Administrative User Guide: Cube Sheets

Last Updated March, 2010

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Adaptive Planning, Inc.
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1. Cube Sheets Overview

The **Cube Sheet** is a type of sheet that allows for multi-dimensional data input across a set of dimensions. The cube sheet was designed to model complex (and multi-dimensional) sales forecasting, but it can be used for planning other elements of a financial model as well.

See the following list of scenarios where a cube sheet may be useful:

- Sales Managers need to input estimated sales in units and price, broken down by month, region, product line, and customer group.
- A Plan Administrator needs to input data for a particular month for several assumptions broken down by a several regions. In a cube sheet, this could be displayed with assumptions down the side, regions across the top, and the months in a dropdown selector.
- A company needs to plan product-related expenses broken down by dimensions. The manufacturing cost of a product varies depending on the region, product, the fabrication machine that is used, and the customer.
- A company would like to plan Personnel as an aggregate rather than by each person (large batch personnel modeling, where you do not identify individual people but instead use total headcounts in different regions, departments, job codes, etc)

Cube Sheet Overview by Topic

Creating Sheets

- Administrators can create multiple Cube Sheets and specify which dimensions are associated with each sheet.
- Account, Time and Plan are always required dimensions on a Cube Sheet; version is always implicitly a dimension, but handled differently.
- The sheet creator can assign up to seven custom dimensions for each sheet. This number does not include the Account, Time, Plan or Version dimensions.
- The sheet creator can specify the initial orientation of the Cube Sheet for viewers. This means that the sheet creator can choose the dimensions that appear on each of the two axes.
- The sheet creator can restrict the combination of certain dimensions.
- A Cube Sheet cannot directly contain General Ledger, Metric, Custom, or Modeled Accounts. Formulas *entered within* a cube sheet may reference other types of accounts, but the cube itself cannot have a non-cube account on an axis.
- Calculation Accounts can be created in a Cube Sheet, with formulas relative to an individual cell's location.
- Assumptions can be created in a Cube Sheet. An assumption is an account that has values at the corporate plan only, but can be referenced from any plan.
- If you make changes to a dimension which is used in a Cube Sheet, you will implicitly alter the cube sheet as well. For example, if you add a new dimension value to your Product dimension, the new product will be added to your cube sheet. If you delete a dimension value from the Product dimension, a row will be deleted from your Cube Sheet.
- Cube Sheets cannot be cloned.
- Cube Accounts cannot be imported via Structure Import.

Viewing and Editing Sheets

- The Cube Sheet Viewer always shows two of the cube's dimensions on the two axes of the sheet grid. All other dimensions are shown as dropdown selectors in the row above the sheet grid.
- Users can change the location of dimensions on the sheet by selecting a non-axis dimension and dragging it onto one of the axes. This results in the dimension that formerly resided on an axis moving up to the dropdown selectors.
- Users can enter data into editable cells, similar to a standard sheet.
- Users can type values or formulas directly into the cell or into the formula bar. Both the Formula Assistant and Capture mode are available in Cube Sheets.
- Users can add cell notes to individual cells and sheet notes, which mirror notes in Standard Sheets.
- Printable View is available.
- Users have the ability to copy data Forward and Downward in a Cube Sheet.
- Splits cannot be added in a Cube Sheet.

Reports

- Users can refer to Cube Sheet elements in Matrix Reports.
- Model (List) reports are not available for Cube Sheets.

General Characteristics

- Cube accounts can be referenced outside the cube, either as aggregated/rollup values or sliced to individual dimension selections.
- Data Privacy, Decimal Precision, and all other account attributes can be specified for Cube Accounts. They should be treated the same as Custom Accounts during creation, including allowing (non-rollup) groups.
- The same strict data access rules apply to Cube Sheets as to any other sheets: you can only see and edit data on plans to which you have access. Likewise, Sheet Availability (the presence or absence of the cube sheet itself on any given plan) works the same as for any other sheet.
- Cube Sheets can be created as Plan-Independent Sheets.
- Users can import data into cube sheets and export data from Cube Sheets. The import functionality includes the ability to import values and formulas.
- Printable view is available for Cube Sheets.

Edition

Cube sheets are available in both the Enterprise and the Corporate editions, but not the Express edition.

2. Cube Sheet Terminology

The following terminology is important to understand to become familiar with Cube Sheets:

Cube

A cube is a multi-dimensional data entry and storage system. Cube is short for “hypercube” and is the mathematical concept of an n-dimensional solid which extends in more than three dimensions. Any particular point in the cube exists at a particular "coordinate" in that cube, specifiable by enumerating a value for each of the dimensions along which the hypercube lies. This is the basic mathematical model underlying most multi-dimensional data entry systems.

Cube Account

In Adaptive Planning, cubes own accounts. These are the accounts that are created within the cube, but can be accessed from the rest of the system outside of the cube. Cube Accounts are divided into three categories: Standard Cube Accounts, Cube Assumptions, and Cube Calculations.

Slice

Computer screens are only capable of displaying two dimensions at a time. Thus, to display a multi-dimensional hypercube, it must be "sliced", by selecting two dimensions to place along the X- and Y-axes of the screen, and then selecting a single value for every other dimension in the cube. This displays a "slice" of the cube, where the values for all non-axis dimensions are locked (allowing the other two dimensions to vary).

Rotation

Rotation is the act of changing which dimensions are on the axes of the screen display.

Orientation

A particular selection of a pair of dimensions to place on the axes of the computer screen is called an orientation.

Dimension

One of either a custom-defined dimension (created by Administrators in Dimension Admin), or a built-in dimension such as Version, Account, Plan, or Time.

Enforced Dimension

One of the built-in dimensions, which is forced to be a part of every cube sheet. These include Version, Account, Plan, and Time.

3. How to Create a Cube Sheet (Step by Step)

Cube Sheets can be created as Plan Dependant or Plan-Independent sheets. There are three main actions required to create a Cube Sheet:

- Create the **Cube Accounts** on which the cube sheet operates
- Specify which dimensions (and which elements of those dimensions) are available on the sheet
- Specify the Sheet Properties (optional)
- Create Cube Restrictions (optional)

Creating a Plan Dependant Cube Sheet

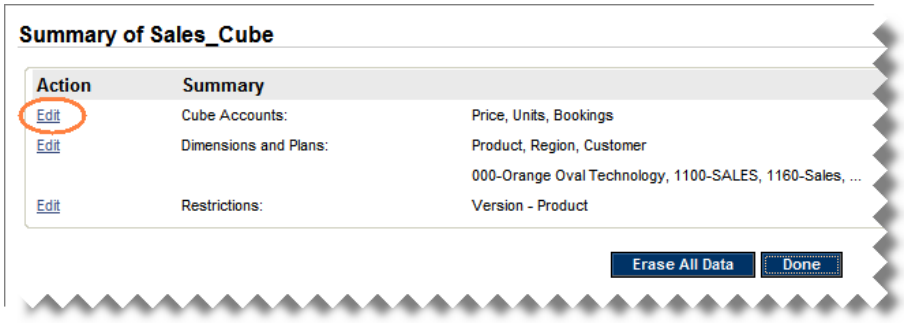
1 **Click on Create a Cube Sheet from the Administration Page**. You will find this link in the Sheets section.

2 **Specify a Sheet name and an Account Group Name**. The **Sheet name** can contain any alphanumeric characters, spaces and special symbols and must be unique. The **Account Group Name** can only contain alphanumeric characters and underscores (no spaces or special characters are allowed). When you create the Account Group Name, it should be similar or the same as the sheet name. You will use the Account Group Name when referring to this sheet in formulas.

3 After you specify the Sheet name and the Account Group Name, **click the Next button**.

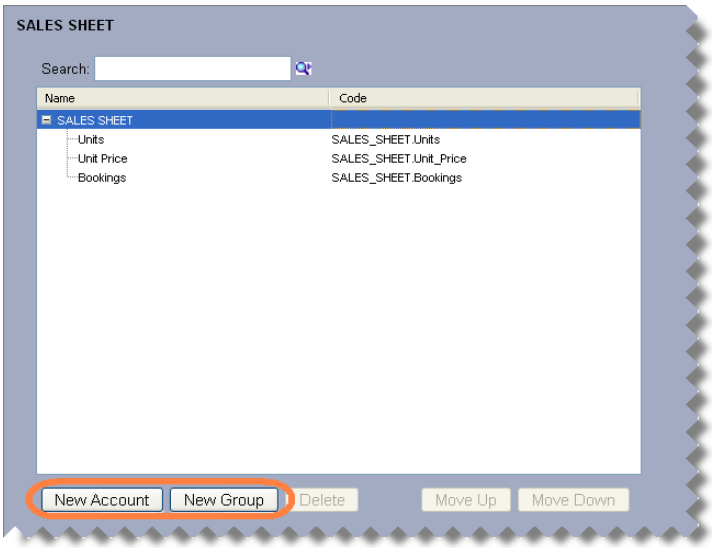
4 Create Cube Accounts.

- When you click **Next**, you are taken to the Summary screen for the Cube Sheet, which is divided into two sections, **Cube Accounts** and **Dimensions and Plans**. Click **Edit** next to Cube Accounts to create the accounts for this sheet**.**

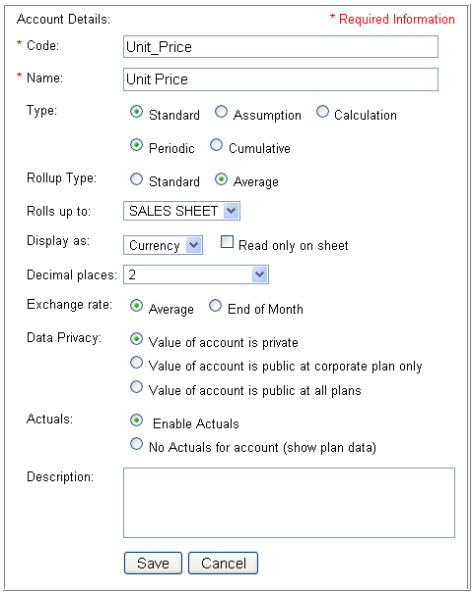


*The **Done** button will take you back to the Sheet Admin Menu screen. The **Erase All Data** button is used to clear all data on a cube sheet, i.e. remove all facts in all versions. This button is only enabled if data exists. When clicked, a warning dialog will be displayed to confirm the action.*

- From this screen, you can create Cube Accounts that are associated with your Cube Sheet. **Click the New Account Button to create Cube Accounts, or the New Group Button to create account groupings.** Cube accounts are treated the same as Custom accounts during creation, including the ability to add (non-rollup) groups.



