SAP TECHED '07

DEVELOPING STATE-OF-THE-ART TABLE USER INTERFACES IN WEB DYNPRO JAVA

CD254

Exercises / Solutions

BERTRAM GANZ
SAP NETWEAVER UI F OPS, SAP AG

PETER BARKER
NETWEAVER UI PRODUCT MANAGEMENT, SAP AG

CHRIS WHEALY
NETWEAVER RIG, SAP (UK) LTD

Exercise 1 – Using Table Cell Variants

This first exercise dealing with Web Dynpro Tables in SAP NetWeaver 7.0 is based on an incomplete Web Dynpro Project template. After having finished this exercise the following learning objectives will be fulfilled:

- Defining a calculated context attribute returning table cell variant keys for node elements (table rows).
- Adding a table cell variant of type *TableStandardCell* to a *TableColumn* UI element
- Adding a cell editor to a table cell variant.
- Binding a *TableColumn* UI Element to a calculated context attribute returning variant keys.
- Implementing a calculated context attribute getter method returning cell variant keys for table node elements.

Estimated time required for completion: 20 min

Related Web Dynpro Project and View Layout

This Exercise is based on the following Web Dynpro project and view layout:

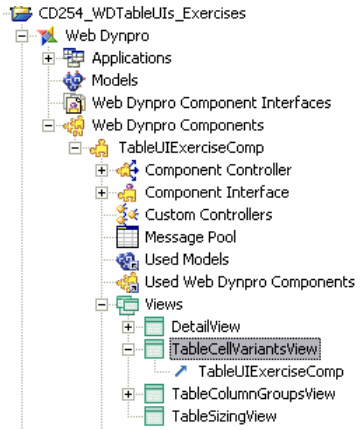
- **CD254_TableUIs_Exercises:** Web Dynpro project template comprising the initial state of the Web Dynpro views this exercises are based on.
- **TableCellVariantsView**: Exercise view for adding a cell variant to a table column.

The exercise solution can be found in the separate Web Dynpro project **CD254_TableUIs_Final**, view **TableCellVariantsView**.

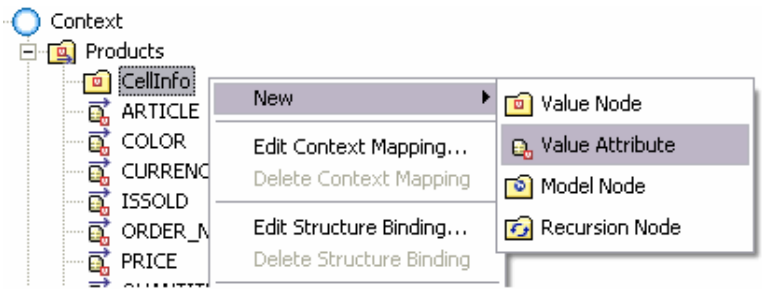
STEP 1 – Defining Required Calculated Context Attribute Returning Cell Variant Key

Every table node element storing table data must be enriched with a context attribute storing the corresponding selected cell variant ID. This is done by first adding a non-singleton node named *CellInfo* with cardinality 1..1 to the mapped table data node in the view controller context and then adding a calculated context attribute of type *String* to return the required *variantKey* per node element at runtime.

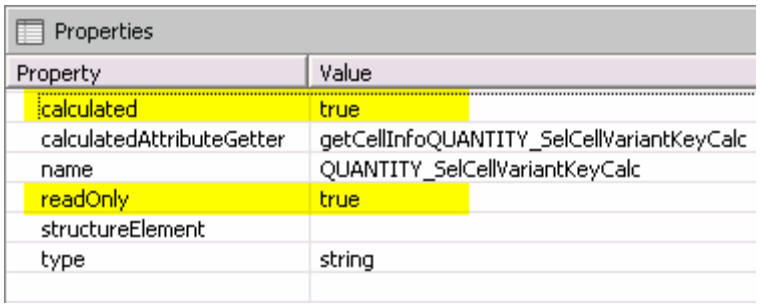
1. Open the Web Dynpro project **CD254_TableUIs_Exercises** within the Web Dynpro Explorer.
2. Navigate to tree node *Web Dynpro – Web Dynpro Components – TableUIExerciseComponent – Views – TableCellVariantsView*



3. Select tab *Context* to extend the pre-defined context structure with additional elements.
4. Open context menu for non-singleton child node **Products.CellInfo** and select menu item *New* → *Value Attribute*
5. Enter name **QUANTITY_SelCellVariantKeyCalc** and press button *Finish*.

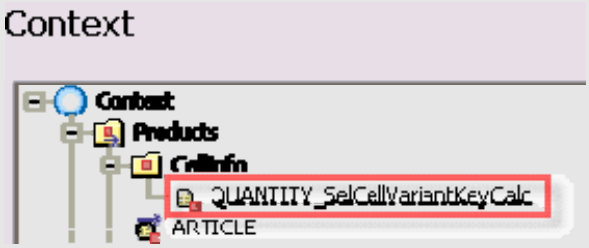


6. In the *Properties* tab set property *calculated* to **true.** Also set property *readOnly* to **true**.



Result

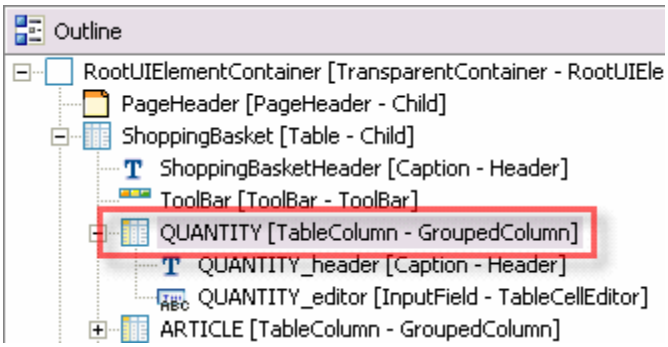
The new calculated context attribute **QUANTITY_SelCellVariantKeyCalc** is added to the view context. The related context attribute getter method returns the table cell variant key for every displayed table row i.e. table node element.



