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E- DOC Healthcare System

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ABSTRACT: In this growing age of technology it is necessary to have a proper health care management system which should be portable so that every person can carry it for personalized health care management. The idea of our project is to provide an organization with a setup that will be helpful to that specific organization as well as the patient associated with the organization as well. The patient will have an application specifically designed for them which will help them to contact with a doctor, interact with him and even make use of Artificial Intelligence for diagnosis of common diseases. The organization on the other hand has management of the system and all the things will be managed with the help of the admin and the receptionist at the organization level [15].

KEYWORDS: mahasbtc, SILVIA, naïve bayes, machine learning, health monitoring.

I. INTRODUCTION

Due to advancement in technology the growth and development of nation is faster and also technology has provided comfort to human being this has made life simple but it is true that every changes made by human being against the nature will have some effect on life so here also it has majorly effected the life of human being and leading to increase in diseases and various health related problem. Due to all these problems it has become necessary that people should have a regular health checkup so that they are kept updated about their health and can be save from any critical diseases which may occur to them. But as the technological advancement is increasing day by day people have no time due to their work or other things and they are not able to give time to their health issues and most of the time neglect it. Due to the workload and the negligence person don't get time to visit the doctor and can't be up-to-date regarding his/her health. Also many times it happens that person will have time but their family doctor is not available due to some or the other work. So in order to fulfill this gap and provide communication among patient and doctor even if they are located at two different places even far away from each other but they can connect and patient can get consultancy from Doctor [1].

The above system is designed to provide a system which is helpful for creating a health management system for patients belonging to a particular hospitals, clinic, etc so that they can provide optimum services to their patient and as well as manage them well. It is nothing but a health care management system where patient or user of the system will be able to keep track of his/her health by regularly concerning to a doctor which will be a general physician which can help to identify general health problems and help provide remedies for it to the patients via texting and the patient if very far can consult him and send his test reports like blood report, etc. with the help of the application provided to him/her by the hospital/clinic and can view it any time as it is saved on the server, whereas the doctor can check the files send to him by the patient any time and provide him with prescription. The patient application has a feature which is available for every patient for diagnosis of common diseases which makes use of "naïve byes" algorithm for implementation of Artificial Intelligence system in the patient's application which takes in input in the form of symptoms and provides with output the probability of the most possible disease the patient is suffering from. There is a set of symptoms which can be taken as input and a set of diseases which can be identified as it is not possible to create a system say to diagnose cancer, Aids, etc these diseases need proper checkups and tests. The link of Mahasbtc can be seen on the patients application which can be used by him her to look for any blood availability of any specific blood group in Maharashtra. The patient application also has an "alert system" which could be used by patients so that they could be reminded of taking a medicine at the time specified by them. The receptionist is provided which will manage

and add patients as and when they come for registration. The server is provided with an admin which will add all the doctors, add the receptionist and add relevant information about them like name, designation and other information about the doctors and provide them with login ids and passwords which the doctors will use to access their accounts in the web application designed for them and communicate with the patients and the receptionist can login to his/her account and can make use of the functionalities of the web application designed for them.

II: RELATED WORK

The mentioned systems are individual and can be used collectively for health management system.

The MediAssist Edge had all those features which is required for health care using computer technology but it was not available on mobile phones.

The base paper we referred to is “Health management using Artificial Intelligence” but it has certain problems which have been removed from our project like it provides automation, easy management, mobility, ease of use to patient, better utilization of resources and is supportive to both patient and the hospital/clinics.

The idea of giving an application to all is good but will not work because no one even a doctor will give his/her advice for free.

III: PROBLEM STATEMENT

Creating a Healthcare System to provide Medical Assistance to patients after their treatment at a Hospital.

IV: SYSTEM IMPLEMENTATION DESIGN

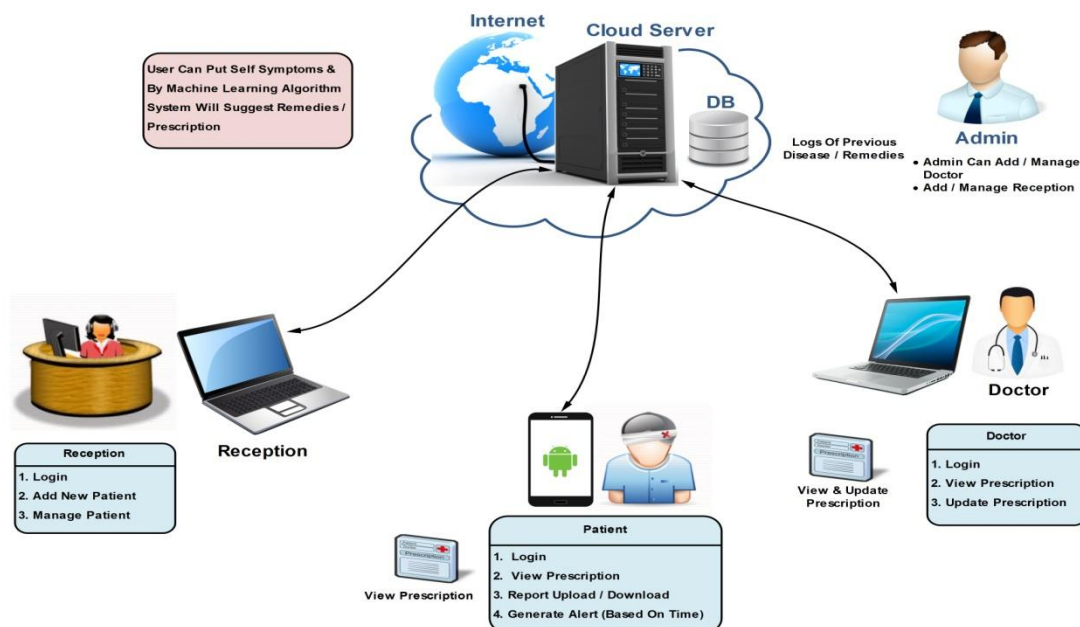


Fig: System Architecture

V. MODULES:

There are basically five modules in the system namely:

1. **Admin**
2. **Doctor's Web Application**
3. **Receptionist Web Application**
4. **Patient's Android Application**
5. **Disease Prediction**
6. **Server with the database**

The explanation of each is given below:

1. **Admin**: Admin will be present at the server. The admin will have control over all of the system from the hospital's /clinic's end. The whole setup of the system is done by the admin like registering the doctor and the receptionist. The doctor and the receptionist will be automatically send emails with their login ids and automatically generated passwords.



Fig: Admin web App

2. **Doctor's Web application**: It will be developed using NetBeans 7.1. This application will be used by the doctor's to communicate with patients, giving them prescription, updating the prescription if needed and viewing files(reports) uploaded by the patient using patient application.



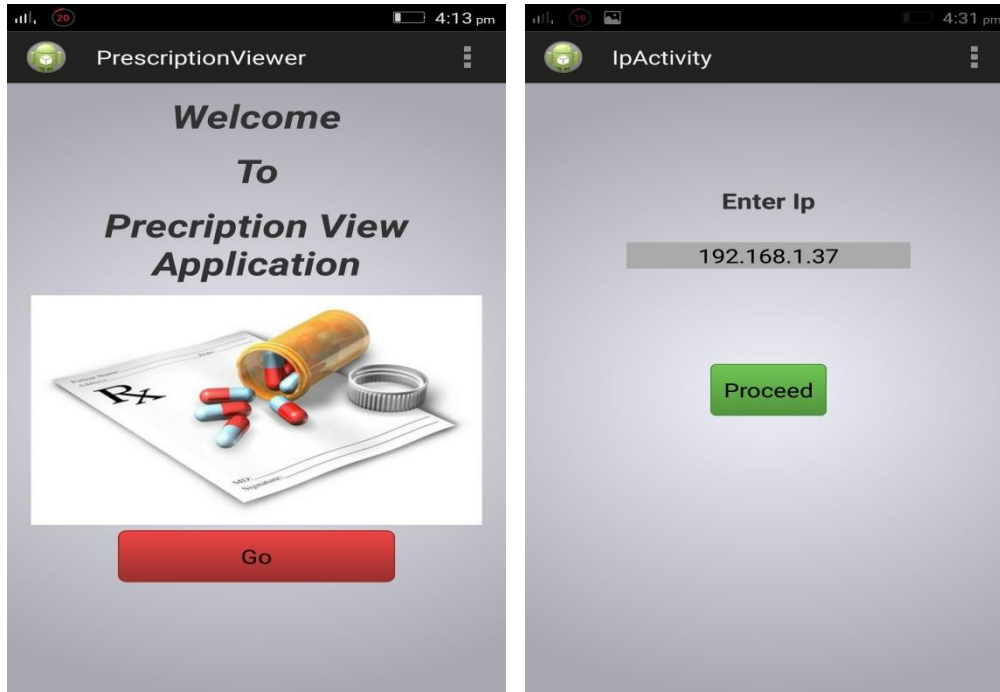
Fig: Doctor Web App

3. **Receptionist's Web Application:** It will also be developed using NetBeans 7.1. It will have functionalities like adding/registering the patient and managing the patient's account.