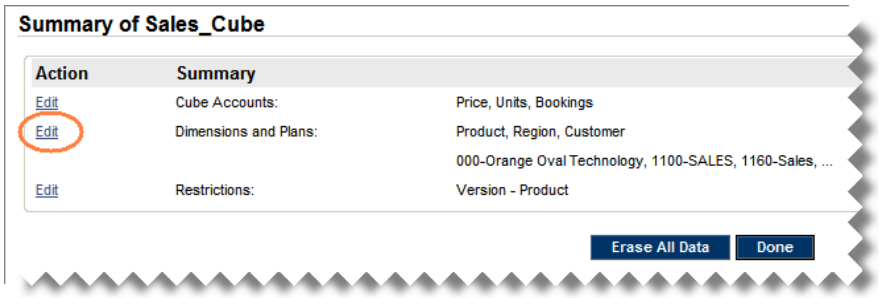
- **Specify the Account Details and click Save**. For more information about each of the Account Details fields, see the section called **Cube Account Details and Characteristics.**



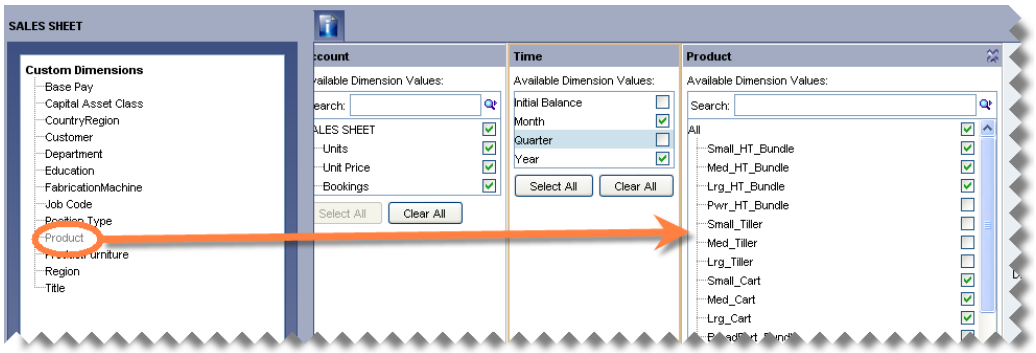
- Once you have added the accounts, **click Done**; this will take you back to the Summary page. In the future, if you need to add new accounts or change the account settings, you can edit the sheet to make additional modifications.

5 Specify the dimensions and the dimension elements that will be used on the sheet.

- **Click Edit next to Dimensions and Plans;** the Dimension and Plans page will open.

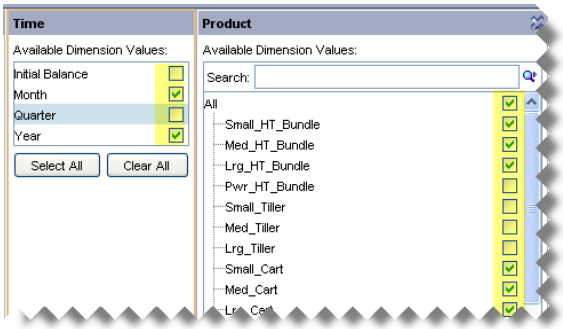


- In this screen, **select the Custom Dimensions that you want to include in the sheet, and drag and drop them into the palette area** as pictured in the screenshot.



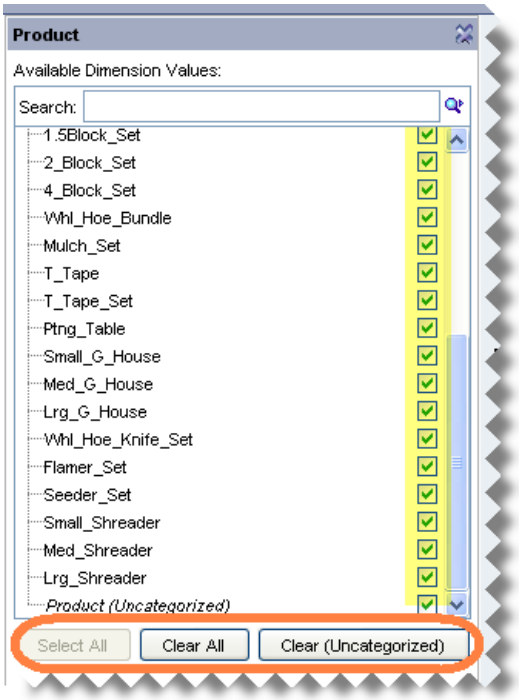
*Note that the **Plan, Account**, and **Time Dimensions** are required; you will not be able to delete these categories, but you can specify the dimension values from each category that will be present in the cube. Admin Users can reorder columns/dimensions in this screen at any time by dragging and dropping the columns. Reordering columns/dimensions will affect the order in which the dropdown selectors for the dimensions appear across the top of the cube sheet and the order dimensions are displayed in Audit Trail and Cell Notes.*

- Once you select the dimensions to be included in the Cube sheet, **select the dimension values that should be present on the sheet.** Checking a box means that the indicated value will be included on the cube; leaving it blank means the value is not included on the cube.



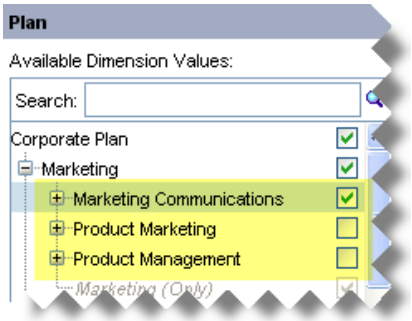
You can check or uncheck any of the boxes in a dimension (except for Plans) without regard to parent-child relationships. It is valid for a child to be selected while its parent is not.

There are three selection buttons that will help sheet designers to quickly check or uncheck multiple dimension values at a time.

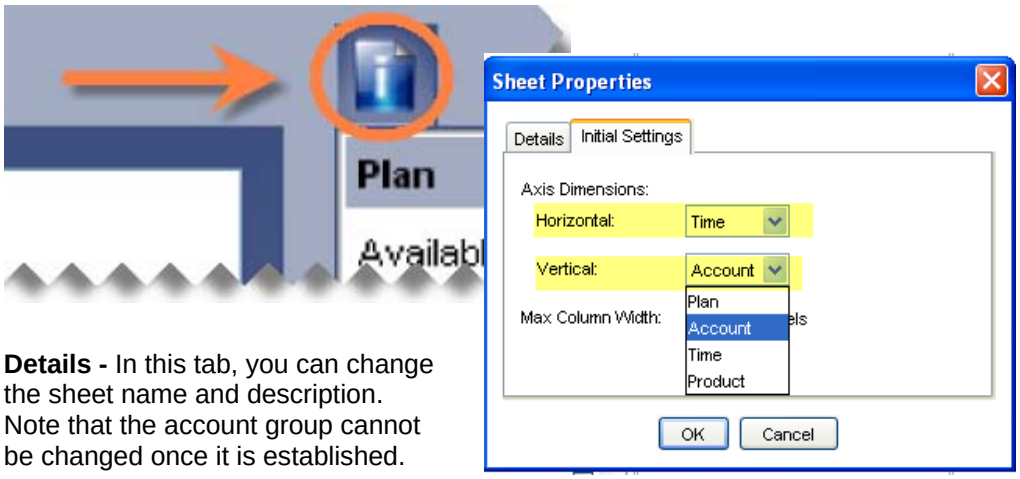


The **Select All** button will check all dimension values. The **Clear All** button will uncheck all dimension values. The **Clear (Uncategorized)** button only appears on non-enforced dimension columns. If clicked it will uncheck all uncategorized dimension values.

Another way to quickly select multiple dimension values is to collapse a node and check or uncheck this node. Checking or un-checking a collapsed parent node will also impact all of its child values.



- **Specify the Sheet Properties by clicking on the Properties button.** This dialog box will contain 2 tabs (unless it is a plan independent sheet, which has an additional tab). Once you have specified the Sheet Properties, click **OK**.

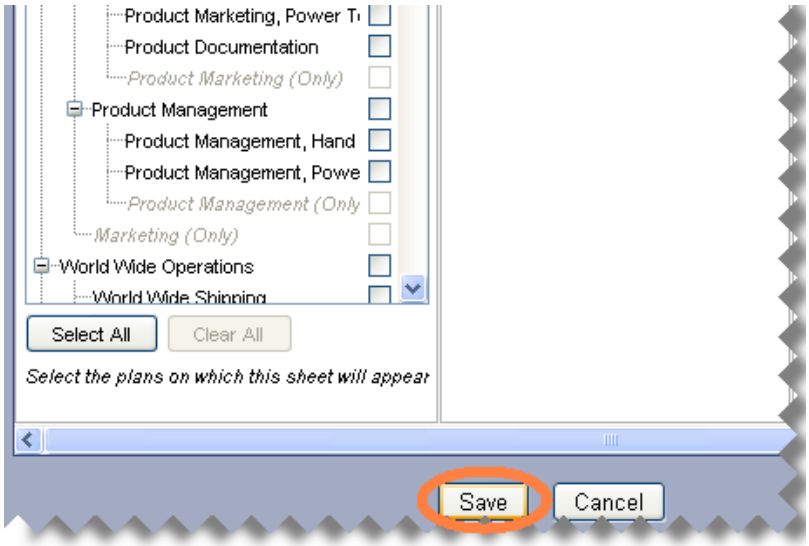


Details - In this tab, you can change the sheet name and description. Note that the account group cannot be changed once it is established.

Initial Settings – In this tab, the sheet designer can select which of the dimensions on the sheet are initially placed on the two axes of the sheet viewer. The Horizontal and Vertical dropdown lists contain a list of all dimensions on the sheet; this includes all enforced dimensions ("account", "plan", and "time") and all custom dimensions which have been dragged onto the canvas. The same dimension cannot be simultaneously selected for both axes.

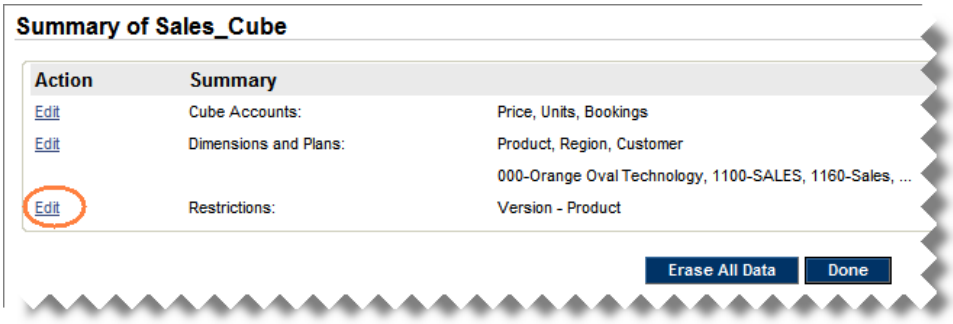
Max Column Width – This option allows a sheet designer to set the maximum viewing column width for all columns in a cube sheet. However, users may override this setting by adjusting the width of each individual column in the sheet view.

