

Telemedicine Solution using Django

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ABSTRACT

The average person usually don't have much information about diseases related to symptoms they have and which doctor to visit for that disease. This causes a lot of wastage of time and money because they have to search doctor by doctor to get the right doctor and get an appointment with that doctor. Also not all doctors treat all diseases, this means just knowing your disease is not enough. Through this telemedicine solution we have tried to mitigate the inefficiency and delays in the system. Patients can get a basic idea of the possible disease they might have and a list of doctors suited to cure this disease is given as output to the patient. Then the patient can connect with doctors on a website.

Keywords— Appointment Booking, Django, Website, Disease Identification, Machine Learning, Telemedicine Solution

I. INTRODUCTION

In the world where with increasing population the number of doctors to patients is very less, and people have less time to spend due to their fast paced life, there is need of a system which can exponentially decrease the problems faced by people in identifying possible diseases they might have and get the right doctor to cure it without wasting their precious time and money. The advantages of internet, Machine learning, mobile and web can be made full use of to make up the time and distance gap between doctors and patients and to provide fast and adequate medical services. We are proposing to develop a doctor patient interaction system on the Django: A python web development platform and having a model which is using machine learning in its backend to guide the patient on his diseases and the perfect doctor for it thus providing patients more efficient and convenient means of communication with doctors [1].

By introduction of our proposed system which comes under the category of a telemedicine solution we aim to mitigate or eliminate following problems, firstly the hesitation of patient of checking is there any disease related to a symptom he/she has..Secondly problem of finding a doctor which will be best for curing a disease, like going

the old school way of asking friends instead of experts. Thirdly, most people have to wait weeks or even months to get a doctor's appointment and have to physically visit a doctor to just get an appointment. Fourth, the trust issues that patients have on doctors about their education and capabilities. Fifth, the problems that doctors have in managing patients, appointments and booking along with money. Lastly the problems that a hospital's management faces in managing a team of doctors as their resources.

II. FEASIBILITY STUDY

Detailed study was carried out before and after hosting the website to check workability of the proposed system, CSRF tokens were used to prevent cyber attacks on the website. We have ensured that no person will get access to critical data without proper authentication. Also since the website only requires a browser to run, this proposed system can out reach any mobile application in terms of users and with simple UI, it will have a low churn rate. All the tools and software's used are open source and credible platforms making the development and changes in the proposed system easier, also making it easier to integrate this solution with other solutions likes EMR. System is broken down into modules to ensure code reusability.

III. PRIOR APPROACH

A patient never knows what disease he has. All he knows are symptoms, and to know the disease he/she has to go to many doctors. Other Online platforms are only for searching for hospitals, medical stores and clinics[2].They don't allow patients to even get an idea of possible diseases a patient might have. Some applications only allow online booking or just information about doctors but don't allow doctors to create slots of their available timings. Also these applications don't allow hospital management to get control over business aspects like cost of appointments.

IV. OUR APPROACH

Proposed system has 3 main user roles : Patient , Doctor and a Super Admin (which could be management of the Hospital/ Doctor itself).Patient first goes to the website using any device having internet connection and a web browser making it more accessible then just making an android application. Firstly Patient does Sign Up with his basic details like name, email, mobile number, age, gender etc, and he/she sets a password for his/her account. Then the user gets a confirmation mail on his/her email that he/she has successfully registered along with his/her

username. After Sign In using username and password , Patient gets a Question module about his symptoms where he/she has to answer the questions in yes or no. On the basis of answers of questions about symptoms our Machine learning trained model decides what are the likely disease(s) that the user might have, giving its confidence score and disease name, symptoms name to the user. Also the system suggests doctors that are experts of that particular field/disease.

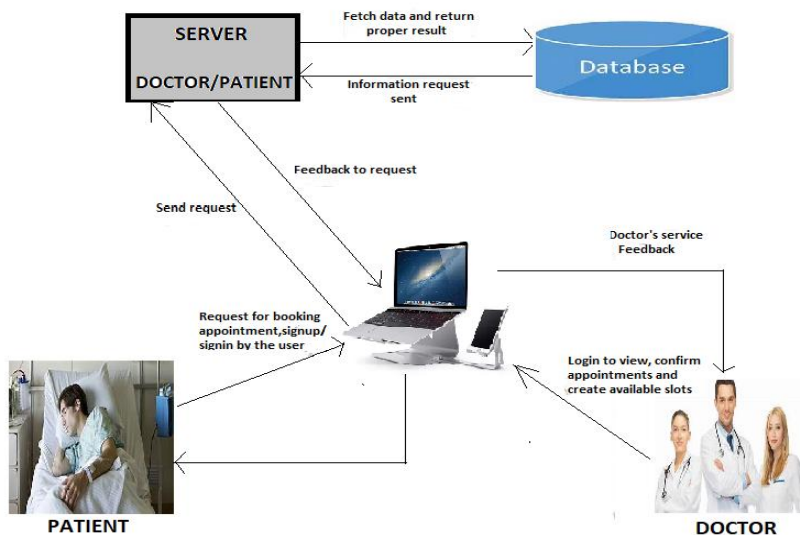


Fig. 1 System Design for Proposed System

Thus giving the user a right direction on whom to approach. The list of doctors are doctors who have signed Up on our platform. Now the Patient can view the list of available doctors with the timings and venue and can book an appointment against it. The doctor also does his Sign Up by giving his basic details and education, specialisation details. He/she also gets a confirmation of registration along with login details Also he can create the available slots on when he/she will sit at a particular clinic and upload the

