Online Health Care

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Abstract— **The importance of health care is immense in a society and over the past years, this sector has been evolving to produce a more efficient and computerized system. Bangladesh has also made a significant improvement in the health care system over the years. This paper presents the development of a web application for the general public of Bangladesh where they can store their own medical data and access it anytime, from anywhere. In the Online Health Care (OHC) system, users can register as patients to store their medical data in the database. The system also consists of registered doctors under the enlisted hospitals, who can give free medical advice and prescribe necessary medications to the patients when requested for an appointment. The doctors can view their patient's data and issue prescriptions. The system has been developed using Codeigniter, a PHP framework. The database has been designed using mySQL and XAMPP as the server. The system has been tested, verified and implemented. It provides an efficient way of storing information electronically, a faster communication mechanism between patients and doctors, and also ensures better security for the users.**

Keywords- Online Heath Care (OHC) system ; SQL Server ; web application ; PHP; database ; medical data ; patients, doctors;

I. INTRODUCTION

In today's world everything is becoming computerized and web based. Different organizations have already moved towards computerized systems which made lives easier and faster. One of the most important sectors of any nation is their health care sector. The organization of people, institutions and resources that deliver services related to health to meet the medical needs of the general public or any individual is referred to as Health Care System.

The importance of health care is immense in a society and over the past years, this sector has been evolving to produce a more efficient and computerized system. Bangladesh has also made a significant improvement in the health care system and currently Bangladesh government (ICT division) is also undergoing different projects related to health care to make this sector digitalized.

The main objective of this paper is to develop a web based application for the general public of Bangladesh where they can store their own medical data and access it anytime, from anywhere. Online Health Care (OHC) system is the application of computer, mobile phones, internet and other technologies, which aims to provide services electronically to improve patient's medical needs. In our Online Health Care system, users can register as patients to store their medical data in the database. The system also consists of registered doctors under the enlisted hospitals, who can give medical advice and prescribe necessary medications to the patients when requested for an appointment. There is also an android mobile application associated with the Online Health Care system web application.
 This paper has been organised as follows: section II discusses the related works and existing system related to eHealth care, section III demonstrates the proposed system, section IV talks

about research objectives and methodology, and then section V draws conclusion of the project.

II. EXISTING SYSTEM

In Bangladesh, heath care system is also moving towards computerized based system like other industries. Many health organizations already use digital hospital management system. For example, hospitals like Apollo and United hospitals have their own customized software to carry out the daily activities of the hospital such as - patient registration, scheduling appointments or diagnostic tests, medicine department, billing system and many others. But these operations are only handled by the hospital employees and are specific to their own hospitals. There are no scopes for the patients to use it personally and cannot access it from anywhere else. This is just a hospital management software designed for a specific hospital.

The authors in [2] have discussed about the current status, challenges and future developments of eHealth in Bangladesh. In the paper [2], the authors discussed about the possible scopes of health care services in the country, the concept of eHospital, how government is contributing to move towards digitalized health care sector, the challenges it might face and future areas to work on. From their research analysis, they concluded that the condition and scope of eHospital is good but it is not sufficient. One of the major problems encountered was that the most of the general public in not well informed of the services of electronic health care. Therefore they suggested for future work on user friendly electronic health care system which would be easily available throughout the country and easy to access by any users.

The authors of paper [1] has described the challenges and opportunities of health system in Bangladesh. According to their research findings, there are lots of challenges in Bangladesh's health care system but there are also possible scopes for overcoming those obstacles. The paper gives emphasis on the equity of health system both in private and public sector. It discusses about the importance of dynamic leadership to design and improve the condition of health care system in Bangladesh.

III. PROPOSED SYSTEM

The proposed system of our paper is not only about a general hospital management software for one particular hospital. The proposed Online Heath Care (OHC) is about a web application designed for the purpose of providing digital health care service to the general public of Bangladesh, which can be accessed from anywhere inside the country. It is not only about giving basic health consultancy, but here the users, once registered as patients, can store their medical data in the database for future reference. The patients will have their own profiles, under which there are options for taking input of medical data, viewing the previous records, taking online appointments of registered doctors and seeking online medications from the appointed doctors. The appointed doctors can view the patient's data and listen to patient's health complain via message system, based on which they give the

primary medication. This is a two way communication between patients and doctors over the online health care system.
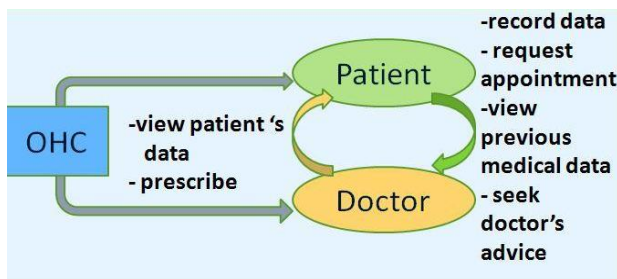

