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RESEARCH PAPER

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APP FOR ONLINE OPD APPOINTMENT AND HOSPITAL MANAGEMENT SYSTEM

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Abstract: The purpose of the project is to implement an online database system that caters the doctor appointment scheduling, reservation and records management of consultation for a hospital or clinic. In this era of pandemic, medical clinics and hospitals imposed strict guidelines on the number of people who can enter their facility. Consultations to doctors are also very limited and can facilitate a limited number of patients. The online system for appointment and consultation is one of the solutions that can be used in order to give the people a way on how to contact their doctors and reserve an appointment for consultation. The implementation of the said project will help hospitals and clinics provide better client management while ease and comfort is the advantage on the patient end. The analysis and implementation result shows that the project is feasible and implementation is highly recommended by the researchers.

Keywords: OPD appointment, Online doctor consultation, web application.

I. INTRODUCTION

Traditionally, medical appointments were made with schedulers over the telephone or in person. These methods are based on verbal communications with real people and allow for maximum flexibility in complicated situations. However, because these traditional methods require the intervention of schedulers, the ability to get a timely appointment is not only limited by the availability of appointment slots, but also by the schedulers and phone lines. Patients' satisfaction with appointment booking is influenced by their ability to book at the right time with the right health service providers.

The Internet has recently emerged as another means to make appointments. Several studies conducted satisfaction surveys and found that Web-based appointment scheduling is an extremely important feature, and most patients would use the service again.

There are two major types of Web-based medical appointment services, medical scheduling software as a service (SaaS) and proprietary Web-based scheduling systems. Medical scheduling software as service has gained increasing prominence in recent years. These appointment systems are not built up by health care practices themselves, but are provided and maintained by health IT companies on a paid subscription basis. The appointment services are cloud-based and can be integrated into health care providers' own management systems. The other type of appointment service is proprietary appointment systems, which are integrated into patient portals on providers' websites. A patient portal is a secured Web-based service that allows patients to access their health information and communicate with their health care providers at any time.

There are two modes of Web-based appointment systems, asynchronous and real-time. In the asynchronous mode, appointments are requested through emails or electronic forms on providers' websites, and then manually processed by schedulers. In the real-time mode, patients can directly interact with providers' scheduling management systems. Although the asynchronous Web-based appointment

systems also use the Internet as a medium, they basically replicate the process of telephone-based appointment scheduling. Under the asynchronous mode, if an appointment is requested outside of a provider's business hours, it will not be processed until schedulers return to work. Normally, Web-based appointment requests are put in the same queue as phone-call appointments, and are thus limited by the backlog of phone calls in the queue.

II. LITERATURE SURVEY

Choudhari et al (2019) proposes an Android Application for Doctor's Appointment. The proposed system consists of two main panels which include the patient, the patient can register with the system, login into the system. After logging into the system, the patient can see a list of available doctors and click on any available doctor to view the profile of the doctor and access the doctor schedule, and can send a request for an appointment. The doctor on the other hand will be able to view requests from patients and can respond to patient requests by either accepting the request or rejecting the request. The system will then notify the patient as to the response from the doctor and get notification 2 hours before the actual appointment which will be very useful in case the patient tends to forget the appointment. However, the research does not integrate medical consultation.

Jain et al (2020) "Design and implementation of a clinic appointment registration system", designed and implemented a desktop-based .NET application for clinic appointment registration with the use of MS Access as the database for keeping medical records. The operational function of the system includes appointment registration, data management (Data addition, deletion and searching) and data backup and recovery. The research is based on the following sections: the introduction into the system, the second section is based on the system requirements analysis where the functional requirement analysis and the technical requirement analysis are specified, the third section was the system design where the system function modular design, and database design, the last section of the research work is the System implementation. Because of the inadequate teaching equipment, the functionality of online credit card payment was not implemented.

