Advance Platform for Computerized and Electronic Hospitality Development

Anup Arvind Lahoti, Prof. P. L. Ramteke

Student of M.E, Department of CSE, HVPM's COET, Amravati, India

Associate Professor and Head, Dept. of (CS & IT), HVPM's COET, Amravati, India

ABSTRACT: The Healthcare is very Large-scale, distributed and essential systems for all of the human being present on the earth. Such a healthcare systems are difficult to develop due to their complex and decentralized nature. In the old days, the healthcare and hospitality is only based on the paper and done manually. Which is very much time-consuming and hectic job for all the stakeholders of this ecosystem. In this paper, I am trying to make this distributed old fashioned healthcare system to advance E-Healthcare system using some advance features for developing the platform as a basis for designing, implementing, deploying, invoking and managing all the healthcare services under one roof. With the design of integrated electronic health records (EHR), there are several benefits to all stakeholders in the healthcare ecosystem like physicians, nurses, pharmacists and other healthcare professionals, as well as for patients. We propose some of the advanced features that help to make the old-fashioned Hospitality to Advanced E-Healthcare system by adding an EHR system, E-documentation, E-prescription and alerting facilities in user friendly manner. The facilities that are provided with this project makes the system of Healthcare more efficient and proper and giving Patient more care than the earlier system.

KEYWORDS: Advanced E-Healthcare, health information technology (HIT),Electronic Health Records (EHR), Encrypted Password, e-Prescription, e-documentation, Alertmessaging.

I. INTRODUCTION

The ratio of health problems, disease, surgeries are growing day-by-day in the today's world. And as the population is growing at the very much increasing rate, the healthcare has been evolving as a daily concern for persons of every age group. Hence, all the health information technology (HIT) is widely seen as an essential component of the healthcare system of the future, the use of electronic health records (EHRs) in patient care [1]. That is now changing, with the implementation of the Health Information Technology. To obtain incentive payments, providers have to use EHR systems and make "meaningful use" of them to improve patient care using advance platform and features. The use of Computing technology in the healthcare system cannot be fulfill by simply translating the old fashioned manual records into electronic format but at the same time it should have to make use of other technique creating an electronic infrastructure that makes our healthcare system more efficient and proper.

In the case of organizations of hospital or in the multispecialty hospital staff's work is very much challenging in several ways. Clinicians must have to handle large volumes of shared data such as patient records, test reports and X-rays. Their work is team oriented, with much collaboration between different fields in the same hospital or between their organization and sometimes with other expertise also [5]. Their environment is hectic and filled with disruptions, and also sometimes they must have to memorize several parallel pending activities. The access to the patient's data that is required by the doctor is necessarily needed to keep private. The security and privacy of the patients medical information is becoming the large question for all services providers in the hospital [2]. So it becomes necessary to use electronic and computing facilities that make it easy for all the services providers to keep all the data in the secure manner.

In all stages of hospitality, clinicians have been heavily involved including nurses, physicians, surgeons, anaesthesiologists, radiologists, and pharmacists. So for keeping all of the clinicians or services provider's data it becomes necessary to use computerized data and record keeping. However, hardware and computing devices has becoming small, wearable, and mobile the software infrastructure has evolved surprisingly little [3]. That could all

displays for large x-rays and bulky information networked with the available software infrastructure hindered our visions of software that provide secure data access, colleague collaborations, and pending and parallel task management that makes it easy for all staff to work easily.

Consider a physician is giving diagnosis for a patient; this process is typical, lengthy, incremental and gathering lots of information in many different locations. For example, the physician enters notes of medical information of Patients in the electronic patient record (EPR), studies x-ray images with a radiologist, and discusses proper medication with colleagues, the lab gives a blood sample result, and the physician must have to study it. So, the physician must have access to many applications that show the data in different locations, while still tending to other activities and usually sharing material with colleagues and expert advices this makes the hectic job. So for reducing the overhead of Physicians and their staff we are proposing the application that will help all physicians to collectively perform their entire task using a single computer application by sitting at only one place [10].By using our software framework users can organize their handling of devices, services, and data in terms of computational activities that facilitate recreating, sharing, and swiftly switching computational context on demand at whatever device is at hand.

The use of computing technology in the healthcare system, provide access to electronic patient records are a step in the direction of providing accurate and timely information to hospital staff in support of adequate decision-making. This has motivated the need of electronic and computing technology in hospitals based on designs which respond to their particular conditions and demands [4]. As the data relevant to the hospitals are complex information-rich environments that also includes a significant technical and computational infrastructure, the need for coordination and collaboration among all the stakeholders of healthcare ecosystem containing, an intense information exchange, specialists with different areas of expertise and the mobility of hospital staff, patients, documents and equipment. So, in this paper we have mentioned some of the advanced features that are necessary for embedding the new and advanced technology in the health and hospitality field. This features makes this healthcare field largely patient centric, easy to use and work for all the staff members along with Physicians and suitable for today's fast world.

