An Integrated Health Care Management system for Health care Data

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Abstract: A state of complete physical, mental, and social well-being is referred to as health. Health care plays a major role in everyone's life and is in huge demand as it is a limited resource. The hospital resources become deficient when the demand for the resources increases than the supply and resource sharing become even more challenging. Facilitating the health amenities or resources to the people in need at the time of emergency is utmost important. This integrated health care system helps the client or patient searching for the nearest hospital, by providing the list of best hospitals available in the locality or area. This will allow the user's in finding the hospitals nearby as per the location specified. It saves the time of the user searching for the hospital and in times of emergency.

Index Terms - **Integrated health care, resource sharing**

I. INTRODUCTION

Health is the totality of physical, mental, and spiritual well-being. Maintaining one's physical condition and taking precautions to lower the risk of contracting various diseases constitutes being healthy. The healthcare industry is the biggest sector and is a collection of several industries that provides commodities and solutions to treat patients with remedial, precautionary care. When demand for resources exceeds supply, the hospital's resources are insufficient, making resource sharing even more difficult. The integrated health care system helps the client or patient searching for the nearest hospital, by providing the list of best hospitals available in the locality or area. The integrated database of all the hospitals in the locality in a city is maintained in one Integrated Server. The client or patient has to select the location where he wants to visit the hospital and can view the list of hospitals and their facilities available based on the location selected. The hospital facilities can be the doctor availability, doctor visiting hours, hospital speciality, medical equipment's available in the hospital, operation theatre, lab facilities, blood bank, ambulance facility etc. On choosing the hospital, the user can visit the hospital for regular checkup based on the availability of the doctor in the hospital and can also get admitted in the hospital in case of serious or emergency health issue. The client can request for the bed by filling the details in the admission form and submitting it. The hospital people can view the appointments of the client and can approve the client's request for the bed by checking the availability of bed and other facilities.

II EXISTING SYSTEM

In the existing healthcare system, every day the healthcare system produces a huge amount of information, and managing it is difficult for all healthcare organizations. Healthcare organizations have come to appreciate the importance of technology-based solutions for supporting their operations, functions, and information management.

III PROPOSED SYSTEM

This is an integrated health care system that helps the user in finding the hospitals nearby based on the location at the earliest. The user can view the list of hospitals and their facilities available based on the location selected. The hospital facilities can be the doctor availability, doctor visiting hours, hospital speciality, medical equipment's available in the hospital, operation theatre, lab facilities, blood bank, ambulance facility etc. The OPD service enables the user or client to visit the doctor when it is most appropriate for treatment and to be admitted to the hospital in an emergency. With this technique, less time is neededto locate hospitals and learn about their amenities during an emergency. To build this application anaconda IDE has been used and python

and Django frame work is used to build the interface. For the backend SQLite database is used to store all the data. The hospital data and their facilities, user details and locations of the hospital will be stored in the database.

- **Module 1: Server head**

The server head module will help in creation of locations for the hospitals to be located. The various locations for the different hospitals is created. The server head has the authority to authenticate the hospitals based on the facilities available in them. The hospital facilities are bed availability, blood bank, operation theatre, ambulance, doctor availability, lab facilities etc. The hospitals register first and only on the approval of the server head, the hospitals can login and add their facilities to the server. The doctor details and their time of availability are also added. The server head can also reject the hospitals if more facilities are not available.

- **Module 2: Hospital Administrator**

The hospital data and details of hospital facilities like blood bank, medical equipment's, operation theatre, lab facilities, doctor availability, ambulance services etc. are collected by hospital administrator. The data and details of hospital facilities collected is stored in the database. The doctor details like name of doctor, specialization, visiting hours of doctor etc. are also added by the hospital administrator. The hospital can register and add their facilities only on the approval of the server head. The hospital administrator will not be able to add the hospital facilities when rejected by the server head. The server head has the authority to approve or reject the hospitals based on the facilities available in hospital. On the successful approval of the hospital, the hospital administrator will add the hospital data in the server. The user's request for admission in hospital is approved by hospital administrator.

- **Module 3: Hospital Search**

The hospital Search is where the person can search for the hospitals in a particular locality. The patient or client has to select the location where he wants to visit the hospital. On choosing the location, the client or patient will be able to view the list of hospitals and the facilities available in hospital. On viewing the hospitals and visiting hours of doctor, the client can visit the hospital and can go for checkup with the doctor and can also get admitted in the hospital. The client should fill all his details in the admission form requesting for the admission. The client can admit once the hospital administrator approves the request.