6 Click Save to save your changes.

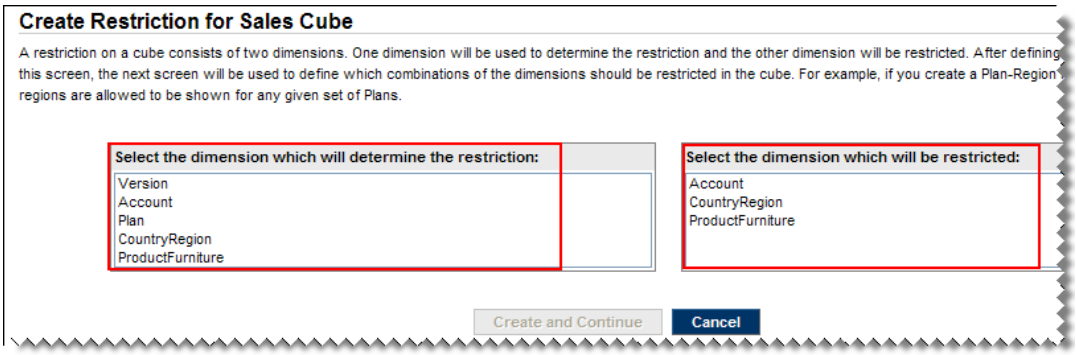


7 Create Cube Restrictions

- **Click Edit next to Restrictions;** the Restrictions page will open.



- This opens a Restrictions Summary page, **click the Add New button** to open the **Create Restriction** page.



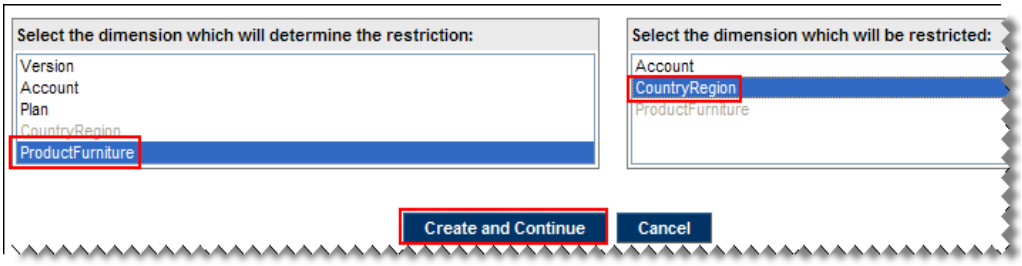
A **restriction consists of a pair of dimensions**, the primary dimension (which determines the restriction), and the secondary dimension (which will be restricted.) This can be illustrated with a Salesperson/Region restriction, such as in the following two examples:

- Product 1 is sold in Regions A, B, and C
- Product 2 is not sold in Region D

In both of these examples, Product is the primary dimension (which determines the restriction), and Region is the secondary dimension (which will be restricted.)

The first step on this page is to specify the two dimensions, but not yet define any combinations as being valid or invalid (that is done in subsequent steps).

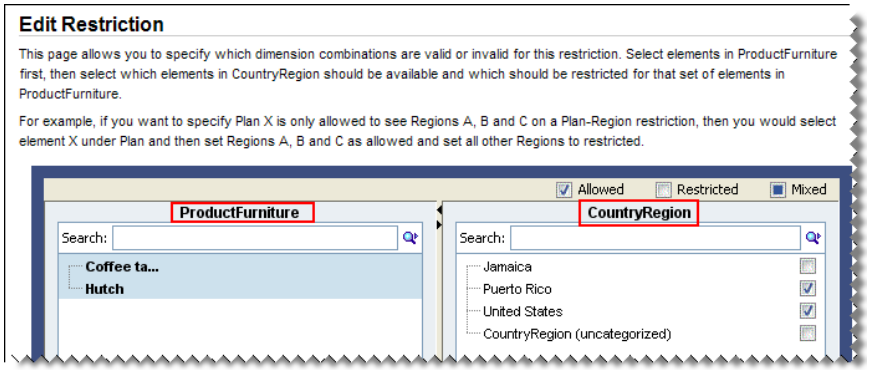
- **Select the two dimensions, then click Create and Continue.**



This opens the **Edit Restricted Combinations** page, which lists the two dimensions selected in the previous step. The primary dimension (which determines the restriction) is on the left; the secondary dimension (which will be restricted) is on the right.

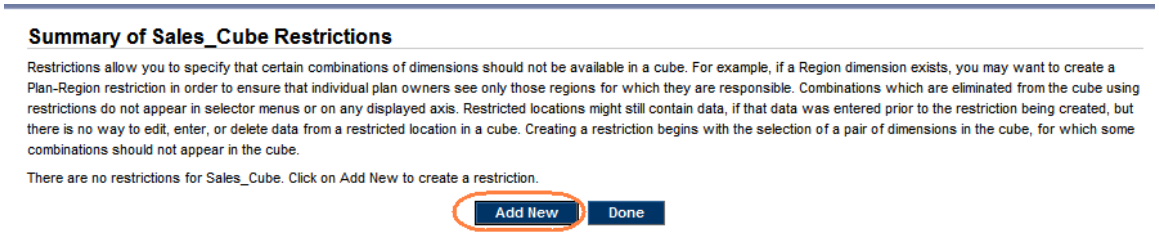
- **Select the primary dimension value(s) first**. More than one dimension value can be selected by holding down the Shift key (to select a range of values), or the Ctrl key (to select certain dimension values)

- Next, **specify how the secondary dimension values will be restricted. Click on the box next to each to select Allowed (checked) or Restricted (unchecked).**



Note: *"Mixed" is highlighted when a secondary dimension value is allowed for some of the selected primary dimension values, and restricted for others. If a parent dimension value has some children which are Allowed and some which are Restricted, then the parent displays as Allowed (not Mixed). A parent element is displayed as Restricted only all of its children are restricted. A parent can never be restricted if it has an Allowed child. Furthermore, a parent will always display as Restricted if all of its children are restricted*.

- Once both the primary and secondary dimension values have been specified, **click Save**. The user is then returned to the Summary of Sales Cube Restrictions page, where the new restriction is listed.



For more information about Cube Restrictions, see the section called **Cube Sheet Dimension Restrictions** below.

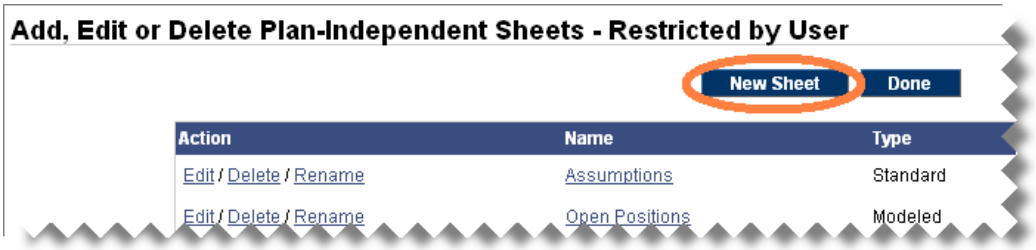
Creating a Plan-Independent Cube Sheet

Plan-Independent Cube Sheets can be assigned to specific users, instead of assigned by plan access, as with plan-dependent Sheets. When you create Plan-Independent Cube Sheets, you

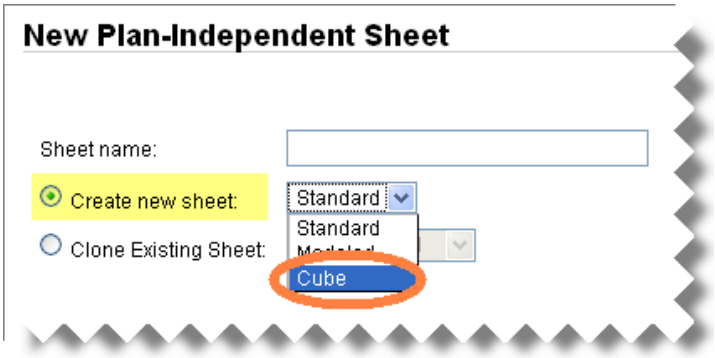
will follow the same steps detailed in the previous section with two exceptions, which are detailed below.

1 When creating a **Plan-Independent Cube Sheet**, start by clicking on the **Manage Plan-Independent Sheets – Restricted by User** link in the Administration screen.

Next, **click New Sheet.**

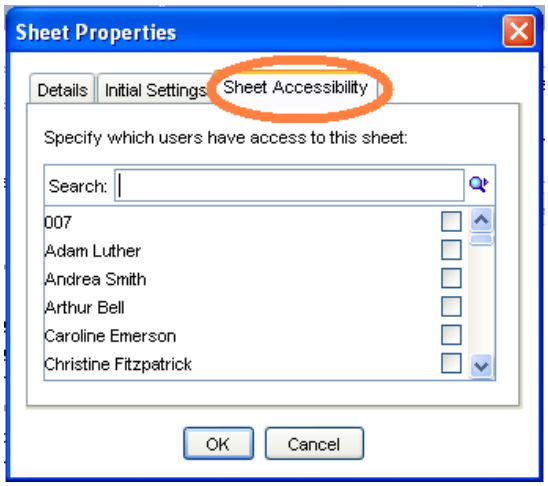


Then **select Cube from the "Create new sheet" from the dropdown list.**



Then, **follow steps 2-7 as detailed in the Creating a Plan Dependent Cube Sheet section.**

2 When you update the Sheet Properties, **specify which users have access to the Cube Sheet.** In Plan-Independent Cube Sheets**,** the Sheet Properties Dialog Box will contain an additional tab called **Sheet Accessibility**.



In this dialog box, all users are listed in alphabetical order. A checked box grants the user access to the plan independent cube sheet.

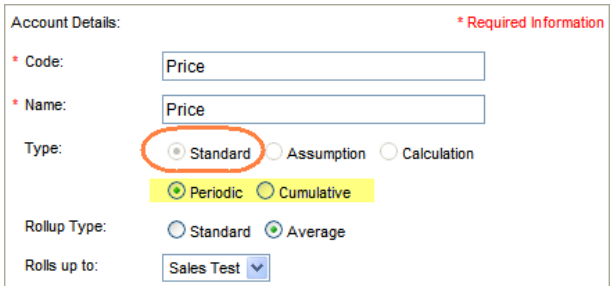
4. Cube Account Details and Characteristics

In this section, you will learn more about general Cube Account characteristics and the details or settings that you can specify when creating a new Cube Account.

Cube Account Types

There are three different Cube Account Types: **Standard, Assumption**, and **Calculation** Accounts.

- ***Standard Cube Accounts*** are similar to Custom accounts except you cannot create formulas in the Formulas Tab. When you select the **Standard** type, you will have the option to select Cumulative or Periodic for a parent account. If Cumulative is selected, you will have the option to select Planned by Balance or Planned by Delta.



In a Cube Sheet for Sales planning, an implementer could create the Price per Unit, COGS per Unit, and Units accounts as Standard Accounts. With Price, COGS per unit,

and Units as standard cube accounts, the end users will be able to key values or formulas into the accounts at specific points on the cube. In a model where price only varies by one variable, product, you could create the Price accounts as Global Assumptions.

If you want to create a formula that is specific only to certain plan and dimension combinations, create a Standard Cube Account and populate the formulas at the specific coordinates in the sheet. You can import both values and formulas to a Cube Sheet. If you want to create a global formula for all plans and dimension combinations, you could create the account as a Cube Calculation Account.

