

Application Fields and Innovative Technologies

Empowering Aging Adults Through Voice Based AI Health Documentation: Design and Evaluation Study K. Meyer, D. Noll. *Gerontechnology* 25(s)

Purpose The ageing population and increasing prevalence of chronic conditions result in increased pressure on healthcare systems. In this context, digital health tools present a promising approach to ease the burden on care providers while empowering older individuals to take an active role in maintaining their health [1]. Digital self-monitoring platforms have proven to enhance patient autonomy, support chronic care management, and reduce workload in primary care settings [2]. As part of a Master's thesis project [3], this study aimed to develop and evaluate a mobile, speech-based AI agent system designed to empower aging individuals by enabling straightforward and personalized health documentation. The research focused on assessing technical feasibility, user acceptance, and compliance with European regulatory requirements, thereby contributing to healthy aging and greater independence. **Method** A multi-stage approach was applied: (1) analysis of existing digital health documentation systems and user needs, (2) review of regulatory requirements under European frameworks, (3) definition of functional and non-functional requirements, (4) conceptual design and prototypical implementation of the mobile, speech-based AI agent system, consisting of a mobile app using Firebase as its backend database and a Gemini-based AI agent system, and (5) preliminary user acceptance evaluation conducted through an open-ended qualitative survey with pre- and post-use questionnaires completed over a two-week testing period to gather exploratory feedback on usability, perceived benefits, and alignment with previously defined system requirements. **Results and Discussion** The prototype enables users to document their daily well-being via voice input, including parameters such as mood, pain intensity, and interventions. The AI agent system provides personalized analyses, deviation detection, recommendations, and weekly health summaries (Figure 1). Data can be stored long-term, visualized, and exported as a PDF to support sharing with clinicians or caregivers and continuity of care. The prototype was preliminarily tested by three digitally-affine participants (ages 55, 61, and 62). A comparison of responses prior to and following the two-week usage period indicated that initial expectations, such as support in health documentation and preparation for medical appointments, were met, resulting in a perceived strengthening of trust in the AI system despite some ongoing concerns. The AI-generated recommendations were perceived as meaningful and supportive. Overall, survey results indicate high user acceptance regarding usability and perceived benefit. Identified areas for improvement include speech recognition accuracy, AI transparency, and system performance. A regulatory assessment demonstrated that classification as a Class IIa medical device is feasible, although it is associated with substantial organizational effort, particularly regarding data protection and technical documentation. The AI agent architecture offers potential for integrating additional functionalities in future iterations. These findings highlight the promise of speech-based AI systems in supporting aging individuals through accessible, personalized health documentation, thereby enhancing communication and continuity of care.

References

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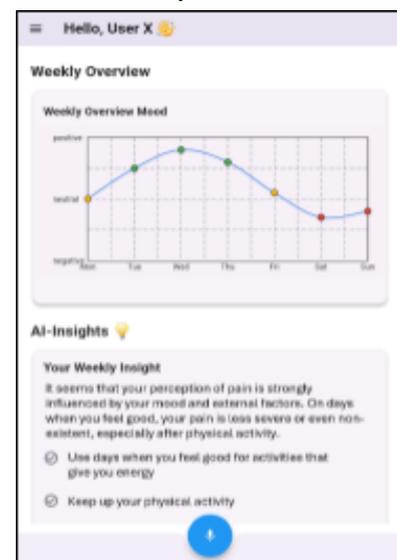


Figure SEQ Figure \^* ARABIC 1. App home screen with weekly overview and AI insights