Medical Diagnosis

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Abstract— The main objective of this project is to implement an Android based Healthcare Information System. This system will help the users to identify certain diseases by answering certain questions asked by the system. Based on the diagnosis received, the user will be getting some suggestion of medicines that are available at the local chemist without prescription with an advice to visit the doctor. The database will be developed with open source software. This application will also provide online help to the patients to get more detail about the already diagnosed disease.

Keywords: Medical Prescription, Differential Diagnosis, Healthcare, Disease Detector, Disease Analyser, Ayurvedic Diagnosis, Allopathic Diagnosis

I. INTRODUCTION

[2] This disease diagnosis system is an expert system which is used for simplifying the task of doctors. It is a system that checks a patient at initial level and suggests the possible diseases. It starts with asking about symptoms to the patient, if the system is able to name the disease then it provides the name and the corresponding medical prescription, If the system is not sure enough, then it redirects the patient to provide more symptoms of the disease. On the basis of available cumulative information, the system will display the name and the medical prescription of the disease. This system not only simplifies task of the doctors but also helps the patients by providing initial medicines for small diseases in emergency.

It reminds the possible diseases to the doctor on the basis of symptoms (to overcome human errors like diligence, versatility and tiredness). It can assist a doctor and also help the patient to conduct a diagnosis in order to identify the disease. On finding the disease, a user would be provided with three options.[1] Allopathic Medicines,[5] Ayurvedic Medicines or [3] Nearby Hospitals. Hence in last option it gives user a provision to know about medical centres in neighbourhood in case the user is new to the place/town. It is a complete health care management system.

II. MATERIAL AND METHODOLOGY

As this is an Android based application, we used different set of tools. In front-end, for coding and framework we used, Eclipse J2EE, SDK-11, ADK and compatible emulator to check the real-time running of the application just as on android device. For back-end we used SQLite database to store the symptoms. The symptoms are being taken as binary digits '0' or '1', '1' being the true value. Array is being made with binary bits corresponding to its respective symptoms. For GPS functionality the Google Places library could be used which gives nearby Medical centers or hospitals.

A. Extensibility

This software is extendable in ways that its original developers may not expect. The following principles enhance extensibility like hide data structure, avoid traversing multiple links or methods, avoid case statements on object type and distinguish public and private operations

B. Reusability

Reusability is possible as and when require in this application. We can update it next version. Reusable software reduces design, coding and testing cost by amortizing effort over several designs. Reducing the amount of code also simplifies understanding, which increases the likelihood that the code is correct. We follow up both types of reusability: Sharing of newly written code within a project and reuse of previously written code on new projects.

C. Understandability

A method is understandable if someone other than the creator of the method can understand the code (as well as the creator after a time lapse). We use the method, which small and coherent helps to accomplish this.

D. Cost-Effectiveness

Its cost is under the budget and make within given time period. It is desirable to aim for a system with a minimum cost subject to the condition that it must satisfy the entire requirement.

E. Diseases Covered

The application covers many known diseases. The list of different types of diseases is shown in the tables below.

Pain Type
Peripheral Vascular disease
Osteoarithritis
Ankylosing Spondilytis
Spinal Stenosis
Aplastic Anaemia
Autoimmune Hemolytic Anaemia
B12 Deficiency Anaemia
Ideopathic Thrombocytopenic Perpura Anaemia
Sideroblastic Anemia
Thrombotic Thrombocytopenic Perpura Anaemia
Leg Perthes disease
Slipped Capital Femoral Epiphylis
Osteomyelitis

Table 1: List of Diseases Related to Pain in the Body

The table above gives a list of diseases which can be diagnosed on the basis of pain in different parts of the body

Skin Type
Hypothyroidism
Schmidts Syndrome
Hypercortisolism

Table 2: List of 'Skin Type' of Problems

The table above gives the list of skin problems commonly faced by the people based on the symptom's user give input as.

