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MedConnect PLUS: Health Management System

Arun Kumar S[1], Robinson Thakuri[2], Paban Bhakat[3], G. Sri Ranga Sai Ganesh[4]
[1]*Assistant professor, Department of Computer Science and Engineering, Presidency University, Bangalore, India*
[2, 3, 4]*Student, Department of Computer Science and Engineering, Presidency University, Bangalore, India*

Abstract: ***The utilization of mobile applications in healthcare represents a frontier of innovation with the potential, to significantly enhance patients' daily healthcare management. These applications have the capacity to improve the efficiency of healthcare delivery, ultimately leading to cost reduction, and play a pivotal role in disease prevention by influencing behavior change. The paper introduces a model for an interactive healthcare application designed to meet the collaborative needs of both doctors and patients. The envisioned mobile application seeks to optimize communication among various stakeholders in the healthcare sector, including doctors, pharmacists and patients, thereby enhancing overall healthcare service and delivery. Object Oriented Analysis is employed in the software development process. This proposed mobile application is geared towards facilitating effective communication by incorporating advanced technologies to streamline processes such as appointment scheduling, health record management, and patient-doctor interactions. Emphasis is placed on the application's commitment to data security and compliance with healthcare regulations, ensuring the protection of sensitive patient information within a secure environment. The user-friendly interfaces tailored for both patients and doctors highlight the application's intention to cultivate a more interconnected and accessible healthcare ecosystem.***

I. INTRODUCTION

In the contemporary era, advanced mobile communication systems have converged with portable computational devices, giving rise to handheld devices such as smartphones, iPads, tablets, and PCs. These devices are not only capable of running third-party software but have also witnessed an exponential increase in users, particularly among healthcare professionals. This study aims to categorize smartphones based on healthcare technologies, considering their functionalities and services, and provide a summarized overview of articles in each category. Numerous medical applications and websites tailored for smartphones have been developed and widely embraced by healthcare professionals, experts, doctors, consultants, and patients. The utilization of smartphones in healthcare is gaining prominence, with medical service provider applications serving as valuable tools for evidence-based medicine at the point of care. Furthermore, smartphones play a pivotal role in mobile clinical communication, ensuring accuracy in references and facilitating efficient communication between healthcare providers. The attention to smartphones in healthcare is expanding, with their significance extending to patient education, disease management, remote patient monitoring, and self-awareness. The traditional challenges associated with doctor appointments, such as long waits and potential cancellations, are being addressed through the rapid development of mobile communication technology. In response, the proposed work introduces an online medical management application on the Android platform, simplifying the process of scheduling doctor appointments. This Android-based online doctor appointment application comprises two modules, one designed for patients. The patient module includes a login and registration screen, requiring patients to register before accessing the application for check-ups. Once logged in, patients can select a specific hospital, view its details, and choose from a list of doctors with accompanying details. Appointment requests for preferred day and time slots can be made, with patients receiving notifications confirming the successfully added appointment. Additional features include the ability to view the hospital's location on a map, contact the hospital or doctor via call or email, enhancing overall convenience for patients. Amid the plethora of online scheduling tools available on the internet, the proposed application stands out for its simplicity, cost-effectiveness, and time-saving benefits. Practitioners and patients alike can access a portal throughs unique identifications, fostering improved communication, patient engagement, and efficient access to healthcare services. The proposed online medical management application represents a significant stride in leveraging mobile technology to enhance patient-doctor interactions and streamline medical services.

The healthcare sector is presently witnessing substantial progress in modern technology, with a focus on processing and distributing relevant patient information electronically. This aims to elevate the overall quality of care and hospitality. Particularly, the domain of mobile e-health encompasses various information and telecommunication technologies, providing healthcare services to patients located remotely and supplying supporting tools for mobile healthcare professionals. The benefits of these applications are diverse, primarily concentrating on improving access to medical resources and enhancing patient care.

