



MedConsult: An android based medical consultation and treatment support system for rural dwellers

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Abstract

Quality medical consultation has posed to be difficult to get by some patients who are situated at rural areas. Due to the fact that some individuals do not have good medical facilities at the rural areas which they dwell, they tend to travel all the way to the urban areas in order to get consulted by quality medical consultants, which in some cases they might end up not meeting with the consultants due to various documentation processes and also the volume of patients who are waiting to be consulted. This study is aimed at developing an android based medical consultation application whereby patients can register and get consultation from volunteer medical consultants just by using their mobile phones for little or no cost.

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1. Introduction

Mobile health, according to the World Health Organization (WHO), is the practice of medicine and public health that is supported by portable electronic equipment including cell phones, patient monitoring devices, personal digital assistants, and other wireless gadgets. (Lee et al., 2017). The global adoption of mobile technology and the expansion of cellular infrastructure have contributed to the creation of this field. Today, everyone has a mobile phone. Mobile phone use is so pervasive that it has facilitated their incorporation into the healthcare industry.

The development of communications devices has helped patients to move from one-on-one visits to the hospital to using mobile networks to continually receive healthcare services (Logan, 2013) ^[7]. Using fast internet communication devices, sick people and their relatives can easily use a range of educational materials, including details on how to manage certain health challenges. Through organizational platforms, patients can receive information about their drugs or illnesses, examine pertinent portions of their electronic medical data, and contact with their healthcare professionals via a Web chat platform (Logan, 2013) ^[7]. Patients can also update their demographic data, seek an appointment or referral, and renew their prescriptions via some portals.

Mobile health systems are used to carry out various health projects in disadvantaged communities. The six main areas on which these programs and projects concentrate are treatment and support services, health education and awareness services, data collection and remote monitoring services, disease surveillance and drug adherence services, health information systems and point of care services, and emergency medical services (Arwa, 2014) ^[2].

Poor individuals in developing nations struggle to receive proper medical care, especially in rural areas. In the poor world, finding affordable, high-quality healthcare services has been a major problem. Given that more of our rural populations have access to mobile networks, mobile health approach is thought to be one of the healthcare sector's most improving. The use of these mobile health facilities aims to improve the effectiveness and accessibility of healthcare services as well as lower death rates in rural areas. The healthcare systems in our local communities might be considerably improved by these qualities, which would enhance millions of people's quality of life.

A mobile health application for consultation and treatment support is presented in this study. The application will give residents in our rural communities a free platform to access healthcare services. The android-based application will be used to recruit volunteer medical professionals who will provide consultation and treatment support to rural residents using their mobile devices. Mobile health application can deliver pertinent information in a timely manner for medical and emergency purposes, helping in the distribution of resources to the people in demand.

Related Literatures

In John, Haketo and Adewale (2009) ^[6] primary healthcare delivery in Nigeria used telemedicine. With e-reporting on patients, healthcare data forms, disease surveillance data forms, and immunization data forms were created. Only disease surveillance and healthcare institution distribution were addressed in the study.

Mohan and Sultan (2009) ^[8] created a system for administering mobile healthcare throughout the Caribbean. The network infrastructure, the alarm notification and reasoning engine, the patient and healthcare provider interfaces, and the system as a whole are made up of these four parts. Not all of the world's ailments could be treated since a thinking engine handled the important component of the system, the section that performs the diagnostic.

Nizar Z., Mohammad M. M. & Alaa S. (2016) ^[10] developed a mobile healthcare system based on Android and Web applications. The system helps patients, identifies and selects doctors based on the location and the specialties of the doctors. The system allows patients to make appointments with doctors and assigns reminders to take the prescribed medications and vaccinations. The results of testing the applications show a big saving of time and mobility of doctors and patients.

Hoda, Mariam & Liyakathunisa (2017) ^[5] developed a Smart mobile application that estimates accurately coronary heart diseases risk over 10 years based on clinical and nonclinical data and classifies the patient risk to low, moderate or high. The System also directs the patients to further treatment recommendations. The application intensifies the communication channel between the lab workers and patients residing in rural areas and cardiologists and specialist residing in urban places.

Suresh Y., Kumar T. V., Afreen F., Muniruddin M. & Kumar C. A., (2020) ^[9] developed a novel healthcare mobile application that manages information about different hospitals in the nearby localities of the user and the system can provide basic information about patient medications. Further, in the case of emergency situations, the healthcare mobile application plays an indispensable role by assisting the user in prescribing the appropriate first aid measures.

