**TECHNISCHE UNIVERSITÄT DRESDEN**

# Accessible Documents

## How to create accessible PDF documents with InDesign

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# Contact

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# 1 Content

# 2 Introduction

Nowadays, universal and unrestricted access to documents has become commonplace. In particular, PDF documents can be created quickly and easily, they look the same everywhere and can be read by any device. Whether for the distribution of printed material or forms: PDF documents are used extensively everywhere to provide various contents.

Not everyone can benefit from this natural access. Especially people with disabilities are often confronted with inaccessible PDF documents. An example: without appropriate precautions, a blind person cannot read a scanned copy, even if it has been converted into PDF format.

With the Act on Equal Opportunities for People with Disabilities[1] and the BITV 2.0[2], respectively, public bodies are also legally obliged to make digital offerings accessible.

On the following pages we would like to give you instructions on how to make your documents accessible to more people. Furthermore, your work should become more effective and efficient in the long term.

The instructions focus on *Adobe InDesign 16* for Windows and macOS. Of course, you can use the concepts, support and tips presented here regardless of which version of *InDesign* you are using.

[1] Act on the Equality of People with Disabilities (German)

[2] Accessible Information Technology Regulation (as of 2019) (German)

# 3 Basic Principles

First, we will look at some basic aspects of accessibility. You can skip this section and go directly to the guide (page 17 onwards) if you are already familiar with the basics. The guide is deliberately kept clear and simple with examples and pictures.

## 3.1 Visual Barriers

Documents that cause problems for people with visual or other disabilities are quickly created without appropriate knowledge. However, in this guide we are talking primarily about blind people or people with visual impairments. The latter is not only the most common limitation when working with a computer, but also the one with the most varied characteristics. What both groups have in common is that purely visual information cannot be perceived or can only be partially perceived.

Sighted people distinguish headings from other text visually, blind people purely structurally by being informed that it is a heading. This is also the case with many other text elements, such as paragraphs, lists, references, tables and directories. Moreover, blind people explore a document sequentially, so the reading order must be logical.

People with a visual impairment can usually only perceive information visually to a limited extent. They often need support in the form of enlargement or increased contrast.

## 3.2 Introduction of PDF/UA

Digital documents can be distributed and spread easily, reliably and in original form with the *Portable Document Forma*t (PDF). Originally, the format was designed to preserve the print-like, visual impression rather than to preserve the meaning and structure of the underlying content. This creates barriers for readers, who are dependent on digital accessibility of the content

The document's contents can be structured, completed or extended in the PDF by means of appropriate labelling. This enables readers who are not or not exclusively interested in visual expression to fully understand the content and use it independently.

This is done by inserting so-called tags into the document. These are standard elements - such as headings, lists or paragraphs - which provide an indication of the included content or its function. These tags can then be used by assistive technologies, e. g. screen readers, to output and prepare the document content.

In order to give unrestricted access to PDF documents to as many people as possible, the global standard ISO 14289-1, better known as PDF/UA, was developed in 2012. UA stands for *Universal Accessibility*.

The standard focuses on the technical aspects and does not contain any instructions for the practical application of the required measures and

possibilities. The support of the standard is supposed to ensure that PDF - creating programs can create partly accessible or even accessible documents without requiring special knowledge of the users.

The following conditions for PDF/UA compliant documents are defined:

- Significant content must be separated from decorative elements (artifacts) and must be marked as such.

- the meaningful elements must be arranged in a structure tree and reflect the relationships to each other (e. g. groupings, etc.).

- This structure tree should reflect the logical reading order of the document.

- Information must not only be conveyed by purely visual characteristics. Therefore, pictures and graphics must also be provided with alternative textual descriptions.

- Navigation within the document must be made possible.

The **PDF/A** standard, which many applications support, has nothing to do with *Accessibility*, but stands for *PDF Archive* and is supposed to enable the long-term storage of documents. The so-called *Tagged PDF* can be seen as a previous version of PDF, which itself is not an ISO standard.

# 4 Structure of InDesign

The application window of *InDesign* is divided into several areas. Figure 1 shows these areas in macOS. The only difference to Windows is that the menu bar is below the application bar and not above it. The term **menu** is used in this guide when you need to access items on the menu bar.

For this guide, the **menu** and **control panels** are particularly relevant. For the images in this guide, the InDesign application window was used with Workspace **Advanced**, with an activated application frame under macOS.

You can set both in the **Window** menu. For basic information on working with *InDesign* and the workspaces, we recommend that you refer to the User's Guide.

## 4.1 Context Menu

For some items, you must open the **context menu** to access the desired setting options. This is done by right-clicking on the item.
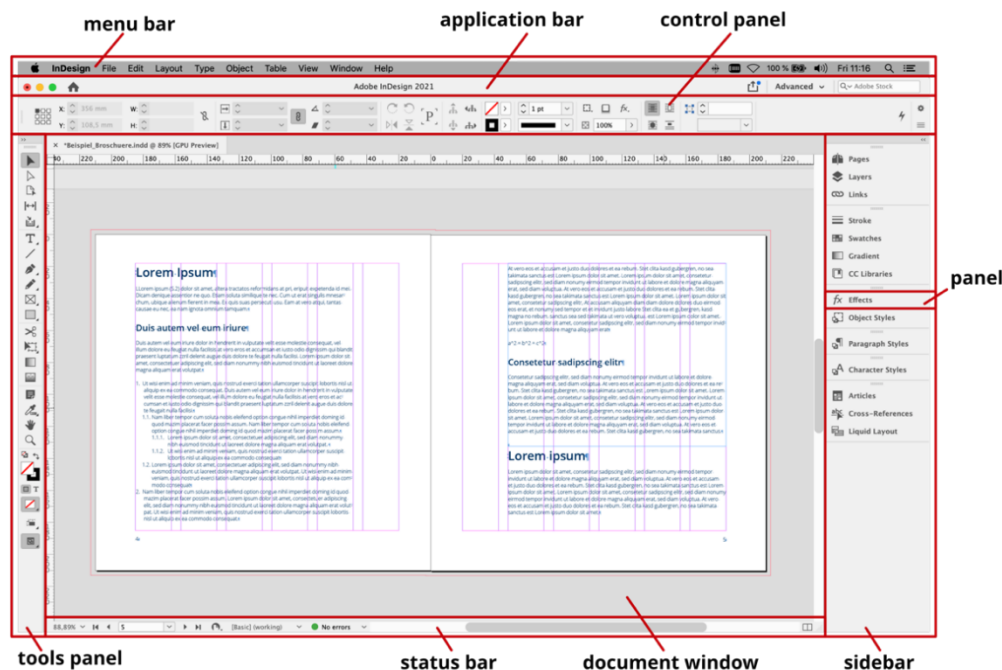


*Figure 1 Structure of the InDesign Application Window*

## 4.2 Panels

All control panels can be opened via the **Window** menu (Figure 2). For an efficient workflow we recommend to dock the relevant control panels on the right **side bar**. Depending on the set working area, there is already a pre-selection of the available control panels in the sidebar. You can move, dock and undock them from the sidebar at any time by holding down the mouse button. So, you can define your own personal work area. To create an accessible PDF document, you need the panels **Paragraph Styles**, **Character Styles** and **Article**.

## 4.3 Keyboard Control

*InDesign* offers a number of standard key combinations for working more efficiently. These are listed in this brochure in the appropriate sections. In the version used for this manual (16), however, there are still accessibility problems when using *InDesign*, as the basic functions cannot be accessed without a mouse pointer. For information on possible key combinations, see the User's Guide.

Press the specified keys simultaneously. The symbol of the operating system (Windows: ⊞, macOS: ) next to the key combination indicates to which operating system it belongs.

Menu **Window** → **Article**

Menu **Window** → **Styles** → **Paragraph Styles**

Menu **Window** → **Styles** → **Character Styles**

F11 ⊞       ⌘ F11 

⇧ F11 ⊞    ⌘ ⇧ F11 



*Figure 2 Open Panels*

# 5 Document Structure

In the introduction it has become clear that when creating documents, content should not only be prepared in a purely visual way, but a semantic meaning should also be assigned to the individual elements. The best way this can be done is to use the available **character** and **paragraph styles**. These are templates for headings, paragraphs, lists, etc.

Mark a text passage and select the desired style in the **Paragraph Styles** or **Character Styles** panel to assign it to the text passage, as shown in Figure 3.

You can create new styles using the **Paragraph Styles** (Figure 3) and **Character Styles** panels. You can edit existing styles using the **Paragraph Style Options** or the **Character Styles Options** dialogue box. To open this dialogue box, use the context menu of a style (Figure 4).

Panel **Paragraph Styles** → Select paragraph style → Open **Context Menu** → **Edit Paragraph Style**

Panel **Character Styles** → Select character style → Open **Context Menu** → **Edit Character Style**
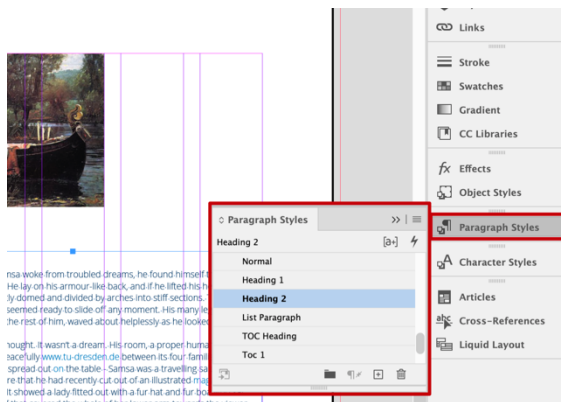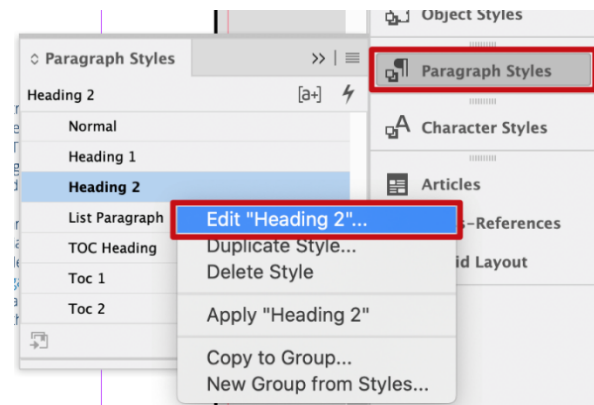


*Figure 3 Paragraph Styles Panel*



*Figure 4 Open Paragraph Style Options*

In addition to visual formatting and language settings, the **paragraph** and **character style options** allow you to specify the mark-up for **PDF export** (Figure 5). This mark-up is called a PDF tag. You have the following options:

- `P`: Paragraph

- `H1` to `H6`: Heading from Level 1 to 6

- `Artefact`: Artifact, decorative element without any content relevance (e. g. decorative graphic)

- `[Automatic]`: *InDesign* automatically defines the mark-up for PDF export (e. g. for bullets).

