

Accessibility notes

Documentation



Accessibility Chair of UPC
Architecture, design and technology for all

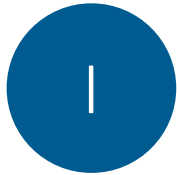
Dr. Daniel Guasch Murillo

December 2022



Concepts

Infoaccessibility



Infoaccessibility

Definition

Application of the principles of universal accessibility to communication and information technologies, so that all people can communicate and access any information system, on an equal footing.

Infoaccessibility

Universal Design Criteria



1. Equitable use
2. Flexibility in use
3. Simple and intuitive use
4. Perceptible information
5. Tolerance error
6. Low effort
7. Size and space for access and use

Infoaccessibility



Means of support

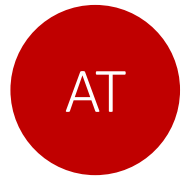
The means of support are grants that act as intermediaries between the environment and people with disabilities, which allows them to improve the quality of life and increase personal autonomy.

Infoaccessibility

Means of support / Technical aids



Means of support



Technical aids

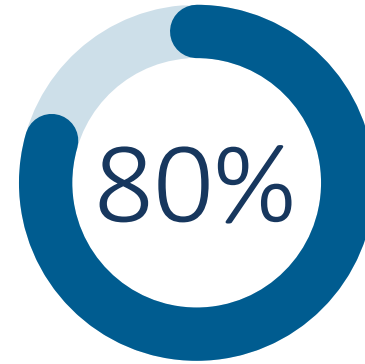
- Screen reader (or reviewer), performs a text-to-speech conversion and allows navigation through the document using hotkeys. Ex. JAWS, VoiceOver...
- Screen Magnifier, enlarges an area of the screen. Ex. ZoomText, Magnifier.
- Text dictation, performs a speech-to-text conversion.
- Personal assistant, automate actions. Ex. Siri, Cortana, Alexa ...
- ...

Infoaccessibility

Accessibility, approach 20 / 80



Effort



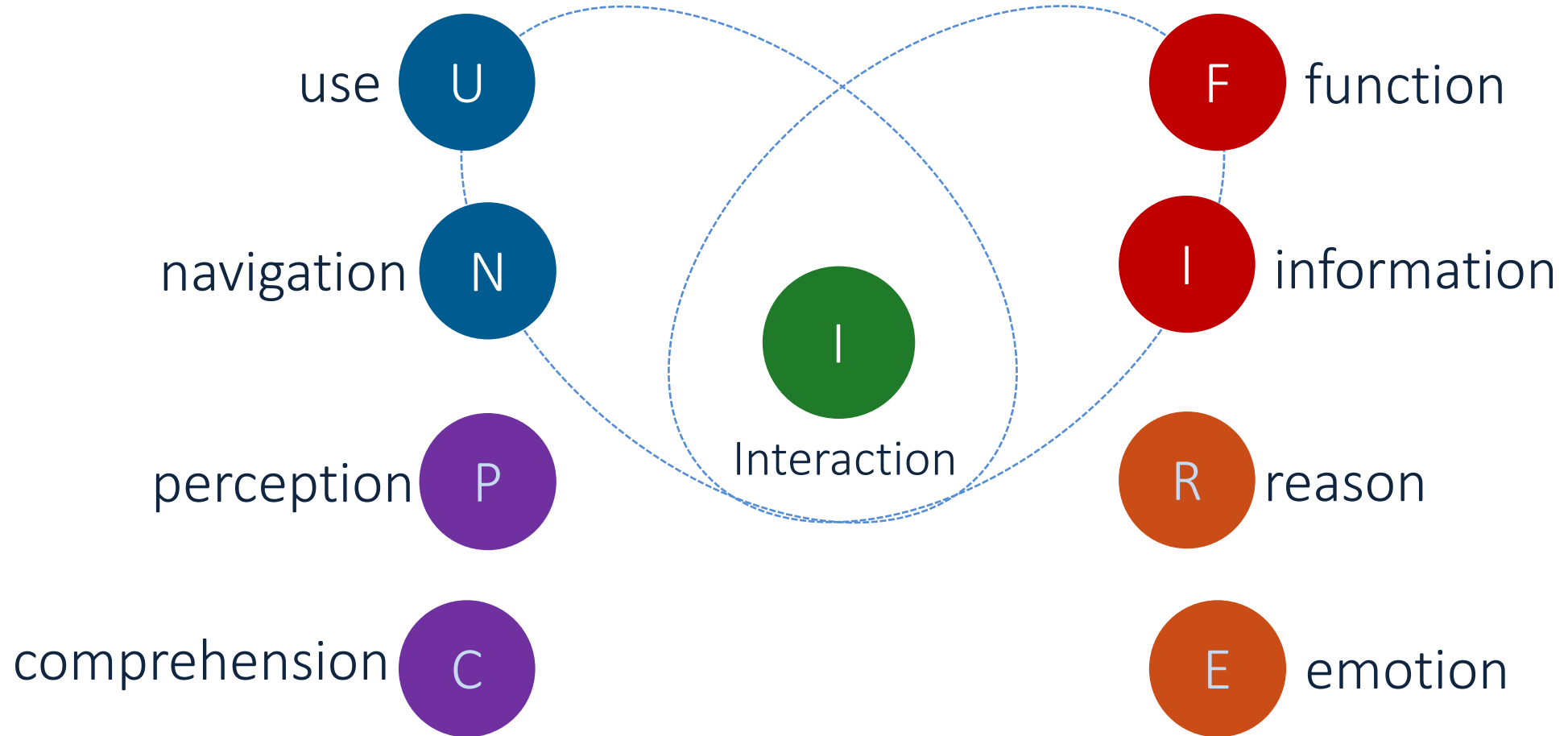
Impact

 For all people, Universal Design.

 For each disability, support products.

Infoaccessibility

Reflexional elements



Infoaccessibility

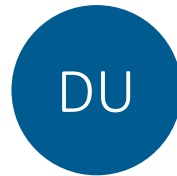
Key questions

Who



User

Why



Universal Design

What



WCAG 2.1

How



Software

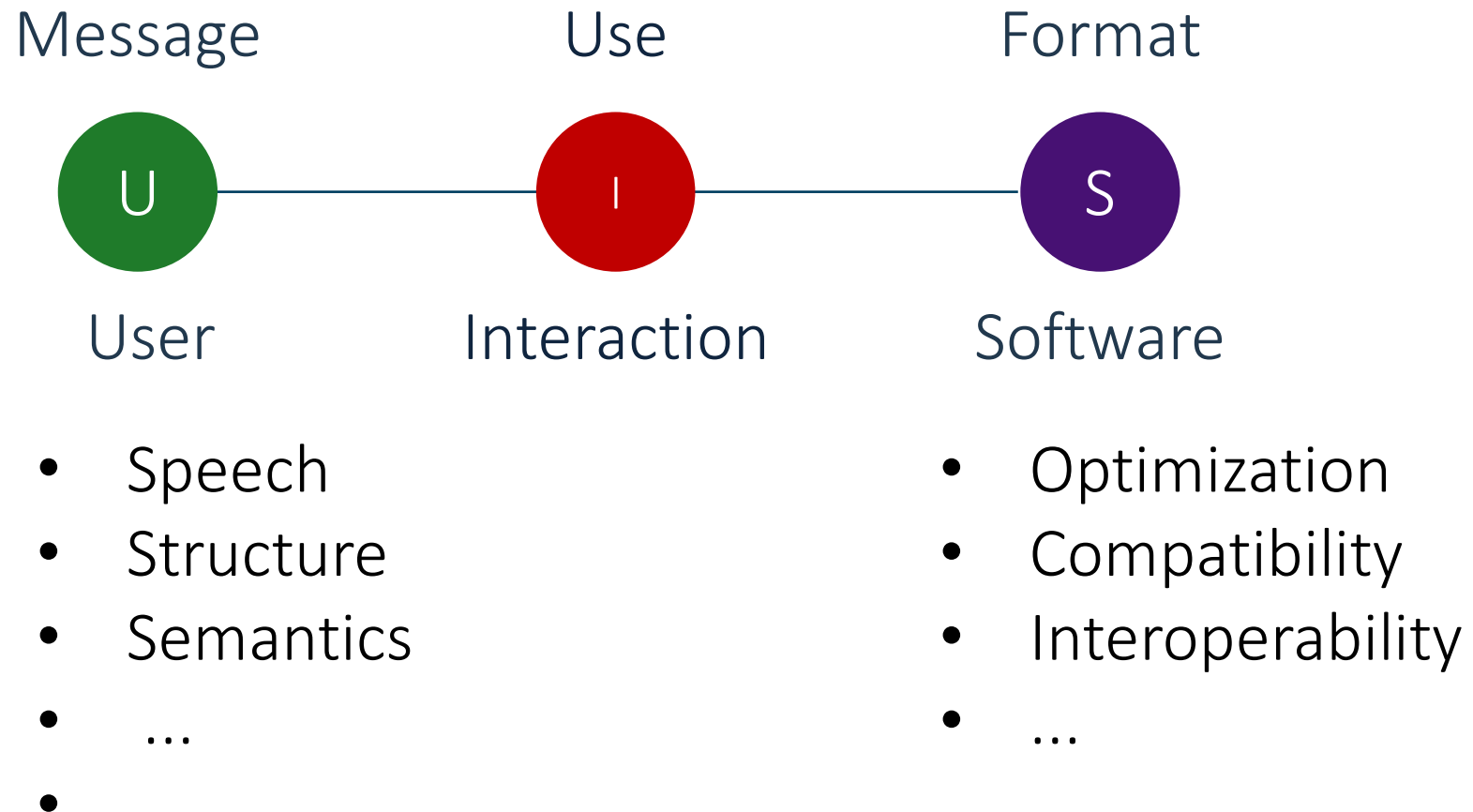
Where



Document

Infoaccessibility

Key elements.



Infoaccessibility

Strategy: separating content from the format
You need to define styles, patterns, or templates



HTML



Word



Power Point



CSS



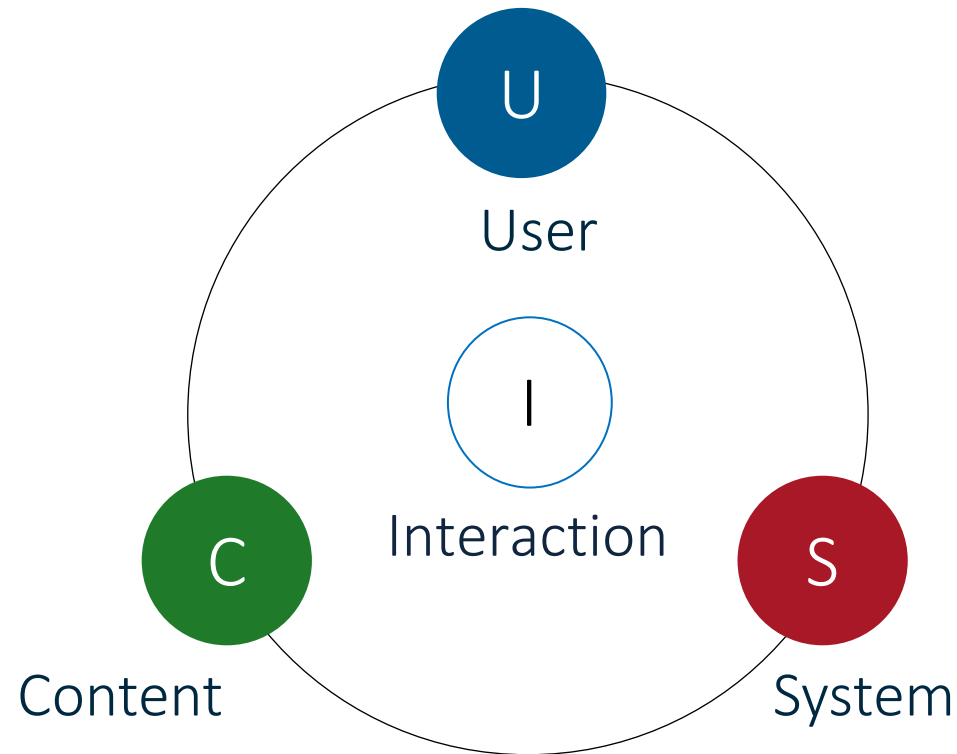
Style



Slide Master

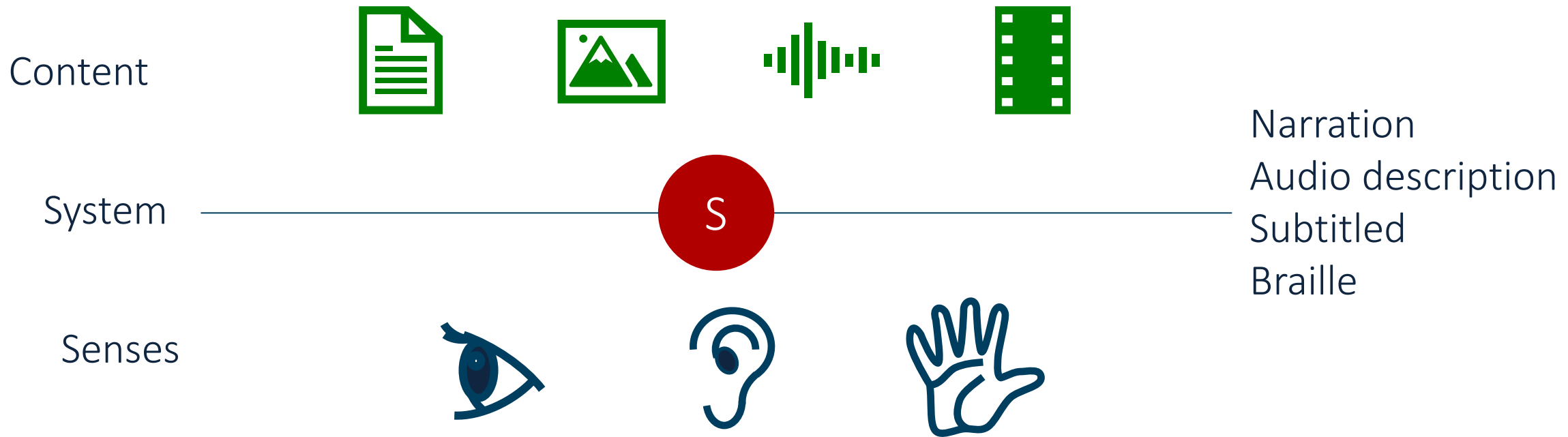
Infoaccessibility

The system and content must allow a correct interaction with the user.



