

# The Table Tool in axesPDF®

V01.2025





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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 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 to 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 prerequisites:

- The table is built logically
- The relationship between header cells and data cells or between header cells and subordinated header cells is clear and distinct
- The table is understandable

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

## **1.2 Requirements for data tables**

#### **1.2.1** Built logically

Correct tables always have a rectangular shape

There may be empty cells but no cell is missing.

|              | 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     |

Incorrect tables have incomplete rows or columns

If a table has incomplete rows or columns then 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 distinct relationships

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

|              | Column Header 1 |             | Column H | leader 2    |
|--------------|-----------------|-------------|----------|-------------|
| Row Header 1 | Data Cell 1     | Data Cell 4 | ļ        | Data Cell 7 |
| Row Header 2 | Data Cell 2     | Data Cell 5 | 5        | Data Cell 8 |
| Row Header 3 | Data Cell 3     | Data Cell 6 | 5        | 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.

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

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

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

Figure 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<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |
| 202  |                   | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |
| 301  | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |
| 302  | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |
| 303  | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |

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

## **1.4 Complex tables**

# **1.4.1** Define 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 define their relationship by adding Header IDs and specifying which Headers each cell is associated with.

You can also visualize a complex table as: 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 understandability.

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

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

| Reom           | Monday            | Tuesday           | Wednesday         | Thursday          | Friday            |
|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Pétraining roo | oms               |                   |                   |                   |                   |
| 201            | Course<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |
| 202            |                   | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |
| Cenference ro  | oms               |                   |                   |                   |                   |
| 301            | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |
| 302            | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |
| 303            | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |

Figure 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 roo | PC training rooms |                   |                   |                   |                   |  |  |
| 201             | Course<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |  |  |
| 202             | +                 | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |  |  |
| Conference roo  | oms               |                   |                   |                   |                   |  |  |
| 301             | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |  |  |
| 302             | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |  |  |
| 303             | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |  |  |

Figure 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<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |  |
| 202              |                   | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |  |
| Conference       | rooms             |                   |                   |                   |                   |  |
| Up to 8 pers     | ons               |                   |                   |                   |                   |  |
| 301              | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |  |
| 302              | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |  |
| Up to 20 persons |                   |                   |                   |                   |                   |  |
| 303              | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |  |



| Reom |                       |      | Monday            | Tuesday           | Wednesday         | Thursday          | Friday            |  |  |
|------|-----------------------|------|-------------------|-------------------|-------------------|-------------------|-------------------|--|--|
| Pet  | PO training rooms     |      |                   |                   |                   |                   |                   |  |  |
| 201  | +                     |      | Course<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |  |  |
| 202  | •                     |      |                   | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |  |  |
| Con  | ference               | roo  | oms               |                   |                   |                   |                   |  |  |
| Up   | to <mark>8</mark> per | ons  | 5                 |                   |                   |                   |                   |  |  |
| 301  |                       |      | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |  |  |
| 302  |                       |      | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |  |  |
| Up   | to 20 pe              | rsoi | ns                |                   |                   |                   |                   |  |  |
| 303  |                       |      | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |  |  |

Figure 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 roo  | ms                |                   | -                 |                   |                   |
| 201              | Course<br>18-2305 | Course<br>18-5563 |                   | Reserved          |                   |
| 202              |                   | Course<br>18-2310 | Course<br>18-2310 | Course<br>18-2310 |                   |
| Conference rooms |                   |                   |                   |                   |                   |
| Up to 8 person   | s                 |                   |                   |                   |                   |
| 301              | Course<br>18-4101 | Course<br>18-4102 | Course<br>18-4103 | Course<br>18-4104 | Course<br>18-4105 |
| 302              | Course<br>18-4473 | Course<br>18-4483 | Course<br>18-4328 | Course<br>18-4905 |                   |
| Up to 20 perso   | ns                |                   |                   |                   |                   |
| 303              | Course<br>18-4219 |                   | Course<br>18-4106 | Reserved          | Reserved          |

Figure 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 should be able to answer the following : Is this table simple or complex?

