



Living Labs and Open Toolkit for the co-design of
accessible IT systems and tools

PROJECT

Living Labs and Open Toolkit for the co-design of accessible IT systems and tools

AGREEMENT NUMBER

LC-01624438/101018048

Report: Summative evaluation of LIVE IT hackathons



**Co-funded by
the European Union**

Document Filename	Summative evaluation of LIVE IT hackathons
Nature Of Document	R
Number Of Pages	17
Work Package	All Work Packages
Partner Responsible	All partners
Author(s)	All partners
Contributor(s)	All partners
Reviewed by	Joe Cullen
Approved by	Panagiotis Bamidis, Project Coordinator

PROJECT FULL TITLE	Living Labs and Open Toolkit for the co-design of accessible IT systems and tools
Start Of Project	1 April 2021
Duration	12 months
Project URL	https://liveit-project.eu/
Disclaimer	The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Disclaimer Statement

The content of the publication herein is the sole responsibility of the publishers and does not necessarily represent the views expressed by the European Commission or its services. While the information contained in the document is believed to be accurate, the authors(s) or any other participant in the LIVE IT consortium make no warranty of any kind with regard to this material including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. Neither the LIVE IT Consortium nor any of its members, their officers, employees or agents shall be responsible or liable in negligence or otherwise howsoever in respect of any inaccuracy or omission herein, or direct, indirect, special, incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Statement of Originality

This Deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Copyright

© The LIVE IT Consortium, consisting of:

- Aristotelio Panepistimio Thessalonikis (AUTH), Greece
- Arcola Research LLP (ARC), United Kingdom
- National University Of Ireland Galway (NUIG)
- Universidade Catolica Portuguesa (UCP), Portugal



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License, 2017. For details, see <http://creativecommons.org/licenses/by-sa/4.0/>. The text, figures and tables in this report can be reused under the provisions of this License. Logos and other trademarks are not covered by this license. The content of the documents marked as restricted or confidential are not to be disclosed externally without prior written consent from the LIVE IT Consortium.

Acknowledgements

The LIVE IT team would like to thank all of our collaborating partners, especially those organisations working with us on the ground in developing the Co-Labs, and all of the LIVE IT ‘users’ – people with cognitive disabilities – for giving their time and insights to contribute to this research.

Table of Contents

LIST OF ACRONYMS	4
1 HACKATHONS' TAKEAWAY	5
1.1 1 ST HACKATHON: FACILITATING AUTHENTICATION AND ONLINE FORMS.....	5
1.2 2 ND HACKATHON: PROCESSING HEAVY TEXT-BASED AND CLUTTERED PAGES.....	6
1.3 3 RD HACKATHON: HANDLING COMPLEX INTERFACES, MULTISTAGE TASKS AND LIMITING INTERRUPTIONS.....	10
1.4 4 TH HACKATHON: UNDERSTANDING AND INTERPRETING NUMERICAL, TEXT AND GRAPHICS INFORMATION.....	13
1.5 5 TH HACKATHON: ACCESSIBLE SUPPORT AND INSTRUCTIONS.....	14
1.6 OVERALL HACKATHON TAKEAWAYS.....	16

LIST OF ACRONYMS

Acronym	Description
PwCD	People with Cognitive Disabilities
AUTH	Aristotle University of Thessaloniki
ARC	Arcola Research LLP
NUIG	National University of Ireland Galway
UCP	Catholic University of Portugal

1 HACKATHONS' TAKEAWAY

1.1 1ST HACKATHON: FACILITATING AUTHENTICATION AND ONLINE FORMS

No raw data was produced during the hackathon; no recordings or transcripts exist because hackathon teams worked on their own time and did not record their work sessions or, any existing data is already presented in co-lab data summaries. Teams that worked on their own time without a LIVE IT partner present did not record their work sessions or produce transcripts. Teams that worked with a LIVE IT partner did so within co-lab sessions, so any recordings or transcripts are part of the co-lab data summary.

The presentations of teams' contributions were given during the live closing session in December 2021. These presentations exist online in an accessible format on a website created by a UK participant. The website link to the 1st Hackathon presentations is: [Link](#)

Participating countries: Ireland, Greece, Portugal

Irish Team: secondary student with dyslexia and a teacher

The team explored three tools that were listed on the LIVE IT Open Toolkit for the purposes of the first hackathon: Avira, Android Scanner, and Access Angel. The team recommended that Access Angel be updated to allow for the reading of text on posters, signs, and other locations not on a screen. The Irish presentation can be found by following this link: [Link](#)

The request for a text-to-speech tool that could read hard copy meeting agendas handed out during meetings, signs encountered during day-to-day offline life, and non-screen-based text occurred frequently during the project.