- ***Cube Assumptions*** are similar to global assumptions. Under all circumstances, the assumption value is only editable at the corporate plan level. If assumptions are made available at plans other than the corporate plan, they will appear in read-only form. Cube Assumptions are local to the sheet; they cannot be referenced from outside the Cube Sheet. When the Assumption type is selected, "Periodic" will appear below the account type radio buttons and this cannot be changed.

  In a Cube Sheet for Sales Planning, the Price account could be created as a Cube Assumption if the price varies depending on all dimensions in the cube with the exception of plan. Creating the Price account as a Cube Assumption will allow users to input values or formulas at the Corporate (Only) plan level.

- ***Cube Calculation Accounts*** are comparable to Calculated Accounts in a Modeled Sheet. When **Calculation** is selected, the Formula box will appear. The Formula is a required field. If you need help creating the formula, you can use the Formula Assistant. In addition, you will have the option to choose Cumulative or Periodic. However, if you select cumulative, you will not see the Planned by Delta and Planned by Balance options.

  The formula created for a Cube Calculation Account applies to all instances of that account (all plan and dimension combinations) on the Cube Sheet.

  Note: *There are unique restrictions for the formulas that can be created in a Cube Calculation Account. The formulas for a Cube Calculation Account are required to always evaluate to zero at a particular location in the cube if all of the Cube's input accounts are empty at that location. If a user tries to enter a formula which would not satisfy that rule, the attempt to save the cube calculation will fail with an error: "Cube Calculation Formulas must evaluate to zero when the cube's other accounts are zero*.

Cube Account Details

When creating a new Cube Account, you must complete the account details section before you can save the account. See the following for descriptions/requirements for each of the Account Details fields:

Code – The code must be unique and can only contain alphanumeric characters and underscores (no spaces or special characters are allowed).

Name – The name is a description of the account. An account name can contain any alphanumeric characters, spaces, or special symbols.

Type - There are three different cube account types: Standard, Assumption, and Calculation. See the previous section for more information.

Rollup Type - This pertains to how time period rollups are displayed.

- A **Standard** rollup of a periodic account will sum the time periods in a quarter or a year to derive the quarter or year total. A Standard rollup of a cumulative account will display the last time period in the quarter for the quarter, and the last time period in the year for the year.
- An **Average** rollup will display an average value for the quarter or the year in those rollup time periods.

Rolls up to – This indicates the parent account or group.

Display as – Cube Accounts can be displayed as Number, Currency, or Percent.

Read only on sheet – Select this check box to make the account read only in the Cube Sheet. This option will only appear in Standard child accounts and Assumptions; you will not see this checkbox for account groups, parent accounts, and calculations.

Decimal Places – This applies to the display of the account on both sheets and in reports. A cube account can be set to display anywhere from zero to nine decimal places.

Exchange Rate – If you plan in multi-currency, select either the Average or End of Month exchange rate for any cube accounts displayed as currency. This option is only available if the account is set to display as Currency.

Data Privacy – By default all accounts are marked as **Value of account is private**. The data privacy feature allows an administrator to open up specific accounts so that the values of those accounts are usable within formulas written by users on other plans.

Actuals - The **Enable Actuals** choice is appropriate if you want to import actuals to this account. If you are going to calculate actuals, this is also the correct choice. The **No Actuals** choice means that the actual dataset for this account will use data that is in the plan itself, whether entered through sheets on the plan or supplied as a formula.

Behavior of Cube Accounts on Sheets

During the creation of a Cube Sheet, an Administrator creates the Cube Accounts that appear on the Cube Sheet. Cube Accounts can also be placed on Standard Sheets. This section describes the behavior of Cube Accounts in the Sheet Viewer.

Cube Accounts on a Cube Sheet

The behavior of a Cube Account on Cube Sheet may vary depending on the account type and account settings specified by an Administrator. See the following for more information:

- ***Standard Cube Accounts*** – unless an Administrator has specifically made a Standard Cube Account read-only in the account details section, the account will be editable on the Cube Sheet. In the sheet view, users will be able to input values and formulas at the intersection of any of the dimensions on the sheet.

- ***Cube Assumptions*** **–** an Administrator can make a Cube Assumption visible at all plan levels or at the Corporate plan only. If the Cube Assumption is visible at all plan levels, it will appear as read-only in the Cube Sheet at every plan with the exception of the Corporate (Only) plan. At the Corporate (Only) plan level, users (with access to this plan) will be able to input values or formulas. *An Administrator can make a Cube Assumption read-only in the Account Details section.*

  Note: Just like Global Assumptions, even though Cube Assumptions are only editable at the Corporate plan level, they can be referenced in formulas from any plan level. The only difference is that Cube Assumptions can **only** be referred to from within the Cube Sheet where they exist.

- ***Calculation Cube Accounts*** **–** are always read-only in the Cube Sheet Viewer and always display the result of the formula created by the Administrator in the Account Details section. From the Sheet Viewer, users cannot override the formula or edit the logic in the formula. All changes to this type of account must be made in the Account Details section in the Cube Sheet editor.

Cube Accounts on a Standard Sheet

When building a Standard Sheet, you can display Cube Accounts on the sheet just as you can with GL Accounts, Custom Accounts, Metric Accounts, Modeled Accounts, Assumptions and Exchange Rates. Cube Accounts are always read-only on a Standard Sheet.

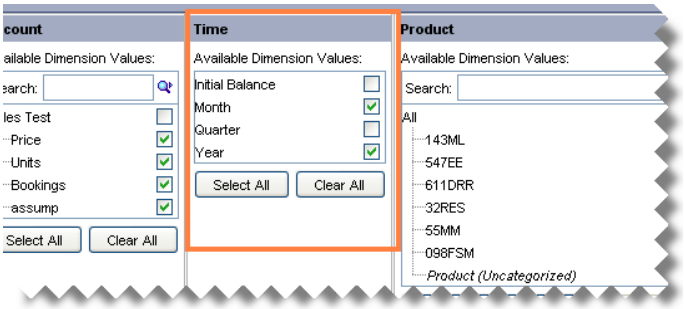
Note: When you display a Cube Account on a Standard sheet, the account value will display the aggregate value (not filtered by any dimensions). If you want to see a breakdown of the data by dimensions, you cannot display this in a Standard sheet, but you can create a report that shows a breakdown by any dimension or dimensions present on the Cube.

5. More about Enforced Dimensions (Time, Account, and Plan)

Time, Account, and Plan are the three enforced dimensions in a Cube Sheet. The following outlines special meanings for checkboxes in the Cube Sheet Builder and Viewer.

Time

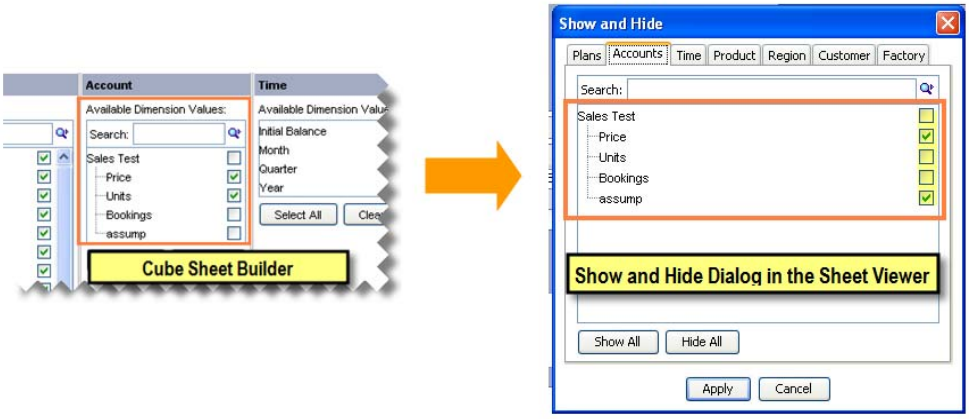
The required **Time element behaves differently than the other dimensions.** You will notice that **Time** has four checkboxes, which are all peers of each other, or non-hierarchical: Initial Balance, Month, Quarter, and Year.



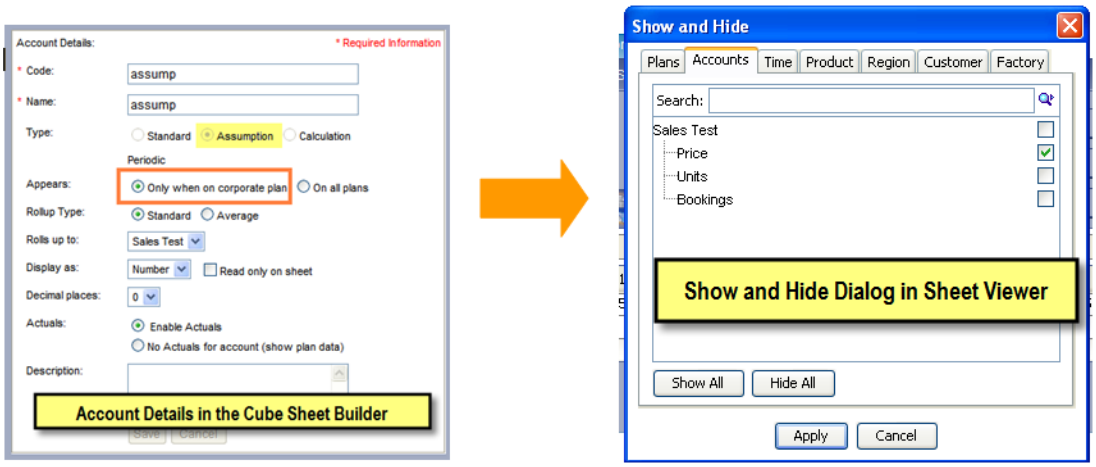
Checking one of these options will cause the columns of that granularity to show on the dimension when the sheet is displayed. Unlike all other cube dimensions, a user can override this setting in the Sheet Viewer to see other columns of time granularity. The only exception is Initial Balance. Administrators can show or hide the Initial Balance column for this cube sheet in the Viewer and an End User cannot override this option.

Account

Selection of accounts in the sheet builder is equivalent to setting the default view state for a Cube Account. That is, by default this account will be visible in the viewer if checked in the builder, and hidden in the viewer if unchecked in the builder. Similar to the behavior of the Time dimension, a user can choose to override this setting and make an account visible/hidden using the Show and Hide option in the viewer. This means that even if an Administrator has hidden an account when building the sheet, the user will have the option to display the account. There is one exception, which is listed in the next section.



If the an Administrator makes the Cube Assumption hidden on all plans except the corporate plan, the user will not be able to make the Cube Assumption available by updating the Show and Hide Settings. Notice that when the Cube Assumption called “assump” is updated so it only appears when on the Corporate plan, the user does not have the option to display this account.



Plan

Plan shows the entire Plan tree of the company. Un-checking a box in this column means the *sheet will not appear on that plan* (or, in the case of a Plan-Independent Cube Sheet, means the plan will not appear on the sheet).