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

## 1.6 Read more

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



## 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 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.

## 2.2 How do you start the Table Tool?

**Q** -Logical Structure Content Font Extras Viewer File (个 E H 1 / 42 Previous Next Zoom Out Zoom In Zoom Page Width Tag Selection Table Navigation Zoom Tools

You can find the **Table** button in the **Viewer** tab:

Figure 7: The "Viewer" tab

## 2.3 Basic features

#### 2.3.1 Different types of table cells

If you select a table cell by using the Table Tool, you can recognize the type of cell based on different marks:

| Туре   | Marked with                  | Example        |
|--|------------------------------|----------------|
| Table Header Cell (TH)   | Purple frame                 | <b>Weather</b> |
| Table Data Cell (TD)   | Green frame                  | Cloudy         |
| Completely empty<br>cell without<br>MarkedContent<br>elements (TH or TD) | Not possible to be<br>marked | -              |



## 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.

For selected cells: The indicator symbol

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.

| Indicator Symbol | Number of associated header cells   |
|------------------|---|
| 0                | 0   |
|                  | 2 associated header cells<br>Additionally, red lines indicate with which header cells a<br>selected cell is associated. |

#### For header cells that can be assigned to selected cells: The task icon

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 multiple header cells.

| Task icon | Symbol     | Function   |
|-----------|------------|--|
|           | Triple bar | Direct association of all cells that are<br>marked by this task icon, with all selected<br>cells in a straight line –vertically if the<br>bars are arranged vertically, or<br>horizontally if the 3 bars are arranged<br>horizontally. |
| 0         | Single bar | Direct association of a single cell that is<br>marked by this task icon, with all selected<br>cells in a straight line –vertically if the bar<br>is arranged vertically, or horizontally if<br>the bar is arranged horizontally.       |
| ۲         | Star       | Direct association of a single cell that is<br>marked by this task icon, with all selected<br>cells in a curved line.  |



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 color to red. This indicates the de-associating mode.

## 2.3.3 Associate header cells

To make associations, select either header cells (for example, to assign them the corresponding scope attribute) or data cells.

Only then the task icons with the 3 symbols triple bar, single bar or star will appear.

The exact procedure is described in chapters

- Step 4a: Associate header cells by using scope attributes
- <u>Step 4b: Associate header cells by using Header IDs</u>

## 2.4 Shortcuts

| Shortcut | Function   |
|----------|--|
| ALT      | task icon changes its color to red. You are now able to <b>delete</b> existing associations. |
| CTRL     | 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 ...

- 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 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 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 colored frames.

If there are still header cells marked as TD, select only the related cells and change their structure type in the **Properties** task pane 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 association based on scope attributes. (See <u>Step 4a: Associate</u> <u>header cells by using scope attributes</u>). 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 Header IDs. If you work with the Table Tool in axesPDF® you are as fast as using scope attributes. You can skip step 3 and go straight to step 4b: Associate header cells by using Header IDs.

#### lf no

Your table is a complex table. You have to associate header cells by using IDs. (See <u>Step 4b: Associate header cells by using Header IDs</u>).



#### 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
  - a. Add the scope attribute **Column** in the **Properties** pane
- 2. Select all row headers
  - a. Add the scope attribute Row in the Properties pane
- 3. Select all headers, that are valid for columns as well as for rows
  - a. Add the scope attribute Both in the Properties pane

#### Example

Row headers are selected. Now define the appropriate scope in the **Properties** task pane. This is the scope **Row**.

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Figure 8: Row headers were selected with the Table Tool

If you then select the row headers again using the Table Tool, you can recognize the associations graphically by the arrow symbols.

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| > Caption                    | 02.05.2020                  | 21 °C                        | 13 %                          | slightly cloudy       | ✓ Table                 | bert highly hop bo |     | -     |
| Eigura                       | 02.03.2020                  | 21 C                         | 15 C                          | slightly cloudy       | Scope                   | Row                |     | ▼ Sti |
|                              | 03.05.2020                  | 20 °C                        | 11 °C                         | slightly cloudy       | Row Span ‡              |                    | 1.0 | ×     |
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Figure 9: Row headers with scope "Row" were selected with the Table Tool

#### 2.5.5 Step 4b: Associate header cells by using Header IDs

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

- 1. Evaluate the deepest level of header cells.<sup>1</sup>
- 2. 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)
- **3.** Then select the header cells that you have associated with, and associate their headers by clicking the related task icon.
- 4. 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.

