A Window Based Portal for Doctors & Patients using PHP and MySQL

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***Abstract* - The objective of our portal-Cliniro (Clinic-hero) is to create a common gateway for doctors as well as patients and improvise the manual and traditional clinic management system that will provide faster, efficient and quality healthcare services. To initiate with, we tried to understand the manual system used by doctors and propose an automated system to realize the benefits of e-Health and try to make advancements to the already operating system and services. Utilization of a portal for clinic management will improve the efficiency of the clinic by reducing wastage of time experienced by patients. It also will help to provide patient care, patient data management and recalling information required by the doctor from the system. There are many existing systems for hospital management but few for clinic management systems and even negligible ones which put together doctors and patients' sides on a single platform. Additionally, Cliniro will also consist an Assistant login which will help doctors to smoothen the clinic management process.**

Keywords: PHP, MySQL, Data Analysis & Visualization, Data Handling.

I. INTRODUCTION

Cliniro is a web-based portal designed for registration and management of patient's records and easy access of the records. It will manage the clinic's operation efficiently. Normally, such huge management systems are common in hospitals but rarely in clinics. The traditional paper-pen based method causes a lot of problems like data redundancy, missing data, loss of data, wastage of time and many more for the doctor. Cliniro will try to make them extinct to a greater extent.

The key objective of Cliniro is to digitize every process in a clinic and help patients to preserve and manage their clinical documents like prescriptions. Along with clinic management it is a platform which provides doctors to schedule their day-to-day work and events and also get the glimpse of current medical related news across the globe. Data analysis is one of today's needs. Cliniro will provide a dashboard which will display data visualizations giving insights of the clinical data like revenue, number of patients monthly, etc.

This system will have three sections- Doctor, Patient and Assistant. The doctor can save data of his patients, events, appointments scheduling, etc. Moreover, the patient can sign up, save, and view their prescriptions and appointments from various doctors in a single place. An assistant can enter patient data, schedule patients' appointments, manage billing section and some other features.

All these activities would be cumbersome on the doctors and patients if done manually, hence the need for efficient and easy to use management software will help both.

II. RELATED WORK

Healthcare is a gigantic industry based on legacy systems, which can lead to many shortcomings. Not only Governments but also many major tech companies including Google, Microsoft have started investing more into digital health [1]. Front end desk system at hospital that will help patients to learn about doctors, appointment times, relevant departments, laboratory test and specific medicine about his/her medical situation. [2]. There are web applications for the patients where they can store their own medical data and access it anytime and from anywhere. Customers can register as patients to store their medical data in the database, whereas the doctors can view their patient's data including their prescriptions. [3]. The proposed architecture for the hospital management system consists of 5 main layers: Digital layer equipment, computer network, data exchange and share, business application and external application [4]. In order to clarify the process of consulting various doctors and the hassle of taking many appointments and registrations, there are applications generated with a unique id for the patient and the consulting doctor and will be global for both the parties. Patients can generate a QR code based on the prescription made by the

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doctor which can be then scanned by the pharmaceuticals. This helps to acquire all the medicines from the prescription, reduce the confounding by names of the medicines, and reduce the amount of time required [5]. Clinic Management System (CMAS) mobile application based on Agile methodology and Mobile-D approach with the application has admin (clinic staff) and patient privileges [6].

After reviewing the above papers, we could clearly see that we need a less complicated, economic, and interoperable methodology to fill in the gaps.

III. PROPOSED METHODOLOGY

There will be three major parts of this portal- Doctor, Patient and Assistant. The patients will have their own profiles, under which there are options for taking input of medical data, viewing the previous records, and taking online appointments of the registered doctors. On the other hand, the doctors who have registered their clinics can give appointments to patients, store their data and prescription, schedule their personal events and access inventory. This is a two-way communication between patients and doctors over our Cliniro portal.