Greek Team 1: AMEN, health care professionals from a non-profit society in the area of cognitive disability

The team proposed the creation of a multidisciplinary electronic support platform for individuals by health professionals.

Greek Team 2: PRO.ME.SIP, university students with knowledge of programming and cognitive disability

The team conducted an in-depth analysis of the accessibility, usability, and functionality of the LIVE IT Open Toolkit. They recommended multiple improvements for the LIVE IT Open Toolkit. Recommended improvements focused on the landing page, results list, how the Toolkit title appears on browser tabs, Toolkit icons, and UI/UX improvements.

Greek Team 3: EPSEP, a non-profit society for psychosocial research and intervention to improve the quality of life of people with psychosocial problems

The team conducted an analysis of the usability of the LIVE IT Open Toolkit. They recommended improvements for the results list.

Greek Team 4: EEEEEK, a school for students with cognitive disabilities

The team used the LIVE IT Open Toolkit with students with cognitive disabilities and their caregivers. The team recommended that voice navigation be added to the Open Toolkit. They also recommended producing an “easy to read” version of the Toolkit website.

All four Greek team presentations can be found at this link: [Link](#)

Portuguese Team: ADFP, a non-profit that works with students with cognitive disabilities

The team explored the use of translator and text-to-speech tools. Their first challenge was to issue a certificate for their COVID-19 vaccination and proceeded with provided ideas: request that a translation button should be present integrated in websites and not have to use external apps or buttons in menus. Even better, a translator that could start reading content aloud with the press of a physical button in keyboards.

Overall Themes from Hackathon 1:

- 1) The dual goals of exploring, improving and/or creating new tools AND piloting the Open Toolkit produced vastly different hackathon contributions. Some teams focused on exploring and improving existing tools. Some teams focused on the Toolkit itself.
- 2) Making text accessible is essential, which is not a new finding. However, it is still an issue.

1.2 2ND HACKATHON: PROCESSING HEAVY TEXT-BASED AND CLUTTERED PAGES

No raw data was produced during the hackathon; no recordings or transcripts exist because hackathon teams worked on their own time and did not record their work sessions or, any existing data is already presented in co-lab data summaries. Teams that worked on their own time without a LIVE IT partner present did not record their work sessions or produce transcripts. Teams that worked with a LIVE IT partner did so within co-lab sessions, so any recordings or transcripts are part of the co-lab data summary.

The presentations of teams' contributions were given during the live closing session in February 2022. The presentations can be found by following this link: [Link](#)

Participating countries: UK, Ireland, Greece, Portugal

UK Team 1: An adult in academia with cognitive disability that impacts reading

This one-person team explored a tool not listed on the LIVE IT Open Toolkit at the time of the hackathon: Adobe Liquid. The tool was subsequently added to the Open Toolkit. The presenter highlighted the issue that most PDFs used in education and academia are fixed layout and visually overwhelming. Text-to-speech tools often cannot help with full scholarly article files, for example. The presenter proposed an Adobe Liquid Chrome Extension. An Adobe Liquid Chrome Extension could help with PDF files not being made consistently and/or adequately accessible.

The problem of PDFs not being accessible in full was a major theme across all co-labs.

UK Team 2: 3 Bristol co-lab participants and 5 London co-lab participants, all with multiple cognitive disabilities

The team visited text-dense websites that they would typically visit in day-to-day life during co-lab sessions with LIVE IT co-lab facilitators. The team recommended several improvements to existing websites. First, they requested on-demand options for altering the appearance (removing hyperlinks, background colour, font, font colour, spacing) and accessing text (icons, sounds, pictures, live text-to-speech) that did not require additional programs/applications/extensions and additional processing on their part. Second, they requested virtual reality accessibility tools that mirror real life interactions and relied on culturally relevant audio and visual options rather than text.

Additionally, the team explored the tools on the LIVE IT Open Toolkit. Some of the tools were not open access or free, so they could not be used. The tools that could be accessed were helpful.

All UK team contributions can be found by following this link: [Link](#)

The need for quality audio and visual versions of information that is of the same quality as the text information is another major theme across all co-labs.