Adeniyi J. K., Adeniyi T. T., Ogundokun R. O., Misra S., Agrawal A., Ahuja R. (2022) ^[1] developed a primary health system that addresses the health challenges of individuals in rural areas and those with limited financial capacity in Nigeria. Considering the risk of losing relevant patient information to the public domain, the use of fingerprint authentication was built into the system. The system uses fingerprint authentication to secure access to the back end of the system which is the database that holds medical records. The accuracy of the approach showed an encouraging result of 97%.

Propose System Procedure

The Object Oriented Analysis and Design (OOAD) methodology and notation symbols of the Unified Modeling Language (UML) were adopted in the analysis and design of the new system.

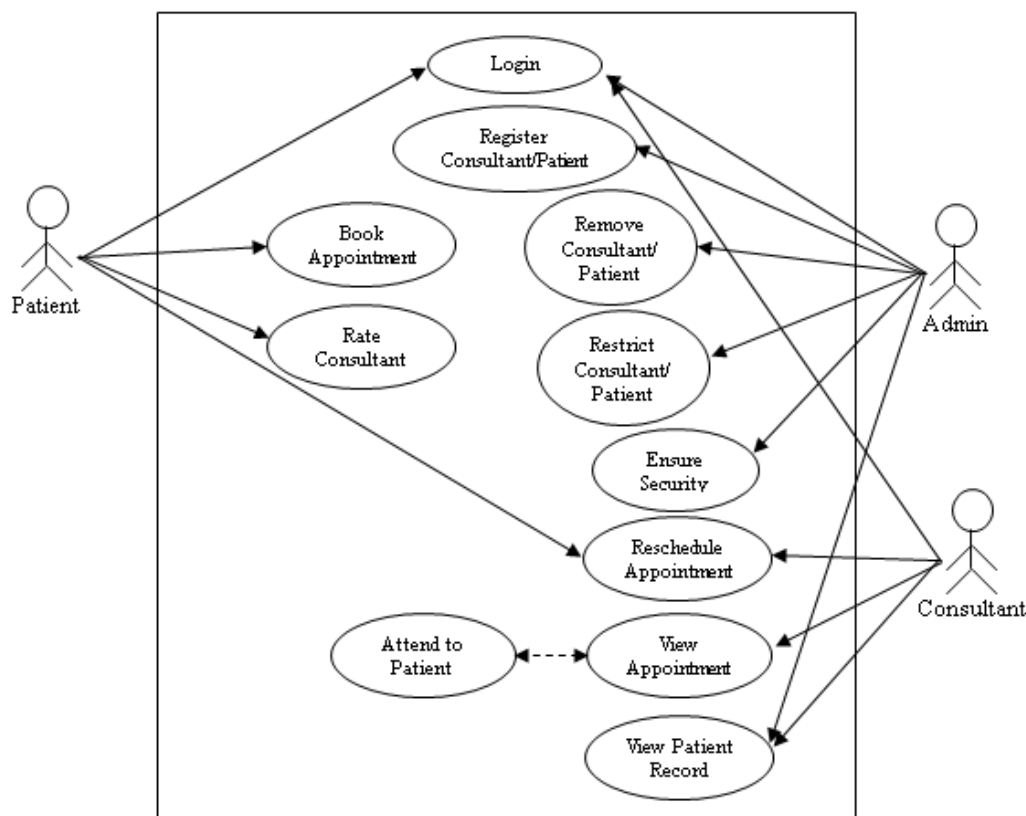


Fig 1: Use Case Diagram of the System

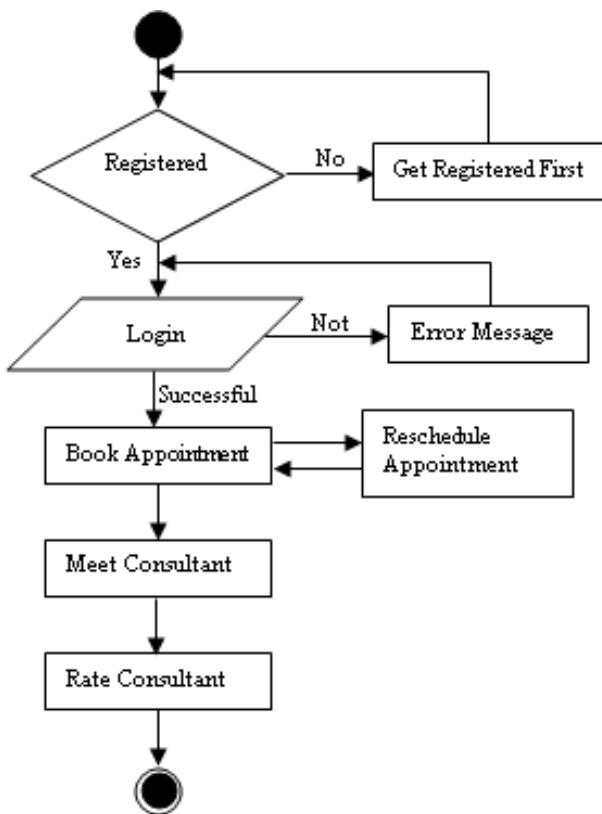


Fig 2: Patient Activity Diagram

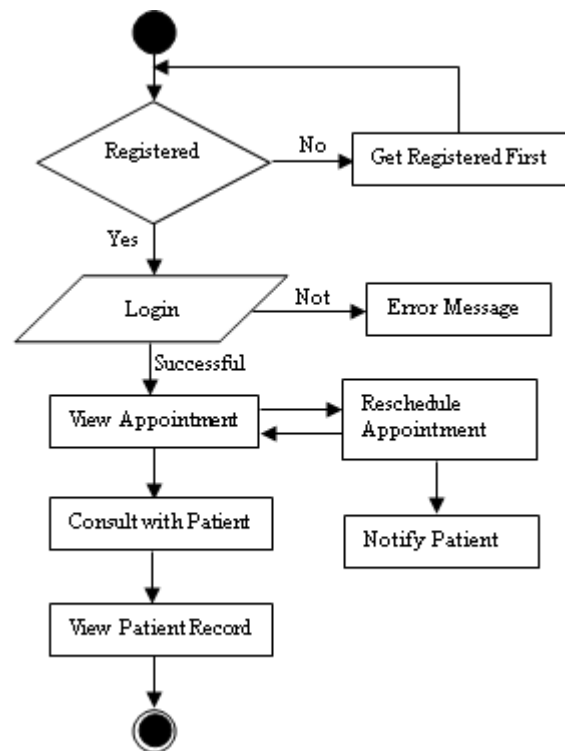


Fig 3: Consultant's Activity Diagram of the System

System Implementation Plan

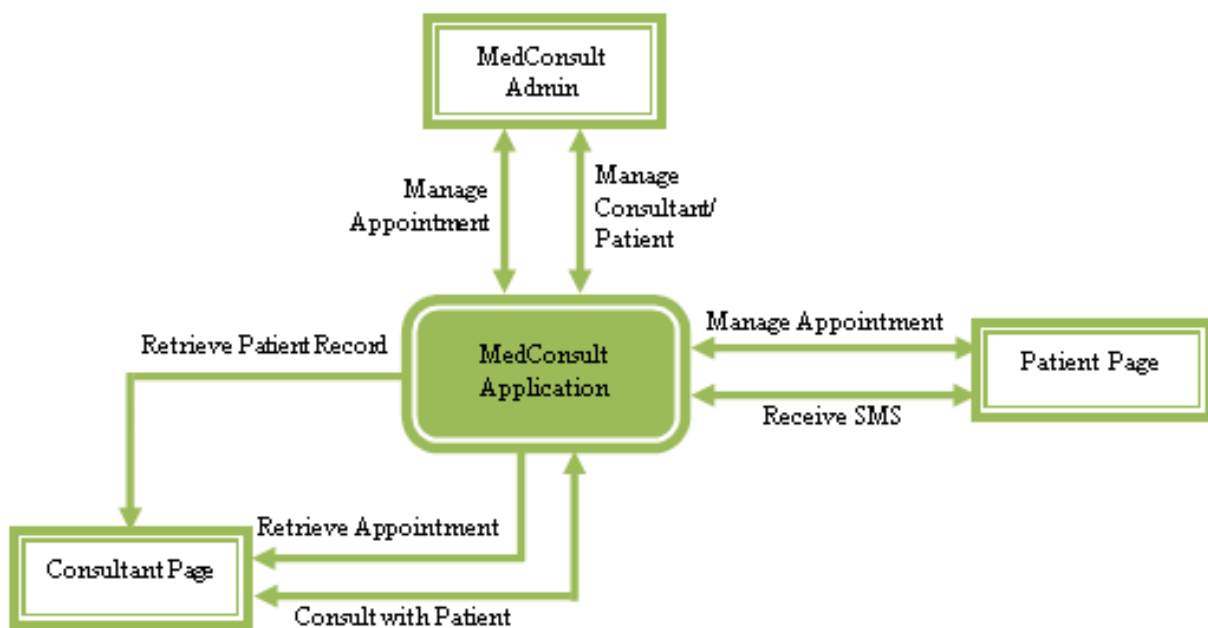


Fig 4: MedConsult Implementation Plan

MedConsult Admin

The administrator registers or modifies a patient's or doctor's information using the MedConsult. The MedConsult web application displays all appointments that patients have added, and in certain situations, administrators have the authority to change a patient's appointment at the patient's request.