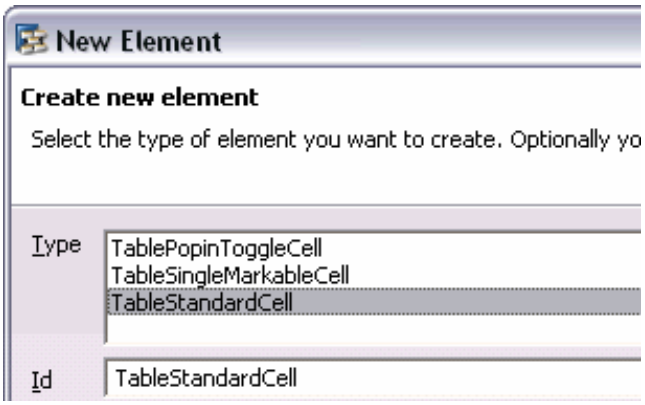
STEP 2 – Adding a Cell Variant to a TableColumn UI Element

Next we add a cell variant of type *TableStandardCell* to the first table column *QUANTITY*. In this cell variant we add a table cell editor of type *TextView*. Finally, the new cell variant is specified with a corresponding variant key.

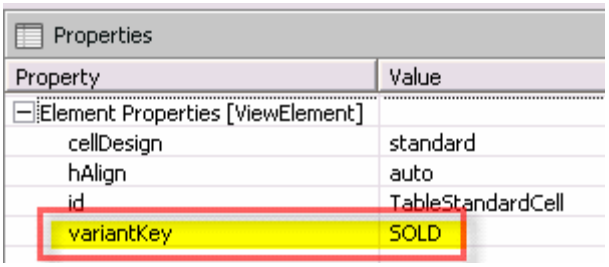
1. Select tab *Layout* of view TableCellVariantsView to add a new cell variant to the first table column.
2. In the *Outline* view select *TableColumn* UI element **RootUIElementContainer – ShoppingBasket – QUANTITY.**



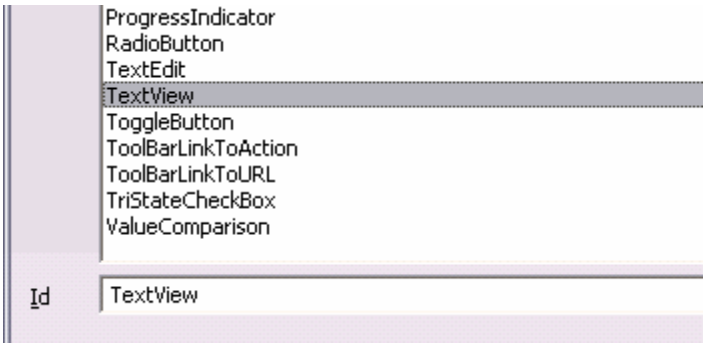
3. Open context menu and select item **Insert CellVariant.**
4. In popup window *New element* select the type of the associated cell variant UI element: **TableStandardCell**.
5. Keep the UI element Id unchanged and press button *Finish.*



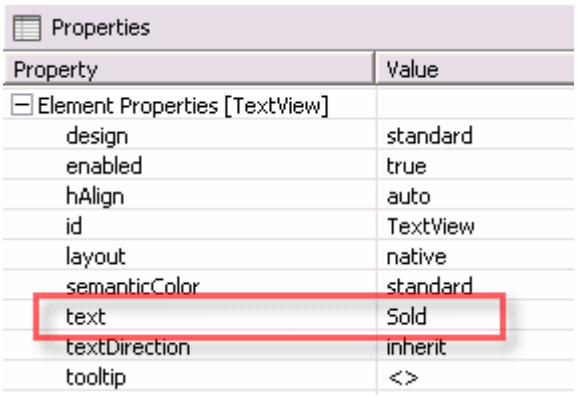
6. In the *Outline* view select the newly added *TableStandardCell* UI element **RootUIElementContainer – ShoppingBasket – QUANTITY – TableStandardCell.**
7. In the *Properties* tab enter value **SOLD** for property *variantKey*.



8. Open context menu for UI element **TableStandardCell** and select menu item **Insert Editor.**
9. In popup window *New element* select the type of the associated cell editor UI element: **TextView**.
10. Keep the UI element Id unchanged and press button *Finish.*

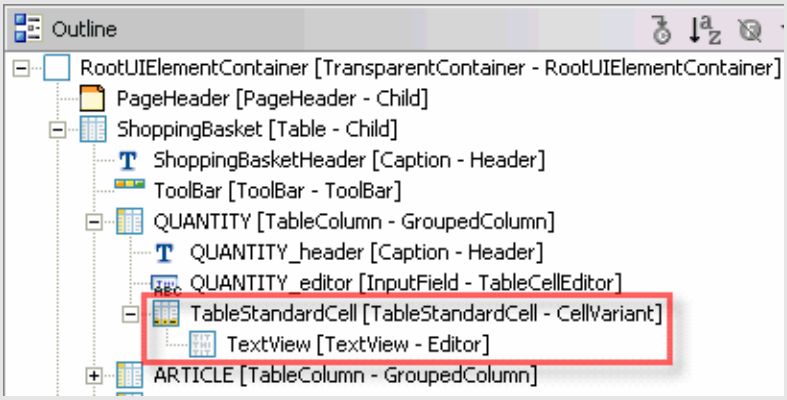


11. In the *Outline* view select the newly added *Editor* UI element **RootUIElementContainer – ShoppingBasket – QUANTITY – TableStandardCell - TextView.**
12. In the *Properties* tab enter value **Sold** for property *text*.