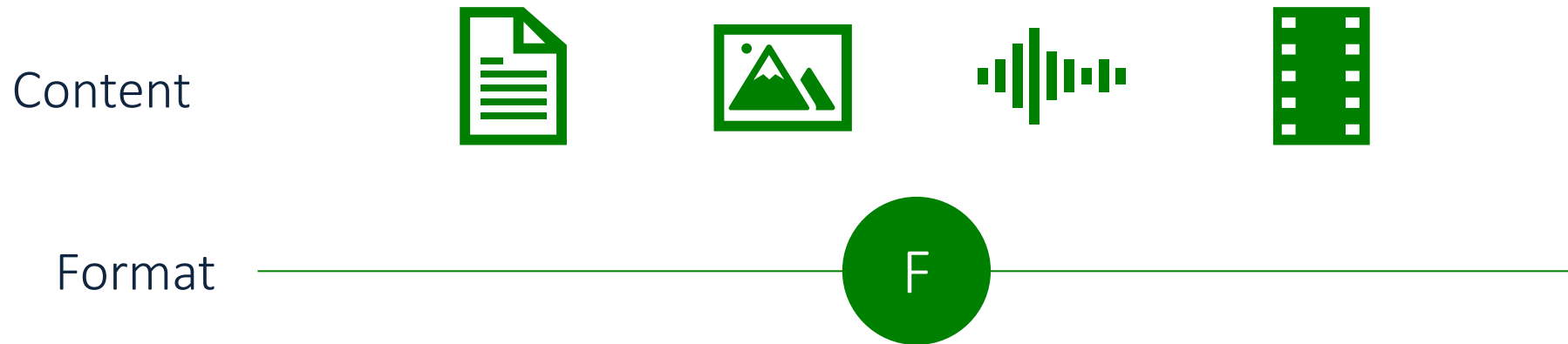
Infoaccessibility

The system and content must allow alternative rendering mechanisms.



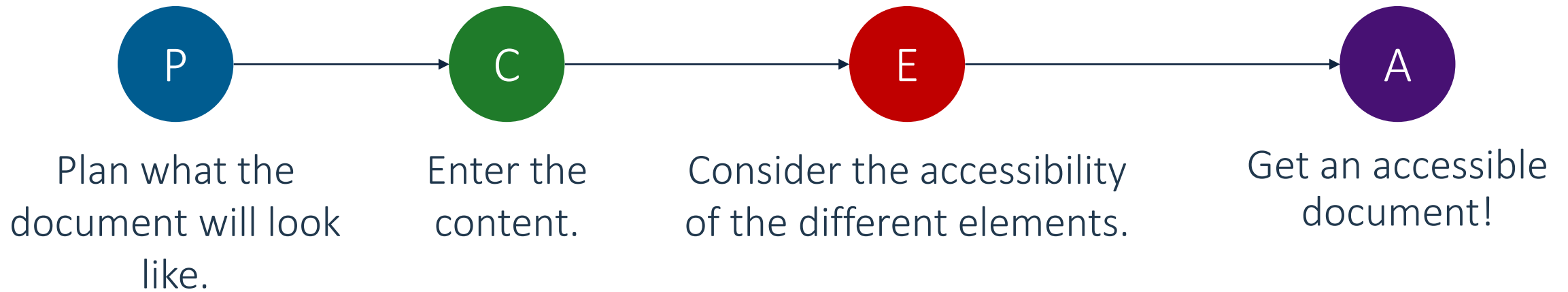
Infoaccessibility

A document is accessible when all its contents and formats are also accessible.



Infoaccessibility

Processing process



WAI

(W3C)
World Wide Web Consortium

Web Accessibility Initiative
(WAI)



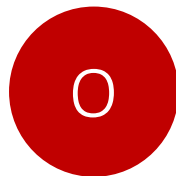
WAI-WCAG 2.1

WCAG 2.1 (Web Content Accessibility Guidelines)

Recommendations on infoaccessibility are defined in WCAG 2.1 (Web Content Accessibility Guidelines) and must be properly understood and applied on the basis of 4 principles.



perceivable



operable



understandable



Robust

WAI-WCAG 2.1

User interface information and components should be displayed to users in ways they can perceive (perceivable).

This principle implies:

1. Provide alternate text for non-textual content. It can also be transformed into other formats that users need, such as Braille, speech synthesis, symbols or easy reading, etc.
2. Provide alternatives to multimedia content, in a synchronized way.
3. Create content that can be presented in multiple ways without losing information or structure.
4. Make it easier for users to view and listen to the content allowing to discriminate the nuclear information of the complementary.



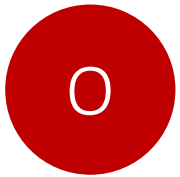
perceivable

WAI-WCAG 2.1

User interface components and content navigation must be usable (operable).

This principle implies:

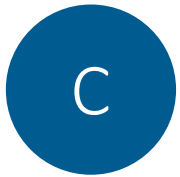
1. Be able to control all functions from multiple user interfaces, such as keyboards, pushbuttons, touch screens, etc.
2. Provide sufficient time for users to be able to read and use the contents.
3. Avoid designing content that can cause epileptic seizures.
4. Provide alternatives to help users navigate, search for content, and set where they are.
5. Make it easier for users to use functionality through various inputs beyond the keyboard.



operable

WAI-WCAG 2.1

The information and actions of user interfaces need to be understood (understandable).



understandable

This principle implies:

1. Write the text in a way that is readable and understandable.
2. Design the appearance and functionality of user interfaces to make them predictable for users.
3. Incorporate mechanisms to prevent and correct user errors.

WAI-WCAG 2.1

The content must be robust enough that it can be interpreted correctly by both users and the means of support (robust).



robust


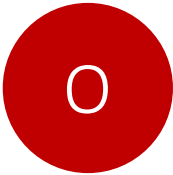
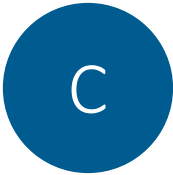




This principle implies:

1. Maximize compatibility with products, formats, support media, etc.

WAI-WCAG 2.1

Web Accessibility Initiative (WAI)

WCAG 2.1

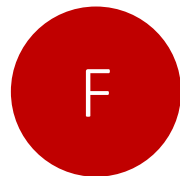
			
perceivable	operable	understandable	robust
4 guidelines 29 criteria	5 guidelines 29 criteria	3 guidelines 17 criteria	1 Agenda 3 criteria
			

Minimum for public administration

WAI-ARIA 1.1

WAI-ARIA (Accessible Rich Internet Applications Suite)

WAI-ARIA 1.1 defines a way to make Web content and Web applications more accessible to people with disabilities. It especially helps with dynamic content and advanced user interface controls developed with HTML, JavaScript, and related technologies.



roles



properties



methods

WAI-ARIA 1.1

WAI-ARIA 1.1 provides



roles



properties



methods

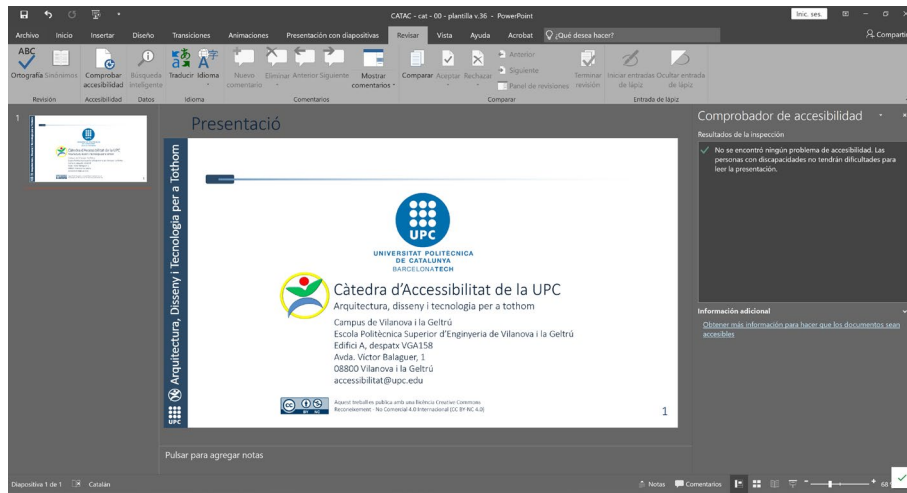
- Roles to describe the type of widget presented, such as “menu”, “treeitem”, “slider”, and “progressbar”.
- Roles to describe the structure of the Web page, such as headings, regions, and tables (grids).
- Properties to describe the state widgets are in, such as “checked” for a check box, or “haspopup” for a menu.
- Properties to define live regions of a page that are likely to get updates (such as stock quotes), as well as an interruption policy for those updates—for example, critical updates may be presented in an alert dialog box, and incidental updates occur within the page.
- A way to provide keyboard navigation for the Web objects and events, such as those mentioned above



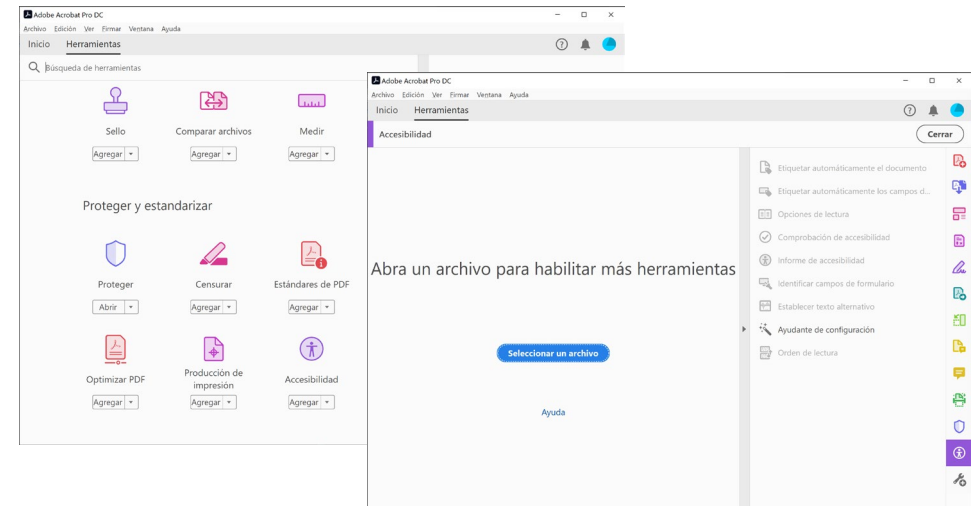
Tools

Accessibility tools

Document editors



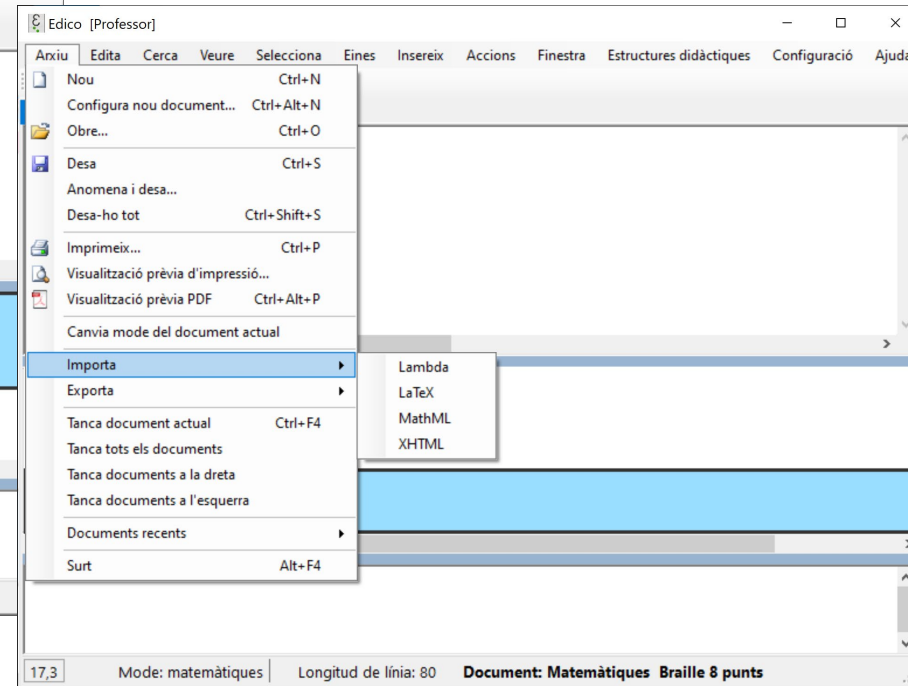
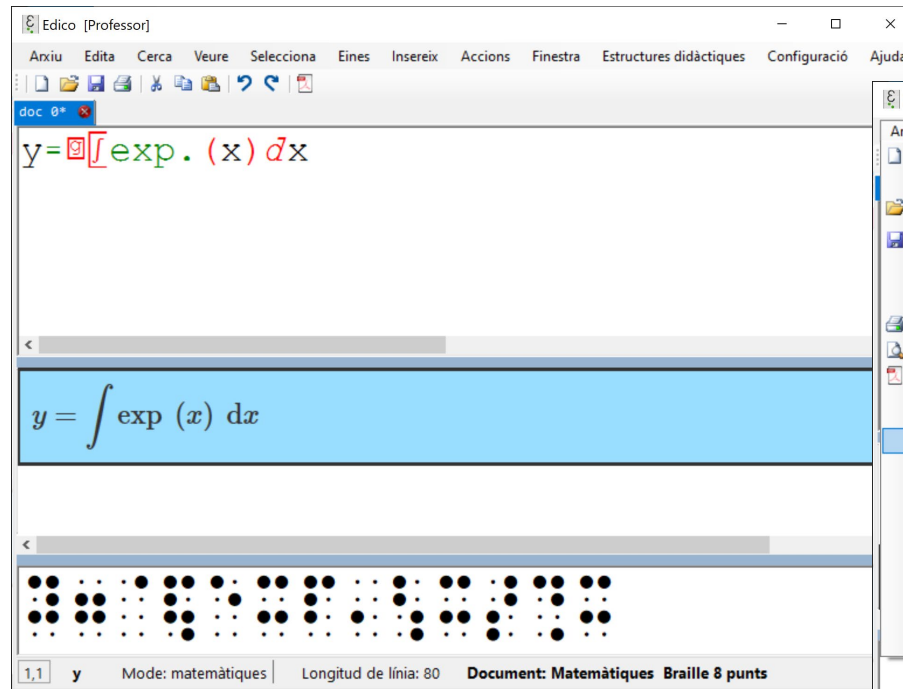
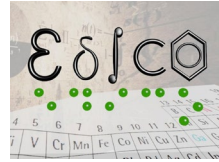
Accessibility Checker Tool



Accessibility Tool

Accessibility Tools

Scientific editors



Accessible scientific editing tool
(LaTeX, MathML, xHTML)

