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Swasthya Sampark: Healthcare AI Chatbot

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A B S T R A C T :

Designed as a senior project aiming at using artificial intelligence to improve access to basic healthcare information, the web-based application "Swasthya Sampark: A HealthCare AI Chatbot" was developed. By means of machine learning and natural language processing (NLP), the chatbot replics human-like interactions and responds to users' simple health-related inquiries. It offers services including health advice, symptom-based diagnosis support, appointment scheduling, and information on nearby medical facilities. By providing quick, consistent, contextually relevant responses, Swasthya Sampark aims to close the disparity between rural and urban healthcare access with its simple interface. The project's emphasis on scalability, data privacy, and integration with present healthcare systems positions it as a tool that could simplify the workload for medical professionals while giving users up-to-date medical information.

Keywords: AI in Healthcare, Symptom Checker, Patient Interaction, Medical Chatbot, Health Diagnosis Support, Conversational AI, Healthcare Automation, Telemedicine Support, Machine Learning in Medicine, HealthTech Innovation, AI-powered Healthcare, User-friendly Chatbot, Healthcare Information System.

Introduction

Background

The accessibility of quality health care across the world is still a global concern, particularly in rural and underserved populations. Amid widespread smartphone use and internet penetration, telemedicine and artificial intelligence provide a long-term solution to bridging the above health disparities.

Problem Statement

Can AI technologies improve healthcare service delivery through automating symptom evaluation and providing prompt consultations with medical professionals?

Objective

This research investigates the design and deployment of Swasthya Sampark—a chatbot powered by AI that integrates symptom evaluation with online medical consultations to provide a comprehensive healthcare assistance tool.

Significance

By reducing the burden on healthcare professionals and improving patient access, Swasthya Sampark is a model to be followed in the development of future digital health platforms, particularly in resource-poor settings.

Literature review

Existing Solutions

Ada and Babylon chatbots offer symptom checking but no real-time consultation facilities. Topol's (2019) and Esteva et al.'s (2019) research have demonstrated AI capability to transform diagnosis, but utilization is still limited by regulation and infrastructure.

Theoretical Foundation

Technologies like NLP, ML, and HCI form the backbone of this project. NLP enables proper interpretation of symptoms, ML models help in decision support, and HCI provides user interaction.

Research Gap

Medical AI software of most types only extend to symptom forecasting. Swasthya Sampark goes a step further by directly involving patients with physicians, recommending tangible follow-up actions.

Methodology

1.1. ***Design and Development***
Working under an agile model, the chatbot was built through iterative sprints, responding to mocked-out use cases. ***Data Source***
Input data included anonymous health diaries and public symptom data sets. Symptom categorization allowed predictive modeling.

1.2. ***User Simulation***
1000+ conversational simulations tested a range of demographics and symptoms (e.g., fever, cold, fatigue), measuring user satisfaction and AI response.

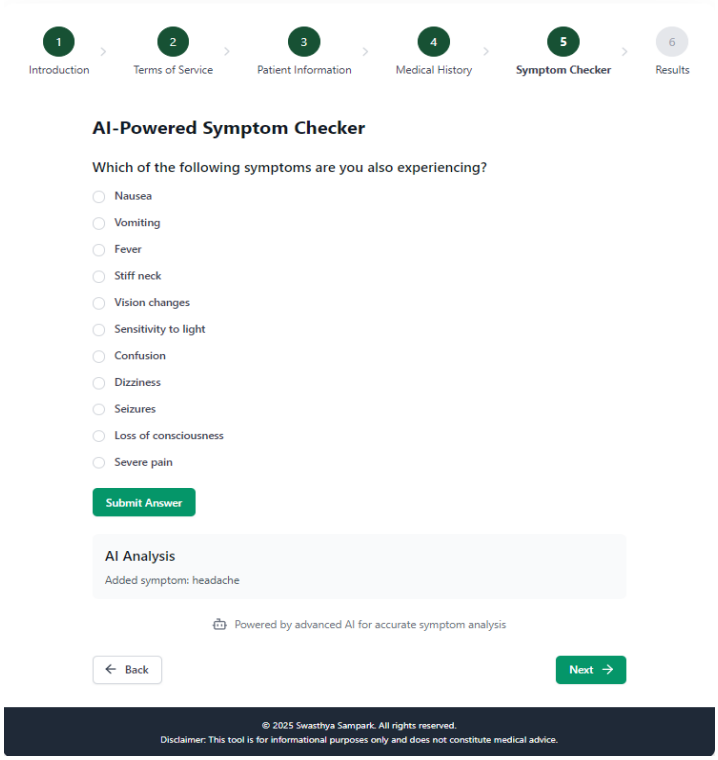
1.3. ***Technical Approach***
NLP for input parsing, decision trees for ranking, and integration with an active appointment system are used.