II. ADVANCE FEATURES ADDED

A. Auto ID generation

As the security is the vital important aspects in the medical and healthcare field, it's very much important to keep all the diagnostic information secure and private. As we are, giving the application for advanced computerized hospitality, all the functions from Appointment scheduling, Electronic medical record keeping including all the diagnostic information to prescriptions suggested by the doctor are presents in the particular patient module [6]. This information is necessarily needs to be kept secure from anyone's others access without the permission of particular patient. To deal with this type of problem we added the feature of Auto ID generation and Encrypted Password which provides proper security.

We have given very important facility for any patient to assign its User-ID and Password for giving the facility to any time accessing of their record. With the normal user-ID generation, normally by using the first name of the patient or any continuous code that are easily known or understandable by any one. In the Advance Hospitality, we have added the feature of Auto-ID generation. In this feature the ID for particular user i.e. for doctor or staff person or for patient is generated randomly. This randomly generated ID is not understandable by any one easily. This User-ID is composed of the characters from your first name, last name and some random numeric characteristics also. This random and auto generated User-ID provide proper security and access control for valid user of the information.

B. Encrypted Password

As said in the earlier section, medical information security is vital important. In the Advanced hospitality we are storing the electronic patient record and access it at any time. In case of the medical information system, the EHR contains the data relevant to personal information of the patient that must have to be hidden for local access. If the EHR, can get access by any untrusted person he can make any irrelevant changes or can forge any record or prescription information which could be harmful for someone. So, to avoid this access control is very much important, and the main controlling is started from user logged-in and started using application.

In this paper, we are providing security in the first phase of accessing the Advanced Hospitality application by providing encrypted password only after properly Sign-up for using this application first time. In our application the password is encrypted by using the Base64 method which is very much hard to understand by any one normally. The Base64 encoding schemes are mostly used when there is a need to encode binary information that needs to be stored and transferred over media that are developed to deal with textual information [7]. So this method fits well for application development. Basically, Base64 method represents the binary information in ASCII format by converting it into a base64 representation. This method uses a-z, A-Z and 0-9 for the first 62 values. Other Base64 variations share the same property but make use of different symbols in the last two values. This guarantees that the data stays unchanged without modification during transfer.Once the password is assign to the particular patient and stored in to the database of the patient. It is very difficult to get it by anyone easily. If sometime the database is opened in front of someone, instead of that any one cannot understand that password easily as it is encrypted with base64 method. Our used Base64 method is generally used in a number of applications including electronic mail via MIME, and keeping complex information in XML, and for mostly trusted and secure applications.

C. Electronic Prescription

Till the time, all the work in the hospital is going on manually and largely based on the paper records. The Physician also followed the same thing, he writes the prescription on the paper along with the medicines and dosages information. This prescription and related information is very important to take and recover from diseases or any allergic reaction that patient is suffering from. This process is very slow time consuming. Along with this there is one major drawback that concern with security, as the hand written prescription can be easily forge or could be mistakenly provided. Along with this the medicines name written by the doctor is also sometimes not understandable by pharmacist. In this case, due to wrong prescription causes any serious injury or can lead to death.

So, to deal with this in our Advanced Healthcare system application, we have given the facility of writing the Electronic Prescription. By this e-Prescription facility, doctor writes the computerized prescription for the particular patient [8]. He should write the medicine names and dosages in a chart like format that can be understandable by both Pharmacist and Patient easily. By writing the prescription information in the electronic format one another facility is added that it can be easily transferred to any expert for his important advice at any please and at any time so that one can get proper advice and prescription. With this patient cannot have to carry his medicine and prescription report at all time and at all the places, only he has to open his account with given User-ID and Password and he has to get all his medical information at any place without handling much of the paper records.

D. Electronic Documentation

As said earlier, number of surgeries and medical problems are growing on increasing. Now days, after successfully completing the surgeries, there are large number of medicines and exercise needs to be performing on regular basis. These all the medicines charts and exercise charts given by hospital are need to be kept safely by patient all the time with them. So, in our Advanced E-healthcare, we added the facility, that helps to provide all of these documents in the computerized and electronic format. This reduces burden of their hospital staff to print, attach all proper documents for all of their discharging patients. This documentation also includes discharge summery, including the data and time of admission and type of disease/surgery patient is suffering from which is mostly important in medical leaves also.

