Online OPD Management with Rating and Review System to Hospitals and Doctors

Chaitanya Garware, Ruturaj Sutar, and Krishna Londhe

Abstract The number of patients visiting hospitals increases everyday due to more health consciousness among people. Patient's fulfilment and solace are the needs of each emergency clinic. The Indian Health Governance Centers are also concentrating on the patient treatment as the key factor of hospital organization. Health Management Board has brought numerous upgrades through IT for patients that positively affect the patient involvement with clinics just as taking authoritative choices based on health indicators. The outpatient department (OPD) services of most of the hospitals are facing long waiting time problems which result in patient's dissatisfaction, and also it doesn't predict any quality measures for the selection of doctor as per the patients' need. Also, traditional OPD mechanisms have several limitations with respect to availability and quality of the doctors. Current investigations have discovered restricted proof for a relationship between specialist emotional intelligence (EI) and the patient-doctor relationship (PDR). Constant improvements in management of OPD through new policies are essential for better patient management and for proper utilization of skill, expertise, and time of senior doctors. It will be more convenient and preferable if the patients could receive the most efficient treatment plan along with the predicted waiting time of their consultation time to their corresponding doctors on their mobile applications in real time. Many sectors of the industry use "rating and review system" to make their service more reliable, scalable, efficient, and convenient to everyone. The proposed system describes a generalizable method that systematically combines hospitals, doctors, patients, and medicals in a single system providing "patient's reviews and rating to hospitals and doctors" which leads to "online OPD management." In today's world, we consider the doctor to be God, but does this idea apply to all doctors? We can't easily trust anyone especially regarding health issue, so the patient needs the best doctor as per annoyance. In this case, one can use the proposed system to find a good doctor or hospital for the molestation cure. Hospitals, doctors, patients, and chemists will first register themselves in this system with all the information. After the patient's check-up, the doctor will send the prescription of the patient's

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medicine to the chemist online. The patient will be able to give a rating and review to that doctor or hospital based on the quality of treatment experienced. This obviously means that physicians need to provide the best treatment to patients for good ratings and reviews. So, the proposed system can manage many tasks that are usually time-consuming and inconvenient with respect to doctors and patients also.

Keywords Health consciousness · OPD management · Health management · PDR · Patient management · Quality of treatment

1 Introduction

Today's world is a world of technology. In this world, there are different technologies to make people's daily life pleasant and healthy. But Android is the technology that is the most famous of all these technologies. Today at least one person in every family has a smartphone. So, improving the health system with the help of smartphones is a need of the hour. Today the world population is 7.8 billion, and there are currently 3.5 billion smartphone users in the world. From this we can understand that through the use of smartphones we can make people an integral and important part of the health system. The health industry is a very important and constantly growing industry.

If you want to go to the hospital today, first you must go to the hospital and make an appointment. Then you have to wait for your appointment. In all these procedures, a lot of patient time is wasted. At this point, if the patient makes an appointment online from his home, using his smartphone, and if he can know the approximate time of his appointment, it can save a lot of time for that patient. Suppose you are in an unfamiliar city and you want to go to a hospital, you cannot go to any hospital because you do not know which hospital or which doctor is right for which disease. So, if people know which doctor treats which disease with the help of smartphone, it will be convenient for the patient. In this too, it is not enough to know which doctor treats which disease but also which doctor treats the best for that disease. If the hospital or doctor is given a rating and review according to his treatment, then the new patient can find the right doctor using the rating and review for him.

In the current system, the compounder is the link between the doctor and the patient. As a result, the patient's information about the disease may be leaked. At this point, if the patient can interact directly with the doctor, his disease can be kept secret. Also, the rating and review system will require each clinic or doctor to treat it well to keep its rating high and good reviews. This will definitely improve the quality of health care. Also, in this system, the doctor will send the prescription of the patient's medicine online to the chemist, which will stop the use of the paper required for the prescription.

2 Literature Survey

A hospital information system (HIS) is used to recognize features capable of improving doctors' satisfaction levels. A prototype inclusive of system standard, information standard, and service standard related to a hospital information system is used to form antecedents of patient fulfilment [1].

Huge sufferers' lines at dispensaries and clinics are an issue that faces the probably glossy and fine surrounding in the UAE. As this occasionally prompts disappointment from visiting sufferers, we attempted to take care of this issue with extra useful capacities by building up the hospital-pharmacy management system. The basic role of this exploration is to build up a framework that joins the databases of a medical clinic and a drug store together for a superior incorporated framework that gives a superior lucid workplace [2].