If your document has many paragraph and character styles, you can assign the styles to the PDF tags more easily and clearly using the **Edit All Export Tags** dialogue box (Figure 7). You can access this via the **Paragraph Styles** or **Character Styles** control panel options (Figure 6).  In this dialogue box, all paragraph and character styles and their assigned PDF tags are listed in table form and can be adjusted accordingly by clicking in the second column.

Make sure that the assignment of the tags to the styles is correct and that you use the styles properly. For example, the first heading in the document should be assigned to a paragraph style that is marked as `H1` when exporting to PDF.

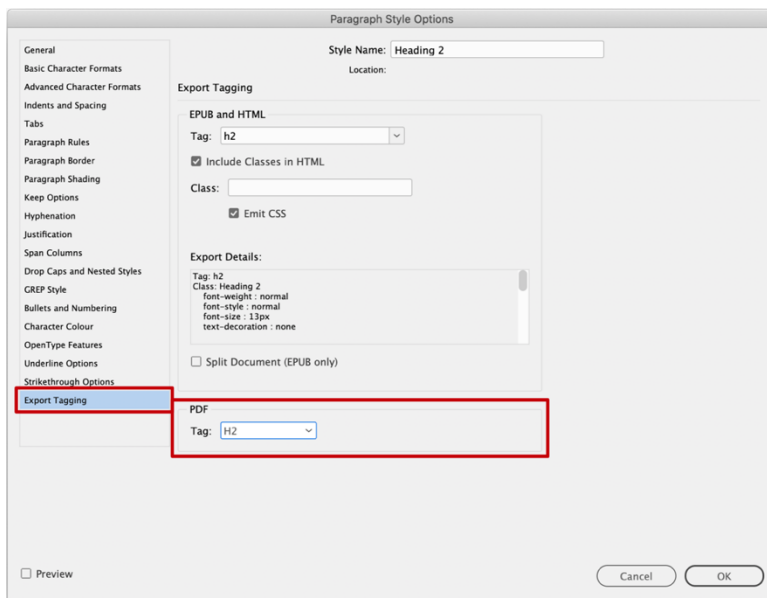Dialogue Window **Paragraph Style Options** → **Export Tagging** → **PDF** → **Tag**



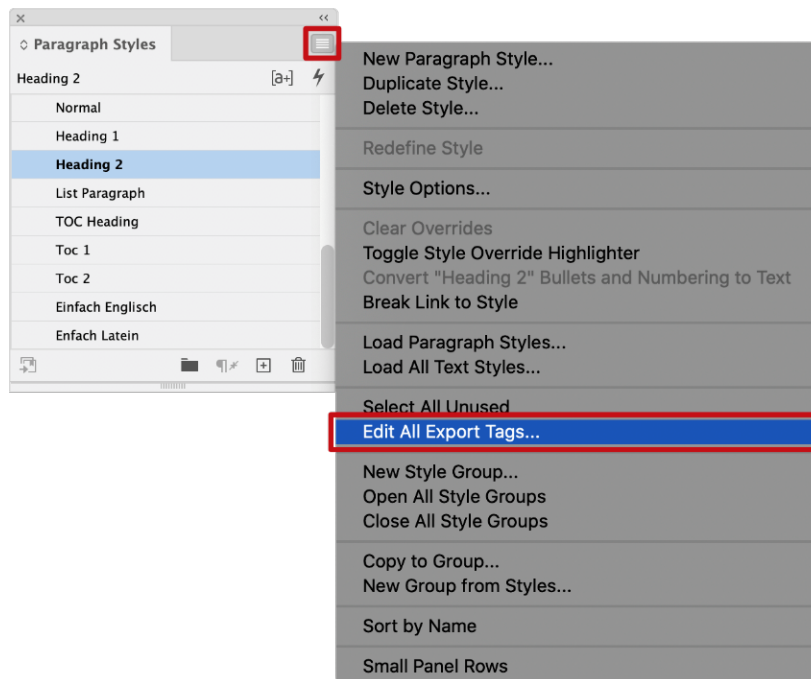*Figure 5 Tagging of the Paragraph Style for PDF export*

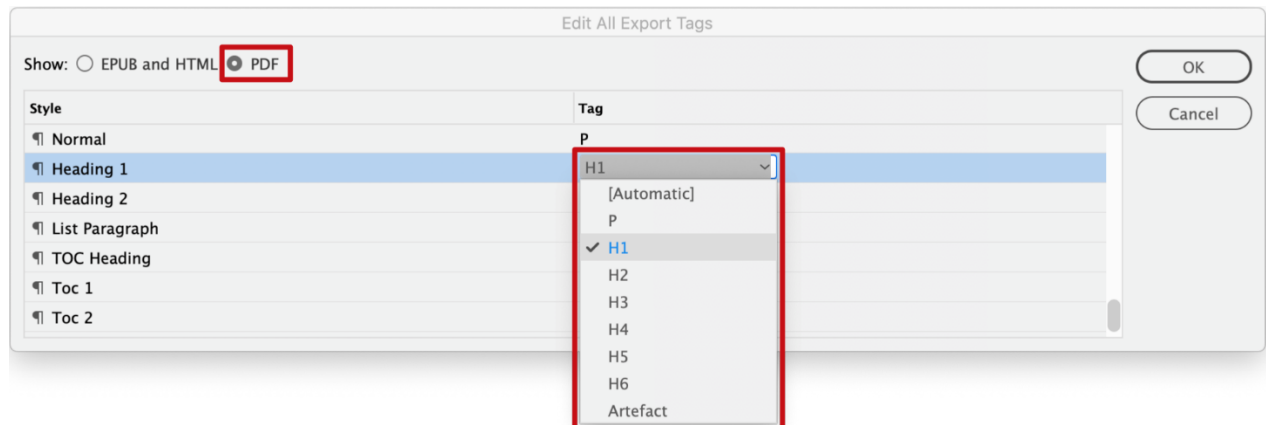*Figure 6 Open Dialogue Box "Edit All Export Tags"*



*Figure 7 Edit All Export Tags*

# 6 Guideline

In this section you will find practical guidelines on how to turn your *InDesign* document into an accessible PDF. The guideline covers essential steps that you should follow when creating an accessible document: Set **Document Properties**, **Word Processing** and adding **Image Descriptions**, **Setting the Reading Order** and finally **Creating a PDF-Document** and **review** it.

Following the guideline does not automatically guarantee a PDF document that is accessible in any case. This requires further specific checks and adjustments, e. g. with *Adobe Acrobat DC* (Page 17).

## 6.1 Document Properties

The first step for an accessible document is to describe it more detailed with general characteristics. Add a document title to your document and check the document language.

### 6.1.1 Document Title

If your document has a title, it will later appear as the window title of your PDF document. People who use voice output will have the window title read out and therefore know which document it is. In *InDesign* you define the document title via the File Info (Figure 8). Enter all meta information about the document here. In addition to the title, you can also add further information to the document describing it more detailed. However, the title is primarily important for accessibility.

Menu **File → File Info → Basic → Document Title**   [Strg] [Alt] [⇧] [I] [⊞]      [⌘] [⌥] [⇧] [I] []
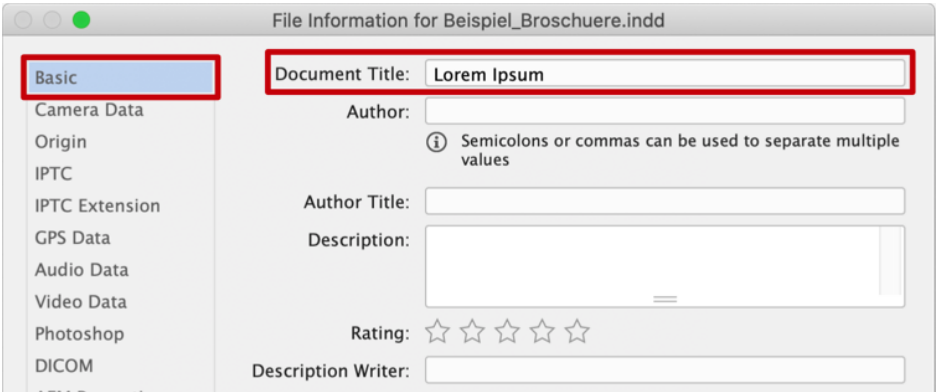


*Figure 8 Enter Document Title in File Info*

### 6.1.2 Document Language

Every PDF document has a basic language. This property is particularly relevant for people who use a speech output.

In *InDesign*, you specify the language using the paragraph and character styles format options (Figure 9). If your document has sections or individual words in different languages, they will require different paragraph or character styles to ensure that the speech output will reproduce the text correctly.

The basic language of the entire document is set in *InDesign* only when exporting the PDF file (Page 35).