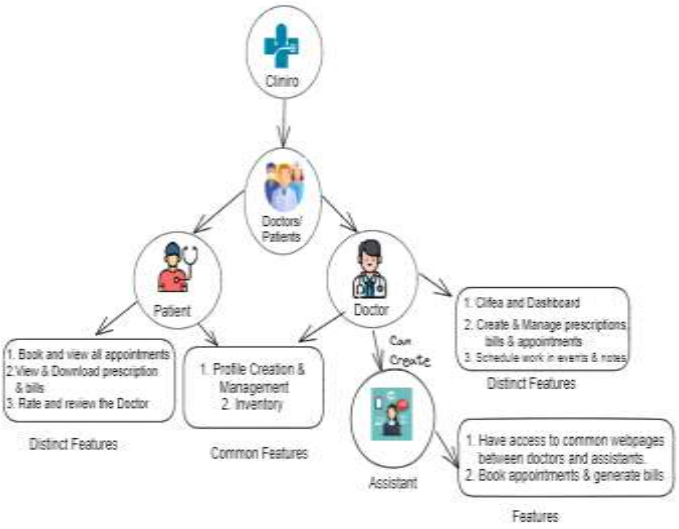

Fig 1: Basic Flow Chart

A. DOCTOR

Initially to start with, the doctor needs to create their profile by signing up in order to register himself on the portal. After registering, when a doctor logs into the portal he can see the landing page of Cliniro. It consists of various sections like a quote section which includes quotes which are fetched using the API and a new quote can be viewed every time the button is clicked. It contains a weather section where the weather information of any place is displayed using the API. There is also a stopwatch feature which can be used by doctors for various purposes. The doctor can also have a glimpse of all his appointments and events scheduled for the day here.

The doctor can view the patient's information like name, weight, height, allergies, medical history, etc. For that, the patient must first register himself and enter all his details, which can later be viewed by the doctor. The doctor can simply enter the patient's name and fetch and review all the details of the patient. This can save a lot of time and efforts of the doctor as well as patients.

Additionally, doctors can create prescriptions digitally. Every prescription will be a customized one as it will contain the doctor's name and his clinic's details. These prescriptions can be viewed by the patients on their side and if needed they can also maintain the hard copy of the same. This is not only beneficial from the Green IT perspective but is a reliable option to preserve all the prescriptions in a longer run.

Moreover, the appointment scheduling can be done easily by the doctor. A doctor can see the patient's name, appointment creation date, appointment date, the current status of the appointment (canceled, active or done) and the final action performed on it. Only the doctor has the authority to cancel any appointments booked.

Furthermore, the bills of each patient can also be generated and managed by the doctor. Over and above that, events like Continuing Medical Education (CME) programs and other medical events can be scheduled by the doctor for his own professional day to day activities management. Lastly, he can also create and save his own personal notes for the clinic.

B. PATIENT

Primitively, to start with the patients must register themselves on the portal by feeding all the necessary details like name, height, weight, allergies, etc. The patients can consult various doctors according to their specializations. So, maintenance of all those prescriptions and related documents is done efficiently.

The prescriptions as well as the bills are visible by the patients from their side, which can be downloaded by them later if required. The data from the doctors, who are already registered on Cliniro, can only be seen. Hence, the patient as well as doctors should be associated with Cliniro mandatorily.

Besides all of this, the patients can also review and rate the medical treatment they received from the doctor anonymously. It will not only help the doctor to improvise but also will also help in boosting his confidence on the professional upfront.

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C. ASSISTANT

The assistant login can only be provided by the doctor for a particular clinic. After creating a login for the assistant, only the doctor has the authority to change the password for the same. Not all the sections are open to the assistant, except for the patients and inventory. An assistant can schedule appointments for patients, enter a patient's data, handle billing section, view inventory, access the drawing board and a few more features. Apart from this, an assistant can view daily appointments scheduled for the doctor but not the events as they are exclusive for the doctor. This assistant was added after a survey done with doctors to keep up with their needs of saving time and efforts and maximize efficiency of the clinic.

D. CLINIRO FEATURES (CLIFEA)

1) Data Visualization

Data is fundamentally useless without analytics. Analytics is how you make sense of your data and uncover meaningful trends. The collection of data in health care settings has become more streamlined in recent years. Not only does it help to improve day-to-day operations but also helps doctors to make more informed decisions based on those insights from data. We have used different types of data visualizations like graphs, plots, and charts to accurately represent various data like monthly generated revenue, number of patients treated on a monthly basis and rating by the patients. The reviews can be read at the end.

2) Inventory

The inventory contains contact details of medical assistance like blood banks, pharmacy, pathology labs, other clinics, hospitals, and ambulance services. This section is common for all- Doctors, Patients and Assistants. A patient can book any of these services by selecting their location and service needed. The inventory section at the Doctor's side has an additional option of adding a receptionist/assistant whose login creation and change in credentials can only be done by the doctor himself.

3) Scratchpad

Every now and then, doctors need to explain some medicinal terms or concepts to the patient for their better understanding and treatment. They usually grab paper and pens for this purpose. To replace this fuss, we have added a scratchpad which is easily accessible by the doctors. Also, by using the different colors available, patients can perceive the terms well.