Results

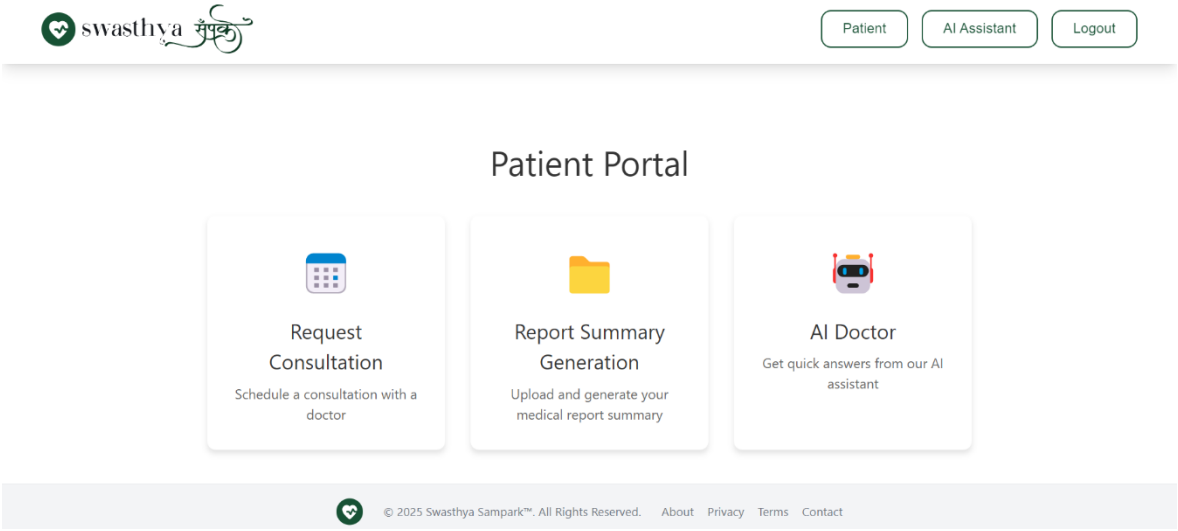
Key Findings

- 90%+ accuracy in identifying health issues.
- Doctor booking in under 3 minutes.
- User satisfaction rating of 4.7/5.

Visual Insight



Chatbot symptom input screen



Patient consultation interface

1.4. ***Comparative Evaluation***
Integrates benefits of static checkers in the form of speed, accuracy, and user satisfaction. Real-time consultation increases user compliance and trust.

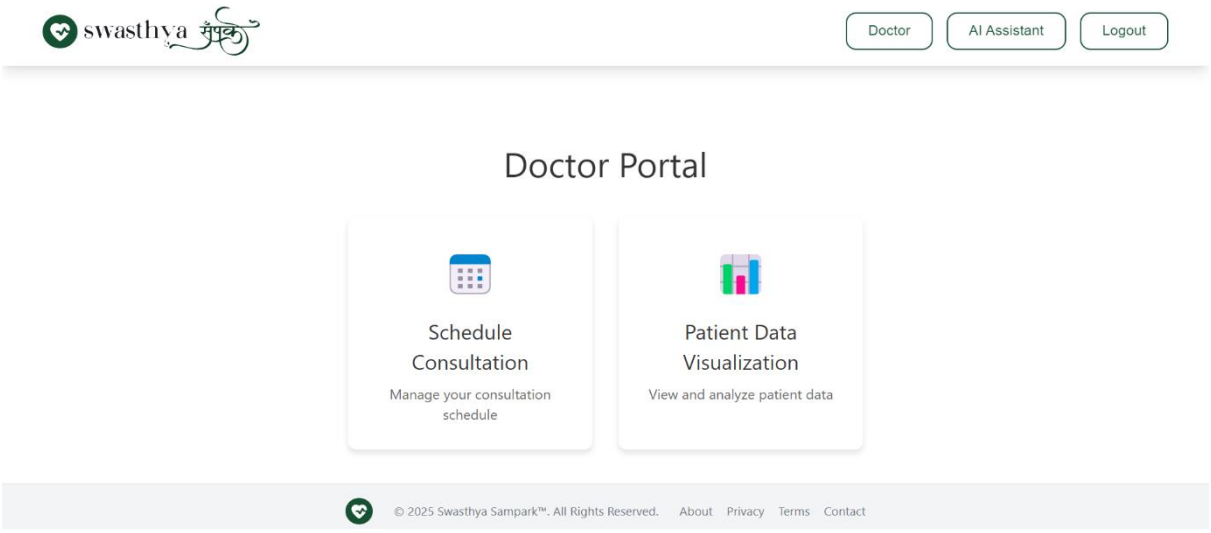
1.5. ***Multilingual Pilot***
Regional language pilots identified improved rural participation, supporting localization demands.