Irish Team: third level students with dyslexia or ADHD

The team explored the usability of the LIVE IT Open Toolkit and selected tools from the Toolkit to use while completing coursework during the week. They recommended some slight changes to the way the Open Toolkit operated, like having the results show up in a new tab so that everything did not disappear when navigating. They used Snap & Read and Helperbird. They recommended a new tool that combined the capabilities of Snap & Read and Helperbird. For example, one team member wanted the Open Dyslexic font option with the Helperbird tool and the support of the text-to-speech from Snap & Read. Additionally, one team member did not feel supported by either tool, because they need audio and visual (non-text) options for taking in information. The Irish team presentation can be found at this link: [Link](#)

Greek Team 1: AMEN, health care professionals in the area of cognitive disability

The team explored the usability of the LIVE IT Open Toolkit with caregivers and selected tools to use with people with cognitive disabilities and their caregivers. While exploring tools, they encountered a few challenges. First, the voices for the text-to-speech tools, especially the open access ones, were very robotic. Second, translation options were limited and many tools only function in English or a very limited number of languages. The Greek team presentation can be found at this link: [Link](#)

Robotic voice complaints were very common across all co-lab locations when using text-to-speech tools.

Translation and language challenges became a major theme for this project. This is an urgent matter.

Greek Team 2: PRO.ME.SIP, university students with knowledge of programming and cognitive disability

The team explored the LIVE IT Open Toolkit from a technical and design / layout / interface aspect and proposed a list of suggestions for improvement.

Portuguese Team 1: ADFP, a non-profit that works with students with cognitive disabilities

The team explored tools listed on the LIVE IT Open Toolkit with students with cognitive disabilities. They explored Total Ad Block and Helperbird. They also explored the usability of the Open Toolkit with students with cognitive disabilities. They requested improvements in two areas. First, they requested tools that work more seamlessly with their primary language, Portuguese. Second, they requested open access or free features for all because some of the features that would have been very helpful were behind a paywall. Additionally, they requested

an Open Toolkit browser extension that would make recommended tools available without having to visit another website.

Portuguese Team 2: CECD, a school for students with cognitive disabilities

The team explored tools listed on the LIVE IT Open Toolkit with students with cognitive disabilities. They explored Microsoft Narrator, Text Help: Read and Write, CBoard, Helperbird, Total Ad Block, Liquid Mode, and Minimal Consent. The most common challenge was that the tool did not work in Portuguese. If the tool was available in Portuguese, the second most common challenge was needing to download and install something prior to using the tool or encountering barriers to smooth and continuous text-to-speech operation. The Portuguese team contributions can be found by following this link: [Link](#)

Translation and language challenges became a major theme across all aspects of this project. This is an urgent matter.

Portuguese Team 3: Colegio Bolo de Neve, secondary students with cognitive disabilities

The team experimented with the LIVE IT Open Toolkit and also the feature of voting for enlisted tools. They struggled understanding the voting system and the rating scale from 1 to 5, therefore they suggested the use of an emoticon rating system.

Portuguese Team 4: Colegio Bolo de Neve, secondary students with cognitive disabilities

The team explored the LIVE IT Open Toolkit and the ease of use. They focused on providing a Portuguese version for people that do not speak English, and also providing some guides on what the next step in each action of the user of the Open Toolkit process should be.

Overall Themes from Hackathon 2:

- 1) Language and translation challenges are extremely relevant for the European context and are largely unaddressed by open access and free tools. Essentially, most tools only function in one language (English) or a very limited number of languages.
- 2) There is a pressing need for quality text alternatives that communicate the same ideas as the text-based materials that currently dominate society.
- 3) PDFs still present many accessibility challenges.

1.3 3RD HACKATHON: HANDLING COMPLEX INTERFACES, MULTISTAGE TASKS AND LIMITING INTERRUPTIONS

No raw data was produced during the hackathon; no recordings or transcripts exist because hackathon teams worked on their own time and did not record their work sessions or, any existing data is already presented in co-lab data summaries. Teams that worked on their own time without a LIVE IT partner present did not record their work sessions or produce transcripts. Teams that worked with a LIVE IT partner did so within co-lab sessions, so any recordings or transcripts are part of the co-lab data summary.

The presentations of teams' contributions were given during the live closing session in February 2022. The presentations can be found by following this link: [Link](#)

Participating countries: Participating countries: UK, Ireland, Greece, Portugal

UK Team 1: Bristol co-lab participant with multiple cognitive disabilities

One of the participants in the Bristol co-design lab submitted a presentation (1 slide) for this hackathon. The participant used the LIVE IT Open Toolkit and selected tools from the Toolkit to use during the co-lab scenarios. User feedback about the Open Toolkit included two main points. First, more filtering options are needed for the Open Toolkit website, especially to filter out tools that are not open access or free to use. Second, the Open Toolkit needs more supports for accessing the text on the website via built in options for changing font and font size and images to go with the text. User feedback about the tools was that none of the tools did what the participant really wanted, which was seamless customisation of all websites without having to access multiple tools.

