

Android App for People with IDD to Report Abuse

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Abstract: Abuse is a significant concern within the Intellectual and Developmental Disabilities (IDD) community, often accompanied by communication challenges and vulnerability. Our project, the "Speak Up IDD" Android application, is designed to empower and safeguard individuals with IDD by offering a platform to educate them, reporting abuse and seek assistance. This innovative app addresses the urgent issue of abuse within the IDD community. "Speak Up IDD" focuses on providing individuals with IDD a means to express their concerns, ensuring their safety and well-being. The app features a user-friendly interface that caters to varying communication abilities. It offers diverse reporting options, including text-to-speech capabilities, symbol-based communication boards, and voice recognition, ensuring accessibility for users with diverse communication needs. The central function of the app revolves around abuse reporting. Users can confidentially report instances of abuse, whether physical, emotional, or neglect, through a secure and private channel. The app guides users through the reporting process, providing prompts and assistance while safeguarding their anonymity and protection. To further support users, "Speak Up IDD" includes real-time alerts and notifications that can be sent to designated contacts, such as caregivers, family members, or support organizations, ensuring swift responses to reported incidents. The "Speak Up IDD" app is more than just a reporting tool; it is a lifeline for those in the IDD community who are at risk of abuse. Its mission is to create a safer environment, raise awareness, and ensure that no individual with IDD suffers in silence. By providing them with the means to speak up, we aim to empower individuals with IDD, protect their rights, and foster a more supportive and secure community for all.

Keywords: Intellectual and developmental disabilities, Learning Disabilities, Empowerment, Education, Abuse, Natural Language Processing.

I. INTRODUCTION

In today's interconnected world, technology has become a powerful tool for everyone, especially those who are often left out. People with intellectual and developmental disabilities (IDD) often face numerous challenges, including the increased risk of abuse and exploitation. Abuse within the intellectual and developmental disabilities (I/DD) community has become alarmingly widespread. Unfortunately, cases of abuse against individuals with I/DD are significantly underreported to the relevant authorities. Many individuals with I/DD face challenges in recognizing and reporting abuse due to limited awareness and self-advocacy. To address this issue and ensure that individuals with IDD have a platform to voice their concerns and seek help, we have developed the "Speak Up IDD" Android app. The "Speak Up IDD" app is more than a technological innovation; it's a beacon of hope and empowerment. Designed to be a safe, accessible, and user-friendly avenue, this app allows individuals with IDD to educate and report instances of abuse, neglect, or mistreatment. Our project encompasses the journey from conceptualization to development and implementation, emphasizing the profound significance of such a tool in today's society. It serves as a window into the background and context that gave rise to the "Speak Up IDD" app. It explores the prevalence of abuse within the IDD community and sheds light on the daunting challenges faced by individuals when trying to report such incidents. At its core, this project is inspired by the urgency to amplify the voices of a segment of the population that has been historically underserved and unheard. Moreover, our project underscores the far-reaching impact that the "Speak Up IDD" app can have, touching the lives of individuals with IDD, their families, support networks, and the broader

community. By leveraging technology to facilitate reporting and intervention, the app not only provides a lifeline in times of crisis but also fosters a profound sense of empowerment and self-determination among its users.

II. LITERATURE REVIEW

Thomas Howard III, Krishna Venkatasubramanian, et al. [1] In this paper they discussed about an app i.e. "Recognize". They developed mobile computing-based app called "Recognize" to help people with IDD. This app will help people with IDD to recognize abuse and its various forms i.e., physical, verbal, sexual, financial, neglect. Here they developed three types of prototypes. In this mobile application, outcomes of co-design process are compared to and evaluated by people with IDD who are instructors of the application.

Juan C. Torrado, Javier Gomez, Ane German, et al. [2] In recent years we use Information technologies as well as communication technologies to educate people with IDD. This paper includes research findings while researchers testing ACC technologies with IDD people. In this paper we discuss about various assistive technologies for IDD people which include various examples of co-design. Here they explain several aspects, including outdoor and indoor way- finding, reading skills training, daily life task guidance, and emotional self-regulation.

Julia Borblik, Olga Shabalina, Marina Kultsova, et al. [3] This paper presents a technology for user interface design in mobile applications intended for individuals with IDD. An example of how this technology is applied is showcased through the development of the interface for the Viamigo digital travel assistant, designed to support individuals with IDD. This collaborative effort involves staff, PhD, and master's students at Thomas More University in Geel, Belgium, as well as CAD and SE Departments at Volgograd State Technical University in Volgograd, Russia.

Mauro Jose Conte, Marcelo Gitirana Gomes Ferreira, et al.