In clinics, the way toward keeping up the record of patients and representatives working in the medical clinic, ascertaining bills, and so forth requires preparing and record-keeping in various divisions. Keeping in view a solid requirement for dealing with the above data quick and effectively, online hospital MIS has been structured and created. It is easy to understand and gives straightforward and productive approach to dealing with the working of medical clinics [3].

In the Taiwanese social healthcare insurance framework, clinics are confronting an undeniably serious medicinal services showcase. Clinic managers, considering this competition, are setting expanding significance on improving the nature of human health services so as to guarantee patients' fulfilment. By what means can service quality (SQ) be improved in medicinal services settings? This examination investigated how quality administration impacts representative impression of administration quality [4].

Human services is so intriguing for our general public. For the most part, hospital management information system (HMIS) is a computer-based framework that can organize all data for empowering human services suppliers to do their works successfully and effectively. As indicated by utilizing these frameworks over the globe, this requires a solid need to see such frameworks and its capacities [5].

To make index based secure access to patient's very own information and clinical records by utilizing RFID labels and web services with the assistance of equipment unit. This framework utilizes web administration interfaces to help standard electronic health records for patient record interoperability. Clients can view and update their own clinical data by means of the site, which flawlessly sync with each other. Since the framework is based on web administrations, it is anything but easy to refresh, adjust, and develop [6].

The paper built up a mechanized framework that is utilized to oversee understanding patient data and its organization. This was so as to take out the issue of unseemly information-keeping, incorrect reports, time wastage in putting away, handling, and recovering data experienced by the customary emergency clinic framework so as to improve the general effectiveness of the association [7].

In a social health insurance milieu, the utilization of NFC (near-field communication) innovation can be utilized for cutting down medicinal services costs as well as encourages robotizing and smoothing out patient's recognizable proof procedures in emergency clinics and utilization of cell phones like PDA, advanced cells, and for structuring a human services the board frameworks [8].

Quality in medicinal services administrations has gotten a subject of study, obtaining an uncommon undertone for both individual and aggregate well-being administrations [9].

The bleeding edge technology of the twenty-first age has demonstrated to surrender significant positive upgrades and has left an immense effect in current medication and human services. Smartphone is one of the most generally utilized gadgets in correspondence [10].

Clinic management framework is a healthy framework that oversees and robotizes the working in the emergency clinic. The framework is proposed to decrease the manual intercession to the most extreme level conceivable. This framework utilizes RFID labels to make sure about access. It likewise empowers proficient situating. Recognizable proof of patients who can't impart is done productively by the utilization of RFID cards [11].

This proposed system contains making the online appointments, getting online prescription of medicines, and giving rating and review to hospital/doctor. Giving rating and review to doctors or hospitals is the key feature of this proposed system.

3 Proposed System

The proposed system takes multiple inputs such as hospital details, doctor details, chemist details, and patients details as shown in Fig. 1. There are four modules in this system. All four modules are connected to each other in a special way. The four modules are:

1. Hospital Module
2. Doctor Module
3. Patient Module
4. Chemist Module

Hospital Module First of all, the hospital (i.e., hospital head) will register itself in the system. After registering the hospital staff (including doctors and nurses) will log in using the username and password of the hospital. This module is for hospitals with multiple doctors. The following are important functions for the hospital after logging in.

Hospital Appointment History The Hospital Appointment History function contains a register of the hospital's appointments to date. It has a list of the year's first. The list of years includes the list of months. And the list of months includes the list

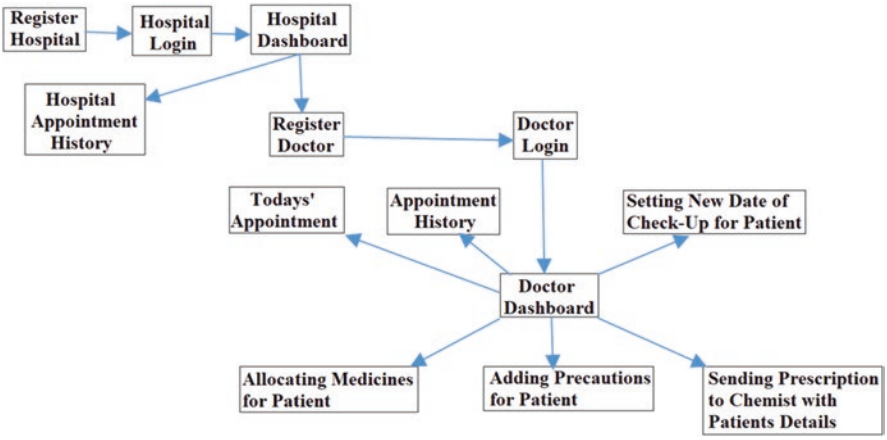

Fig. 1 Block diagram of hospital module

of days. This day's list contains all the appointments that came to that hospital that day.