Result

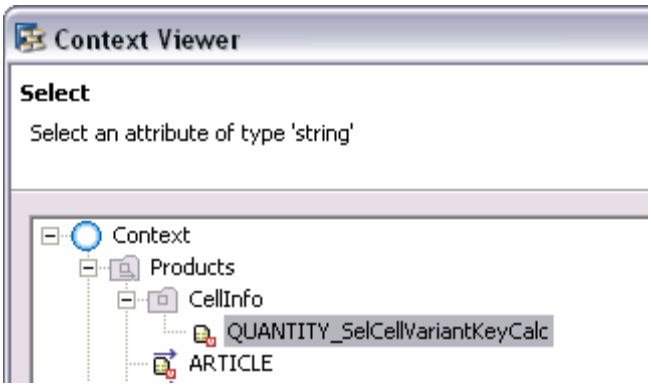
A new cell variant of type TableStandardCell is added to the first table column Quantity. To address this cell variant a corresponding variant key SOLD was set.



STEP 3 – Binding the TableColumn UI Element to the Defined Calculated Context Attribute

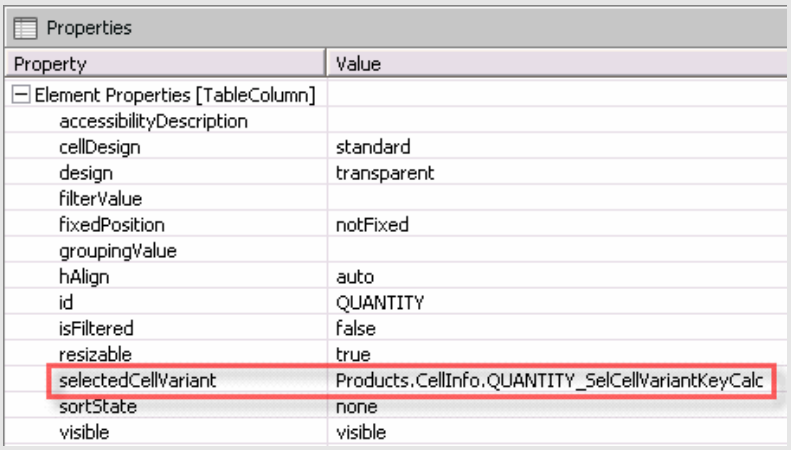
In this step we define the data binding relation between table column QUANTITY displaying cell variants and the calculated context attribute **QUANTITY_SelCellVariantKeyCal** defined in STEP 1. Based on this binding relation the table retrieves variant keys as Strings for every displayed table row i.e. node element in the table's data node.

1. In the *Outline* view select the *TableColumn* UI element **RootUIElementContainer – ShoppingBasket – QUANTITY.**
2. In the *Properties* tab select property *selectedCellVariant* which is currently undefined.
3. Press button ... in column *Value* to define a data binding relation.
4. Select calculated context attribute **Context – Products – CellInfo – QUANTITY_SelCellVariantKeyCalc** and press *OK* button.



Result

The *TableColumn* UI element QUANTITY comprising a table cell variant is bound to the calculated context attribut **QUANTITY_SelCellVariantKeyCalc**. The related getter method calculates the variant key of the cell variant to be displayed for every table row i.e. node element.



STEP 4 – Implementing a Calculated Context Attribute Getter Returning Cell Variant Key

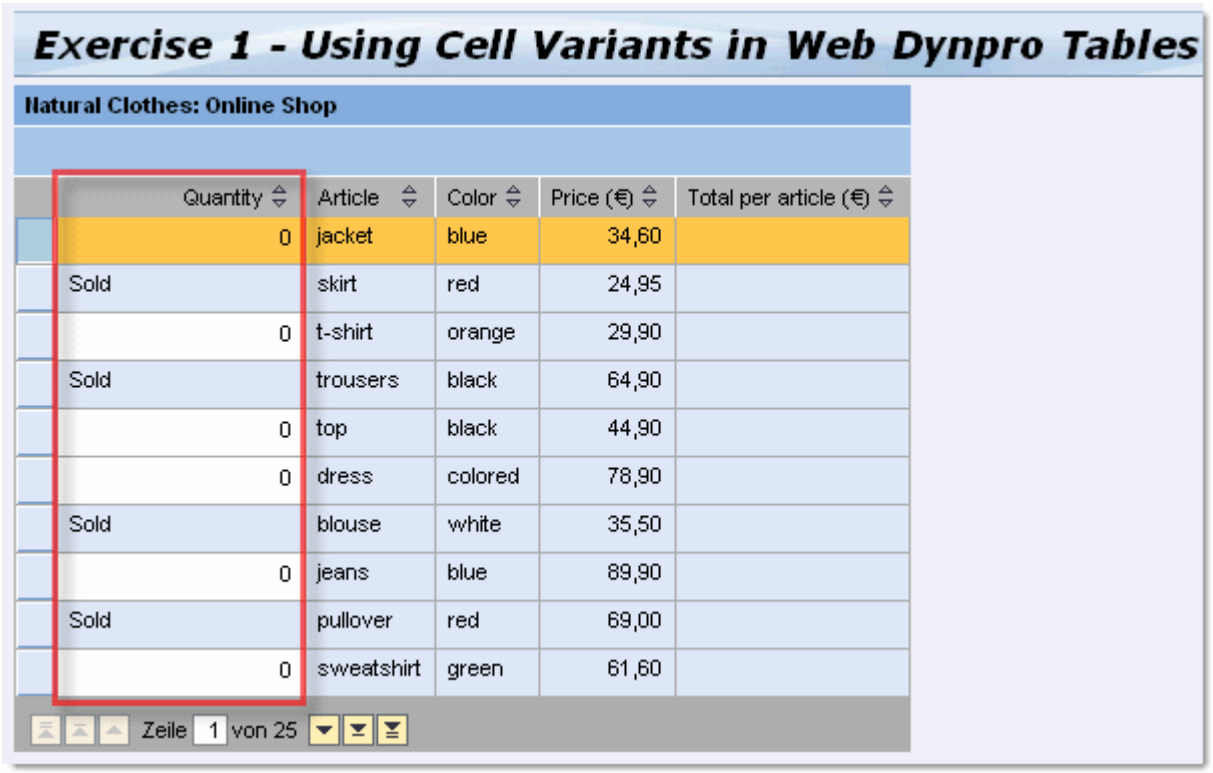
Finally we look at the implementation of the calculated context attribute getter method **getCellInfoQUANTITY_SelCellVariantKeyCalc().** It returns a variant key for every node element in the table's data node.

