Doc-Tient: A Digital Way to Healthcare

Akshay Autade [1], Ravikumar Lubdhi [2], Sangram Patil [3], Shrihari Khatawkar [4]
Department of Computer Science
[1,2,3,4] Annasaheb Dange College of Engineering and Technology, Ashta
Maharashtra, India
[1] autadeakshay7@gmail.com, [2] ravikumar.lubdhi@gmail.com,
[3] psangram666@gmail.com [4] sdk_cse@adcet.in

***Abstract*- We here propose a doctor-patient handling and managing system that provides digital consultation through a web-based portal. It helps doctors in managing their workload and patients to book doctor's appointments digitally. The system allows doctors to manage their appointments. Patients are needed to book appointments online and those slots are reserved in their name. The system manages the appointment data for many doctors for various dates and times. Each time a patient visits a doctor, his/her medical entry is stored in the database server by the system. Next time when a patient logs in he/she can view his/her entire medical history when needed. At the same time a doctor can view patient's all medical history. This leads to an efficient and automated doctor-patient digital consultation system through an online user interface.**

Keywords*: *Appointment, online consultation, digital, Web-portal, healthcare, XAMMP

I. INTRODUCTION

Healthcare is an essential aspect in everyone's life. Doctors are the key factor in managing the healthcare of society. In today's scenario of pandemic due to COVID-19 many of us are not able to go to the hospital for minor illness or for routine checkups. Traditional method adopted for consulting with doctors is a time-consuming process for which one must take appointments and go to the hospital physically which may lead to serious issues in these pandemic days. The patients also have to wait in a queue for getting appointment. If the doctor had to cancel the appointment for emergency reasons, then the patient is unaware about the cancelation of the appointment. In today's world of rapidly growing technology one can use proposed system to overcome such problems and inconvenience which the patients have to face. There is much work in the literature in this regard [1-9]. A web-based appointment system has been proposed in which a scheduling system is provided for doctors and patients. Each time when a patient visits a doctor, their medical entry is stored in the database server by system. Next time when a patient logs in he/she can view his/her entire medical history when needed. At the same time a doctor can view a patient's previous medical history. This database server is portable and keeps continuous record of a patient. There are other studies which contain hand-held healthcare and methodical algorithms for appointment scheduling inclusive of self- inspection.

The proposed work in this paper is an online consultation system. It uses a web platform for the task of making an appointment to the doctor easily and reliable for the users. Web based online digital consultation application "Doc-Tient" contains three modules. The first one is the patient module designed for the patients that contains various aspects of patient entity. The patient has to register himself on to the portal before logging in to the web-portal. After logging in, the patient can take appointment and can access his profile. The patient has the option of selecting a doctor from the list of doctors and can view the doctor's department. The patient can request for an appointment on his preferred day/time. The selected day/time slot will be reserved, and patient will receive the notification of the successfully approved appointment. The patient can view the progress of his appointment. In addition, the patient can view the reports of various details like treatment report, prescription report and billing report.

The second module is the doctor module that is designed for doctor entity. The doctors have access to all details of patients and appointments tendered by them. The doctor can add treatment details along with prescription, also can view patient's details and his profile details. All the doctors of the specific departments are registered by the admin.

The third module is designed for the admin. The admin views all details of doctors and all appointments by the patients. The admin can add doctor, view patient's details and doctor's details. All the doctors of the specific clinic are registered by the admin. Doctors cannot register themselves without admin's intervention this provision is for avoiding the malpractices.

Rest of the paper is organized as follows. Section II explains the design interface and the tools which have been used. Section III discusses the implementation and screenshots. Section IV concludes the paper.

II. DESIGN INTERFACE

The front-end design is simple and user-friendly. When a user enters on to the web-portal he can access to various functions of system. The patient can make an appointment by selecting the preferred doctor, appointment reason, date and time. The appointments are managed by the admin through a website. The admin also registers a doctor. Admin can view doctors, view patient's records and view feedback also. The back-end design includes a server which acts as a centralized database. All the data of the registered doctors and patients and data regarding the appointments are stored on the server.

A. WEB-PORTAL

A web portal is a specially designed website that often serves as the single point of access for all the information. It has advanced content management capabilities. One more distinctive feature of portals is that access to certain information is provided only after a registration. The web platform also provides various databases and Web services. Web platform provides connectivity between the server and the portal, hence the task of making an appointment to a doctor using a web-portal application connected to server becomes easy using the advanced features and libraries available on the web platform.

B. SOFTWARE DEVELOPMENT TOOLS

The following software tools were used during the development process.

