

Remote Patient Care Monitoring System for Rural Area

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Abstract: *Recent advancement in health care technologies provides a brand new edge to medical services. The health condition of the folks living in remote rural areas of Asian countries is much worse than urban folks. To watch basic medical parameters for identifying the abnormalities within the early stage of chronic diseases want regular interval hospital visits that may be a comparatively costly and long method. Rare availabilities of medical experts or medical centres, the content of the folks, and correct care at the proper time area unit are the prime causes of great medical concern that result in surprising death. This work is an Associate in Nursing attempt to solve basic health issues and take recommendations from registered physicians for the betterment of the targeted community. The connectedness of Associate in Nursing E-Solution that improves provision settings at intervals the agricultural elements of the developing world and discusses a projected patient-centric E-Solution that suits the agricultural setting, the foremost advantage of implementing such an Associate in Nursing E-Solution is that it ensures the provision of the Specialist across a distance at many E-Clinics in the shortest possible time frame.*

Keywords: Data Mining, E-Solution; Electronic Medical Records; E-Clinic; E-Consultation; E-Clinic Management Centre

I. INTRODUCTION

The involvement of technology in recent times has brought a revolution in most of the fields of human life. Health care is one of the prime issues for the person that is integrating with technology and reaching successive levels. Many advanced medical facilities and devices utilized in few well-maintained hospitals in the metropolitan cities of Asian country like urban centres, Delhi, Hyderabad, etc. square measure delivery a good change within the medical field.

However, it's discovered that the charges of these hospitals and therefore the devices or instrumentality used for health observation square measure too overpriced and it's terribly troublesome to avail those facilities by poor those who square measure affected a lot of by health issues attributable to drinking contaminated water and ingestion of poor nutrition food. Moreover, several existing medical facilities and medical instruments square measures required to be upgraded with the net Application to ease the life of the human.

e-Health is one of the advancements within the field of healthcare that deals with health connected interactions, services and knowledge delivered or highlighted through the popular recent technology i.e. internet. good e-Health care will be the new replacement of the standard tending model during which paperwork is taken into account mutually of the foremost problematic factor. More than half the population is staying in rural areas of India. inside rural places, the financial condition index is found higher in eight major states out of twenty-eight states of Asian country (Eastern part: Odisha, Manipur; Central part: Madhya Pradesh; Western parts: geographical region, Gujrat; Northern part: Uttar Pradesh, Bihar, Jharkhand). just about a simple fraction of poor folks of the country belonging to these eight states, during which one out of 10 lives in an exceedingly remote geographical region of India. In those remote rural communities, medical facilities like medical experts, basic medical instruments, and medical canters to monitor the tending of the patients square measure terribly restricted. Rare avail skills of medical examiners or medical centres, ignorance of the folks and correct care at the right time square measure the prime causes of significant medical concern that result in unexpected death per pay analysis of Indian data, it's according that there's a shortage of over 500,000 doctors. As per the magnitude relation customary of

World Health Organization (WHO), it's expressed that there ought to be a minimum of one doctor for a thousand patients i.e. 1:1000 that has been consistently unsuccessful in Asian countries from year to year. Thus health indicator of the remote rural community is obtaining worse day by day. For such reasons, our objective is to develop associate degree net application for remote monitoring health observation system which supplies a cheap, reliable, private, secure, and economical answer for the targeted community.

Patients in rural areas incur significant expenditure in travelling long distances and outlay tons of their time to consult Specialists in cities thanks to the dearth of Specialists in their areas. This issue may be addressed by associate degree e-Solution that creates acceptable use of Electronic Medical Records (EMR) and Telemedicine technologies that allow the patient to consult a Specialist through e-Consultation. supply setting in rural components nowadays exposes restricted access to extremely specialized consultancies. Patients in rural areas ought to travel long distances to consult a Specialist in an associate degree geographic region. This entails a large quantity of price, time, and inconvenience particularly for the old, post-operative, and re-convalescing patients World Health Organization has received specialized treatments. In rural areas, patients' medical records square measured keep within the record rooms of the hospitals wherever they're ordered and managed manually.