In our prescribed Electronic documentation facility, for the hospital staff point of view, there is facility to browse and attach the particular file and folder to particular patients accounts, by selecting the particular patients and the documents. At the receiving side, patient can open his portal, logged in as a valid user of the system. If he is necessity of particular document, he should open the e-documents facility, and download his required documents, save the file and can read it or print it when necessary [9]. All the work of attaching, downloading and printing is done in offline mode. This is very important benefits to not bother about internet availability. This system is working as like e-mail facility and not like manual time consuming mail sending facility. Some example working of the system is shown in the following output diagram shown in below Figure 1.a as browsing and attaching the file to the particular patients account from Hospital and Figure1.b shows all the sent documents details.
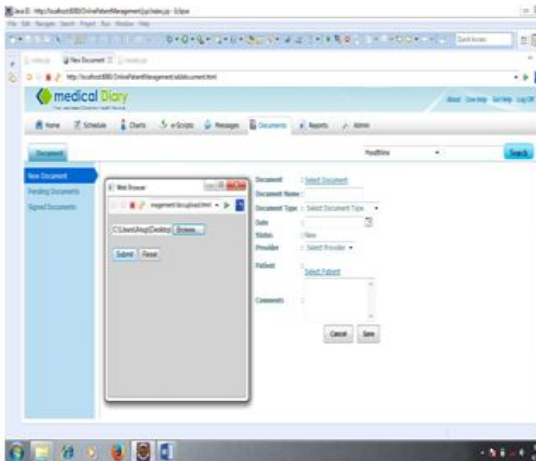
Figure 1.a: Staff can browse the file given by the doctor and attach to the selected patients chart.
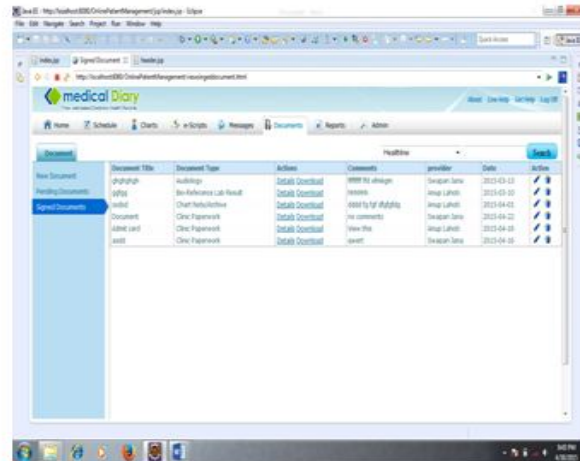

Figure 1.b: One can check all the sent documents from the hospital to proper patients.

E. Alert Messaging

As the regular performing of exercise and taking of medicine is very much important to get completely cure from disease or surgery. In the today's, busy schedule of every person, patient forgot to take proper medicine and they are affording of performing regular exercise. The proper time-to-time review of patient in the hospital is very much important, but most of the time patient forgot to go to the hospital. So, it's very much important to give regular alert to the patient for their medicine taking, exercise alerting and review appointment scheduling, etc.

In our proposed system of advanced hospitality, there is facility of alert messaging that can be done by the hospital on regular basis, to properly and completely curing their patients [11]. This scheme work as our regular messaging which we done with our mobile. In this, there is Inbox, Sent box and new message typing and sending facility is available. This sending and receiving of message can be done by any doctor to any other expert or to patient or from any patient to any doctor in the hospital. Doctor can check, if his staff member should send the message to all patient or not and one can take proper action and make arrangement accordingly. If the patient is not following the alert messages then doctor can suggest the patient accordingly. The function of this messaging facility is done as shown in the following figures as Figure 2.a shows how new message can be send and Figure 2.b shows the record of all the sent messages.
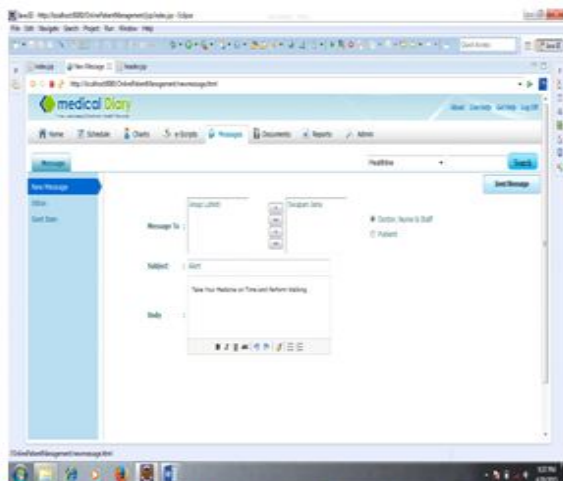

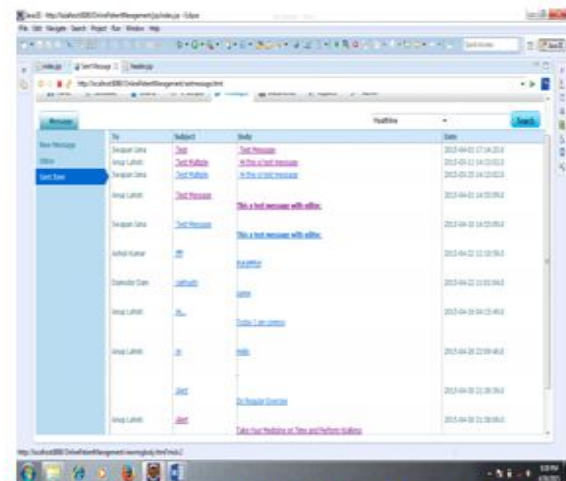Figure 2.a: Facility of sending alert message to selected person

Figure 2.b: All the sent messages can be viewed for properly checking purpose.

