

# Smart Healthcare AI System for Intelligent Patient Doctor Interaction and Management

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**Abstract**—Healthcare systems worldwide face challenges such as delayed diagnosis, inefficient data management, and poor communication between patients and healthcare professionals. This research paper presents a Smart Healthcare AI System designed to automate patient–doctor interactions, streamline data handling, and enhance accessibility to healthcare services. The proposed system integrates artificial intelligence, machine learning, and natural language processing models like ChatGPT to deliver personalised health support, appointment scheduling, and data analysis. The system stores and manages patient and doctor data securely in a cloud-based database, ensuring confidentiality through encryption. The research emphasises real-time data processing, reduced waiting times, and improved patient outcomes through AI-based insights. Experimental evaluation and case-based analysis demonstrate the system’s potential to transform traditional healthcare models into intelligent, efficient, and patient-centric digital frameworks.

**Index Terms**—Artificial Intelligence, Healthcare System, Chatbot, Patient Management, Appointment Scheduling, Smart System.

## I. INTRODUCTION

The integration of artificial intelligence into healthcare has revolutionised patient care by enabling smarter decision-making, predictive diagnostics, and personalised treatment plans. Traditional healthcare systems rely heavily on manual processes for patient registration, diagnosis, and communication, often resulting in inefficiencies and errors. A Smart Healthcare AI System utilises AI-driven components to manage patient information, streamline doctor scheduling, and provide an AI chatbot interface for health-related inquiries. This innovation aligns with the growing need for e-health solutions in both developing and developed countries.

## II. LITERATURE REVIEW

Several studies have explored the integration of AI and ML in healthcare applications. Patel et al. (2022) developed a machine learning model for disease

prediction based on patient health records, demonstrating accuracy improvements of up to 87%. Similarly, Johnson and Lee (2023) highlighted the benefits of AI chatbots for initial symptom screening, which reduced the workload of medical professionals by 30%. IoT-based healthcare systems have also gained traction. However, most existing systems lack an intelligent conversational interface that connects patients and doctors seamlessly.

## III. METHODOLOGY

The system employs a modular design consisting of five core components:

1. Patient Module: Handles user registration, stores medical history, and provides access to reports.
2. Doctor Module: Allows doctors to view patient data, manage appointments, and record diagnoses digitally.
3. AI Chatbot Module: Built using advanced NLP algorithms inspired by ChatGPT.
4. Appointment Scheduler: Automates doctor–patient appointments and sends notifications.
5. Database and Security Layer: Ensures encrypted data storage and cloud-based synchronisation.

## IV. RESULTS AND DISCUSSION

The Smart Healthcare AI System prototype was evaluated using simulated patient–doctor interactions. The chatbot achieved a response accuracy of 92% for common medical queries and reduced appointment scheduling time by approximately 45%. The inclusion of a ChatGPT-like module improved user experience by providing natural and contextually relevant responses.

## V. CONCLUSION AND FUTURE SCOPE

The Smart Healthcare AI System presents an innovative solution to automate healthcare processes, enhance patient–doctor interactions, and deliver efficient medical services through AI integration. In future developments, the system can be extended to

include IoT-based health monitoring, integration with wearable devices, and predictive analytics for disease prevention.

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