Unlike all other cube dimensions, Plan respects parenthood: if a child is checked, its parent (and all its ancestry) is automatically selected. If a parent gets unchecked, all of its children get unchecked. When a user checks a parent plan when all of its children are un-selected, the user will see the following message:

6. Cube Sheet Dimension Restrictions

Cube sheets are designed to include the use of multiple dimensions, such as product, region, and sales person. In the design of a cube sheet, an administrator can limit the valid combinations of dimension values. Consequently, users of the cube sheet can more easily find the data they need, without having to search through meaningless or irrelevant dimension value combinations.

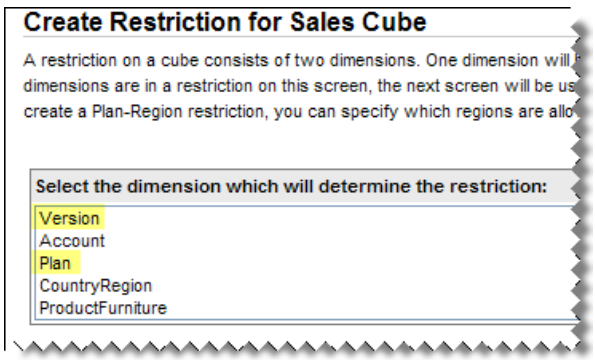
Following are several examples of this planning need:

- A product is not available for sale in certain regions.
- A sale person is responsible for specific regions.
- A company is selling a new product next year; the product is not available in earlier years.
- A new product is available in the budget plan version, but not in other plan versions.

Restrictions on Dimension Combinations

Only one restriction is allowed to exist for any given pair of dimensions, regardless of their primary/secondary order. For example, a cube sheet cannot have both a Plan-Region restriction and a Region-Plan restriction, nor can it have two Plan-Region restrictions.

Plan and Version appear only in the primary dimension selector (not in the secondary dimension selector).



This is because a plan-dependent cube sheet always shows all plans to which the user has access, regardless of any restrictions.

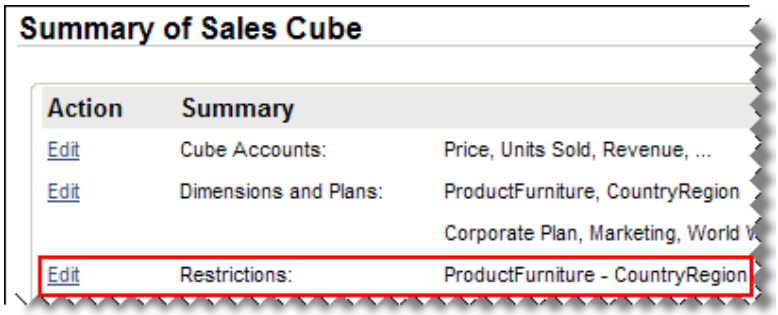
And although version is not a dimension that can be selected in the cube sheet builder, version is always part of the coordinate of a cell. (A cell value always exists in a particular version). But having version available in cube restrictions allows administrators to hide dimension values on a per-version basis. For example, a product is being discontinued and will not be available for planning in next year's budget version.

The Time dimension is not available for restriction. An individual user may choose to hide certain time elements in the sheet viewer, but all time coordinates in a version are always valid and can contain data.

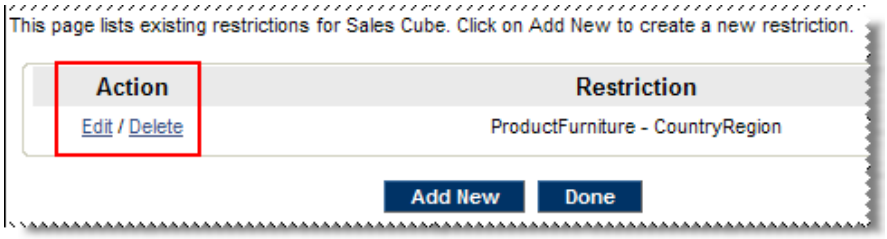
Edit or Delete Restricted Combinations

An existing cube sheet restriction can be edited or deleted by following these steps:

1 **Click Edit** next to Restrictions. This opens the Summary of Sales Cube Restrictions page.



2 **Click on the Edit or Delete links**.



3 Clicking Edit takes the user to the same Edit Restriction page that was used to create the restriction in the first place. The same actions described above to create the restriction are available to edit it. It is not necessary to save between different actions within the same restriction; clicking Save saves all the combinations within this restriction.

What Happens to Existing Data in Restricted Combinations?

When a combination of dimension values is restricted, any data at the invalid location is not deleted, but it **will no longer be visible on the cube sheet**. However, this data stills contribute to any rollup values, and will be visible if a report displays data in such a way that the invalid combination is shown. When a new restricted combination is saved, the administrator sees a warning that existing data will be hidden as a result of new invalid combinations.

Restricted cells do not have any special features in reports. Since they generally contain no data, restricted cells usually appear as blank cells in a report. The matrix report writer does not prevent users from including restricted combinations.

What the Cube Sheet User Sees

The main purpose of this functionality is to restrict the cube sheet's dimension dropdown menus so that they do not include combinations that do not make sense, or are not allowed.

If a dimension in a restricted combination is displayed on the sheet in a dimension selector (that is, not being displayed in the rows or columns axis of the sheet), the restricted elements will not appear in the dimension dropdown.

If both dimensions in a restricted combination are displayed on axes of the sheet, the restricted locations are displayed as read-only cells. Cell Explorer can be used on such a restricted cell, and cell notes can be viewed, but the Formula Assistant is not available since the cell cannot be edited.

What the cube sheet user sees depends on how the Administrator has created the restrictions. Following are the different possibilities:

- **A dimension value may be completely hidden from the cube sheet**. In this case, the dimension value is not displayed anywhere in the cube sheet; it does not appear in the axes, nor in the dimension dropdown menus. No data can exist in this cube sheet at the hidden dimension value.

- **Certain combinations are restricted**. The dimensions and dimension values included in the restriction are part of the cube sheet and may be displayed on the sheet, depending on how it is laid out, per the above descriptions. The invalid combination locations are allowed to contain data, if that data was there prior to the restriction being created. However, that data cannot be edited or generally seen by users.

- **A user may choose to hide a dimension value from his view only.** This type of hiding is user-specific, and does not remove data. It is simply a customization of the user's view of the cube sheet.

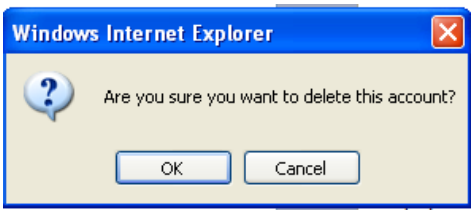
7. Editing Cube Sheet Components

This section describes how changes to the different components of a cube sheet impact the existing sheet.

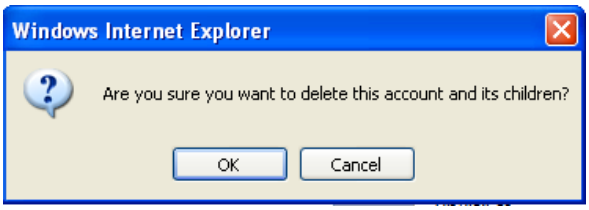
Account Changes

- When any type of account is added to the cube sheet, its initial appearance in the dimension selector (selected or not) is the same as its parent account. If its parent account is the Cube Sheet group itself, then its initial appearance is "on".

- When a data entry account is added to a cube sheet, the cells for this account will be "blank". When a data entry account is deleted from a Cube Sheet, all of the data associated with that account will be deleted in all versions. Users will get the following message with the option to delete the account or cancel the request when attempting to delete an account.



- When an account or group with children is deleted, the entire tree is deleted (including all associated data in all plans) and the users will receive this message:



Enforced Dimension Value Changes

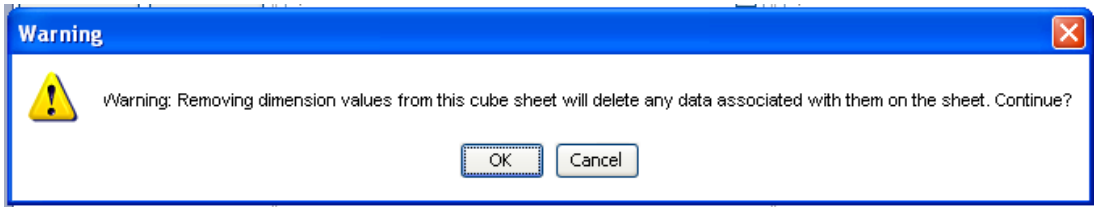
When an admin changes the visibility of elements of an enforced dimension, the behavior is as follows:

- Checking a plan makes the sheet visible on that plan
- Un-checking a plan hides the sheet from that plan, but does not delete any data for the sheet on that plan (same as modeled sheets)
- Checking an account makes the (previously-existing) account appear on the sheet in its natural location in the account tree
- Un-checking an account hides the account from all users on the sheet (even Administrators), but does not delete any data in that account
- Checking a time granularity makes that new set of columns appear, by default, when a user views the sheet with time on an axis
- Un-checking a time granularity makes that set of columns not appear, by default, when a user views the sheet with time on an axis

Other Dimension Value Changes

- For non-enforced dimensions, when a dimension value element is added to a dimension in Dimension Admin which is already on the cube sheet, that value is added silently, and inherits the value visibility of its parent value on this sheet. If its parent is the root of the dimension, then it inherits the visibility of the "All" element.
- The existence of data associated with a particular dimension value on a cube sheet counts as that dimension value being "in use", so it is therefore it cannot be deleted from the **Define Dimensions Screen**. The visibility of a dimension value on a Cube Sheet that does not have any data associated with the value does not count as being in use, and the value can be deleted in **Define Dimensions Screen**. Deleting a dimension value that is not “in use” in the Define Dimensions screen will cause the same dimension value to be removed from all cube sheets.
- When a previously-existing dimension value is made visible on a cube sheet for the first time (select a checkbox in dimension column), it is just made visible as an option to users of the cube sheet (no warnings or data changes required).