Once a patient visits the clinic it's necessary to travel through all the records to search out the relevant record that imposes delay to the method. The patient records square measure accrued for looking out a selected record once a clinic is near to begin. This drawback may well be addressed by connecting the Patient and therefore the advisor through a web-based Electronic case history (EMR) system. the employment of electronic medical records would conjointly facilitate managing patients' medical records a lot with efficiency. The pertinence of associate degree E-Solution that improves supply settings within the rural components of the developing world and discusses a projected patient-centric E-Solution that suits the agricultural setting. the most advantage of implementing such an associate degree E-Solution is that it ensures the supply of the Specialist across a distance at several E- Clinics inside the shortest doable time frame. E-health facilitation of illness management has the potential to extend engagement and effectiveness and extend access to worry in rural areas. the most advantage of implementing such an answer is that the accessibility of the Specialist across a distance at several e-clinics inside the shortest doable time-frame Patients' travel expenditures, travelling time square measure drastically reduced. Specialists will treat patients in any part of the country giving wider access to patients everywhere in the country. Decision-making is simpler since a holistic read of the patient's medical data is obtainable through the system. Medical reports serve the executive functions of the hospital. information transferring may happen between the AryogyaVibhag (Jr.Doctor) and Doctor wherever the AryogyaVibhag (Jr.Doctor) will offer his concepts and suggestions to the Doctor whereas there's conjointly a good potential for clinical analysis as knowledge is kept electronically. The AryogyaVibhag (Jr.Doctor) decides whether or not a patient is eligible to be reviewed within the system for consultation supported by the criticality of the patient's state. The patient has to get themselves registered and provide symptoms.

II. RELATED WORK

In order to acquire wide knowledge about Remote Health Care Management System using E-health, many research papers of various authors related to this project have been studied thoroughly. The papers listed below will give brief explanation of the whole theme.

[1] S. Vijaya Shetty, G. A. Karthik, and M. Ashwin, "Symptom primarily based Health Prediction mistreatment data processing," Taking sure distinguished symptoms and their diseases to create a Machine learning model to predict common diseases based on real symptoms is that the objective of this analysis. With the dataset of the most ordinarily exhibited diseases, the authors engineered a relevance predicting the attainable illness supported the input of symptoms. The proposed model utilizes the aptitude of various Machine learning algorithms combined with text processes to attain correct prediction.

[2] "IOT primarily based Remote Patient Health Monitoring System," G. G. Warsi, K. Hans, and S. K. Khatri, Remote patient health observation system is associate degree IoT device that may well be used with patients or aged at our homes whose period health readings like temperature, pressure, and cardiogram could be monitored remotely on a hand-held device. This IoT device can mechanically send associate degree consciousness of the users just in case of associate degree emergency which during this case would be fluctuation of the readings of the sensors on the far side the normal vary. The servers then cipher the data which might be displayed on hand-held devices. just in case the values received from the



sensors square measure outside the traditional vary then associate degree alerts are going to be sent to the user from the server.

[3] Authors Madhu J. and Narasimha Rain this project have tried to solve a health care downside presently society is facing. the most objective of the project was to style a foreign health care system. It includes 3main parts. the primary half is, detection of patient's vital organ mistreatment sensors, the second for causing information to cloud storage and therefore the last half was providing the detected information for remote viewing. Remote viewing of the info permits a doctor or guardian to observe a patient's health progress off from hospital premises.

[4] during this paper, a transportable physiological checking framework is displayed, which can perpetually screen the patient's heartbeat, temperature, and other basic parameters of the space. we tend to project a continual checking and management instrument to screen the patient condition and store the patient data in a server utilizing Wi-Fi Module primarily based on remote correspondence. A remote A health observation system mistreatment IoT is projected wherever the licensed personnel will access this information keep mistreatment any IoT platform and supported these values received, the diseases square measure diagnosed by the doctors from a distance.

[5] authors Fraser HS, Biondich P, Moodley D, Choi S, Mamlin BW, Szolovits discuss pilot comes demonstrating that such systems square measure attainable and can expand to manage many thousands of patients. we tend to conjointly pass on the foremost necessary sensible lessons in style and implementation from our expertise in doing this work. Finally, we tend to discuss the importance of collaboration comes within the development of electronic medical record systems instead of reinventing systems in isolation, and therefore the use of open standards and ASCII text file code.

III. PROPOSED SYSTEM

E-health facilitation of disease management has the potential to increase engagement and effectiveness and extend access to care in rural areas. The main benefit of implementing such a solution is the availability of the Specialist across a distance at many e-clinics within the shortest possible time frame. Patients' travel expenditures and traveling time are drastically reduced. Specialists can treat patients in any part of the country giving wider access to patients all over the country. Decision-making is easier since a holistic view of the patient's medical information is available through the system. Medical reports serve the administrative purposes of the hospital. Knowledge transferring could happen between the AryogyaVibhag (Jr.Doctor) and Doctor where the AryogyaVibhag (Jr.Doctor) can provide his ideas and suggestions to the Doctor while there is also a great potential for clinical research as data is stored electronically. The AryogyaVibhag (Jr.Doctor) decides whether a patient is eligible to be reviewed in the system for consultation based on the criticality of the patient's state. The patient needs to get themselves registered and give symptoms.