Today's Appointment In the Today's Appointment function, the doctor will see a list of all the appointments made for him today.

Appointment History In the Appointment History function, the doctor will get a register of all his appointments till date. It will first have a list of years. The year list will have a list of months. And the list of months will have a list of days. This day list will include a list of all the appointments that came to that doctor that day.

Setting New Date of Check-Up for Patient In the Setting New Date of Check-Up for Patient function, the doctor can set the next date of examination for the patient. The patient will receive the notification on the specified day.

Allocating Medicines for Patient In the Allocating Medicines for Patient function, the doctor can examine the patient and select the medications he/she wants to prescribe and create a prescription.

Adding Precautions for Patient In the Adding Precautions for Patient function, the doctor can set the patient's account information on what care to take during drug treatment.

Sending Prescription to Chemist with Patients' Details In the Sending Prescription to Chemist with Patient Details function, the doctor can send the prescription prepared for the patient to the chemist online.

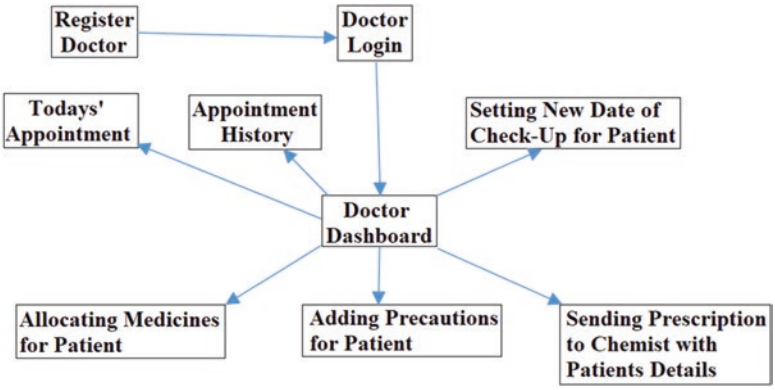

Fig. 2 Block diagram of doctor module

Doctor Module First of all, the doctor will register himself/herself in the system as shown in Fig. 2. After registering himself/herself, the doctor will log in using his/her registered username and password. There are six important functions for the doctor after logging in.

Today's Appointment In the Today's Appointment function, the doctor will see a list of all the appointments made for him today.

Appointment History In the Appointment History function, the doctor will get a register of all his appointments till date. It will first have a list of years. The year list will have a list of months. And the list of months will have a list of days. This day list will include a list of all the appointments that came to that doctor that day.

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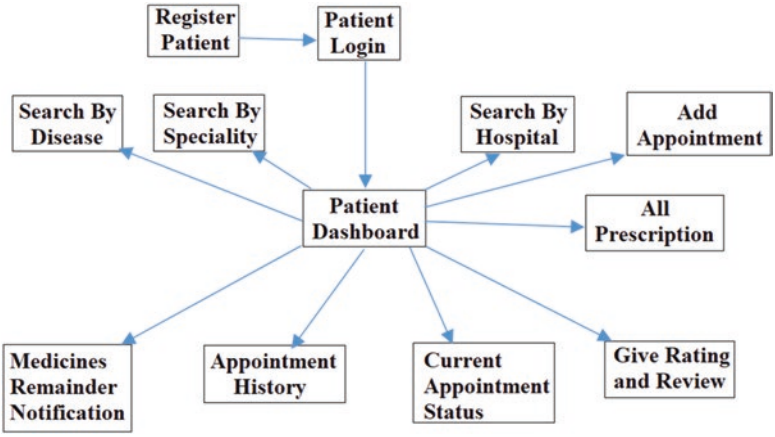

Fig. 3 Block diagram of patient module

Patient Module First of all, the patient will register himself/herself in the system as shown in Fig. 3. After registering himself/herself, the patient will log in using his/her registered username and password. There are nine important functions for the patient after logging in.

Search by Disease In the Search by Disease function, the patient can find a good doctor according to his illness.

