Sakhi: AI Health Companion

"Your Health, Your Voice, Your Sakhi"

Rinita Sarkar
rinitasarkar@microsoft.com

Snehal Gaikwad
sngaikwad@microsoft.com

Abstract— 'SAKHI' is an AI powered comprehensive health companion app designed to empower rural women by providing accessible, affordable, and culturally sensitive health care support offering instant health guidance in regional languages. SAKHI aims to bridge the gap in healthcare accessibility by offering a suite of features including instant health support, hospital finder, personalized dietary recommendations, voice command and multi-lingual options. This paper delves into the technological foundation, functionalities, and potential impact of the SAKHI app on rural women's health.

Keywords—AI and Technology in healthcare, Empower women in rural area

I. INTRODUCTION

Women in rural areas often face significant barriers to accessing quality healthcare, ranging from poor health literacy, cultural norms to lack of medical facilities and professionals. 'SAKHI' is an AI-powered comprehensive health companion app designed to address these issues by providing tailored healthcare support that is both accessible and culturally sensitive.

II. KEY FEATURES

A. Instant Health Support

Tool/Technology: Microsoft Copilot, Azure openai

Description: SAKHI offers an AI-driven chatbot that provides immediate health guidance to users. This feature ensures that women in rural areas have access to accurate and reliable health information at their fingertips, facilitating prompt and informed health decisions.This features enables the women to get instant help through chatbot as in rural areas women faces challenges due to illiteracy and external support.

B. Affordablle Hospital Finder Features:

Tools/Technologies: Geolocation services, Mapping Services(e.g. Azure Maps), Data Analytics and ML

Description: Integrating nearby Affordable Hospital Finder features which helps users to locate nearby hospitals and healthcare facilities that are both accessible and affordable. This is particularly beneficial in rural areas where hospitals are few and far between. Azure Maps can be used to access geolocation data and provide real-time navigation.

C. Personalized Dietary Recommendations

Tools/Technologies: *NLP, Machine Learning Algorithms, Language Understanding Intelligent Service (LUIS), Azure Cognitive Services, Copilot*

Description: an AI-powered virtual dietician that offers personalized dietary advice.By leveraging advanced technologies such as NLP, machine learning, and Azure Cognitive Services, this feature provides personalized dietary recommendations that cater to the unique needs of women in rural communities.Using Azure AI, the app can analyze user health data, dietary preferences, and nutritional requirements to offer personalized dietary recommendations.

D. Voice Command Support:

Tools/Technologies: Azure Cognitive Services' Speech API

Description: The app supports voice commands, providing handsfree usability and making it accessible to users with low literacy and tech-knowledge. This feature ensures that all women, regardless of their literacy levels, can easily navigate and benefit from the app's health resources.Achieving high accuracy in voice recognition amidst diverse accents and dialects presents a technical hurdle. Additionally, ensuring technology can function well in noisy environments.

E. Multi-Lingual Support:

Tools/Technologies: Azure Translator

Description: Recognizing the linguistic diversity of India, SAKHI supports all major Indian regional languages. This feature ensures that women from different linguistic backgrounds can use the app in their preferred language, enhancing its accessibility and usability. By utilizing Azure's translation services, the chatbot can communicate in multiple languages, catering to diverse linguistic needs.

F. Emergency Alert:

Description: The app features an emergency alert system that allows users to quickly seek help in case of a health emergency. This feature is vital for ensuring the safety and well-being of women in rural areas, providing them with a reliable way to alert authorities or healthcare providers in urgent situations.

G. *Offline Mode Support:*

Tools/Technologies: Azure Offline Sync

Description: Integrating crucial feature for rural areas with limited or unreliable network access. This ensures that the app remains functional and accessible, even in areas with poor connectivity, allowing users to access health information and resources anytime, anywhere. Azure Offline Sync can be used to sync data between the app and the cloud when connectivity is restored.

H. *Appointment Reminder:*

Tools/Technologies: Azure Notification Hubs

Description: an appointment reminder feature sends timely notifications for upcoming health appointments. This ensures that women do not miss important medical consultations and follow-ups, promoting consistent and proactive healthcare management.

I. *Integration of Microsoft Technologies:*

Tools/Technologies: Microsoft Copilot, Azure OpenAI, Azure Bot Service, Azure Maps, Azure Cognitive Services, Azure AI and ML, Azure Notification Hubs, Azure Blob Storage, Azure Offline Sync

Description: Leveraging Microsoft technologies, the SAKHI App can significantly enhance its functionality, security, and user experience. Integrating Azure AI and Machine Learning, Cognitive Services, Bot Service, Maps, Notification Hubs, Blob Storage, Power BI, Offline Sync, Security Center, and Active Directory ensures that the app meets the unique healthcare needs of women in rural areas. These technologies empower users with improved healthcare access and outcomes.

III.   NATURAL LANGUAGE PROCESSING

A. *Speech Recognition:*

Tool/Technology: Microsoft Speech SDK, Microsoft Azure Speech Service

Description: Speech recognition technology allows the AI Copilot Chatbot to convert spoken language into text. This is particularly valuable in rural areas where literacy rates might be lower, enabling women to interact with the app through voice commands. Technologies such as Microsoft Speech SDK, Microsoft Azure Speech Service can be integrated to provide accurate and real-time speech recognition.