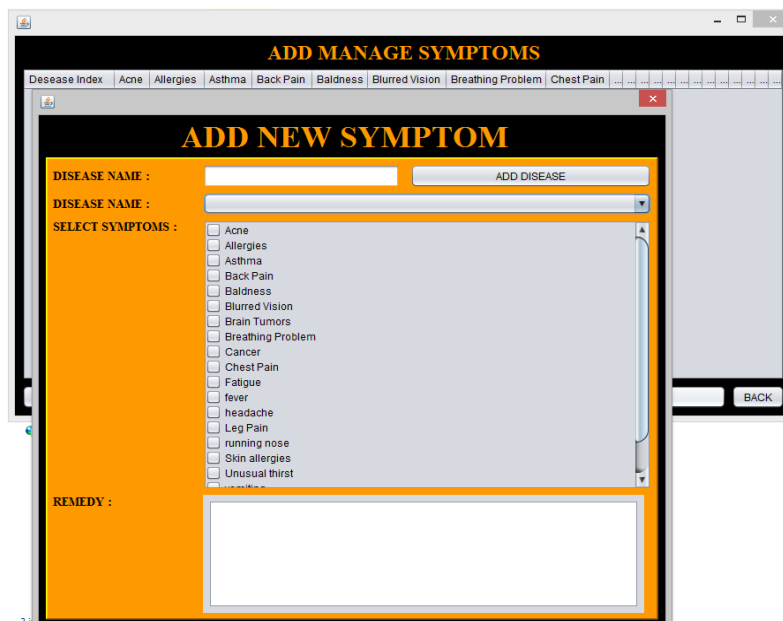


Fig: Reception web App

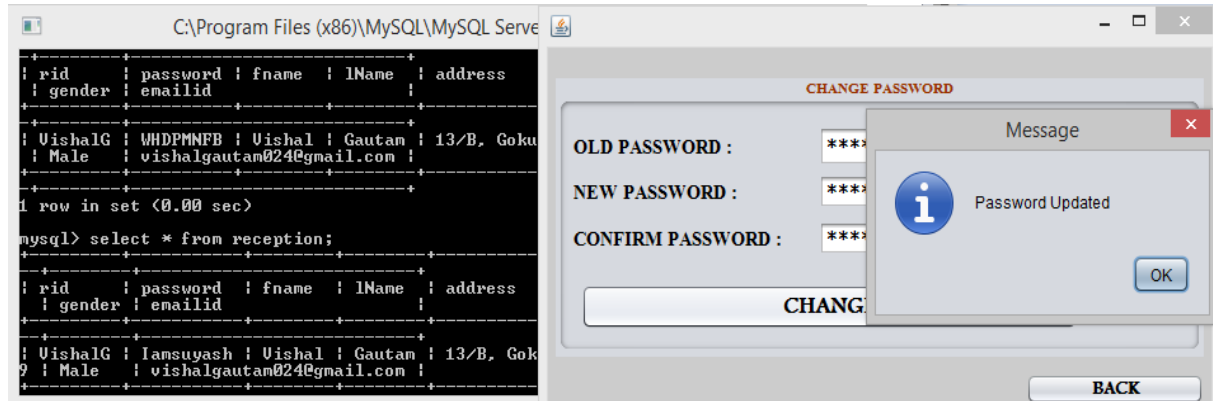
4. **Patient's Android application:** This android application will be developed using android adt-bundle. The android app will have features like contacting with doctor, uploading files, alert system, diagnosis of common diseases using Artificial Intelligence and viewing prescription. The patient application is very important part of the system. The patient can view the prescription and the files uploaded anytime he/she wants to.



5. **Disease Prediction:** The Disease Prediction using Artificial Intelligence is one of the key features which will be used in the patient android application for the diagnosis of common diseases. It will take symptoms as input and give the most probable disease as output. For implementation of Artificial Intelligence we are making use of 'Naïve Bayes' algorithm. The symptoms are stored in a sequential database which is static in nature. Through data mining of the database the probability of occurrence of the diseases will be given as output.



6. **Server with the database:** The server we are using here is “GlassFish” server and this will be implemented using Netbeans 7.1 with the database connectivity to a relational and dynamic database which here is “mysql”.



Working:

The server side is present in the hospital or clinic wherever the system needs to be set up. The server is setup in the hospital and the server we are using is “glassfish server”. The “glassfish server” is setup using netbeans 7.1. The admin starts by setting up the whole system, he adds the doctor’s and receptionist’s account and send an email to their respective email with the username and password for their web applications. The admin has the following functions of adding, managing and deleting the accounts of the doctors and receptionist. The receptionist on the other hand is responsible for adding patient and managing the patient account. As discussed above that the receptionist and the doctor will receive the password for his/her web application on the email registered with his/her name with the login details.

The patient first gets itself registered himself on the hospitals/clinic database and then a login id and password is created for the patient which is used by the patient to login to the hospitals/clinic android application provided for the patients, the login and password will be used by the patient to access the exclusive services of the application which are consulting a doctor, viewing and uploading documents in pdf, image, etc. formats, he can also view prescription given to him by the doctor and can make use of the alert based system as well.

This application is basically an android application which we will create by using Android adt-bundle. The patient app has an “alert system” which can be used for alerting the patient to take the medicine at a specific time (as set by the patient).The patient application also has an Artificial Intelligence system which is implemented by using “naive bayes” algorithm which takes a specific set of symptoms to diagnose some common diseases. The database which is used to save symptoms and disease relationship is sequential and static database which will be used to diagnose the disease. The server will have the algorithm of “Naive Bayes” present which use data mining technique for the diagnosis of the diseases.

The algorithm is as stated below:



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ALGORITHM:

The Bayes Naive classifier selects the most likely classification V_{nb} given the attribute values a_1, a_2, \dots, a_n . This results in:

$$V_{nb} = \operatorname{argmax}_{v_j \in V} P(v_j) \prod p(a_i | v_j)$$

We generally estimate $P(a_i | v_j)$ using m-estimates:

$$P(a_i | v_j) = \frac{n_c + m_p}{n + m}$$

Where:

n = the number of training examples for which $v = v_j$

n_c = number of examples for which $v = v_j$ and $a = a_i$

p = a priori estimate for $P(a_i | v_j)$

m = the equivalent sample size. [16]

The Artificial Intelligence part will work even if a person has downloaded the application without even being a patient from the android store. The doctor is online/offline can be viewed through the application. He/she can even leave a message for the doctor if they want.

The doctor can use the login id and password provided to him through the email and can access the functionalities of the web application which provides him the functions like the prescription if needed, he can download and view the files that have been uploaded by the patient and these files are stored on the server and can be anytime viewed by the doctor or the patient. The doctor's web application and the receptionist web application is developed using "Netbeans 7.1".