Figure 1: Basic Flowchart

IV. RESEARCH OBJECTIVE & METHODOLOGY:

A. Objective:

The main objective of our project is to create a web application on Health Care in Bangladesh, where the users, registered as patients, can upload their own medical data in the system. These information is saved and updated in the database and the user can access these data anytime, from anywhere. The users can easily view their past medical records, both in tabular and graphical form. There is also few registered doctors, who can give primary medication, when requested by a patient.

B. Advantage of this system:

- Keeping track of one's health condition is something one often fail to maintain and find it difficult to keep manual record of past medical data.

  Our health care system provides an easy solution where an user can record their own medical data such as blood sugar level, blood pressure, pulse rate and body temperature and save it in the database for future reference. For example, a diabetes patient need to keep track of their blood sugar level on regular basis. If he/she conduct the test at home, they need to write down manually the test result or maintain a diary to keep track of changes in their blood sugar level. Recording manually is time consuming process and there are chances of data being lost. In our online health care, users can give input of their test results which would be saved in the database. They can also see the changes/ trend in their data both tabular and graphical way.

- Visiting a doctor for minor health issues such as common cold, pressure problem is a time consuming process in our hectic schedule.

  So instead of visiting the doctors physically for such minor issues, the patients can take appointments from our registered doctors, under the enlisted hospital and receive primary free medical advice based on their medical data. This option can be beneficial for the general public who do not have easy access to good health care service.

C. Methodology :

Online Health Care is a web application for providing free health related services to the general public of Bangladesh. The system has been developed using Codeigniter, a PHP framework. The database has been designed using mySQL and XAMPP/ WAMP as the server. The API of the web application is used to develop a separate android application which synchronizes with the website.

There are two aspects of Online Health Care. One is about how the patients can be benefited from the proposed system and another is how the doctor's module works.

Patient's Module:

➢
  The users who want to receive the facility of this Online Health Care service, first needs register as patients in our web application of OHC.

➢
  On successful registration, a patient profile will be created. The patient needs to login to view their profile.

Figure 2: Login

➢
  After login, they can update their own medical data in the database. Primarily, there options for four parameters- body temperature, blood pressure: Systolic and Diastolic, blood sugar level and pulse rate. The entry will be sorted according to the date. Figure 3 shows the overview of how a patient can enter their medical data.
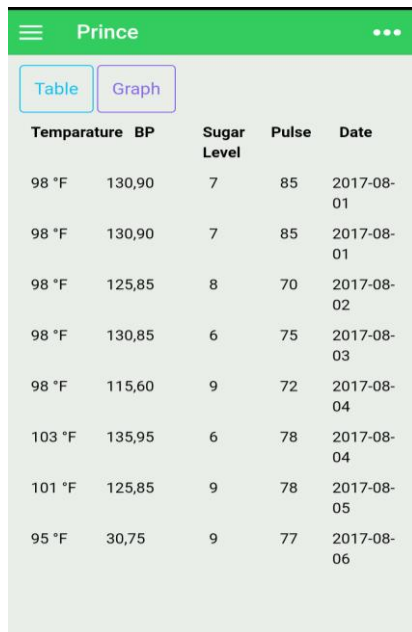
Figure3: Input of Patient's Data

➢ The medical data will be stored in the database and the patient can access it from anywhere, anytime. The medical records can be viewed in both tabular and graphical form.

Figure 4a. shows how the patient's data is represented in tabular form, sorted according to the date of input.

Figure 4a: Tabular Representation of Patient's data

Figure 4b. shows how the patient's data is represented in graphical form, sorted according to the date of input. The y-axis represents the input variables, for example blood pressure, and x axis represents the date of data input. The first graph in the picture shows how the blood pressure varied with time, the second one shows the variation in sugar level, third one is for the change in body temperature and the last one is about the pulse rate.
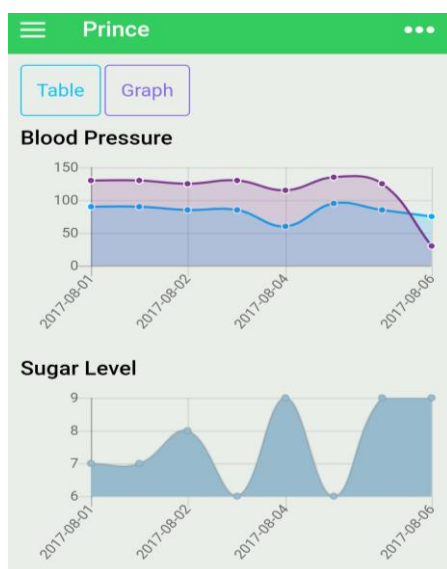