Accessibility tools

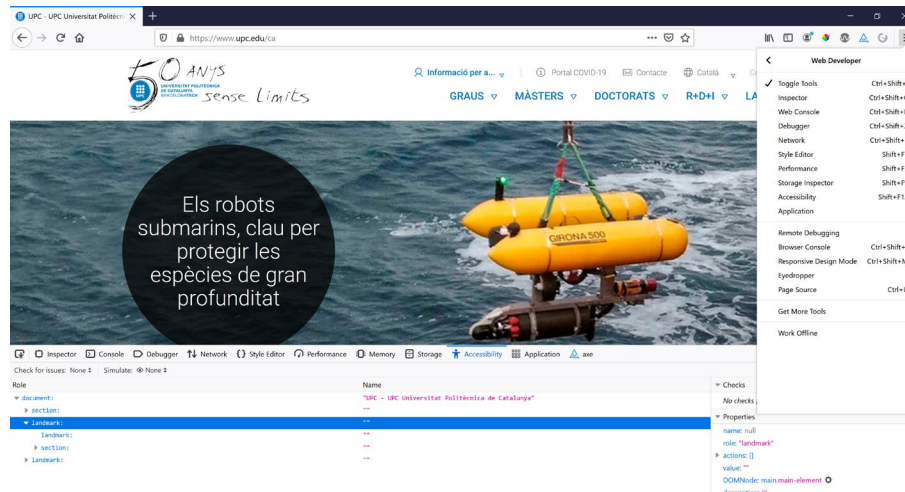
Web browsers



Firefox

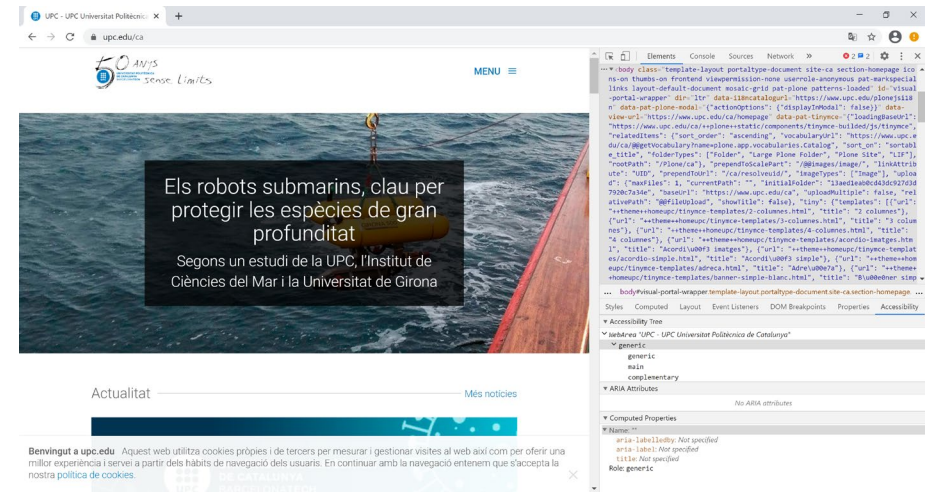


Google chrome



Accessibility Inspector

<https://www.mozilla.org/es-ES/firefox/new/>

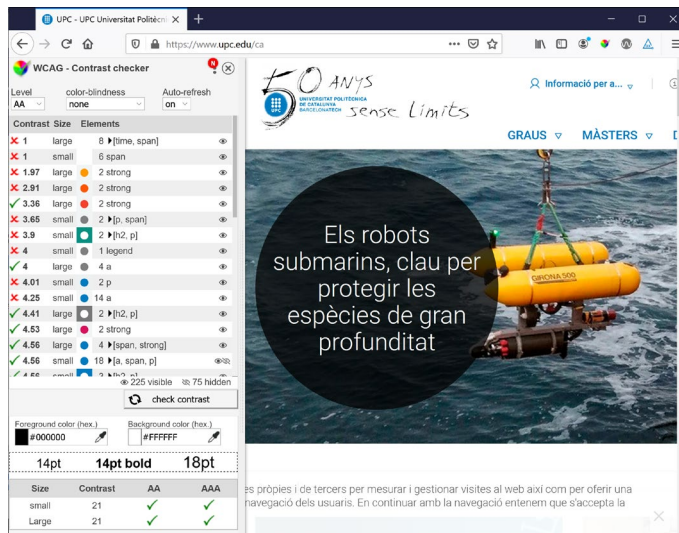


Accessibility

<https://www.google.com/intl/es-es/chrome/>

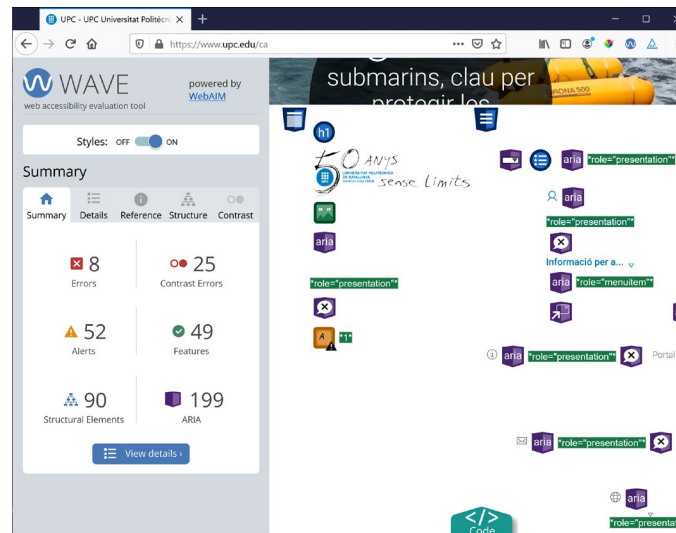
Accessibility tools

Browser extensions



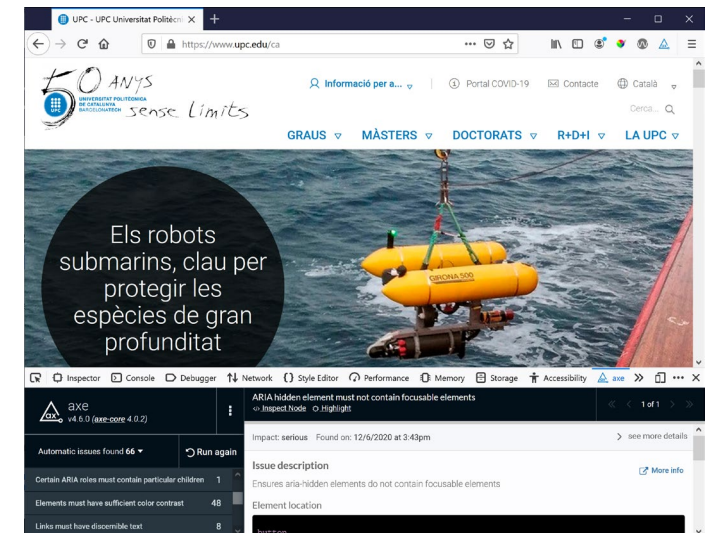
WCAG Contrast checker

https://addons.mozilla.org/en-US/firefox/addon/wcag-contrast-checker/?utm_source=addons.mozilla.org&utm_medium=referral&utm_content=search



WAVE Accessibility Extension

<https://addons.mozilla.org/en-US/firefox/addon/wave-accessibility-tool/>

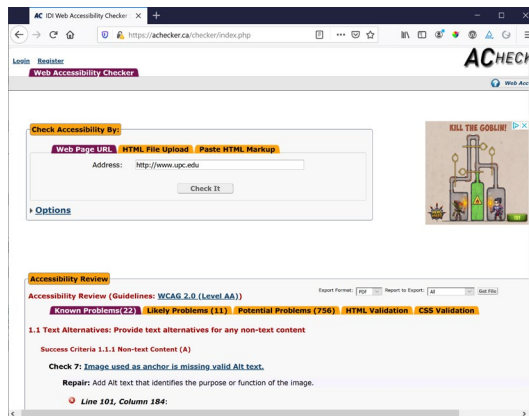


axe - Web Accessibility Testing

<https://addons.mozilla.org/es/firefox/addon/axe-devtools/>

Accessibility tools

Online Web Validators

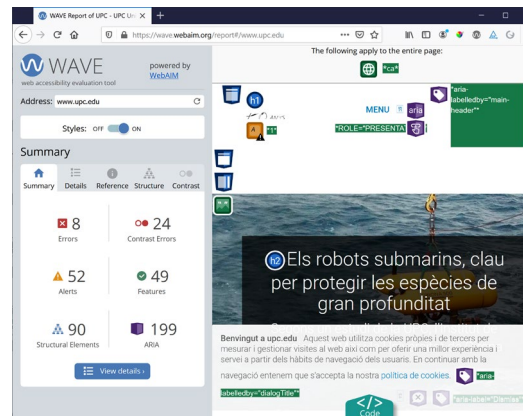


AChecker

<https://achecker.ca/checker/index.php>

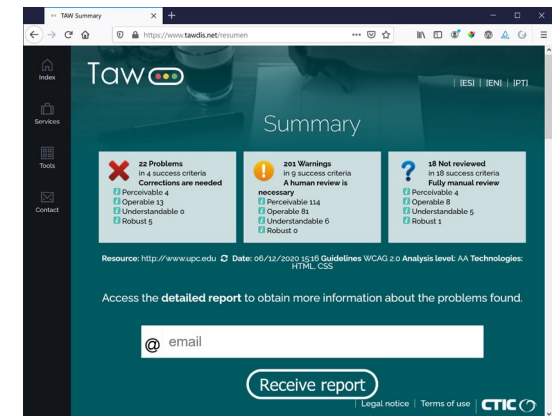


web accessibility evaluation tool



WAVE

<https://wave.webaim.org/>

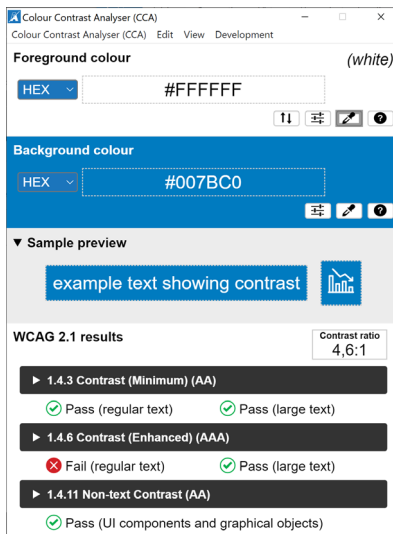


Taw

<https://www.tawdis.net/#>

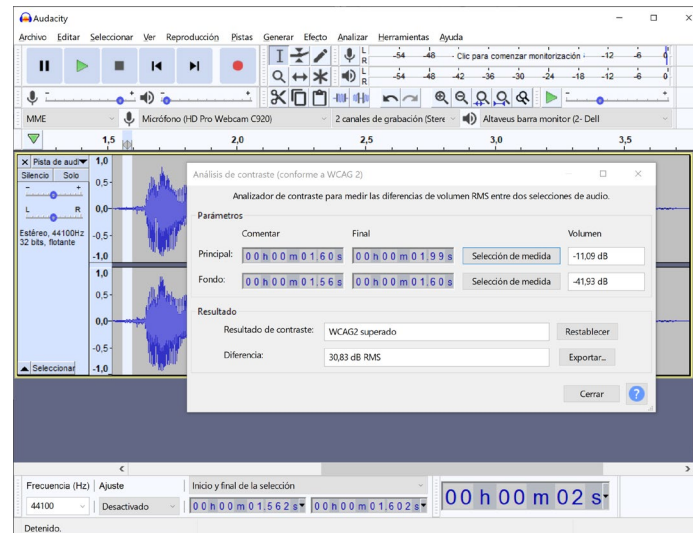
Accessibility tools

Desktop apps



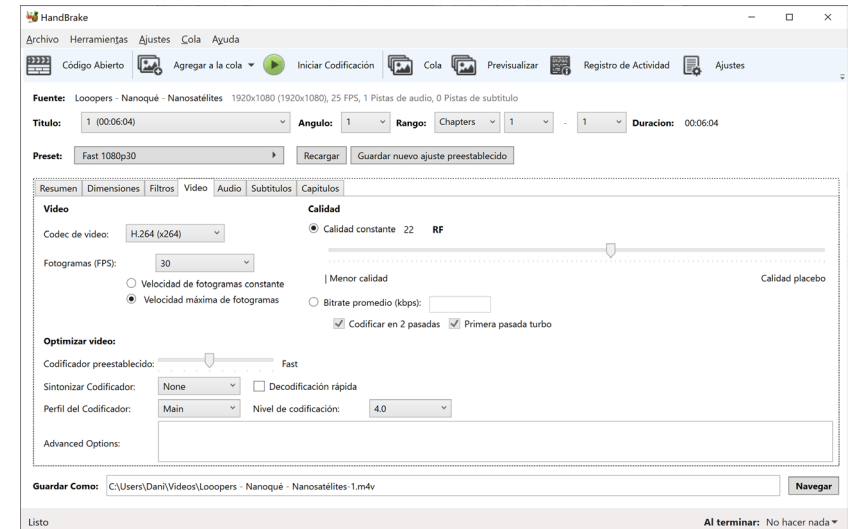
Color contrast

<https://developer.paciellogroup.com/resources/contrastanalyser/>



Contrast and audio settings

<https://www.audacityteam.org/>

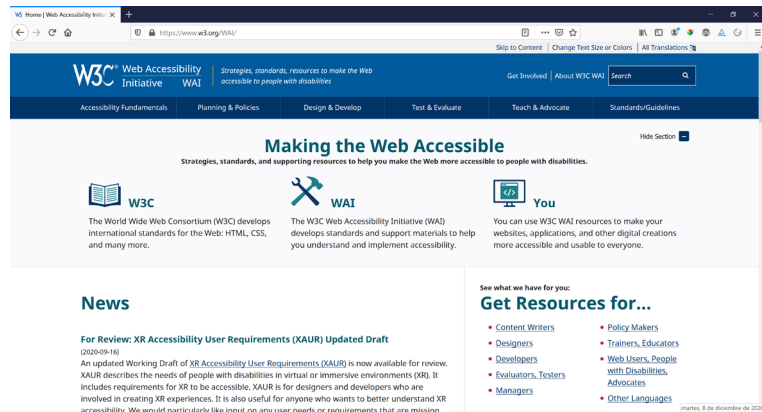


Subtitled and video settings

<https://www.audacityteam.org/>

Accessibility tools

Reference bibliography



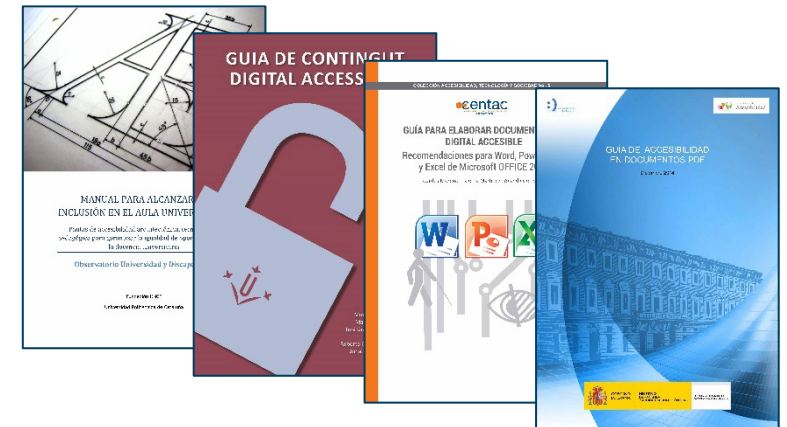
Online documentation

<https://www.w3.org/WAI/>



Regulations

<http://administracionelectronica.gob.es/PAe/acesibilidad/une-en-301549-2019.pdf>



Guides

https://upcommons.upc.edu/bitstream/handle/2117/15006/manual_alcanzar_inclusion.pdf?sequence=6&isAllowed=y



Guidelines

General

Use the latest and most up-to-date software possible.

