Centralized Hospital Management and Data Sharing System for Government Hospitals in Kerala

[1]Mubash M [2]Nimitha J [3]Ratheesh T K
[2]Assitant Professor
[1,2,3]Department of Information Technology
[1,2,3]Government Engineering College Idukki, Painavu, Kerala

Abstract

Rapid changes are happening in the health sector for the patient treatment process. Most of the hospitals now uses automated management systems for managing patient data including their personal and medical data. But sharing of patient data of patients moving across hospitals for better treatment is still a hurdle especially between Govt. Hospitals in Kerala. This research work addresses the problem of the information flow across Govt. hospitals or across individual Hospital Management Systems. This is done by designing a Centralized Hospital Management System. So the main purpose of this design is to fix the information flow problem in hospital shifting of critical patients and hospital shifting of patients with other critical reasons. The proposed system also addresses the convenience of availing the service of expert doctors from nearby hospitals if there is difficulty in shifting patients due to his/ her bad physical conditions.

Keyword- Data Sharing System, Centralized Hospital Management System

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I. INTRODUCTION

This system is to simplify the most of the works by Hospital Staffs, Doctors and Nurses and Hospital to Hospital during the time of critical situations. We are using this system by controlling through Web Application. Now a day's most of the places across the world are using Web Application. So here we also preferring same kind of application for the security and all. Through this application software we are using the available features to each and every one of hospital staffs and doctors etc. Like: (1) Ease of use to everyone in hospital, (2) Reducing difficulties in lab and pharmacy,(3) Reducing the difficulty of doctors and nurses, (4) Reducing the difficulties of patients, (5) Making a advance visitors checking system with in it.

In this system, introducing new features for helping the hospital staffs, doctors, nurses, ambulance, and hospital management in critical situations, Like: 1) Giving alert system from one hospital to another hospital at hospital shifting, 2) Checking the availability of doctors for urgent cases from other hospitals, 3) Giving and IOT device in ambulance for giving instructions to ambulance from hospitals about shifting hospitals, 4) Checking the availability of blood in nearby blood bank or in hospitals, 5) Checking the availability of facilities in other hospitals in critical times. The main feature is interconnection of hospital. Through this system we are thinking that it will helps every one thus we are introducing new systems with all available features with newly added features.

II. LITERATURE SURVEY

1) Big data exchange between Ambulance Bus to Hospital network through internet in Telemedicine using computer communication network and 3G Mobile Antenna:

India has the second largest population in the world. And at the same time there is more accident death when traveling by road. Accidents mostly lead to death since emergency treatment and the operation cannot be performed in an ambulance bus. Ambulance bus are not equipped with speciality medical equipments because these equipments requires more space which is not available in the ambulance bus.

The critical emergency treatment could not be done in inside of the ambulance bus. Because of this there is an increase in critical patient's death. The Ambulance bus has to travel to hospital and only then the treatment for the critical patient is started. Since the Indian economy is poor the small scale hospitals are not being able to implement satellite based Telemedicine for exchange big data from an ambulance bus to hospitals. In this paper they are designed a low cost 3G/4G internet antenna in an ambulance bus for Telemedicine using computer communication and mobile booster amplifier which can be used for the best transmission of big data exchange for patient report from ambulance bus to the hospital network and also they can reduced transfer delay by using the 3G/4G internet dish antenna.

Internet based mobile telemedicine bus can be used to save critical accident patients and a l s o   m o s t emergency specialty treatment is available in ambulance bus and contains X-ray machine for taking fracture image, scanner machine , operation theaters and the power to machines are supplied by inverter and solar power.

2) Design and implement of performance management system for hospital staff based on BSC:

As a matter of fact, the performance evaluation of most current hospital medical staffs turns to be broad and vague frequently. It becomes much more difficult to reflect the actual working situation of employees accurately by lacking of factual data, objectivity and rationality. What the goal of research of this article is to develop a performance management system based on BSC, in order to collect the pivotal performance indicators automatically from the current hospital business management systems and HIS systems, which in turn lead to an automated and objective evaluation system by transferring those indicators into quantitative evaluation values according to required rules. As a case study on HangZhou First People's Hospital, it proposed the concept of system model and functional component by means of researching performance evaluation through approaches such as AHP and Delphi poll. It could get good result after finishing system program compilation implementing system with C code based on. Net framework and passing the tests through a serial of such researching activities as performance assessment criteria analysis, data acquisition analysis, design of processing flow and database design.