In recent times, the healthcare and affiliated sectors have increasingly adopted mobile technology, particularly in the realm of e-healthcare applications. While instances of implementing mobile workstations at smaller medical units for enhanced access to specialist medical advice exist, the majority of applications are geared towards supporting patients in their homes. These applications can take a patient-centric approach, providing direct access to a mobile phone for communication with healthcare providers, or a nurse-centric approach, where nurses visiting and caring for patients at home have access to mobile applications to communicate with other medical staff. The potential of mobile healthcare is substantial, contributing to improved efficiency, enhanced healthcare quality, remote monitoring of patients by doctors, more comfortable health management for patients outside the hospital setting, and the ability for home care providers to deliver superior healthcare to seniors. This approach also has the potential to reduce the overall cost of care by minimizing the necessity for patients to make frequent visits to their doctors. A recent study indicates that patients who engage with their e-health records are more likely to comprehend their medical issues and adhere to prescribed medications. E-health applications empower patients, fostering a sense of control and reducing confusion. This engagement is believed to increase medication adherence, improve doctor-patient relationships, prompt patients to ask more informed questions, and alleviate anxiety without adding extra burdens on healthcare providers. Dr. Joseph kell, a professor at the Pennsylvania University, emphasizes that the increased transparency increased by sharing medical records to the patients during their hospital stay will lead to greater patient engagement, satisfaction, and a propensity to ask questions and identify errors. Nevertheless, it is recognized that an excess of unnecessary information may trigger anxiety among patients. Additionally, there is an understanding that patients with lower educational levels may require more detailed explanations of health issues, while those with higher education levels may grasp their health records more easily. The healthcare sector has witnessed substantial technological advancements, particularly in computing, for the electronic processing and distribution of pertinent patient information, ultimately augmenting the quality of care. In the realm of mobile e-health, various information and telecommunication technologies are harnessed to deliver healthcare services to geographically distant patients, along with providing supportive tools for mobile healthcare professionals. The diverse advantages of such applications encompass improved access to medical resources, signifying a transformative evolution in healthcare practices.

II. LITERATURE SURVEY

Introducing a communication system designed for doctor-patient interactions, our platform features an efficient administration of multiple nodes. These nodes serve as points for seamless interaction between doctors and patients. Patients benefit from easy access to hospital server nodes, enabling them to engage with doctors regarding their symptoms. The system allows doctors to list and monitor patients dispersed geographically, facilitating the provision of necessary diagnoses as required. [1].

Proposing a system that enables patients to effortlessly schedule their appointments online, providing a streamlined interface for doctors to view and manage these appointments. Patients have the flexibility to book appointments online, considering the availability of their preferred doctors and their own time constraints. Meanwhile, doctors can adjust their working hours based on the volume of patients scheduled for a given day, allowing for increased flexibility and efficient time management. [2].

Furthermore, the system approximates the patients' arrival time and sends notifications to their registered numbers. During installation, users can customize additional information, eliminating the necessity for a technician to install the software [3].

Waiting time refers to the duration one has to wait for a particular action to take place after the request or mandate for that action. Specifically in healthcare, patients' waiting time is characterized as "the interval from the patient's entry into the outpatient clinic until the moment they receive their prescription." This encompasses the overall time span from registration to the consultation with a doctor. The waiting time can be further divided into two components: the time required to consult with a physician and the time taken to acquire prescribed medication [4].

The inception of a patient appointment system or schedule for healthcare centers dates back to a significant period. The management of patient appointments has a long history, with previous efforts focusing on developing simplified queuing models and relatively static scheduling conditions. Another initiative involved utilizing mathematical queuing models to calculate waiting times between patients and doctors, with the aim of minimizing overall waiting times [5].

Traditionally the medical apointment systems are considered both the doctor time and patient time are more important. Therefore, an appointment system was initially created to reduce doctor idle time. However, the contemporary design of appointment systems is now centered around decisive factors that consider the needs and preferences of both patients and doctors. [6].