Dialogue Window **Paragraph Style Options/Character Style Options** → **Advanced Character Formats** → **Language**
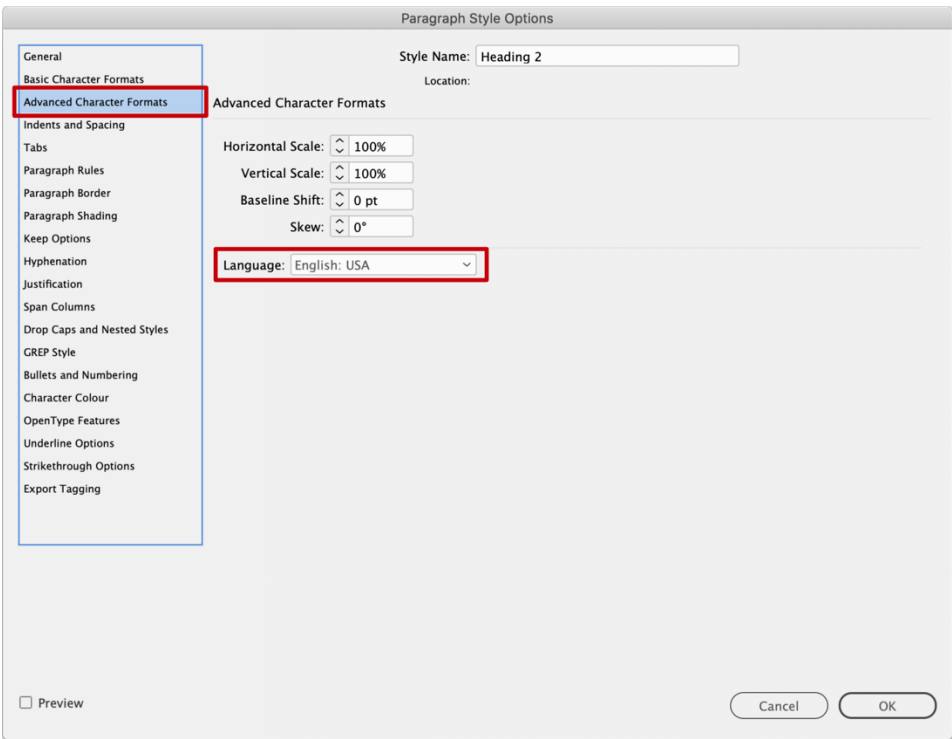


*Figure 9 Define Language for Paragraph Style*

## 6.2 Word Processing

After these preparations you can get down to the real work: creating the content.

### 6.2.1 Notes on Design

All visual characteristics of texts (font size, font colour, positioning and number of placeholders, etc.) should be organised with paragraph styles and character styles. Avoid using spaces and lines to position text.

Suppose you insert several blank lines between two lines of text to make room for a graphic that is to appear between the two lines. For people who use speech output, each blank line inserted in this way is read out as "blank".

You can check your document for existing spaces and lines by using the **Normal screen mode**, which displays the formatting characters (a full stop for a space, a paragraph symbol ¶ for a paragraph or space).

Menu **View** → **Screen Mode** → **Normal**

W ⊞ W 

Avoid manual or automatic word division in your document. When converting your presentation into a PDF document, these are usually not converted correctly. In addition, word division makes the reading more difficult for people with a visual impairment. You can deactivate hyphenation for each paragraph style in the **paragraph style options** dialogue box (Figure 10).

Dialogue box **Paragraph Style Options** → **Hyphenation** → Deactivate checkbox **Hyphenate**
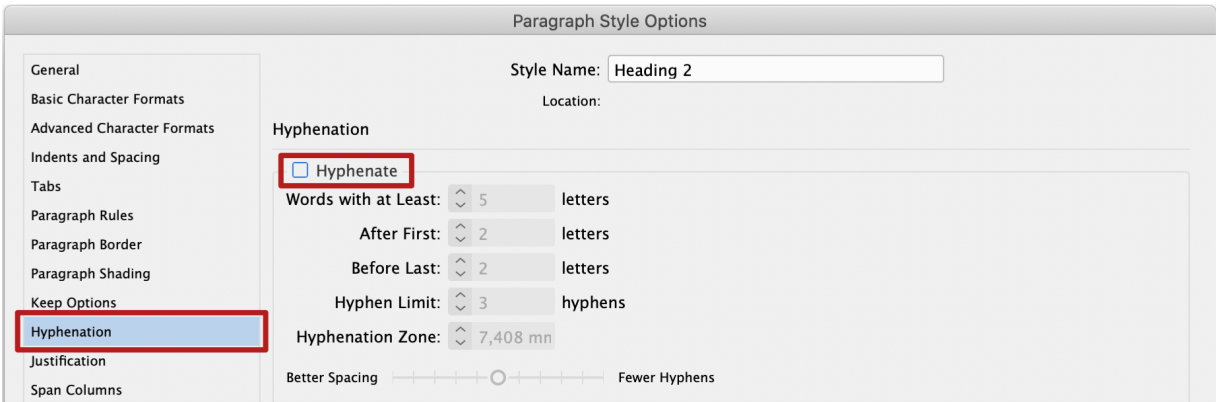


*Figure 10 Deactivate Hyphenation*

### 6.2.2    Headers and Footers

Recurring page contents, such as the page number or the always same footer, should be designed in such a way that assistive technologies do not reproduce them at the beginning of each page. Therefore, you should insert header and footer elements as text fields in the master pages[3] in InDesign. During PDF export, these elements are marked as artifacts and thus as intended ignored by assistive technologies.

Avoid writing content relevant information, e. g. contact details, in the footer only, as this information is no longer accessible to everyone when converted to a PDF document. We recommend that you write such information on an extra page.

### 6.2.3    Headings

Headings are the most important elements for navigation and orientation for blind people enabling them to read content in a structured way. If you use the paragraph and character styles correctly, *InDesign* provides good conversion to PDF in this area. For PDF export, make sure that the paragraph styles for headings are assigned to the correct PDF tags (see page 11).

The nesting of headings in the document must also be correct. This means that the first heading in the document must be a level 1 heading (`H1`) and the next smaller heading must be a level 2 heading (`H2`). Accordingly, an `H1` heading must not be followed

directly by a Level 3 (`H3`) heading if there is no `H2` heading in between.

Use the heading styles like any other paragraph and character style: mark your text and click on the paragraph style you want to use for headings in the **Paragraph Styles** panel.

### 6.2.4    Paragraphs

Simple paragraphs of text in your document should be formatted as such. The predefined paragraph style is usually designated [Basic Paragraph]. As described on page 11, you should assign the PDF paragraph tag `P` to it. Depending on how your document is to be formatted, different design and language variations of this template can then be created.

### 6.2.5    Bullets and Numberings

The type of bullet is not reproduced by speech output. It is of secondary importance for accessibility, as the various types of bullet points are usually insignificant in terms of content and are only used for decoration. However, you should pay attention to the outline structure, i. e. you should structure your contents sensibly with the help of the different **list levels.**

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[3] Adobe InDesign: Create Headers and Footers

In *InDesign*, different levels can currently only be defined for numbering and therefore only numbered lists can be nested. Enumerations can be nested visually, but semantically they are not marked as nested lists. As a result, the content relationship between the upper list element and the list elements indented below it is lost for assistive technologies.

Therefore, for complex lists with nesting, use numbered lists and define a paragraph style[4] for each list level, as shown in Figure 11. In addition, all list paragraph styles must be selected **Automatic** as PDF tags under Tags export, otherwise they will not be correctly marked during export (see page 11).

Dialogue box **Paragraph Styles Options → Bullets and Numbering → Level**
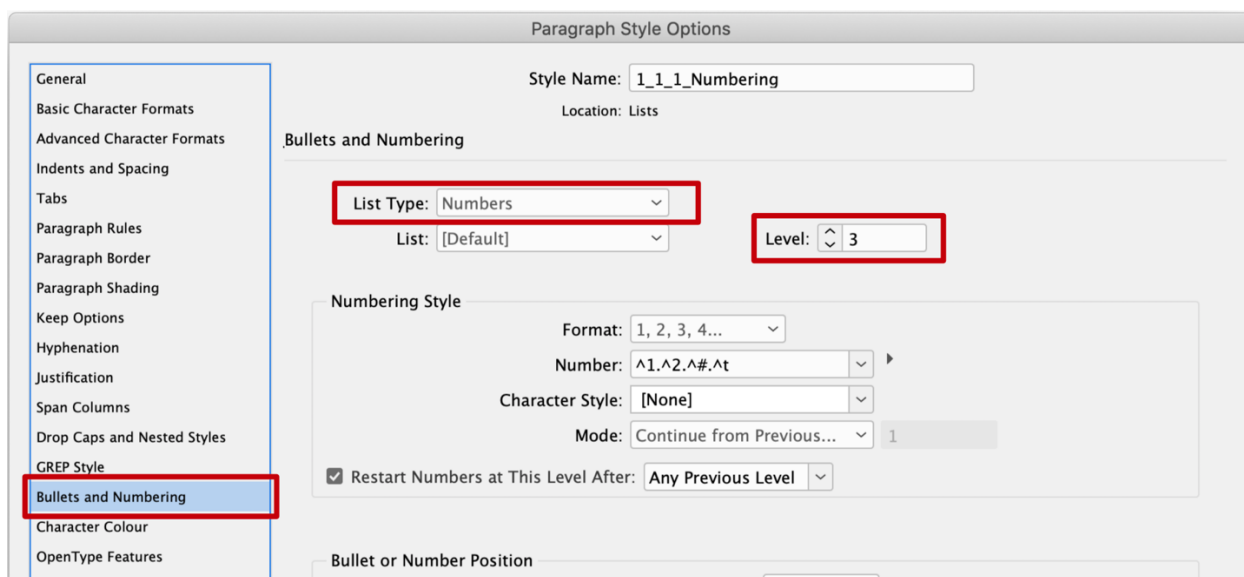


*Figure 11 Paragraph Styles Options: Define Level for Numbering*

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[4] Adobe InDesign: Create bulleted or numbered lists

### 6.2.6 Links und Cross References

Links or cross references in the presentation should be active shortcuts. In a PDF document such active elements can be enabled by **left-clicking** on them **while holding down the Control key**. They will then lead to the referring element.

