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HOSPITAL PRE-BOOKING AND MANAGEMENT SYSTEM

[1]Abhijith R, [2]Abhijith S, [3] Akshay G, [4]Arjun P R, [5]Betsy Joy

[1]Student, [2]Student, [3]Student, [4]Student, [5]Assistant Professor (CSE)
Computer Science and Engineering Department,
Nehru College of Engineering and Research Centre (NCERC), Thrissur, India

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Abstract - The hospital pre-booking and management system is a software solution designed to revolutionize hospital operations by enabling online appointment booking, efficient scheduling, and resource optimization. The system allows patients to book appointments with ease while providing healthcare providers with tools to manage schedules and coordinate resources effectively. With integration into electronic health records (EHR), it ensures seamless access to patient information, enhancing clinical decision-making and communication. The system also includes automated reminders and patient communication features to reduce no-shows and improve engagement. By automating administrative tasks and optimizing resource utilization, this system aims to improve hospital efficiency, reduce patient wait times, and ultimately elevate the quality of healthcare delivery. Efficient management of doctor appointments and availability is crucial for ensuring timely and effective healthcare delivery in hospitals. This project proposes the development of an intelligent reservation system tailored for hospitals, aimed at streamlining the scheduling process and enhancing patient experience. The system will leverage advanced algorithms and real-time data to provide accurate information on doctor availability, appointment timing, and specialty-specific scheduling.

Keywords: Efficient, Booking appointments, Management

1. INTRODUCTION

A hospital pre-booking and management system project represents a pivotal advancement in the healthcare administration, offering a comprehensive solution to reduce challenges faced by hospitals and medical facilities. From facilitating seamless appointment scheduling for patients to ensuring efficient management of extensive patient records involved in hospital management.

In today's fast-paced world, efficient management of hospital resources and timely patient care are crucial. To address this need, we introduce the Hospital Pre-Booking and Management System. This system aims to streamline the hospital workflow by allowing patients to pre-book appointments, manage their medical records, and help hospital staff efficiently organize resources. The system offers a user-friendly interface for both patients and hospital staff. Patients can easily book appointments with their preferred healthcare providers through a mobile app or a website. They can also receive notifications for upcoming appointments, reducing the likelihood of no-shows. Additionally, patients can view and manage their appointment history, helping them stay informed about their healthcare journey. For instance, it can connect with electronic health records (EHR) to provide healthcare providers with real-time patient information, ensuring continuity of care. The system can also generate reports and analytics to help hospital administrators make data-driven decisions about resource allocation and staffing.

2. LITERATURE REVIEW

[1] Mobile application for hospital management systems, in our modern life the development of new innovations in the Technology field has brought a great motivation for the researchers and the developers in various fields. There are enormous applications in the field of IOT regarding healthcare with base software, sensing, communicating devices via wireless. This system is to mainly support the real time application to gather and transmit the medical data regardless of the physical location among IEEE802.15.4 wireless network and CDMA cellular network for hospital and home environments. The IOT enables us to monitor various medical parameters by using a computer network, cloud computing, smart sensors and monitors in the field of health care so that it improves to detect the disease and also provide the required methodologies for treatment. This proposed system is used to include the hospital resource management not including pre-booking.

[2] A study on the construction of a cloud-based patients accessible hospital management system, Patients Accessible Hospital information system (PAHIS) is a computer application system based on cloud computing and used for both doctors and patients to deal with information management and online operation in hospital management and medical activities. It can provide integrated management about human flow, goods flow, money flow of the hospital and its affiliated units. Meanwhile, it can use some methods of collection, storage, processing, extraction, transport, aggregation to make all of that data that covers every step of medical activities generate a variety of information. Therefore, it can provide a comprehensive, automated management information system which provides a variety of services (Yin et al., 2006). This proposed system does not include features like doctor login, booking appointments etc.

[3] Hospital queuing recommendation system based on patient treatment time. Nowadays, the patient overcrowding and ineffective management of the patient queue are the major problems faced by the hospitals. Managing the patient queue and predicting the wait time of the patients in the hospital has become a difficult job because each of the patients may need to undergo different kinds of operations, such as general checkup, CT scanning, sugar level test, blood test, X-ray, minor surgery etc., during their treatments. In this paper, each of these phases or operations is referred to as treatment tasks or tasks.The

proposed system schedules waiting time, but it does not include doctor selection according to patient choice, pre-booking of appointments etc.

