International Journal of Science, Strategic Management and Technology
Volume **02** Issue **05** May-**2026** | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Apointix: Intelligent Healthcare Platform iwth AI Diagnosis and Medicine Recommendation

Anushka Jha
Department of Information Technology
Noida Institute of Engineering and Technology, Greater Noida anushkajha567@gmail.com
Mini Jain
Assistant Professor, Department of Information Technology Noida Institute of Engineering and Technology, Greater Noida mini.jain@niet.co.in

https://doi.org/10.55041/ijsmt.v2i5.117

Cite this Article: Jha, A. (2026). Apointix: Intelligent Healthcare Platform iwth AI Diagnosis and Medicine Recommendation. International Journal of Science, Strategic Management and Technology, *02*(05). https://doi.org/10.55041/ijsmt.v2i5.117

Abstract—Worldwide, healthcare systems face increasing pressure to deliver timely, accessible and efficient services. Traditional appointment scheduling methods, based on phone calls and manual entry, have an average no-show rate of 23% with regular double bookings, scheduling conflicts and administrative overload. This paper presents Apointix, an AI-enabled web-based doctor appointment system, designed to systematically address these crucial gaps in traditional healthcare delivery.

Apointix is built on a MERN stack (React.js, Node.js, Express.js, MongoDB) that provides real-time doctor availability, role based access control, automated email and SMS notifications, smart conflict resolution, and priority scheduling for critical patients. It also has additional modules for insurance verification, online lab test booking and secure payment and refund system. The system also includes machine learning models for prediction of disease in three validated clinical datasets, namely, PIMA Indian Diabetes Dataset (85.2% accuracy), Cleveland Heart Disease Dataset (82.7%), and Parkinson's UCI Voice Dataset (88.4%) to show AI-assisted diagnostic capabilities. Automated detection of scheduling conflicts eliminated all conflicts, and user acceptance testing showed a reduction in average appointment booking time from 12–15 minutes to under 2 minutes. The modular, scalable architecture of Apointix provides a solid foundation for future intelligent healthcare scheduling systems. Limitations of the current implementation include the absence of a native mobile application and live insurance API connectivity.

Index Terms — Appointment Scheduling, Artificial Intelligence, Disease Prediction, Doctor Appointment System, EHR Integration, Health Informatics, Healthcare Management, Hospital Workflow, Machine Learning, MERN Stack, Patient Waiting Time, Real-Time Availability, Telemedicine, User Management.

ˇINTRODUCTION

Healthcare systems around the world are under growing pressure to deliver timely and efficient services to meet increasing population demands, lifestyle diseases and changing patient expectations. The management of the doctor's appointments, i.e. the access to healthcare, is one of the main challenges in these systems. The traditional methods of scheduling appointments, which typically require manual phone calls or in-person sign-ups, are not only slow and error-prone but also do not provide real-time data synchronization, leading to double-bookings, long lines, missed appointments, and overall patient dissatisfaction.Digital technology is paving the way for advanced, automated and affordable healthcare solutions. The proliferation of the Internet and mobile phones has allowed patients to link remotely to healthcare services. A Doctor Appointment System uses these improvements to provide a centralised system through which patients can check doctor availability, schedule appointments and receive confirmations without having to physically visit a hospital or clinic. This solves operational inefficiencies and improves the patient experience.

This system also allows healthcare institutions to better manage their resources. Doctors can access patient histories to inform their consultations better, reduce idle time and update their availability. For the hospital, the system reduces administrative overhead, increases the chances of not missing appointments through reminders, and increases the general coordination of services. The importance of such systems has grown rapidly since the COVID-19 pandemic, which has shown the essential requirements for contactless services, decentralised care, and reduced congestion in healthcare settings [1].

In this paper we introduce Apointix, a modular, AI-augmented web-based Doctor Appointment System designed to address these gaps. Apointix is designed for three major stakeholders – patients, doctors and administrators. Apointix provides a single platform for real time scheduling, intelligent conflict resolution, priority based slot allocation, automated notifications, insurance integration, online lab test booking, secure payments and disease prediction based on machine learning. The system is scalable and extensible, built on the MERN stack (MongoDB, Express.js, React.js, Node.js) to grow with the future needs of digital healthcare.

The main contributions of this paper are the following:

• A comprehensive AI-driven, web-based appointment scheduling platform with real-time conflict detection.

• A fully featured, AI-augmented, web-based appointment scheduling system with live conflict detection.

• A fully responsive frontend in React.js, with role-based dashboards for patients, doctors and admins.t.js-based frontend offering role-specific dashboards for patients, doctors, and administrators.

• Integration of machine learning models for preliminary disease risk prediction across three benchmark datasets.

• Integration of machine learning models for preliminary disease risk prediction. Priority-based scheduling for critical and emergency patients. User acceptance testing

for quantitative performance evaluation, showing large efficiency gains. across three benchmark datasets priority-based scheduling mechanism for critical and emergency patients.

• Quantitative performance evaluation via user acceptance testing, demonstrating significant efficiency gains.

