2020_TR_04 Lero Technical Report

EU Accessibility Directive: Creating On-Line Teaching Materials

Adapted following research undertaken by the Science Foundation Ireland funded COVIGILANT project

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on the accessibility of the websites and mobile applications of public sector bodies

[Extract from introduction]
This Directive aims to ensure that the websites and mobile applications of public sector bodies are made more accessible on the basis of common accessibility requirements. Requirements for the accessibility of websites and mobile applications Member States shall ensure that public sector bodies take the necessary measures to make their websites and mobile applications more accessible by making them perceivable, operable, understandable and robust. Reviews are conducted against a harmonised European standard, EN 301 549, which replicates the more commonly known Web Content Accessibility Guidelines.

This document consists of questions which could be used to evaluate our on-line teaching. They were developed by researchers in a 5-stage process within the COVIGILANT project:

1. Researcher 1 (IR) extracted relevant requirements from the European standard EN 301 549;
2. Checking these against the standard and specifics of the Web Content Accessibility Guidelines, Researcher 2 (DT) formulated these into 29 questions;
3. Researcher 1 consolidated these into 20 questions;
4. Researcher 3 (JB) reviewed the questions in discussion with Researcher 1, ensuring that they could be understood and measured.

5. Researchers 1, 2 and 4 (CS) detailed the questions further, focused on evaluation of the user interface (UI) and user interaction, and on on-line teaching.
6. The COVIGILANT team reviewed the questions.

Thus, we have a list of 35 questions which should be relevant to on-line teaching. This is not intended to be a complete or required list, but can be used as a starting point supporting academics when considering the accessibility of their teaching materials.

In our on-line teaching materials:

Usage Without/Or Limited Vision
Q1: Are alternative options available allowing interaction with the software for those that have no / limited vision?
Q2: Does the software offer audio and tactile user inputs/feedback?
Q3: Can audio be controlled?

Without Perception of Colour: Refers to Colour Blind people (Note 1)
Q4: Is a colour-blind friendly design available?
Q5: Are used colours appropriate for colour blind users? (Note 2)

Usage Without/Or Limited Hearing
Q6: Are alternative options to interact with the software that do not require/or with hearing available?

Usage Without Manipulation
Q7: Can a user fully operate the software without the use of voice?
Q8: Are alternative options to interact with the software that does not require vocalization available?

Usage With Limited Manipulation or Strength
Q9: Is voice control available?

Usage With Limited Cognition
Q10: Are there features which make the technology simple and easy to use by individuals with limited cognitive, language and learning abilities?

Navigational/interactive Elements (UI): Identify and assess the availability of descriptive labels of the buttons, images, etc. and indications of elements triggering changes (buttons, links, etc.)
Q11: Is labelling clear?
Q12: Are navigational components prominent enough?
Q13: Are there alternative approaches available for navigation? (Note 3)

Input fields
Q14: Are the input fields easy to identify and fill in?
Q15: Have you considered the size of the text font?
Q16: Have you considered the size of font in input fields?
Q17: Have you considered the size of graphics on touch screens?

Text: Assess text accessibility (Note 4)
Q18: Is magnification available?
Q19: Is contrast ratio at least 4:5:1?
Q20: Is contrast ratio at least 3:1 against its background?

Support for new users: A series of interactions and instructions used to get information on the software quickly. (Note 5)
Q21: Does the software offer any support for new users who are getting started?

Q22: If support for getting started is done through video, animations and audio, are there transcripts, captions and/or audio description available?

Physical Effort
Q23: Can a user complete a task without scrolling?
Q24: Are keyboard shortcuts options for replacing gestures available? (Note 6)
Q25: Does the pointer gesture have the specific requirements to function?

Cultural Universality: the extent to which the system can be used by all kinds of users regardless of their cultural background and beliefs
Q26: What languages are available?
Q27: What age group is the software designed for?
Q28: Are age restrictions used in the activation process of the software?

Other considerations
Q29: Is interactive assistance available?
Q30: Are elements easily identifiable/visible? Can I see the elements?
Q31: Are parts, elements or aspects of the interface not visibly available?
Q32: Can users configure technical aspects of the software?
Q33: Can users configure visual design aspects of the software?
Q34: Can users configure acoustic design aspects of the software?
Q35: Are effective constraints in place to prevent errors?

Note 1: Requirements
The use of patterns and textures to show the contrast in graphs and charts.
The use of colours and symbols to convey error messages.
The use of text labels for colour filters and swatches.
The use of underline for the links to differentiate between regular text.
The use of poor colour combinations (Note 2).
The design of primary buttons to make them stand out
The use of symbols to mark required form fields, i.e., an asterisk or use labels

Note 2: Poor colour combinations
Green & Red
Green & Brown
Blue & Purple
Green & Blue
Light Green & Yellow
Blue & Grey
Green & Grey
Green & Black

Note 3: Levels of interaction
Menus, buttons, etc. are part of the user interface and suggest different levels of interaction. Here we are thinking about people with particular challenges, such as cognitive, limited manipulation or muscle weakness. Different available options can support interaction in these cases.
Users need to be aware what elements are included in the user interface and how to interact with them. For example, the back buttons used in applications should have labels important for the TalkBack (Android) / VoiceOver (iOS) function (in the accessibility settings) when is activated. Students may have digital books with exercises or other digital interactive materials such as video and audio, to support their learning process. There should be various options to carry out functions such as: open a particular page, use the menu to select a lesson, exercises or answers (e.g. with buttons, arrows or checkboxes) or close the page. Each of these suggest that some form of interaction with the user interface is required. Whichever option is chosen, it must be tailored to the various needs of the user.

Note 4: These are normative WCAG 2.0 success criteria for design, and also include accessibility. See https://w3c.github.io/Mobile-A11y-TF-Note/ for further information.

Note 5: Various techniques to get users started can be used in the software; some of them suggest interaction with the user. https://material.io/design/communication/onboarding.html#usage

Note 6: Gestures
How the user interacts with the multi-touch technology: for example, Drag, Swipe, Tap, Click, Touch, Double Touch, Long Touch.

Information on presentation at SDDI (Software Developer Diversity and Inclusion) 2020 included in : https://medium.com/bits-and-behavior/trip-report-2020-software-developer-diversity-and-inclusion-workshop-5e2b5e8b3ae3 (accessed September 2020). The questions in this presentation were at Stage 4 of the Research process listed above.