[4] e Sayana: A Web Based Clinic Appointment System for MOH Clinics in Sri Lanka, Hospital Management Information Systems (HMIS) typically comprises a set of cohesive modules to cater to clinical and non-clinical workflows at a hospital. The interface for transaction management in HMIS includes various service areas such as patient registration counters, bill payment counters, laboratory test requisition, sample collection or report collection counters, pharmacy counters, as well as patient waiting areas for out-patient visits and appointments. Management of high patient loads in such areas is a challenge and efficient systems are needed, especially at tertiary care facilities. With increasing availability of mobile devices and ubiquitous technologies, the need for a smart and streamlined Queue Management System (QMS) has become imperative for improving patient experience and optimizing performance metrics for hospitals for streamlined healthcare service delivery. This proposed system failed to include login options for users such as doctors, patients etc.

[5] A Doctor Recommendation Algorithm Based on Doctor Performances and Patient Preferences, With the popularization and rapid development of Internet, the Internet services have pervaded every aspect of people's lives. Shanghai Medical League Appointment Platform (hereafter called appointment platform) is such a unified appointment platform established for the difficult problem of registration. It is set up under the Medical League Project hosted by the development center of Shanghai Shenkang hospital. Now the platform has covered 35 municipal hospitals and 5525 specialists to appoint. However, lots of patients, especially the first-time patients, are bothered by how to choose a right doctor when there are so many doctors for reservations online. Besides, the appointment platform has a problem of "reservation imbalance".This system includes doctor recommendation as per patient preference but does not include login option for doctors.

[6] Mobile augmented smart queue management system for hospitals, Hospital Management Information Systems (HMIS) typically consist of a set of cohesive modules to cater to clinical and non-clinical workflows at a hospital. The interface for transaction management in HMIS includes various service areas such as patient registration counters, bill payment counters, laboratory test requisition, sample collection or report collection counters, pharmacy counters, as well as patient waiting areas for out-patient visits and appointments. Management of high patient loads in such areas is a challenge and efficient systems are needed, especially at tertiary care facilities. With increasing availability of mobile devices and ubiquitous technologies, the need for a smart and streamlined Queue Management System (QMS) has become imperative for improving patient experience and optimizing performance metrics for hospitals for streamlined healthcare service delivery.

[7] A hospital resource and patient management system based on real time data capture and intelligent decision making. Since the 1960s hospitals have deployed information systems for effective operations, routine administrative and managerial tasks, and for tactical and strategic healthcare planning. The acquisition and ready retrieval of information when needed has enabled hospitals to operate as lean and agile enterprises, minimizing both operational and capital costs by increasing efficiency while improving on patient care and other aspects of service delivery. However, the pressure on hospitals to square two conflicting objectives continues to grow, especially in the current times of economic recession in some parts of the world and significant stresses on personal and public finances. These two conflicting goals are the needs to optimize both operations and patient care: optimizing care and providing the latest clinical procedures, technologies, medicines and services to meet the needs and expectations of the aging population all imply sizable new costs that had not hitherto existed.

[8] A Smartphone based Application to Improve the Health Care System of Bangladesh, Health care is a basic need of every human being. In Bangladesh the healthcare system is mainly provided by the government with little or no charge. But this comes with many complications. The huge number of patients makes it difficult for the government hospitals to provide them with quality health care. As a result, thousands of private hospitals are established with a view to meet the growing need of the masses for quality health care. But when one wishes to take service from a hospital, he first tries to collect some information about that hospital. This information is not only hard to find but also difficult to understand in some cases. Especially when people from rural areas come to urban areas for better health care service, they find it very difficult to choose a suitable hospital. Besides, when comparing a number of hospitals for finding better alternatives, it poses some complexities.

3. PROBLEM STATEMENT

The "Hospital Pre-Booking and Management System" is designed to address the complexities and inefficiencies associated with scheduling medical appointments, managing patient information, and coordinating resources in a healthcare setting. The goal is to improve patient experiences, streamline administrative processes, and enhance overall operational efficiency. Healthcare facilities often struggle with managing patient appointments, handling walk-ins, coordinating resources, and maintaining patient records. Limited Accessibility means many existing systems lack multiple channels for appointment booking, such as online portals, mobile apps, or automated phone systems, making it challenging for patients to schedule appointments conveniently. Poor User Experience means Clunky interfaces, long wait times, and complex booking processes contribute to a poor user experience, discouraging patients from using the system and leading to frustration.

4. PROPOSED SYSTEM

A hospital pre-booking and management system allows patients to schedule appointments online, improving efficiency and reducing wait times. Online Appointment Scheduling provides patients with the ability to book appointments with doctors and specialists through a user-friendly web or mobile interface. Health Records Management is used to centralize storage and management of patient medical records, including past diagnoses, treatments, and prescriptions. Reporting and Analytics includes comprehensive

reporting and analytics capabilities to track key performance indicators and identify areas for improvement.