3.1 Modules

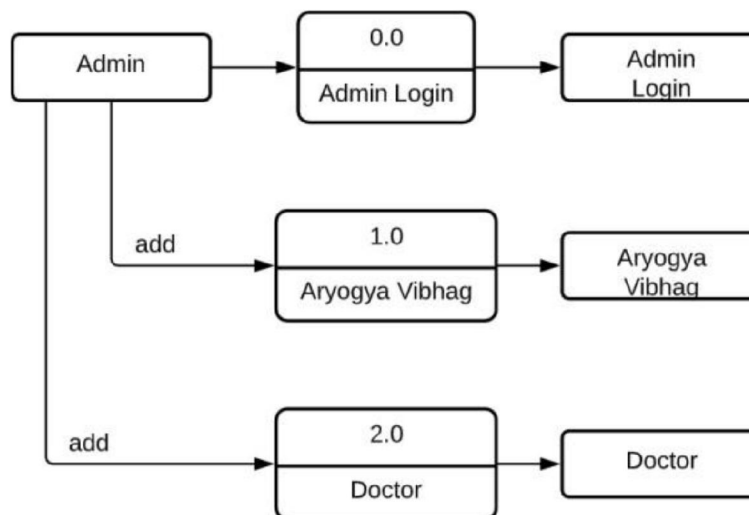


Fig.1: Initial phase of the design



3.2 Administrator

The admin can log in and operate the whole system. The admin will log in and can add, delete and view the Doctor And Aarogya Vibhag.

A. Aarogya Vibhag (Jr. Doctor)

The user Aarogya Vibhag(Jr. Doctor) can log in to the system and add the Patient's details. Aarogya Vibhag(Jr.doctor) can search for a doctor based on symptoms. Aarogya Vibhag(Jr.doctor) can view the allocated Doctor. Chat with Senior Doctor.

B. Doctor (Senior Doctor)

The Senior Doctor can register and log in. Senior Doctors can view allocated patients. also view symptoms & Detected diseases. Chat with Aarogya Vibhag (Jr.doctor). Submit Prescription for arogya vibhag.