The management of a patient appointment system involves utilizing a computer application to oversee and minimize patient waiting times within a healthcare center. Notably, certain healthcare centers opt not to implement any appointment system, leading to comparatively longer average waiting times for patients when compared to healthcare centers that have adopted patient appointment systems [7].

An online booking system, also referred to as a web based system, operates on the web, which is composed of pages collectively known as a website. A website functions as a computer program running on a web server, granting access to a collection of interconnected web pages. Essentially, a system is a combination of independent components collaborating to achieve a shared objective [8].

In the realm of existing hospital appointment schemes, a specific application designed for managing patients apointment scheduling has employed exponential enter arrival times. However, it is important to note that this model operates under the assumption that exponential enter arrival times cannot be directly verified by date, and its effectiveness is constrained by the inherent nature of appointment scheduling [9].

Future apointment are typically scheduled, and the specific model of call arrivals has a restricted impact on measure associated with the waiting time before the call and appointment. Therefore, the challenge in developing an appointment system lies in creating a system tailored to the healthcare procedural environment. This allows the appointment provider in the healthcare center to efficiently schedule patients into appropriate time slots on specific days [10].

III. OBJECTIVES

Enhancing accessibility to healthcare, expediting patient-provider communication, and enhancing overall healthcare management are the main goals of a doctor app. The purpose of the app is to make it easier for patients to schedule appointments in a convenient way. Another objective is to facilitate the sharing of information so that physicians may easily obtain patient data, diagnostic results, and treatment histories. It also hopes to deliver timely notifications for prescription reminders, follow-up appointments, and health updates. Through the provision of useful health materials, safe communication, and proactive healthcare initiatives, the app aims to increase patient participation. In addition, the software aims to streamline administrative duties for medical practitioners, cutting down on paperwork and improving practice efficiency. The doctor app's ultimate goal is to support the development of a technologically sophisticated, patient-centered healthcare environment.

IV. PROPOSED WORK

The envisioned system is a mobile application designed to facilitate seamless communication between doctors and patients. It encompasses various processes, including doctor search, queue management, registration checks, settings and notifications, easy access to medical records, and real-time chats between doctors and patients. The system aims to enhance the availability of critical information for individual review, introducing automated and more efficient versions of existing procedures. It seeks to offer novel ways to support and deliver healthcare platforms, replacing and refining current processes, procedures, and work habits to ultimately improve outcomes. The proposed system consists of two main panels: Patient and Doctor. Users are required to download and install the application on their mobile devices, providing a permanent presence on the device until intentionally uninstalled. Patient registration is necessary for the initial use, generating a unique username and password for subsequent logins. Once logged in, patients can filter doctors based on location or specialty. The application displays a list of doctors, allowing patients to select and view profiles, schedules, and request appointments at their convenience. The patient sends an appointment request, which the doctor can accept or reject, updating the database . Patients receive confirmation messages, and a notification reminder is sent hours before the scheduled appointment to mitigate forgetfulness. Additionally, the system addresses direct waiting time, allowing patients to check the registration page for successful appointment confirmation with a specific doctor. Doctors may impose charges based on the volume and distribution of appointments, influencing their income and comfort levels.

V. METHODOLOGY

Creating a medical app requires a methodical approach to guarantee both user delight and efficacy. Usually, the procedure starts with in-depth study to comprehend patient and healthcare provider demands. The app's design and feature set are influenced by this research phase. After that, an interface that is easy to use and intuitive is developed, taking into account the particular needs of the healthcare sector. Coding and testing are done during the development phase to make sure the app is secure, functional, and complies with healthcare laws. For information to be shared seamlessly, integration with pertinent databases and systems is essential. Continuous testing and improvement are also necessary to find and fix any problems. In addition, the app needs to follow industry guidelines and give priority to data security and privacy. User feedback is essential for optimizing the functionality of the app and starting a cycle of ongoing improvement. To ensure that the app is used successfully and that patients and healthcare professionals are aware of it, a strong marketing and adoption strategy is also necessary.