**External Links**

If your text contains URLs on web pages, you can automatically convert them into active hyperlinks using the **Type** menu.

Menu **Type → Hyperlinks and Cross References → Convert URLs to Hyperlinks... → Convert All**

Alternatively, you can insert a hyperlink via the context menu of a marked text.

Mark Text → Open **Context Menu → Hyperlinks → New Hyperlink...**

With this procedure, the source of the hyperlink, e. g. a URL, is no longer displayed in the text. Instead, the marked text refers to the stored object. In the dialogue box **New Hyperlink** (Figure 12) you can select the type of link:

- **URL** of a website
- **File** on the computer
- **E-Mail**-Address
- **Page** within the document (Cross - reference)
- **Text anchor** in an *InDesign*-Document

Give all hyperlinks in your document an alternative text that briefly describes the target of the link. For existing or automatically created hyperlinks, you can do this using the **Edit Hyperlink** dialogue box, which you open via the link's context menu. From the **New Hyperlink** or **Edit Hyperlink** dialogue box, go to **Accessibility** in the lower section. In the provided text box, enter a meaningful short description of the target, as shown in Figure 12. For a URL to a web page, this can be the title of the web page.

Links need an alternative text; otherwise, assistive technologies will reproduce them character by character. In the case of a very long URL with many special characters, the hyperlink is therefore no longer accessible. If a generated short URL is used, its target is often not apparent from the text anymore. Moreover, links must be clearly named to make them understandable outside the context and to show where they lead. This means, for example, that it is not sufficient to label a link with "here".

**Cross - References**

Cross-references are links to objects within the same document. This includes references to tables, figures, headings or pages. You can insert cross-references to paragraphs in your *InDesign* document using the **Type** menu (Figure 13). Cross-references to all paragraphs, sorted by paragraph style, are possible. Just as with external links, make sure to add a meaningful alternative text (Figure 14).

If there are any changes in your document that affect the already inserted cross-references, you can update them using the **Type** menu.
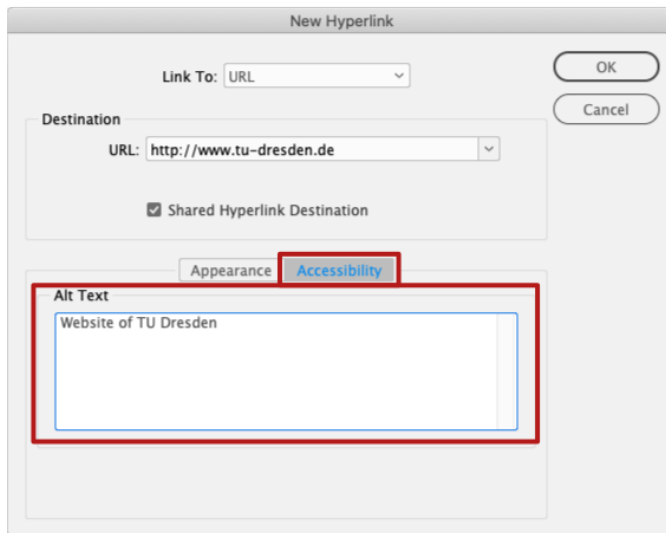
*Figure 12 Add an Alt Text to a Hyperlink*

Menu **Type** → **Hyperlinks and Cross - References** → **Insert Cross- Reference...**

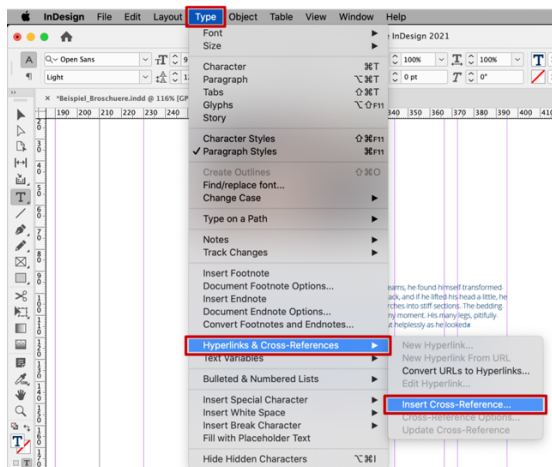Menu **Type** → **Hyperlinks and Cross - References** → **Update Cross - Reference**


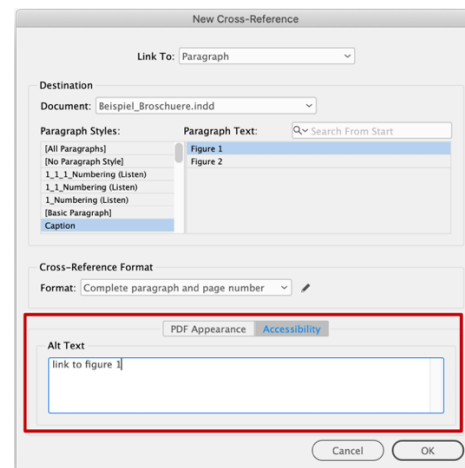*Figure 13 Insert Cross - Reference*


*Figure 14 Add an Alt Text to a Cross - Reference*

### 6.2.7 Tables of Contents

Tables of Contents have, similar to headings, the function of providing an overview, orientation and navigation. With *InDesign,* you can automatically create a table of contents which, when converted to PDF, enable active list-like navigation. This is based on you having created headings with the aid of Paragraph Styles, as described in this guide.

First, navigate to the location in the document where you want to place the table of contents.  You can insert and always update the table of contents via the menu **Layout** (Figure 15).

In the **Table of Contents** dialogue box, make sure that the **Create PDF Bookmark** check box is selected (Figure 16). Also, after creating the table of contents, you must set alternative texts for the list items, as described for hyperlinks (page 22).

Menu **Layout** → **Table of Contents...**
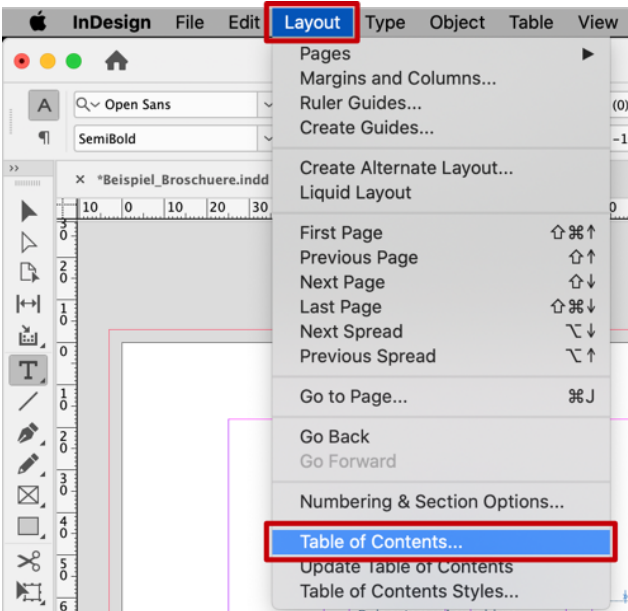