Zhan and Liu (2020) proposed Android Application of patient Appointment System, the system is a mobile based for medical appointment. The focus and scope of this research work is to provide communication between the patient and the doctor, whereby a patient can schedule appointment with the doctor as per the doctors' availability, patient can also interact with doctor through a message system. Modules in this research work include the patient registering, login, search for available doctor, request for appointment. The server generates a QR code for the patient and accept the appointment, the doctor also login, and scan the QR code generated for
the patient and also view patient details. The research work does not take into consideration the online medical consultation.

Mahalakshmi, et al (2020) proposed an Online Appointment Reservation and Scheduling for Healthcare, this research work show the Different types of Appointment Scheduling, also Show the study between the traditional appointment reservation and scheduling system, also the software architecture for online appointment reservation and scheduling system were enlisted which include; Features of online appointment reservation and scheduling (Schedule appointment, Reschedule appointment, Check doctors availability, send reminder message, view patient information cancel appointment), practical flow of an online appointment structure, functionality of the appointment system. However, the research work was not implemented on any platform.

III. PROBLEM STATEMENT

A web application has to be developed for booking an online appointment for Out Patient Consultation (OPD) at a hospital. The app should be having a feature to be integrated with the existing Integrated Hospital Management System which is developed in React and MongoDB environment.

IV. OBJECTIVE

The main objective of this paper is to propose an Online OPD appointment and hospital information system suitable to the likes of both patients and doctors.

It is not possible for everyone to attend a physical appointment with a doctor given the pandemic and the strict rules and regulations that rightfully need to be followed. So it becomes imperative to have a system that allows the patients to book appointments online and give them a choice to have online consultation or in-person appointment.

The proposed system is to meet the following aims:-

- Online appointment booking.
- Filtration of information based on keywords like specialization, disease etc.
- General information about the doctor.
- Letting the patient choose a suitable day and time slot.
- Letting the doctor declare availability.
- Categorization of doctors based on specialization.
- Instant appointment confirmation.

V. METHODOLOGY

The appointment system requires two interfaces: one for the patient side and one for the doctor's side. So the whole application has been divided into two modules having

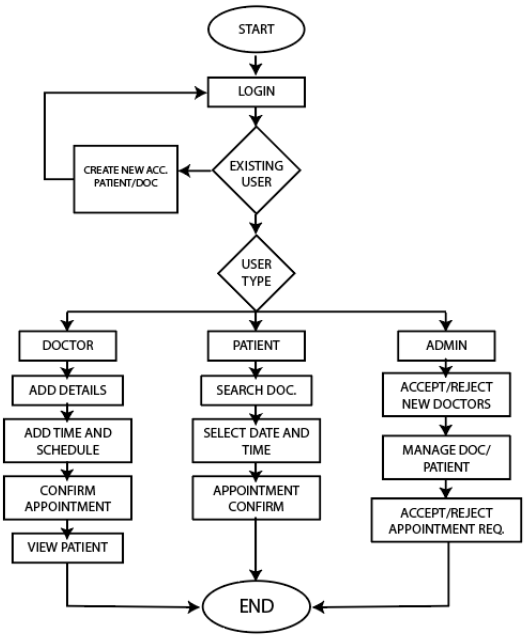
separate flows that are governed by the requirements of the patient or the doctor.

The opening screen asks if the user is a patient or a doctor and proceeds to register the user. The entire flow of the application can be understood as pictured below.

Design Methodology:- Development of a system for distinct processes is called design methodology. It gives an accurate solution for each design process.

1. Reusable component: React uses reusable components for efficient and effective coding. It reduces the time factor to develop the project.
2. Choose an adequate programming language: Choose the suitable language for programming of system by considering the factors like compilation, interpretation, execution speed etc.
3. Design software system: A software system can be designed with a well set of processes. Software system design follows a modularized approach.
4. Consider testing with all possible modules: An individual module can be tested for evaluation of accuracy of the system.
5. Documentation: Documentation develops to give the clear idea about each and every step of system development

APPLICATION FLOW



The course of actions required to be undertaken to book one's appointment:-

1. First the user has to specify about him/her being a doctor or a patient by choosing the appropriate option shown on screen.
2. Next the user has to register as a doctor or patient and then log in.
3. Now once the user is logged in as a patient, he/she can specify their location and search for doctors based on disease and speciality.
4. After searching, the page will display the relevant doctors in the area with the expertise in the chosen field and the user can choose the doctor and view their profile.
5. Once the user chooses a doctor, a page will display dates and time slots made available by the doctor. Choose a suitable day and time slot and book.
6. In case the user is a doctor, he/she can confirm the appointment or cancel it citing unavailability.