4) Be updated

This feature of Cliniro displays medical related news throughout the world. It is fetched by using the news API. This section will keep the doctor acquainted with the medical tidings across the globe.

E. SYSTEM ARCHITECTURE

All functions in this system that we previously described are synchronizing work based on web applications. PHP language and MySQL database were used to develop the system. Users can easily use computers, laptops or mobile phones which can access the internet. This system can be operated on windows, Linux, IOS as well as android. The system architecture of the clinic management system is demonstrated in Fig 2.

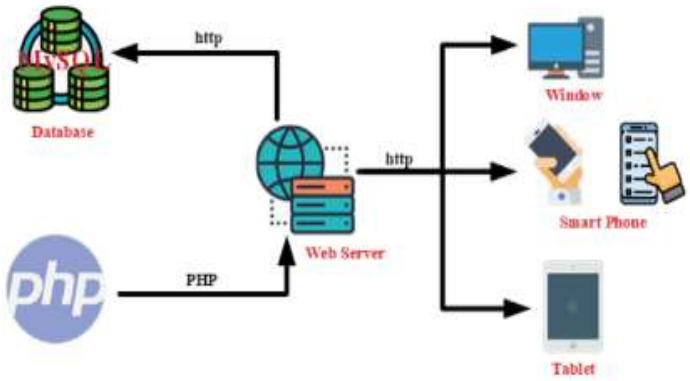

Fig 2: System Architecture

IV. DEVELOPED SYSTEM AND RESULTS

We have successfully developed a web-based portal (Cliniro) which will have three logins- Doctors, Patients and Assistant.

Fig 3: Cliniro Landing Page

Above shown is the landing page for Cliniro which will have the features, about us, contact and login.

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Fig 4: Registration for Other medical services

Other medical services mentioned in the inventory like ambulance, labs, blood banks, etc. can register themselves to the portal here on the landing page itself.

Fig 5: Doctor Landing Page

After successful login, the landing page of doctor along with CLIFEA will be seen as shown below

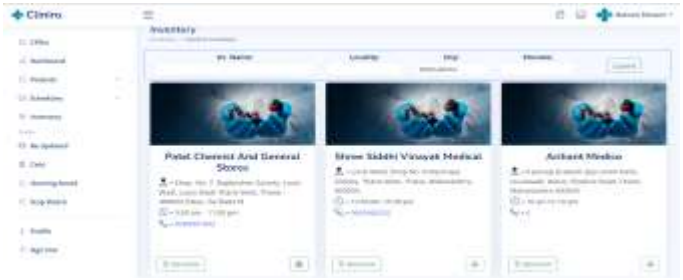

Fig 6: Inventory Page

As mentioned in the Cliniro features above, one can access the inventory.

Fig 7: Patient Section

Above image shows the patient section of the doctor's side where the doctor can view the patient's complete information like prescriptions, appointments, and billing.

Fig 8: Dashboard Page

Dashboard displaying the insights generated from the data stored of a particular clinic with the help of visualizations.

Fig 9: Patient Landing Page

After successful login the patient will be landed on the patient landing page as shown below and further patients can avail all the features provided by Cliniro by navigating through the nav bar.

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V. CONCLUSION

The Healthcare Sector is remarkably crucial in our humankind. This area has been constantly evolving to produce a more coherent and efficient system and we too, have attempted to fairly contribute for the amelioration of the healthcare sector. Cliniro is going to help doctors to reduce their manual work and perform all the clinical tasks proficiently by digitizing the process in addition to several other handy features. Doctors will have access to the patient's history to maintain permanent records and provide easy and effective storage of prescriptions and bills to the patients as well. Lastly Cliniro, as its name suggests (Clinic-Hero) will take care of the doctors, patients, and entire management of the clinic along with implementing the green engineering concepts in a more efficacious way.

VI. FUTURE SCOPE

In the future, we plan to ameliorate the system by incorporating other functionalities related to health care. The patients could directly upload and save the picture of their medical reports in the database. We can even integrate this existing web application with different hardware components and devices. This in return will help the users to directly take input from the device such as blood sugar machine, and record it in the database via the mobile application. This system can further be protracted to a real-time consultation known as Online telemedicine i.e. technology-enabled communication which allows patients to connect with doctors virtually especially when patients cannot visit the clinic.

Consolidation of Cliniro with the rapidly emerging ICT technologies such as big data, IoT, artificial intelligence, robotics, and blockchain, digital healthcare, etc. can effectively meet the meteoric increase in technical demand for medical services.

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