3) Design and Implementation of Hospital Emergency Nursing Information Management System:

In this paper, they are concentrate on the problem of design and implementation of hospital emergency nursing information management system, which is of great importance in modern hospital management. This system is made up of several parts: making card, registration, medical treatment, drug information management, pharmacy dispensing, emergency, data dictionary maintenance, database backup, report printing and so on. Particularly, there are seven function modules in this system, including: 1) Emergency register management, 2) Price making, 3) Charge, 4) Nurse station management, 5) Report printing, 6) Pharmacy dispensing, and 7) Data dictionary maintenance. Based on the above design, the proposed system can provide high quality treatments and good services for patients and their families.

4) Intelligent Hospital Management System (IHMS):

An intelligent hospital information management system was developed to assist the patient at the front desk of a hospital. The patient will be able to learn about the doctors, appointment times, relevant departments, laboratory tests and the specific medicine about his/her medical situation. System will provide an intelligent front desk information service for the patients at the hospital entrance. It will also provide software assistance for the doctors to diagnose easily and rapidly by using the program's decision mechanism.

III. PROPOSED WORK

We are proposing a centralized hospital management system which addresses the various issues defined above. The various Govt hospitals in Kerala can be members of this centralized management system, even though individual administration is also possible. The centralized system allows service sharing which includes sharing of both expert doctors service as well as sharing of patient data when there is a need of shifting him/her due to medical emergencies like lack of adequate facility. Through this system the patient data will be shared between the member hospitals if needed. Using this system the availability of a doctor in any other hospital can be checked if a patient is in a critical stage and the expert doctor is unavailable there. This is really applicable when there exist problems in shifting the patient due to multiple reasons. Also the doctors can give instruction or medical advices through the same system. The security of data for such a system is a major concern even though it not much addresses in the prototype implemented now. The service of Cloud infrastructure may be availed for maintaining the central database.

A. About the Application

The proposed system allows 9 roles viz. (1) Super Admin (2) Admin (3) Superintend (4) Department Head (5) Doctors (6) Nurses (7) Lab (8) Pharmacy and (9) Gate Watchman. The system give an alert to the hospital while a patient is shifting. In case a hospital can't accommodate the patient they can reject with valid reason. This will help in directing the patient to another hospital. The system uses the concept of Load Sharing in distributed multimedia-on-demand. The proposed system is a secured system for all client hospitals in Govt. Sector. The major advantages of this system is the considerable reduction of the loss of information of a patient's disease. We look forward to have good treatment to all patients especially the financially poor people of Kerala.

In these roles we are giving permission to use this application except patients. Each of the roles have their on separated duties in this application. Each of them are different with each other. Like:

1) Super Admin

Super Admin have full control over this application like: (1)add/delete hospital (2)add/delete admin (3)add/delete doctors, nurses and departments (4)view patients (5)view lad and pharmacy sections (6)view visitors (7)etc..

2) Admin

Admin control this application like: (1)add/delete appointments of doctors (2)check doctors are available or not (3)view patients details (4)view lad and pharmacy sections (5)view visitors (6)etc..

3) Superintend
Superintend can use this application like: (1)Add/delete doctors/ nurses/ HOD (2)Assign nurses and doctors duty days (3)view patients details (4)Check the attendance of doctors, nurses and HOD (7)etc...

4) Department Head
Department Head can use this application like: (1) To check the duty doctors (2) to check today's appointments (3) view patients details (4) update the patient examinations by ward round or other way (5) Prescribe the medicines and test for the patients from which pharmacy and lab (6) give alter to shift the patient when conditions are become worse (7) etc...

5) Doctors
Doctors can use this application like: (1) To check the duty days (2) to check today's appointments (3) view patients details (4) update the patient examinations by ward round or other way (5) Prescribe the medicines and test for the patients from which pharmacy and lab (6) give alter to shift the patient when conditions are become worse (7) etc...

6) Nurses
Nurses can use this application like: (1)To check the duty days (2)to check in which department today's duty (3)view patients details (4)update the vitals of the patient by hourly or time prescribed (5)update which are the medicines are given to the patients (6)give alter to doctors whether the patient condition's changes (7)etc...

7) Lab Section
Lab Section can use this application to view the suggested tests or scan or etc. By the doctors to the patient and update the results

8) Pharmacy Section
Tests or others to the patient's page directly. Pharmacy Section can use this application to view the prescribed medicines from doctors to each patient and update which ones are delivered. This helps to the Patient care takers to avoid their difficulty in hospitals.

