



A Humanistic Approach to Natural Language Processing and Information Accessibility for the Disabled

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ABSTRACT: In the advancing age of technology, providing the disabled (i.e., deaf, blind, learning issue) equal rights to access information remains a challenge. Although the field of Natural Language Processing (NLP) has seen many advances in recent years, NLP in communicative assistive technologies demands a more comprehensive, humanistic approach. The purpose of this study is to investigate that NLP technology could be successfully applied to improve the accessibility of information for the disabled by means of the coordination between technological innovation and human needs. The research that is carried out here is qualitative, focusing on a case study approach for the cases of assistive applications based on NLP by having interviews with of users and developers involved in this type of applications. Our results show that although several NLP tools provide strong potential for features (e.g., speech to text, text to speech, and simplified language) for those with hearing, vision, cognitive, and/or reading needs; there are still numerous gaps. These are linguistic biases, lack of adaptability to local languages, and lack of user centred design. Users stressed the criticality of adaptability, fit for purpose, and ease of use to achieve real accessibility. It follows that human centredness in developing NLP systems, serves to enhance, not only the user experience for the impaired subset, but that this user centred design, contributes to the wider theme of digital inclusivity. It suggests a co creation approach of multidisciplinary work technologists, disability advocates and linguists as a first step to build more fashionable and ethical NLP based tools.

Keywords: Natural language processing, NLP, humanistic approach, information, accessibility, the disabled.

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1. Introduction

In an increasingly digital world, access to information has become a fundamental prerequisite for full participation in education, employment, and social life. For individuals with disabilities particularly those who are hearing impaired, visually impaired, or have reading or cognitive difficulties barriers to accessing digital content persist, despite advancements in technology. As global commitments toward digital inclusion and equitable access grow stronger, particularly through frameworks like the United Nations' Sustainable Development Goals (SDGs), it becomes imperative to ensure that assistive technologies are not only available, but also effective, ethical, and inclusive.

Natural Language Processing (NLP), a subfield of artificial intelligence (AI), has shown considerable promise in addressing accessibility challenges. From speech to text systems that support the hearing impaired to text simplification and summarization tools for individuals with reading difficulties, NLP is increasingly embedded in various assistive applications. However, many of these tools are developed with limited input from the end users they aim to serve, leading to solutions that may be technologically advanced but lack practical usability. In addition, linguistic bias, lack of support for minority languages, and insufficient adaptability to cultural contexts further limit their accessibility and effectiveness.

This research seeks to address this gap by advocating for a humanistic approach to the design and implementation of NLP based assistive technologies. While technical development continues to push boundaries, this study emphasizes the need for solutions that are grounded in the lived experiences, preferences, and challenges of the disabled.

To that end, the study explores the current landscape of NLP enabled assistive tools and investigates how these technologies can be better aligned with the actual needs of diverse user groups. Using a qualitative research design, including case studies and semi structured interviews with both developers and end users, the paper identifies key challenges and success factors in creating more inclusive NLP applications.

By occupying this niche, the research contributes to the growing discourse on ethical AI and inclusive design, offering practical insights into how technology can genuinely serve marginalized communities. Ultimately, this