IV. RELATED WORK

Mary Beni Reshma and two others [1] proposed a device that use different sensors like pulse, ECG, temperature to determine the patient's cardiac condition. Even if the individual is at his place After that, the sensing element is connected to a microprocessor that permits for monitoring taking heart pulse data and transmitting it across the net. The system then sets high and low limitations. As soon as the patient's heart beats, the monitoring begins. When a value exceeds a specified threshold, the device transmits a warning to the user .

Kar Way Tan and two others [2] proposed two estimation models based on Principal Component Analysis and Multiple Linear Regression to enable hospital with the foresight of the bed tenancy scenario's so as to avoid bed crisis situations where patients hold up more than ten hours for beds. The goal is to transform the health centre's bed management from receptive to proactive.

Jiexun Li and three others [3] suggested a novel admission prediction models based on a variety of pre-hospital indicators to assist hospitals in estimating the number of patients who will be admitted. The goal of this research is to create models that can predict admission from an emergency room to a hospital inpatient bed.

Byron Graham and three others [4] surveyed that overcrowding in emergency departments (EDs) can have major effects for patients and employees, including longer wait times, ambulance diverts, lower staff morale, and worse outcomes. The purpose of this study is to compare the performance of machine learning algorithms in developing models to predict hospital admissions from the emergency department.

Tabib Ibne Mazhar and two others [5] surveyed that Predicting length of stay is critical for providing better treatment and amenities to inpatients. Not only are hospital resources limited, but inpatients find it difficult to absorb the cost for an extended period of time. a system that uses machine learning techniques to estimate the length of stay of SCI patients is proposed.

Lalit Garg and two others [6] proposed new strategy to efficiently forecast bed requirements in a care unit, taking into account the effect of patient demographics at the time of admission, is one of the paper's innovative contributions. This approach can also be used to estimate the expected daily cost of care for all patients in each patient group, as well as the projected total daily cost of care for all patients

li-chin chen and three others [7] have analyzed that the cost of travel makes treatment prohibitive. The number of people going to health-care facilities is growing. The goal of this research is to present a deep neural network technique to modelling the complicated decision of a patient's travel distance to obtain care, which is an important indicator for resource allocation decisions.

V. METHODOLOGY

Health care plays a major role in everyone's life and is in huge demand as it is a limited resource. The hospital resources become deficient when the demand for the resources increases than the supply and resource sharing become even more challenging. Facilitating the health amenities or resources to the people in need at the time of emergency is utmost important. The integrated health care system helps the client or patient searching for the nearest hospital, by providing the list of best hospitals available in the locality or area. The client or patient in need of hospital after having met with an accident or in case of any serious health issue can select the location and can view the list of hospitals and facilities. The integrated database of all the hospitals in the locality in a city is maintained in one Integrated Server. The hospital facilities can be the doctor availability,doctor visiting hours, hospital speciality, medical equipment's available in the hospital, operation theatre, lab facilities, blood bank, ambulance facility etc.

In this system, thehospital administrator will collect, add and manage all the data about the hospital and its facilities. Thehospital administrator will collect hospital data like the list of doctors available in the hospital, bed availability, hospital address, city, phone number, medical equipment's, operation theatre, ambulance facility etc. and add them to the Integrated server. The server head or admin has the authority to authenticate i.e., to approve or reject the hospitals on viewing the hospital facilities. Only the approved hospitals can add their data to the Integrated Server. The hospital administrator can also add the doctor details and also can view the facilities available in the hospital. The hospital people can view the appointments of the client and can approve the client's request for the bed by checking the availability of bed and other facilities. The client gets confirmed once the hospital approves his/her request. So, when the new client searches for bed in the same hospital will be able to view the updated count in the facilities of the hospital.

To build this system anaconda IDE has been used and python and Django frame work is used to buildthe interface. For the backend SQLite database is used to store all the data. The hospital data and their facilities, user details and locations of the hospital will be stored in the database. This system will allow the user's in finding the hospitals nearby as per the location specified. This saves the time of the user searching for the hospital and in times of emergency.

VI. RESULTS AND DISCUSSION

The integrated health care system uses modules like server head who creates the locations where the hospitals are to be located and authenticate the hospitals based on their facilities, hospital administrator who adds the hospital facilities to the server on approval by server head, hospital search where the user use to find the suitable hospitals nearby.