Search by Specialty In the Search by Specialty function, the patient can find the good doctor he wants according to the doctor's specialty.

Search by Hospital In the Search by Hospital function, the patient can find a good doctor in that hospital according to his illness.

Add Appointment In the Add Appointment function, the patient can find the doctor he wants and set an appointment for that doctor.

All Prescriptions In the All Prescriptions function, the patient will get a list of all his prescriptions till date. It will first have a list of years. The year list will have a list of months. And the list of months will have a list of days. The list of these days will contain the information of the prescription received by the patient on that day.

Medicine Remainder Notification/Alarm In the Medicine Reminder Notification/Alarm function, the patient should take the medicine on time so that the patient will see the notification or alarm at the time when he wants to take the medicine as set by the chemist.

Appointment History The Appointment History function lists all the appointments the patient has made to date. It will first have a list of years. The year list will have a list of months. And the list of months will have a list of days. The list of these days will contain the details of which doctor the patient had made an appointment with that day.

Current Appointment Status Current Appointment Status will tell the patient how much longer it will take for his current appointment.

Give Rating and Review In the Give Rating and Review function, the patient can give rating and review to the doctor or the hospital on certain days after the treatment.

Chemist Module First of all, the chemist will register himself/herself in the system as shown in Fig. 4. After registering himself/herself, the chemist will log in using his/her registered username and password. There are three important functions for the chemist after logging in.

Prescription Register In this Prescription Register function, the chemist will get the prescription of all the medicines that have come in his medicine till date. It will first have a list of years. The year list will have a list of months. And in the list of months, it will be a list of days. This day list will include a list of all prescriptions received that day.

Today's Prescription The Today's Prescription function will list all the prescriptions received that today.

Adding Remainder on Patient's Prescription The Adding Reminder on Patient's Prescription function will record which medications are to be taken at what time and how much to be taken in the prescription given by the doctor.

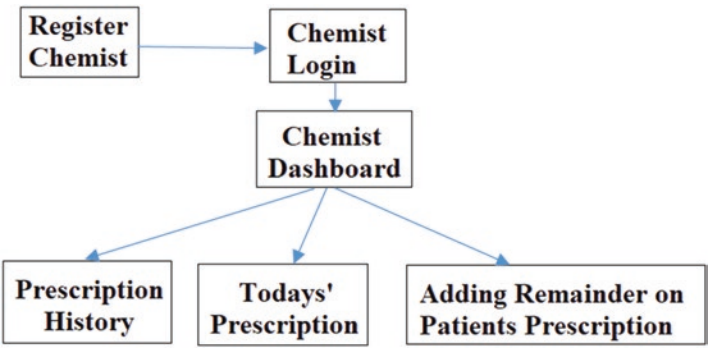

Fig. 4 Block diagram of chemist module

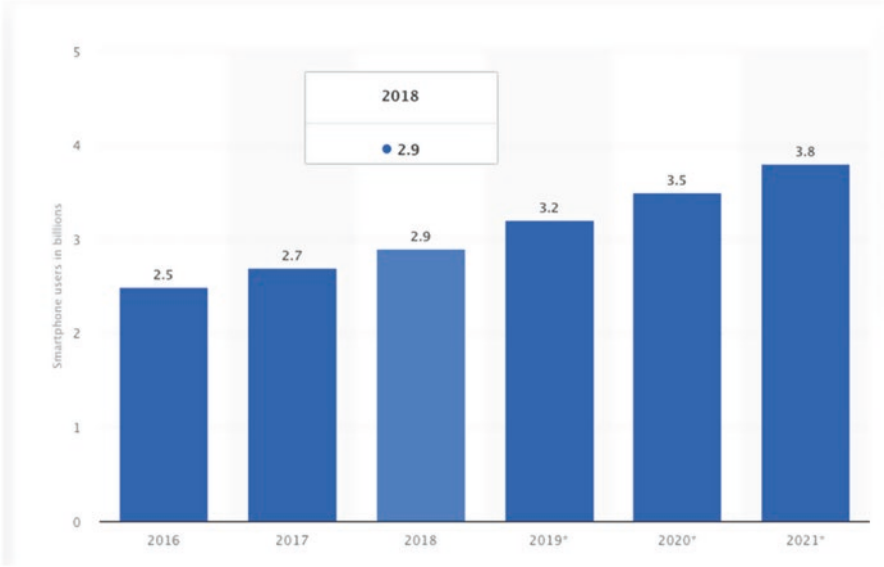

Fig. 5 The number of smartphone users worldwide from 2016 to 2021 (in billions)

Worldwide Smartphone Use The quantity of cell phone clients overall today outperforms 3 billion and is gauged to additionally develop by a few hundred millions in the next few years. China, India, and the United States are the nations with the most noteworthy number of cell phone clients, with every nation effectively outperforming the 100 million client mark in Fig. 5.