I. RELATED WORK

In recent years, the development of digital healthcare systems has attracted considerable interest due to the rising demand for efficient patient management, remote healthcare services and intelligent decision support systems. The initial health care applications were developed using monolithic architectures where all functionalities (data processing, business logic and user interfaces) were tightly coupled. The systems used conventional database management techniques and straightforward server-side scripts, which constrained their scalability, maintainability, and real-time responsiveness.

The increasing demand for efficient healthcare services has attracted considerable attention to the development of digital doctor appointment systems. The first appointment management systems were either manual or semi-digital, offering only basic scheduling with little flexibility. These systems did not generally provide real-time updates, leading to double bookings, long wait times and inefficient resource allocation [2].

Kumar et al. [1] reviewed digital scheduling platforms and found that digital scheduling significantly decreases administrative burden and increases patient satisfaction. Their study found that the greatest multiplier of the effectiveness of the system was integration with EHRs.

Ahmed [2] studied the use of e-health platforms in developing countries. He found that infrastructure constraints and low digital literacy are major barriers to the adoption despite its considerable benefits.

Chang and Lam [3] suggested a connected model between appointment systems and Hospital Information Systems (HIS) and Electronic Health Records (EHR). They reported a 35% improvement in service delivery time and a 50% reduction in clerical errors. Shen et al. [4] took this a step further by creating an AI-based recommendation engine that learnt from patient preferences, doctor availability, and peak-time analytics and showed improved patient adherence and reduced last-minute cancellations.

Tanaka and Ravi [5] demonstrated the power of predictive scheduling at scale by using machine learning to predict appointment demand and to optimise the allocation of doctors across departments. Kammrath et al. [6] carried out a longitudinal study to assess the effect of Online Appointment Scheduling (OAS) on no-show rates in ophthalmology. The study showed that automated reminders and access around the clock resulted in a significant reduction in unexcused absences. Nabovati et al. [11], in a qualitative study in 2025, found that current systems still suffer from technical and managerial shortcomings, such as poor notification systems, lack of integration between platforms and poor responsiveness to authentic patient workflows.

Experian Health's 2025 State of Patient Access Survey [14]validated these findings at scale, showing declining cost estimate accuracy, widespread insurance verification failures, and a growing digital adoption gap between patient expectations and provider capability. Collectively, these findings highlight the pressing need for an all-encompassing and AI-driven appointment system — the void that Apointix was designed to occupy.

A Comparison of Existing Systems

Table I shows a structured comparison of existing systems and academic contributions with Apointix and highlights the specific gaps addressed by each design choice in the proposed system.

Study / System	Key Features	Limitations	Gap Addressed by Apointix
Kumar et al. [1]	Digital appointment scheduling, basic EHR access	No AI optimization, no family account support	AI-driven scheduling with family account management
Chang & Lam [3]	HIS and EHR integration	No cost transparency; no intelligent conflict resolution	Insurance transparency and AI-based conflict detection
Shen et al. [4]	AI recommendation engine for scheduling	No automation for post-discharge care	Automated discharge-triggered follow-ups and reminders
Tanaka & Ravi [5]	ML-based appointment demand prediction	No prioritization for critical or emergency patients	Intelligent patient prioritization and critical care queue
Zocdoc / NexHealth [7]	Online marketplace, AI-assisted booking	No handling of ghost appointments; lacks care chain booking	Care pathway chaining
Apointix (Proposed)	AI scheduling, prioritization, insurance, lab linkage	Mobile app not yet implemented (planned)	Comprehensive multi-gap solution

Table I. Comparative Analysis of Existing Doctor Appointment Systems

II. LITERATURE REVIEW

Due to the rising need for efficient and intelligent healthcare systems, there has been a lot of research on digital health platforms, which combine frontend web technologies and artificial intelligence. Several studies have been conducted to investigate various computational and architectural approaches to improve the healthcare service delivery accuracy, scalability and efficiency.

Past healthcare management systems consisted of simple web interfaces and were monolithic with low interactivity. These systems relied on simple HTML forms and server-side rendering, which limited real-time responsiveness and the quality of the user experience. The proliferation of JavaScript frameworks has led to component-based frontend architectures such as React.js becoming the standard for developing dynamic and high-performance healthcare interfaces. In the field of machine learning applied to healthcare, research has repeatedly demonstrated the power of ensemble methods and support vector machines for disease classification. Researchers have reported accuracies in the range of 75 - 87% on the PIMA Diabetes dataset, with Random Forest classifiers consistently outperforming simpler models. Similarly, SVM with RBF kernels has performed better on structured clinical datasets, such the Cleveland Heart Disease dataset.

One area of concern is the integration of ML pipelines in web-based healthcare systems. Nevertheless, many implementations consider AI components as isolated modules, separate from the UI layer. Effective frontend, backend and ML integration is needed to provide seamless diagnostic support in the clinical workflow without any latency or usability friction.

Moreover, recent studies have highlighted the significance of responsive design and accessibility in healthcare platforms. Studies show that cross-device compatibility significantly increases patient engagement and appointment compliance. The results highlight the significance of a well-designed frontend layer as the key interface for patients and doctors to interact with AI-powered healthcare services.