timings and cost. He/she has a Dashboard where he/she can see the list of appointments that patients have made along with Patient(s) details. Also sometimes users want to book an appointment for their family members so they can do that by giving their details instead of re-registering on the platform. Super Admin role can be fulfilled by a doctor when he/she is the only one handling a clinic or an upper management of a hospital / medical college as per business requirements.

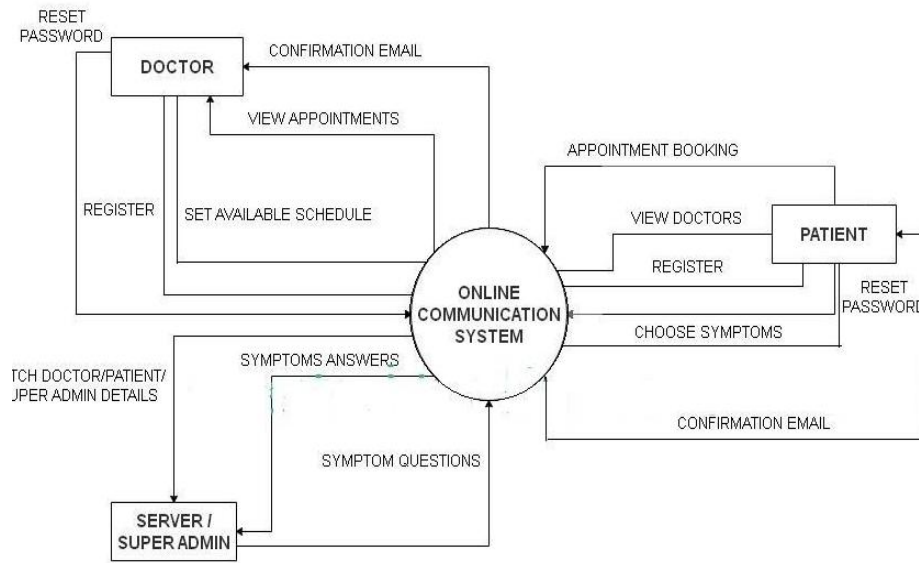


Figure 2 Data Flow Diagram

Design Interface

The front end design is made user-friendly. After going to the website the patient will register himself and then will Sign In using username and password. No social sign up is considered in scope .The appointments are managed by the admin through a website. The admin also

registers a doctor. Admin has permission to access records of doctors, patient. Database like sqlite which is the default database used by Django is used. All the data of the registered doctors and patients and the data regarding the appointments are placed on the server. The questions are also available in the database.

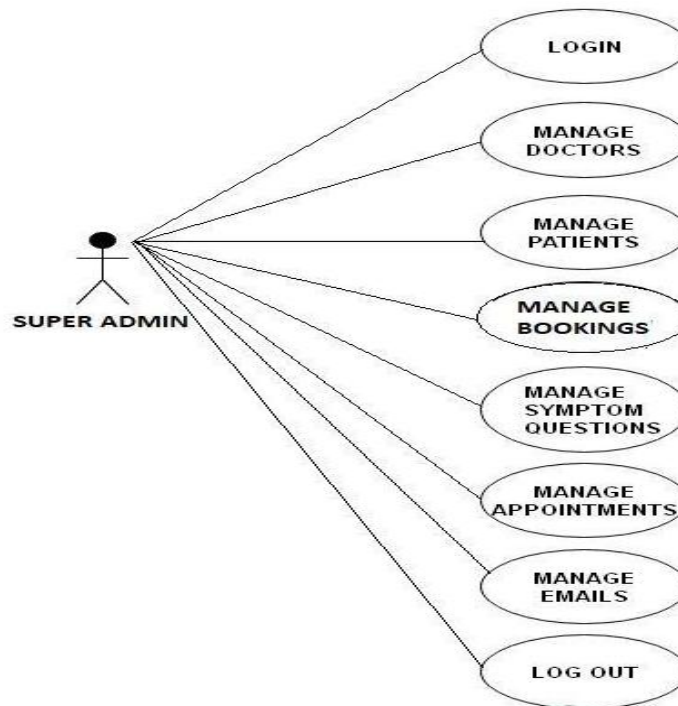


Figure 3: Use Case Diagram for Super Admin

A. Django

Django is an open source python web development framework which is used to develop websites and in some cases progressive web apps too. Django as a framework is easy to learn and due to set of rules the code is quite clean,

thus improving code readability. Python is used as base language for coding in django and since python code is very small and easy to write, Django is a idle choice. Django uses SQLite a default database.

