

The Table Tool in axesPDF®

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1 Basic knowledge about tables

1.1 The difference between data tables and layout tables

In nearly all cases, in which you simply use the expression “table”, you talk about data tables. Data tables are used to organize data with a logical relationship in grids. Accessible PDF tables need tags that indicate header cells and data cells as well as tag attributes that define the relationship between the cells.

In order to make data tables accessible, they have to fulfil the following pre-requisites:

- Built logically
- Clear and unique relationship between header cells and data cells or between header cells and subordinated header cells
- Understandable

In the perspective of semantics, layout tables are no real tables but hacks for positioning elements. You must linearize them in order to make their content accessible.

1.2 Requirements for data tables

1.2.1 Built logically

Logical table: Rectangular

A table that is built logically is always rectangular.

	Column Header 1	Column Header 2	Column Header 3
Row Header 1	Data Cell 1	Data Cell 4	Data Cell 7
Row Header 2	Data Cell 2	Data Cell 5	Data Cell 8
Row Header 3	Data Cell 3	Data Cell 6	Data Cell 9

Illogical table: with stairs

If a table has a stair, then it is built illogically. It cannot be made accessible.

	Column Header 1	Column Header 2	
Row Header 1	Data Cell 1	Data Cell 4	Data Cell 10
Row Header 2	Data Cell 2	Data Cell 5	Data Cell 11
Row Header 3	Data Cell 3	Data Cell 6	Data Cell 12



1.2.2 Clear and unique relationship

Have a look at data cell 4, 5 and 6: their relationship to header cells is not clear. Are they associated with header cell 1 or with header cell 2? Such a table cannot be made accessible.

	Column Header 1		Column Header 2
Row Header 1	Data Cell 1	Data Cell 4	Data Cell 7
Row Header 2	Data Cell 2	Data Cell 5	Data Cell 8
Row Header 3	Data Cell 3	Data Cell 6	Data Cell 9

1.2.3 Understandable

Understanding first, making accessible second: An author or remediator must understand the table data and their relationships. Otherwise it is not possible to make the table accessible.

1.3 Simple Table

A table is simple if every header cell is valid for the complete column or row.

Table 1: Room allocation schedule as an example for a simple table

Room	Monday	Tuesday	Wednesday	Thursday	Friday
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved



Room	Monday	Tuesday	Wednesday	Thursday	Friday
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 1: The column header "Monday" (like all the other column headers) is valid for a complete column.

Room	Monday	Tuesday	Wednesday	Thursday	Friday
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 2: The row header "301" (like all the other row headers) is valid for a complete row.

1.4 Complex tables

1.4.1 Mark the relationship by using Header IDs or by reworking the complex table into several simple tables

A table is complex if there is at least one header cell, that is not valid for the complete column or row. You have to mark their relationship by adding Header IDs and specify for every cell to which Headers the cell is associated.



You can also see it this way: A complex table is a table with nested header cells. In nearly all cases you can divide the complex table into several simple tables. This usually takes up more space in your document, but improves the comprehensibility.

Table 2: Room allocation schedule as an example for a complex table with level 2 header cells.

Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 3: The column header "Room" is valid for "PC training rooms" and "Conference rooms" and these headers are valid for the corresponding rooms.



Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 4: The column header "Monday" (like all the other weekdays) is valid for the cells marked with a diamond.

Table 3: Room allocation schedule as an example for a complex table with level 3 header cells.

Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
Up to 8 persons					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
Up to 20 persons					
303	Course 18-4219		Course 18-4106	Reserved	Reserved



Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
Up to 8 persons					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
Up to 20 persons					
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 5: The column headers "Room", "PC training rooms", "Conference rooms", "Up to 8 persons" and "Up to 20 persons" are valid for the cells marked with a diamond.

Room	Monday	Tuesday	Wednesday	Thursday	Friday
PC training rooms					
201	Course 18-2305	Course 18-5563		Reserved	
202		Course 18-2310	Course 18-2310	Course 18-2310	
Conference rooms					
Up to 8 persons					
301	Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302	Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
Up to 20 persons					
303	Course 18-4219		Course 18-4106	Reserved	Reserved

Image 6: The column header "Monday" (like all the other weekdays) is valid for the cells marked with a diamond.



1.5 Simple or complex?

If you have read all the pages carefully, you can very easily answer whether the following table is a simple or a complex table.