UK Team 2: London co-lab participants, supported by Neurodiversity Learning

This team explored the LIVE IT Open Toolkit and also used some of the tools listed in the Toolkit with people with cognitive disabilities. The team presented recommendations for the Open Toolkit to increase accessibility of the Toolkit. The team also presented reviews of two tools from the Toolkit: Speechify and Helperbird. For the Open Toolkit, the team recommended revising the text so that it was less jargon-y and academic sounding. Additionally, the team recommended non-text additions to the Toolkit website such as YouTube videos to go with all text descriptions and icons to help with navigation. For the two tools, Speechify and Helperbird, the participants liked that Speechify allowed for physical books to be scanned and that Helperbird had many easy-to-use tools for accessing text on the screen.

Both of the UK team presentations can be found within a single slide deck which is posted on this webpage: [Link](#)

Irish Team: stakeholders who work with students with cognitive disabilities at the school and national levels

This team explored the LIVE IT Open Toolkit from the perspective of professionals who recommend resources for students with cognitive disabilities. The team provided feedback on the layout and the features of the LIVE IT Open Toolkit. Their feedback supported that of the people with cognitive disabilities on other teams. First, they recommended more interactive and multimodal content on the Toolkit website. Second, they recommended a variety of grouping mechanisms for the tools. Third, they recommended including video explanations of the tools. The Irish team presentation can be viewed by following this link: [Link](#)

Greek Team 1: EPSEP, a research group focused on supporting people with brain injury and dementia

This was the only team to explore the LIVE IT Makerspace, which is a component of the Open Toolkit. They recommended using the Makerspace as a place to share ideas about supporting people with dementia.

Greek Team 2: EEEK Aleksandrias, a school for students with cognitive disabilities

This team explored the LIVE IT Open Toolkit and also used some of the tools listed in the toolkit with students with cognitive disabilities. The tools used are: Google Chrome, Microsoft Edge, Text from to Speech, Microsoft Speech to Text, AutoCorrect Windows 10, Coloradd-color identification, Visual Keyboard, Access Angel, and Contrast Checker. With all tools, this group found that students required the support of special educators to use the tools. Additionally, they recommended improving speech to text tools to include a predictive feature or a feature to help students who did not articulate words the way the tool expected them to be articulated.

Greek Team 3: Promesip, university students with knowledge of programming and cognitive disability

This team once again provided feedback on the usability and accessibility of the LIVE IT Open Toolkit website. They also shared an accessibility tool they were developing. They created two separate presentations, which are listed on the Greek page for Hackathon 3 on the hackathon website (link copied below). The Open Toolkit feedback focused on two areas: the main sidebar on the website, and a web accessibility evaluation for the website. The tool presentation for

their tool, Speak It, which takes in audio from live spoken words or an audio file and uses the audio to return suggested accessibility tools based on keywords within the audio.

All Greek team presentations can be found by following this link: [Link](#)

Portuguese Team 1: ADFP, a non-profit that works with students with cognitive disabilities

The team explored the LIVE IT Open Toolkit with students with cognitive disabilities. The team found that the Toolkit was difficult for students to use because each page had too much information, it was difficult for them to see what each tool does, they were unsure of how to select the most suitable tool, there were very few open access tools, and language was an issue. They recommended using icons, visuals, and videos on the website.

Portuguese Team 2: CECD, a school for students with cognitive disabilities

The team explored the LIVE IT Open Toolkit with students with cognitive disabilities. The team also used Alexa/Google assistant with the students. Their presentation included recommendations for improving the Toolkit and feedback on Alexa/Google assistant. For the toolkit, they recommended increasing the font size and icon size and that the icons should be active links. Additionally, they recommended using less text to convey information. The team feedback on Alexa was mostly positive.

Portuguese Team 3: Colegio Bolo de Neve, secondary students with cognitive disabilities

The team explored the LIVE IT Open Toolkit and suggested provision of videos presenting challenges and recommended solutions.