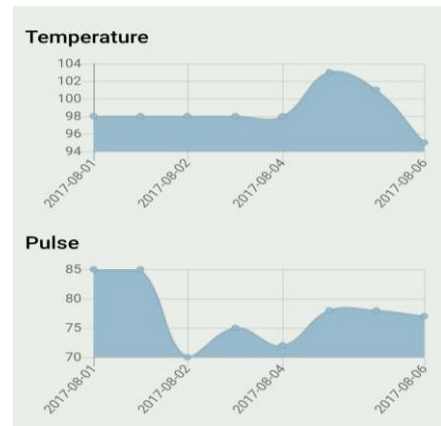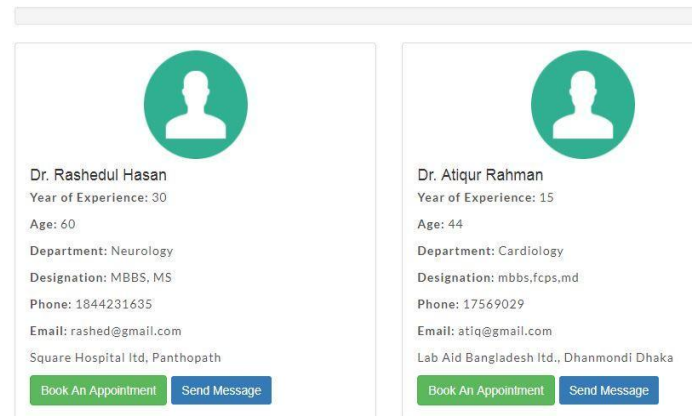Figure 4b: Graphical Representation of Patient's data

Figure 4b: Graphical Representation of Patient's data

➢ The patient can take doctor's appointment from the available registered doctors and communicate via messages. Figure 5 shows few of the registered doctors available for appointment. The patient can choose a date for appointment and also send message regarding their health complains.

Figure 5: Doctor's appointment and Sending messages.

➢ Once a patient requests for an appointment, the respective doctor can view the patient's medical records and prescribe medications on the appointed date only. After the day of appointment, the status will be changed to expired. The patient can then view the prescription as suggested by the doctor.

Figure 6 shows the appointments and prescription option from patient's profile.

Figure 6: Patient taking doctor's appointment.

Doctor's Portal:

- The doctors of the Online Health Care application are registered by the admin of the hospital enlisted in the system.
- Doctors cannot use the application without the admin approval.
- Only the registered doctors who have been appointed by a patient can view the patient's medical information on the specific date of appointment. After that time, the option will be expired.

  Figure 7 shows how the doctor views their appointment list.

Figure 7: Appointment list from doctor's profile.

- The appointed doctor can then prescribe necessary medicines or suggest medications to their respective patients. Figure 8 shows the option for prescription.

Figure 8 : Option for prescription

D. Database :

The system has been designed using mySQL database. The database named is eHospital and has 8 entities represented as eight tables created under eHospital.

V. FUTURE WORK

In the future, we plan to upgrade the system and incorporate other functionalities related to health care. The patients would be able to upload directly the picture of their report and save it in the database. There is also another scope to make this project into a complete health care solution, if we could incorporate this existing web application to hardware device. Then the users could directly take input from the device such as blood sugar machine, and record it in the database via the mobile application. There would also be a information directory about different kinds of medicines. Since health care is a huge sector, there are scopes for possible research in future.

VI. CONCLUSION

Health Care Sector is a very important sector in every society. It is the basic rights of every individual to get access to proper health care. This sector has been evolving to produce a more efficient and computerized system. Bangladesh has also made a significant improvement in the health care system over the years and Bangladesh government (ICT division) has taken different projects to make health care sector digitalized like other industries. In this research, we could develop a web application which can be used for the general public of Bangladesh, where they can store their own medical data and access it anytime, from anywhere. The system will also consists of registered doctors under the enlisted hospitals, who can give free medical advice and prescribe necessary medications to the patients when requested for an appointment. Online Health Care is an efficient and cost effective way of virtual communication between patients and doctors. The main challenge of this project was the time constraint and access to limited resources.

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