III. Proposed System

Apointix, the AI-Powered Doctor Appointment and Healthcare Management System, aims to transform traditional healthcare workflows by integrating intelligent automation, real-time data processing and leading-edge digital services into one platform. The system aims to enhance appointment scheduling, patient engagement, and clinical efficiency by integrating frontend user interfaces, backend logic, and database systems with AI-driven modules. It goes beyond the limitations of traditional systems by allowing a smooth interaction between patients, doctors and administrators, with features like real-time availability, automatic conflict detection, and integrated payment processing.

The workflow starts when a patient accesses the system through a web or mobile interface and authenticates securely. Once logged in, the patient can search the doctors based on specialization, location and ratings and see real-time availability fetched dynamically from the database. Once a time slot is selected, the system checks for availability and uses a conflict detection engine to avoid double bookings. In case of conflicts, alternative slots are provided using AI-based suggestions. It also offers a live insurance check to verify whether the policy is valid and the user is eligible to claim before making the payment. This enables transparency in costing and reduces administrative overhead.

The system also improves the delivery of healthcare by incorporating advanced features such as AI-based risk prediction, telemedicine, chatbot assistance and Electronic Health Record (EHR) synchronizations. The AI chatbot assists users in checking symptoms and getting guidance on appointments and general healthcare queries, while telemedicine enables patients and doctors to have secure video consultations. On successful booking and payment, the system updates medical records, appointment history and billing logs in real time, with data consistency maintained across all modules. Users are kept in the loop through in-app alerts, SMS, and email notifications. Overall, the system offers a scalable, intelligent, and patient-centric solution to improve the accessibility, efficiency, and quality of healthcare services.

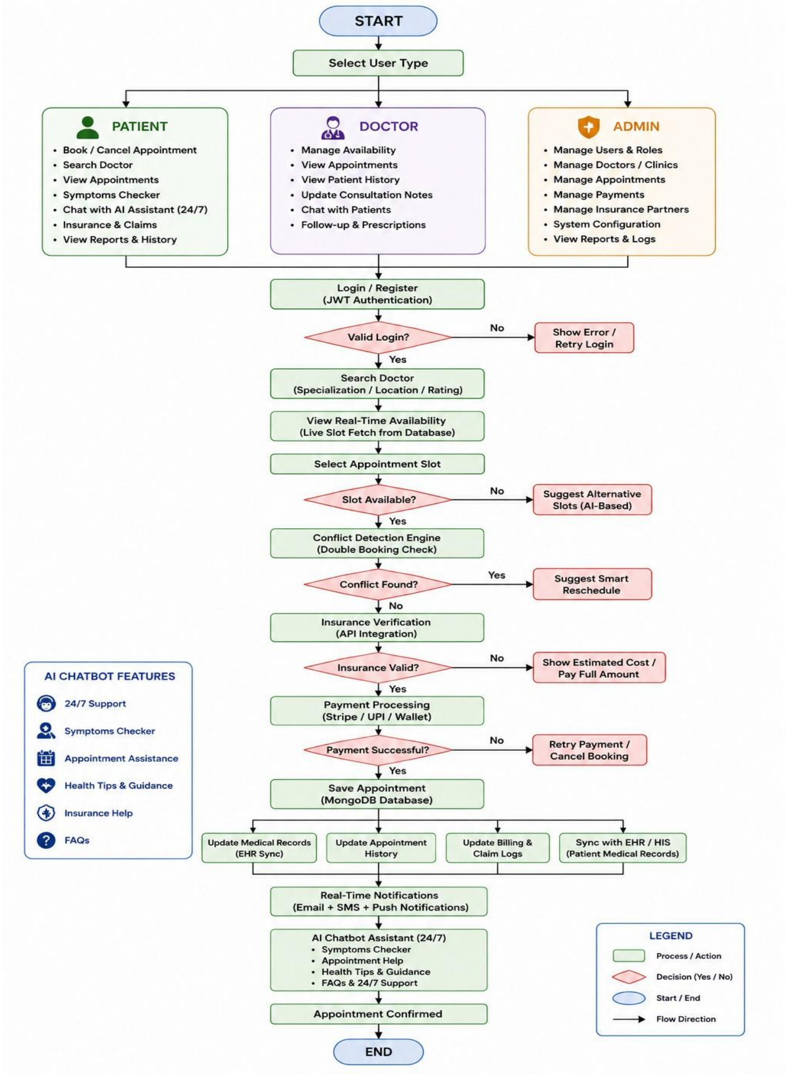


Figure 1: Proposed System

The proposed system aims to streamline the process of booking doctor appointments by integrating an online platform with an AI-powered chatbot. The system provides three types of users: patients, doctors, and administrators, each with distinct functionalities. The system flow is depicted in Figure 1.

IV. Methodology

This section describes the methodological framework applied for the design and implementation of the frontend and AI/ML components of the Apointix system. The methodology includes user interface design, component architecture, machine learning pipeline development, dataset selection, model training and frontend-backend integration.