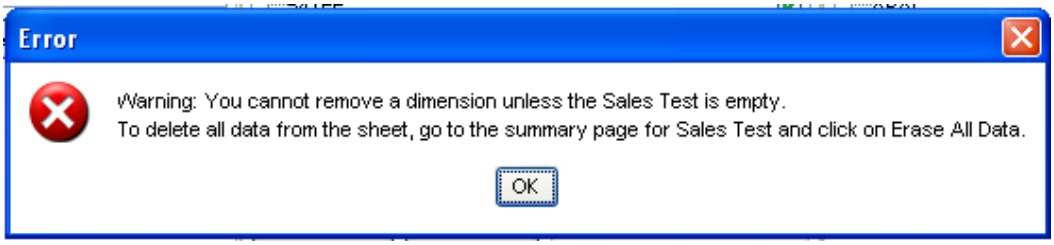
- When a previously-visible dimension value is made invisible on a cube sheet (unselect a checkbox in dimension column), then if there is any data entered for that dimension value on this cube, the user will receive the following warning:



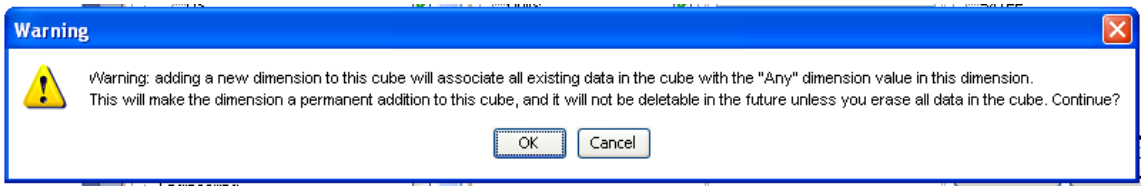
Choosing the OK button in the Warning dialog will delete all data associated with that dimension value on this cube sheet in all versions.

Dimension Changes

- If a dimension is placed on a Cube Sheet, this counts as the dimension being "in use" in the Define Dimensions screen and the dimension cannot be deleted (even if there is no data in the cube).
- Removing a non-enforced dimension from an existing cube is not allowed unless there is no data at all within the cube. If the cube contains no data, dimensions can be added and deleted without warnings. If there is data, the following message will appear:



- Adding a new dimension to an existing cube is allowed, but pops up a warning to the user if the cube contains any data at all:



Dimension Changes – Impact on Cube Restrictions

- **If a dimension or a dimension value is removed from a cube sheet,** any restrictions that refer to that dimension or value are deleted. Therefore, if the dimension or value is re-added to the sheet, the restrictions would need to be re-created.

- **If a new dimension value is added** to a dimension (e.g. a new product is created), it will default to the same restrictions as its parent. If a new value has no parent, it will default to Allowed in all restricted combinations that contain this dimension.

- **If a dimension value is moved to a different parent** within the dimension, the dimension value is treated as a new dimension with respect to restrictions (i.e. old restrictions on the value are deleted, and it defaults to the same restrictions as its new parent).

A dimension or a dimension value with a restriction on it cannot be deleted from Dimension Administration.

8. Formula Evaluation within the Cube

When a formula is evaluated from within Cube Sheet, the current "inferred/implied coordinate" system of determining a formula term's location is used. Any reference to another account *in the cube where the formula resides* is assumed to have all the same discriminant values as the cell where the formula resides, unless they are explicitly overridden in the formula term.

This is an extension of the current behavior of Standard Sheet formulas. In Standard Sheets, all primary coordinates are the same for terms in a formula as they are for the cell where the formula resides, unless the coordinate is overridden explicitly. For example, a formula in account ABC referring to ACCT.XYZ is assumed to be referring to the value of account XYZ *on the same plan and in the same month* as the cell in account ABC). In Standard Sheets, we explicitly do *not* infer this for splits or dimensions. **However**, in Cube Sheets all of the dimensions are part of the primary coordinate system, so all of them will be assumed to be the same in a formula term, unless overridden.

Here is an example:

In the cell for Account "CubeUnitSales" in Region "Europe" for Product "Product A" on plan "Direct Sales" in month "Jan 2009", a formula is placed that says "=ACCT.CubeUnitSales[Product=Product B]". This formula will be calculated by finding the value of the CubeUnitSales account in Region "Europe" for Product "Product B" on plan "Direct Sales" in month "Jan 2009". Note that all other aspects of the coordinate (Region, plan, month) are inferred or "inherited" from the context of the cell where the formula resides; only the Product dimension changes.

Cube Calculations

Formulas for Cube Calculation accounts are similar to those for Metric accounts: they will generally *not* contain discriminants on terms, though if they do have them, they overlay in exactly the same way as formulas in individual cube cells do. Cube Calculation accounts, like metrics, are generally kept discriminant-free so that they can have the coordinates of all the cells where they appear be inherited and their values can be sliced in the same way that cube data entry accounts are.

Cube Assumptions

A reference to a Cube Assumption account (e.g. ASSUM.Inflation) is always evaluated on the Corporate Plan, regardless of the plan location of the cell which contains the reference. **However**, all other coordinates of this cell, which contains the reference in the cube, are inferred into Assumption terms: Cube Assumptions are sliced in all the same ways as any other Cube Account except for how they handle the Plan dimension.

References to Extra-Cube Accounts in Cube Formulas

When a formula inside a Cube Sheet refers to an account outside the cube, *even if it is referring to an account from another cube*, the dimension coordinates of the location of the formula are *not* inherited into the formula term. The primary coordinates of plan and month *are* inherited. As an example, in the cube cell for Account "CubeUnitSales" in Region "Europe" for Product "Product A" on plan "Direct Sales" in month "Jan 2009", a formula is placed that says "=ACCT.SalesSheet.Units". This formula will be calculated by finding the value of the Units account on the modeled sheet named "SalesSheet" on plan "Direct Sales" in month "Jan 2009".

Note: The data will not be filtered on Product A in Region Europe.

Behavior when Same Dimension is Used on Plan and in a Cube Sheet

If the same dimension exists in the plan tree and within a sheet (Cube or other), the plan dimension is ignored. For example, if a dimension, Region, is a plan dimension and an explicit cube dimension, then when a formula references the Region dimension (e.g. ACCT.Units_Sold[Region=US]), the plan dimension Region is ignored.

9. Formula References From Outside the Cube

A reference to a Cube Account from a cell which is *not in a cube* are possible. Formula terms which refer to Cube Accounts inherit/infer *only* the plan and month of the cell in which the formula resides. All other coordinates of the containing cell are ignored, and, if not specified in the term, are assumed to be an implied "all values" for each unspecified dimension. If fewer dimension discriminants are supplied on the formula term referring to the cube account than the cube sheet has in its coordinate system, the resulting value is calculating by "rolling up" all values for the non-specified dimensions.

10. Importing Data to Cube Sheets

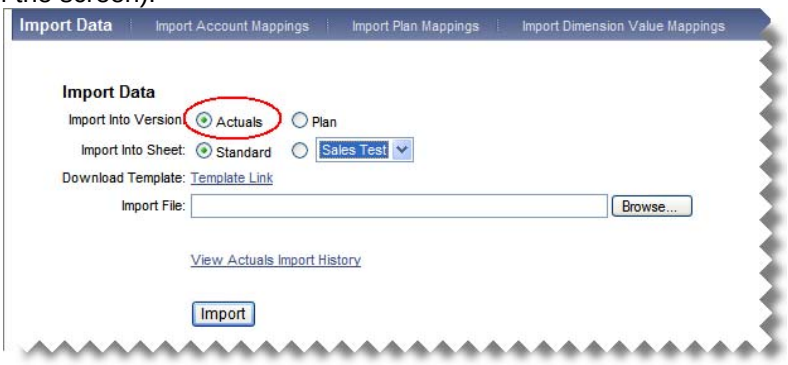
The only method of importing data to a Cube Sheet is a manual import; the Automated Data Integration feature does not apply to Cube sheet imports. Importing data to Cube Sheets is very similar to importing data to Standard Sheet. The main difference is that a different template is used for the Cube Sheet import. Another key difference is that **users can import values or formulas into a Cube Sheet**, whereas only values are allowed in a Standard Sheet import.

Note: *Data cannot be imported to Cube Calculation Accounts or to restricted cube sheet locations.*

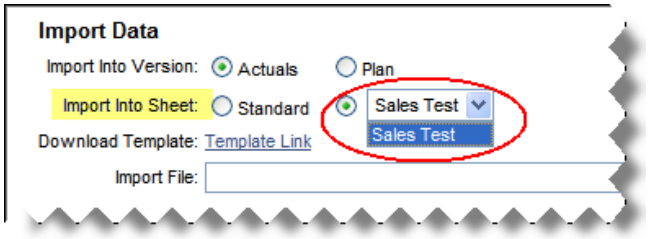
Often the plan implementer will perform the first import and assist the administrator in learning this process.

1 Go to the Import Tab

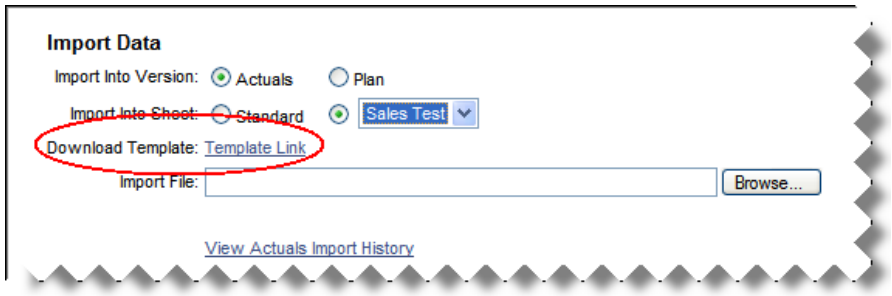
2 **Select the Actuals radio button next to Import Into Version**. (When the Actuals radio button is selected, the data in the import template will import to the Actuals: Reference version. If Plan is selected, the data will be imported to the version that is currently selected at the top of the screen).



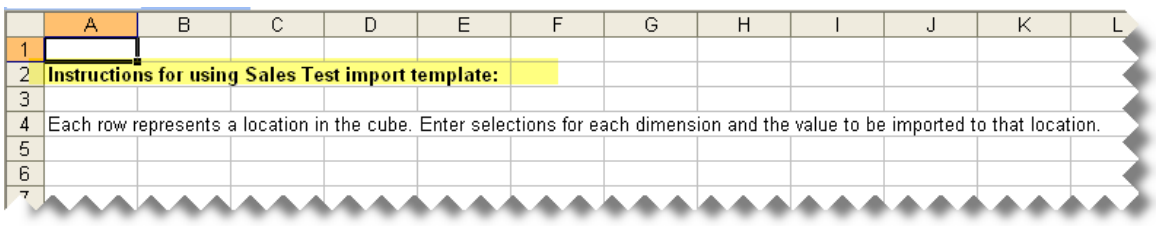
3 To import Cube Sheet Data, **select the second radio button next to Import Into Sheet and select the Cube Sheet to which you are importing data from the dropdown list**.



4 **Download the actual import template by clicking on Template Link**. This download is an Excel file, and it contains general importing instructions.

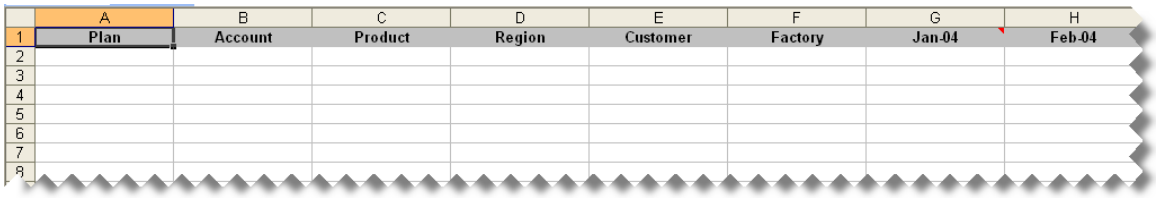


An example of a Cube Sheet Import Template is shown here.



