

SAP BW



Web Reporting Table Interface

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1 Overview

Business Information Warehouse Web Reporting enables access to BW data using an Internet browser. In most cases, this is installed with the operating system. You do not require an additional software installation. The demands on the Web browser are minimal, since there is a pure HTML solution.

This document is for Web designers and ABAP programmers who want to create complex applications (Information Cockpits and so on) using BW Web Reporting, and who want to alter the display of tables appropriately.

The interface described in this document allows you to modify individual cell data (characteristic values, column headings, value cells and so on) as regards contents, presentation and navigation options.

This document assumes that you have knowledge of the contents of the Web functions description.

2 Execution

- Using the *Class Builder* (SE24) or the *Object Navigator* (SE80), create a class with a class name in the customer namespace.
- This class should have the same form as the class CL_RSR_WWW_MODIFY_TABLE.
- Only implement the methods that fill cell contents that you want to change. These methods are outlined in the section entitled 'Interface'.
- Create your Web template with the table provided by SAP.
- Enhance the object tag of the table in the Web template with the additional parameter <param name='MODIFY_CLASS' value='YourClassName'>.
- Carry out a check-in with the modified Web template.

When you next call up the Web template, your class is called up with the modified table contents.

For test purposes, you should use transaction RSRT2. Check the HTML checkbox and enter the contents of the start URL from CMD=LDOC as the URL.

You now have the option of checking the generation of HTML in the debugger. Set simple breakpoints and restart the transaction.

3 Interface

You have the option of using the interface provided by SAP to modify the presentation of tables in BW Web Reporting to meet your requirements. The possibilities range from a simple presentation modification to a data-specific enhancement of navigation options and presentation.

The technical realization uses ABAP-OO.

- You create an ABAP-OO class
- This class should have the same form as the class CL_RSR_WWW_MODIFY_TABLE.
- You specify the class name in the object tag of the table item in the Web Template as follows::

```
<object>
...
<param name="MODIFY_CLASS" value="YourClassName">
...
</object>
```

The methods that you use to modify cell contents are listed below. The 'CHANGING' parameters for all methods are the default parameters defined for standard BW Web Reporting. You can redefine these parameters in the implementation of the interface methods. If you do not want to change a cell type, leave the implementation empty.

The interface offers the following functions:

- Attributes.
- Events. These allow you to make initializations
- Methods for the manipulation of cell contents
- Service methods

3.1 Attributes

The following class instance attributes are filled automatically . Their values are taken from the Web Reporting Framework. The attributes are read-only.

Attribute	Description
N_ITEM_NAME	Logical name of table This is needed for command URLs. You can use it to change table attributes, for example.
N_GENERATE_LINKS	Generate navigation links If the value = "X", URLs can be generated for modification. If the value is blank, you can only display the item. You can not change it.
N_ALT_STYLES	Display zebra list If the value = "X", the format changes for alternate rows.
N_STATELESS	Web site call without interaction If the value = "X", the Web site is called and the session is then built up on the application server. BW 2.0 does not support any further interaction.
N_R_CREATION_PARAMETERS	Table creation parameters You can get the name value pairs involved in the creation of the table with the reference to an instance of the class CL_RSR_PARAMETER. Methods such as GET are available to get the values. The name value pairs include the start URL parameters

	and the name value pairs specified in the item object tag in the Web template. Therefore, parameters can be sent to your class using the start URL or the object tag (in the Web template). The class reusability and usage area can be heightened considerably, for example, by using customer-specific parameters that customize the class.
N_JAVASCRIPT	Using JavaScript If the value = "X", you can use JavaScript functions. Otherwise you should not use JavaScript, as you can not be sure that the calling Web browser supports it.
N_DATA_PROVIDER_NAME	Logical name of the Data Provider This is needed for the generation of navigation URLs.
N_NO_DATA	No matching data found
N_NO_AUTHORIZATION	No authorization for displaying data
N_R_DATA_SET	Data Provider data This attribute is <u>only needed for special applications</u> and is explained in more detail in the appendix. Usually, the information transferred by the method interfaces is enough to determine the cell contents.