Use the automatic tools of the editors.

Apply the 7 Universal Design criteria.



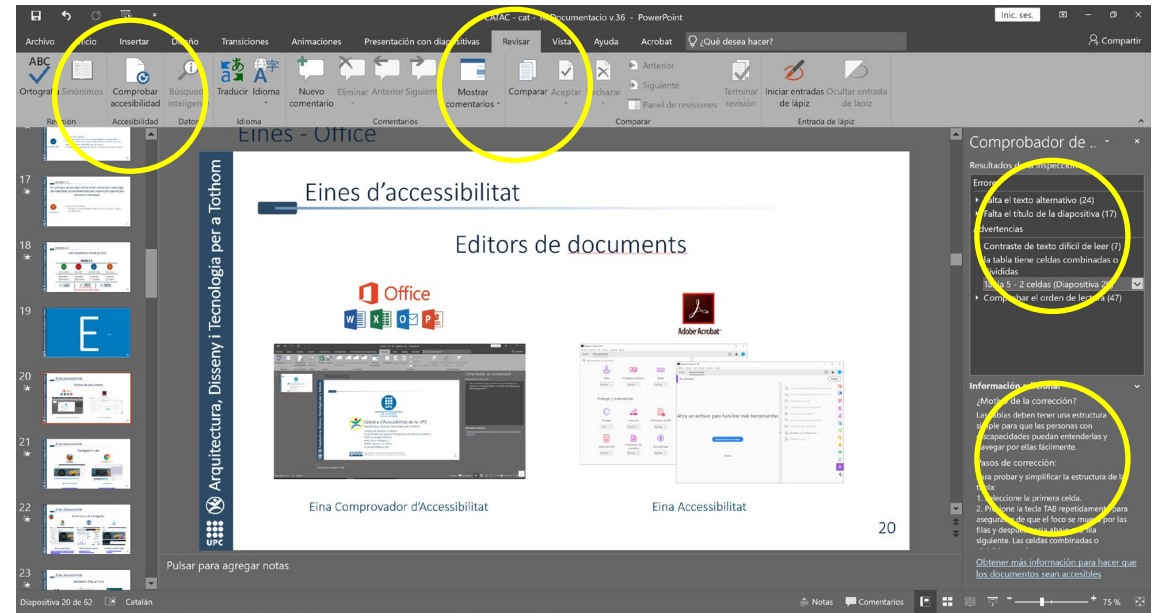
The concepts apply to any office editor.

The examples were made with Microsoft Office Professional Plus 2019

Accessibility validation

Use the editor's accessibility validation tools.

- Errors: Automatically detected issues.
- Warnings: Parameters that must be validated manually.
- Support information: Information on how to fix potential problems.

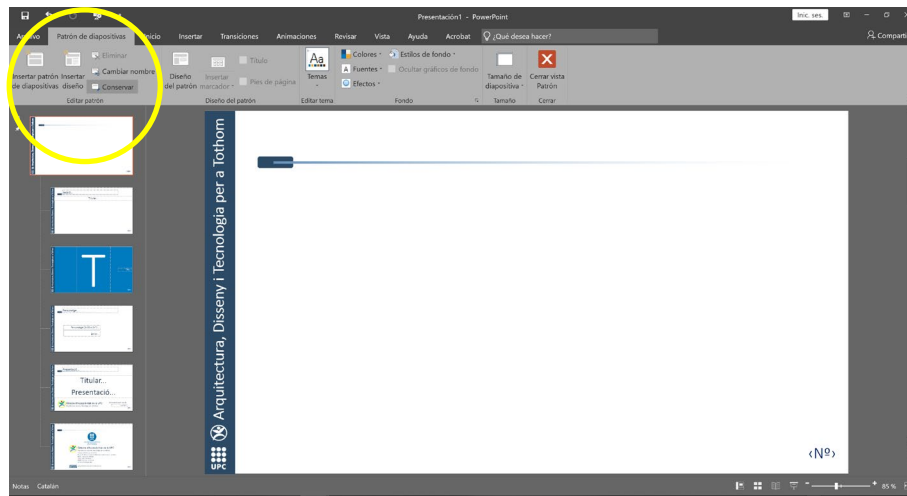


Menu Review / Accessibility Checker Tool

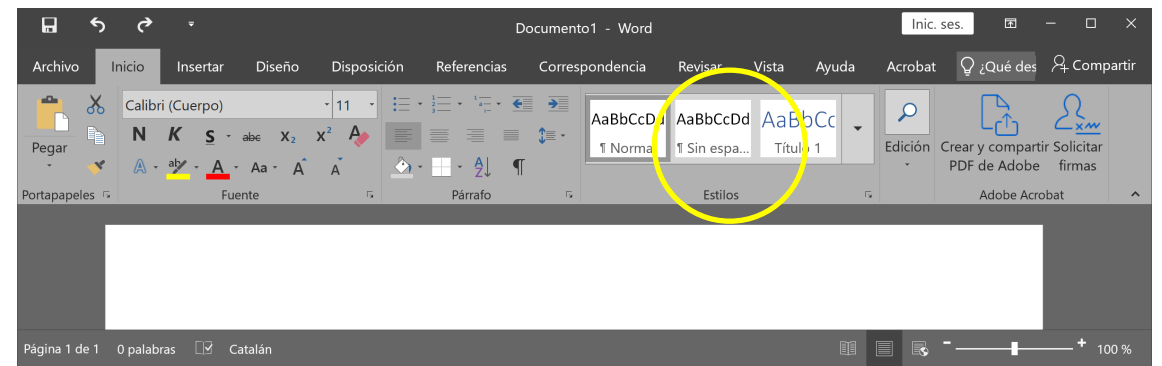
Styles

Use the style tools.

Styles are the basis of document processing.



 Slide Master Menu



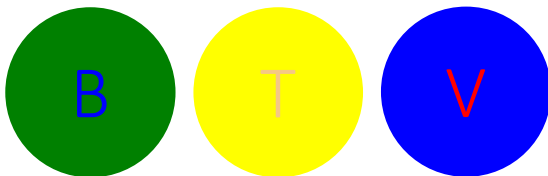
 Styles Menu

Colors

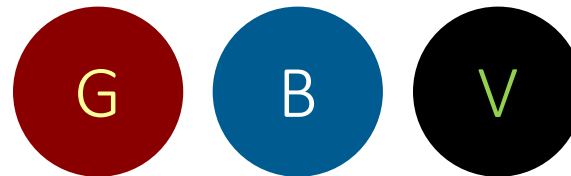
Ensure color contrast.

The text color relative to the background must have a contrast of 4.5: 1 (AA) or 7: 1 (AAA).
 The color of objects, or giant text, relative to the background must have a contrast of 3: 1 (AA).

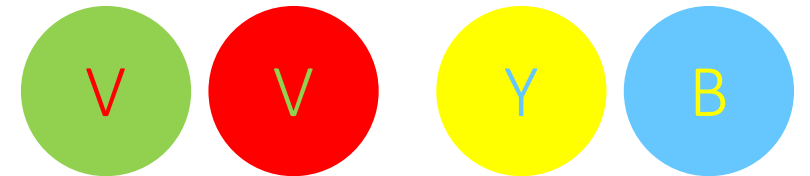
Poor contrast <3:1



High contrast >7:1



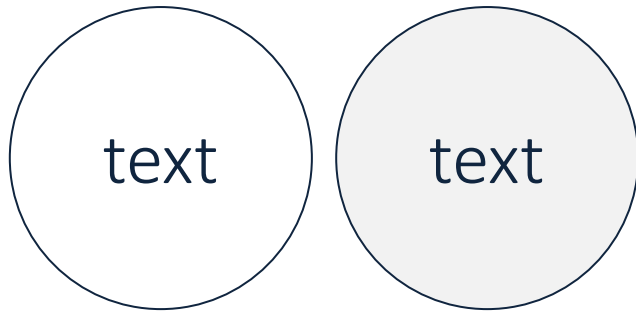
Avoid green-red and blue-yellow



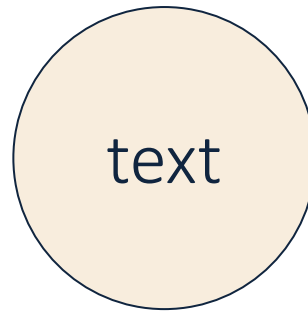
Contrast ratio value range [1.21].

Document background color

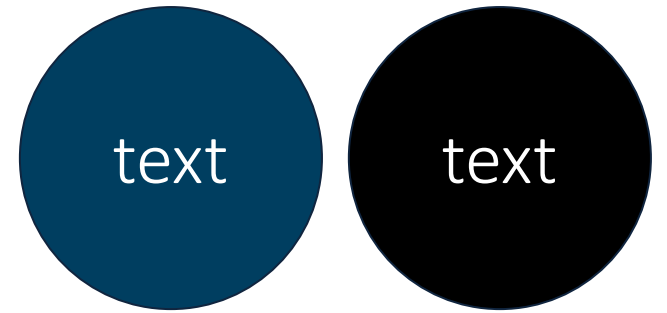
The color of the document background will be assessed based on the light conditions where accessed.



Clear mode (day)



Custom mode



Dark mode (night)



Apply to the document template.



Apply it throughout the same document.

Fonts

Documents

- Style without watermarks: Calibre, Helvetica, Arial, Verdana, ...
- Size between 11-14.
- Avoid italic and bold.
- Do not use more than two types of fonts.
- High contrast between letter and background.

Projections

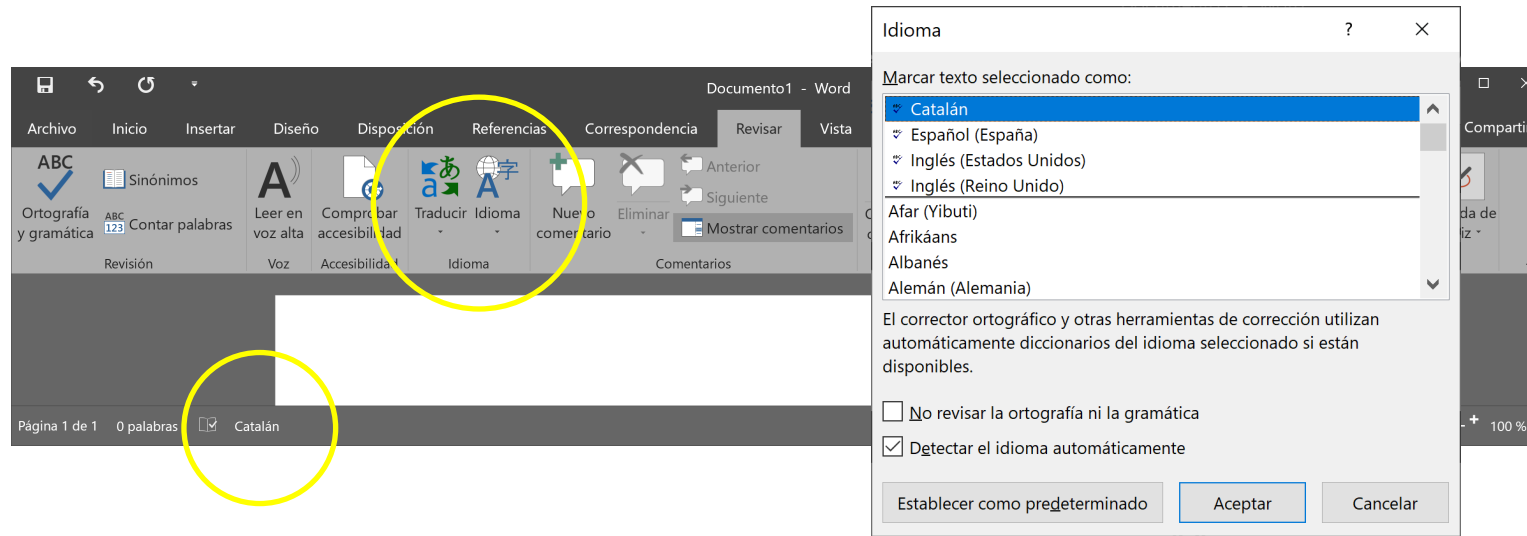
Distance (m)	Font size (cm)	
	Minimum	Recommended
5 m	7,0 cm	14 cm
4 m	5,6 cm	11 cm
3 m	4,2 cm	8,4 cm
2 m	2,8 cm	5,6 cm
1 m	1,4 cm	2,8 cm
50 cm	0,7 cm	1,4 cm



Language

Use the Language Tool.