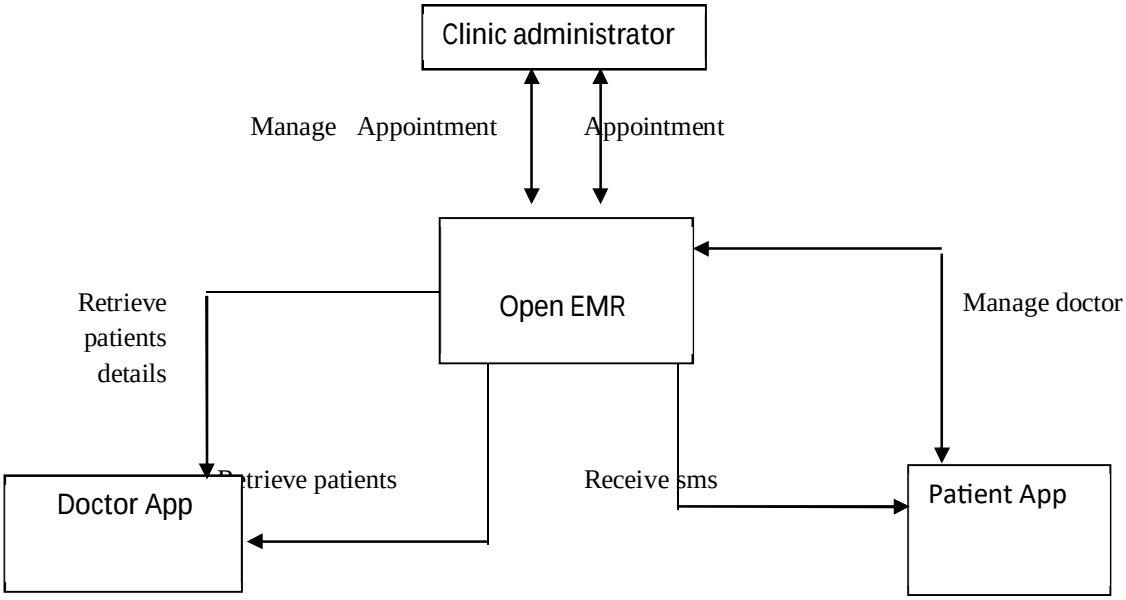

Figure: MedConnect Plus

VI. CONCLUSION

The medical application operates for the betterment of society, creating a collaborative platform between patients and doctors. The key feature of the application ensures that doctors have access to the complete history of their patients' health status, while patients retain control over their own medical records.The emergence of doctor apps has exceptionally changed the healthcare industry by offering aninnovative and functional platform that connects the patients and the medical professionals. These applications provides user with improved accesibility, convenience, and improved healthcare experiences, have effectively met the changing requirements of patients in our fast-paced digital life.The primary aim is to streamline the exchange of accurate and up-todate information, minimizing time and effort for both parties and improving the overall efficiency of information flow within the healthcare system. A significant advantage of this proposed application is its capability to provide healthcare providers, particularly doctors, with comprehensive histories of their patients' health status. Concurrently, patients can securely access and manage their health data from any location, ensuring a portable health information system that empowers individuals to manage their well-being proactively. The envisioned system is anticipated to play a crucial role in expediting the diagnosis and treatment process for medical professionals. By facilitating communication and interaction between doctors and patients, the application aims to enhance the overall efficiency of healthcare delivery. Doctors stand to benefit from a more thorough understanding of their patients' medical histories, enabling more informed decision-making, while patients will experience a heightened level of engagement and personalized care. In essence, the proposed medical healthcare application emerges as a valuable tool that not only simplifies the information-sharing process but also empowers both healthcare providers and patients alike. The envisioned benefits include improved efficiency, enhanced accessibility to health data, and a streamlined healthcare experience that ultimately contributes to the broader welfare of society