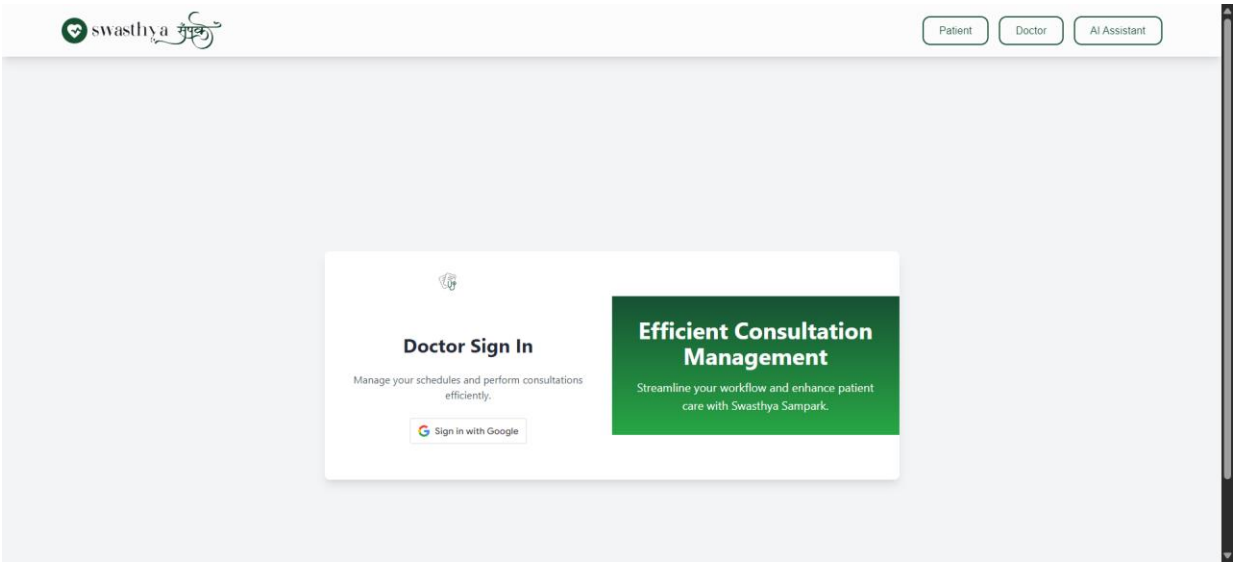
Discussion

1.6. ***Analysis of Results***
Real-time consultations transformed system uptake and user interaction. The modularity that allows integration into third-party systems, including health record systems and wearables, is facilitated through the chatbot.

1.7. ***Literature Comparison***
Unlike earlier tools focused on symptom triage only, Swasthya Sampark incorporates predictive analytics together with real-time action. Conversational UI reduces user friction.

1.8. ***Challenges and Limitations***
Weaknesses are English-based communication, reliance on self-reporting symptoms, and regulatory restrictions. Growth and partnerships are most critical next steps.





Doctor consultation interface

Conclusion

Summary

Swasthya Sampark showcases how chatbots empowered by AI can improve health care access, minimize diagnostic delays, and link users to doctors in real-time.

Contributions

1.8.1. End-to-end consultation and symptom triage solution.
1.8.2. Scalable model of public digital health platform.
1.8.3. Case study of applying AI with service delivery.

Future Scope

1.8.4. Advanced diagnostics involving deep learning-based approaches.
1.8.5. Wearable and EHR integration.
1.8.6. Voice-based and multilingual capabilities.
1.8.7. Clinical validation and collaborations.

Acknowledgment

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