- Visual Studio Code
- Chrome Browser
- XAMPP Server
- MySQL (Database)
- PHP, HTML, CSS, jQuery, Bootstrap

C. BLOCK DIAGRAM OF PROPOSED SYSTEM

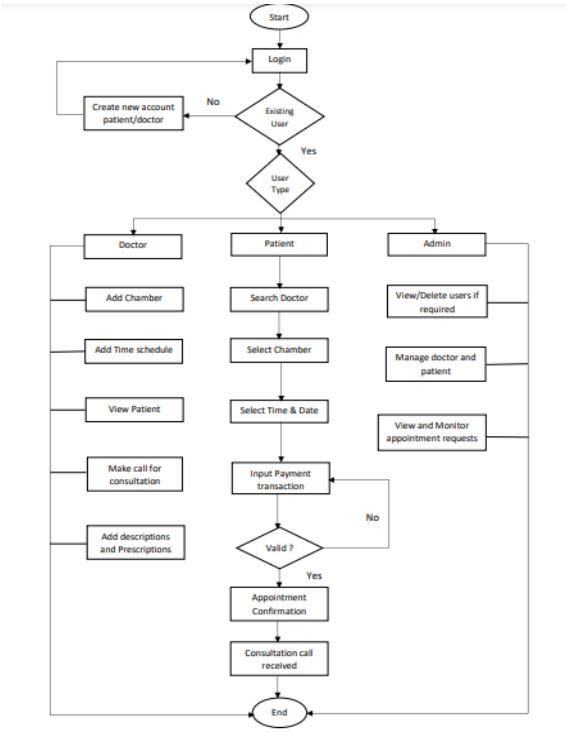

Figure 1: Architecture of the Doc-Tient appointment system

III. IMPLEMENTATION

Once a user accesses the web-portal, the splash-screen that contains various functionalities and facilities offered by the proposed system will appear as shown below.

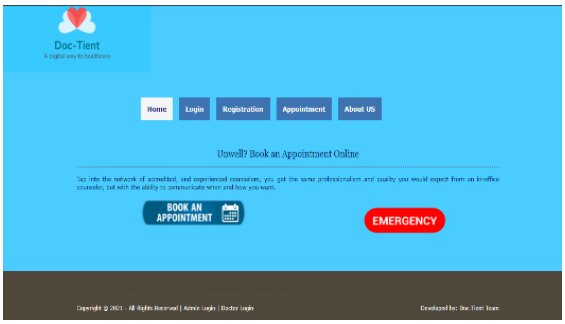

Figure 2: Showing the splash screen

Firstly, the patient has to register himself on to the web-portal. After registration, the patient receives a username and a password. For signing up, the patient has to fill the given fields which includes username, email, password and confirm password. Then by clicking on the signup button registration process terminates itself and then all the information provided by the user is saved in the database located on the server by system itself. The signup screen is shown below.

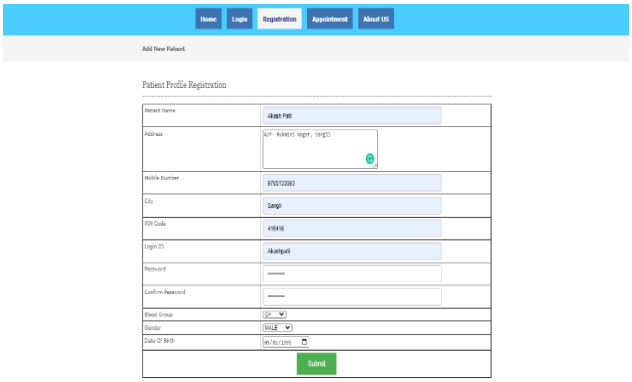

Figure 3: The Signup screen

After successful registration a pop-up notification message appears on main screen. With this touchstone user can login to the system through username and password. The login screen as shown below:

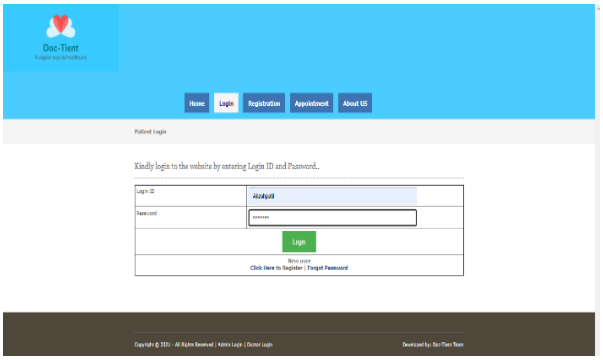

Figure 4: The Login Page

With valid login credentials user can access the functionalities like add information, modify information, make appointments, view appointment status etc. For a purpose of booking an appointment, user needs to fill out some details like appointment date and time, preferred doctor, department, and appointment reasons. After initiating appointment, user can view his appointment's progress. Other options are also provided like appointment cancellation, profile management, access to prescription details and treatment details. After completing all the activities, patient can log out from the account.

