ABSTRACT

Traditional reporting methods used by therapists for tracking the development of children with autism are often ineffective. Technology now offers various solutions, including mobile applications and machine learning, to digitize therapy reporting and enhance developmental analysis. Machine learning has proven to facilitate the therapy process by providing insightful analysis. This capstone project focuses on developing an Android mobile application that enables therapists and parents to report therapy activities efficiently.

ParentPal *is a comprehensive therapy activity reporting app with a primary feature: the Psychological Behavior Report powered by Natural Language Processing (NLP). This app transforms pediatric therapy reporting into a digital format using the applied behavior analysis (ABA) method and includes a child development graph for ease of use. Additional features of* ParentPal *include chat consultations with therapists, material references, tips and tricks, a list of food recommendations, and report history.*

ParentPal *application underwent rigorous testing, including UI/UX evaluations, NLP model accuracy assessments, and connectivity checks between the mobile app and cloud services. The System Usability Scale (SUS) assessment yielded an average score of 81.33. The sentiment analysis model demonstrated high accuracy with a 97% accuracy rate and F1-scores of 0.98 for the "negative" label, 0.96 for the "neutral" label, and 0.96 for the "positive" label. The material recommendation model achieved an accuracy rate of 99%, and API testing showed an average response time of 1212 ms. Black Box testing confirmed the application's reliability. The* indoBERT *model successfully distinguished between negative, neutral, and positive sentiments, enabling accurate analysis of the development of autistic children. Overall, the* ParentPal *application provides effective solutions for addressing the social, health, usability, sustainability, and security challenges associated with autism spectrum disorder (ASD).*

Keywords: ParentPal, *Natural Language Processing* (NLP), *Machine Learning*, Android *Mobile Application*, Google Cloud Platform.