VI. SOFTWARE IMPLEMENTATION

The purpose of this application is to simplify the appointment booking process by making it online. The user can log into the application as a patient and specify his/her disease and search for doctors based on specialization.

A different module, that is to be used by the doctors is also created within the application that gives the doctors options such as: specify availability, accepting and rejecting requests, creation of profile etc.

The system is developed by using the following technologies.

Front-end

- Javascript using the ReactNative framework
- CSS, SCSS

Back-end

- MongoDB
- NodeJS
- Firebase

The design of this system involves a series of phases in which the output of one phase provides the input to the next phase.

• In the first phase (requirement phase), the end-users, administrators, and employees are interrogated to discover their aim and objectives, requirements, and expectations from the application.

• In the second phase (design phase), the application is designed to meet the end-user's requirements. This entails the data flow diagram, context diagram, and use case diagrams.

• In the third phase (implementation phase), the graphical user interface of the system is designed with HTML, CSS, React, while NodeJS, MongoDB and Firebase were employed as back-end design. The application interconnects with the database located on a remote server. It is to make sure that the application is mobile-responsive to make it

easier for both the administrator and the employees to use the application.

• In the fourth phase (testing phase), the work of each component of the application designed was tested and is integrated into a system.

• Finally, in the last phase (deployment phase), we deploy the application we developed.