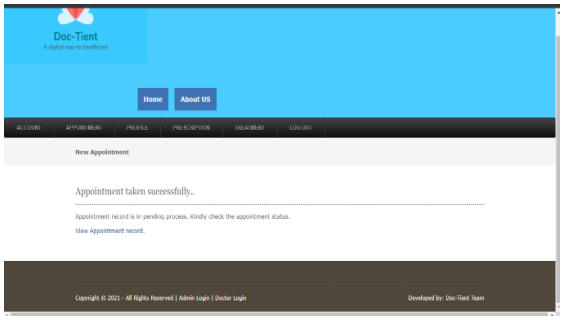

Figure 5: After booking an appointment

Patient can view his/her medical report after clicking View Report option as shown below. User can see the appointment report, prescription report, treatment report and billing report.

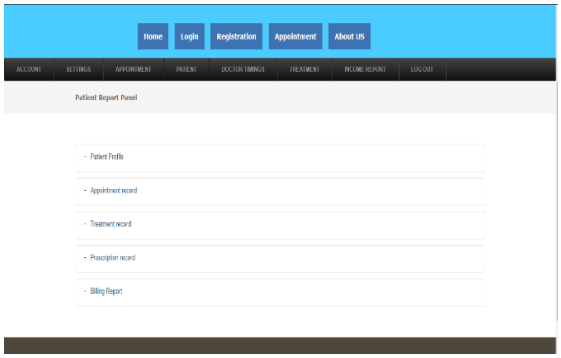

Figure 6: Patient report

User can view all the details of prescription if you click on the 'View prescription record' option. User can print these prescription records for future reference.

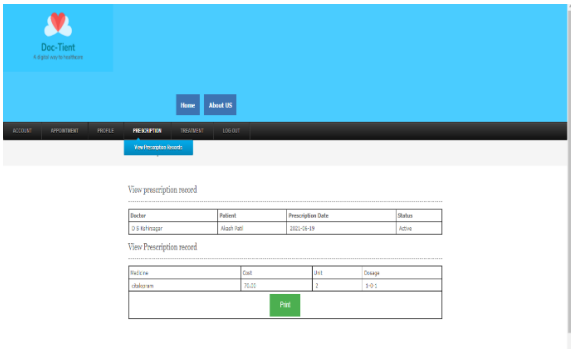

Figure 7: Prescription record details

For registration to the portal, doctors need to contact the admin who then creates the login credentials for the doctors. With these credentials doctors can access the functionalities of the system. Doctor's login page is shown below:

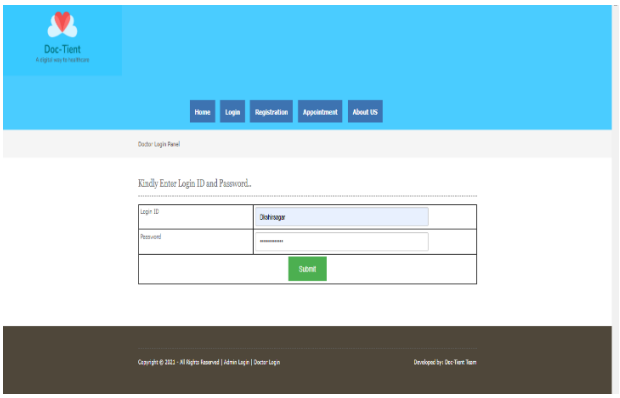

Figure 8: Doctor login page

Doctor has access to all the appointment requests by the patients. He can accept or deny the same. He also has access to various disciplines including to patient's medical history, patient's profile, prescription generation field, treatment details, doctor's income details, etc. as shown in figure below:

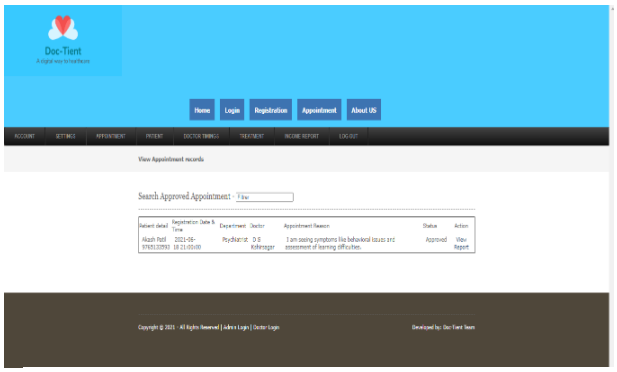

Figure 9: View approved appointments

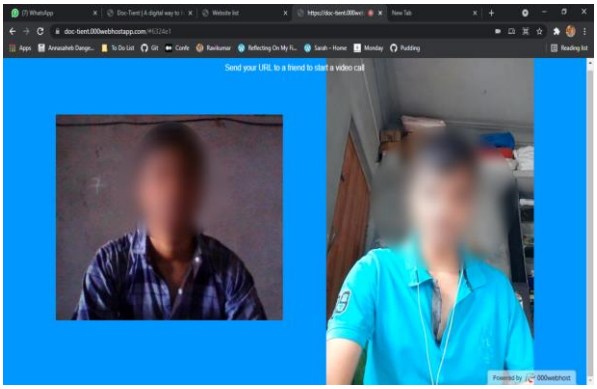

Figure 10: Video consultation

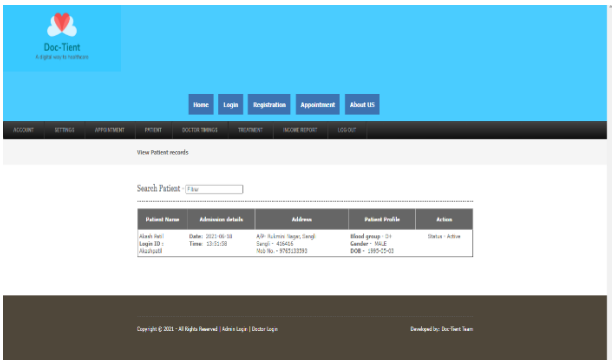

Figure 11: Search patients using filter

In addition to above mentioned functionalities doctors also have option to video consultation generation at the time of appointment as shown in figure 10. Along with this there are various option are available like profile, settings, timings, treatment, prescription, income report, and logout.

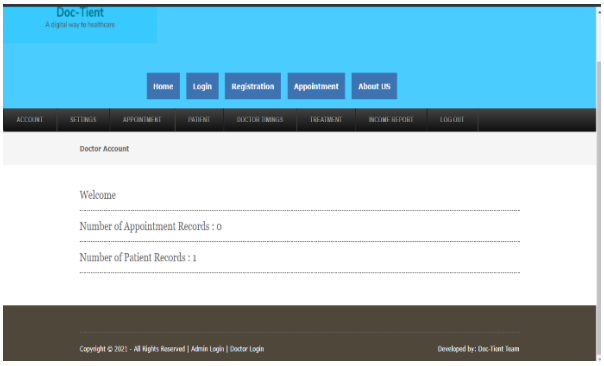

Figure 12: Doctor home page

The final module is Admin module. Admin monitors all the ongoing activities on the portal. The admin views all details of doctors and all appointments by the patients.

The admin can add doctor, view patient's details and doctor's details and can view appointments also.

