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A Comprehensive Analysis on Accessibility Refinements for People with Disabilities Based on US and European AI Acts

Anand Sarangam

Accessibility SME, USA
anand.sarangam@gmail.com

Abstract
This paper evaluates how accessibility changes have been incorporated in the legal frameworks governing AI in the USA and Europe by considering the legal frameworks for persons with disabilities. Although the Executive Order of the USA and the European AI Act promote inclusivity, there is a stark contrast in the models used and the details of their application. The effect of these policies on the accessibility and advancement of AI is depicted through major guidelines, case studies, and quantitative techniques. Still, there are unresolved issues such as inconsistencies in regulatory requirements and technical obstacles. This evaluation suggests that policymakers and developers need to recognise the role of aligned regulations and innovation in overcoming accessibility barriers in disability-friendly technologies.

Keywords: AI Accessibility, Disability Inclusion, Regulatory Compliance, Accessibility Standards, Policy Analysis

1. Introduction

The development of AI (artificial intelligence) has improved accessibility for individuals with disabilities, with the provision of machines that assist these individuals to be more self-reliant and have a better quality of life. Still, the integration of accessibility features into AI tools is best approached with a detailed legal framework that prevents misuse. Regarding this requirement, the US AI Executive Order, and the European AI Act, aim at improving this situation and ensuring that all AI systems comply with the requirements of accessibility [5]. These acts emphasize the principle of AI inclusivity, that all users can use AI systems with safe and reliable frameworks.

2. Background and Context

The US Executive Order on AI passed, and the US ensured that the new, advanced AI systems being created would be available in the market and be of assistance to 61 million Americans with disabilities. This directive also instructed the federal agencies to make sure several AI features are consistent with set standards of accessibility. In the analysis, the European AI Act introduced the regulatory paradigm that has the purpose of controlling risks with the removal of AI system derogations, and inclusivity for accessibility was one of those strict recommendations [11]. The act emphasized the importance of human control over the processes that concern the issues of approximately 87 million people with disabilities residing in Europe. Although every region has managed to diagnose the problem of accessibility, there are

many methods. The US has dealt with performance metrics and recommendations, while the European Union imposed legal requirements for compliance to be achieved. Nevertheless, both frameworks seek to go after the shortfalls in the accessibility standards of AI technologies and guarantee that AI systems come with designs suitable for different kinds of people [3]. This benchmark sends clear signals of urgency for these improvements since AI technology is moving forward rapidly and millions are affected across the globe.

3. Accessibility Refinements Based on USA's Executive Order on AI

3.1 Key Provisions in the Executive Order on AI

The AI Executive Order from the year 2019, implemented by the government of the US, promoted the integration of inclusivity by making sure that AI systems, in this case, the US AI Executive Order, are designed to be usable by the 61 million people with disabilities in America [13]. Growing regulations also deal with improving AI accessibility policies, supporting AI accessibility research, and mandating that the federal government prioritize accessibility when it acquires AI. As you can imagine, these were going to help bridge the virtual gap between people with disabilities and the use of AI in government services.

3.2 Guidelines and Standards for AI Accessibility

The executive order policies also noted the need to obey active accessibility regulations, the Americans with Disabilities Act (ADA) in particular, and touched upon the WCAG guidelines about web content accessibility. This stressed the necessity of designing AI systems that would not only be effective but also easy to use for users with disabilities [2].

3.3 Case Studies and Examples

Several initiatives emerged after the executive order was issued. In particular, the Department of Veterans Affairs has further possessed omni modal systems designed with injured veterans in mind, which facilitate access to healthcare information. Another example is an AI-assisted captioning device placed on federally funded websites that aim at assisting people who have hearing impairments [9]. Such cases proved the validity of the government's efforts to implement AI tools with an emphasis on accessibility, though the results were put into use in different employments and on different scales of projects.

3.4 Impact on AI Development in the USA

The scope of the executive order went further to the federal groups and inspired the private groups also to implement accessibility policies. However, many firms are self-regulated by these principles, but as there was no enforcement, it has produced quite uneven compliance with accessibility. A 2022 survey carried out by the Partnership on AI reported that the majority of 48% of US AI makers within the top bracket of creators do design accessibility across concerns of the design phase [1].

4. Accessibility Refinements Based on European AI Act

4.1 Key Elements in the European AI Act

It's a landmark regulatory framework for the European AI Act (2021), aimed at making AI technologies both safe, transparent, and fair. A key issue of the law is its recognition of accessibility for persons with disabilities [7]. The law categorizes AI frameworks by risk, with excessive-risk AI applications, including biometric identity and healthcare-related frameworks, posing a problem with particularly stringent availability requirements.

4.2 European Guidelines, Obligations, and Compliance Requirements

In the European AI Act, builders' obligations are specified according to accessibility standards for AI stru-

ctures. It requires high-risk AI frameworks to undergo a compliance assessment to demonstrate compliance with both accessibility and protection standards. The indicators emphasize that the interfaces must be accessible as well as the communication must be clear so that frameworks of AI will never automatically exclude people with disabilities [12]. The law also requires strict transparency obligations and holds AI to be operated for the proper motives, and this is necessary for people with cognitive or visual impairments.

