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ClinApp: A Microservices-Based Platform for Efficient Medical Visit Scheduling

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Abstract. Clin App is a platform streamlining medical appointment management and patient data collection using a conversational agent. Focused on healthcare professionals and patients, it offers appointment automation, questionnaire creation, and medical data management. This work showcases ClinApp's microservices-based architecture and its user-centered design.

Keywords. Medical Appointment Management, Microservices Architecture, Real-time Scheduling

1. Introduction

Digital healthcare is constantly evolving and Appointment Scheduling (AS) follows this trend. In [1], a recent systematic review regarding web-based appointment systems (WAS) showed that in most cases there was a significant improvement in many critical factors. To this end, ClinApp was designed, which promotes streamlines scheduling, questionnaire design, and appointment availability for healthcare professionals and patients.

2. Methods

ClinApp platform employs a microservices-based backend architecture, promoting modularity and scalability [2]. Key microservices, developed using Node.js, such as Authentication, Organizations, Questionnaires, and Calendarwork together to manage various aspects of the system. A RabbitMQ message broker ensures efficient communication between services, while a database-per-service paradigm, using dedicated MongoDB instances, is employed. Metadata referencing FHIR specification

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enable interoperability. A separately deployed API integrates a conversational agent with speech recognition and text-to-speech capabilities, providing a more natural user experience [3]. The API connects with the Questionnaires Service, enabling voice-based interactions for a subset of questionnaires, streamlining patient engagement.

3. Results

ClinApp's frontend caters to healthcare professionals, administrators, and patients. The web-based Administration Dashboard and BI Dashboard, manage calendars, questionnaires, and data visualization. The Patient Mobile App, developed using Flutter, allows patients to book appointments and answer questionnaires, ensuring a seamless experience.

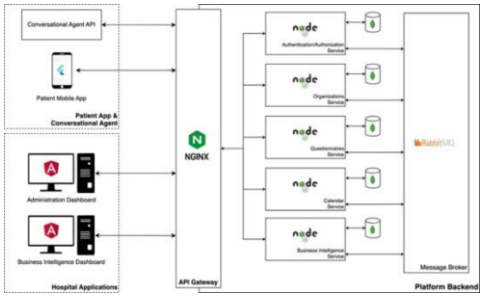

Figure 1. Architecture diagram of ClinApp system, and technologies used.

4. Discussion and Conclusions

ClinApp's architecture demonstrates the potential of microservices and conversational agents in healthcare AS. ClinApp's adoption could optimize healthcare delivery and enhance patient satisfaction.

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