*Figure 15 Insert Table of Contents*
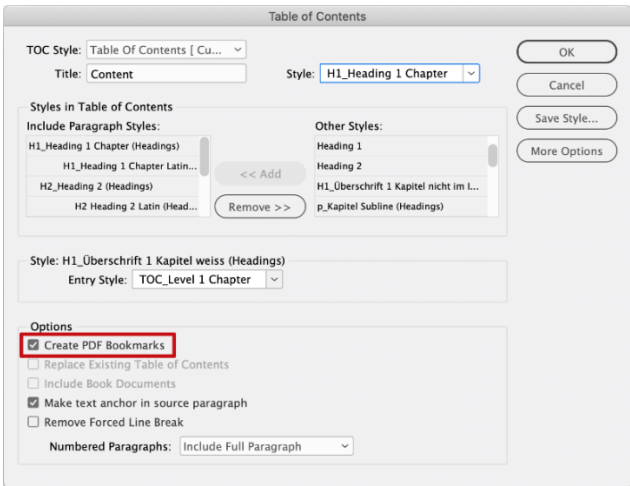


*Figure 16 Insert Table of Contents*

**Why are bookmarks so important?**

Bookmarks are an important element for navigating and orienting yourself in documents. They resemble an interactive Table of Contents. If you view a document that contains bookmarks in Acrobat, they are displayed in the left-hand area. If you click on a bookmark, the focus in the document jumps directly to the corresponding content. This is a great help especially for long documents.
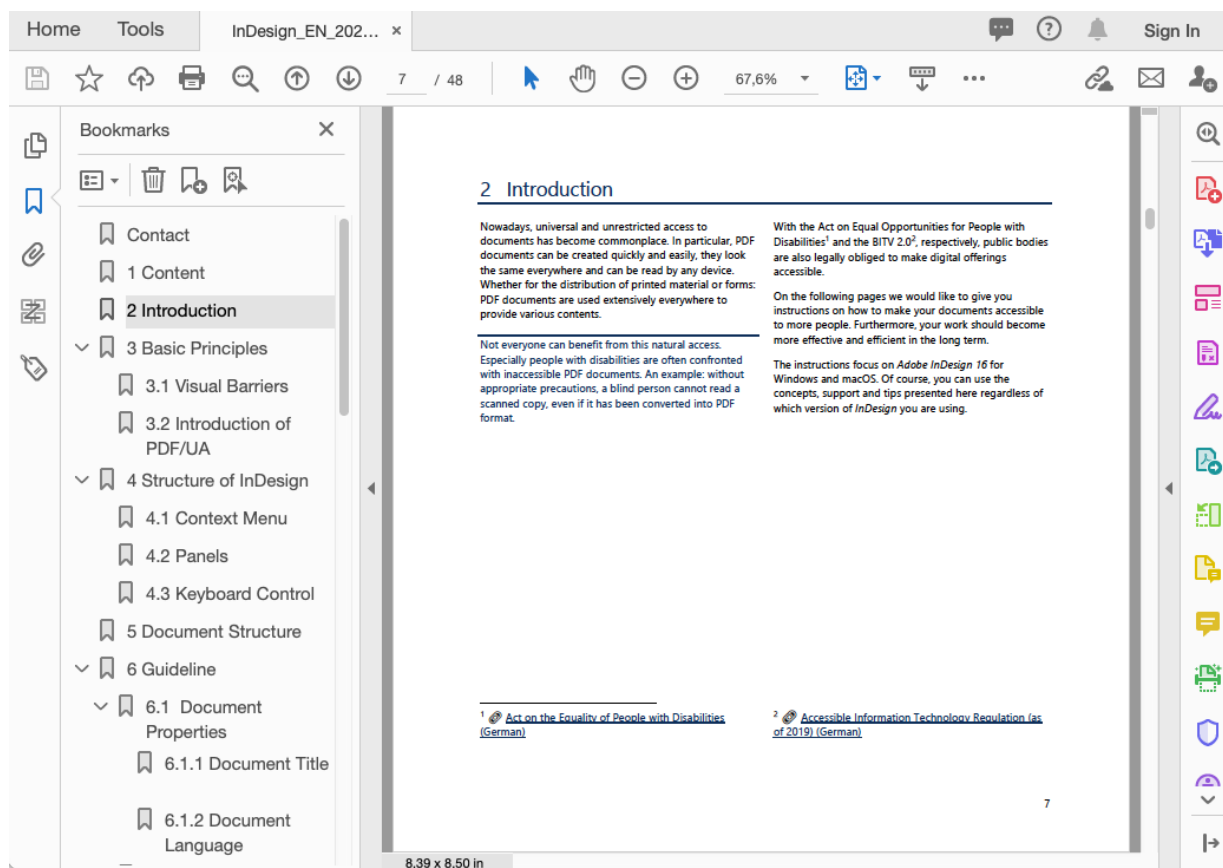


*Figure 17 Bookmark list of a PDF Document in Adobe Acrobat*

### 6.2.8    Tables

If your document is to contain tables, make sure that they are structured logically. Pseudo tables, which are simulated in *InDesign* using tabs and spaces, should be avoided at all costs.

#### When is a table logically structured?

Even blind people can read and understand tables. In the simplest case, they navigate from cell to cell using the keyboard and have the contents read out to them. Thereby they can recognise which cells are heading cells and thus understand the meaning of the individual information in the cells - provided that the table has the necessary structure and has not been brought into table form only visually. Figure 18 shows how a simple, logically structured table in PDF is presented to blind people.

The table is introduced with `<Table>`. Rows are marked with `<TR>`, columns with `<TD>` or with `<TH>` for headings.

### Create a Table

The **Table** menu allows you to create a new table. In the **Create Table** window, select the number of header rows (Figure 19). These are also marked as such when exporting to PDF.

*InDesign* only supports tables that can be read vertically - tables with headers and data cells below. Horizontal tables, i. e. tables with a first column, currently cannot be displayed with *InDesign* in an accessible way. This requires a plug-in such as *MadeToTag* from *axaio.*

For complex and long tables that do not fit into a text box or on a page, you should also set the **table options** to repeat the header row in each text box or at least on each page (Figure 20). This ensures that the table is still understandable when turning pages. However, in the PDF document such a table with several header rows is marked as a single table. The header row is therefore read out several times. This redundancy is not optimal and should be avoided, e. g. by using the paid *InDesign* plug-in *MadeToTag*.



*Figure 18 Logical Structure of a table in PDF in the Adobe-Acrobat Tag-Editor (left)*

Menu **Table** → **Create Table…** → **Header Rows**

Ctrl Alt ⇧ T ⊞       ⌘ ⌥ ⇧ T 



*Figure 19 Set the number of Header Rows*

Select Table → Menu **Table** → **Table Options** → **Headers and Footers** → **Repeat Header**
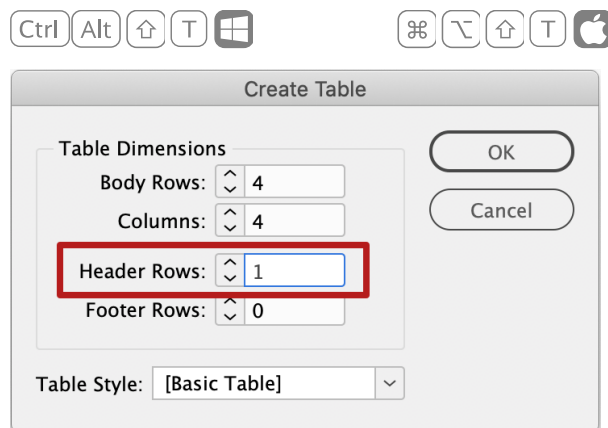
Strg Alt ⇧ B ⊞       ⌘ ⌥ ⇧ B 



*Figure 20 Repeat Header*

For details on creating tables, refer to the *Adobe InDesign User's Guide*.

**Summary**

A summary is especially important for complex and large tables or tables where visual highlighting has been done. The summary should make explicit reference to the purpose and in particular to the highlighted features. It can also explain the structure of complex tables in summary form, which can increase understanding of the relationships presented, especially for people using speech output who cannot see the whole picture of the table. You can set the summary as **alternative text** on the table after PDF export using *Adobe Acrobat DC*.

**Note**: Complex, multidimensional, nested tables are difficult or impossible for blind people to read. If possible, complex tables should be divided into several simple tables to ensure legibility and accessibility. Alternatively, you should include a meaningful description of the table in the alternative text.

When choosing colours for the table, you should pay particular attention to the needs of people with visual impairment or colour vision problems. Therefore, you should make sure that there is sufficient contrast between the text and the background and that the information is understandable without colour.

## 6.3   Image Descriptions

Please note that pictures and graphics require a meaningful alternative description in order to be accessible to blind people.

### 6.3.1   Degression: Image Description

Blind people cannot understand images, graphics or diagrams without help. They need an explanation of the contents, a so-called alternative description.

A good image description should have the following characteristics:

- Objectivity (do not introduce your own interpretation)
- Comprehensibility (taking into account the target group)
- Meaningfulness (the description must make sense both without and within the context)
- Clarity and compliance with didactic knowledge
- Effectiveness (keep information complete, but as brief and concise as possible)

The image description should be consistent and structured in a strict order according to the type of graphic. The internal reading flow of the graphic should also be taken into account. When describing the image, you should begin with a rough and general description and move on to more detailed and specific information.

An image description should enable the non-visual reader to obtain all the necessary information according to the purpose of the graphic.

The description should include the following information depending on the context and purpose of the image:

- Intention and purpose of the picture
- Place depicted
- Objects, buildings, people
- Emotions, atmosphere
- What happens in the picture?
- Colours (however, in diagrams the description of visual attributes is only necessary if it provides additional information)
- Only include information that is not accessible in any other way, e. g. you should not simply repeat the caption or just use explanations from the surrounding text.

### 6.3.2　Defining Alt Text for images

In *InDesign* you can add an alternative text to an image using the **Object** menu (Figure 21). First, select the corresponding image. In the dialogue box **Object Export Options**, you must then enter the alternative text under **Alt Text**, as shown in Figure 22.

In the **Object Export Options** dialogue box, you can also specify under **Tagged PDF,** whether the image is a decorative graphic. Therefore, select **Artefact** in the selection field **Apply Tag** (Figure 23). Alternatively, you can assign a paragraph style to decorative graphics, which will be tagged as `Artefact` in the exported PDF document (see page 11).

Select Picture ⟶ Menu **Object** ⟶ **Object Export Options**... ⟶ **Alt Text**



*Figure 21 Open Object Export Options*



*Figure 22 Add an Alt Text to a picture*



*Figure 23 Tag a decorative graphic as Artefact*

### 6.3.3 Examples for Alternative Descriptions

There are different types of pictures, graphics and diagrams. If you have no experience with the textual description of your graphic content, the following examples can help you[5]. Please note that different information may be relevant depending on the context of the graphic.

**Decorative Pictures (Decorative Graphics)**

Backgrounds or other graphic decorative elements and placeholders in your document, which do not contain any information relevant to the content, do not require an extra alternative description. As described above, they must be tagged as decorative. Alternatively, you should consider removing purely decorative images from the document.



*Figure 24 Example: Decorative Picture*

**Pictures with Text**

With advertising, logos, etc. the alternative text should contain the text of the graphic. In this example the alternative text of Figure 25 should be as follows:

*Font graphics: Blindtext weiss*

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[5] The examples are based on the recommendations of the Practical Guide for the Creation of Text-based Alternatives for Graphics of the DVBS (The German



*Figure 25 Example: Picture with Text*

**Content Relevant Pictures**

The picture refers to the content but is not described in detail in the text. In this case, the description of the image can be very complex. Therefore, as an alternative, a link to the detailed picture description can be provided, which is located elsewhere (e. g. on another page or in an extra document). A possible alternative description of Figure 26 is:

*Painting of a woman with long hair sitting in a boat. The woman in the picture is wearing a flowing white dress. A large elaborately patterned fabric is draped around her. In her right hand she holds the anchor chain of the boat. Her expression...*



*Figure 26 Example: Painting*

Association of Blind and Visually Impaired Students and Professionals)

**Charts**

For a chart description you should keep to the following structure:

1. **Overview:** Title, chart type, general content, special features such as alignment
2. *Axes:* arrangement, labelling, unit, scale (range of values, intervals), intersection point of the axes
3. **Data,** depending on the type of chart, for example: number of data series, name and arrangement of data, description of rough progressions, actual data values (tabular, if possible)

Depending on the purpose of the chart and the description, you can also integrate subjective statements regarding the chart content into the description. However, you must mark these as interpretations or your own interpretations. A possible alternative text for Figure 27 is:

*Expenses of the last years. Bar chart. Above the columns you will find the respective values of the vertical axis.*

*The horizontal axis is a time axis with the years 2000 to 2004. The vertical axis is not shown and has the unit millions.*

*A data series is shown. The values for the years 2000 and 2004 are significantly smaller than the values for the years 2001 to 2003.*

*Data values: 2000: 5,7 Mio., 2001: 22,6 Mio., 2002: 21,9 Mio., 2003: 22,6 Mio., 2004: 6,7 Mio.*



*Figure 27 Example: Chart*

**Formulas**

We recommend to insert formulas as pictures to ensure that they are accessible to everyone. If you use pictures in your document that contain mathematical representations such as formulas or special characters, the alternative text should contain a textual version of this formula.