III. PERFORMANCE AND RESULT ANALYSIS

In the past, all the working in the hospital is going on manually and based on paper based records, which is much slow and time consuming [12]. So, to deal with this we add some advance features in the old hospitably that makes this much essential field of healthcare work in accordance with today's busy scheduled world. The analysis of our advance working is done in following some points:

- In the old days the personal manual medical records are seen by any one easily. And in the computerized system, with the simple user-ID generation, normally by using the first name of the patient or any continuous code that are easily known or understandable by any one provide threat to personal information security. So, we have added the feature for Security and privacy of personal information by assigning auto generated User-ID and Encrypted password scheme. In this feature the ID for particular user i.e. for doctor or staff person or for patient is generated randomly. This randomly generated ID is not understandable by any one easily and provides proper security and access control for valid user of the information.

- In the manual record keeping, there is no personal security mechanism provided for our personal medical information. And when there is normal password is provided to access data it can be stolen, or can be generated easily by any one. In our Advanced Healthcare system we have added the feature of giving encrypted password that cannot by easily understand by any one even after it is seen in the database. This provided security as a Locker from access control

- The previous prescription mechanism that is provided by the doctor on the paper based and hand written format can be easily forge. The prescription is provided wrongly if one is unable to understand the hand writing of the doctor easily. In contrast to that, we have added the facility of providing Electronic Prescription. By e-prescription, it is written computerized, so there is no problem with not understanding the handwriting and or any further mistake done by any other physician who is administering the previous medical history.

- Keeping medical documentation all the time, which are written on the paper safely, is very difficult job. It is very much important as sometimes there is requirement of medical documents in the educational institutions, offices, organizations, factories, etc. as the proof of person's fitness or suffering from some medical problems helps to work accordingly. For taking some health insurance services, it is necessary to submit, our medical report details, discharge summery, Hospital and pharmacies billing slips, etc. By using our advanced facility of e-documentation in the medical sector both hospital staff and patients get benefitted. As it reduces the burden of employees to keep the documentation for all the particular patients separately, at any time if there is need of any kind of document given to the patient either by the physician or by the staff it can be prepare computerized and send to the particular patients account. So that at any time, when patient is in need of this document can download these documents and print it in the offline mode also.

- In the old days, there no mechanism for alerting the patient for their further treatment which is done out of hospital or for alerting them for his review appointment scheduling dates. In our advanced hospitality system we have added the feature of alert messaging with which any patient can get daily alert for their medicines schedule or exercise performance, etc. The reviewing appointment can also be made with scheduled time and date by this messaging facility, which is very much user friendly as like messages in our mobile phones.

    In this way, Our Advanced E-Healthcare system [13] is very much user friendly, fast, proper, secure and accommodated with many advance features that fits with today's busy and fast world.

IV. CONCLUSION

As from the previous studies of the researchers and the current hospitality services we can understand that the current Healthcare management system have lots of drawbacks. And because of this some of the patients have to lose their life by filling improper and delayed prescription. So, to overcome some of this drawback, we have proposed the developing platform for the project i.e. Advance E-Healthcare system which is the great improvement over the manual system using hand written and paper based facility. The computerization of the system has speed up all the process needed in the hospitality. In the above paper the Electronic Prescription, Documentation and Messaging alert all this facilities given makes the system User friendly, efficient, Correct and Cost effective than the old manual one. The Advanced e-Healthcare managing system using proposed features can satisfy all of the needed features that are essential for today's hospitality.

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BIOGRAPHY

Anup ArvindLahotiis a Student of Master of Engineering (M.E.) in the Computer Science and Engineering Department of HVPM's College of Engineering and Technology, SantGadge Baba Amravati University, Amravati. He received Bachelor of Engineering (B.E.) degree in 2013 from SGBAU, Amravati, MS, India.

Prof. P. L. Ramteke is Associate Professor and Head ofthe Department in the Information Technology Department ofHVPM's College ofEngineering and Technology, SantGadge Baba Amravati University, Amravati.He received Master of Engineering (M.E.) degree in Computer Science and Engineering from SGBAU,Amtavati, MS, India. He is also completed his M.Phil in Computer Science stream. He has submitted his research work for Doctorate Degree in Mobile Computing Domain.