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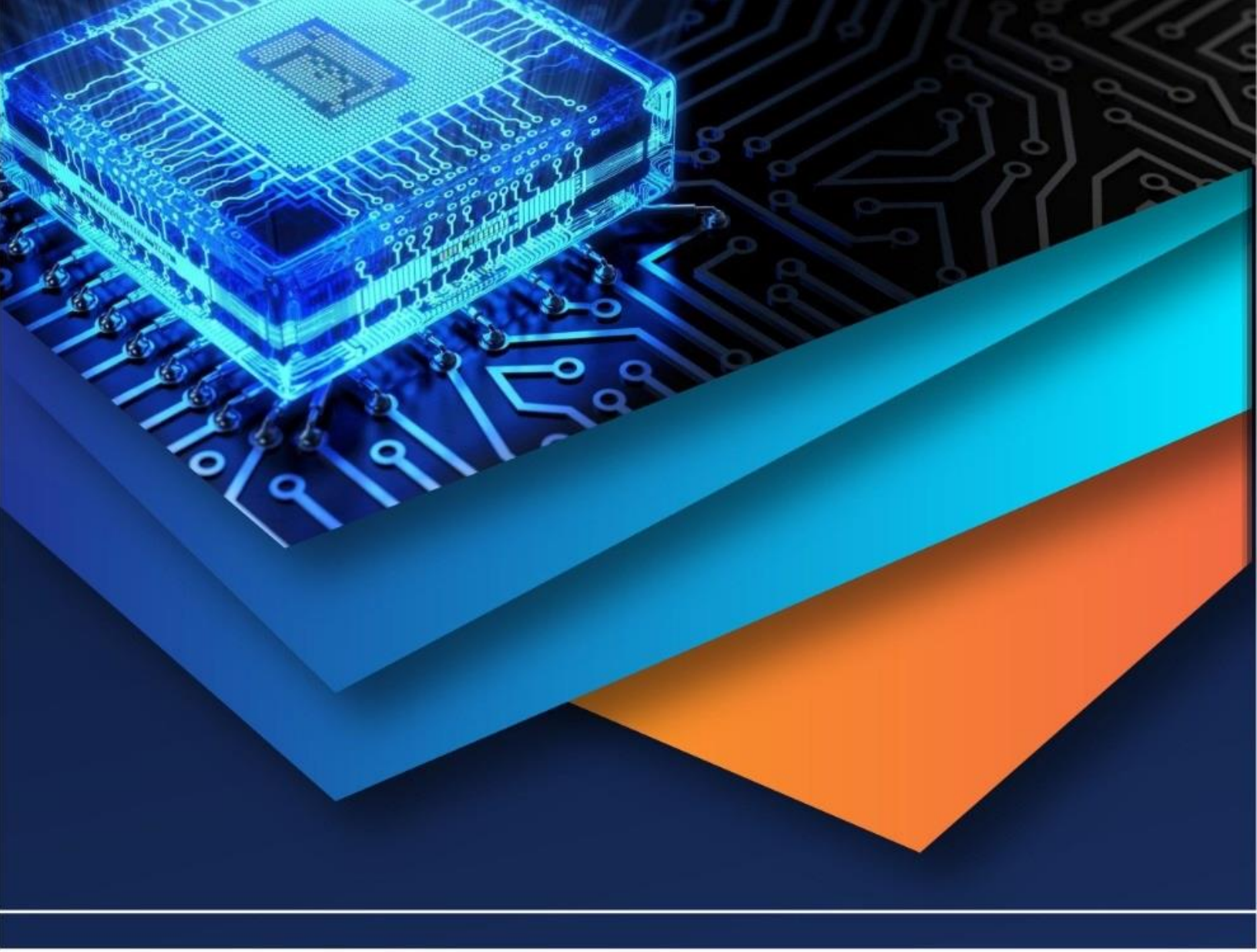

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