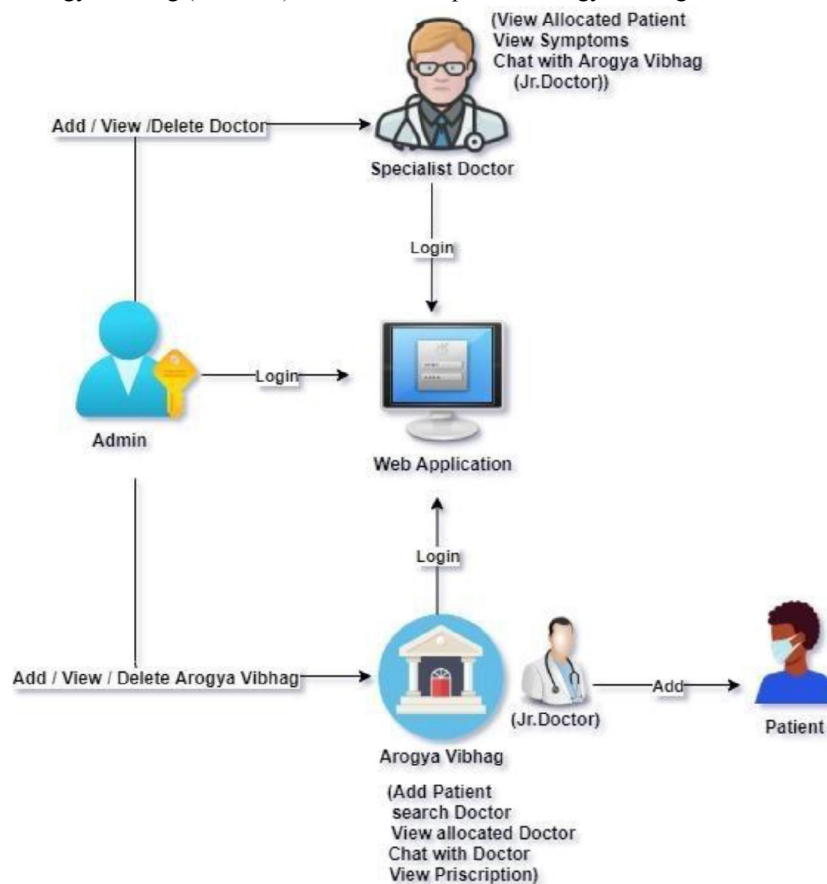


Fig 2: System Architecture

The rural e-health system is a web app that can be helpful for people in rural areas, as they do not have access to good medical facilities. In this age of digitalization, this means is put to use and can save lives. For the detection of disease data mining technique is used. SVM algorithm is used. In the system, the admin can add doctors including specialties, and view and delete doctors. He can add, view, and delete aryogyavibhag. The Aryogyavibhag Jr. Doctor can add patients and their details like their symptoms. He can search for a specialist doctor and detect disease, view the allocated doctor and chat with him and view the prescription. The Senior Doctor will be in contact with the Aryogyavibhag Doctor. He can view the allocated patients, and view their symptoms and system-detected diseases. He can chat and submit the prescription to the Aryogyavibhag Doctor. The patients of the rural area will be heavily benefited from the rural e-health system.

IV. WORKING OF PROJECT

- In our project, there are three modules one is 'admin' second one is a 'senior doctor', and the 'junior Doctor' is our arogya vibhag .
- In this admin can add senior doctor, junior doctor, view patients that are allocated to doctors.
- The junior doctor adds patient enter symptoms of patients in our application.
- Using the SVM algorithm our application allocates specialist doctors to patients.
- Using this web application senior doctors can give a prescription, and comments for the patient to junior doctor.
- By the guidance of a senior doctor, our arogya vibhag (Jr.Doctor) will treat patients .

V. FEASIBILITY STUDY

5.1 Feasibility Study

It is an analysis of the capability to complete a project effectively, taking into account legal, economic, technological, scheduling, and other factors. Rather than diving into a project and hoping for the best, a feasibility study permits project executives to investigate the possible negative and positive outcomes of a project before investing too much time and money. In the current study, we are focusing only on the economic, technical, and operational aspects. E-health facilitation of disease management has the potential to increase engagement and effectiveness and extend access to care in rural areas.

5.2 Economic Feasibility

Analysis in India, public health care is not equally scattered amongst the rural and urban sectors both in terms of services and geographically. 80% of health care facilities are in urban areas and only 20% in rural areas. The rural areas depend on public health centers, sub-centers, and community health centers which are managed by Registered Medical Practitioners, one or two nurses, etc. They are not equipped to handle tertiary care services so, during the emergency, there is a need for specialist doctors to give the treatment directly or indirectly. Indirect treatment by adopting rural e-health system. To implement an e-health system the hospital should collaborate with Arogyavibhag (Jr. Doctor) and Senior Doctor. To make the operation feasible, it is essential to generate INR 100 per consultation. As this is a web app for rural areas, no infrastructure leasing financial services are needed Just the cost of service providers is needed.

5.3 Technical Feasibility

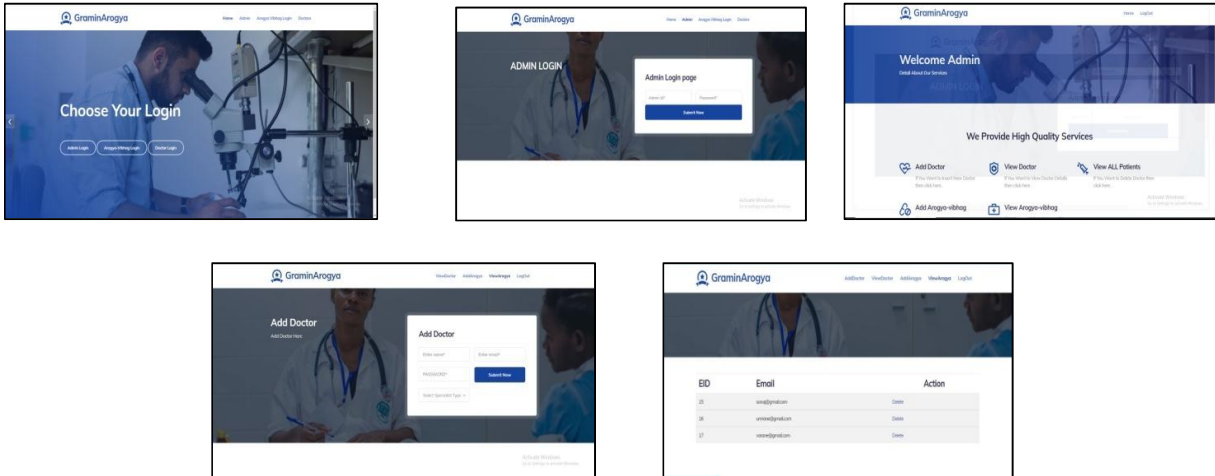
To implement a rural e-health system there is a need for technical support from different network and communication providers. The rural e-health system should be linked to arogyavibhag and senior doctors. The user end should be linked. Domain uses data mining. This project uses Java technology. MySQL Database is used for database requirements.