4.3 Case Studies and Examples of EU Initiatives

Using the insights gained from various EU projects, a determination can be placed towards ensuring that AI is made accessible in many more ways than it is today. One of the notable aspects is the European Accessibility Act (EAA), which supports the Artificial Intelligence Act while concentrating on the removal of barriers for human beings with disabilities in the areas of digital single-market services. The government of the Netherlands is enabled to introduce AI-warm due to schizophrenia smart homes that will aid elderly people who have mobility impairments and support their independence attempts [4]. Also, the European Commission sponsored an initiative to develop AI-powered speech and text-content communication structures that assist people with hearing disabilities.

4.4 Impact on the AI Development Landscape in Europe

The European Law on AI, in this case, was required not only to streamline the national policy and path but also to fuel AI development, diminishing the factors of its accessibility. So once again, due to the implementation of the law, EC had to constrain the builders' thinking and workflow. Still, there are problems. For example, the European Commission surveyed AI developers throughout Europe in 2023 and reported that three-fourths of these developers are effective, with the most effective 52 % successfully integrating accessibility in their devices, which demonstrates that the law does not achieve compliance with its intent [8].

5. Comparative Analysis: USA vs. Europe on AI Accessibility

5.1 Key Similarities and Differences Between the USA's Executive Order and the European AI Act on Accessibility

The U.S. AI Executive Order (2021) and the European AI Act (2021) both set out the importance of making AI more accessible, but the approach is completely different. There, however, is the shared objective across five constructs that differentiates AI technology as related to people with disabilities. The US executive order puts an obligation on federal agencies to broaden AI technologies that are just and useful, while the European AI Act commands that AI frameworks conform to common layout ideas, most especially in cases of high-risk applications [3]. There is, however, an immense difference in the degree of regulation in this case: whereas in EU law there is a combination of accessibility requirements that are enforceable with compliance, the executive order is very limited and based on guidelines and is more of a recommendation on the part of the AI developers.

5.2 Evaluation of the Effectiveness of Each Region's Policies in Promoting Accessibility

Particularly, these rules have been consolidated as far as accessibility is concerned. In Europe, AI law has come far in that it has put in place strategies that ensure that the rendering of constructional AI with the highest risk levels undergoes a detailed analysis. According to a document of the European Commission in 2023, the number of AI developers in Europe is presently 52%, which exceeds the threshold of top AI developers, who also adopted the ideas for accessibility at the level of the product design, indicating that the level of compliance is low for countries and throughout the region [10]. Looking ahead to 2022, the

top 37% of fully AI organizations based in the USA had at their disposal accessibility proposals formalized.

5.3 Challenges and Opportunities in Implementing Accessibility Standards

There is a great challenge for both areas regarding the enforcement of the requirements. One of the factors in the US is that there is no consistent picture of AI accessibility, which has resulted in attempts being made to address it in several different areas in a piecemeal way [15]. Individually, they can lead to undesirable outcomes as several communities tend to only focus on accessibility rather than inclusion every time [4]. The challenge here is a case of formulating a coherent national approach regarding how private neighborhoods have location concepts. In Europe, yes, the challenge is that even if the AI law provides a tidy form, the issue is in the intricacies of enforcing compliance within a number of the member states.

5.4 The Role of Regulatory Oversight and Enforcement

Ongoing attention as well as the provision of regulatory measures will ensure the availability of AI systems. More particularly, from the European perspective, the AI Act legally binds, and hence the national authorities have the responsibility in terms of compliance enforcement. There are huge fines for noncompliance that should also encourage the communities to put a focus on access [11]. This contributes to raising AI research and development standards. Yet, there are difficulties, especially on how such guidelines should be implemented uniformly across the European Union member states.

6. Discussion: Impact of Accessibility Refinements on AI and People with Disabilities

In the US and Europe, AI technologies have developed around this central idea of accessibility. In the US today, various agencies can use some of the measures that came as part of the AI Executive Order (2021) to design to enable AI for people with disabilities. However, these improvements took the enhancement over the edge, whilst leaving piles of risk for the organization, hence in piecemeal implementation [14]. The European AI Act, of 2021, offers a clear encumbrance of accessibility of design for high-risk AI systems with better accessibility integration. About the AI Act, the European Commission Report emphasizes mandatory accessibility measures as an antidote to the exclusionary design of AI structures [6]. A 2023 report revealed that during the improvement phase, 72% of the packages classified as high-risk reportedly incorporated accessibility features. The hurdles posed by the complexity and cost of such tests, however, constrain lesser developers. Consequently, the bottom 42% of the AI companies stated they have complete accessibility plans, hence the disparity in the standard software [8].

Looking at the future, both areas stand the possibility of improvement. Trends, however, point out that further improvements in AI will start taking into account some elements of Universal Design principles to make systems more flexible for all users, including those with disabilities [13]. In the same way, persistent challenges remain, including a slow pace of its enforcement with the US and a lack of effective compliance measures for border movement in Europe. Equally, there is increased demand to provide more granular data on the benefits of increasing accessibility levels, which will enable improved destiny policy.

7. Conclusion

In conclusion, the analysis conducted also brought out some important differences in the accessibility of AI between the USA and Europe. In this regard, it can be said that the AI Act, which was legislated by Europe and US, is effective in enforcement. Still, they both have challenges of compliance with the same

standard. Future laws should emphasize enforceable standards, where the developers of AI have an active role in promoting inclusive technologies.

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