3.2 Events

3.2.1 Initialization

Initialization of the table. This method is called before the table is processed. References to the DataSet help in the analysis of metadata on the navigation status and of data itself. At this point, the class attributes already listed are full.

Method	Start
---------------	--------------

3.2.2 New Row

The following method is called up before the beginning of a new row. Suitable initializations can be carried out for the row.

Method	New_Row
Importing parameter	Description
I_Y	New row number

3.2.3 Header Finished

The following method is called up after the header has been processed. Suitable initializations can be carried out for the row.

Method	Header_Finished
---------------	------------------------

Importing parameter	Description
I_Y	New row number

3.2.4 Finished

This method allows you to carry out operations after the table has been completed. This could include, for example, the setting of JavaScript functions using the method 'Set_Javascript_Function' (see the section on 'Service Methods') or clean-up.

Method	Finished
--------	----------

3.3 Manipulation of Cell Contents

The following methods are for manipulating cell contents.

Only implement the methods for the cell types you want to change.

The system automatically uses the default contents for all other cell types.

The default contents can change between releases and patches. Therefore, we recommend that, if a cell content is changed, you should copy the entire content from, for example, C_CELL_CONTENT, and not simply work the field using REPLACE or similar operations.

For manipulation, all methods have importing parameters that describe the context of the cell.

All methods have the same changing parameters. These parameters provide the default values and can be changed in the methods. As these parameters are independent of the method, they are only listed here.

Changing parameter	Description
C_CELL_ID	Cell ID If this parameter is not filled, the cell has no ID. The ID can be used for reworking the cell contents with JavaScript.
C_CELL_CONTENT	Cell contents The cell contents can be very simple (for example a number) or very complex (for example hierarchy nodes (icons with expand and collapse URLs and text)).
C_CELL_STYLE	Cell style The style defines the color, font, font size, spacing and many more cell features. The styles are defined in the Cascading Style Sheet. This is assigned to the template.
C_CELL_TD_EXTEND	Enhancement of the TD tag Here you can set cell properties such as width, height, alignment or color. Usually this parameter is empty because many presentation properties are defined when the style is specified.

3.3.1 Headers

You can use the following method to modify the contents of header cells:

Method	Caption_Cell
Importing parameter	Description

I_X	X-coordinate of the table cell
I_Y	Y-coordinate of the table cell
I_IS_EMPTY	Cell is empty 'X' = empty
I_IOBJNM_ROW	Characteristic in the rows Characteristic of the row axis whose heading is shown in this cell.
I_ATTRINM_ROW	Attribute for characteristic in the rows Attribute for characteristic in the row axis whose heading is shown in this column.
I_TEXT_ROW	Characteristic/attribute text
I_IOBJNM_COLUMN	Characteristic in the columns Characteristic in the column axis whose heading is shown in this cell.
I_ATTRINM_COLUMN	Attribute for characteristic in the columns Attribute for characteristic of the column axis whose heading is shown in this cell.
I_TEXT_COLUMN	Characteristic/attribute text
I_ROWSPAN	Number of cells to be merged along the row axis
I_COLSPAN	Number of cells to be merged along the column axis
I_IS_REPETITION	Repetition 'X' = Cell contents are repeated.

3.3.2 Scaling Factors

You can use the following method to modify the contents of scaling factor cells:

Method	Scaling_Factor_Cell
Importing parameter	Description
I_X	X-coordinate of the table cell
I_Y	Y-coordinate of the table cell
I_TEXT	Scaling text
I_IS_SUM	Totals cell 'X' = totals cell
I_NUM_SCALE	Scaling factor
I_CURRENCY	Currency
I_UNIT	Unit

3.3.3 Characteristic Values

You can use the following method to modify characteristic values contents:

Method	Characteristic_Cell
Importing parameter	Description
I_X	X-coordinate of the table cell