1. Open the *Implementation* tab for view controller *TableUIExerciseComponent – Views – TableCellVariantsView.*
2. Read the following lines of code in the calculated context attribute getter method **getCellInfoQUANTITY_SelCellVariantKeyCalc():**

```
public java.lang.String getCellInfoQUANTITY_SelCellVariantKeyCalc(
  IPrivateTableCellVariantsView.ICellInfoElement element)
{
  //@@begin getCellInfoQUANTITY_SelCellVariantKeyCalc(
  // IPrivateTableCellVariantsView.ICellInfoElement)
  IPrivateTableCellVariantsView.IProductsElement prodEl =
    (IPrivateTableCellVariantsView.IProductsElement) element
       .node().getParentElement();
  return prodEl.getISSOLD()
    ? WDTableCellDesign.BADVALUE_LIGHT
    : WDTableCellDesign.STANDARD;
  //@@end
}
```

Testing First Exercise Application TableCellVariantsExerciseApp

1. To save the metadata of your project, choose  (*Save All Metadata*) in the toolbar.
2. In the Web Dynpro Explorer, open the node *CE254_WDTableUIs_Exercises – Web Dynpro – Applications – TableCellVariantsExerciseApp.*
3. In the node's context menu, choose ***Deploy new Archive and Run***. The exercise application is then started in a new browser window.
4. In case you have successfully completed the exercise steps, the first table column *Quantity* displays table rows with different cell editors. For all sold natural clothe articles a *TextView* cell variant with text **Sold** is displayed.



Exercise 2 – Sizing and Layouting Table UIs

Estimated time required for completion: 15 min

Related Web Dynpro Project and Application

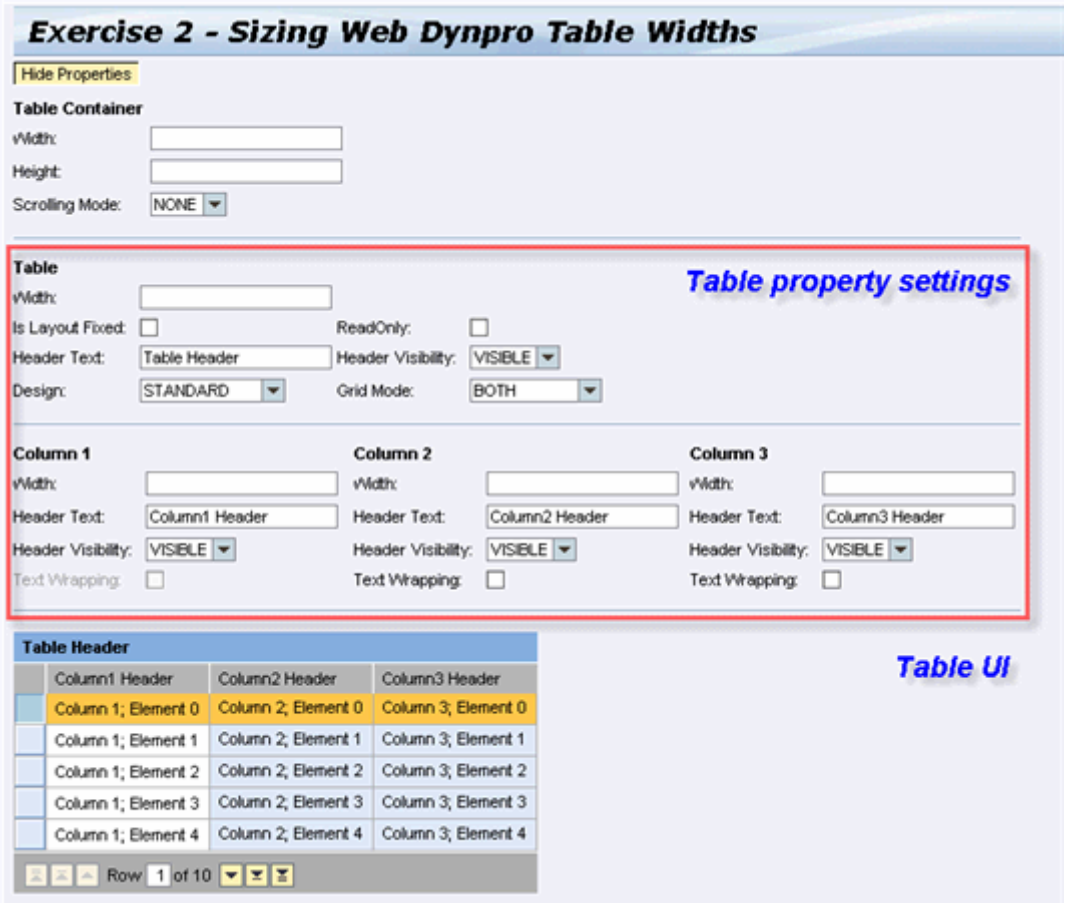
This Exercise is based on the following Web Dynpro project and view layout:

- **CD254_TableUIs_Exercises:** Web Dynpro project template comprising the Web Dynpro view this exercise is based on.
- **TableSizingApp**: Exercise application for testing widths-specific table UI element properties.

STEP 1 – Preparation: Running the TableSizing Application in the Web Dynpro HTML Client

---

1. Open the Web Dynpro project **CD254_TableUIs_Exercises** within the Web Dynpro Explorer.
2. Navigate to node *Web Dynpro – Applications – TableSizingExerciseApp*
3. In the node's context menu, choose ***Run***. The exercise application is then started in a new browser window.
4. With this Web Dynpro application You can interactively change and test width-specific table property settings.