[4] People with IDD have intelligence quotient below 70-75 range. These people have difficulties while performing daily tasks. They discussed how the app is used in Brazil. So Assistive technology such as "Alternative and Augmentative communication" contribute or helps people with IDD and covers all the form of communication. It provides basic needs, helps people with IDD to develop skills, making friends.

Onintra Poobrasert, Piyada Sabayjai, Namnueng Mitsamarn, et al [5] In Thailand, they focus on people with LD. Children with LD focuses many problems in their normal life. To overcome this problem, they developed an application that helps these people for reading, writing, and learning purpose. This will help them to live normal life. This application also provides to choose language between "Thai" and "English". They developed an app that helps people with LD. The main goal of this application is to make writing easier for learning disabilities people. At the starting they take input from user. And analyse their writing and suggest next words for user which will help user to write the sentence fast.

Anushka Sharma, Mukta Pandya, et al. [6] There are differently able people in the world including IDD people, visually impairment, vocally impairment, audibly impairment. So here they discussed about an IOT device that will help these people. It makes their lives easily. This device includes sensors or various assistive technology for communication purpose. The main goal of this application is to make people able to communicate easily. For visually challenged people they take picture of object and by using Google technology they convert the word in spoken. This IOT device uses "Raspberry Pi" and "Google's Technology".

III. PROPOSED SYSTEM

This research aims to create an Android app for people with IDD to report abuse. It is simple to use with options. They can report abuse by filling out the form to report abuse. They can attach voice recordings and even they can attach pictures. It is safe because all information is sent securely.

This app also provides education about what is abuse, its types.

When people send information, it can be checked by NGO people. They check what kind of problem it is and they make sure that all Information is correct. Then they decide who needs to take care about it like calling to right people or helping in some other way.

Our android app is designed to utilize Google's Tensor flow, kotlin programming language. Kotlin is a contemporary, statically typed programming language known for its versatility and type inference. It is designed to seamlessly work with Java, leveraging the Java Class Library for the JVM version of its standard library.

The application will contain the following Algorithms:

Natural Language Processing (NLP): Natural Language Processing (NLP) is a field of artificial intelligence that focuses on the interaction between computers and human language. In the context of developing a system for people with intellectual and developmental disabilities to report abuse, NLP plays a crucial role in understanding and interpreting the reports

Text Preprocessing: NLP algorithms typically start by pre-processing the text data. This involves tasks like tokenization (breaking text into words or sentences), removing punctuation, and converting text to lowercase.

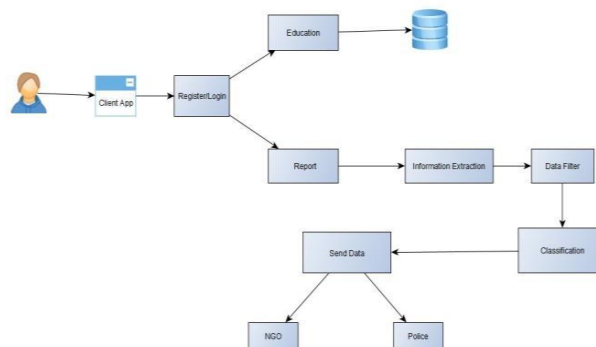
Text Classification: For abuse reporting, text classification algorithms can be employed. User's reports can be classified into different classes such as "abuse", "concern", or "other." This helps in organizing and prioritizing reports.

Named Entity Recognition (NER): NER algorithms can identify entities mentioned in the text, such as names, locations, and dates. NER can be useful for identifying specific person, places, or times mentioned in the reports.

Part-of-Speech Tagging: Part-of-speech tagging used to assign grammatical categories (like noun, verb, adjective, etc.) to each word in a sentence. This can help in understanding the structure of the report.

Syntax and Grammar Analysis: Parsing algorithms can be used to analyze the grammatical structure of sentences. This can help in understanding the relationships between different parts of the report.

3.1 System Architecture



The proposed system architecture for with Intellectual and Developmental Disabilities (IDD) is designed with a dual focus on education and abuse reporting. On the client side, the system features an educational module delivering content through various formats to accommodate diverse learning styles, ensuring an engaging and inclusive learning experience. Simultaneously, a user-friendly reporting interface facilitates seamless abuse reporting, supporting different communication modes for enhanced accessibility. The application layer manages educational content, abuse reporting, and user authentication, incorporating machine learning for adaptive communication during report submissions. The server-side components, including the web server, content delivery system, and reporting processing module, collaborate to efficiently manage requests, deliver educational content, and process abuse reports securely. The secure database ensures the protection of sensitive user information through encryption. A dedicated security layer with end-to-end encryption and robust authentication mechanisms prioritizes user privacy during both educational and reporting interactions. Furthermore, a community engagement module fosters user interaction through forums and feedback mechanisms, promoting a sense of community and continuous improvement. This architecture aims to create a supportive and accessible environment for individuals with IDD, combining education and abuse reporting within a unified and secure platform.