This paper includes 6 major modules. These modules show a detailed overview of our hospital pre-booking and management system. The modules are:

1. User Authentication Module: This module manages user accounts, authentication, and access control to ensure secure access to the system. Establish user roles and authentication methods, such as username/password or 2FA.

2. Appointment Scheduling Module: Allows patients to book appointments with doctors based on availability. Implement calendar integration for managing available time slots. Design a user-friendly interface for patients to request appointments. Set up automated notifications for appointment reminders and staff alerts.

3. Patient Registration Module: Enables registration of new patients into the system. Create a secure registration form for patients. Implement validation checks to ensure data accuracy. Store patient information securely in compliance with regulations like HIPAA.

4. Doctor Management Module: Maintains a database of doctors, including their specialties, availability, and contact information.

5. Medical Records Management Module: Facilitates the storage and retrieval of electronic health records (EHR) for patients.

6. Reporting and Analytics Module: Generates various reports related to appointments, patient demographics, revenue, and other key metrics.

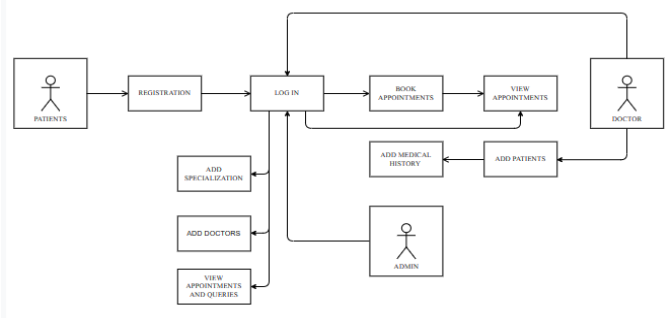

Fig 1: System Architecture

5. RESULTS AND DISCUSSION

The implementation of a hospital pre-booking and management system has yielded significant benefits in streamlining patient care and resource allocation. Through this system, patients can schedule appointments in advance, reducing waiting times and optimizing the utilization of medical staff and facilities. Overall, the adoption of a hospital pre-booking and management system represents a transformative step towards modernizing healthcare delivery and enhancing the quality of service provided to patients.

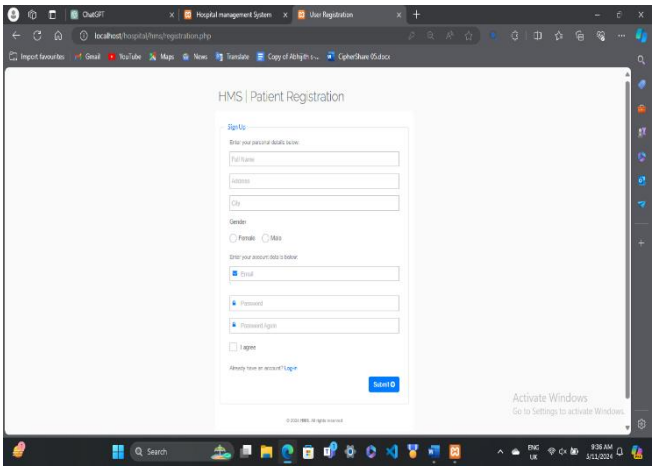

Fig 2: Patient Registration Page

The above screenshots show our patient registration (sign up) page through which patients can register into our website using their id and creating a password. Then they can login into the website using this id and password, anyone who forgot their password can create a new password by clicking the forgot password option.