A. Server head

This module helps to create the locations where the hospitals are located. Various localities for different hospitals are created. Hospitals can add their facilities to the integrated server on approval by server head.
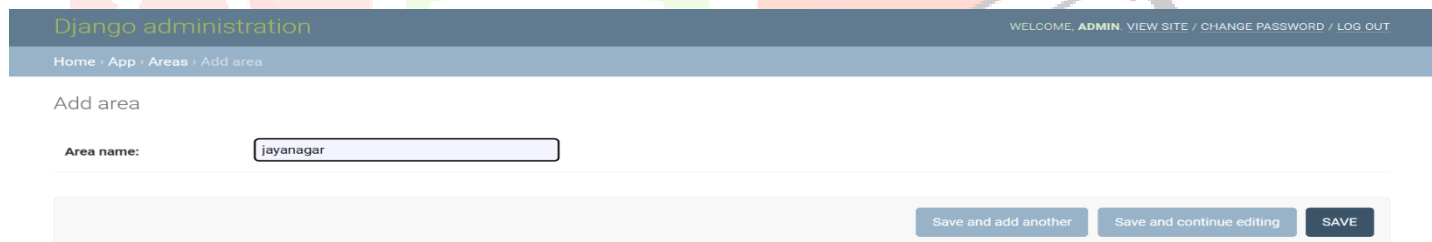

Figure 1: creation of locations by server head

B. Hospital administrator

This module helps in collecting the hospital data and details of hospital facilities like blood bank, medical equipment's, operation theatre, lab facilities, doctor availability, ambulance services etc. The data and details of hospital facilities collected is stored in the database. The doctor details like name of doctor, specialization, visiting hours of doctor etc. are also added by the hospital administrator. The hospital can register and add their facilities only on the approval of the server head. The hospital administrator will not be able to add the hospital facilities when rejected by the server head. On the successful approval of the hospital, the hospital administrator will add the hospital data in the server.
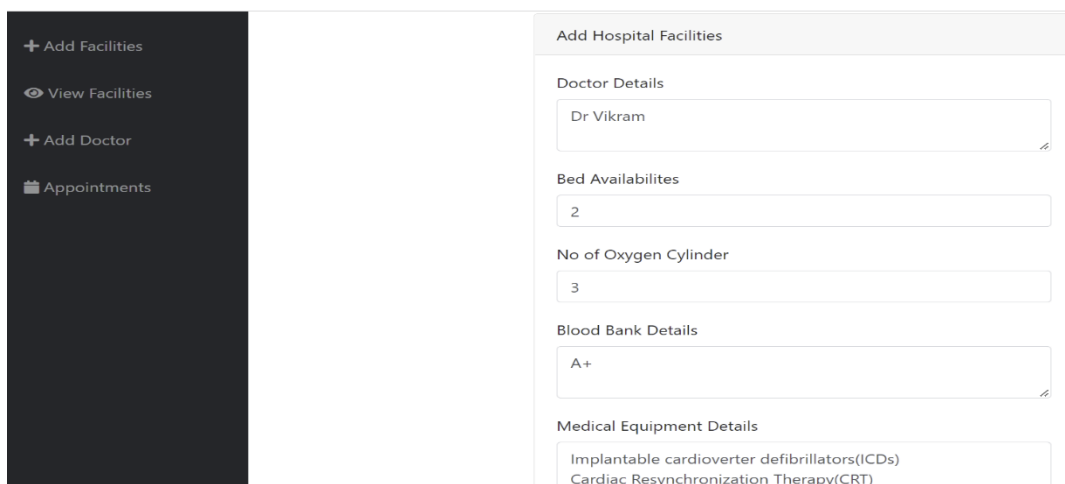
Figure 2: Hospital facilities added by hospital administrator

C. Hospital Search

The hospital Search is the module where the person can search for the hospitals in a particular locality. The patient or client has to select the location where he wants to visit the hospital. On choosing the location, the client or patient will be able to view the list of hospitals and the facilities available in hospital. On viewing the hospitals and visiting hours of doctor, the client can visit the hospital and can go for checkup with the doctor and can also get admitted in the hospital.
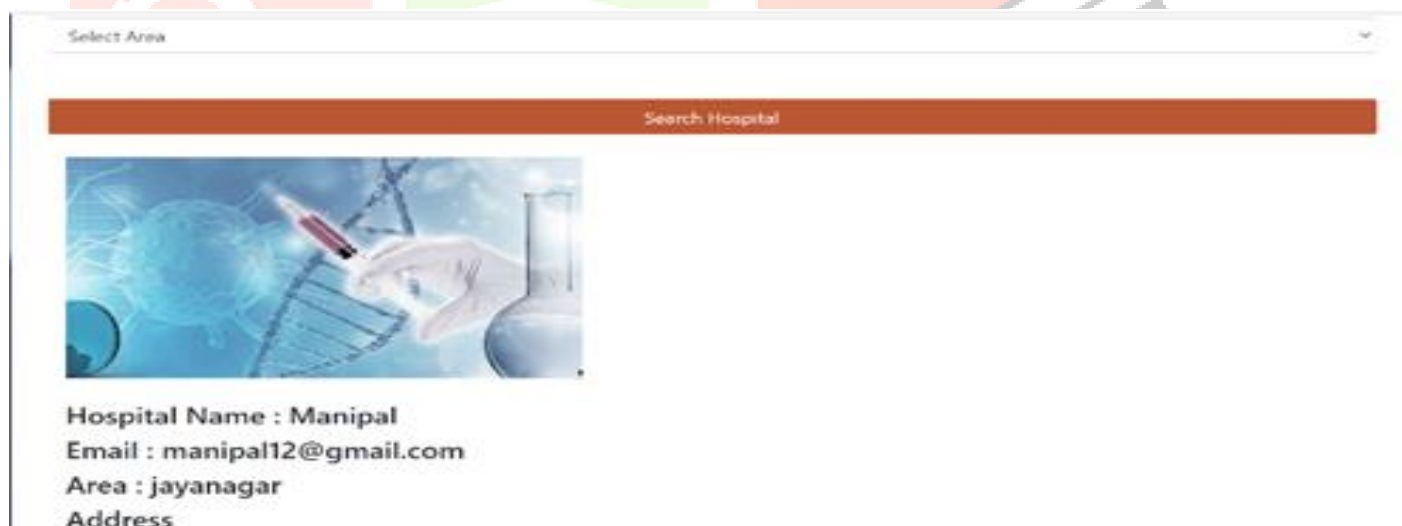
Figure 3: To view hospitals based on search location