Consultant Page

In order to grant consultants access to their appointment list, a login page is intended to verify their identity. A Consultant can view today's appointments, view future appointments, search for a patient using their identification number, or phone the chemist with questions about prescriptions after logging in. The screen will automatically show an alert dialogue with the details of the first patient to be seen if there are any appointments scheduled for today. The Consultant

can choose from this alert dialogue to read the patient's more information or to delete the patient's appointment from the list after the appointment.

Patient Page

Similar functionality found in the Doctor App, such as Password Resetting, Viewing Personal Details, and Login, are also present in the Patient App. However, since this should only be done by the administrator, the patient will not be able to change their personal information through the app. The chosen appointment can be edited or deleted from the Appointments window via an alert dialogue that displays details about the upcoming appointment. By adding an

appointment, a patient can choose a time slot from a calendar. The available timeslots and the doctors for the morning and afternoon shifts for the specified day are automatically displayed in a list format once the desired date has been selected. An appointment ID will be created following the addition of an appointment.

Implementation of the new MedConsult Application

The system is made up of an admin interface, consultant interface and patient interface, and the various data in these sections are categorically stored in their various databases. Below is a detailed explanation of all three interfaces and their implementations.

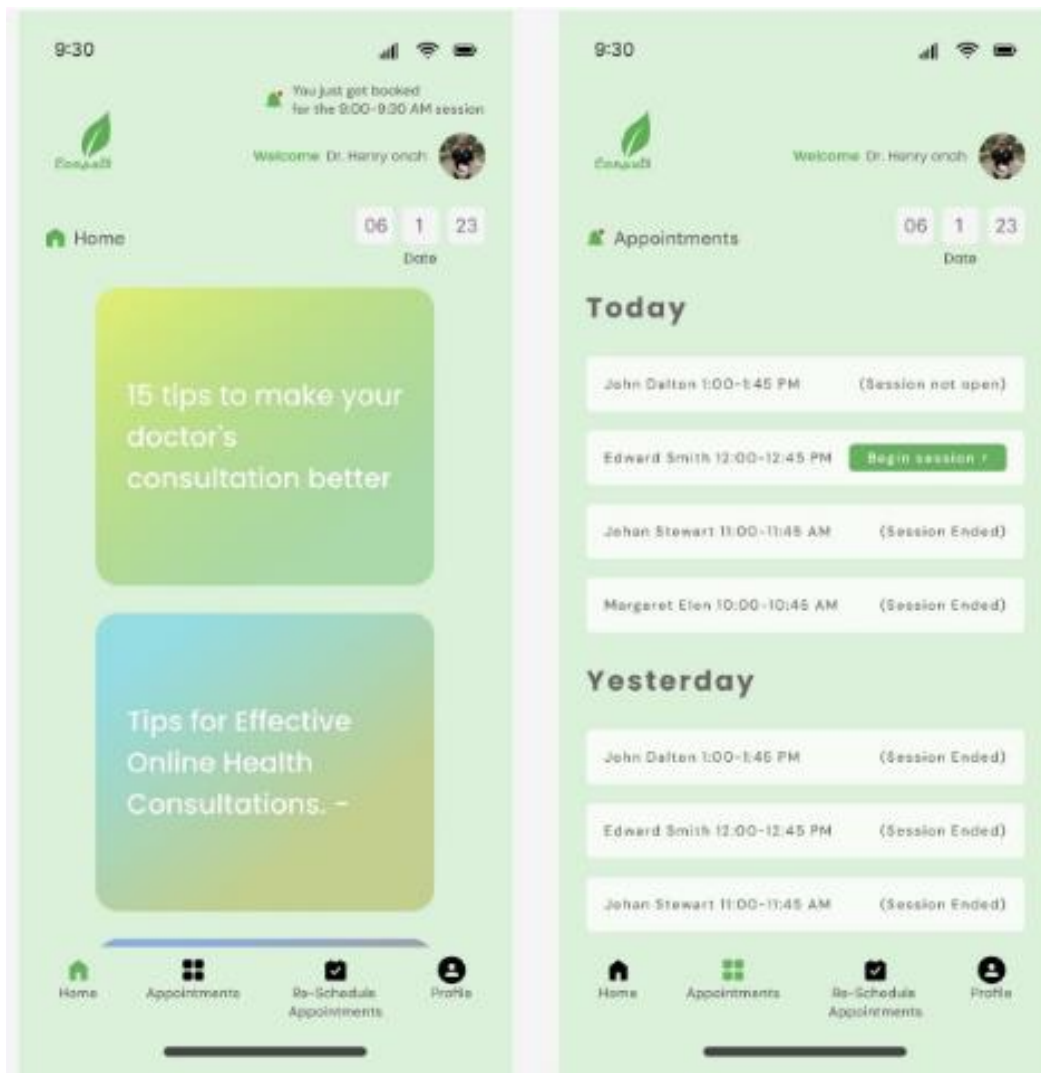


Fig 5: The Consultant's dashboard for appointments