STEP 2 – Setting Absolute Table Widths

1. Set all three table columns to absolute widths: 100px, 100px, 100px. Then change one column width to **50px**. What happens?
    a. Column width gets smaller
    b. Column width remains the same
2. Then additionally define an absolute table width by entering width size **300px**. First, set all table column widths to 100px. What happens?
    a. The table width is equal to the sum of all table column widths. Consequently the table width does not change.
    b. The table width is equal the sum of all table column widths plus the width of the selection column. Consequently the table width must shrink.
3. Set an absolute column width to 2000px. What's the result?
    a. _____
4. In the first editable table column enter some very long text. Then set the table's *readOnly* property to **true**. What happens?
    a. The total table width does not change
    b. The total table width gets larger as a longer cell text entry must be displayed so that the defined minimal width is not large enough.

STEP 3 – Setting Relative Table Widths

1. First restart the *TableSizingApplication* so that the initial table setting are displayed
2. Set all three table columns to relative widths: 20%, 30%, 50%. Set the table width to 50%. Press Return and look at the displayed table layout. Now set the 50% table column width to 10%. What happens?
    c. All table columns are resized.
    d. The width of the table selection column gets larger to fill the missing width (50%) of all three table columns
3. Set all three table columns to relative widths: 30%, 30%, 40%. Set the table width to 50%. Press Return and look at the displayed table layout. Now enter a long column header text by appending the same string many times with copy and paste. Then press return. What happens?
    a. _____

STEP 4 – Setting Fixed Table Layout and Wrapping Texts in Cell Editors

1. First restart the *TableSizingApplication* so that the initial table setting are displayed
2. In the first editable table column enter some very long text. Then set the table's *readOnly* property to **true**. What happens?
    a. The total table width does not change but the first table column gets wider whereas the second table column gets smaller
    b. The total table width does not change as well as the first table column width. The invisible text gets visible via tooltip information.

STEP 5 – Wrapping Texts in Cell Editors

3. First restart the *TableSizingApplication* so that the initial table setting are displayed
4. Set all three table columns to relative widths: 30%, 30%, 40%. Set the table width to 300px.
    a. Enable text wrapping for the second table column and look at the result in the rendered table UI:
    _____

Exercise 3 – Adding Grouped Table Columns

This third exercise dealing with Web Dynpro Tables in SAP NetWeaver 7.0 is based on an incomplete Web Dynpro Project template. After having finished this exercise the following learning objectives will be fulfilled:

- Adding nested table column groups (two hierarchy levels) to a *Table* UI element.
- Adding table columns to existing table column groups with cut & paste.

Estimated time required for completion: 15 min

Related Web Dynpro Project and View Layout

This Exercise is based on the following Web Dynpro project and view layout:

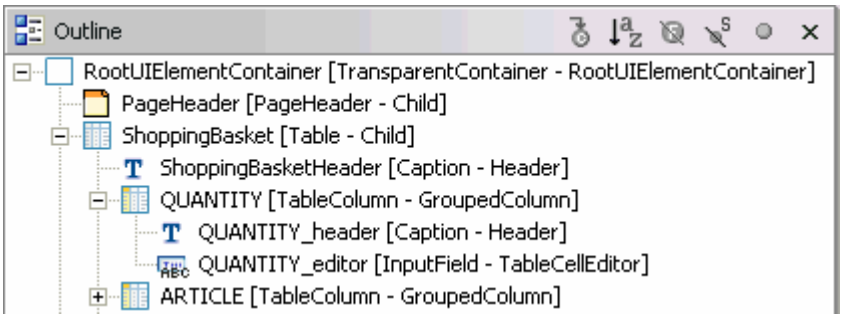
- **CD254_TableUIs_Exercises:** Web Dynpro project template comprising the initial state of the Web Dynpro views this exercises are based on.
- **TableColumnGroupsView**: Exercise view for adding grouped columns to a Web Dynpro table.

The exercise solution can be found in separate Web Dynpro project **CD254_TableUIs.**

STEP 1 – Preparation: Adding Table Columns to a Table in a Flat Hierarchy

Before You can add hierarchically nested table column groups you must first add all table columns in a flat hierarchy directly under the emebedding *Table* UI element. After having completed the table binding definitions between table, table columns, table cell editors and the context You can re-arrange all columns in a hierarchically grouped manner.

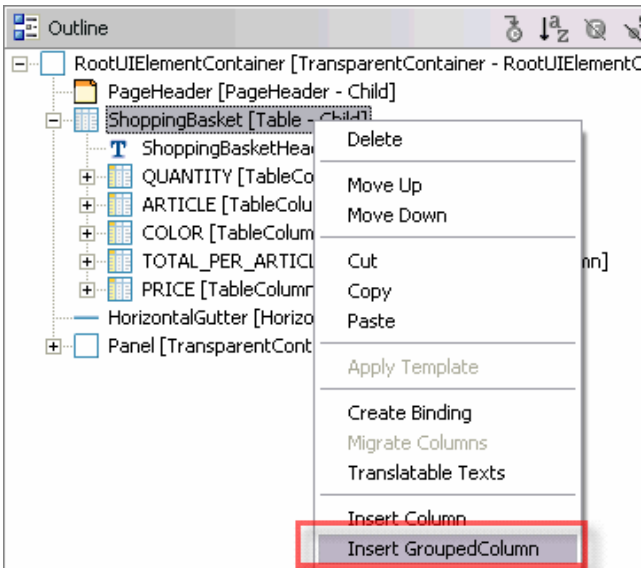
1. Open the Web Dynpro project **CD254_TableUIs_Exercises** within the Web Dynpro Explorer.
2. Navigate to tree node *Web Dynpro – Web Dynpro Components – TableUIExerciseComponent – Views – TableColumnGroups*
3. Look at the predefined table columns QUANTITY, ARTICLE, COLOR, TOTAL_PER_ARTICLE and PRICE. All columns comprise header and cell editor UI elements and the context binding is already defined. We will now group the existing table columns in a nested hierarchy.