B. *Language Translation:*

Tool/Technology: Microsoft Translator

Description: The AI App incorporates language translation tools to bridge language barriers. This ensures that users can access healthcare information in their native languages. Services such as Microsoft Translator play a crucial role in providing accurate and context-sensitive translations.

IV.   ACCESS TO SUPPORT SERVICES

A. *AI driven Chatbots with NLP:*

Tools/Technologies: Chatbot frameworks (e.g., *Microsoft Bot Framework*), NLP libraries (e.g., spaCy, GPT-3/3.5 & 4, *NLTK*)

Description: AI-powered chatbots with NLP capabilities can be developed to provide immediate health guidance to users. Chatbot frameworks like Microsoft Bot Framework can help build and deploy chatbots quickly. NLP libraries can be used for understanding and generating human-like responses.

B. *Knowledge Base Integration:*

Description: Collaborate with professional counselors and health experts to create a knowledge base for the chatbots. This knowledge base should include frequently asked questions, guidance, and information on relevant health and support services.

C. *User-Friendly Interface:*

Tools/Technologies: React Native, Xamarin, HTML/CSS, JavaScript, Progressive Web Apps

Description: A user-friendly interface can be created that will allow users to easily access support services, including Instant health support to scheduling appointments. The interface should be designed to ensure that rural area women can easily navigate and utilize its features to improve their health outcomes.

D. *Privacy and Confidentiality:*

Description: Privacy and confidentiality of user interactions should be ensured with support services. Implementing end-to-end encryption for chatbot interactions and ensuring that personal and medical information remains confidential.

E. *Continuous Knowledge Base Update:*

Description: Continuously update and expand the knowledge base to provide accurate and up-to-date information. This involves regular collaboration with experts to incorporate the latest insights and advice.

V. IMPACT ON WOMEN'S HEALTH

A. Accessibility:

The app's user-friendly interface, voice command support, and multilingual features ensure that women from diverse backgrounds can access healthcare information and services. Offline mode support further enhances accessibility, making the app a reliable companion in areas with limited connectivity.

B. Affordability:

By helping users find affordable hospitals and providing free health support, the SAKHI app reduces the financial burden on women in rural areas. Personalized dietary recommendations also promote cost-effective nutrition, improving health without incurring additional expenses.

C. Empowerment:

The SAKHI app empowers women to take control of their health by providing them with the tools and information they need to make informed decisions. Emergency alerts, appointment reminders, and real-time health support enhance their confidence, fostering a sense of self-reliance and empowerment.

VI. POTENTIAL TECHNICAL CHALLENGES/RISKS:

Data Privacy and Security: Handling sensitive health information demands stringent data privacy and security measures. Compliance with regulations such as GDPR and HIPAA is essential to protect user data from breaches and misuse. Implementing secure encryption protocols, routine security audits, and effective data anonymization techniques are critical yet challenging tasks.

Cultural Sensitivity: The app must be culturally sensitive in its communication and recommendations. Misunderstanding or ignoring local customs and practices can lead to resistance and reduced engagement.

Scalability: As user base and data volume grow, ensuring that the app scales efficiently without degradation in performance is crucial.

Accurate Health Recommendations: Providing personalized dietary recommendations and instant health support relies heavily on the app's underlying AI algorithms. Ensuring the accuracy, relevance, and safety of these recommendations requires continuous monitoring and updating of the AI models

Offline Mode Integration: Maintaining a seamless user experience in offline mode requires efficient data synchronization techniques. Ensuring that health information, appointment reminders, and emergency alerts are updated and accessible without internet connectivity is challenging.

Multi-Lingual Support: The app's multi-lingual capability is crucial for reaching a diverse user base. However, accurate and contextually appropriate translations are challenging to implement and maintain. Ensuring the app can handle language nuances and dialects without losing the original intent of the information is vital for user trust and engagement.

User Education and Adoption: Convincing users to adopt the platform and educating them on its features and benefits is a technical challenge. Ensuring the platform is user-friendly and has clear onboarding processes is crucial.

Reliability and Availability: Maintaining high uptime and availability, especially during critical situations, is a technical risk. Downtime or unavailability could leave users vulnerable.

Technical Literacy: Users need basic smartphone and app navigation skills, which may be lacking in some rural populations.

VII. TECHNICAL ARCHITECTURE
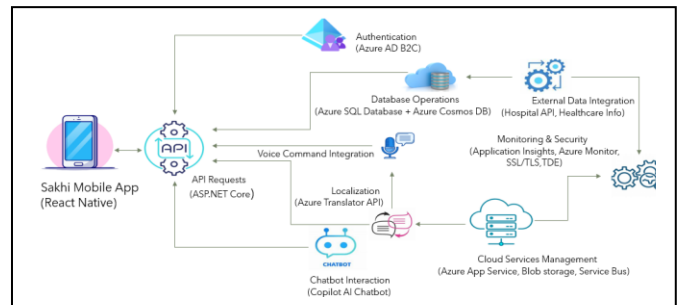
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