#### Example

Select a data cell or a nested heading cell: the task icons with the symbols triple bar, single bar or star appear on the left-hand side of the heading cells that can be associated to the selected cells. These header cells are also highlighted in blue. If

<sup>&</sup>lt;sup>1</sup> 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.



you move the mouse pointer over a task icon, this header cell is highlighted in dark blue.

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| Caption                  | Table 2: Weather fore            | cart for Zurich for the new | et E dave                     |                       | Structure Type           | TD                       |        | Prop    |
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Figure 10: Data cells were selected with the Table Tool

After clicking on a task icon, the assignments are immediately displayed by red lines.

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|                              | 01 05 2020                    | 10 %                        | o °C                          | cloudy                | Placement        | Inline (default)     | ~ ×   | Roler  |
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Figure 11: Data cells with Header IDs were selected with the Table Tool



## 2.5.6 Step 5: Final check of associated header cells

#### Check with the Table Tool

You can finally check your work by selecting the entire table (or individual cells) with the Table Tool.

If you have associated the cells by using the scope attributes, you will see arrow symbols on the TH cells:

| Date       | Max.<br>Temperature | Min.<br>Temperature | Weather         |
|------------|---------------------|---------------------|-----------------|
| 29.04.2020 | °23 °C              | ∘13 °C              | cloudy          |
| 30.04.2020 | ∘20 °C              | ି11 °C              | olight rain     |
| 01.05.2020 | ∘19 °C              | ି <b>8 °C</b>       | •cloudy         |
| 02.05.2020 | ∘21 °C              | ∘13 °C              | slightly cloudy |
| 03.05.2020 | ି20 °C              | ି11 °C              | slightly cloudy |

Figure 12: Complete table with scope attributes was selected with the Table Tool

For associations using Header IDs, you will see red lines between the cells:

| Date       | Max.<br>Temperature  | Min.<br>Temperature  | Weather         |  |
|------------|----------------------|----------------------|-----------------|--|
| 29.04.2020 | ∽ <mark>23 °C</mark> | թ13 °C               | eloudy          |  |
| 30.04.2020 | ⊮ <mark>20 °C</mark> | •₃11 °C              |                 |  |
| 01.05.2020 | ∍19 °C               | -₀ <mark>8 °C</mark> | cloudy          |  |
| 02.05.2020 | ∋ <mark>₂1 °C</mark> | • <b>∌13 °C</b>      |                 |  |
| 03.05.2020 | ₃20 °C               | 9 <mark>11 ℃</mark>  | slightly cloudy |  |

Figure 13: Complete table with Header IDs was selected with the Table Tool

#### Check with the Tag Selection tool

Switch to the Tag Selection tool and select TH cell(s).

If you have used the scope attribute, the assigned TD cells will be highlighted in bright red for a selected TH cell:



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| Table 3: Weather forecast for Zurich for the next 5 days |  |                             |                              |                 | Structure Type         | TH                   |       | open    |  |
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|  | 29.04.2020                               | 23 °C                       | 13 °C                        | cloudy          | Language               | [no value]           | - ×   | ; hec   |  |
|  | <b>30 04 2020</b> 20 °C 11 °C light rain |                             |                              |                 | ✓ Attributes           |                      |       |         |  |
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Figure 14: TH with scope "Column" was selected with the Tag Selection Tool

If you have used Header IDs, the associated TH cells will be highlighted in bright red for a selected TD cell:

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|   |         | Table 3: Weather fore       | cast for Zurich for the nex | xt 5 days          |              | Structure Type TD   |                    | per    | pert     |
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| ) III III   |         | Date                        | Max.                        | Min.               | Weather      | Alternative Text  | [no value]         | ;      | 8        |
| > 🎛 тн  |         | Temperature                 | Temperature                 |                    | Actual Text  | [no value]  | >                  | ( ling |          |
| > 🇰 TR  |         | 20.04.2020                  | 22.90                       | 12.00              | at a condex  | Expansion Text  | [no value]         | >      | < _      |
|   |         | 29.04.2020                  | 23 -C                       | 13 °C              | cloudy       | Language  | [no value]         | • >    | heck     |
|   |         | 30.04.2020                  | 20 °C                       | 11 °C              | light rain   | Attributes     Attributes |                    |        | <u>e</u> |
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Figure 15: TD with Header IDs was selected with the Tag Selection Tool