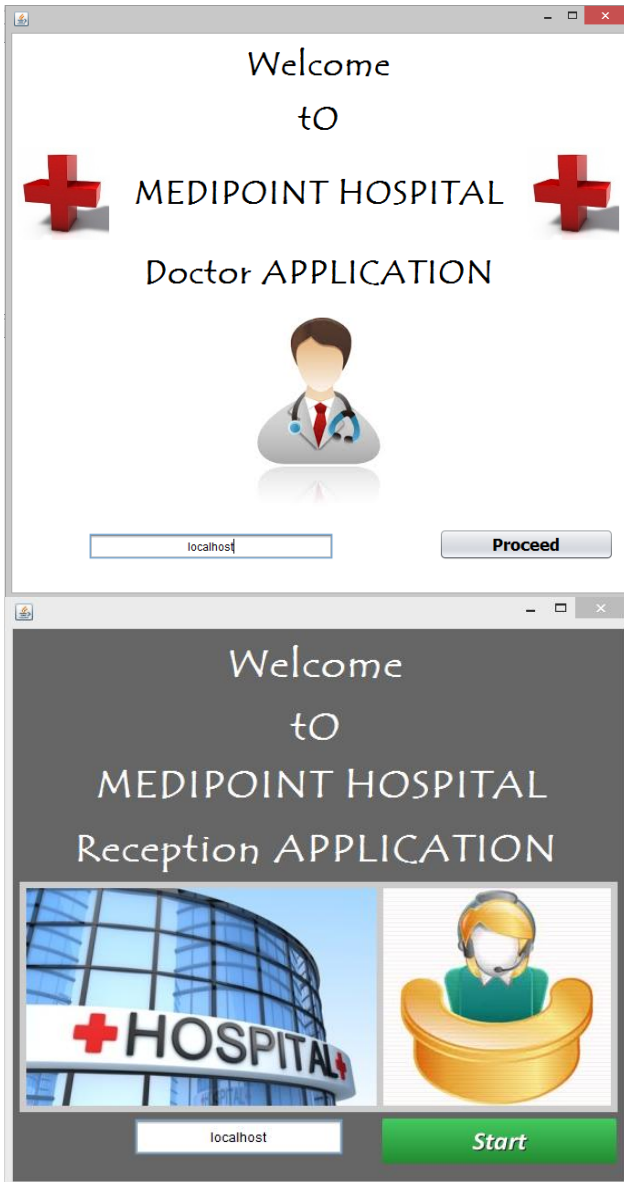
ADVANTAGES:

1. Saves Time and Money (Resources).
2. Facilitates the patient to remotely contact the doctor for advice.
3. A better track of one's health can thus be kept.
4. The patient does not have to change their doctor at any point of time as they have a good medium for communication.
5. Disease Prediction gives a fair idea of that a person might be suffering through based upon symptom study.
6. No external hardware required by the users.

DIS-ADVANTAGES:

1. Not as much helpful to patients with grave diseases.
2. Not applicable for grave disease prediction that require various tests.

VI: FINAL RESULT:



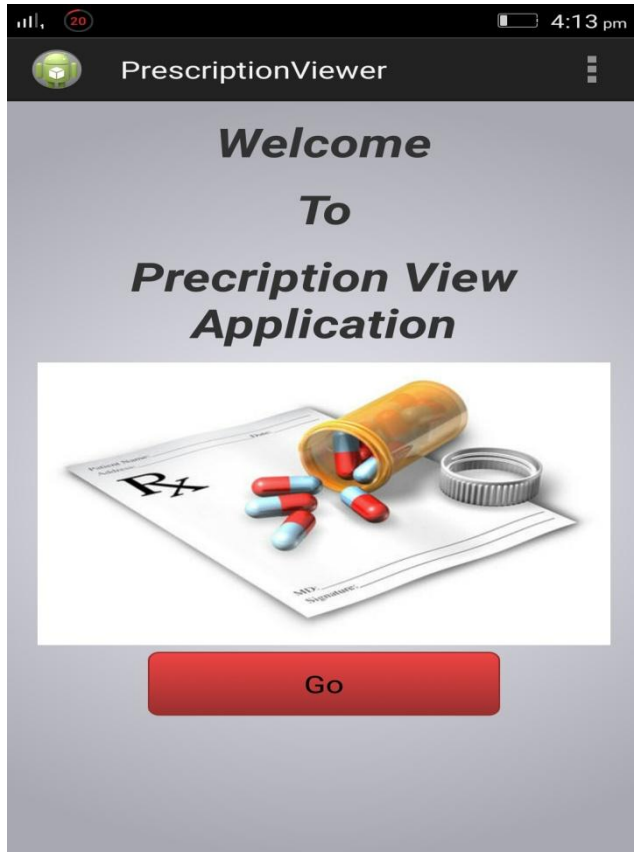
ANDROID PATIENT HOMEPAGE:



