cannot enter **Miller and Son**). You therefore enter **500001** in the *Supplier* variable field.

You can add further values by clicking the plus icon to the right of the entry field. If the variable supports operators, such as greater than or less than, a dropdown list box is displayed.

Value Selection Help

The type of value entry allowed depends on how the content has been defined. For example, if you can select single values, multiple values, or set an interval.

The following options are available depending on the variable.

Allowed Value Entry	Description
Single value	Allows you to select one value.
One or more values	Allows you to select one or more values separated by semi-colons.
One or more values with an operator	Allows you to select one or more values with an operator such as greater than or less than. Note that the between operator is `..`, the unequal operator is `<>`.
Interval	Allows you to select a single or interval value, for example, 100 or 19494 .. 4343434.

Allowed Value Entry	Description
Relative select	Allows you to restrict a specified characteristic to a relative variable selection. Relative selections are based on basic characteristics, such as Date, Week, Month, Fiscal Period, and Company. When you start the report, the system fills the cells in the report with the corresponding values.

Expand the following table to view some examples of relative selections.

Variable	Relative Selection	Description
Posting Date	Today	Shows today's date.
Invoice Creation Date	Last 7 Days	Shows a time range of the last 7 days, including to-day.
Fiscal Month	Current Fiscal Period	Shows the current month.
Company	Multiple Default Compa-nies	Derives multiple default companies based on the user's position.

When making value entries, note that you can choose either a relative select or other entries but not both.

13.2.3 Share Views and Selections with Business Users

Share your personalized views with other users in the organization.

You can share your personalized views with your team members or other users in the organization so that they can reuse the view. You can share only end user views. To do this follow these steps:

1. Navigate to ▎▶ *Analysis* ❯ *Reports* ▎, and open a report.
2. Select the **Choose View** icon to see the list of views.
3. Select and open any view under the *End User* section.
4. Go to more actions (…) , and select *Share View*. The system opens a dialog box.
   If you want to share the selections, you can choose the personalized selections from the drop downl ist.
5. From the value help, select a valid user from within your organization.
6. Enter the required details and click *Share*.
   The system makes the report available in the *Shared Views* section of the recipient that you have specified. In addition, if a valid e-mail ID is maintained for the user, the system sends an e-mail notification.

To accept or reject the shared view, follow these steps:

1. Go to ▎▶ *Analysis* ❯ *Reports* ▎ and from the **Select Variant** dropdown select *Shared Views*. The system shows you the list of all the views shared by different users.
2. Open a view. In the shared view mode,
   - You cannot switch to any other view
   - You can change the predefined selections from dropdown selection.
     You can also choose a shared selection that is listed under the **Shared** header.

- In the *Selection* tab, you can restrict data using any of the parameters. You can also apply filters.
- In the *View* tab, you can see the definition of the view. You cannot edit it.

3. After previewing the data, you can either accept or reject the view. On clicking *Reject*, the system removes the view from the shared views. On clicking *Accept* the system allows you to save the view with the same name or personalize it with a different name. The view is removed from the shared views, and is displayed in your list of *Report Views*.

> ⓘ Note
>
> When you share a view or selection with other business users, technically a new copy of the view or selection is created for each of the target users when they accept the shared view.
>
> Therefore, any reference (view ID) of the original report view, which works fine for you, as the original user, cannot be used to refer to a shared view of target users.
>
> For example, in Excel addin workbook, if a view or selection is inserted into the excel sheet, and the view is shared to other users, then the workbook cannot be used by target users to access the shared copies of the original report view. Ideally, the target user should accept the shared view in the web client, and then insert the new copy of the report view (with the new view ID) into the workbook.

13.2.4 Functions in the Content Area

Many of the functions in the content area of the report are available from the column headers of the report. The functions available differ for characteristics and key figures. To display the functions, click the column headers.

Functions for Characteristics

Function	Use
Sort	Click the arrow next to the characteristic to sort values in ascending or descending order. A period next to the characteristic indicates that the values are not sorted.
Display	Displays the description or ID of characteristic values. The name of the characteristic appears in a pop-up window. You can decide to display the description, ID, or a combination thereof. Note that the display function is disabled if only IDs are available to display.
Subtotals	Enables you to display or hide subtotal results of key figures for characteristics.
Filter	A list of characteristic values appears in a pop-up window. You can select one or more values by which to filter the report. You can also use the search with its auto-fill function to make it easier to find values. Once you have set a filter, a filter icon appears next to the name of the report view.
Add	Enables you to add a characteristic to the right of the column you click.
Remove	Enables you to remove characteristics. Note that in columns, one characteristic has to remain.