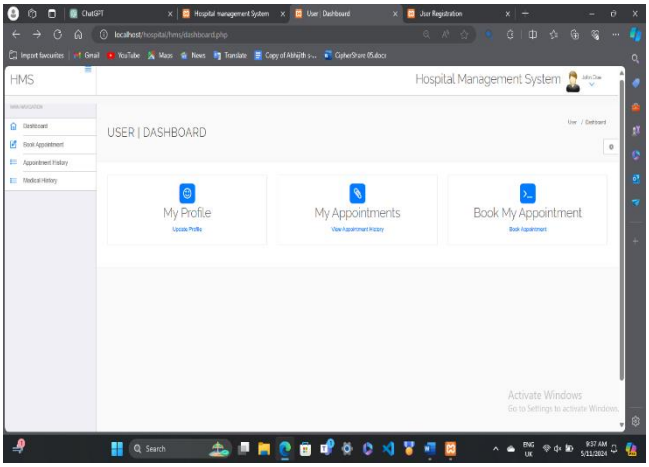

Fig 3: User Dashboard Page

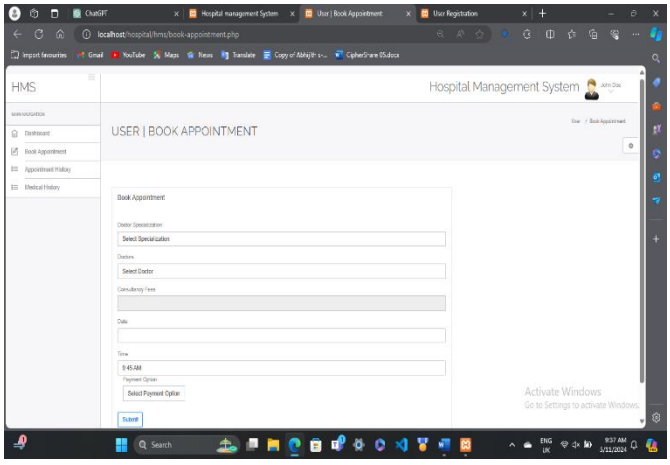

Fig 4: User Booking Appointment Page

The above screenshots show a user dashboard page for the users who completed the login process. In this page users can book appointments, view and cancel their appointments and also, they can edit their profile.

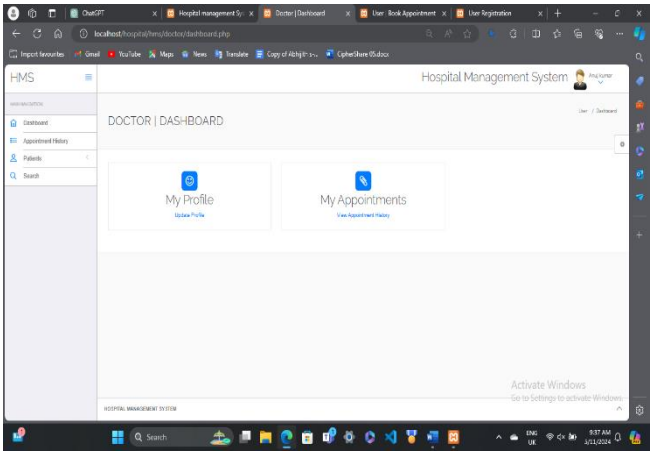

Fig 5: Doctor Dashboard Page

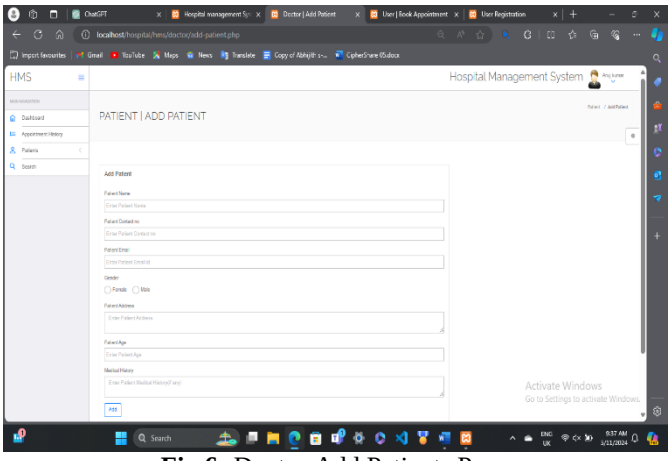

Fig 6: Doctor Add Patients Page

The above screenshot shows the doctor dashboard page. Doctors are added into our system by admin. Doctors can log in to the website using the id and password provided by the admin. Doctors can add patients into their patients list.

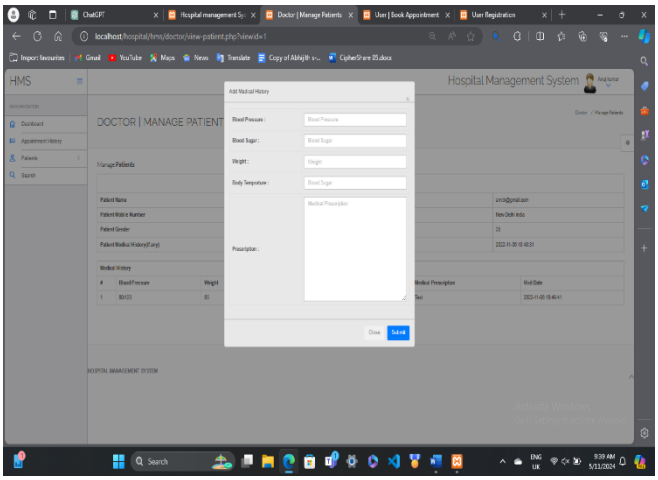

Fig 7: Doctor Add Medical History Page

The above screenshots show the doctor can manage his/her patients by viewing the appointments and also doctors can add essential medical history of the patients which can be also viewed by the patients.