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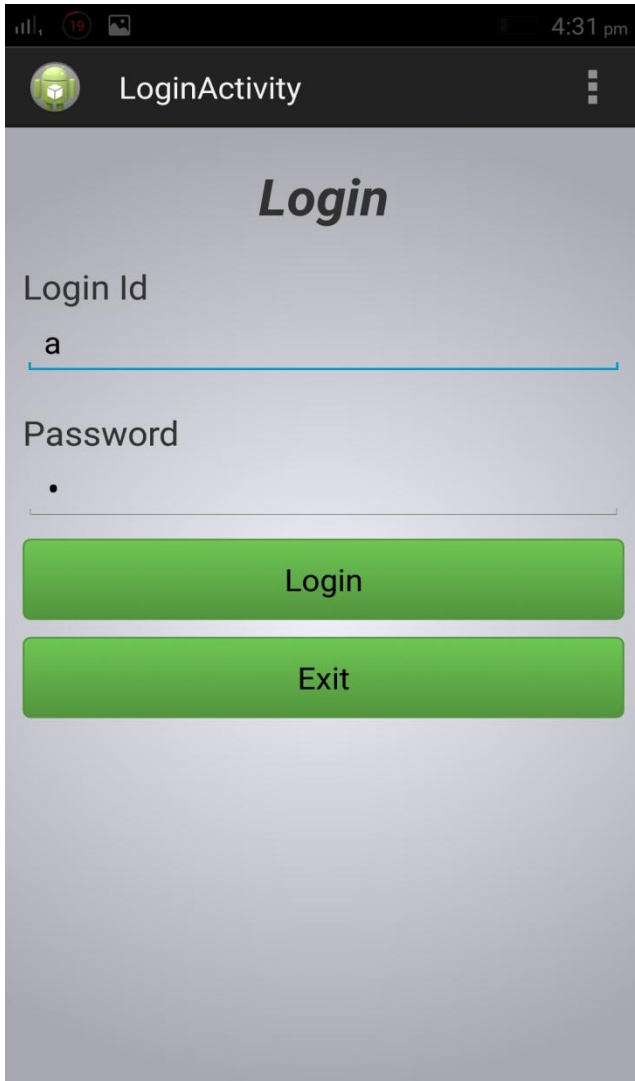




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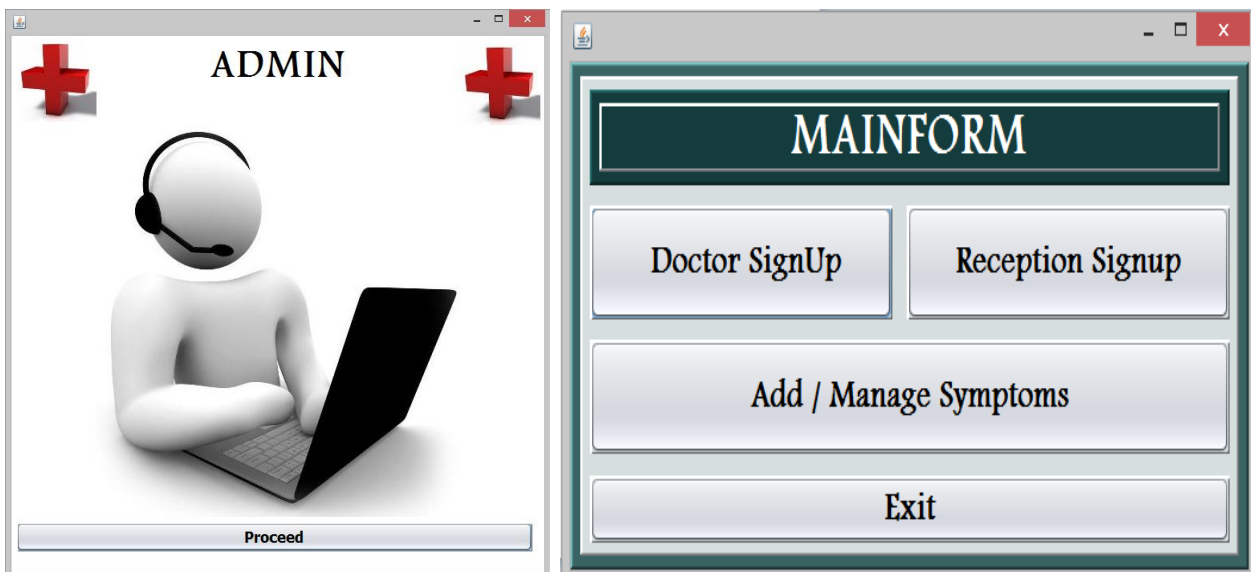


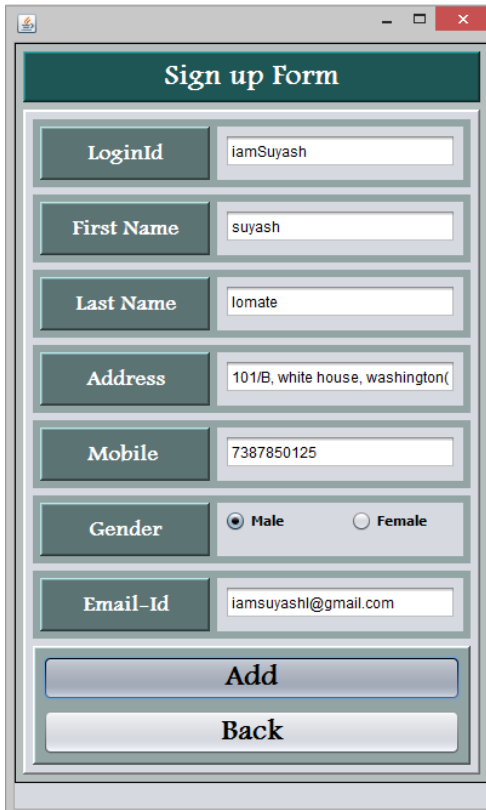
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ADMIN APPLICATION:





Sign up Form

LoginId: iamSuyash

First Name: suyash

Last Name: lomate

Address: 101/B, white house, washington(

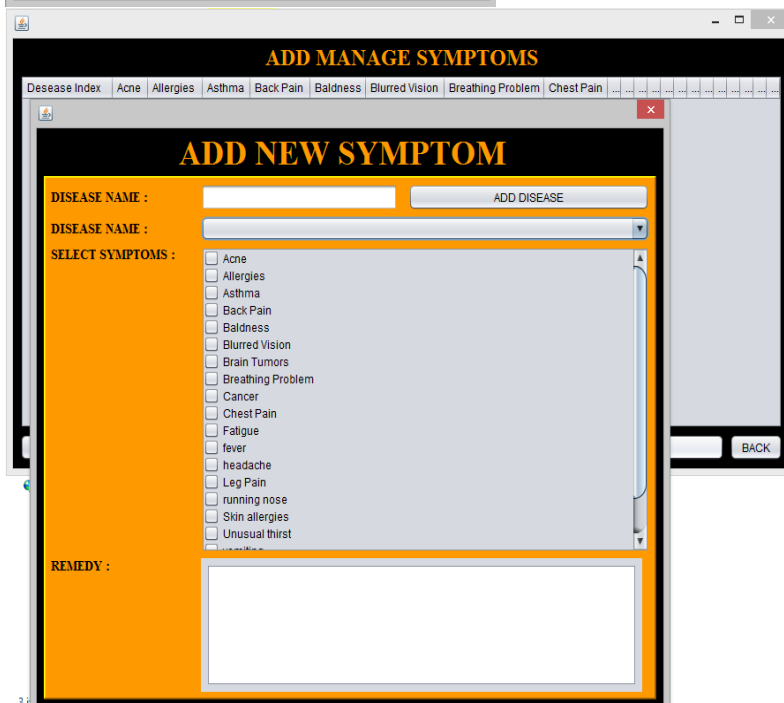
Mobile: 7387850125

Gender: Male Female

Email-Id: iamsuyashl@gmail.com

Add

Back



ADD MANAGE SYMPTOMS

Desease Index | Acne | Allergies | Asthma | Back Pain | Baldness | Blurred Vision | Breathing Problem | Chest Pain

ADD NEW SYMPTOM

DISEASE NAME : **ADD DISEASE**

DISEASE NAME :

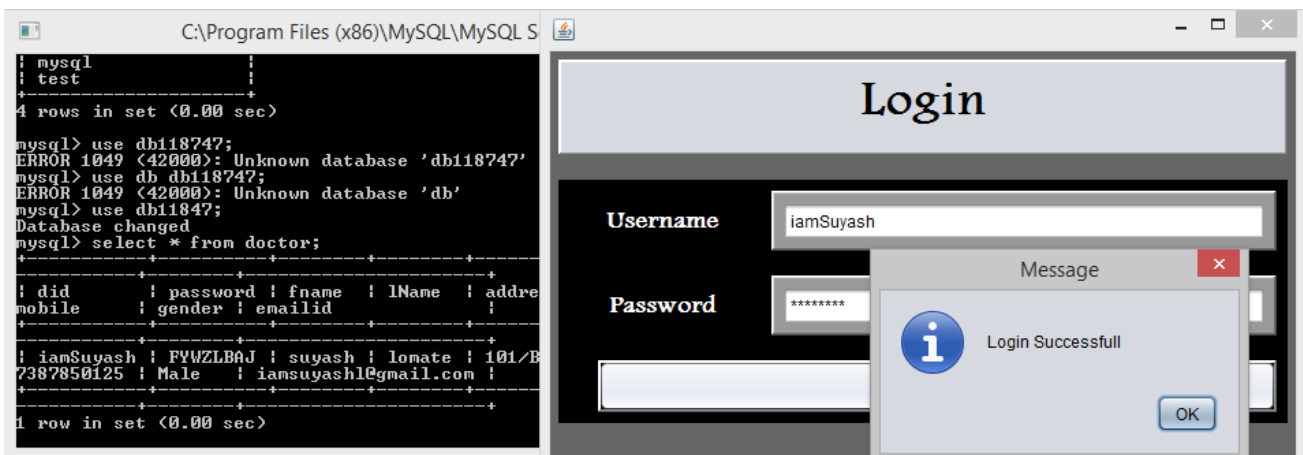
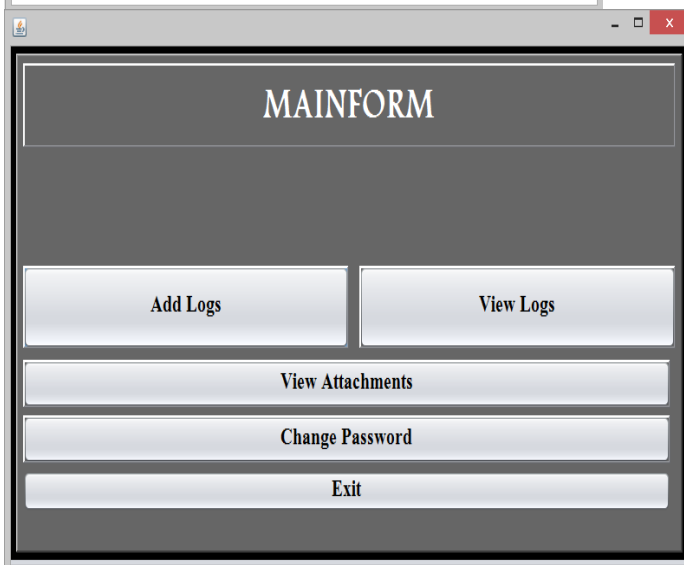
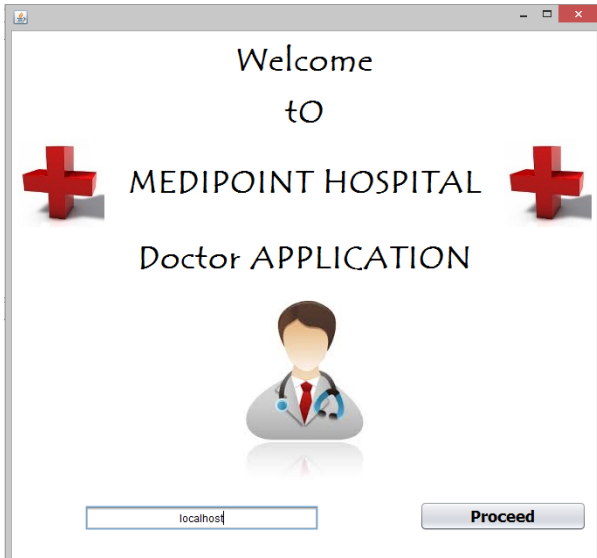
SELECT SYMPTOMS :