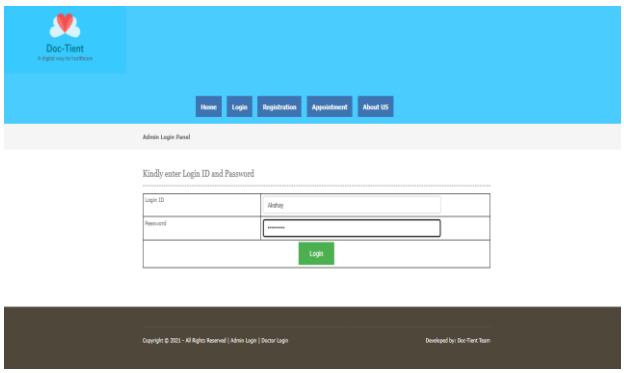

Figure 13: Admin login page

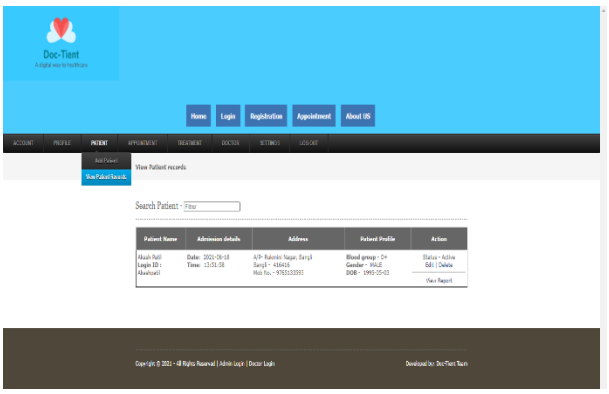

Figure 14: View patients record

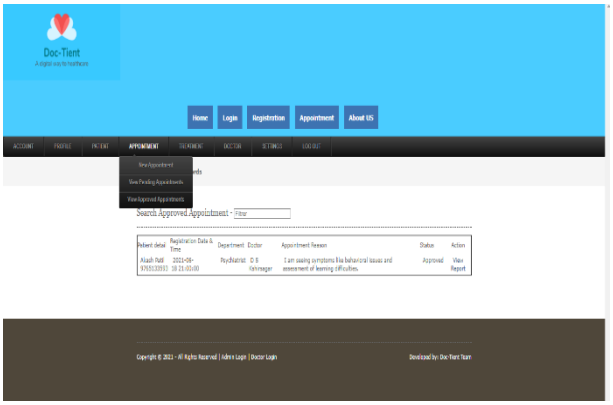

Figure 15: View all the appointment (pending and approved)

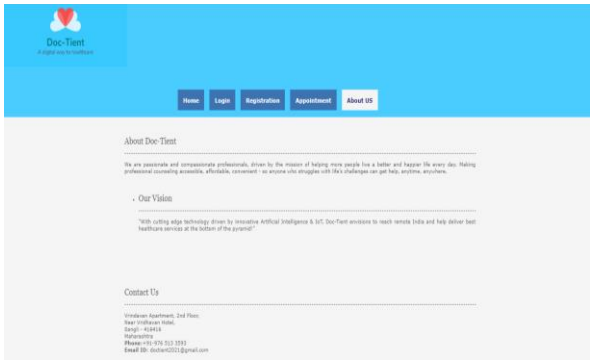

Figure 16: About us page

IV. CONCLUSION AND FUTURE WORK

The proposed digital appointment consultation system has been implemented in Visual Studio and Xampp server for web-portal development and it is developed using HTML and PHP languages. The proposed system is efficient and has friendly user interface. It completely achieves two main objectives that is efficient appointment booking and video consultation facility. Along with these two objectives, proposed system is able to fulfill a lots of additional features like prescription generation, access to medical history, income report, etc. Addition of the admin and doctor modules in the web-portal are included in future work. The future scope of development includes addition of authorized payment gateways for billing purposes and providing local languages to encourage core user groups to be engaged with this service. Some more future directions are the improvements in the patient's module which includes setting reminders for the appointments and saving the appointment date to the calendar.

V. REFRENCES

[1] Deepti Ameta, Kalpana Mudaliar and Palak Patel "Medication Reminder And Healthcare – An Android Application", International Journal of Managing Public Sector Information and Communication Technologies (IJMPICT) Vol. 6, June 2015, pp. 39-48.

[2] Yeo Symey, Suresh Sankaran arayanan, Siti Nurafifah binti Sait "Application of Smart Technologies for Mobile Patient Appointment System", International Journal of Advanced Trends in Computer Science and Engineering, august 2013.

[3] YoeSyMey and Suresh Sankaranarayanan "Near Field Communication based Patient Appointment", International Conference on Cloud and Ubiquitous Computing and EmergingTechnologies, 2013, pp.98-103.

[4] RashmiA.Nimbalkar and R.A. Fadnavis "Domain Specific Search of Nearest Hospital and Healthcare Management System", Recent Advances in Engineering and Computational Sciences (RAECS), 2014, pp.1-5.

[5] A. Luschi, A. Belardinelli, L. Marzi, F. Frosini, R. Miniati and E. Iadanza "Careggi Smart Hospital: a mobile app for patients, citizens and healthcare staff", IEEE-EMBS International Conference on Biomedical and Health informatics (BHI), 2014, pp.125-128.

[6] S.Gavaskar, A. Sumithra, A.Saranya "Health Portal-An Android Smarter Healthcare Application", International Journal of Research in Engineering and Technology, Sep-2013.

[7] Frank Sposaro and Gary Tyson, "iFall: An android application for fall monitoring and response", 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 1:6119–22, 2009.

[8] Pei-Fang Tsai, I-sheng Chen, and Keven Pothoven "Development of Handheld Healthcare Information System in an Outpatient Physical Therapy Clinic", proceedings of the 2014 IEEE 18th International Conference on Computer Supported Cooperative Work in Design, pp. 559-602.

[9] Bin Mu, Feng Xiao, Shijin Yuan "A Rule-based Disease Self-inspection and Hospital Registration Recommendation System", Software Engineering and Service Science (ICSESS), 2012 IEEE 3rd International Conference, 22-24 June 2012.