5 **Click on the second tab at the bottom of the downloaded spreadsheet**. This spreadsheet tab will have the same name as the sheet to which you are importing data.

6 **Populate the template with the data to be imported.** The Plan, Account, and any Dimension Fields listed on this template are required fields. See the following for descriptions of the fields.



	A	B	C	D	E	F	G	H
1	Plan	Account	Product	Region	Customer	Factory	Jan-04	Feb-04
2								
3								
4								
5								
6								
7								
8								

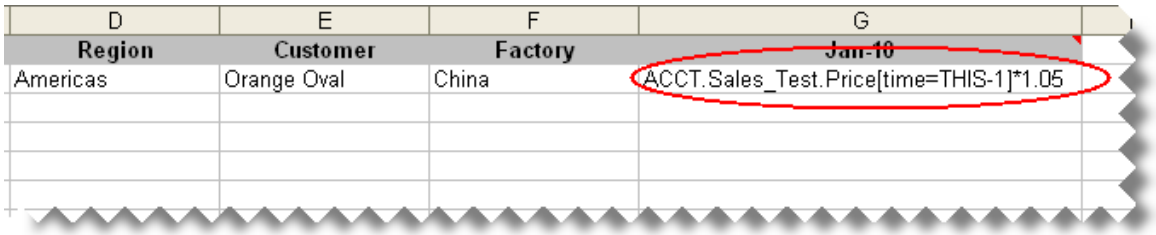
Account: Account identifier, e.g. the account code or name from a source file. This is a required field; it cannot be empty.

Plan: Plan identifier, e.g. the department code or name from a source file. This is a required field; it cannot be empty.

Custom Dimension fields: in the example template above, Product, Region, Customer, and Factory are the custom dimensions included in this specific Cube sheet. The custom dimensions generated in the template will mirror the custom dimensions available on the Cube Sheet you selected before downloading the template. These will vary from model to model and must be populated for the import to work correctly.

Jan-04: This column is used to hold data for a given month. The header (Jan-04) is just an example, and can be changed to represent the appropriate month and year of the actual data. The header must be in the format **MM/01/YY**, where MM is the month and YY is the year. Each date entered must be the first of that month. Additional columns can be created to represent additional months of actual data to be imported. In this column, you will input the value or formula that corresponds with the dimensions specified in any given row.

Note: If you are importing formulas to a Cube Sheet, omit the equal sign when populating the formula in the template.



D	E	F	G
Region	Customer	Factory	Jan-10
Americas	Orange Oval	China	ACCT.Sales_Test.Price[time=THIS-1]*1.05

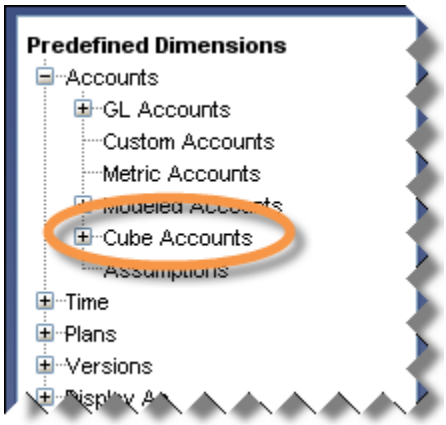
7 Once the spreadsheet has been populated with actual data, and it has been properly formatted, **save the template to a convenient location on your computer**. **Click on the Browse button to locate the file just saved. Click Import.**

Note: When an import coordinate has a value of zero at the time of import, the application will treat the zero as if the value was a blank. That is, a zero will erase existing value at the same coordinate.

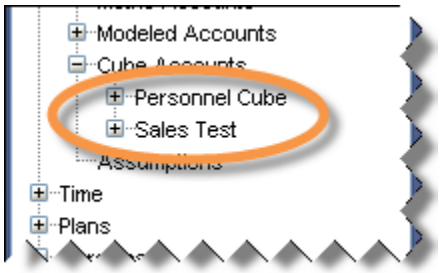
11. Reporting on Cube Sheet Data

Matrix reports are used to report on Cube Sheet data; changes made in Cube Sheets can also be tracked in the Audit Trail. If you are already familiar with creating Matrix Report which include GL Accounts, Custom Accounts, Assumptions, Modeled Accounts, Metric Accounts and Exchange Rates, you will find that there is little or no difference in creating a Cube Sheet that includes Cube Accounts. When you report on Cube accounts, you can report on the accounts at the aggregate level or you can filter by any of the dimensions included on the Cube Sheet.

You will notice a new category for Cube Accounts in the Account tree in the Matrix Report Builder.



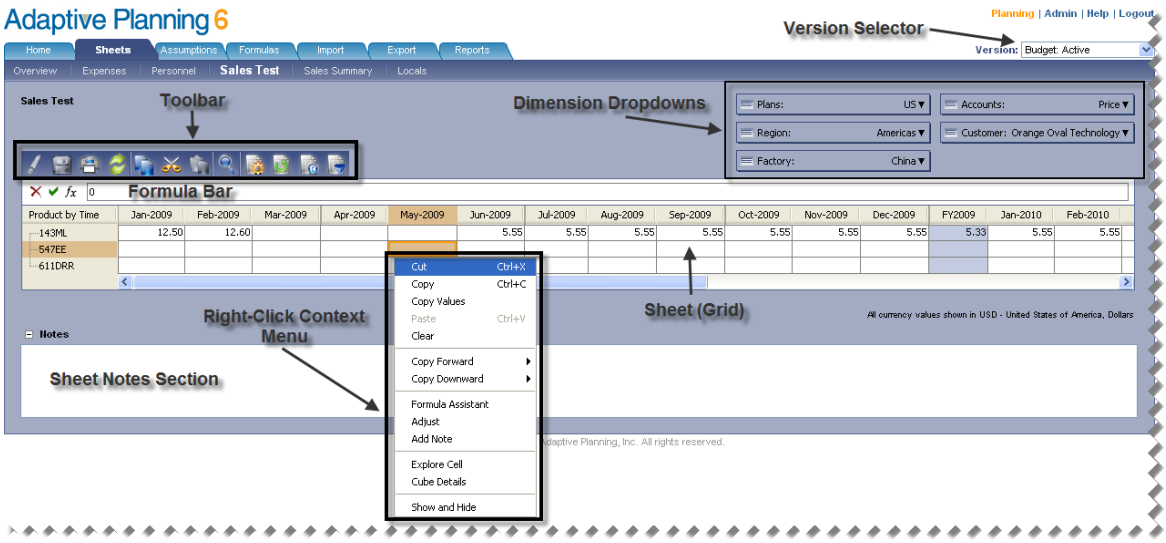
When you click on the plus sign next to Cube Accounts, you will see a list of all of the Cube Sheets which exist in your model.



You can expand any of the Cube Sheets in this list to see the accounts associated with each sheet. You can drag and drop any of the accounts into the Report Design Area. Any dimensions and dimension values that are included in a Cube Sheet can also be included in the report.

12. Cube Sheet Viewer

In the Cube Sheet viewer, you can view and edit data in plans to which you have been granted access.



Cube Sheet Viewer – Sections

The Cube Sheet viewer is made up of the following sections:

(1) Version Selector – this field appears in the top right corner of the screen and contains all of the versions to which you have been given access. This is where you select the version that you want to view or edit. Make sure that the correct version is selected before making and saving any changes on the sheet.

(2) Dimension Dropdowns– this section appears just above the sheet in a 2-column list on the right side of the screen. In this section, select the appropriate values from each of the dropdown lists. The two dimensions which are currently shown on the two axes of the sheet itself will not appear in the dimension dropdowns.

When you click on the dimension value or the down arrow, the list of available dimension values appears. The dropdown list contains a search field, which helps a user locate a dimension value. When you change the selection in a dimension dropdown, the sheet refreshes with the data corresponding to the new selection. Only one value can be selected in each dropdown and rollup dimension values are valid choices.

(3) Sheet (Grid) – The sheet is a place for inputting and viewing data. When you make entries into the sheet, you can key data directly into cells or you can first select a cell and key data into the Formula Bar. Any cells with a white or light blue background are editable; cells with a gray background are read-only. You will find the functionality in both the **Toolbar** and the **Right-Click Context Menu** helpful when making entries into the

sheets. In addition, if you are creating formulas and you need help creating the formula in the correct syntax, you can rely on the **Formula Assistant**.

See the following for more information about how data is displayed in the sheet:

- Edited but unsaved data appears as blue text against white; normal data appears as black text against white
- Errors in formulas in cells appear as red text against white
- Errors in referred-to cells result in red background with "f(x)" in black text
- Read-only cells appear with a gray background
- Actuals data appears in green text against gray background
- Rollup cells have a light blue background

(4) **Formula Bar –**If you input a value or a formula into the **Formula Bar** make sure that you click the **Apply** button (this is the button with the green checkmark icon) once you have completed your entry. The value or formula will not populate into the sheet until you click the **Apply** button. Also, the formula will not evaluate until you save the sheet.

(5) **Toolbar**- The toolbar appears above the sheet and is used to perform many functions: you can erase all edits since your last save, save your edits, send the current view on your sheet to Excel (Printable View button), and refresh the sheet. Standard cut, copy, and paste functionality is available in the toolbar as well. If you want to find out more about a cell or drill into formulas in a cell, you can select the Cell Explorer button (button with a magnifying glass) to get more information. Users can use the last four buttons to modify the view and preferences in the sheet. For more information about this functionality, see the section called **Editing the Sheet View and Show and Hide.**

(6) **Right-Click Context Menu** – When making entries in a sheet, you can right-click on different areas of the sheet to bring up the menu. The options that appear in the menu are dependent on where you clicked on the screen: you will see different options when you click on an editable cell vs. a read-only cell or a cell vs. a column or row header. The menu contains most of the functionality that appears in the toolbar, with some exceptions.

The following details the functionality that is unique to the right-click context menu:

- **Copy Values** – If you are copying data in cells that contain formulas and you want to copy the result of the formula rather than the formula itself, you would select this option. To copy the actual formulas, you would use the **Copy** option.
- **Clear** – You can select one cell or a range of cells, right click on the selection, and choose Clear to delete any values or formulas in the selected cells.