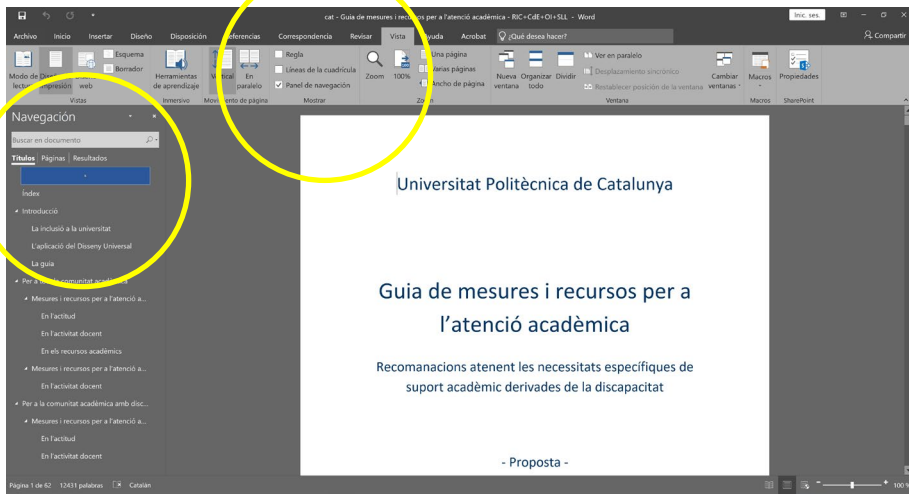
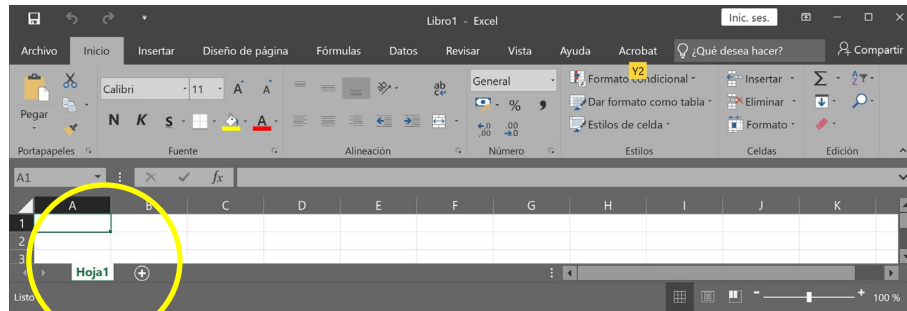
All texts must have their language correctly defined.
 Screen readers use it to select voices.



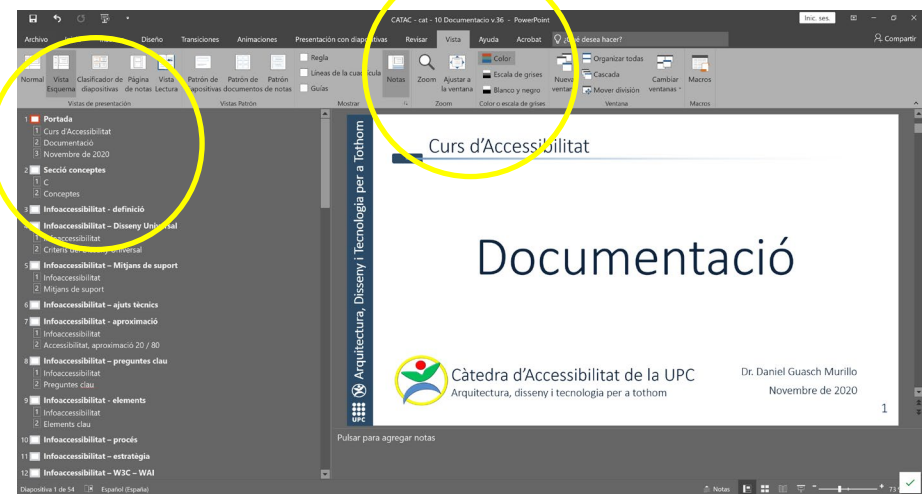
Titles

Creates a hierarchical content structure.

Sheets Tool



View Menu / Navigation Panel Tool



View Menu / Outline View Tool

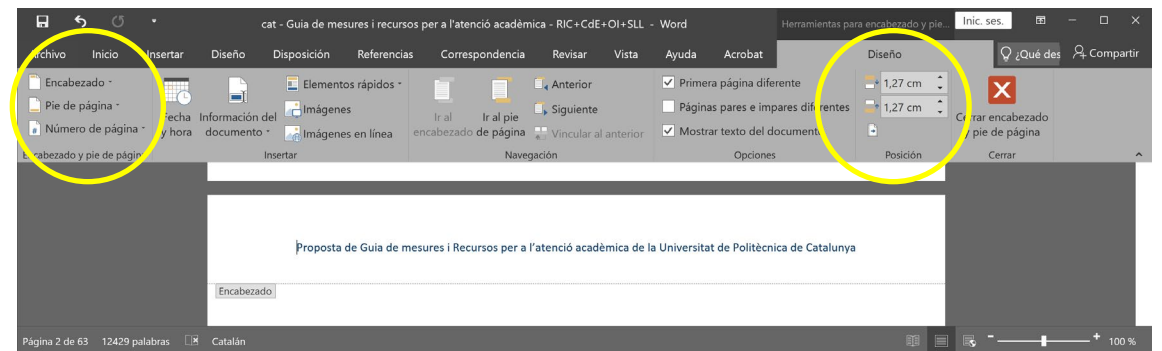
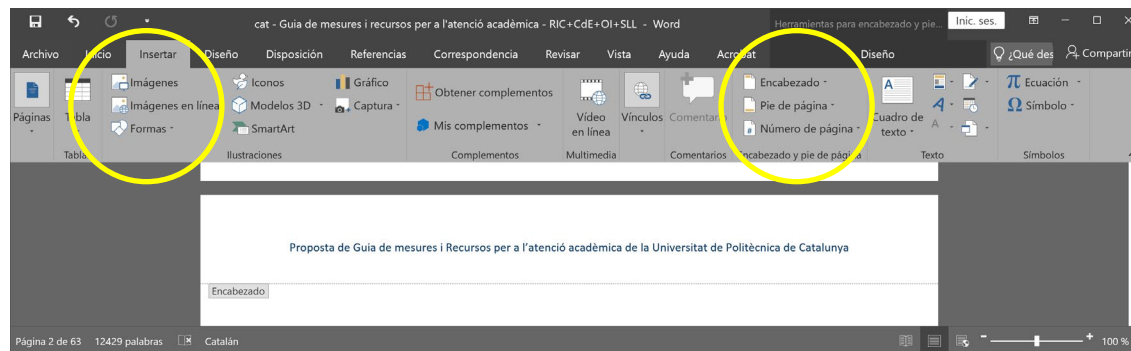
Headers and Footers

Use the Headers and Footers tools.

Use the same font as in the rest of the document.

In page numbers use the same font size as in the rest of the document.

Separate text from headers and footers from page numbers.

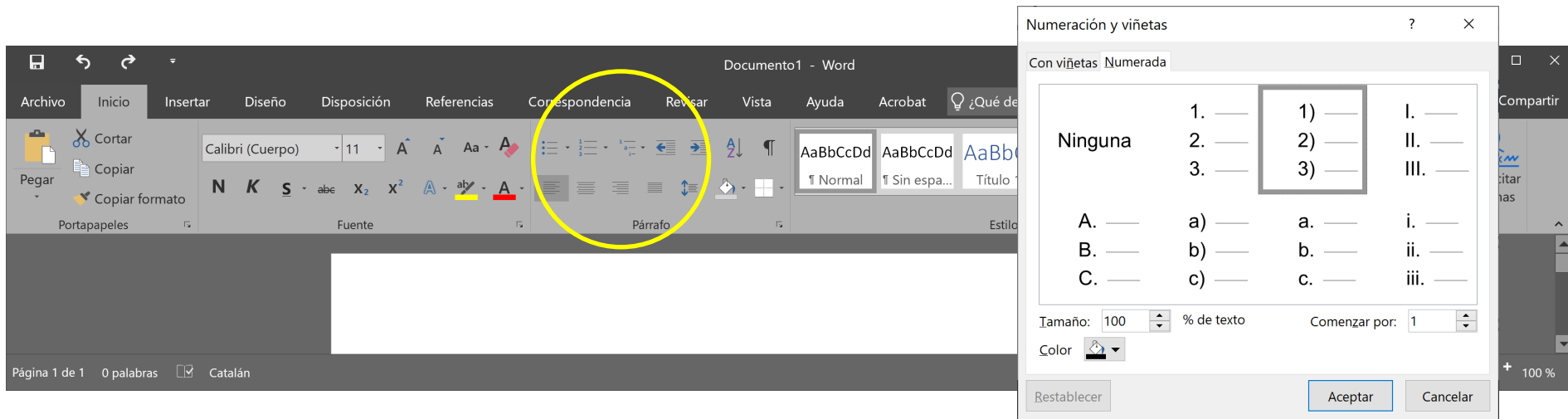


 Insert menu or Layout / Tools Header or Footer

Lists

Use the tools to create lists or enumerations.

Avoid creating lists by inserting unnecessary spaces and line breaks.
As well as avoid manual numbering



Tables of contents

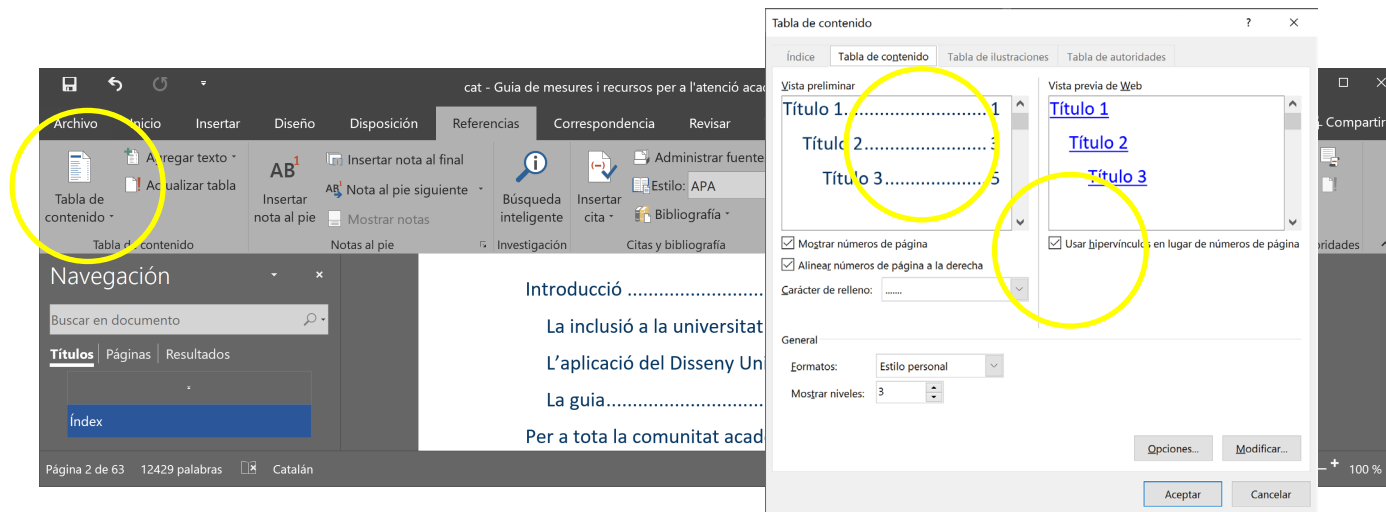
Use the Table of Contents Tool

It should not exceed three levels.

The character between the text and the page number must be the point.

Do not leave without characters.

Enable hyperlink mode for the content index.

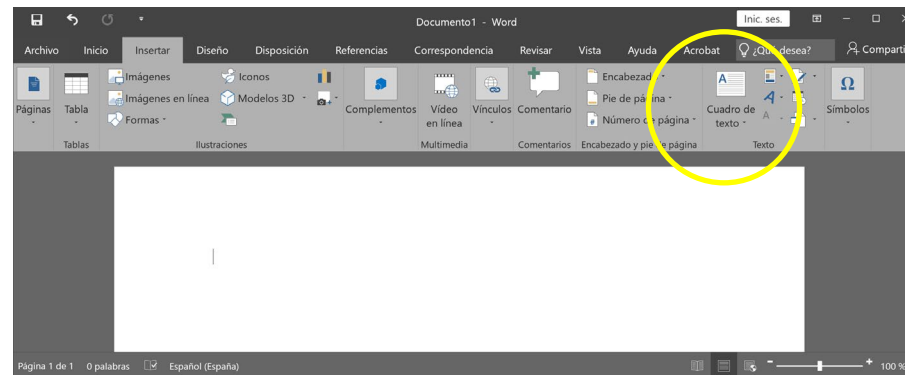


Text boxes

In Word avoid using text boxes.

These are treated as images and their content is not read by the supporting products.

If text boxes are used, alternative text must be added.

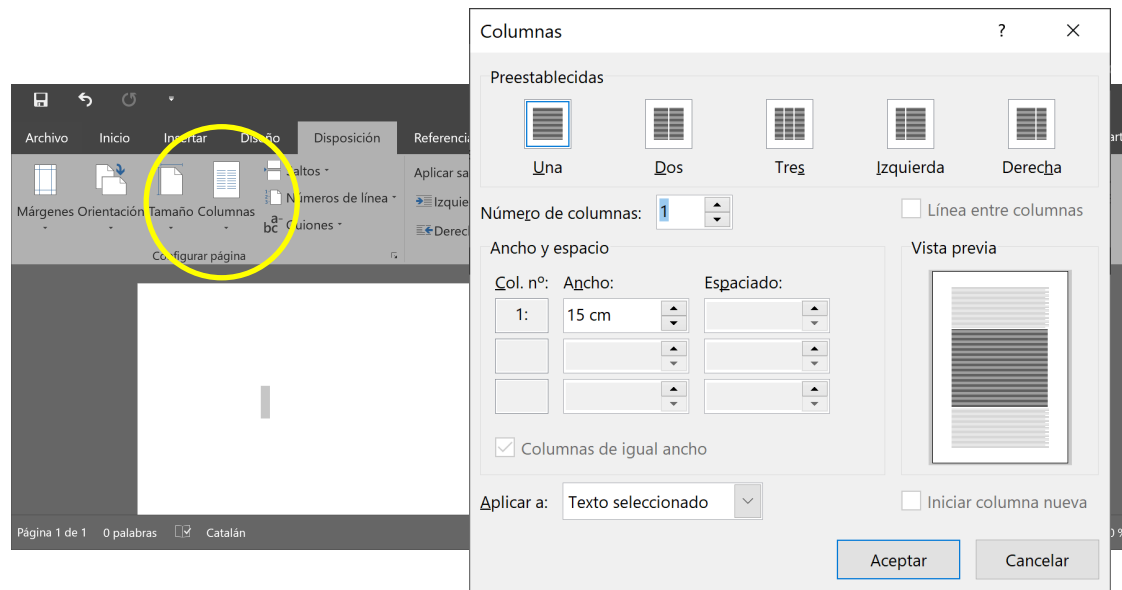


Insert Menu / Text Box Tool

Columns

Use the Columns Tool.

Avoid simulating columns with text boxes, spaces, or tabs.