When describing formulas, ensure that they are clear. If your document has many formulas, you should use *LaTeX* or *MathML* notation in the alternative text to make your graphical formula representations accessible. You can find more information on this topic in the corresponding literature[6].

In Figure 28, the alternative text of the illustrated formula in *LaTeX* notation is:

Equation: \ [ a = b + 2 * k * \pi \]

Or written out in text form:

*Equation: a equals b plus 2 multiplied k multiplied Pi*

$$a = b + 2k \cdot \pi$$

*Figure 28 Example: Formula*

For further examples of alternative descriptions we recommend the Practical Guide for the Creation of Text-based Alternatives for Graphics of the DVBS.

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[6] Wikibooks, Library of free textbooks, non-fiction and specialist books: Compendium LaTeX: For Mathematicians

## 6.4   Setting the Reading Order

Before you export your InDesign document as a PDF document, you must ensure that the order of paragraphs and images is also semantically correct and is reproduced correctly by assistive technologies. To do so, you should anchor images in the text and sort paragraphs using the article control panel.

### 6.4.1   Anchoring Pictures

In print layout, pictures are often not placed directly where the text refers to them. For an accessible document, it is therefore essential to provide active cross-references (page 22) to pictures. Moreover, it is also important that the picture is still described in the semantic flow of reading close to the referenced.

In *InDesign*, you must anchor the graphic frame containing the image in a suitable position in the text frame. Therefore, select the text frame with the

selection tool, click on the blue square in the right third of the upper edge and drag it to the desired position in the text (Figure 29).  The square changes into an anchor symbol and a dotted line goes from the image to the anchored position in the text (Figure 30).

For individual text frames, e. g. captions or texts in the marginal column, you can proceed in the same way.

### 6.4.2   Order of Paragraphs

To ensure that the created paragraphs and embedded images in the exported PDF document are actually tagged, you must then group them into articles in the article control panel and specify their order.



*Figure 29 Anchor a picture in a text frame*



*Figure 30 Anchored Picture in the text*

First open the **Article** control panel via the **Window** menu. Add new articles by clicking on the plus symbol at the bottom right of the control panel. Make sure that **Include When Exporting** is selected so that the articles are tagged in the exported PDF (Figure 31). Otherwise, the article and the sections it contains will not be accessible to users of assistive technologies.

To add an object to an article, for example a text field, select it and drag it to the article control panel while holding down the left mouse button. Release the mouse button here (Figure 32). Alternatively, select **Add Selection to Articles**, the simple plus symbol at the bottom of the item panel. The object will then appear in the list, indented below the item you dragged it.

In terms of content, pictures that have been anchored to a text (page 33) are located in the text section and thus in the same article as the text section. They do not need to be added to the article. This applies to all anchored objects. When you add a text box to an article, all linked text boxes are automatically added to it.

The order of the articles and the contained objects in the article control panel, from top to bottom, corresponds to the reading order in the exported PDF document. To change the order, select a list entry and drag it to the desired position while holding down the left mouse button.

Make sure that all objects are assigned to an article. Otherwise, they are not tagged and not accessible in the PDF document.

Menu **Window** → **Article** → **New Article** → **Include When Exporting**



*Figure 31 Create a new Article*

Select Object → Drag it into the Article control panel/Button **Add Selection to Articles**



*Figure 32 Add a text section to an Article*

## 6.5   Creating a PDF-Document

You have structured your document as simply as possible and with the help of Style Sheets? Have you provided images with alternative texts and checked your links and references for up-to-dateness? Does your document have a title? Then you have gotten closer to creating your accessible PDF document. Now you only have to export your document as PDF.

For digital publication, a PDF document should be created with bookmarks and active links. Therefore, you should export an interactive PDF (Figure 33).

For an accessible PDF document, ensure that the following options are selected in the **Export to Interactive PDF** dialogue box, as shown in Figure 34 and Figure 35:

- General (Figure 34):
    - o   Forms and Media: Include All
    - o   Create tagged PDF
    - o   Use Structure for Tab Order
- Advanced (Figure 35):
    - o   Display Title: Document Title
    - o   Language: Setting Basic Language of the Document

Menu **File** → **Export...** → Format **Adobe PDF (Interactive)**          Strg  E   ⊞     ⌘ E  



*Figure 33 Export file as interactive PDF*

Dialog Window **Export to Interactive PDF** → **General** → **Options**



*Figure 34 General Export Options*

Dialog Window **Export to Interactive PDF** → **Advanced** → **Accessibility Options**



*Figure 35 Advanced Export Options*

## 6.6 Checking PDF Documents for Accessibility

There are many ways to review and improve the accessibility of PDF documents. Possible tools for automatic and manual checking and correction are described below.

It should be noted that an automatic test method cannot be used to check the sense of the reading sequence, table structure and alternative texts. These must therefore be checked manually. The same applies to maintaining the minimum contrast between text and background, for which programmes such as the *Colour Contrast Analyser* can be used.

The *Colour Contrast Analyser* can be downloaded via
Colour Contrast Analyser



*Figure 36 PAC 3 application window*

### 6.6.1 Checking Accessibility with PAC 3

The *Free PDF Accessibility Checker (PAC 3)* is a program used to check for compliance with the required guidelines of the PDF/UA standard. The program itself does not need to be installed but is only available for Windows operating systems. It provides a detailed inspection report on any problems found in the document (Figure 37) and offers a preview of what the document would look like with an assistive technology. This allows the reading order and nesting to be checked.

The programme can be downloaded from the website PDF Accessibility Checker (PAC 3).

The programme *PAC 3* itself cannot automatically solve any problems and does not offer any editing options. After the test and on the basis of the test report, any problems found must be corrected with another programme (e. g. *Adobe Acrobat DC, axesPDF QuickFix*).



*Figure 37 PAC 3 Report Window*

### 6.6.2 Checking and Improving Accessibility with Adobe Acrobat DC

*Adobe Acrobat DC* is a fee-based programme for editing PDF documents. It offers both the possibility to check PDF documents for compliance with the PDF/UA standard and to correct errors. In contrast to *PAC 3* and *axesPDF QuickFix*, it is not only available for Windows but also for macOS.

Many functions of *Acrobat DC* are accessible via the context menu of an element. You can open this menu with the right mouse button or by pressing the Shift key ⇧ and F10 .

As shown in Figure 38,  the display of the open PDF document is located in the centre of the *Acrobat DC* window. Some **tools** are listed in the right sidebar where you can also search for tools. In the left sidebar - the navigation area - other views of the document are available, including lists of bookmarks and **tags**. Use F6 to switch the focus between the areas.

Using the **Preflight** window shown in Figure 39, the opened PDF document can be checked for compliance with the PDF/UA standards. The window can be searched and opened via the input field of the tool sidebar. In the **Preflight** window under the **Profiles** tab, choose **PDF/UA** and then select **Verify compliance with PDF/UA-1**.  Pressing the **Analyze** button at the bottom of the window starts the checking process. If you cannot find the profile on your computer, enter **PDF/UA** in the **search field**.

After the checking, the **Results** tab opens and lists any errors (Figure 40). Some errors, such as a missing PDF/UA mark or a missing document title, can be corrected directly in the Preflight window. Therefore, again under the tab **Profiles** open the view **Select Single Fixups** (spanner symbol). Depending on the selected library, various correction options are listed here.

To check and edit the reading order and structure, the view of the **tags** can be found in the Acrobat DC sidebar. Here the document structure is visible in a nested list of tags, with the actual elements of the document marked with a box symbol. By selecting a list entry, the corresponding elements are marked in the document preview. The reading order and nesting can be changed by dragging the individual tags. Alternatively, a tag can be cut out and inserted after another selected tag.