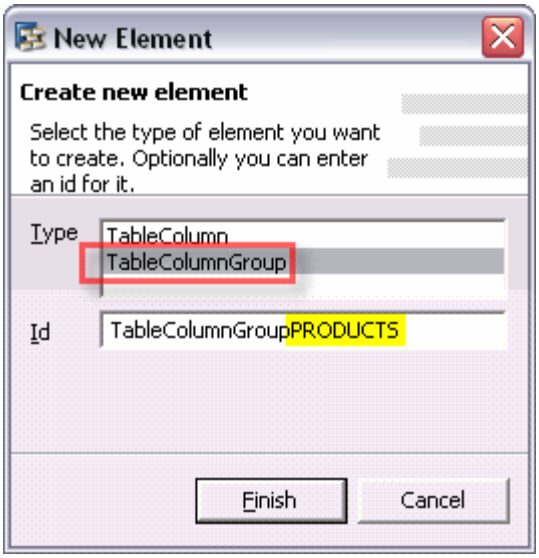
STEP 2 – Adding Nested Table Column Groups To a Table UI Element – Level 1

In this step we add a first column group to the existing shopping basket table: The first column group spans all columns with the header text *Products.*

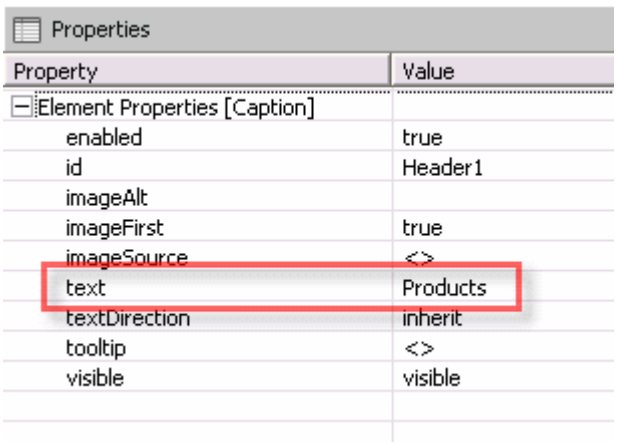
1. In the *Outline* view select *TableColumn* UI element **RootUIElementContainer – ShoppingBasket.**
2. Open context menu for UI element **ShoppingBasket** and select menu item **Insert GroupedColumn.**



3. In popup window *New element* select the type of the table UI element association to be added: **TableColumnGroup**.
4. Enter the UI element Id **TableColumnGroupPRODUCTS** and press button *Finish*.

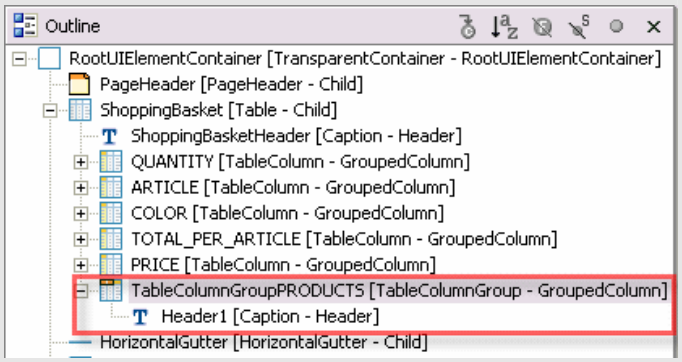


5. In the *Outline* view select *TableColumn* UI element **RootUIElementContainer – ShoppingBasket – TableColumnGroupPRODUCTS.**
6. Select context menu item **Insert Header.**
7. Set property *text* of the newly added header UI element (Caption) to **Products**



Result

The first *TableColumnGroup* UI element with an associated header is added to the table.



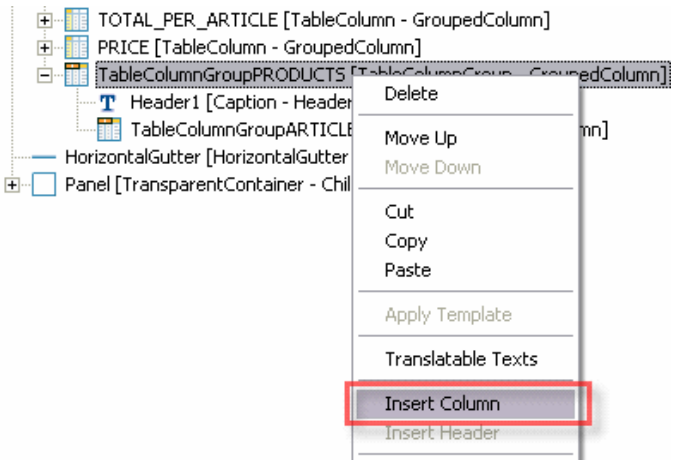
STEP 3 – Adding Nested Table Column Groups To a Table UI Element – Level 2

In this step we add two additional column groups to the existing shopping basket table on a deeper hierarchy level. On the second hierarchy level two column group headers for separating price-related columns (column group header text *Price*) form other article property columns (column group header text *Price)* are added.

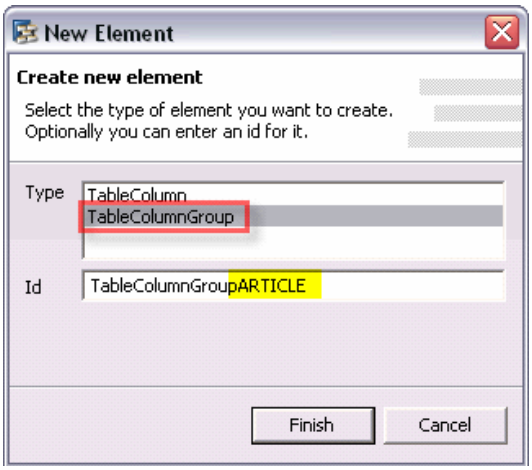
1. In the *Outline* view select *TableColumnGroup* UI element **RootUIElementContainer – ShoppingBasket - TableColumnGroupPRODUCTS.**
2. Open context menu for UI element **TableColumnGroupPRODUCTS** and select menu item **Insert Column.**

NOTE: The UI element association name on deeper table column group hierarchy levels differ from the name on the first hierarchy level.