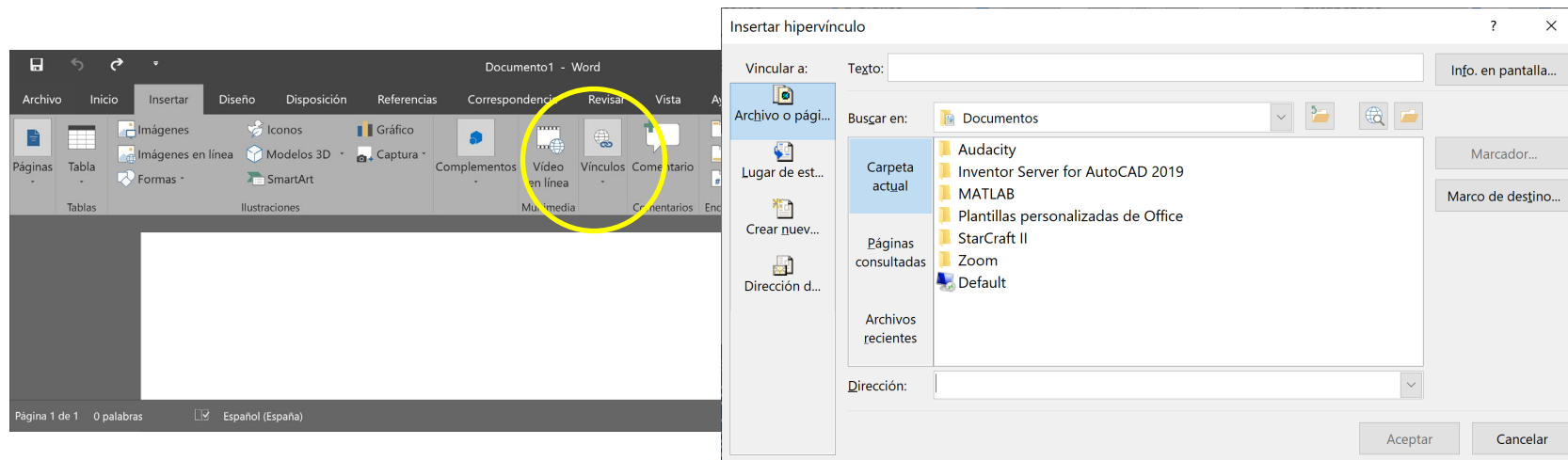


 Layout Menu / Columns Tool

Links

Use the Insert Hyperlink Tool.

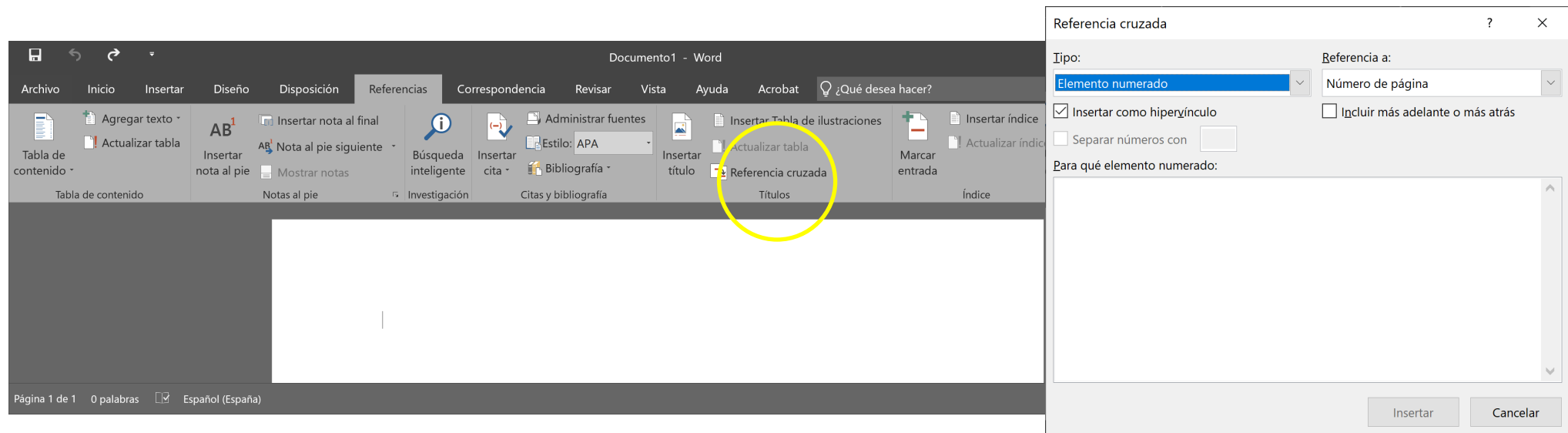
The hyperlink should give a clear description of the destination (avoid putting only the URL or phrase "click the link").




Insert Menu / Links Tool

Cross-references

Use the Tool Cross-references



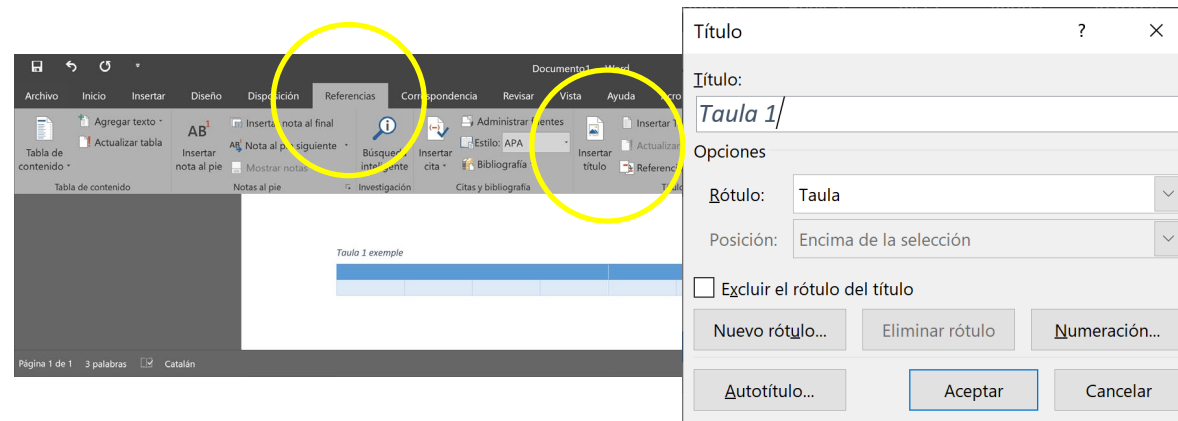
 References Menu / Tool Cross-references

Object captions

Use the Insert Title Tool.

Add captions to embedded objects with corresponding serial numbering.

It is recommended that the heading be before (top) of the embedded object.

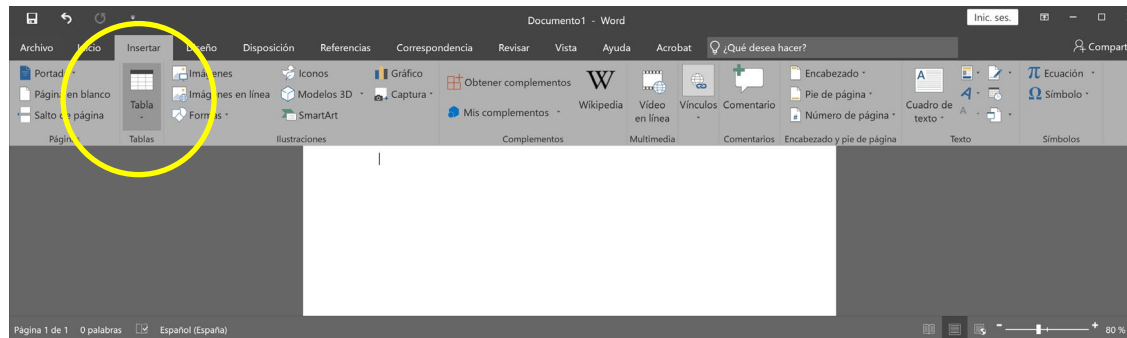


Tables - concept

Use the Insert Table Tool.

Recommended use to display data, not for document layout. Avoid simulating tables with space and tab character repetition.

Avoid attaching multiple tables in one.



Insert Menu / Table Tool

Tables - cells, rows and columns

Avoid empty rows or columns by aesthetics.

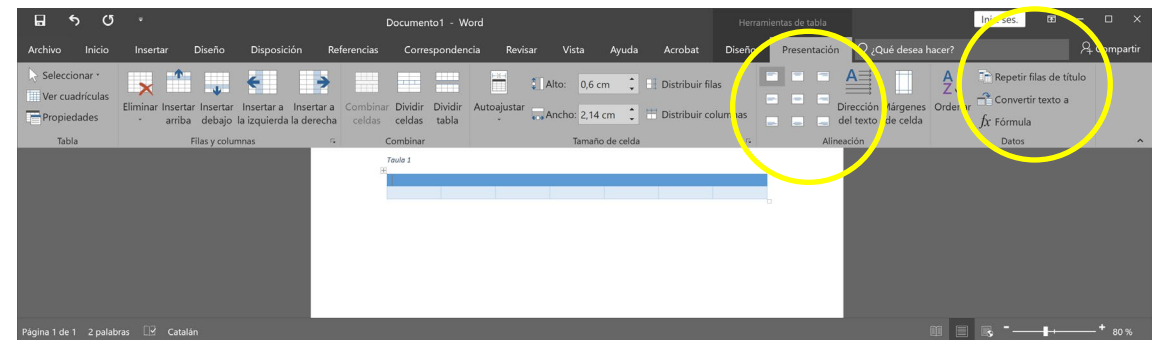
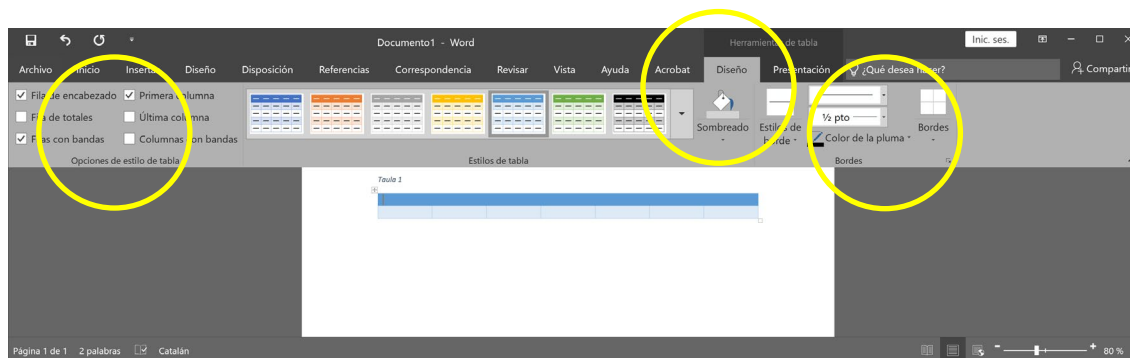
Prevent table rows from breaking between pages.

Do not combine or split cells.

Mark columns, and rows as a title if any.

Repeat the row of table titles on the different pages in case it occupies more than one.

Alignment of the text at the top of each cell (facilitates the understanding of the table to Braille Line users).



Design Menu / ...



Presentation Menu / ...

Tables - style

Table style with high contrast background text, alternating colors, and delimited cells so that reading the contents of each cell is not confusing.

Keep the table style throughout the document.

Include caption above the serially numbered table.

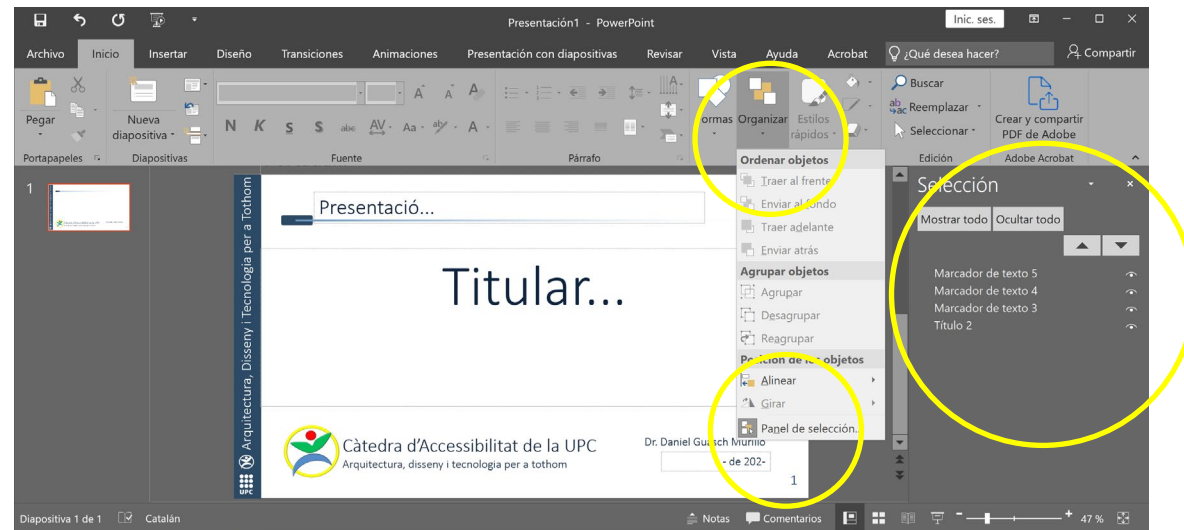
Incorporate descriptive alternative text.

Writing the document should provide information on how the contents of the table are structured.

It is advisable to provide description or explanation of the table after it.

Reading order

Set the order in which the screen reader will access the different elements.

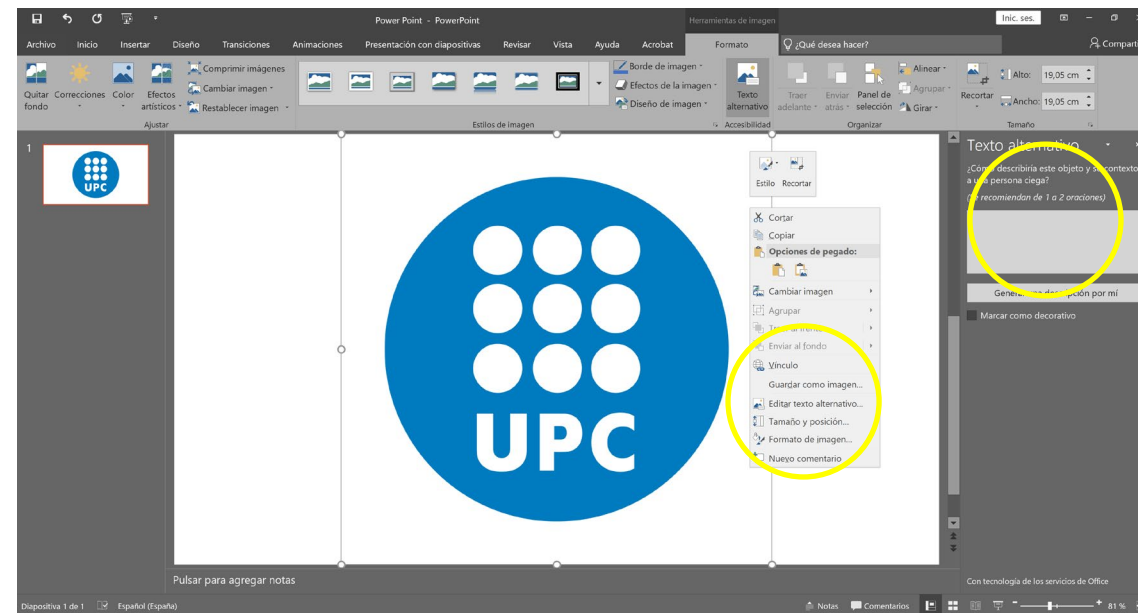


 Start Menu / Arrange Option / Selection Panel Tool

Alternative text

Use the Add Alternate Text Tool.