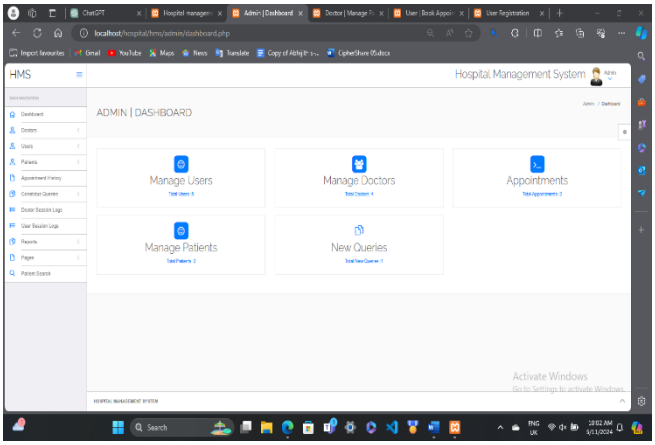

Fig 8: Admin Dashboard Page

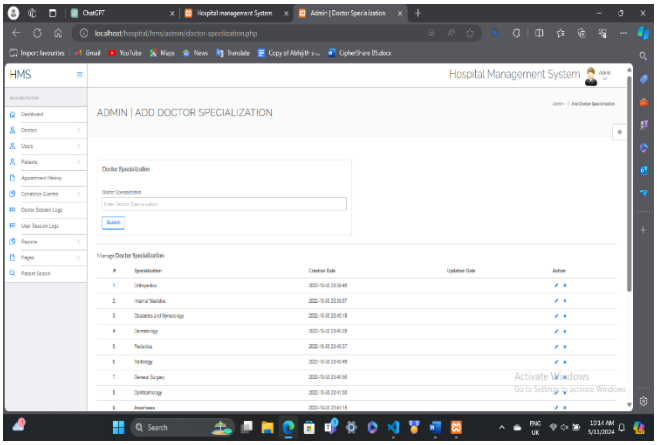

Fig 9: Admin Add Specialization Page

The above screenshots show the admin dashboard. Admin was the first person entered into the website. He/she was the person adding or removing specializations in our system.

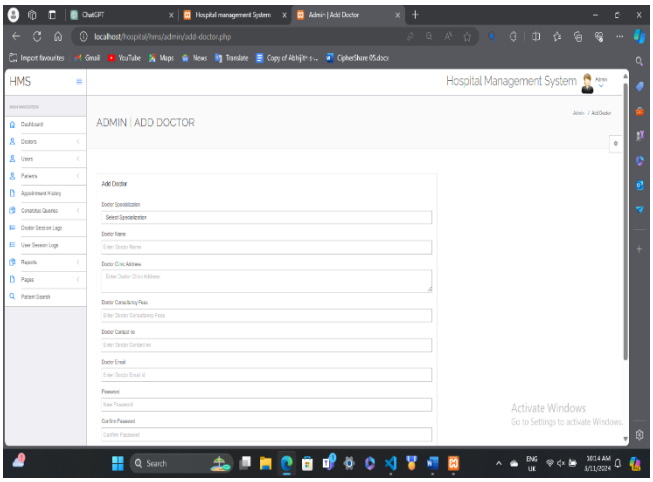

Fig 10: Admin Add Doctors Page

Admin is the person adding the doctors into the system and providing id and password to the doctors. He can also manage patients and doctors in our system. Admin can remove or update doctor details. They can also manage queries and also the contact and about us pages. They can also view the doctor and patients' session logs. They can also view the between dates reports. Admins are the controllers of users and doctors on our website.

6. CONCLUSION

In conclusion, the hospital pre-booking and management system project presentation has established the need to improve healthcare administration processes. By making use of advanced features, such as online booking platforms and proper management systems, hospitals can enhance efficiency and improve patient experiences. The hospital pre-booking and management system promises a transformative solution to streamline patient care. By enabling appointments in advance, it reduces wait times and enhances efficiency. Through robust management tools, it optimizes resource allocation, ensuring smooth operations. In conclusion, this system stands as a pivotal advancement in healthcare administration, fostering a more organized and patient-centric approach to hospital management.

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