9) Gate Watchman
Gate Watchman can use this application to view the visitors now entered or update the in & out of the visitors from any gate. Also keep the details of visitors for each patients. etc...
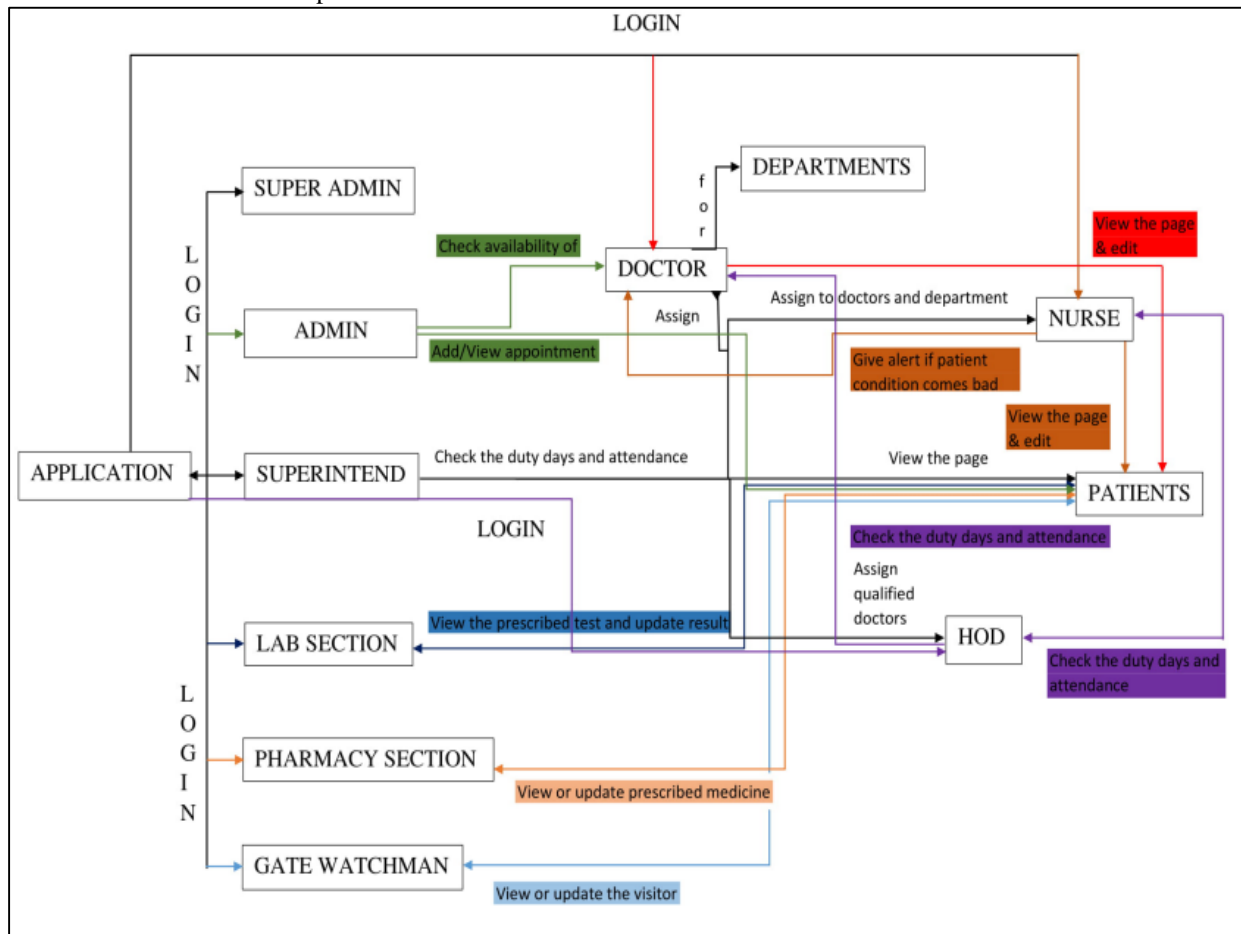