- **Copy Forward** – Only available when a single non-rollup cell is selected. If a value or formula applies to an entire row or multiple cells within a row, you can use this option. Selecting Copy Forward to End will copy the **value or formula** forward to the right-most cell in the row. Notice that you can select the Advanced Copy forward option if the Time element is present in the columns axis. With the Advanced copy forward functionality, you can copy the data forward for the current quarter or year and if the cell contains a value, you can copy if forward with an increment or decrement (e.g. increase it by 10% each month). **Note:** If Time is not present on the X axis in the Cube sheet, you will see the following options:
  Copy to End: copies the value or formula of the currently selected cell into every cell on the current row of the version, from the currently selected cell to the end of the row. Copy to End applies to all values of the dimension on the axis where you are applying Copy Forward, which could include dimensions a user has hidden on the sheet.
  Copy to End Including Cell Note: allows users to copy forward a value or formula as well as a cell note. If a cell note does not exist in the selected cell, this option will be disabled.
- **Copy Downward** – This is similar to Copy Forward, but allows you to copy a value down a selected column. The Advanced option is only available if the Time element is present in the rows axis.
- **Adjust** – You can select a range of cells and aggregately adjust the range proportionately or evenly by a specified value. You also have the option to increase or decrease each of the cells in the range by a certain value or percentage.
- **Add Note** – You can add cell specific notes to each cell by selecting this option. Cell notes can be displayed in reports.

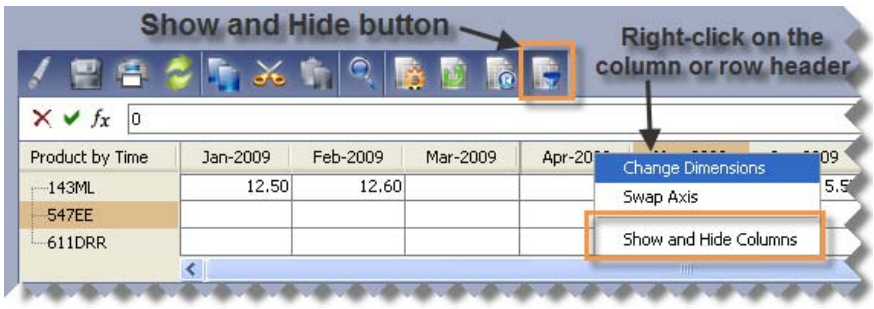
(7) **Sheet Notes –** This is a section at the bottom of the sheet where users can type notes that are specific to the sheet. Unlike cell notes, the **Sheet Notes** do not reference any coordinates on the sheet.

Editing the Sheet View and Preferences

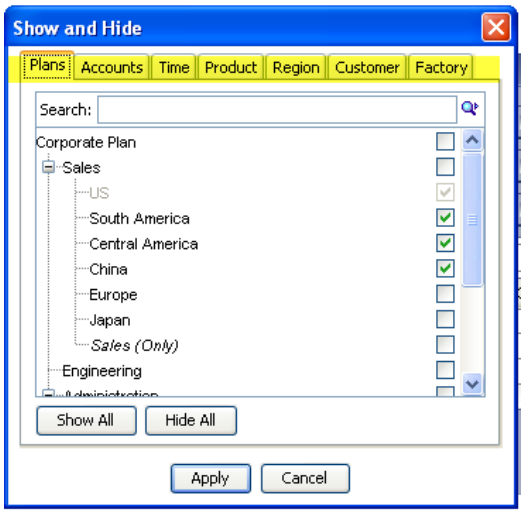
This section explains different ways that a user can change the view of the data in the Sheet Viewer.

Showing and Hiding Dimension Elements

Each user can specify which dimension values are visible in a Cube Sheet. To hide dimension values, open up the Show and Hide Elements popup dialog. This dialog can be opened by clicking on the Show and Hide Elements Toolbar button, or by right-clicking on any header and choosing the context menu option **Show and Hide Rows** or **Show and Hide Columns** depending on whether the selected header is a row or a column header.



The Show and Hide Elements dialog has a tabbed interface where each dimension that has been added to the sheet represents a separate tab. The dimensions/tabs are listed in the order they appear on the sheet. If you opened the dialog via a right-click context menu option on a header, then the tab that corresponds to the dimension you clicked is opened. Otherwise, the first tab is opened.



Each tab will list every element of the dimension that the Administrator specified when creating the Cube Sheet along with a checkbox next to each one. Checking the box will make the corresponding dimension value appear; un-checking it will make it hidden. Element visibility applies to axes and dimension dropdowns. If a dimension value is hidden, then it is hidden from the dropdowns and the axes. Each tab will also have a search control that allows a user to quickly find a dimension value.

With the exception of plan, you can select a child dimension without selecting the parent. A user is not able to uncheck all items in a dimension; at least one item must be checked in order to save the Show and Hide dialog settings.

Plan and Time dimensions are special and have the following restrictions:

- **Plan** - When plan elements are hidden, they are hidden when displayed on an axis, but not hidden in the dropdown selector. You cannot hide the existence of the sheet on the sheets tab. The link to access a cube sheet will always appear for any plan the sheet is available on even if a user has hidden that plan in the Show and Hide Elements dialog.

  The plan dimension dropdown on Cube Sheet will behave identical to all other plan dependent and plan independent sheets:

  On a plan dependent sheet - the plan selector will show the entire plan tree the user has access to. If user switches to a plan that is not associated with the sheet, then the user is redirected to the Overview page. Plans not associated with this cube sheet will have a gray background color.

  On a plan independent sheet - the plan selector will show only those plans that have been associated with the sheet.

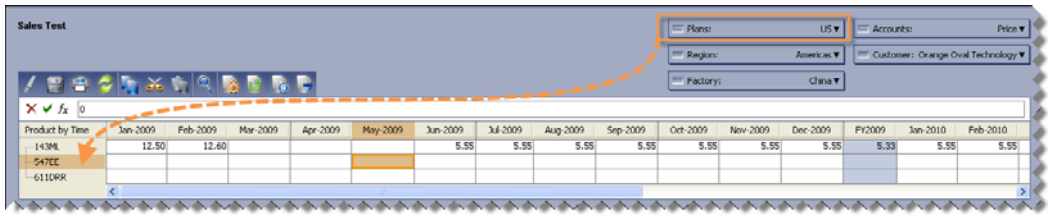
- **Time** - In Show and Hide Dialog, the Time dimensions will not be listed in a hierarchical view. Instead, it will be similar to the Standard Sheet Preferences - listing the Months, Qtrs, Years options for each year that is in the currently selected version.

  When the Time dimension is in a dimension dropdown and there is no saved dimension value, the view will default to the current month if it is available. If current month is not available, then the view will default to the first element in the Time dimension.

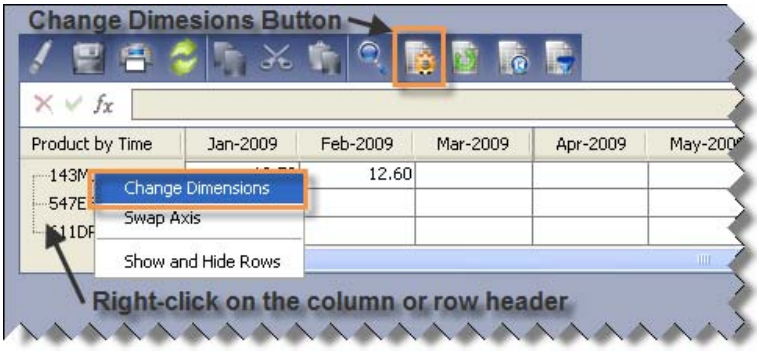
Rotation

To rotate the sheet or change the view of the sheet, you can either drag and drop dimensions on top of axes or you can use the **Change Dimensions** dialog screen.

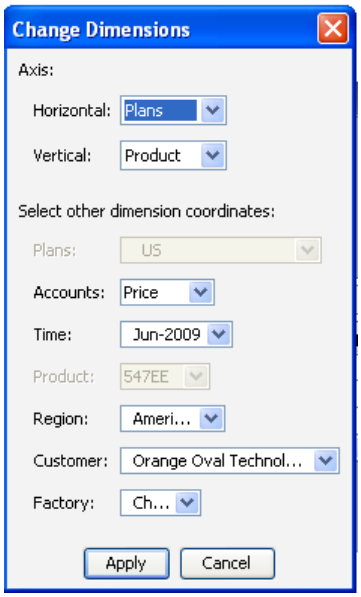
- **Drag and Drop -** If you want to rotate the view of the sheet, you can drag a dimension selector and drop it on a column or row header. The dimension that was dropped on an axis will appear on the axis where you drop it. The dimension that was on the axis will now appear as one of the dimension dropdowns.



Change Dimensions dialog – To open this dialog box, click on the **Change Dimensions** toolbar button, or right click on any header and select **Change Dimensions**.



The top portion of the dialog specifies which dimension is going to be placed on each axis. The bottom portion of the dialog lists the dimensions that are placed in the dimension dropdowns. When a dimension is placed on an axis, that same dimension and its dropdown selector is disabled in the dimension list. Dimensions that are not placed on an axis are enabled and user can choose the dimension value they want to see.

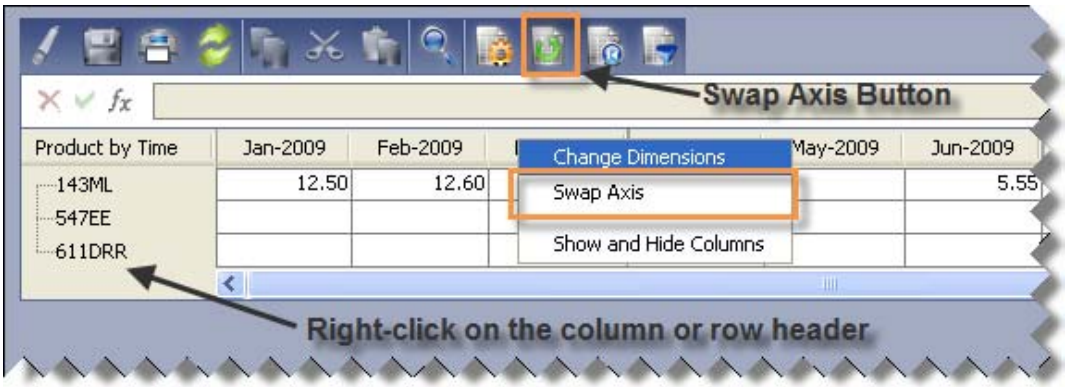


Clicking **Apply** will cause the sheet to rotate and the dimensions selected for the axes are placed on the axes and the other dimensions appear in the list of dimension dropdowns. Rotation or orientation is similar to collapsing accounts on Standard Sheets. That is, if a user performs any kind of save, then the current orientation will also be saved to the database. The view that a user saves is specific to that user only. However, if the user does not save, the orientation will not be retained the next time the user opens the sheet.

Note: Using the **Change Dimensions** dialog is a quick way to navigate to a particular point in the Cube Sheet. You could also select the different dimension values in the Dimension Dropdowns at the top of the screen, but the screen has to refresh with each selection.

Swap Axes

A quick way to swap axes is to click on the Swap Axes toolbar button or right click on any header and choose the context menu option Swap Axes. Selecting this action will swap the X-axis with the Y-axis. This change does not impact the dimension values in the dimension dropdowns at the top of the screen.



Default View

Default view is the initial view specified by the sheet designer. If a user has changed and saved their view, the user can return to the default view by clicking the **Default View** button on the toolbar. When clicked, it will rotate the sheet as specified by the sheet designer, and any hidden elements will be made visible. The default view will not be retained for future instances until the user saves the sheet.