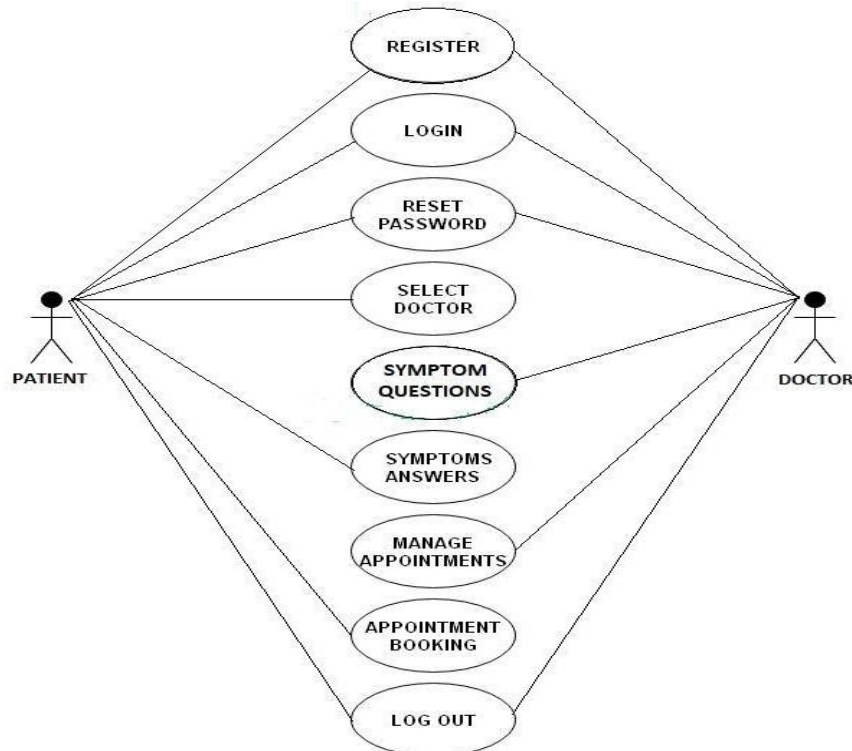


Figure 3: Use Case Diagram: Doctor and Patient

Also Django handles a request in this way. Firstly a request comes to urls.py where url resolution is done. After that view.py to the url specific app is called

where depending on the class/function based view, template is called which loads the HTML and CSS using web page which is sent as response to the client.

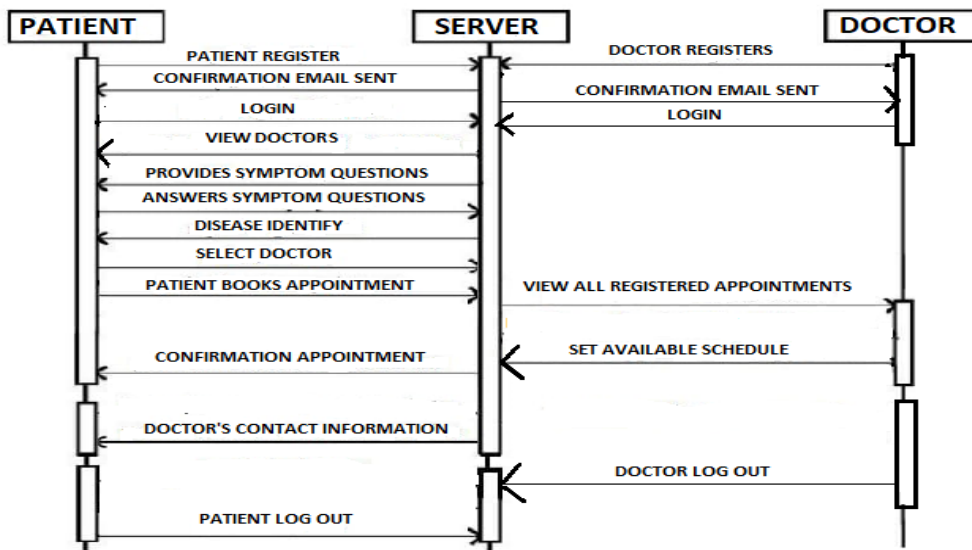


Fig. 4 Sequence Diagram

B. Software Development Tools

Following tools are used for development.

- Django 1.8
- Python 3.6
- IDE: Spyder , PyCharm
- Heroku for website deployment
- Bootstrap4

V. CONCLUSION

This website is of great help for doctors, patients and hospital management. The application is freeware, user friendly and easily accessible. This system has capability to ease the work of the patient and the doctor. Patients don't have to physically go and wait for an appointment. Patients will know a rough idea of what possible disease he/she might have so that he/she might search for doctors of that filed only. Doctors need not worry about managing their appointment[1]. Though you are not going to the clinic for an appointment, your appointment gets booked from anywhere and however you want. This helps to save the time of the patient. The doctor has permission to access his schedule giving him powers to better use his time and become more efficient. This telemedicine solution will improve hospital efficiency. The hospital management gets better control over the business aspect of this appointment system like setting cost per appointment and viewing how many appointments are getting booked by giving them a good business analysis, thus empowering them to make better business decisions[3].

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