I_Y	Y-coordinate of the table cell
I_IOBJNM	Characteristic name
I_AXIS	Axis that contains the characteristic in the drilldown 'X' = columns, 'Y' = rows
I_CHAVL_EXT	Characteristic value in external presentation Key value of the characteristic value after using the conversion exits
I_CHAVL	Characteristic value in internal presentation Key value of the characteristic value. This is needed for filter operations.
I_NODE_IOBJNM	Name of the node characteristic For characteristic nodes, the characteristic name must be specified in the same way as for text nodes 'OHIER_NODE'.
I_TEXT	Characteristic value text
I_HRY_ACTIVE	Status of display hierarchy 'X' = Active
I_DRILLSTATE	Node status 'E' = expanded, 'C' = compressed
I_DISPLAY_LEVEL	Node / leaf display hierarchy level
I_USE_TEXT	Cell contents 'X' = text, ' ' = key
I_IS_SUM	Totals cell 'X' = Totals cell
I_IS_REPETITION	Repetition 'X' = Cell contents are repeated
I_FIRST_CELL	First characteristic value data cell
I_LAST_CELL	Last characteristic data cell
I_CELLSPAN	Number of cells to be merged along the drilldown axis
I_CELLSPAN_ORT	Number of cells to be merged perpendicular to the drilldown axis

3.3.4 Attribute Values

You can use the following method to modify the contents of attribute value cells:

Method	Attributes_Cell
Importing parameter	Description
I_X	X-coordinate of the table cell
I_Y	Y-coordinate of the table cell
I_IS_EMPTY	Cell is empty 'X' = empty
I_IOBJNM	Characteristic name
I_ATTRINM	Attribute name
I_AXIS	Axis that contains the characteristic in the drilldown 'X' = Columns, 'Y' = Rows
I_CHAVL_EXT	Attribute value in external presentation Key value of the attribute values after using the

	conversion exits.
I_CHAVL	Attribute value in internal presentation Key value of attribute value
I_TEXT	Attribute value text
I_USE_TEXT	Cell contents 'X' = text, '' = key
I_IS_SUM	Totals cell 'X' = totals cell
I_CELLSPAN	Number of cells to be merged along the drilldown axis
I_IS_REPETITION	Repetition 'X' = Cell contents are repeated.

3.3.5 Structure Parts

You can use the following method to modify the contents of structure parts:

Method	Structure_Cell
Importing parameter	Description
I_X	X-coordinate of the table cell
I_Y	Y-coordinate of the table cell
I_IOBJNM	Name of the structure
I_AXIS	Axis that contains the characteristic in the drilldown 'X' = columns, 'Y' = rows
I_STRUCTURE_MEMBER	Name of the structure part Key value of the structure part.
I_STRUCTURE_MEMBER_2	Name of the structure part of the other structure Key value of the structure part of the second structure if available. This is needed, for example, for the sorting operations.
I_TEXT	Structure part description
I_IS_SUM	Totals cell 'X' = totals cell
I_IS_REPETITION	Repetition 'X' = cell contents are repeated
I_CELLSPAN	Number of cells that are to be merged along the drilldown axis
I_CELLSPAN_ORT	Number of cells to be merged perpendicular to the drilldown axis

3.3.6 Data Cells

You can use the following method to modify data cell content:

Method	Data_Cell
Importing parameter	Description
I_X	X-coordinate of the table cell

I_Y	Y-coordinate of the table cell
I_VALUE	Value of the cell without scaling
I_DISPLAY_VALUE	Value of the cell after scaling
I_NUMERICAL_SCALE	Scaling factor
I_NUMERICAL_PRECISION	Number of decimal places
I_CURRENCY	Currency 3 figure currency identifier, for example, USD or DEM.
I_UNIT	Unit Unit after using the 3 figure conversion exit.
I_ALERTLEVEL	Alert Level 1, 2, 3 = green; 4, 5, 6 = yellow; 7, 8, 9 = red
I_IS_SUM	Totals cell 'X' = totals cell

Consequently, changes can be made such as showing the alert status with icons, modification of the currency or unit presentation (for example, unit as text), markers and so on.