The Portuguese team presentations can be found by following this link: [Link](#)

Overall Themes from Hackathon 3:

- 1) The dual goals of exploring, improving and/or creating new tools AND piloting the Open Toolkit produced vastly different hackathon contributions. Some teams focused on exploring and improving existing tools. Some teams focused on the Toolkit itself.
- 2) There is a need for high quality modes of communication on the web that do not rely on text. When text is absolutely necessary, it needs to be compatible with screen readers and other accessibility tools.
- 3) Language and translation challenges are extremely relevant for the European context and are largely unaddressed by open access and free tools. Essentially, most tools only function in one language (English) or a very limited number of languages.

1.4 4TH HACKATHON: UNDERSTANDING AND INTERPRETING NUMERICAL, TEXT AND GRAPHICS INFORMATION

No raw data was produced during the hackathon; no recordings or transcripts exist because hackathon teams worked on their own time and did not record their work sessions or, any existing data is already presented in co-lab data summaries. Teams that worked on their own time without a LIVE IT partner present did not record their work sessions or produce transcripts. Teams that worked with a LIVE IT partner did so within co-lab sessions, so any recordings or transcripts are part of the co-lab data summary.

The presentations of teams' contributions were given during the live closing session in March 2022. The presentations can be found by following this link: [Link](#)

Participating countries: Participating countries: UK, Ireland, Greece, Portugal

UK Team: London and Bristol co-lab participants with multiple cognitive disabilities

This presentation was a joint effort between participants in the London and the Bristol co-labs. The participants explored the LIVE IT Open Toolkit in their respective co-labs. Feedback about their "dream advisor tool" aligned with the Irish stakeholder feedback on the Open Toolkit from Hackathon 3. Users should answer a few questions that would then guide the website in producing a list of recommended tools. They also recommended including a virtual receptionist. They recommended a more real, immersive, and interactive experience, and this would rely on virtual reality. Their presentation can be viewed by following this link: [Link](#)

Irish Team: special education teachers who work with primary school students with cognitive disabilities

This team explored the LIVE IT Open Toolkit from the perspective of teachers who work with students with cognitive disabilities. They used the Open Toolkit at work for a week. The team provided feedback on the layout and the features of the LIVE IT Open Toolkit. They recommended that the Toolkit include a clearly denoted list of what tools and features are already on which devices by default. Other feedback about the Toolkit was the same as stakeholder feedback provided in Hackathon 2 and Hackathon 3 about layout, navigation, and features. The Irish team presentation can be viewed by following this link: [Link](#)

Greek Team: EPIONI, a group that works with students with cognitive disabilities (ADHD)

This team explored the LIVE IT Open Toolkit and some tools listed on the toolkit with people with ADHD. The tools used were Google Translate and Google Calendar. Their presentation

included general recommendation for the design of tools for accessibility: clear options, easy symbols, colours that won't tire the eyes, icons and pictures, and videos. Their presentation also included feedback on the usability of the Toolkit. Their recommendations were similar to others in previous hackathons, such as providing a multimodal experience via the Toolkit website. They recommended including sounds in addition to icon, picture, and video information. The Greek presentation can be found by following this link: [Link](#)

Portuguese Team: ADFP, a non-profit that works with students with cognitive disabilities

The team explored the LIVE IT Open Toolkit and one of the tools listed in the Toolkit (Easy Reading) with students with cognitive disabilities. They created a presentation that includes recommendations for tools like Easy Reading and the Open Toolkit. First and foremost, the Easy Reading tool did not include Portuguese, and the tool was not able to function on Portuguese websites. Additionally, the students used the Open Toolkit and struggled with it, because the Toolkit is not available in Portuguese as of this hackathon. The Portuguese presentation can be found by following this link: [Link](#)

Overall Themes for Hackathon 4:

- 1) There is a need for high quality modes of communication on the web that do not rely on text. When text is absolutely necessary, it needs to be compatible with screen readers and other accessibility tools.
- 2) Language and translation challenges are extremely relevant for the European context and are largely unaddressed by open access and free tools. Essentially, most tools only function in one language (English) or a very limited number of languages.
- 3) Virtual reality should be employed and explore more for accessibility purposes.

1.5 5TH HACKATHON: ACCESSIBLE SUPPORT AND INSTRUCTIONS

No raw data was produced during the hackathon; no recordings or transcripts exist because hackathon teams worked on their own time and did not record their work sessions or, any existing data is already presented in co-lab data summaries. Teams that worked on their own time without a LIVE IT partner present did not record their work sessions or produce transcripts. Teams that worked with a LIVE IT partner did so within co-lab sessions, so any recordings or transcripts are part of the co-lab data summary.