Add descriptive text to embedded objects such as images, graphs, shapes...
If you do not provide information, check the option to display as decorative.

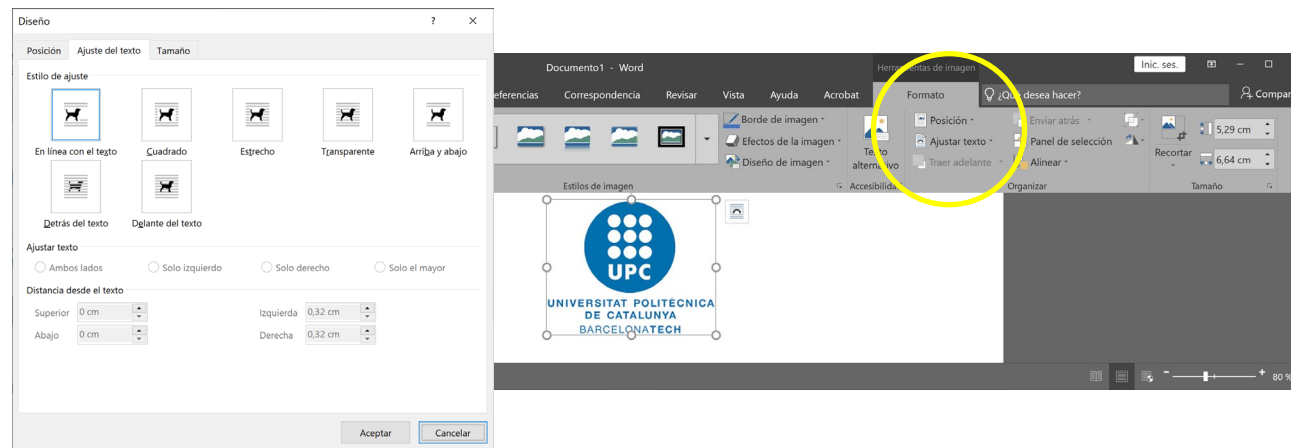


Right mouse button / Edit alternate text tool

Adjusting images to text

Use the Adjust Text Tool.

Align images with text.

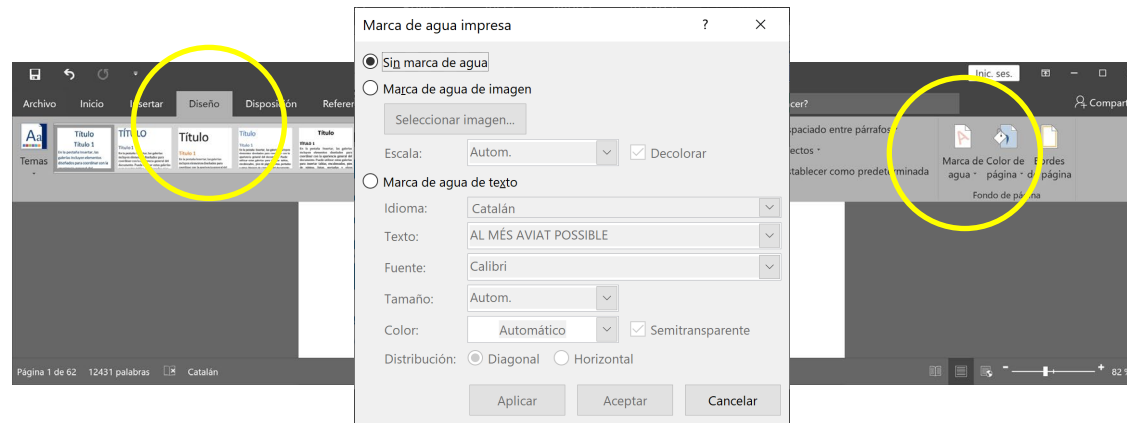


 Format Menu / Adjust Text Tool

Watermarks

Avoid watermarks.

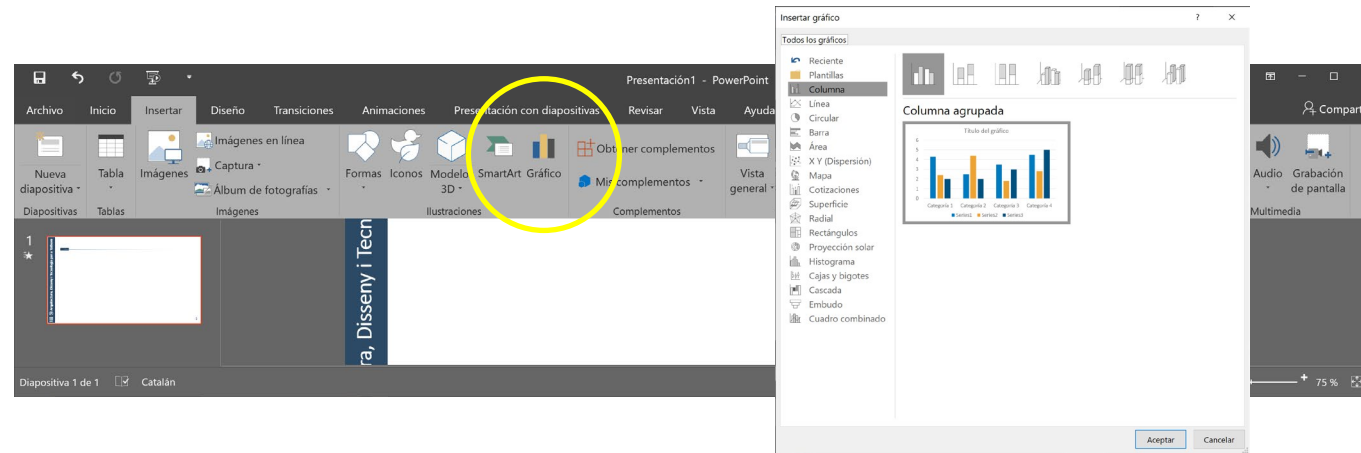
Avoid using watermarks on sheets, images or graphics.



Graphs - concept

Use the Graphic Tool.

The graphs should be simple, providing only the relevant information. They must be accompanied by tables and explanation within the address of the document.



Graphics - style

High contrast and image clipping (bars, circles, lines...).

Alternative colors : dark – light.

Avoid the combination: red-green and red-blue.

Using the combination of brands such as stripes, dots... to differentiate blocks of cheeses or bars.

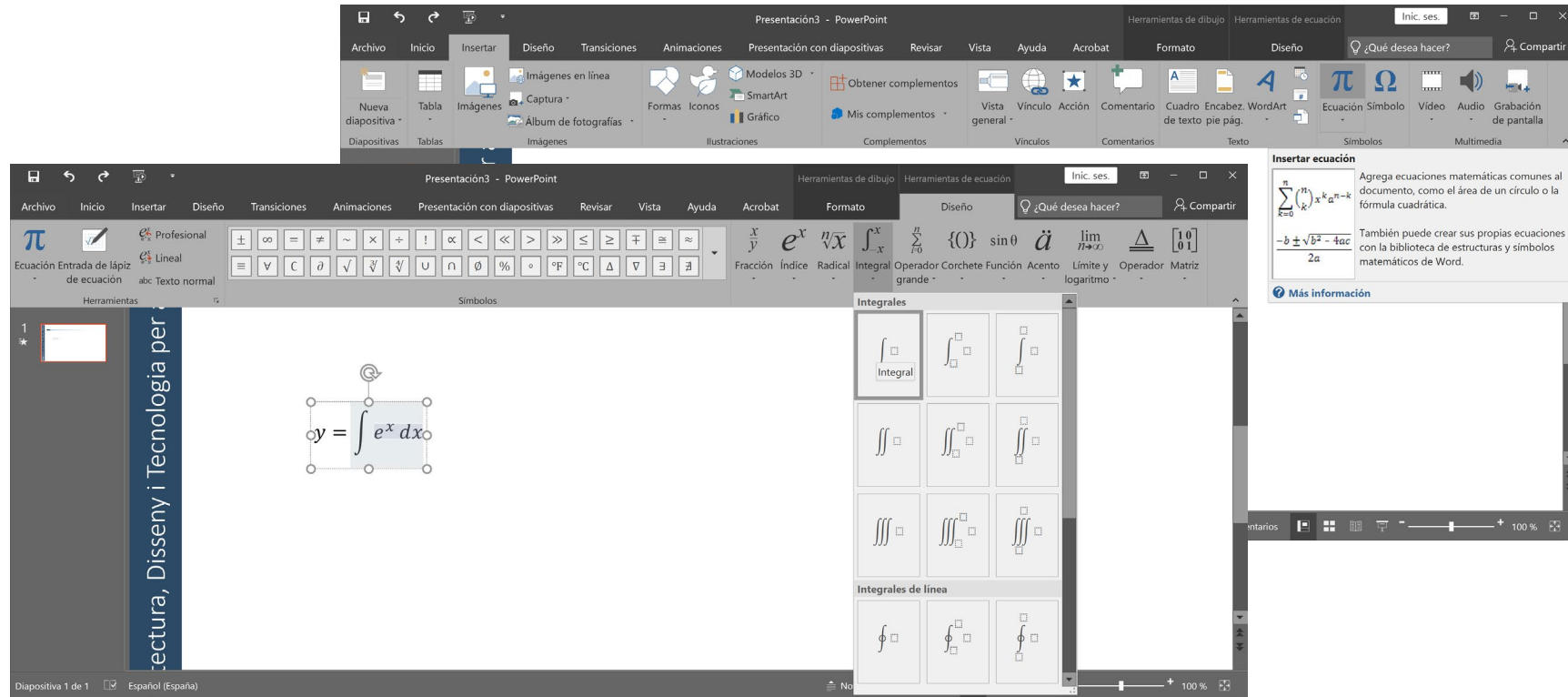
Avoid the use of semantic color. Provide redundant information for information presented in colors.

Incorporate descriptive alternative text.

Make use of subtitles and add quantitative data along with images (bars, circles, lines...).

Equations

Use equations tool



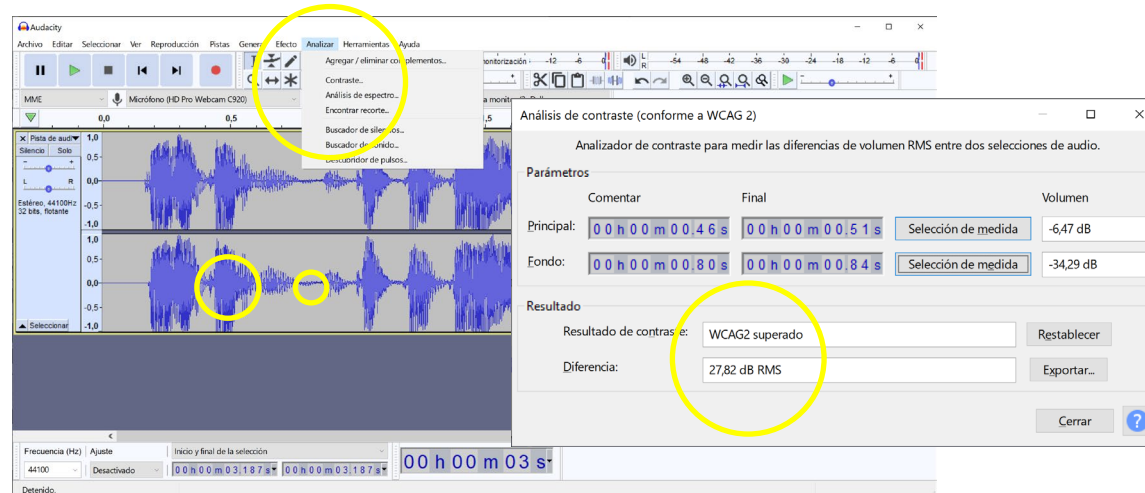
Insert Menu / Equation Tool

Audio

Offer quality and alternative representation.

The main sound should be at least 20 decibels greater than the background sound (contrast).

Provide a transcript of the content.



Analyze Menu / Contrast Tool

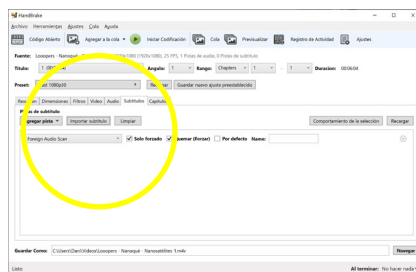
Video


Deliver alternative and increasing quality and representation.

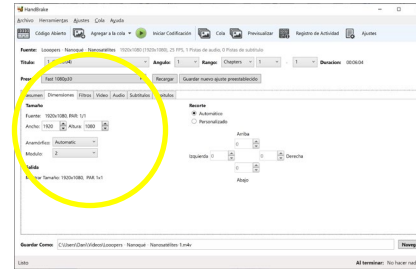
Minimum quality, with a resolution of 352x288 pixels, a frequency of 20fps and a maximum time difference between sound and video of 100ms.

Subtitled, alternative representation with text of the content transcription.

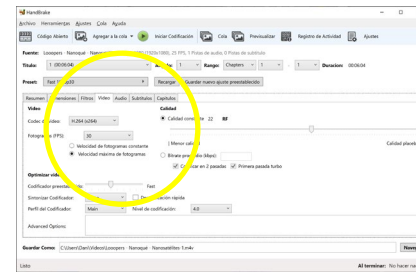
Audio description, augmentative rendering with content audio.