Room		Monday	Tuesday	Wednesday	Thursday	Friday
201	Morning	Course 18-2305	Course 18-5563		Reserved	
	Afternoon	Course 18-2305	Course 18-5563			
	Evening			Reserved		
202			Course 18-2310	Course 18-2310	Course 18-2310	
301		Course 18-4101	Course 18-4102	Course 18-4103	Course 18-4104	Course 18-4105
302		Course 18-4473	Course 18-4483	Course 18-4328	Course 18-4905	
303		Course 18-4219		Course 18-4106	Reserved	Reserved

1.6 Read more

- W3C Web Accessibility Tutorials | Tables Concepts:
<https://www.w3.org/WAI/tutorials/tables/>



2 The Table Tool

2.1 What is the Table Tool?

With the **TABLE TOOL** you can select table cells, check them, add **Scope** attributes or Header IDs. In order to use it, the table already has to be tagged properly.

If tags are missing in your document, you are not able to select table cells or use the **table tool** at all.

2.2 How do you start the table tool?

You find the button to start the **TABLE TOOL** in the **ribbon tab:Viewer**, in the **toolgroup: Tools**, **button: Table**:

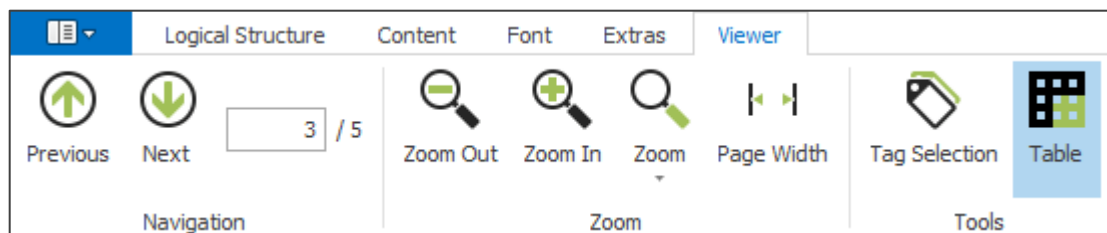


Figure 1: The tab VIEWER with the TABLE TOOL.

2.3 Basic features

2.3.1 Different types of table cells

If you select table cells by using the **TABLE TOOL**, you can recognize the type of the cell based on 3 different marks:

Type	Marked with a	Example
Table Header Cell (TH)	Violet frame	
Table Data Cell (TD)	Green frame	
Empty Cell (TH or TD)	Blue ring	



2.3.2 Understanding the circle symbol

If you select table cells, a circle symbol appears on the left side of the selected cells as well as on the left side of related cells, that could be associated with the selected cells as header cells.

The indicator symbol (on the left side of selected cells)



If there is no association between selected cells and header cells, the **indicator symbol** is empty. If selected cells are already associated with header cells, the number in the circle symbol indicates, how many header cells are associated.

The task icon (on the left side of header cells, that could be associated to selected cells)

The **task icon** indicates, with which header cells the selected cells could be associated with and if you could do this for a single header cell or a bunch of header cells.

You can also use the task icon to de-associate header cells with selected cells by holding the ALT key. The circle of the task icon changes its colour to red. This indicates the de-associating mode.

2.3.3 Recognize and check associated header cells

Indicator Symbol	Number of associated header cells
	0
	2 associated header cells

Additionally, **red lines** indicate, with which header cells a selected cell is associated.

2.3.4 Associate header cells

In order to associate cells with header cells you can choose between two strategies:



1. Only select header cells and add the appropriate **scope attribute** in the context-sensitive **ribbon tab: Properties**. In the following example it is the **scope: row**.

The screenshot shows the axesPDF interface with a document titled "Example_Table_Simple_MissingScope_en.pdf". The "Properties" ribbon tab is active, showing the "Table" section. The "Scope" dropdown is set to "Row". The document content displays three tables: "National Accounts", "Production index", and "Labour market". The "National Accounts" table has two rows highlighted with a pink background, indicating they are selected. The "Properties" panel on the right shows the "Table" section with the "Scope" dropdown set to "Row".

SDDS data category and component	Unit description--	Period of latest data	Latest data	Data for previous period
GDP at current prices	C\$ millions at current prices, SAAR	Q1/15	1,977,028	1,991,596
GDP at constant prices	C\$ millions of chained (2007), SAAR	Q1/15	1,762,406	1,765,019

SDDS data category and component	Unit description--	Period of latest data	Latest data	Data for previous period
Production index (GDP by industry)	C\$ millions of chained (2007), SAAR	May/15	1,643,015	1,646,723

SDDS data category and component	Unit description--	Period of latest data	Latest data	Data for previous period
Employment	000, SA	Jun/15	17,947	17,954
Unemployment	000, SA	Jun/15	1,304	1,308
Wages/Earnings	C\$, SA	May/15	948.15	953.70

2. Only select data cells or nested header cells: the task icons with the symbols **triple bar**, **single bar** or **star** appear on the left side of header cells that can be associated with the selected cells.

