

AI-POWERED HOME-VISIT DOCTOR APPOINTMENT BOOKING SYSTEM

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Introduction:

Access to healthcare services is often difficult for elderly individuals, bedridden patients, and people living in remote areas. Traditional hospital visits involve long waiting times, travel difficulties, and overcrowding, which reduces efficiency and delays treatment.

To address this problem, the proposed system introduces an AI-powered home-visit doctor appointment booking platform. The system enables patients to easily book doctor visits at home through a digital interface. It uses artificial intelligence to analyze symptoms.

The platform also includes features such as multilingual support, chatbot assistance, and automated prescription support. This improves accessibility, reduces hospital dependency, and enhances patient convenience.

The system also ensures better communication between patients and healthcare providers through intelligent interfaces. It minimizes the need for physical hospital visits, especially during emergency or pandemic situations. The integration of AI helps in faster preliminary diagnosis and efficient decision-making. The platform is designed to be scalable and adaptable for different healthcare environments. Overall, the system contributes to the development of smart and accessible digital healthcare solutions.

Objectives:

1. To improve healthcare accessibility for elderly, disabled, and rural patients through home-visit services.
2. To develop an AI-based system for symptom analysis.
3. To provide multilingual support for better accessibility to diverse users.
4. To enable automated prescription generation for efficient healthcare delivery.
5. To reduce waiting time by optimizing appointment scheduling and doctor allocation.

Methodology:

The system is designed using a modular architecture consisting of three main components: Admin portal, Patient portal, and Doctor portal. The architecture ensures efficient communication between different modules and smooth system operation.

The Admin portal manages doctor registration, user data, system monitoring, and overall service control. It also handles authentication and maintains system security. The Patient portal allows users to register, log in, and access healthcare services easily. Patients can enter their symptoms using a simple interface, which is processed by the AI module for analysis. The system also supports multiple languages, enabling users from different regions to interact comfortably and book home-visit appointments. The Doctor portal enables doctors to manage their appointments, view patient details, and provide medical services efficiently. Doctors can review AI-generated suggestions and generate prescriptions accordingly. This helps in reducing manual effort and improving decision-making speed.

The system is developed using modern technologies such as React.js for frontend development to ensure a responsive user interface. Node.js with Express.js is used for backend processing and handling API requests. MongoDB is used as the database to store user information, doctor profiles, and appointment details securely.

AI modules such as symptom checker, multilingual processing, and prescription generation are integrated into the system. The system ensures secure data handling, role-based access control, and efficient appointment management for reliable performance.

Results and Conclusion:

The system was tested in a simulated environment involving 10 patients and 5 doctors to evaluate its performance and efficiency. The results indicate that the system achieved 95% accuracy in predicting symptoms for common diseases, proving the reliability of the AI-based diagnosis support. Additionally, there was a 40% reduction in average appointment time, which significantly improved patient handling efficiency.

The integration of speech recognition allowed non-English speaking patients to interact with the system easily, thereby enhancing accessibility. Moreover, the automatic prescription generation feature reduced doctors' administrative workload by 30%, enabling them to focus more on patient care.

The system successfully delivered patient-oriented medical services by incorporating AI-based auxiliary diagnosis, multi-language translation, and automated prescription filling. It proved especially beneficial for bedridden patients, elderly individuals, and accident victims, who could access medical assistance without the need to travel.

In conclusion, the system demonstrates a major advancement in AI-powered healthcare solutions, improving both efficiency and accessibility. It reduces the burden on healthcare professionals while enhancing patient experience, particularly for those with mobility challenges.

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Future Scope:

The future scope of this project includes:

1. Integration of real-time video consultations for remote healthcare services.
2. Use of wearable health devices for continuous real-time patient monitoring.
3. Implementation of advanced AI models for predictive and preventive healthcare.
4. Enhancing system capability for image and report analysis (like scanning medical reports).
5. Development of secure online payment systems for consultations and home care services.
6. Improving accuracy of symptom checking systems using advanced machine learning algorithms.
7. Introduction of a comprehensive notification system using SMS, email, and mobile app alerts.
8. Providing automatic reminders for appointments, payments, and prescription updates.