

CLINAPP: A VIRTUAL ASSISTANT FOR COLLECTING MEDICAL DATA

K. Grigoriadis*, P. Lagakis**, E. Logaras***, E. Stamkopoulos***, A. Billis***
and P. D. Bamidis***

* GeoSense P.C., Thessaloniki, Greece, ** Computer Center Lagakis, Drama, Greece, *** Lab of Medical Physics and Digital Innovation, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece

kgrigor@geosense.gr, paris@lagakis.gr, evanlogar@auth.gr, vaggosstamko@ece.auth.gr, ampillis@med.auth.gr, bamidis@auth.gr

Introduction

Healthcare is rapidly evolving with technology at its core. A standout is the use of voice technologies like speech recognition and natural language processing in hospital patient interviews [1]. Traditional methods like paper forms and face-to-face interviews have limitations as they're usually time-consuming, error-prone, and not always user-friendly. Voice tech changes the game by enhancing patient engagement, streamlining data entry and improving efficiency [2].

These tools are not just efficient; they're inclusive, catering to patients with limited mobility or language barriers. They also offer data analytics capabilities that help in clinical decision-making. However, challenges like data privacy and system accuracy can't be ignored. As healthcare continues to innovate, voice technologies are set to play a crucial role in elevating patient care and operational efficiency.

ClinApp Virtual Assistant

ClinApp is a web platform for organizing medical visits and collecting medical data through the usage of a conversational agent, that can interact with the patient, acting as a Virtual Assistant. Developed as a Progressive Web App (PWA), it is versatile, functioning across various platforms and devices using a single codebase. The tech stack includes web technologies like PHP, Javascript, HTML, and CSS.

What sets the ClinApp Virtual Assistant apart, is that it is AI-driven, incorporating advanced technologies like real-time voice recognition, Natural Language Processing (NLP), and Text-To-Speech (TTS) conversion. Going beyond the scope of an average chatbot, it takes the lead in conversations, asking patients specific questions to gather data efficiently. This proactive approach streamlines the appointment scheduling process and even preps the attending physician with valuable patient insights before the consultation. Once an appointment is set, it engages patients in a fully automated dialogue, collecting and processing their responses primarily through voice. This data is then presented to healthcare providers ahead of the appointment, allowing for better preparation and more effective consultations.

This shift in dialogue dynamics, from a reactive to a proactive virtual assistant, not only makes the system more efficient but also enhances the user experience by making interactions more structured and less time-consuming.

Conclusion

This work presents an attempt towards the use of voice tech in medical appointments management and medical data collection directly from patients. Future steps include piloting ClinApp in private practices and hospital outpatient departments, where its overall performance and perceived usefulness by end users will be evaluated.

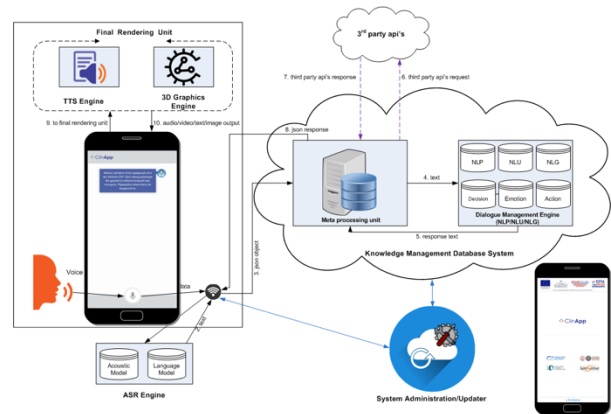


Figure 1: ClinApp virtual assistant architecture

References

1. Dinari, F., Bahaadinbeigy, K., Bassiri, S., Mashouf, E., Bastaminejad, S., & Moulaei, K. (2023). Benefits, barriers, and facilitators of using speech recognition technology in nursing documentation and reporting: A cross-sectional study. *Health science reports*, 6(6), e1330.
2. S. Latif, J. Qadir, A. Qayyum, M. Usama and S. Younis (2021). "Speech Technology for Healthcare: Opportunities, Challenges, and State of the Art," in *IEEE Reviews in Biomedical Engineering*, vol. 14, pp. 342-356

Keywords: Virtual Assistant, Chatbot, Medical Data Management, Conversational Agent

Acknowledgement

This research has been co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (T2EDK-04937).