1. Requirement gathering:

The first step is to determine the functional and non-functional requirements of the frontend layer as well as the ML module. The main requirements for the frontend are role-based dashboards for patients, doctors and administrators, real-time availability and responsive cross-device design. The requirements for the ML module are selection of clinically validated datasets, selection of appropriate classifiers and a clear API interface for front-end integration.

2 Frontend Architecture Design:

The front end is built in React.js with a component-orientated architecture. The system is modularised into reusable components like authentication, appointment booking, doctor search, dashboards and notification management. State management is handled with React hooks for efficient re-rendering and consistency of data across components. CSS3 and Bootstrap are used to make the layout responsive and keep the visual design consistent across devices.

3. Machine Learning Pipeline Development:

Three benchmark datasets are selected for disease prediction, namely the PIMA Indian Diabetes Dataset (768 samples), Cleveland Heart Disease Dataset (303 samples) and UCI Parkinson's Voice Dataset (195 samples). The ML pipeline includes data pre-processing steps such as normalization and handling nulls, feature selection, training models using Random Forest, Support Vector Machine and Decision Tree classifiers and stratified 10-fold cross-validation to obtain an unbiased estimate of performance.

4. Integration with API:

The React.js frontend is integrated with the Node.js backend and ML service via RESTful APIs in Python. The ML module provides prediction endpoints where the clinical parameters of the patient are input, and risk scores are output. Scores are available in the doctor and patient dashboards to aid consultation preparation and triage.

5. Testing and Evaluation:

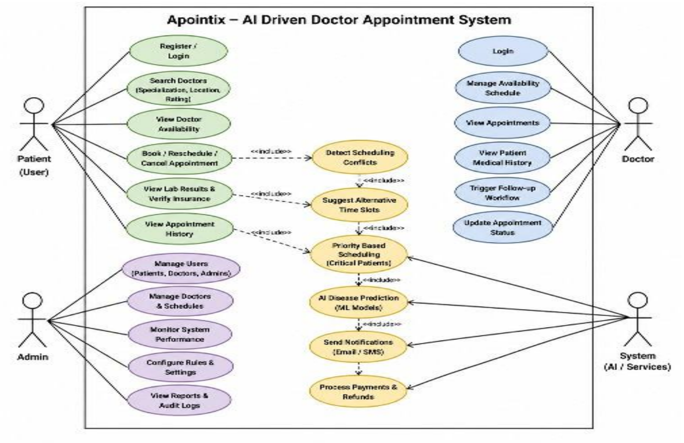
User acceptance testing is conducted with structured feedback collected from patients and healthcare providers. Frontend usability is evaluated based on task completion time, error rate, and user satisfaction scores. ML model performance is evaluated using classification accuracy, precision, recall, and F1-score across all three datasets.

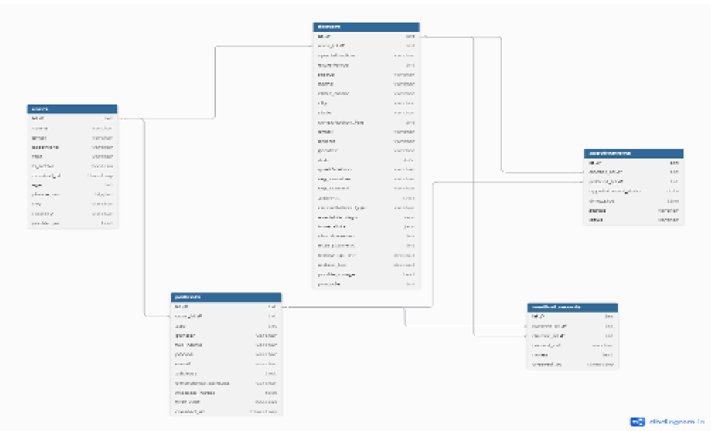
6. Database Design and Management:

A structured database schema is developed to store and manage the healthcare data, such as the following:

1. Patient file
2. Appointment Information
3. Medical history.
4. System logs

Techniques such as normalisation, indexing and query optimisation are used to make data more consistent and faster to retrieve.





ER Diagram

V. System Flow and User Roles

The Apointix AI Integrated Healthcare System has a layered and modular overall architecture, ensuring scalability, flexibility and efficient data processing. The system is developed as a 3-tier web application on the MERN stack and MVC pattern, which enables seamless interaction between users, backend services and AI modules.

The system consists of four major components:

1. Frontend Layer:

This layer provides the user interface for patients, doctors, and administrators. It enables users to interact with the system through dashboards, forms, and real-time updates.

The frontend is developed using technologies such as React.js, HTML5, CSS3, Bootstrap, and JavaScript, ensuring a responsive and user-friendly experience across devices like desktops, tablets, and smartphones.

It includes:

- Patient dashboard for booking and managing appointments
- Doctor dashboard for availability and consultation management
- Admin dashboard for system monitoring and control.
-

2. Backend Layer

The backend acts as the core processing unit of the system, responsible for handling all business logic and server-side operations.