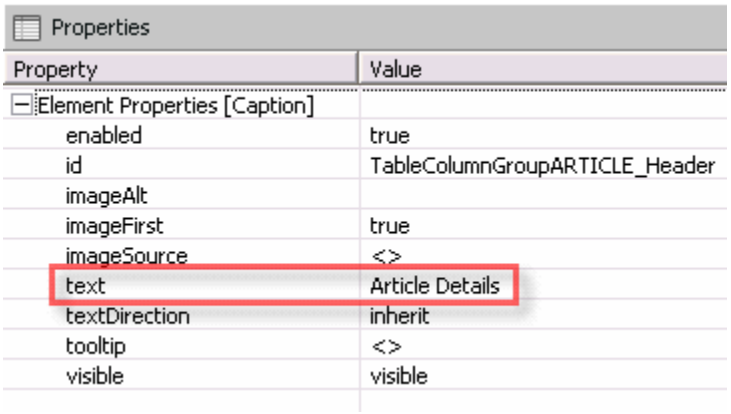
- first level association name = *GroupedColumn*
- deeper level association name = *Column*



3. In popup window *New element* select the type of the table UI element association to be added: **TableColumnGroup**.
4. Enter the UI element Id **TableColumnGroupARTICLE** and press button *Finish*.



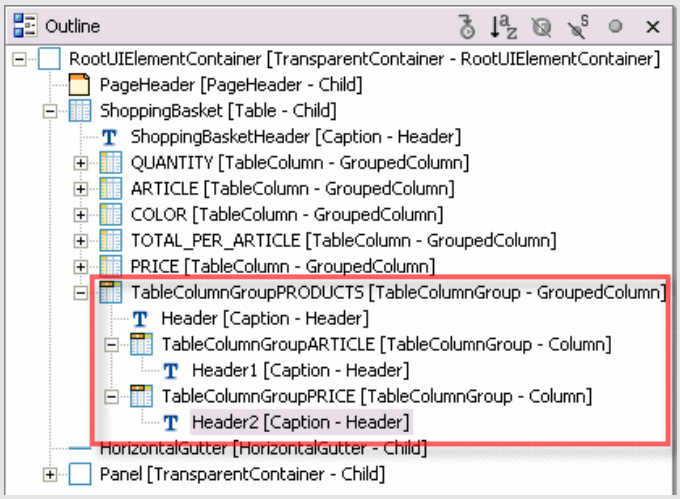
5. In the *Outline* view select *TableColumn* UI element **RootUIElementContainer – ShoppingBasket – TableColumnGroupARTICLE.**
6. Select context menu item **Insert Header.**
7. Set property *text* of the newly added header UI element (Caption) to **Article Details**



8. Repeat steps 1-7 adding another *TableColumnGroup* UI element with name **TableColumnGroupPRICE** and header text **Price Information** or apply copy&paste.

Result

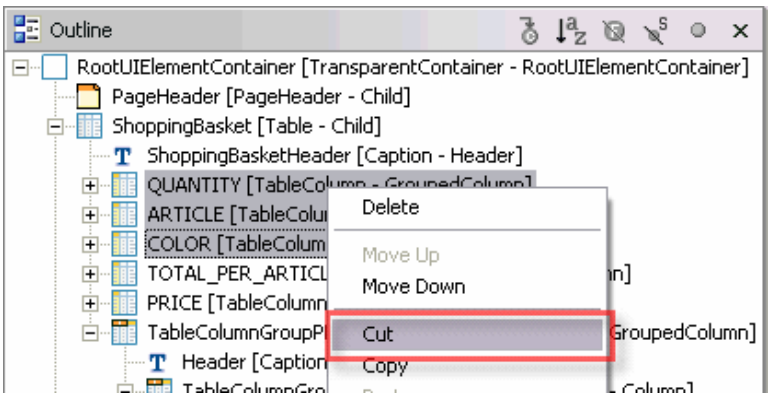
The second level hiearchy comprising two *TableColumnGroup* UI elements with associated headers is added to the table.



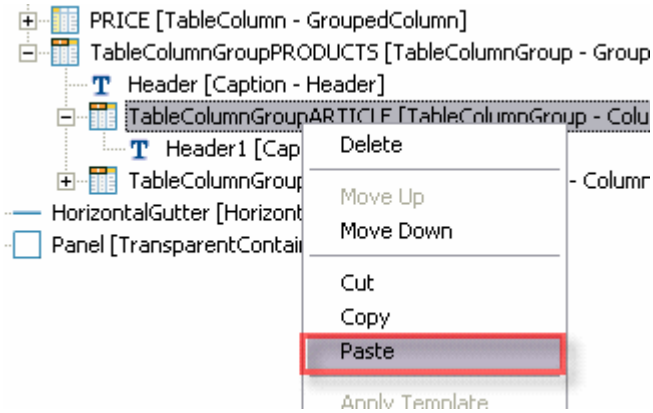
STEP 4 – Adding Table Columns to Table Column Groups With Cut & Paste

In the last exercise step we add the existing table columns to the newly embedded *TableColumnGroupUI* using the **Cut & Paste** function.

1. In the *Outline* view select the three *TableColumn* UI elements **QUANTITY, ARTICLE** and **COLOR.**
2. Open context menu item **Cut.**



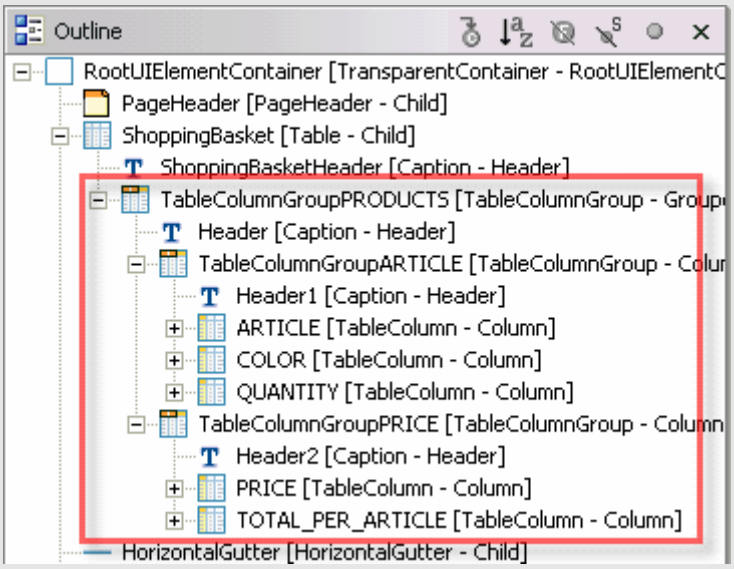
3. Paste table columns to the **TableColumnGroupARTICLE** UI element with context menu item *Paste*.