In the previous 5 years, about 1.4 billion cell phones were sold overall every year, reflecting stagnation in the cell phone market during the most recent couple of years. The cell phone market despite everything has high development potential; however, the cell phone penetration rate is still lower than 70% in numerous profoundly populated nations, specifically China and India. The income of the worldwide cell phone market kept on expanding in the course of the most recent couple of years, in spite of stagnating unit deals – because of a developing normal selling cost of cell phones. These statistics will show that smartphones are the most important and vastly growing technology.

Android Background Services Running assignments out of sight expends a gadget's constrained assets, similar to RAM and battery. This may bring about an awful client experience. For instance, foundation undertakings may debase the battery life of the gadget, or the client may encounter poor gadget execution now and again, for example, viewing a video, playing a game, and utilizing a camera. To improve battery life and give a superior client experience in Fig. 6, Android has advanced more than a few discharges to build up limits on foundation execution. This flowchart can assist you with settling on a choice.

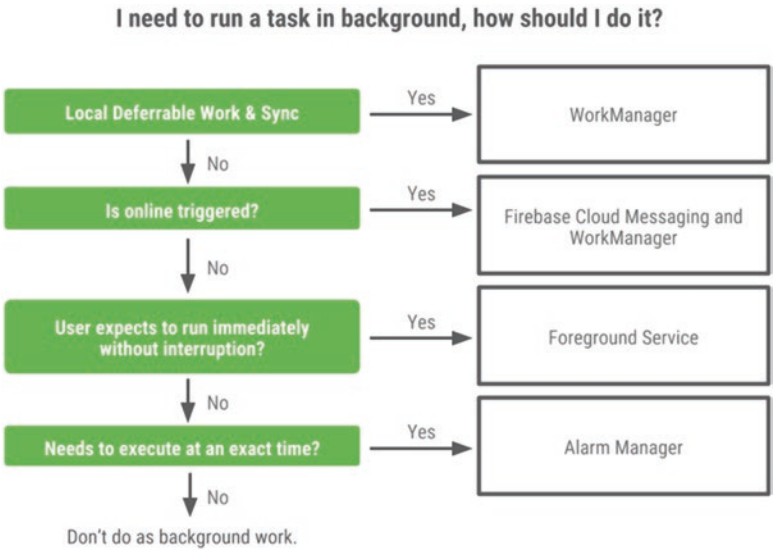

Fig. 6 How background services works in Android

Work Manager is the suggested answer for foundation execution, considering all OS foundation execution limits. You can likewise apply execution requirements to them, for example, activating when the gadget is inert or charging or executing when a substance supplier changes.

On the off chance that a long-running undertaking is to be planned for reaction to an outer occasion like matching up for new online substance, use Firebase Cloud Messaging to advise your application and afterward make a work demand with Work Manager to synchronize the substance. You can get familiar with this in "advising your clients with FCM."

In the event that the application needs to finish a client-started task without conceding regardless of whether the client leaves the application or turns off the screen, for example, on account of music/video playback or route, you should utilize a Foreground administration. The following blog entry in this arrangement plunges further into this utilization case in Table 1.

4 Conclusion

Using this system, you can save yourself a lot of time by making appointments online. Also, with the concept of e-prescription, we can save paper. Also due to the notifications and alarm system, in this system the patient can take his medicines on time. Also rating and review is a very important concept. This will definitely reduce corruption in the health sector, because doctors need to provide good services for good ratings and reviews.

Table 1 Modern background execution

Use case	Examples	Solution
Guaranteed execution of deferrable work	Upload logs to your server	Work Manager
	Encrypt/decrypt content to upload/download	
A task initiated in response to an external event	Syncing new online content like email	FCM + Work Manager
Continue user-initiated work that needs to run immediately even if the user leaves the app	Music player	Foreground Service
	Tracking activity	
	Transit navigation	
Trigger actions that involve user interactions, like notifications at an exact time	Alarm clock	Alarm manager
	Medicine reminder	
	Notification about a TV show that is about to start	

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