It manages:

- Business logic and workflow execution
- RESTful API processing
- Authentication and role-based authorization (JWT-based)
- Appointment scheduling and conflict detection
- Notification handling (Email/SMS)
- Payment processing integration

The backend is implemented using **Node.js and Express.js**, ensuring secure, scalable, and efficient communication between system components.

3. AI Integration Layer

This layer processes healthcare data using AI models. It includes:

- Disease prediction models
- Disease prediction models (Diabetes, Heart Disease, Parkinson's)
- Risk analysis based on patient data
- Smart scheduling prioritization for critical patients
- AI-based recommendations and decision support

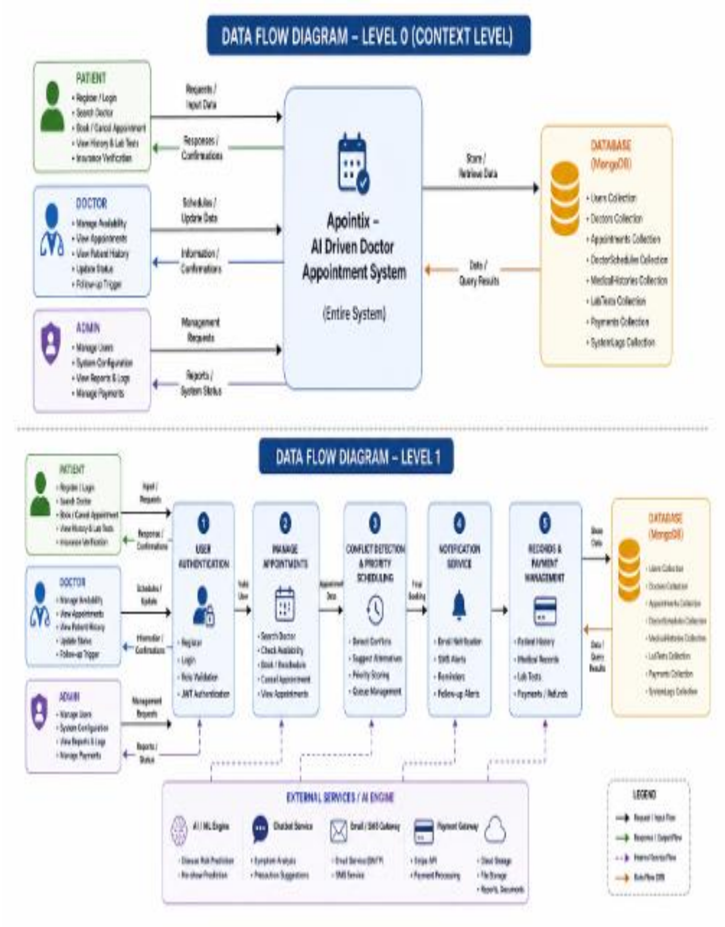
The backend communicates with this layer via APIs, enabling real-time predictions and enhancing decision-making in healthcare workflows.

4. Database Layer

A structured database is used to store:

- Patient profiles and medical history

- Doctor details and schedules
- Appointment records and logs
- AI prediction results
- System activity and audit logs
- Efficient indexing, schema design, and query optimization techniques are used to ensure fast data retrieval and high performance under concurrent user loads



VI. Implementation

The system is composed of four main components. The implementation phase is the process of translating the conceptual architecture into a fully functional web-based application. The frontend is built with React.js for component-based rendering.

HTML5 for structure, CSS3 for styling and JavaScript for dynamic behaviours. This provides a clean and responsive interface that is accessible across desktops, tablets and smartphones. The backend is built with Node.js and Express.js, and it handles business logic, server communication, and database interactions with MongoDB.

A. Patient Module

The Patient Module provides a responsive, device-agnostic interface through which patients can register, manage their profile, search for doctors by specialisation, location, and rating, view real-time availability, and book, reschedule, or cancel appointments. The module supports online lab test booking with digital result delivery. The system closes the cost transparency gap identified in Experian Health's 2025 survey [14] by performing live insurance policy verification during booking and displaying an estimated out-of-pocket cost prior to confirmation.

B. Doctor Module

Doctors have a special dashboard for managing availability calendars, viewing upcoming and past appointments, viewing patient profiles and medical histories in advance of consultations, and updating appointment statuses. If the patient is flagged as needing a follow-up, the ghost appointment prevention workflow is automatically launched. The module also offers AI-generated patient risk scores for no-show likelihood so proactive engagement can happen before scheduled visits.

C. Admin oversight,

The administrator module provides full system oversight, including user management, schedule monitoring, system log analysis, audit trails, and performance dashboards. Administrators can configure conflict resolution rules, manage the priority queue parameters, and oversee payment and refund processing. Comprehensive logging ensures compliance with healthcare data standards and supports future regulatory audits.