4. Repeat steps 1 to 3 with *TableColumn* UI Elements **TOTAL_PER_ARTICLE** , **PRICE** and **TableColumnGroupPRICE**

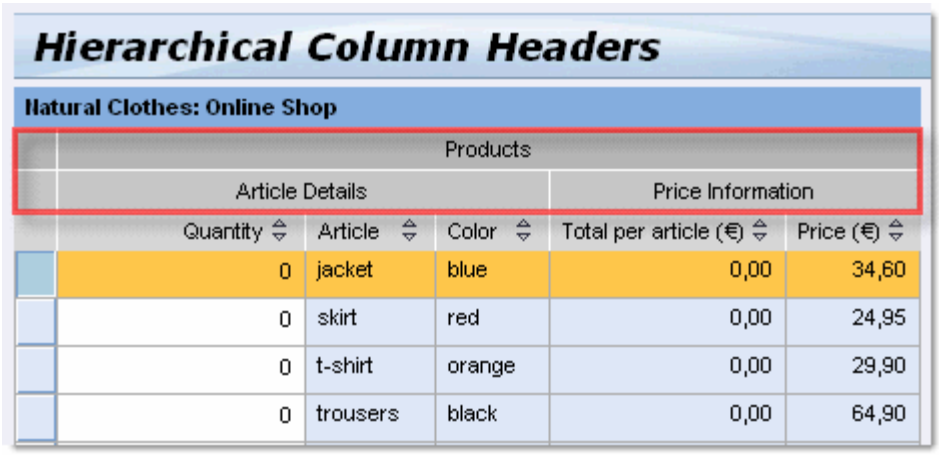
Result

The second level hiearchy comprising two *TableColumnGroup* UI elements with associated headers is added to the table.



Testing Third Exercise Application TableColumnGroupsExerciseApp

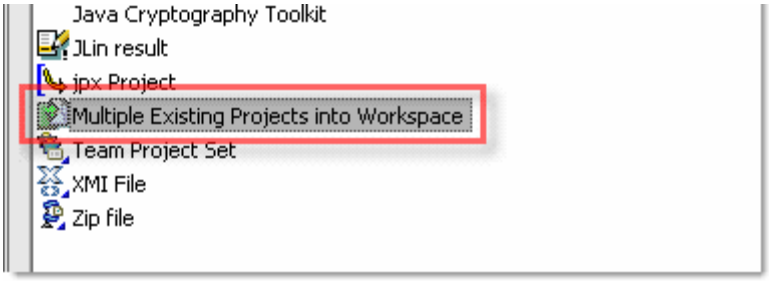
1. To save the metadata of your project, choose  (*Save All Metadata*) in the toolbar.
2. In the Web Dynpro Explorer, open the node *CE254_WDTableUIs_Exercises – Web Dynpro – Applications – TableColumnGroupsExerciseApp.*
3. In the node's context menu, choose ***Deploy new Archive and Run***. The exercise application is then started in a new browser window.
4. In case you have successfully completed the exercise steps, the defined hierarchical table column headers *Products*, *Article* and *Price* are displayed on top of the table columns:



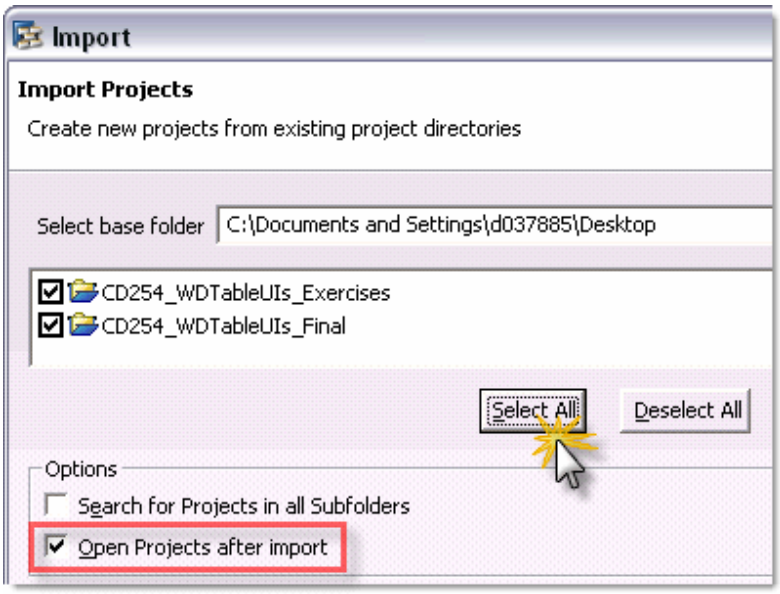
Appendix
Opening Exercise Web Dynpro Projects in SAP NetWeaver Developer Studio

1. Extract ZIP file **CD254_WDTableUIs_Projects.zip** to your **desktop**.

2. Open Your SAP NetWeaver 7.0 Developer Studio
3. Select menu item **File – Import …**
4. In *"Import"* dialog window select node *"Multiple Existing Projects into Workspace"* and click *"Next"*.



5. In the next dialog window press button *"Browse …"*
6. In the *"Browse for Folder"* popup window the desktop folder is already selected comprising two Web Dynpro projects to be imported.
7. Press button *"Next"*.
8. In the next dialog window press button *"Select All"* and mark check box *"Open Projects after Import"*.
9. Press button *"Finish"*



Result

All required Web Dynpro projects for this hands-on session (Web Dynpro Table UIs in SAP NetWeaver 7.0) are now listed inside the Explorer of the Web Dynpro perspective.