Fig 6: Consultant's Profile view

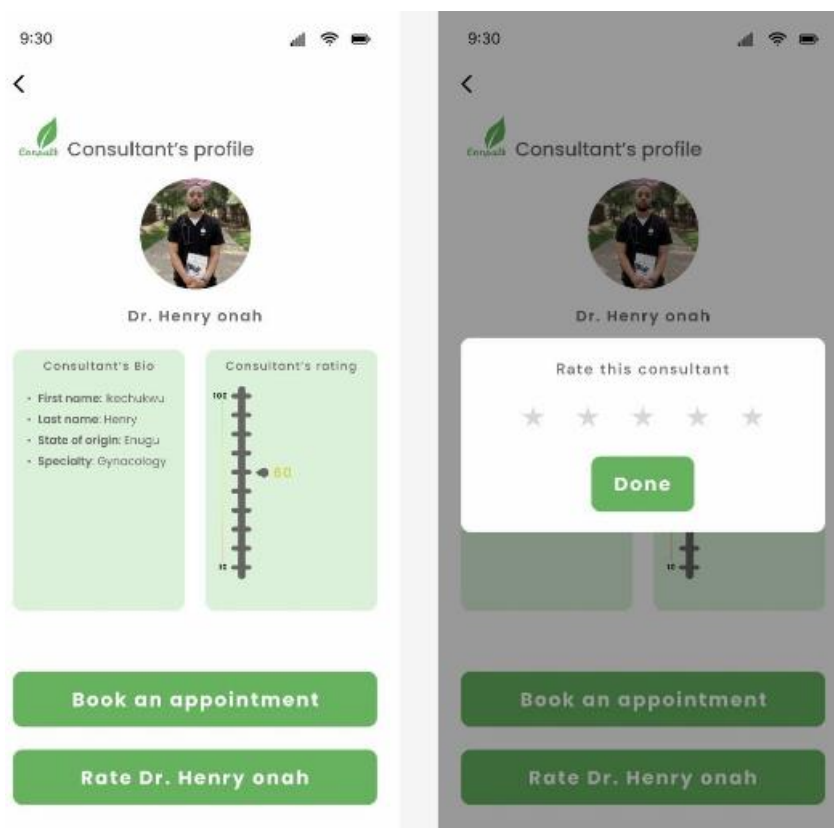


Fig 7: The new system showing the Consultant's booking page

Summary

Medical consultation in the world of today and in Nigeria especially has become a service of high cost. The affordability of quality medical consultation from medical consultants who are specialists in their area of expertise is on the high side, which makes it out of reach for some classes of people. Quality health facilities are supposed to be one of the most basic amenities to every human but due to the structure of our society today, quality health care turns out to be more expensive than the food we humans consume daily. This challenge is what this study has come to tackle. This study presented an android based medical consultation and treatment support application whose main objective is to bring quality medical consultation and treatment support to the doorstep of individuals in the rural areas using their mobile phones.

Conclusion

This study will also help clinics or hospitals digitalize their processes, thereby reducing the population that visits the clinic daily and reducing the physical workload for the consultants and different personnels that work at the clinic. This system was analyzed using object-oriented methodology and can register and verify medical consultants together with the patients on the system. The implementation was done using Dart programming language. With this software, people will be able to have quality medical consultation with little or no money, hospitals/clinics will also have the flexibility of consulting and administering treatment support to individuals online. This software will contribute to society at large by providing basic medical consultation to the people.

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