3.3.7 Error Cell

You can use the following method to modify error cell contents:

Method	Error_Cell
Importing Parameter	Description
I_X	X-coordinate of the table cell
I_Y	Y-coordinate of the table cell
I_TEXT	Error text
I_TYPE	Error type (S, E, A, I, W)

3.4 Service Methods

As well as methods for the manipulation of cell contents, there are service methods. These are needed during the generation of new cell contents.

3.4.1 Generating a Navigation URL

The generation of command URLs takes place using the following method. This ensures that the requests are sent to the correct page instance of the current session.

Method	GET_URL
Importing parameter	Description
I_R_PARAMETER	Command parameters The command parameters are gotten with the help of instances of the class CL_RSR_PARAMETER. Use the methods of this class (for example, ADD and so on) to fill the parameters.
Returning parameter	Description

R_URL	Command URL
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3.4.2 Icons

You use IMG tags in HTML for icons. In order to fill the IMG tag attribute SCR, you need the icon directory path on the ITS. The following method delivers this.

Method	GET_ICON_PATH
Returning parameter	Description
R_PATH	Path to icon directory This path can be used in the HTML IMG path for SCR. Only the screen name is missing.

3.4.3 Using Messages

You can use the following method to use messages. These messages then appear at the beginning of an HTML page in a table. You usually use this function to inform users about errors.

Method	SEND_MESSAGE
Importing Parameter	Description
I_CLASS	Message class
I_TYPE	Message type (I, W, E, A, X)
I_NUMBER	Message number
I_MSGV1	Message variable value 1
I_MSGV2	Message variable value 2
I_MSGV3	Message variable value 3
I_MSGV4	Message variable value 4

3.4.4 JavaScript Functions

You can use the following method to manage JavaScript source code centrally. The source code is put at the start of the HTML page. You can use this function to add your own JavaScript source code and, for example, to call it from the manipulated cells.

Method	SET_JAVASCRIPT_FUNCTION
Importing parameter	Description
I_NAME	Name of source code segment This is unique. If source code has already been stored under a name that you are now using, the previous code is overwritten.
I_CODING	JavaScript source code

4 Appendix

For special applications you need information that is not provided by the method interfaces. The topics described in the appendix are enhancements that deliver the information needed.

You need to understand this section in order to use the interface.

4.1 DataSet

The DataSet contains the view data.

For some applications you need more information in addition to the cell contents. For example, you may need the list of available characteristics or the content of the dynamic filter for linking to other reports.

The data from the DataSet (N_R_DATA_SET) is always current. The attribute N_SX_VERSION_20A_1 of the type RSRDS_SX_DATA_SET_20A_1 is filled automatically. This is the case for metadata (Catalog of characteristics (AXIS_INFO) and so on) as well as for the displayed values (AXIS_DATA and CELL_DATA).

4.1.1 Data Structure

The instance attribute N_R_DATA_SET->N_SX_VERSION_20A_1 consists of the following components:

Component	Description
AXIS_INFO	Metadata description for the characteristics, attributes and structures on the axes.
AXIS_DATA	Characteristic values, attribute values and structure parts according to their sequence on the axes.
CELL_DATA	Value cells. Arrangement takes place by row and then by column.
TXT_SYMBOLS	Text elements for query.

4.1.2 AXIS_INFO

This component describes the distribution of structures, characteristics and attributes on the axes, and their properties.

The AXIS_INFO is a table of axes (rows, columns and filters) with the corresponding axes parts.

AXIS_INFO	Description
AXIS	Axes indicators: 0 : columns 1 : rows 255 : filters
NCHARS	Value cells. Arrangement takes place by row and then by column.
NCOORDS	Number of objects on this axis (number of rows / columns / filter values).
CHARS	Characteristics with their attributes and structures on the axis.