Fig. 1: Internal Architecture of New System

B. Detailed Description of New Features Added in the System

1) Alerting to Hospitals Ambulance
Through this application we are trying to give an alert the hospital while a patient is shifting to the any other hospital due to any critical situation. At the same time we give an information about the patient shifting hospital to ambulance. This is a simple feature in this application. In case the directed hospital can't accommodate the patient they can reject with valid reason and directed to another hospital. At that time this application gave the new direction to ambulance about the new hospital.
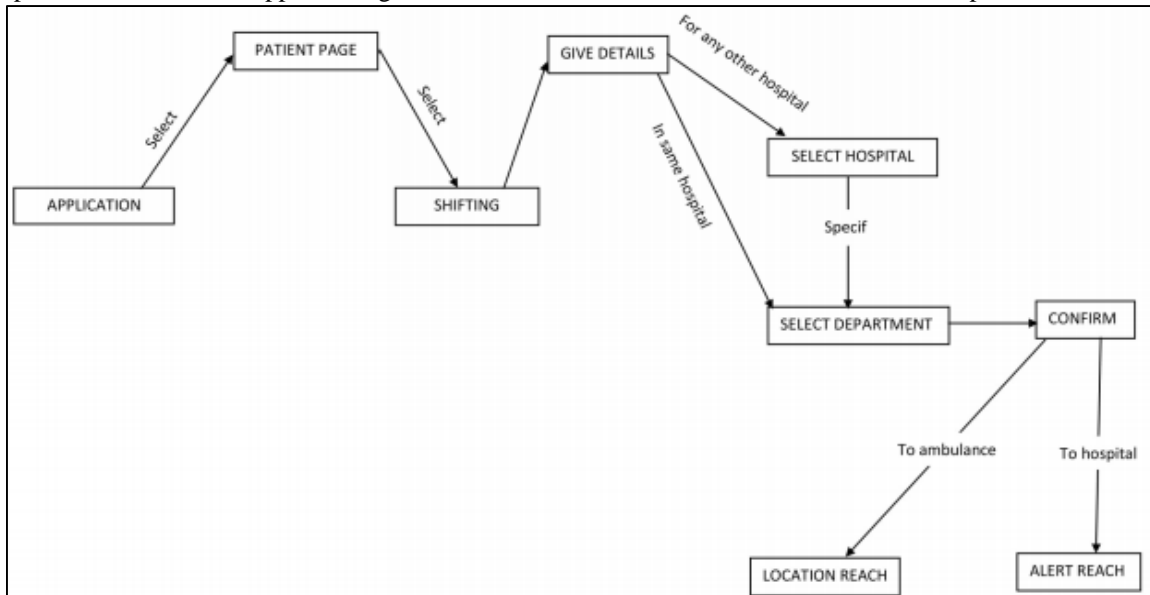
Fig. 2: Architecture of giving an alert

2) Checking Availability of Doctors
Using this same application we can check the availability of doctors in any other hospital if a patient is critical and the doctor was absent, then we can assist the doctor that avail nearby hospitals or in any hospitals. Also the doctors can give instruction or prescribe what to do through this application by using the patient page.
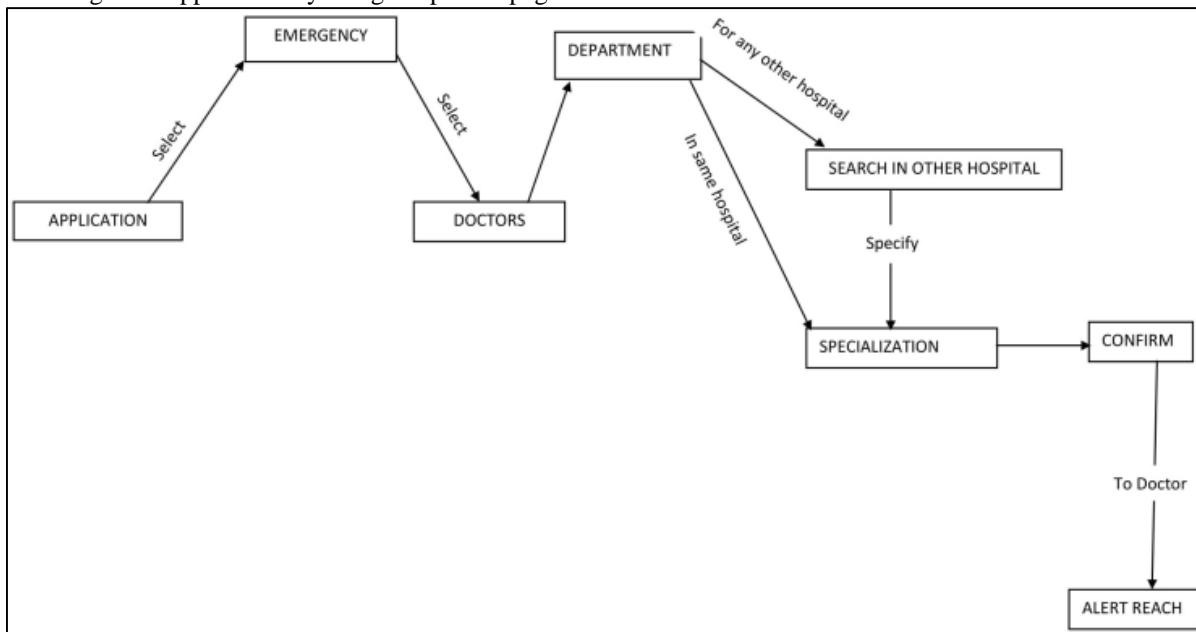
Fig. 3: Architecture of searching doctors