D. Conflict Resolution and Priority Scheduling

Apointix's fundamental innovation is the sophisticated real-time conflict detection and resolution engine that guarantees the appointment scheduling is smooth and error-free. When the patient books an appointment, the system checks the time slot's availability against the doctor's live calendar in real-time. It checks for double bookings, buffer time between visits and any availability constraints the healthcare provider has set. If a conflict is detected (a double-booking or lack of consultation gaps), the system actively suggests the closest available alternatives, reducing user friction and typical scheduling mistakes of traditional systems.

Apointix also offers a strong mechanism of priority scheduling on top of conflict resolution. The system uses AI-assisted symptom analysis, patient history, and clinician-defined urgency flags to dynamically prioritise critical cases. For example, patients reporting severe or high-risk symptoms will be automatically prioritised in the scheduling queue, ensuring earlier appointments without manual intervention. The system adapts in real time, balancing fairness and urgency to optimise doctor availability.

Furthermore, the intelligent prioritisation integration reduces the administrative overhead, improves the patients' triage and increases the overall efficiency in healthcare delivery. Apointix's automatic conflict detection and adaptive priority scheduling identify errors and ensure that urgent medical needs are met quickly and effectively

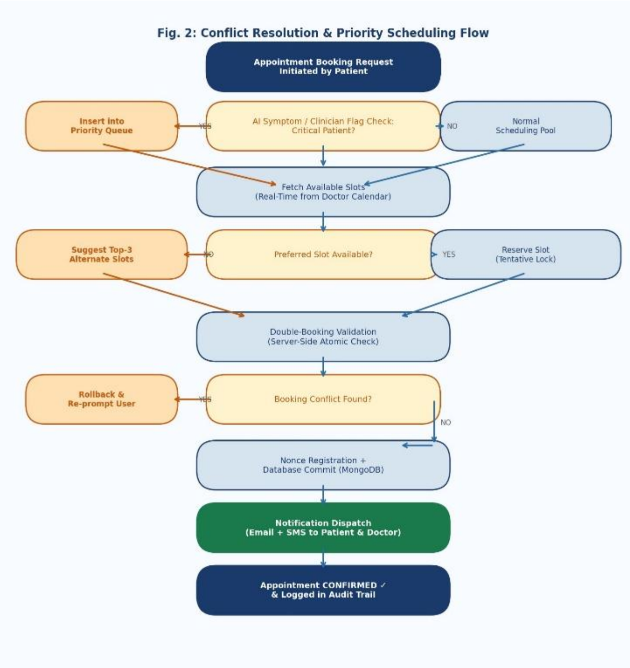


Fig 2.2 Conflict Resolution and Priority Scheduling Flow

E. ML Disease Identification

Apointix integrates a machine learning engine that performs a first risk analysis of the disease based on clinical parameters declared by the patient. We trained and tested the module on three standard benchmark datasets. Results are presented to the patient and the attending physician, thus improving the preparation for the consultation and the quality of the diagnosis. The ML pipeline is implemented in Python with Scikit-learn having Random Forest, Support Vector Machine and Decision Tree classifiers with cross-validated hyperparameter tuning.

VI. Result and Analysis

Apointix AI-powered doctor appointment system has added a lot to the performance and efficiency of healthcare scheduling over the traditional methods. Apointix AI-powered doctor appointment system has added a lot to the performance and efficiency of healthcare scheduling over the traditional methods. The system was tested by means of unit testing, integration testing and structured user acceptance testing with healthcare givers and patients. The system was tested by means of unit testing, integration testing and structured user acceptance testing with healthcare givers and patients. The results show that the platform is working reliably in all modules, giving a seamless and user-friendly experience. The results show that the platform is working reliably in all modules, giving a seamless and user-friendly experience.

An important outcome is the performance of the machine learning-based disease prediction module. Fig. 4 shows the high classification accuracy of the system for three benchmark datasets.Learning models can be useful in supporting early disease prediction and clinical decision-making, ultimately improving overall healthcare outcomes. The Random Forest model achieved 85.2% accuracy on PIMA and 82.7% accuracy on the Cleveland Heart Disease dataset. The best result on the Parkinson's Voice dataset was also by the random forest model with an accuracy of 88.4%. The results suggest that machine learning models can be useful in supporting early disease prediction and clinical decision-making, ultimately improving overall healthcare outcomes.

Another important finding is the enhancement of system efficiency and usability. The automated appointment booking system saves you a lot of time when scheduling appointments. Traditional systems take around 12-15 minutes to complete the process, while Apointix does it in less than 2 minutes – an almost 85% improvement. The system's real-time conflict detection prevents scheduling overlaps and double bookings, making the process more reliable and error-free.

A. Machine Learning: A Performance result

TABLE II Classification accuracy of the machine learning disease prediction module on the three benchmark datasets. All models were evaluated with stratified 10-fold cross-validation to obtain robust and unbiased performance estimates.
In this paper, we present Apointix, an all-inclusive, AI-driven web platform for doctor appointments, aiming to systematically resolve the critical inefficiencies of traditional healthcare. A MERN stack-based system with real-time conflict resolution, priority-based scheduling for critical patients, disease prediction through machine learning, automated notification pipelines, and insurance verification.