The presentations of teams' contributions were given during the live closing session in March 2022. The presentations can be found by following this link: [Link](#)

Participating countries: Participating countries: UK, Ireland, Greece, Portugal

Participating organisation/Co-occurring conference: Design for All

UK Team: London and Bristol co-lab participants with multiple cognitive disabilities

This team addressed the hackathon theme in three ways. First, they continued to explore the LIVE IT Open Toolkit. Second, they held brainstorming sessions to sketch out what the ideal type of support and instructions could look like. Third, a team member, Julia, created the hackathon website linked throughout this report. Their presentation focused primarily on providing recommendations for online support and instructions. They recommend programming multiple routes for navigation to avoid puzzle-like scenarios for finding information. They also recommend signposting, progress bars, breadcrumbs, and embedded instructions and guidance. Their presentation can be viewed by following this link: [Link](#)

Irish Team: Third level students with Dyslexia, ADHD, or Autism

This team addressed the hackathon theme in two ways. First, they provided feedback on Weebly, a web authoring tool used as part of an existing assignment in their course, to meet the project goal of addressing web authoring. Second, they used tools from the LIVE IT Open Toolkit during the course of their day-to-day activities for a week and explored the options for online support and instructions. Their recommendations focused on text and video resources. Text resources need to be clearly structured without jargon and with FAQ's. Video resources that are of the same quality as assigned text materials are extremely useful but hard to find via free and open access tools. Their presentation can be viewed by following this link: [Link](#)

Greek Team 1: NIMIA, a group with knowledge of programming and cognitive disability

This team explored the LIVE IT Open Toolkit and provided recommendations for improving the Toolkit. They recommended the development of a mobile app. They recommended incorporating voice recognition and supports for those with cognitive disabilities associated with hearing issues.

Greek Team 2: AMEN, health care professionals in the area of cognitive disability

This team presented about the Interconnected Activity Scheme.

Both Greek presentations can be viewed by following this link: [Link](#)

Portuguese Team: Colegio Bolo de Neve, secondary students with cognitive disabilities

This team worked towards the hackathon goals via the exploration of two scenarios from the co-design lab: email login and reading articles. Students with cognitive disabilities and their teachers used the LIVE IT Open Toolkit to select tools such as password managers or read aloud tools. Students experienced challenges when searching for and selecting tools. Additionally, students experienced challenges when setting up or downloading/installing tools. To address these challenges, the students recommend creating an Accessibility Personal Assistant. The Accessibility Personal assistant should be virtual, on-demand, personalised, and able to learn from the user. This team's presentation can be viewed by following this link: [Link](#)

Design for All Team: four people with cognitive disabilities (18-26yr old), 1 web designer, 1 web developer

The team explored the LIVE IT Open Toolkit and made recommendations for improving the Toolkit. First, they noted the need for more fluid and instantaneous language support and translation. To help with this, they recommended DeepL. Second, they noted the need for multimodal content. They recommended including video and live support options. Third, they noted the need for a humanised chat bot. Fourth, they noted the need for a FAQ. Finally, they provided some additional feedback on the features of the advisor tool. Their presentation can be viewed by following this link: [Link](#)

Overall Themes from Hackathon 5:

- 1) There is a need for high quality modes of communication on the web that do not rely on text. When text is absolutely necessary, it needs to be compatible with screen readers and other accessibility tools.
- 2) Language and translation challenges are extremely relevant for the European context and are largely unaddressed by open access and free tools. Essentially, most tools only function in one language (English) or a very limited number of languages.
- 3) Virtual reality should be employed and explore more for accessibility purposes.
- 4) There is a need for instantaneous and personalised help and support.

1.6 OVERALL HACKATHON TAKEAWAYS

The following are a list of the major challenges that need to be addressed. They are listed in order of the number of times they were mentioned during the hackathons.

- 1) Language and translation challenges are extremely relevant for the European context and are largely unaddressed by open access and free tools. Essentially, most tools only function in one language (English) or a very limited number of languages.

- 2) There is a need for high quality modes of communication on the web that do not rely on text. When text is absolutely necessary, it needs to be compatible with screen readers and other accessibility tools.
- 3) PDFs still present many accessibility challenges. Is this a training issue for those producing PDFs? The hackathon data suggests yes.
- 4) There is a need for instantaneous and personalised help and support.
- 5) Virtual reality should be employed and explore more for accessibility purposes.

Accessibility by default is still not a reality, and it should be. The burden of accessibility should not rest on those who do not fit the neurotypical mold. Designers and developers, if working from a neurotypical point of view, need to design with people with cognitive disabilities.