APPLICATION SCREENSHOTS

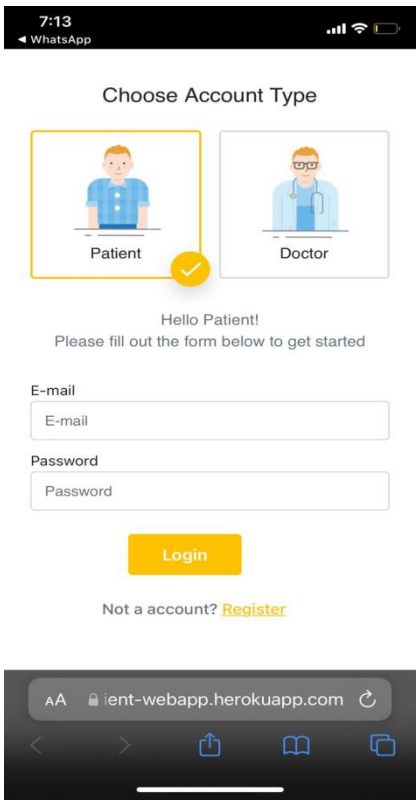


Fig 6.1: Login/Signup

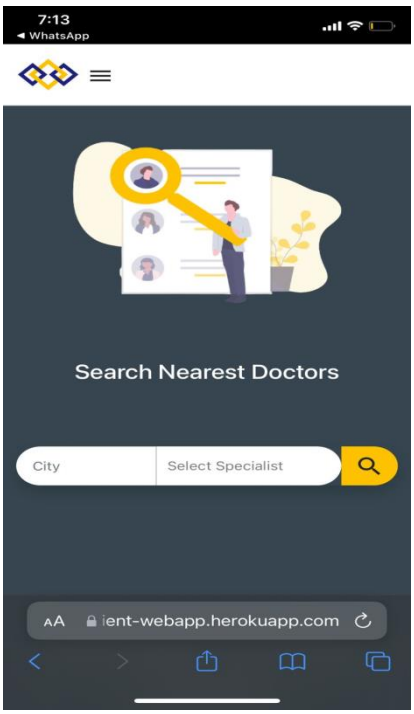


Fig 6.2: Homepage

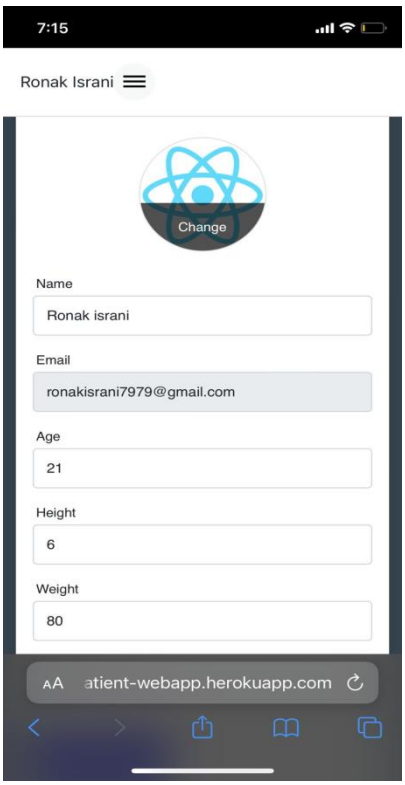


Fig 6.3: Patient's Details Form

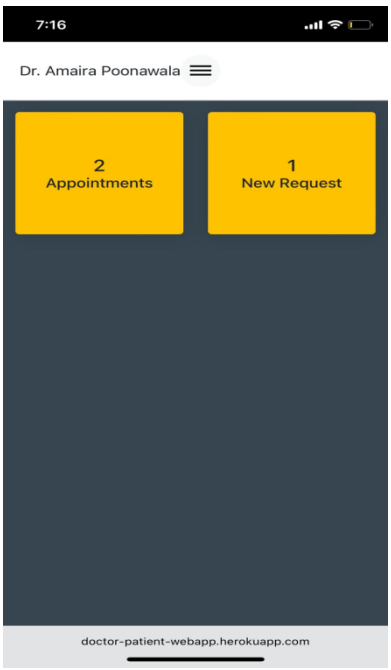


Fig 6.4: Doctor's Appointments

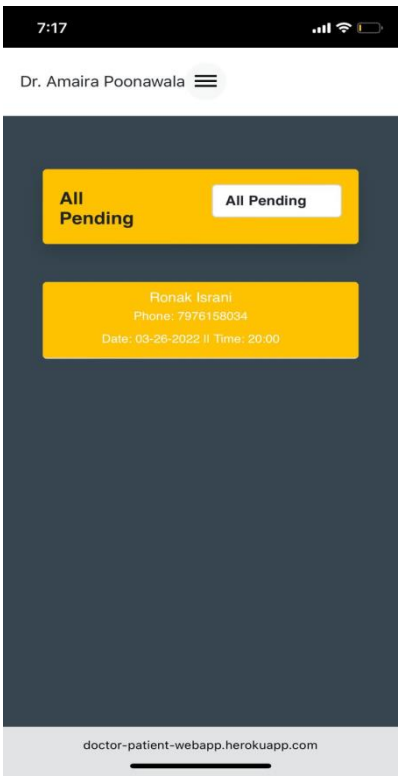


Fig 6.5: Accepted Appointments

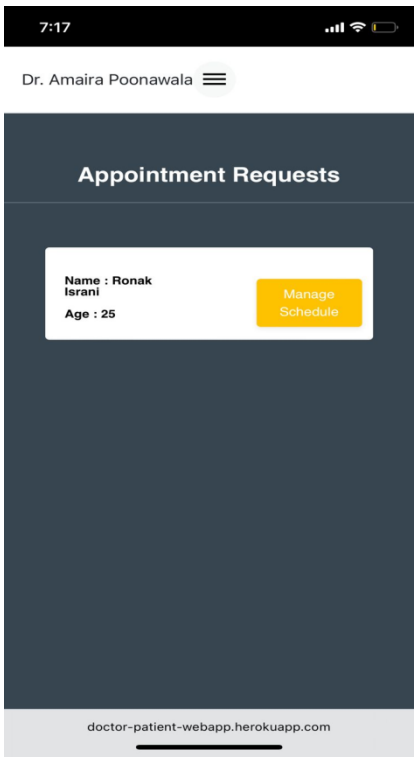


Fig 6.6: Appointment Requests

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