The complex table CHARS has the following structure:

CHARS	Description
CHANM	Characteristic name or structure name
HIENM	Hierarchy name, if the hierarchy is active
VERSION	Hierarchy version
DATETO	Hierarchy key date
CAPTION	Characteristic or structure description
CHAPRSNT	Presentation of the characteristic: 0 : key und text 1 : text 2 : key 3 : text und key 4 : long text 5 : mid-length text 6 : no presentation
ATTRINM	Attributes of a characteristic

The component ATTRINM is a table of characteristic attributes with the following structure:

ATTRINM	Description
ATTRINM	Attribute name
CAPTION	Attribute description
CHAPRSNT	Presentation of the attribute: 0 : key und text 1 : text 2 : key 3 : text und key 4 : long text 5 : mid-length text

That describes the structure of the list.

4.1.3 AXIS_DATA

The component AXIS_DATA describes the content of an axis and consists of a table with the following structure::

AXIS_DATA	Description
AXIS	Axes indicators: 0 : columns 1 : rows 255 : filters

SET	Axis contents
-----	---------------

The complex table SET has the following structure:

SET	Description
TUPLE_ORDINAL	Number of the entry on the axis beginning with 0
CHANM	Characteristic or structure name
CAPTION	Characteristic value text
CHAVL	Internal key value of the characteristic value. This is needed, for example, for filter operations.
CHAVL_EXT	External key value of the characteristic value. This corresponds to the CHAVL after using the conversion exit.
NIOBJNM	With hierarchy nodes, the name of the node characteristic (with text nodes, OHIERNODE).
TLEVEL	Hierarchy level of the entry
DRILLSTATE	Entry status in active hierarchy: L : hierarchy leaf - : expanded nodes +: compressed nodes
OPT	Only with filters: EQ : single value LT : less than LE : less than or equal to GT : more than GE : more than or equal to BL : from values with intervals (structured as two rows) BH : to values with intervals
SIGN	I : include E : exclude
ATTRIBUTES	Attribute values

The component ATTRIBUTES is a table with the following structure:

ATTRIBUTES	Description
ATTRINM	Attribute name
CAPTION	Attribute value text
ATTRIVL	Attribute value key

That describes the axis contents.

4.1.4 CELL_DATA

The number cells of the views are presented as an ordered table of rows of the BAPI type BAPI6111CD. If you imagine the view data as a table, the arrangement of the cells corresponds to that of the data block, in that it takes place first by rows and then by columns.

The index of a particular value can be calculated as follows:

$$\text{Index} = \text{column position} + (\text{row position} - 1) * \text{number of columns}$$

The structure of the data structure is as follows:

Component	Description
CELL_ORDINAL	Numbering of values beginning with 0. CELL_ORDINAL is always one smaller than the index of the rows.
VALUE	Value
FORMATTED_VALUE	Formatted value. Unit and currency are already used in this field.
VALUE_TYPE	The value type can have the following values: ' ' normal, valid value '0' Division by 0 '1' Value not definable '3' Value of various currencies '5' Null value '9' Number overflow 'D' Date 'T' Time 'A' No authorization for this value
CURRENCY	Currency identifier
UNIT	Unit identifiers
MWKZ	The quantity / value indicators can have the following values: 'W' Amount 'M' Quantity 'P' Price 'Q' Relationship '%' Percentage value 'C' Counters 'F' Real number 'D' Date 'T' Time
NUM_SCALE	Scaling factor: 0 for 1, 1 for 10, 2 for 100, 3 for 1000, ...
NUM_PREC	Exactitude of decimal places number
CELL_STATUS	Not used
BACK_COLOR	Not used

4.1.5 TXT_SYMBOLS

The text elements are available as a table of RRX_TXT_SYMBOLS rows. They have the following structure (only the most important components) and significance:

Component	Description
SYM_TYPE	Type of text element: 'V' for variable, 'F' for filter value and 'C' for general text element.
SYM_NAME	Name of object. With variables, this is the variable name, with filters it is the filter

	characteristic, and with general text elements it is the name of the element. A list of general text element names can be found in the Web Reporting functions description.
SYM_FS	Next record number. A text element can be distributed over several rows, (for example, in the case of an interval). This field shows the row number of a part within a text element. If SYM_FS=0, it is a new text element.
SYM_BEGIN_GROUP	A new group within a text element. Groups are usually separated with ";"
SYM_CAPTION	Text element description.
SYM_VALUE	Value of the text element part.