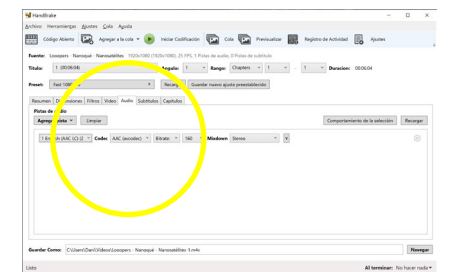
 Subtitles /
Import Tool



 Dimensions
menu



 Video
menu

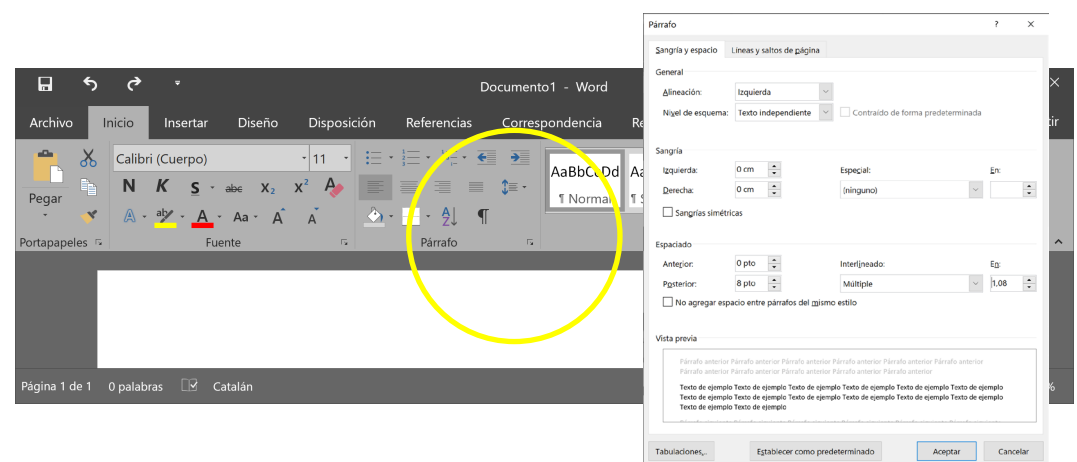
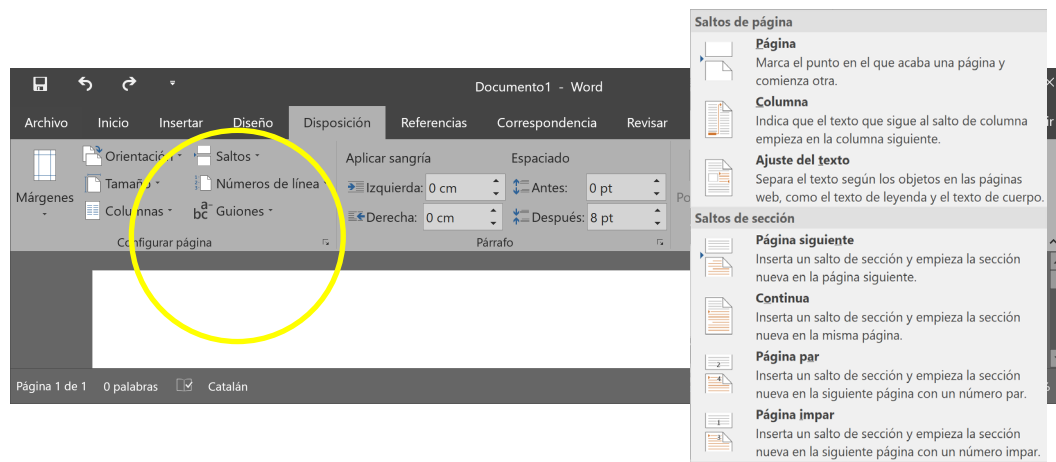


 Audio
menu

Non-printable content

Use break tools between sections, pages, and paragraphs.

Avoid unnecessary spaces and line breaks.

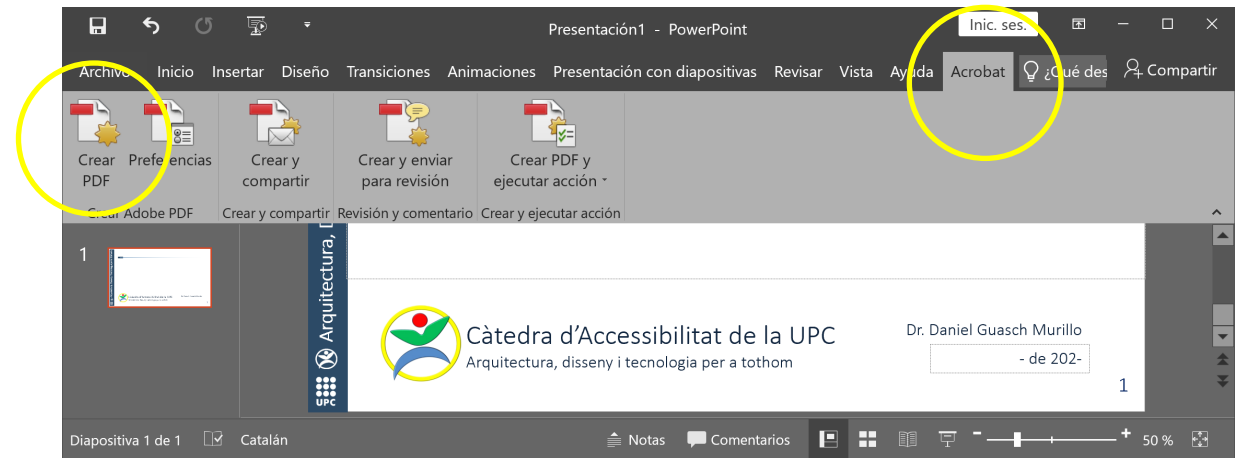
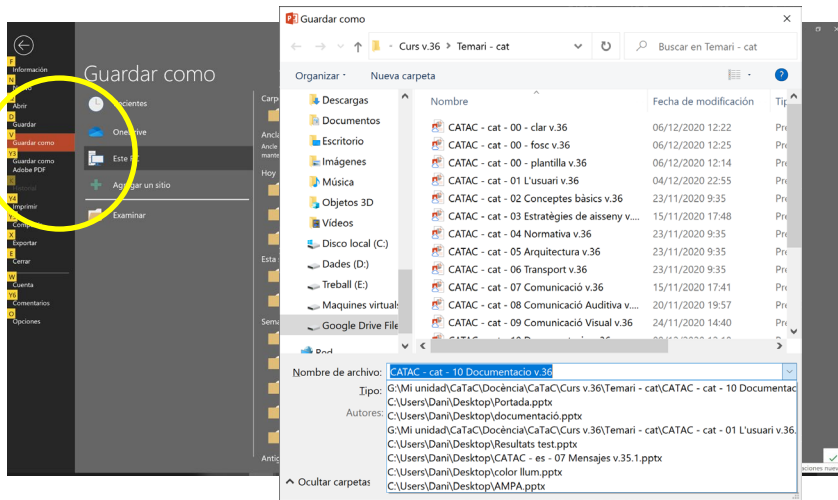


 Design Menu / Jump Tool

 Paragraph Menu / Paragraph Tool

Format changes

Importing or exporting a document does not guarantee that the accessibility of the new document will be maintained.



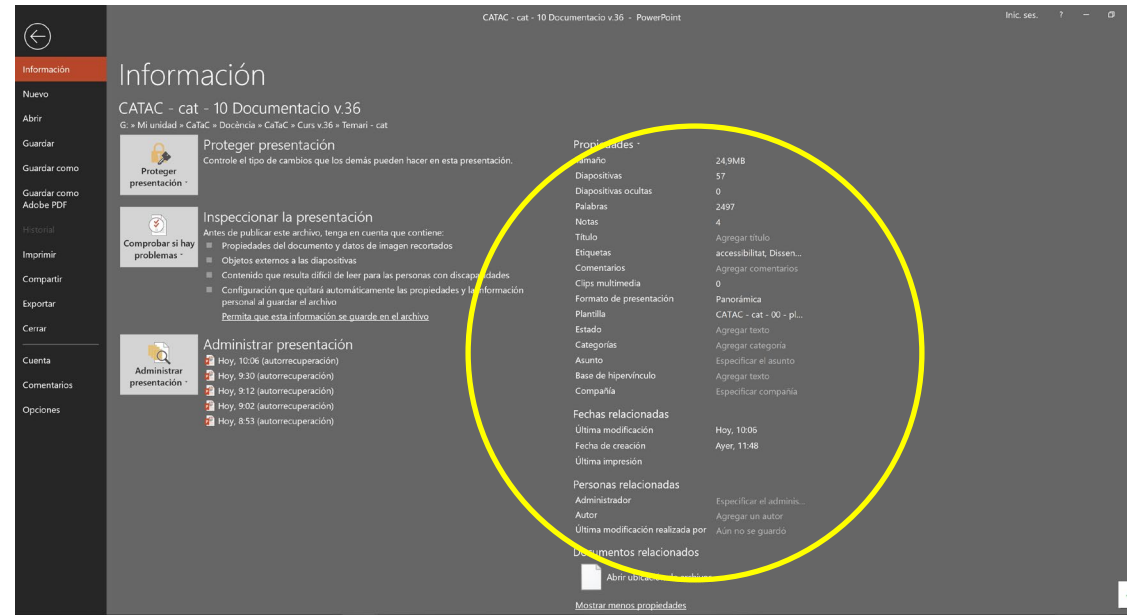
  File Menu /
 Save as Tool

  Adobe Menu /
 Create PDF Tool

Metadata

Incorporate document metadata.

Document metadata such as title, author, keywords, etc. make it easier to identify the document.



Cross-version compatibility

Check compatibility between version.

The image shows a screenshot of the Microsoft PowerPoint interface. On the left, the File menu is open, and the 'Información' (Information) option is highlighted with a yellow circle. Below it, the 'Comprobar si hay problemas' (Check for problems) option is also highlighted with a yellow circle. To the right, the 'Comprobador de compatibilidad de Microsoft PowerPoint' (Microsoft PowerPoint Compatibility Checker) dialog box is open. It displays a warning message and a table of compatibility issues.

Comprobador de compatibilidad de Microsoft PowerPoint

Las versiones anteriores de PowerPoint no admiten las siguientes características de esta presentación. Estas características se pueden perder o degradar si guarda la presentación en un formato de archivo anterior.

Resumen	Repeticiones
Con versiones anteriores de PowerPoint no se pueden editar formas agrupadas ni el texto que contienen dichas formas. (Diapositiva 5)	2 Ayuda
El texto de mensajes personalizados en diseños personalizados se quitará en versiones anteriores de PowerPoint.	15 Ayuda
Las diapositivas ya no se agruparán en secciones.	1 Ayuda
Esta presentación contiene gráficos vectoriales escalables (SVG) que se mostrarán como gráficos de red portátiles (PNG) en versiones anteriores de PowerPoint. (Diapositiva 18, 23, 24, 28, 29, 30, 31, 33, 34, 36, 40, 43, 44, 46, 49, 51, 52, 53)	23 Ayuda
El valor decorativo de este objeto se perderá. (Diapositiva 5, 6, 7, 23, 25)	8 Ayuda

Comprobar la compatibilidad al guardar en formatos de PowerPoint 97-2003.

[Aceptar](#)



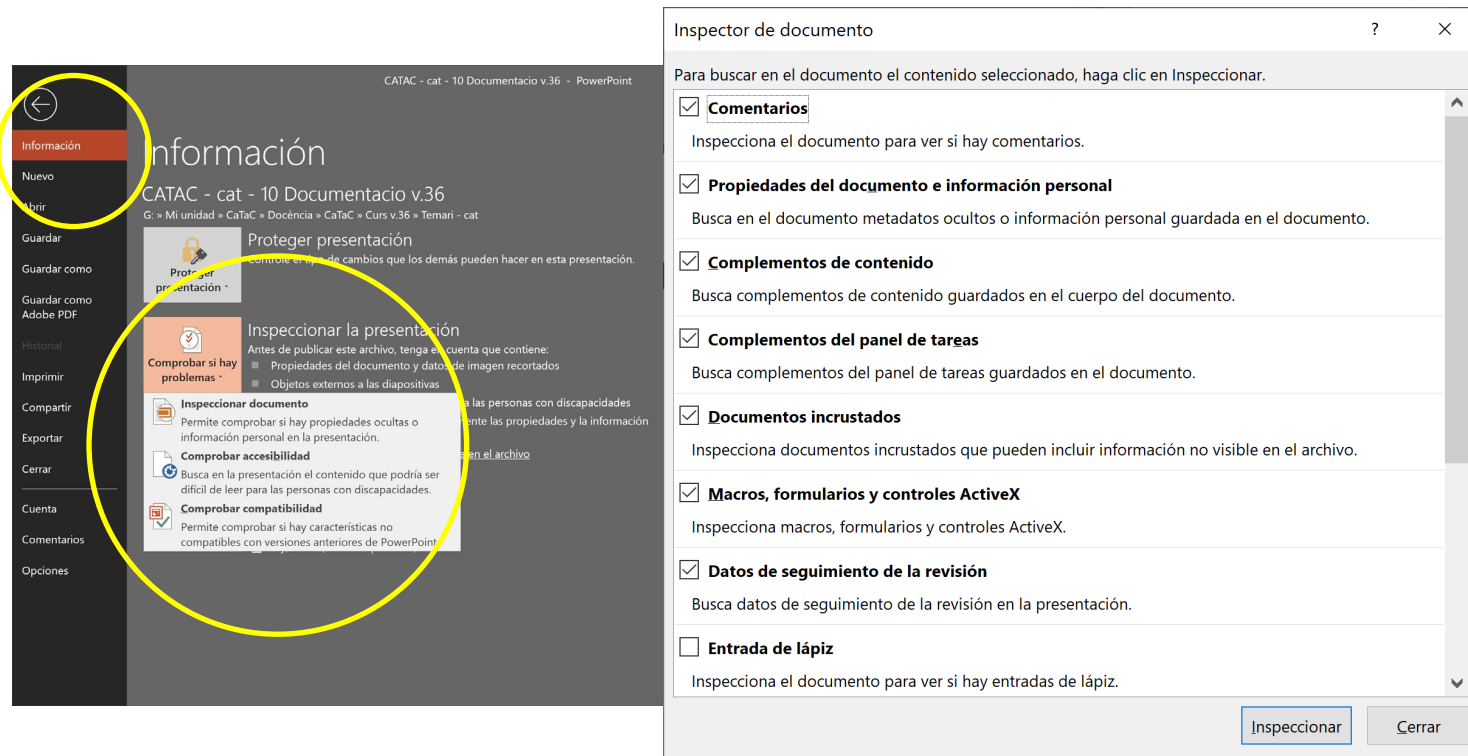
File Menu / Info Option /



Tool Check for problems

Formatting problems

Check if the document has formatting issues.




 File Menu / Info Option /
 Inspect Document Tool



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Architecture, design and technology for all

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