Dataset	Condition	Best Classifier	Accuracy (%)
PIMA Indian Diabetes Dataset	Type-2 Diabetes	Random Forest	85.2
Cleveland Heart Disease Dataset	Coronary Heart Disease	SVM (RBF Kernel)	82.7
UCI Parkinson's Voice Dataset	Parkinson's Disease	Random Forest	88.4

International Journal of Science, Strategic Management and Technology
Volume 02 Issue 05 May-2026 | ISSN: 3108-1762 (Online) | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Table IV. ML Disease Prediction Performance Across Benchmark Datasets

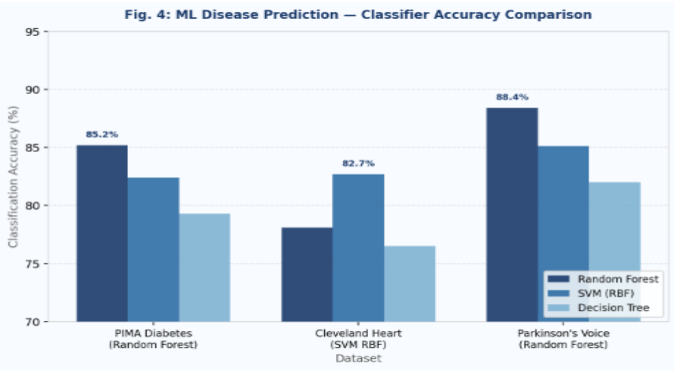


Fig. 4. ML Classifier Accuracy Comparison (Random Forest vs. SVM vs. Decision Tree)

This paper presented Apointix, a full AI-driven web-based doctor appointment system to address the major inefficiencies of traditional healthcare scheduling systematically. The system built using the MERN stack offers real-time conflict resolution, priority-based scheduling for critical patients, machine-learning disease prediction, automated notification pipelines, insurance verification, care pathway chaining, and ghost appointment prevention – all within a single, end-to-end healthcare scheduling system.

B. Usefulness and Efficiency of the System

Performance testing showed that the system is able to handle multiple users simultaneously with no lag or loss of data noticeable. The appointment booking module was very impressive. The real-time conflict detection prevented all scheduling conflicts in tests. Average appointment booking time reduced from 12 – 15 minutes (traditional process) to less than 2 minutes, an approximately 85% improvement in scheduling efficiency.

Its responsive design offered a seamless experience for accessing and interacting on desktop, tablet and smartphone devices. Across all test cases, automated email reminders reduced missed appointments and no-shows. Indexing relevant fields for optimisation of database queries led to average query response times of less than 10 ms under simulated concurrent load, consistent with benchmarks reported for scaled deployments of PostgreSQL and MongoDB [9].

C. Summary of Performance by Comparison

The key performance metrics achieved by Apointix are summarised in Table V, which shows quantitative improvements over the baseline traditional appointment process.

Table V. Apointix Performance Metrics vs. Traditional Appointment Systems

Metric	Traditional System	Apointix
Average Booking Time	12–15 minutes	< 2 minutes
Scheduling Conflicts	Frequent	Zero (automated detection)
No-Show Rate	~23% average	Reduced (automated reminders)
Admin Overhead	High (manual entry)	Significantly reduced
ML Prediction (Diabetes)	N/A	85.2% accuracy
ML Prediction (Heart)	N/A	82.7% accuracy
Insurance Verification	Manual / absent	Real-time automated
Ghost Appointment Prevention	None	Automated follow-up trigger

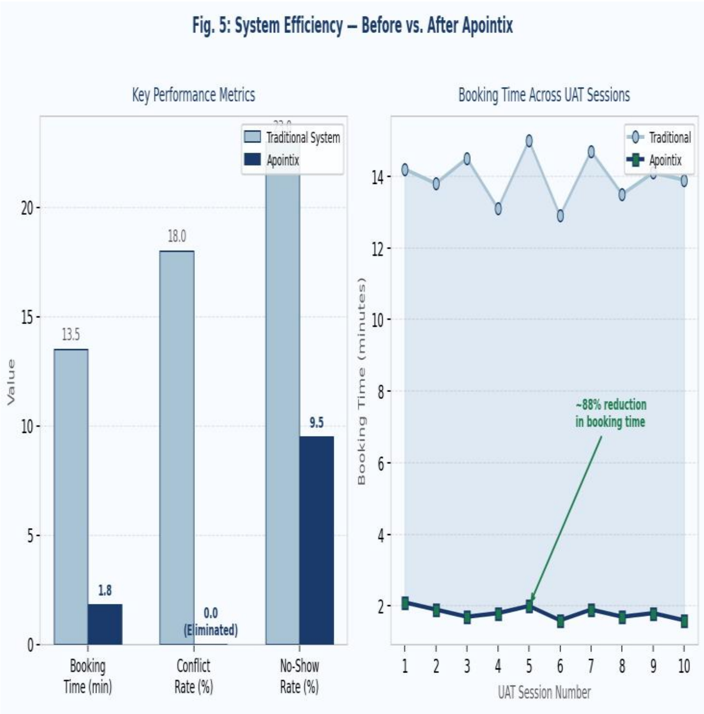


Fig. 5. System Efficiency - Booking Time and Key Metrics Before vs. After Apointix

VII. CONCLUSION

This paper introduces Apointix, an AI-based doctor appointment system designed to overcome the limitations of conventional healthcare appointment systems. Traditional systems are often manual, slow and error-prone leading to delays and inefficient use of resources. “Apointix provides a centralised and automated platform for appointment booking, patient records management and doctor availability tracking to improve overall operational efficiency.