Cut: Ctrl X      Paste: Ctrl V

Cut: ⌘ X      Paste: ⌘ V

**Note**: There is a sidebar called *Order*, which determines the reading order in the *Acrobat Reflow* view. Currently (as of October 2020), however, the reading order defined there is independent of the order of tags used by assistive technologies such as screen readers. Therefore, we want to emphasise here that editing the reading order must be done in the view **Tags** in order to make the document accessible.
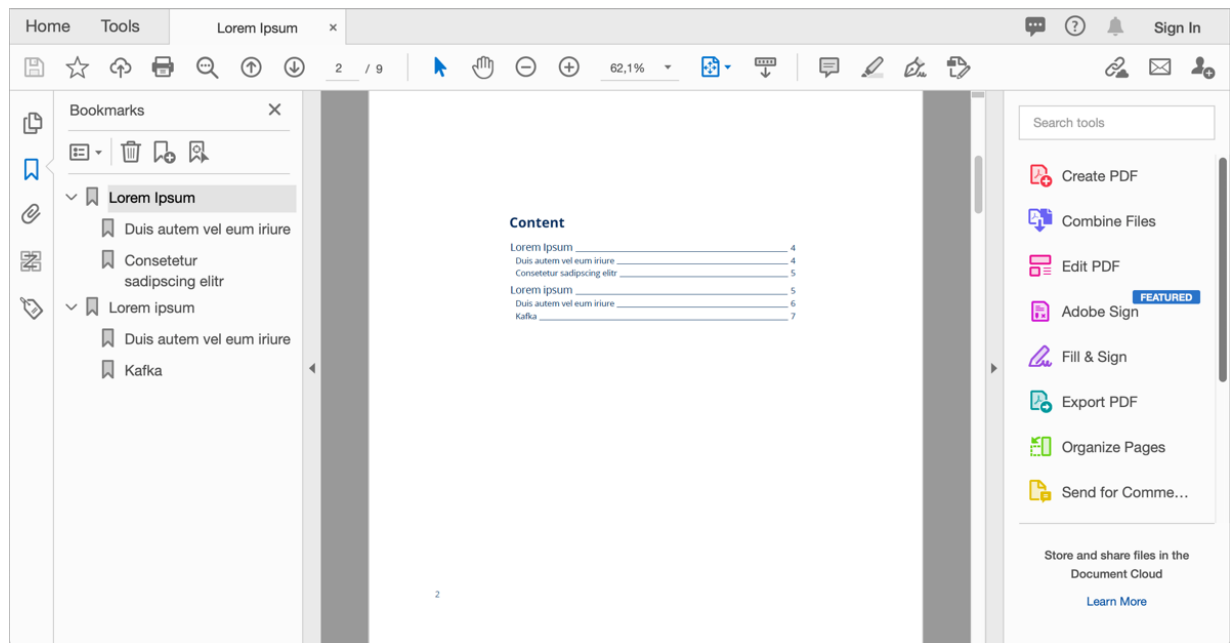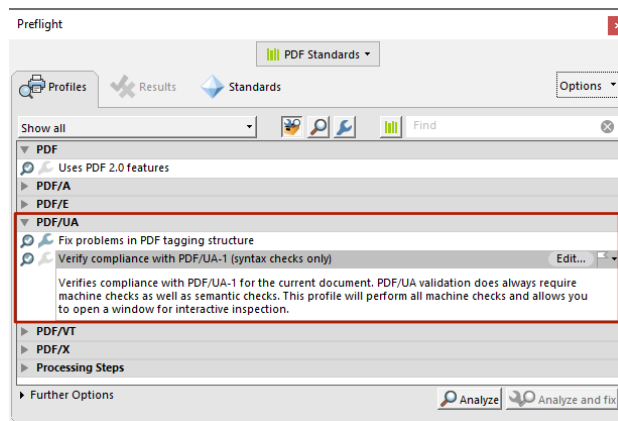
*Figure 38 Adobe Acrobat DC window*



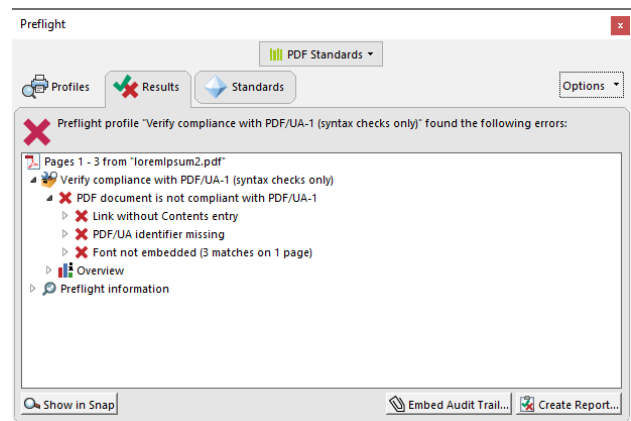*Figure 39 Acrobat DC PDF/UA Inspection in Preflight window*



*Figure 40 Acrobat DC PDF/UA Inspection Results Preflight window*

The view **Tags** also shows whether the elements in the document are correctly tagged, e. g. whether headings have been marked as such. Opening the **context menu** of a tag and selecting **Properties...** opens the **Object Properties** window as shown in Figure 41 and Figure 42. Information such as the tag type, the language and the alternative text can be changed here. For example, if a second level heading is marked as `<P>` instead of `<H2>`, the tag type can be changed in the properties window using a checkbox.

If your document has no tags, open the **Accessibility** tool and select **Tag Document Automatically**. Acrobat will then automatically tag elements. You can then change the tags in the list of tags and add alternative texts. Using the **Reading Order** window

(Figure 47) of the **Accessibility** tool, you can also tag elements manually, as described later.

Purely decorative elements in the document, which do not offer any added value in terms of content, must be marked as such so that they are ignored by assistive technologies. To do this, you have to open the **context menu** for the corresponding element in the tag window and select **Change tag to extra-textual element...** This marks the element as artifact and it will not be displayed in the tag window.

**Caution:** If you delete an element from the tag tree, it is not automatically marked as an artifact, but is considered an *untagged element* in the document, which leads to errors when checking for PDF/UA.
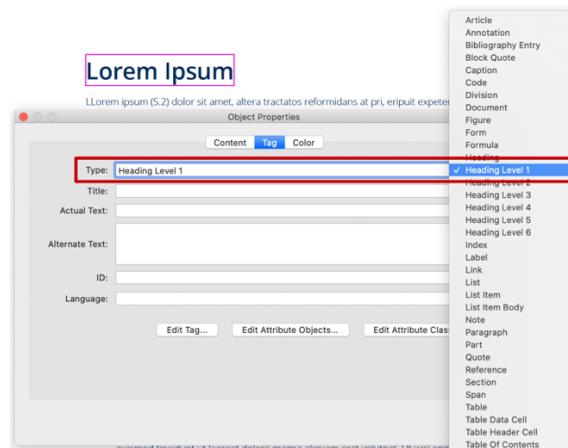


*Figure 41 Open Acrobat DC Object Properties via the context menu of a tag*



*Figure 42 Acrobat DC Object Properties window*

Complex tables are a major obstacle in creating accessible documents. *Acrobat DC* offers a **table editor** that can be used to add information to the table cells. The **table editor** can be started via the **context menu** of the <Table> tag in the tag window (Figure 43). Now the corresponding window is opened via **the context menu** of a cell and by selecting the **properties of the table cell...** (Figure 44).

Here, a cell must be marked as a header or data cell. For header cells you can also specify whether they refer to columns, rows or both (Figure 45). Data cells must also be assigned to the corresponding header cells, which is also possible in this window (Figure 46). For **Assigned Heading IDs**, a corresponding header can be selected and added by clicking the button that is labelled with a plus symbol.

If your table has linked cells that extend over several columns or rows, then this must be set explicitly in the table cell properties. There are two input fields for the number of columns and rows over which the cell extends.

If your table has borders, these may need to be manually marked as artifacts. If the corresponding path elements are already in the tag view, you can proceed as described for the decorative elements before. Otherwise, you must manually mark the individual path objects as **Background/Artifact** using the **Reading Order** tool, as shown in Figure 47. Therefore, select the path object by dragging the mouse pointer over it while pressing the left mouse button. Then select the **Background/Artifact** button in the **Reading Order** window.
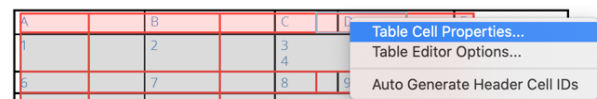


*Figure 43 Open Table Editor via context menu of <Table>-tag*



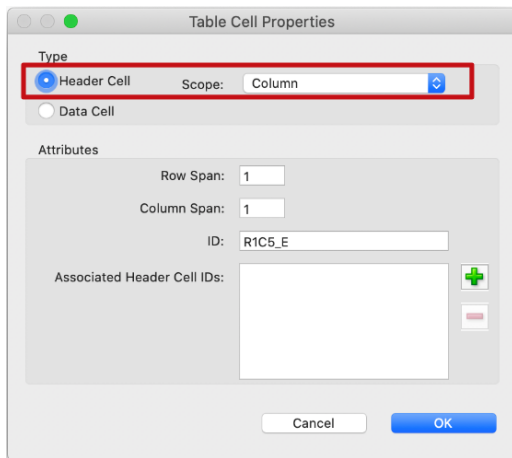*Figure 44 Context menu of a table cell*

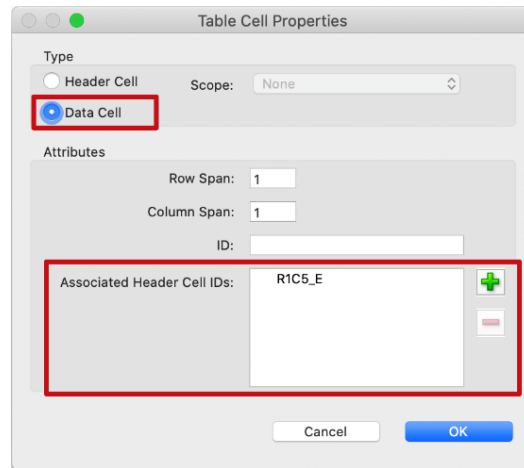*Figure 45 Table Cell Properties window of a Header Cell*


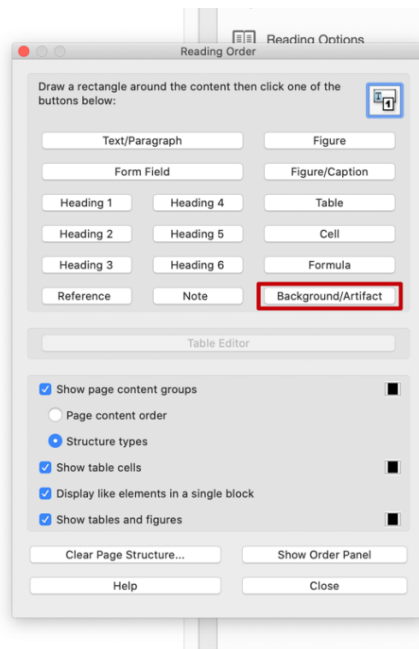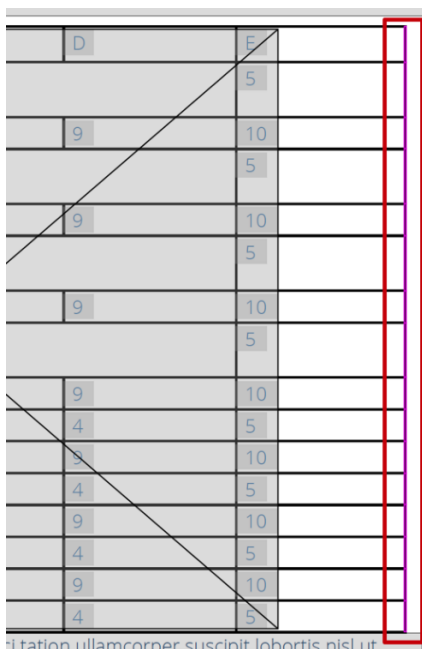*Figure 46 Table Cell Properties window of a Data Cell*