3) About the IoT Device
This is not a complicated newly founded device. We are updating the existing device with a GSM (Global System for Mobile communication) module by attaching to GPS (Global Positioning System). We sent the location to GSM module it read it's as text and give it to GPS and locate the place very easily also send the name of the hospital and it reads in display.
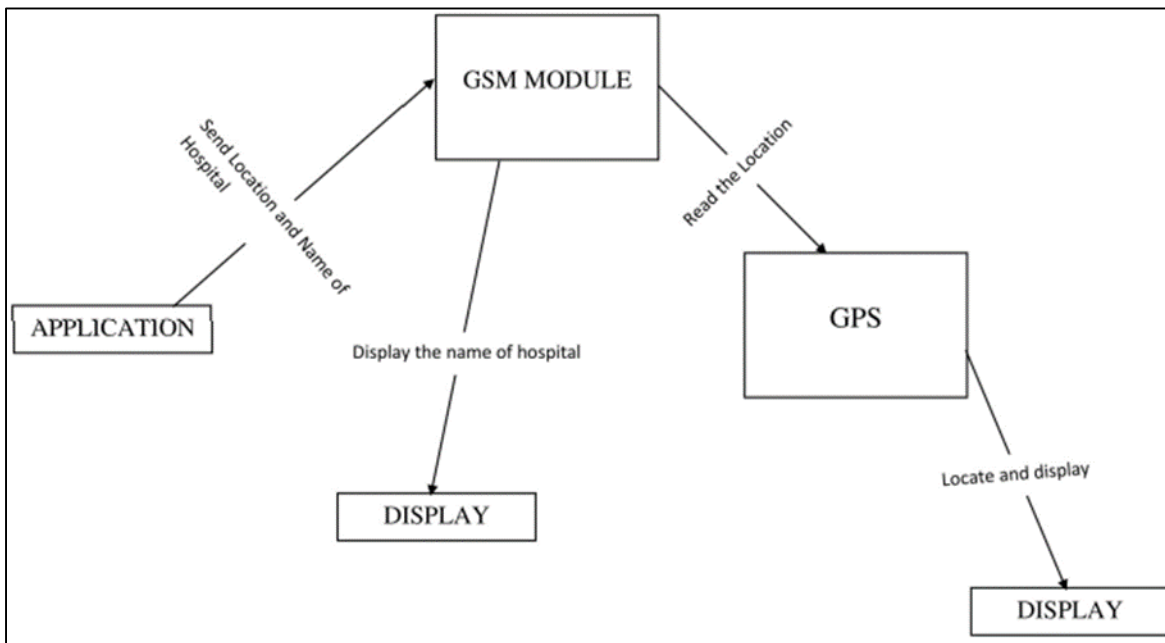
Fig. 4: Architecture of Ambulance System

4) About the Data Sharing
Through this system we can share the data's of any patient from one hospital to other is very easy, also we can send the multimedia diagrams and all through this system too. This make a massive change in Govt. Hospital sessions in kerala.

IV. EXPECTED RESULTS

Using this system we are making our Government hospitals in Kerala automated. This system is defined also for connecting all the government hospitals in Kerala for sharing services between them as mentioned above.

A. Specific Outputs of the Project
- Inter Hospital Referencing
- Availing Doctor Services from the Chained Hospitals
- Patient shifting between hospitals without carrying documents

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