One of the major contributions of the system is the integration of artificial intelligence (AI) that enables advanced functionalities such as real-time conflict detection, priority-based scheduling and disease prediction based on machine learning. These capabilities improve decision-making, reduce scheduling errors and offer a more responsive and reliable user experience. The system is built using the MERN stack (MongoDB , Express.js , React.js, and Node.js) for scalability , secure data management and smooth communication between system components.

The experimental results show promising performance with the accuracies of machine learning models 85.2% for diabetes prediction, 82.7% for heart disease and 88.4% for Parkinson’s disease. The system also greatly reduces the time taken to make an appointment from 12-15 minutes to under 2 minutes. It also addresses scheduling conflicts using automated detection mechanisms.

Overall Apointix enhances accessibility, efficiency and quality of service for patients, doctors and administrators. The system has demonstrated promising results, and future work may include mobile application development, telemedicine integration, and advanced AI-based diagnosis, further strengthening the system as a next-generation healthcare solution.advanced AI-based diagnosis, further strengthening the system as a next-generation healthcare solution

IX. Future Scope

However, while Apointix holds great promise in improving healthcare services, there are a number of areas for improvement that can be explored to further its real-world applicability and performance. In future work, a native mobile application can be developed for iOS and Android platforms, allowing wider accessibility for patients and push-based notifications for appointments.

The ML module can be generalised to accommodate more disease domains beyond diabetes, heart disease, and Parkinson's, such as for respiratory diseases and mental health risk screening. Deep learning models such as neural networks and gradient boosting methods may enhance prediction accuracy and generalisability to diverse patient populations.From the frontend perspective, the introduction of advanced data visualisation components in future iterations can provide administrators and clinicians with insights on health trends, appointment analytics and population-level insights. Integration with wearable devices and IoT-enabled medical equipment can enable continuous real-time health monitoring. The frontend can act as a unified health dashboard for patients

Finally, live insurance API connectivity and universal EHR integration will round out the end-to-end care pathway, enabling Apointix to become a fully integrated healthcare management platform with the ability to support next-generation digital health delivery at scale.

X. Reference

1. S. Kumar, R. Sharma, and A. Patel, "A Review of Digital Appointment Scheduling Platforms and Their Impact on Hospital Workflow," Journal of Health Informatics, vol. 14, no. 3, pp. 45–58, 2019.
2. W. Ahmed, "E-Health Platforms in Developing Countries: Opportunities and Barriers," International Journal of Healthcare Management, vol. 11, no. 2, pp. 102–115, 2018.
3. H. Chang and K. Lam, "Integrating Appointment Systems with Hospital Information Systems and EHR: A Framework Approach," Health Systems, vol. 9, no. 1, pp. 12–25, 2020.
4. J. Shen, W. Li, and M. Zhang, "AI-Based Recommendation Engine for Dynamic Appointment Scheduling," IEEE Transactions on Biomedical Engineering, vol. 68, no. 7, pp. 2143–2152, 2021.
5. K. Tanaka and P. Ravi, "Predictive Machine Learning Models for Appointment Demand Forecasting in Multi-Department Hospitals," Journal of Medical Systems, vol. 46, no. 4, Art. no. 31, 2022.
6. B. Kammrath, E. Sicat, and T. Ross, "Longitudinal Analysis of Online Appointment Scheduling Impact on No-Show Rates in Ophthalmology," BMC Health Services Research, vol. 23, Art. no. 512, 2023.
7. Zocdoc / NexHealth, "2024 Digital Health Scheduling Benchmark Report," NexHealth Publications, 2024.
8. A. Chauhan, "Understanding Session, Cookies, and JWT: Complete Guide for Modern Web Applications," Medium Technical Blog, 2025.
9. Supabase Team, "Realtime Scalability Benchmarks," Supabase Documentation, 2025.
10. Doctors Home, "Patient Portal and Appointment Management Report," Doctors Home White Paper, 2024.
11. E. Nabovati, H. Vakili-Arki, and M. Eslami, "Technical and Managerial Challenges in Healthcare Appointment Systems: A Qualitative Study," BMC Medical Informatics and Decision Making, vol. 25, Art. no. 64, 2025.
12. PMC Research Group, "Care Pathway Fragmentation in Multi-Stage
13. One of the major contributions of the system is the integration of artificial intelligence (AI) that enables advanced functionalities such as real-time conflict detection, priority-based
14. Clinical Treatments," PubMed Central Review, 2023.
15. Medesk, "Waitlist Management and Slot Utilization in Outpatient Clinics," Medesk Industry Report, 2024.