*Figure 47 Label the table border as Artifact using the Reading Order Tool*

### 6.6.3 Checking and Improving Accessibility with axesPDF QuickFix

With the fee-based programme *axesPDF QuickFix*, PDF documents can be checked for compliance with the PDF/UA standard and WCAG 2. It also allows the correction of some errors. The programme is available for Windows and can be downloaded from the website:

axesPDF QuickFix

As shown in Figure 48, the **logical structure** is shown in a tree view in the left sidebar. Here you can check the reading order and the correct labelling of the elements. On the right side of the application window, there are various tools for checking and

editing the document. Via the **Checker** tab in the right sidebar, a PDF/UA standard check of the document can be performed with the results displayed in a tree view. Click the **Refresh** button to start the check

The **Properties** tab of the right sidebar displays the properties of the selected item. This is where, e. g. the label (structure type) can be changed or an alternative text can be set.

In the **Settings** tab of the right sidebar, you can change such settings as the document language and title.
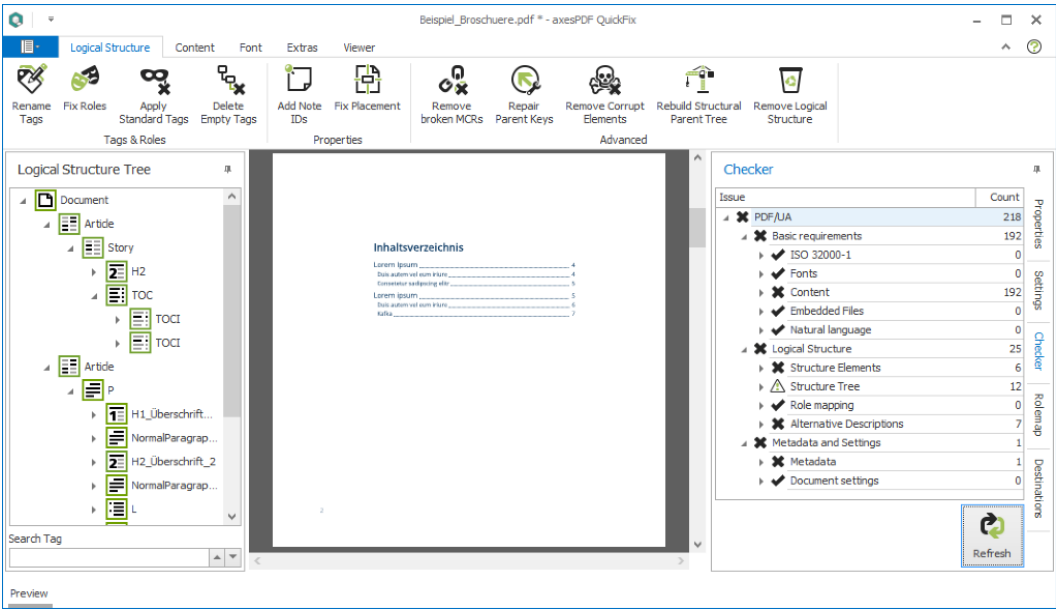


*Figure 48 Application window of axesPDF QuickFix*

*AxesPDF QuickFix* is particularly suitable for marking up complex tables. With the **Table tool**, which is activated via the **Viewer** tab of the ribbon, cells can be assigned to the corresponding header cells by dragging them. In the **Properties** tab of the right sidebar, you can also adjust the size of connected cells. As shown in Figure 49, the corresponding header cells can also be set here.

With *QuickFix,* you can re-mark already marked elements, but it is not possible to label unmarked elements or tag them as artifacts.



*Figure 49 axesPDF QuickFix Properties of connected cells*

### 6.6.4 Online Validation and Fixing With PAVE

Online tools for checking and improving the accessibility of PDF documents have the advantage that they can be used regardless of the operating system. On the other hand, you must first upload your PDF document to a website. It is not always clear what the website operator will do with the document, for example, whether it will be saved permanently or deleted after editing. Before using the online tool, you should therefore make sure that uploading your document is safe from a data protection perspective.

*PAVE* is an online platform that allows you to upload a PDF document, have it checked online and at the same time manually edit[7] any problems that are found but not automatically resolved.

The project can be accessed via the PAVE website.

Using the editing functions, the stored document information can be subsequently checked and modified, and the document structure and element properties can be influenced.

Even if no error is displayed in the document properties, it is still worth checking them again via the **Properties** tab, as shown in Figure 51.

In the **Reading Order** tab (Figure 52) you can check and change the document structure and nesting of items. Use the pencil icon at the end of a list item to edit the selected item. Therefore, the **Tagging** view, as shown in Figure 53, opens. In this view you can, i. a., adjust the alternative text and the type of the element. For purely decorative elements, you must select **Not relevant (will not be read out)** for the element type here.

Complex changes are not possible with *PAVE*. Significant, extensive changes, such as subsequent grouping etc., can be carried out with the fee-based *Adobe Acrobat DC*, for example.

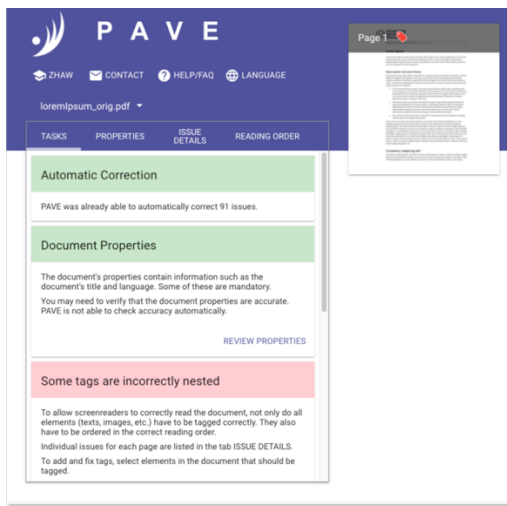---

[7] Video Tutorial: Introduction to PAVE v2.0

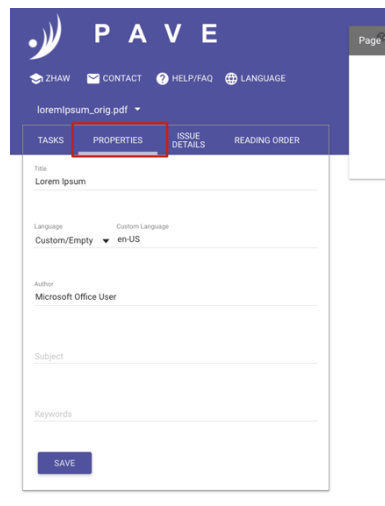*Figure 50 PAVE Tasks View*



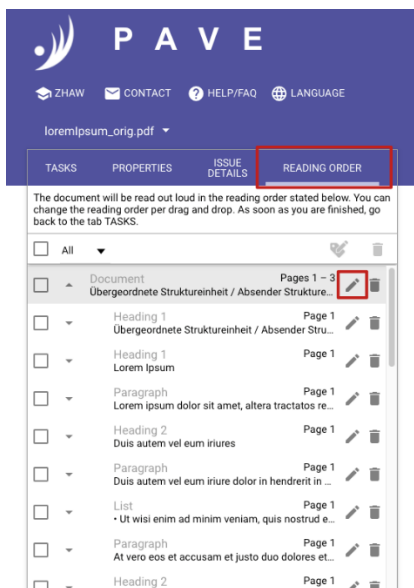*Figure 51 Document Properties in PAVE*



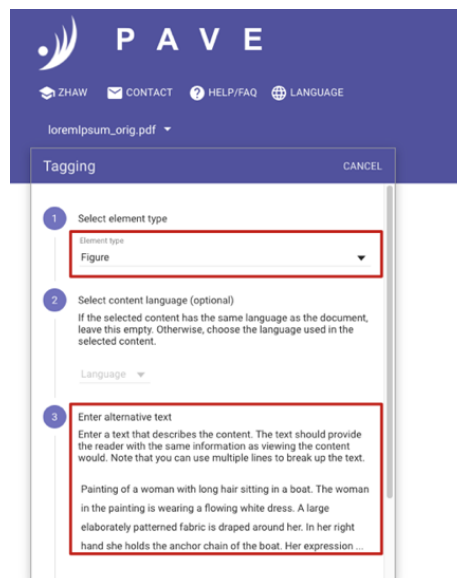*Figure 52 Reading Order in PAVE*



*Figure 53 PAVE Tagging View to Edit Tags*

# 7  Further Literature

A useful overview of further steps can be found, for example, on the websites of the *Aktion Mensch* Initiative for an Accessible Internet [1]. *Adobe* provides a detailed manual for creating accessible PDF documents with *InDesign* [2] and *Acrobat* [3].

*axesPDF QuickFix* also has detailed instructions [4]. Since *Office* 2010, *Microsoft* has integrated an accessibility check into the *Word, Excel* and *PowerPoint* products [5].

[1] Easy For All: PDF-Documents - Readable For All. Part 3 (German)

[2] Adobe InDesign: Creating accessible PDF-File

[3] Adobe: Manual for Creating Accessible PDFs (German).

[4] axesPDF: axesPDF QuickFix – QuickStart-Guide

[5] Microsoft Office: Improve Accessibility With the Accessibility Checker

Download the brochure in PDF format at:

https://tu-dresden.de/agsbs/dokumente