

Digital Accessibility and Artificial Intelligence for an Inclusive Future

Professor Constantine Stephanidis
President of the Hellenic National Accessibility Authority

Advance note regarding the Presentation at Roundtable#1
convened under the theme
“International cooperation to promote technology innovations and transfer for an inclusive future”

17th Session of the Conference of States Parties to the Convention
on the Rights of Persons with Disabilities (CRPD)

The United Nations Headquarters in New York
12 June 2024

Central to the rights of persons with disabilities are the principles of individual autonomy, non-discrimination and accessibility for full and effective participation in society. While accessibility refers equally to the built environment, physical products, and real-world services, as well as to the digital realm, the focus of my brief presentation will be on digital accessibility issues.

Digital accessibility is a broad domain that has been extensively researched for several decades. It aims to ensure that digital tools and technologies are designed and developed so that everyone can use them, including persons with disabilities. Over the years, the field has yielded a wealth of guidelines, assistive technologies, frameworks and tools that support the design and development of accessible systems and applications. In such context, the Design for All approach entails an effort to build accessibility features into digital products and services by design and throughout their entire development life-cycle. Additionally, international organizations have taken an active role in promoting digital accessibility, while individual countries and supranational unions have introduced policy and legal initiatives to ensure it.

Referring briefly to my country, Greece is currently progressing from the “2020-2023 National Action Plan for persons with disabilities” to the “2024-2030 National Strategy” with Annual Action Plans to be reviewed and updated on a yearly basis. The Hellenic National Accessibility Authority (NAA), established in 2021 as the Advisory Body to the Prime Minister and the Presidency of the Government, is engaged with: shaping and promoting proposals for the formulation of public policies on universal accessibility; monitoring the implementation of policies regarding the rights of access of persons with disabilities to the physical and digital space; and contributing to the process of Digital Transformation, so that it works equally well for persons with disabilities.

Returning to the international scene, while the combined efforts of researchers and policymakers have contributed to significant progress over the years in promoting digital accessibility, it is nevertheless notable that in practice digital accessibility remains an elusive goal for the mainstream technologies of today, including the World Wide Web. This alarming realization also emphasizes the challenges ahead towards an inclusive future, as we need extensive efforts on two parallel fronts. On the one hand, it is crucial to make a breakthrough in ensuring that digital accessibility is, in practice, effectively and conclusively provided in all mainstream technologies used today. On the other hand, it is increasingly

becoming evident that for cutting-edge technologies, such as extended reality, intelligent environments and artificial intelligence, currently in their nascent stages, digital accessibility is a far more complex undertaking.

In the quest for digital accessibility, we need to first comprehend the underlying factors that impede adherence to established legislation, before we can devise and implement appropriate remedial measures. Existing research results highlight that the factors hindering the adoption of “accessibility-by-design” include resource constraints, lack of awareness, and inadequacy of existing tools. Software developers themselves have identified that they face major challenges due to the lack of appropriate education in university courses, rendering knowledge and skills acquisition of the topic a personal endeavor. Therefore, a major step forward will be to give digital accessibility in university curricula the prominence that it deserves.

Other reasons include the fact that digital accessibility is not easy to master, given the abundance of guidelines, their complexity, and the difficulties in appropriately evaluating and validating it. What is urgently needed is the development of new tools that can streamline the implementation and validation process, effectively summarizing guidelines, providing appropriate examples, and supporting the evaluation and documentation of results, in an iterative manner, allowing for continuous improvement and refinement. Key in this pursuit is the involvement in the evaluation process of both experts and end-users, thus ensuring that the assessment of digital accessibility adopts a human-centered focus and perspective.

This human-centered focus is also necessary for promoting an inclusive future for technology innovations. Artificial Intelligence (AI) is currently a widely debated domain, particularly concerning its implications with regard to fairness, trustworthiness, and inclusiveness. This encompasses a wider range of issues that promote equal rights for all individuals globally, regardless of their origin, culture, socio-economic status, or technological expertise, and give them equal access to and opportunities to benefit from the utilization of AI. So, it should be emphasized that this discussion is not only applicable to persons with disabilities, as the issue of “inclusiveness” of AI technologies is of equal concern for other vulnerable groups, as well as the general population.

A major issue regarding persons with disabilities refers to the fairness of AI and to the need for not only avoiding discrimination against them, but more importantly, proactively taking steps to ensure that AI systems are usable and useful to them. This demands that AI developers consider a broad variety of factors, including the data used to train AI models, the algorithms used to process that data, but also human biases that may be inadvertently embedded into the AI algorithms. Therefore, the development of AI systems necessitates an inherently multidisciplinary approach, calling for collaboration among experts from diverse fields, in order to foster inclusivity, fairness and ethical conduct.

Another dimension refers to the accessibility of interactions with AI-empowered systems. This encompasses aspects such as user interfaces, input methods, output formats, and overall usability. Considering the plethora of AI systems that are already available today to the wider public, this can include anything from voice-activated assistants, chatbots, recommendation systems, autonomous vehicles, robots, but also AI systems available through mobile apps and desktop applications. Digital accessibility of AI systems requires that they are accessible to all users in terms of interaction, content, and information presentation, an ambitious goal that can only be achieved by adhering to the principle of Design for All,

advocating the need for proactively employing all the necessary tools and procedures to address the needs of all potential users. By doing so, it may then be argued that AI systems can also be trusted by 'all'.

In striving for AI inclusiveness, it is crucial that AI systems are understandable by users. This requires that they do not behave as opaque black boxes; instead, they should provide clear explanations of their decision-making. AI explainability constitutes a relatively new and very active field of research, facing real challenges in accommodating users with disabilities. This highlights the importance of explanations that are accessible themselves, ensuring that they can be perceived, understood, and ideally interacted with, by 'all' individuals. Besides offering explanations in various modalities to accommodate diverse users, a significant challenge lies in explaining the complex decision-making of the system in a simple and effective way to 'all' users, irrespective of any limitations or level of technological expertise.

At the same time, it should be emphasized that it is not enough for systems and services to be digitally accessible, usable, understandable and human-centric, if their actual use by persons with disabilities is inhibited for financial reasons. This means that any such systems should also be affordable. The formulation of policies supporting the widespread adoption of accessible digital systems and services is therefore of paramount importance.

Returning to the existing gap between policy and practice, digital accessibility, despite being a rather well-researched domain, in practice often falls short of expectations. If we wish to aspire for a truly inclusive future, we need to create an inclusive present, fostered by leveraging the knowledge and results germinated over the past decades, based on human-centered design and collaboration.

Looking ahead to a digitally accessible future, it is important that we insist on the priority that AI technologies are designed with humans in mind, promoting inclusivity, fairness and transparency, following accessibility guidelines, involving end-users (including persons with disabilities) in the design process, and collaborating with field experts, with the overall aim to create a 'Human-Centered Universally Designed AI'.

It is evident that an inclusive technological future requires multidisciplinary efforts and strong collaboration at multiple levels. Academics, researchers, software developers working in industry, policymakers and end-users themselves, are called upon to contribute to the creation of a more equitable and sustainable world for all, taking advantage of the transformative capabilities of AI technologies. But this is not enough. International cooperation is essential in promoting technological innovations, introducing regulations to address the challenges and the ethical concerns that may arise from these innovations, and facilitating the transfer of technology for an inclusive future. In this respect, knowledge sharing, capacity building, joint research and development, financial assistance, policy alignment and public-private partnerships are tools at our disposal to foster international cooperation.

In our increasingly interconnected and globalized world, international cooperation is essential in order to effectively address the multifaceted challenges of inclusion, as global challenges require global solutions.