On **mouse-over** the task icon changes the colour to blue. According to the indicated symbol by **clicking the task icon** you can execute one of the following tasks:

Task icon	Symbol	Function
	Triple Bar	Direct association of all cells that are marked by this task icon, with all selected cells in a straight line –vertically if the bars are arranged vertically, or horizontally if the 3 bars are arranged horizontally.



Task icon	Symbol	Function
	Single bar	Direct association of a single cell that is marked by this task icon, with all selected cells in a straight line –vertically if the bar is arranged vertically, or horizontally if the bar is arranged horizontally.
	STar	Direct association of a single cell that is marked by this task icon, with all selected cells in a curved line.

2.4 Shortcuts

Shortcut	Function
ALT	task icon changes its colour to red. You are now in the de-associating mode .
STRG	task icon with triple bar changes to single bar
	task icon with single bar changes to star

2.5 Use the table tool efficiently

2.5.1 Step 1: Pre-Check

Check first if your table really ...

- is a data table
- is built logically
- has clear relations between header cells and data cells
- is understandable

If all requirements are met, continue with step 2. If you have a layout table, linearize it. In all the other cases your table cannot be made accessible.



2.5.2 Step 2: Check if your table is tagged properly

Check if your table is tagged properly:

- Are there still any table issues in the checking results of the automatic PDF/UA check?
- Are all header cells marked as **TH**?
- Are all data cells marked as **TD**?
- Are all empty cells marked with an appropriate tag (**TD** or **TH**)?
- Do all merged cells have the correct **COLSPAN** or **ROWSPAN** attributes?
- Are all rows marked as **TR**?

Select all cells in the table and check the markup based on the coloured frames.

If there are still header cells marked as **TD**, select only the related cells and change their structure type in the **ribbon tab: Properties** to **TH**.

2.5.3 Step 3: Evaluate if you have a simple or a complex table

Evaluate if every header in your table is valid for a complete column and/or a complete row.

If yes

Your table is a simple table.

You can choose the simplified association based on scope attributes. (See step 4a: Associate header cells by using **SCOPE** attributes). The **scope attribute** determines if a header cell is valid for a column, a row or both. You can choose between:

SCOPE attribute	Header is valid for
COLUMN	Complete column
ROW	Complete row
BOTH	Complete column and complete row

Time Saver

Do not evaluate your table if it is a simple or a complex one. Just associate header cells by using **IDs**. If you work with the **table tool** in axesPDF® you are as fast as using **Scope** attributes. You can jump over step 3 and go straight to step 4b: Associate header cells by using **IDs**.

If no

Your table is a complex table. You have to associate header cells by using **IDs**. (See Step 4b: Associate header cells by using **IDs**).



2.5.4 Step 4a: Associate header cells by using Scope attributes

Use the following check list for associating header cells by using **scope** attributes:

1. Select all column headers
2. Add the **scope** attribute **column** in the **ribbon tab: Properties**
3. Select all row headers
4. Add the **scope** attribute **row** in the **ribbon tab: Properties**
5. Select all headers, that are valid for columns as well as for rows
6. Add the **scope** attribute **both** in the **ribbon tab: Properties**

2.5.5 Step 4b: Associate header cells by using IDs

Use the following check list for associating header cells by using **IDs**:

7. Evaluate the deepest level of header cells.¹
8. Select the associated data cells. You can select all these cells in one step. Associate these cells with the header cells by clicking the task icon **triple bar** on the left side of the first header cell with the deepest level. If there is only one header cell that you can associate the selected cells with, click the task icon **single bar**. You can do this at the same time vertically (for column headers) and horizontally (for row headers)
9. Then select the header cells that you have associated with, and associate their headers by clicking the related task icon.
10. Repeat step 3 until you have reached header level 1. You do not have to select these cells because there are no header cells with level 0.

2.5.6 Step 5: Final check of associated header cells

Finally check your associated cells. As a first step click on the **button: Tag Selection**.

If you have associated the cells by using the **scope** attributes, select one row or column of **TH** cells. The associated cells are highlighted in red.

If you have associated the cells by using **Header IDs**, select one or several **TD** cells. The associated cells are highlighted in green. If you have multi-level header cells, start at the deepest level. Only the directly associated header cells are highlighted and not all header cells.

¹ Related to header cells the deepest level is the level with the highest number. For example: header level 4 is deeper than header level 2.