3.2 Additional Features

To develop an app for individuals with IDD to report abuse, prioritize simplicity. Enable users to communicate through speech or images, making the interface straightforward. Incorporate a feature to indicate their location and swiftly reach out for assistance. Ensure confidentiality by allowing anonymous reporting and provide updates on the reported incidents. Enhance accessibility with features like larger text and specialized functionalities. Educate users about abuse and their rights within the app. Establish connections with local support networks, offer multilingual support, and gather

user feedback for continuous improvement. Involve the IDD community in the development process to tailor the app to their specific needs.

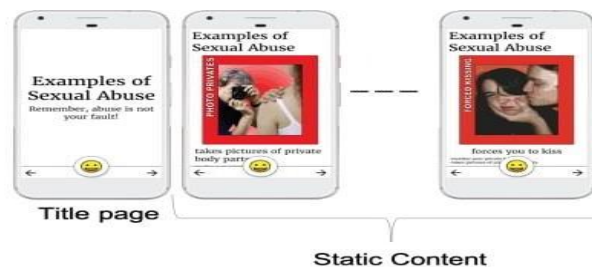
3.3 Challenges

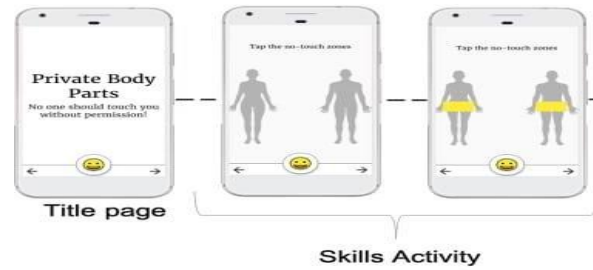
- Limited User Input: Obtaining comprehensive feedback from individuals with Intellectual and Developmental Disabilities (IDD) proved challenging due to communication barriers and diverse cognitive abilities.
- Technological Barriers: Some users faced difficulties in interacting with the app due to varying levels of technological literacy and accessibility requirements.
- Privacy Concerns: Balancing the need for anonymity in abuse reporting with the necessity of tracking and follow-up poses challenges in maintaining user privacy.
- Integration with Existing Systems: Incorporating the app into existing support systems and collaborating with relevant agencies for a coordinated response presented logistical challenges.

3.4 Future Directions

- Augmented Accessibility Features: Research and implementation of advanced accessibility features, such as intuitive gesture controls and refined voice recognition, are crucial to accommodating the diverse needs of users.
- Strategic Partnerships with Support Organizations: Strengthening collaborations with advocacy groups, support organizations, and healthcare providers will enhance user outreach, support mechanisms, and foster a more holistic approach to addressing abuse cases.
- Machine Learning for Adaptive Communication: The exploration of machine learning algorithms to enhance the app's adaptability to diverse communication styles is a promising avenue for future development.
- Community Engagement Initiatives: Initiating community engagement programs to raise awareness and educate caregivers, support professionals, and individuals with IDD will enhance the app's functionality and promote the importance of abuse reporting.
- Continuous User-Centric Testing: Ongoing usability testing with users is imperative to identify and address evolving challenges and to ensure the app remains adaptable to emerging technologies and user expectations.
- Global Accessibility Efforts: Expanding the app's accessibility globally involves incorporating support for additional languages and ensuring cultural sensitivity to cater to diverse user bases.
- Efficacy Research of Reporting Systems: Conducting longitudinal studies to evaluate the reporting system's effectiveness in facilitating timely responses to abuse cases is crucial for ongoing refinement and improvement.
- Advocacy for Policy Changes: Active involvement in advocacy efforts is essential to influence policy changes, promoting the broader societal integration of abuse reporting systems for individuals with IDD.

IV. RESULT





VI. CONCLUSION

In conclusion, the "Speak Up IDD" Android application stands as a potent and indispensable tool in empowering individuals with Intellectual and Developmental Disabilities (IDD) to confidentially report abuse. Effectively overcoming communication barriers, the app establishes a secure platform for reporting various forms of abuse, utilizing a real-time alert system that ensures swift responses and markedly enhances user safety. Beyond its technical functionality, the application plays a pivotal role in increasing awareness and breaking the silence around abuse, contributing significantly to upholding the rights and overall well-being of individuals with IDD. In essence, "Speak Up IDD" serves as a comprehensive and crucial resource, fostering a supportive environment where individuals with IDD can report abuse without fear, ultimately promoting a culture of respect and protection.

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