Functions for Key figures

Function	Use
Add	Enables you to add a key figure to the right of the column you click.
Remove	Enables you to remove the key figures, even those key figures that are initially defined. Note that one key figure has to remain.

Analytical Navigation

In cells of reports displayed in table format, you can use the context menu for further navigation and analysis. Using the context menu, you can view existing documents related to a value. When you click a cell, the documents and reports to which you can navigate are displayed. For example, you can navigate to a preceding document, such as a purchase request, an overview document that provides information about a customer, or to another report.

13.3 Analytics in Smartphones

Work with Reports and Dashboard workcenters in smartphones.

Using the display mode icon on reports, switch between portrait and landscape view for reports.

Reports

In the *Report* workcenter, you can perform following tasks:

Task	How-to
Organize data	Click (Organize data) to select the desired view from the available choices. The report updates immediately to reflect your selections.
Apply filter	Open a report and click (Add Filter). The value help appears. Select the required value. Click *OK*. Either select *Run with filter* to apply the filter immediately, or click on *Later* to continue working on your current report. Note that you cannot scroll if you do not select either of these option.
Show and hide legends	Click (Legend) to show or hide legends.
Change charts	Click the **Change chart** icon to see the list of charts available. Choose the required chart to visualize your data in the desired format.

Task	How-to
Choose views and selections	Click on the view and selection pane to review and choose the different options available. The report updates immediately to reflect your selections.

Dashboard

In the *Dashboard* workcenter, you can perform the following tasks:

Task	How-to
Use interactions	Click a data point on the source report to pass filters to target reports. Click (Filter) in the target report to see the applied filters. The target reports are indicated by (Add Filter). To clear interaction filters, tap anywhere on the screen.
Change charts	Click (Table) to see the list of charts available. Choose the required chart icon to visualize your data in the desired format.
Show and Hide legends	Click (More Actions) to open a dropdown list and choose (Legend) to show or hide legends.
Refresh reports and dashboard	To refresh a report, click (More Actions) and then click (Refresh). To refresh a dashboard, click on the top panel.

Homepage

In the Homepage, you can open the following tiles to perform analytical tasks:

- KPI Tile: Opens to a dashboard or contextual report.The KPI ribbon on the top shows the deviation from target and reference. It also helps you analyze the thresholds and the current status with respect to the thresholds. If the tile opens to a dashboard, you can perform all the tasks that are possible in a smartphone.
  If the tile opens to a report, you can do the following:
  - Use the carousel to scan through multiple contextual reports
  - Click (More Actions) and refresh or hide the report
  - Click the Analyze Data icon to open the report and start working on it

- Report Tile: Opens aggregated reports and allows you to work on them.
- Graphical Reports Tile: Opens report in a bigger screen and allows you to perform all the tasks that you can perform in a report generally.

.

Limitations

- Auto-complete while searching filter values does not work in smartphones
- Report filters is not supported in Windows based smartphones
- Drag and drop action to move fields in reports is not supported in Windows based smartphones
- Show chart values by tapping on data point does not work in smartphones
- The *Analysis* workcenter is not available on Windows based smartphone

Important Disclaimers and Legal Information

Hyperlinks

Some links are classified by an icon and/or a mouseover text. These links provide additional information.
About the icons:

- Links with the icon 🔗 : You are entering a Web site that is not hosted by SAP. By using such links, you agree (unless expressly stated otherwise in your agreements with SAP) to this:

  - The content of the linked-to site is not SAP documentation. You may not infer any product claims against SAP based on this information.

  - SAP does not agree or disagree with the content on the linked-to site, nor does SAP warrant the availability and correctness. SAP shall not be liable for any damages caused by the use of such content unless damages have been caused by SAP's gross negligence or willful misconduct.

- Links with the icon 🔗: You are leaving the documentation for that particular SAP product or service and are entering an SAP-hosted Web site. By using such links, you agree that (unless expressly stated otherwise in your agreements with SAP) you may not infer any product claims against SAP based on this information.

Videos Hosted on External Platforms

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