- Acne
- Allergies
- Asthma
- Back Pain
- Baldness
- Blurred Vision
- Brain Tumors
- Breathing Problem
- Cancer
- Chest Pain
- Fatigue
- fever
- headache
- Leg Pain
- running nose
- Skin allergies
- Unusual thirst

REMEDY :

BACK

DOCTOR APPLICATION:

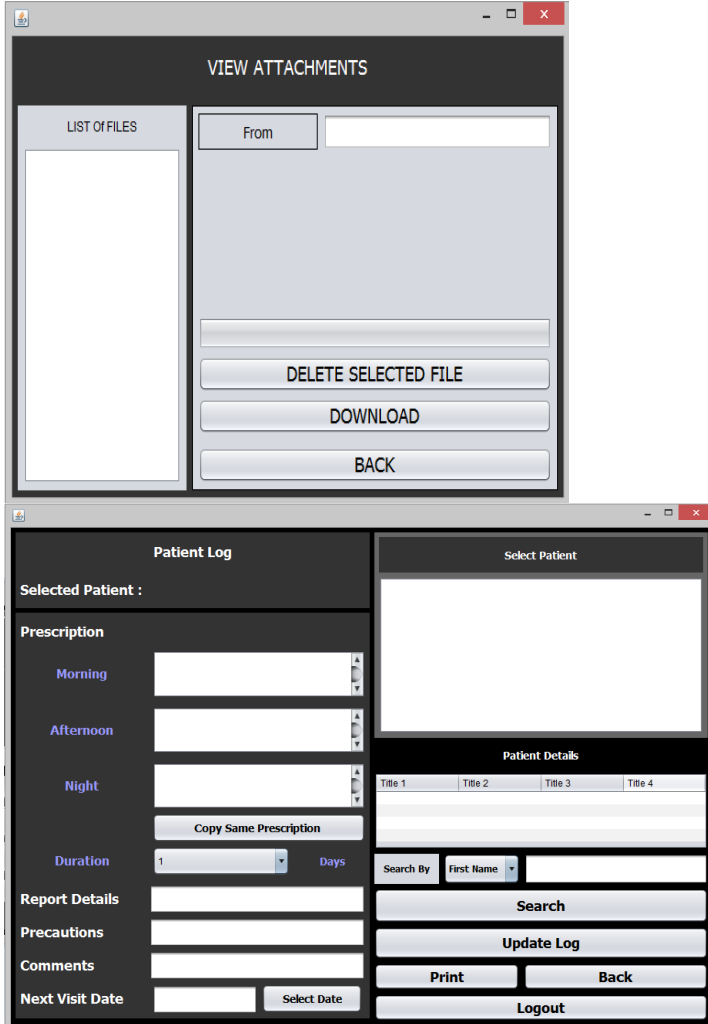




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RECEPTION:

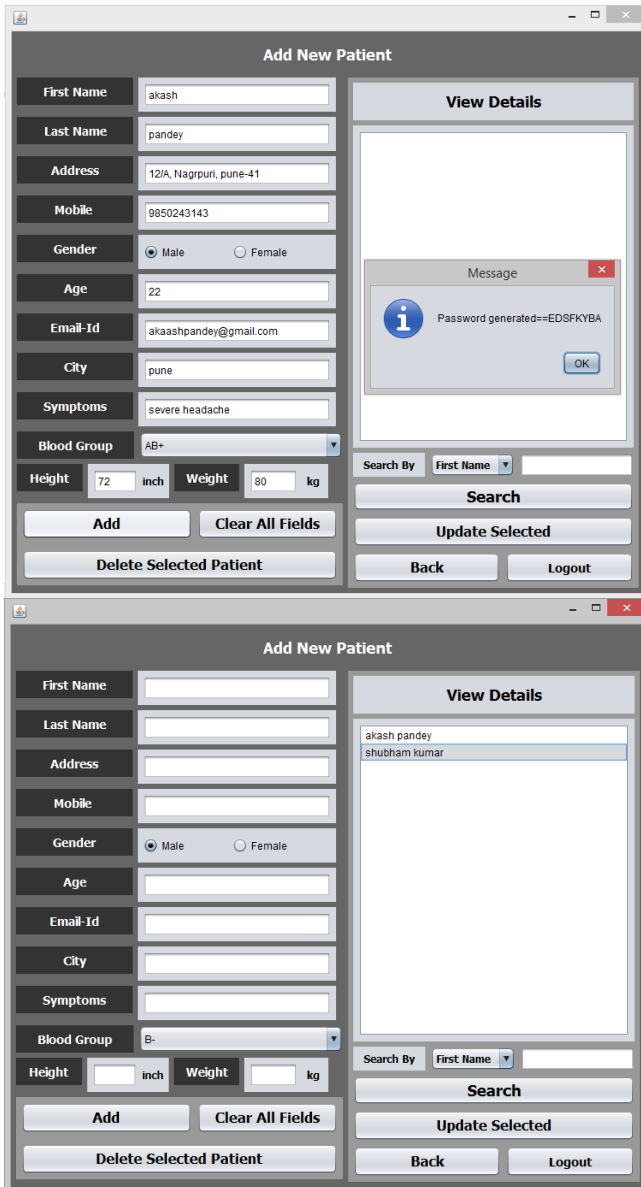


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Add New Patient

First Name: akash
Last Name: pandey
Address: 12/A, Nagrpuri, pune-41
Mobile: 9850243143
Gender: Male Female
Age: 22
Email-Id: akaashpandey@gmail.com
City: pune
Symptoms: severe headache
Blood Group: AB+
Height: 72 inch Weight: 80 kg

View Details

Message: Password generated==EDSKYBA

Search By: First Name
Search
Update Selected
Back Logout

Add Clear All Fields
Delete Selected Patient

FUTURE SCOPE:

Future scope of our system can be:

1. Extending hardware feature to detect pulse rate, heart rate and etc.
2. Improvisation in Disease Prediction using Artificial Intelligence.

IV. CONCLUSION

Health care management system is developed for the purpose of betterment for people health. The mobility is an important factor of this application. It provides easier method to the user to communicate with the doctor and get



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relatively better and faster consultancy. The Application focuses towards mobile based, video conferencing, and Artificially Intelligent bot. This application has enormous future scope and further it can be extended to make it more efficient, reliable and faster.

Artificial Intelligence technology has vast scope and can be made such that it can near to the actual consultant.[15].

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REFERENCES

- [1] Amiya Tripathy, Ajit Varghese, Nikita Chabhaiya and Bejoy Anthony, "MediAssistEdge – Simplifying diagnosis procedure & improving patient doctor connectivity", Don Bosco Institute of Technology, Under Graduate project report 2014.
- [2] Bing Nan Li, Ming-Chui Dong, Sam Chao, "On decision making support in blood bank information systems". Expert Syst. Appl. Vol. 34, Issue 2, pp. 1522-1532, 2008.
- [3] Priyanka V. Mhamunkar, Krishna S. Bansode and Laxman S. Naik, "Android Application to get Word Meaning through Voice", International Journal of Advanced Research in Computer Engineering and Technology, Vol. 2, Issue 2, February 2013.
- [4] J. Allen, "Photoplethysmography and its application in clinical physiological measurement", Physiological Measurement, Vol. 28, pp. R1-R39, 2007.
- [5] Daniel Lakens, "Using a Smartphone to Measure Heart Rate Changes during Recalled Happiness and Anger", IEEE transactions on affective computing, Vol. 4, Issue. 2, April-June 2013.
- [6] Naive Bayes Classifier example
Eric Meisner November 22, 2003.
- [7] <http://www.teamviewer.com/hi/company/company.aspx> [Date of Access: June 15, 2014]
- [8] <http://mahasbtc.com/> [Date of Access: June 15, 2014].
- [9] <http://socialblood.org/> [Date of Access: August 05, 2014].
- [10] <http://www.ignaciomellado.es/blog/Measuring-heart-rate-with-asmartphone-camera> [Date of Access: October 02, 2014].
- [11] Denis Laure, Ilya Paramonov, "Improved Algorithm for Heart Rate Measurement Using Mobile Phone Camera", Proceedings of the 13th Conference of Open Innovations Association FRUCT and 2nd Seminar on e-Tourism for Karelia and Oulu Region, 2013.
- [12] Qeethara Kadhim Al-Shayea, "Artificial Neural Networks in Medical Diagnosis MIS Department", Al-Zaytoonah University of Jordan Amman, Jordan, IJCSI, Vol. 8, pp. 150 – 154, 2 March 2011.
- [13] <http://www.doctorspring.com/> [Date of Access: June 15, 2014].
- [14] <http://silvia4u.info/silvia-for-android/> [Date of Access: October 15, 2014].
- [15] 2015 International Conference on Technologies for Sustainable Development (ICTSD-2015), Feb. 04 – 06, 2015, Mumbai, India (Mobile Based Healthcare Management using Artificial Intelligence)