5.4 Operational Feasibility

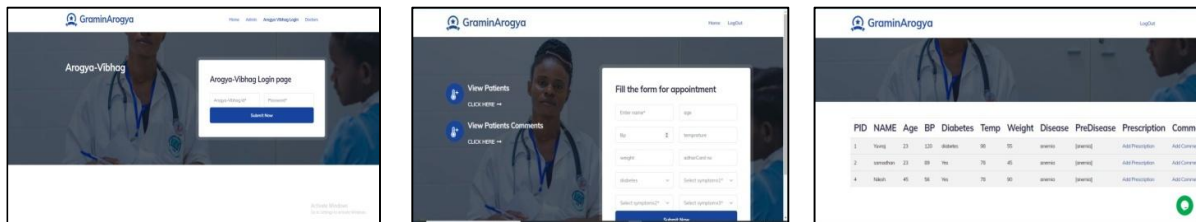
Data collection from Departments of Information Technology, Facilities Management, and Department of Telecommunication yields a positive response in making rural e-health systems operationally feasible. The positive attitude from the medical staff towards rural e-health systems and services is essential to adopt technology that can serve the people in different rural locations. The doctors are ready to run the rural e-health system consultation through the web from the hospital or anywhere. As per the data collected, the patients from different rural locations are ready to accept medical treatment. To operate a rural e-health system in a hospital there is a need for immaculate planning and coordination so that operations are sustainable in the long run. Ensuring availability i.e., designated specialists should be available at the required time is a key challenge. The doctors who handle rural e-health systems have to be trained. As technology develops even people are opening up to these newer forms of technology.

VI. RESULT

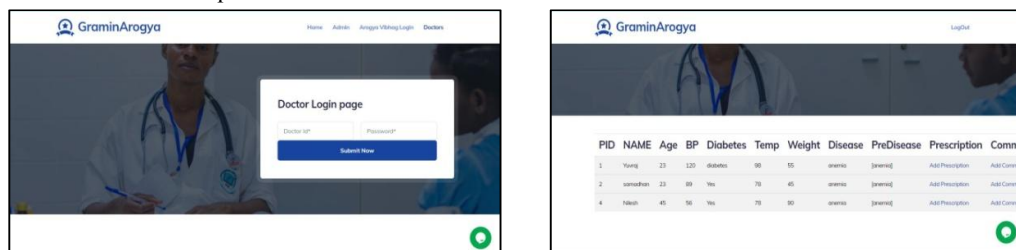
Admin Login: Admin can Add Aarogya Vibhag(Jr.Doctor), Senior doctor, View Doctors, View Patient .



Aarogya Vibhag: Aarogya Vibhag (Jr. Doctor) Can Add Patients symptom. as Per symptom System Allocate Specialist Doctor For Patient. Specialist Doctor Treat Patient Through Aarogya Vibhag .



Specialist Doctor: Specialist Doctor give Treatment to patient With the Help Of Aarogya Vibhag. Specialist Doctor Add Prescription, Comment that Are Required For Treatment.



VII. CONCLUSION

A detailed description of the E-Solution as a proof of technology was developed to support the problems prevailing in the current healthcare settings in rural areas. It shows the significance of implementing an Electronic Medical System and about the system architecture, application design, technologies used, and how the system model should be optimized to suit the conditions considering the critical issues, challenges, and security constraints as well. It is concluded that this is a promising solution that facilitates health consultations in rural communities of developing countries with less Cost, Travel Time and Travel Distance, making a healthy population that will, in turn, catalyze the global development process.

VIII. SCOPE

E-health facilitation of disease management has the potential to increase engagement and effectiveness and extend access to care in rural areas. The main benefit of implementing such a solution is the availability of the Specialist across a distance at many e-clinics within the shortest possible time frame. Patients' travel expenditures, traveling time are drastically reduced. Specialists can treat patients in any part of the country giving wider access to patients all over the country. Decision- making is easier since a holistic view of the patient's medical information is available through the system. Medical reports serve the administrative purposes of the hospital. Knowledge transferring could happen between the AryogyaVibhag (Jr.Doctor) and Doctor where the AryogyaVibhag (Jr.Doctor) can provide his ideas and suggestions to the Doctor while there is also a great potential for clinical research as data is stored electronically. The AryogyaVibhag (Jr.Doctor) decides whether a patient is eligible to be reviewed in the system for consultation based on the criticality of the patient's state. The patient needs to get themselves registered and give symptoms.

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