Facilities Detail [List of Doctors]

Doctor Details

Dr Vikram

No of Bed Available

2

No of Oxygen Available

3

Blood Banks

A+

Medical Equipment Details

Implantable cardioverter defibrillators(ICDs)
Cardiac Resynchronization Therapy(CRT)

Ambulance

24/7 services available

Labs

Sample collection ECG X ray

OT

8 Major OT 3 Minor OT

Emergency Services

OPD is available

Others

24*7 Pharmacy Health checkups

[GET AN ADMISSION] [OPD]

Figure 4: Hospital facilities like OPD for checkup and admission

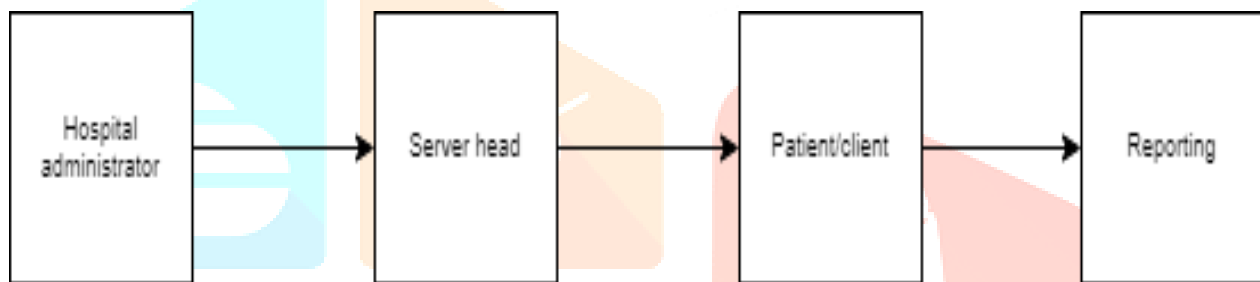How does an integrated healthcare system in health care sector work?

Figure 5: Block diagram of Integrated Health care system

The figure 5 shows the hospital data and facilities of all the hospitals in various localities collected and added to the Integrated server by hospital administrator on approval by server head. The patient or client can viewing the hospital facilities by choosing search location can report to the hospital at the earliest.

VII. CONCLUSION

Health is something that people seek because it helps to facilitate and provide happiness. Longevity and quality of life are two factors that can be used to describe health. There are situations where the person meets with an accident or suffer from serious health issue. Facilitating the hospital resources at the earliest possible time is utmost important. Finding the suitable hospital as per the patient's requirement in the nearest location at the earliest is quite challenging. This system will allow the client's in finding the hospitals nearby as per the location specified. This saves the time of the client or patient searching for the hospital and in times of emergency. The feasible resources be known for his or her health issue. On viewing the list of hospitals and their facilities available, the client can visit the hospital for the checkup and also can get admitted in hospital on suggestion by the doctor.

VIII. FUTURE WORK.

The goal is to provide the people with the data on the nearest hospitals and facilities at the earliest possible in times of emergency. Along with this,this system can be enhanced by using the geolocator device that tracks the location of the person when meets with an accident and send a Text SMS alert in the phone. To evaluate the patient's state, measurements can be made of parameters like heart rate, temperature, and ECG frequency. Patients or caregivers are alerted with a message when a patient's sensor reading is determined to be abnormal. They are also given an SMS recommendation for the closest hospital. People might benefit from this so that the patient or caregivers won't have to run around in a panic looking for hospitals close by.

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