Respiratory Type
Pneumonia

| Sarcoidosis |
| Hemothorax |
| Chronic Bronchiti |

Table 3: List of all the Probable 'Respiratory Type' of Diseases

The table shows a list of all the probable 'Respiratory type' of diseases used in the database which would actually be reviewed by an expert Medical Practitioner so that the diagnosis is correct and reliable.

| Gastrointestinal Type |
| Peripheral Vascular disease |
| Osteoarithritis |
| Ankylosing Spondilytis |
| Spinal Stenosis |
| Hepititis A |
| Non ST Mycocardial Infarction |
| UTI |
| Constipation |
| IBS |
| Schmidts syndrome |

Table 4: List of all the Probable 'Gastrointestinal Type' of Diseases

The table above lists all the probable 'Gastrointestinal type' of diseases used in the database and this would actually be reviewed by an expert Medical Practitioner

III. PROCEDURE USED

According to the diagrams, it is two tier architecture. We provide a form that shows a list of symptoms. From the listed symptoms, user has to select those that he/she have. On the basis of selected symptoms, an array of symptoms is generated giving '1' for the symptoms b eing input by the user and then the system will generate related disease. If the information for the disease is not enough the system will redirect to give symptoms again.
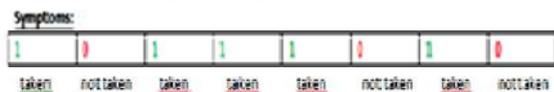

Fig. 1: Array Where Symptoms Input by User Gets '1' and Symptoms by Default Gets its Values as '0'

On the basis of the given series of information a query is generated and the database responses to that query based on the particular set of symptoms given by the user to database.
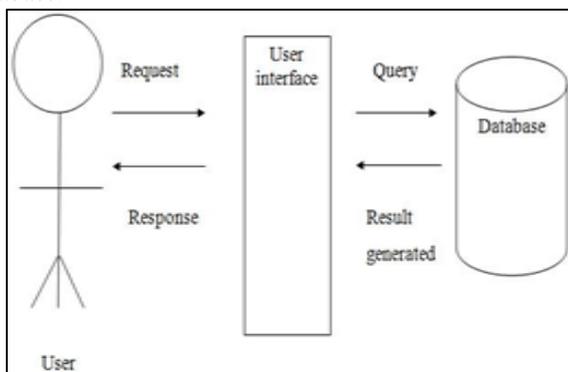

Fig. 2: Request-Response Flow of Control

This shows the request-response flow of control in this application. User inputs the symptoms through UI and DOM (Document Object Model) helps to enter into DB which returns the allopathic/ayurvedic cures of the probable diseases.
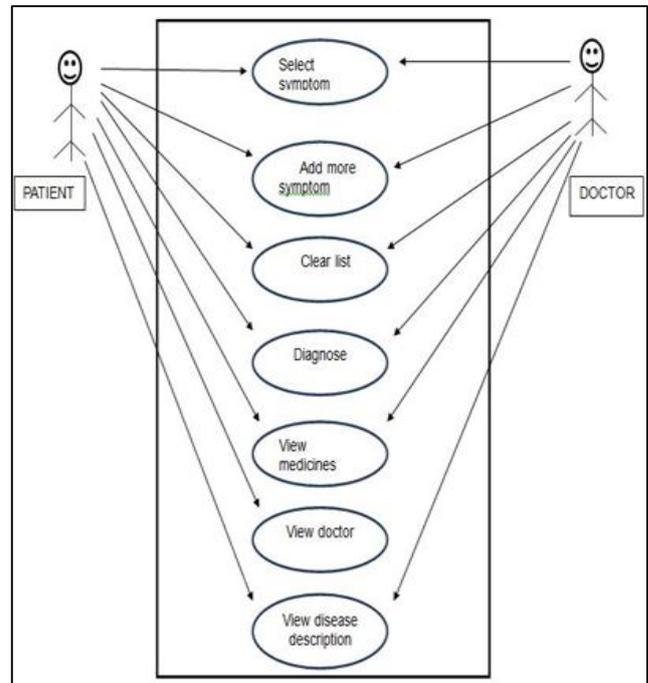

Fig. 3: User Diagram for the Application where User Gets to Input, and Symptoms and Gets to Know the Nearby Doctors/Hospitals

This diagram makes it easier to understand how user friendly and easy this application will be for the users. It will be displayed on single screen and the user can choose the option depending upon the need at that time. So, based on the requirements of the user, selection can be done and all the information can be provided within seconds.
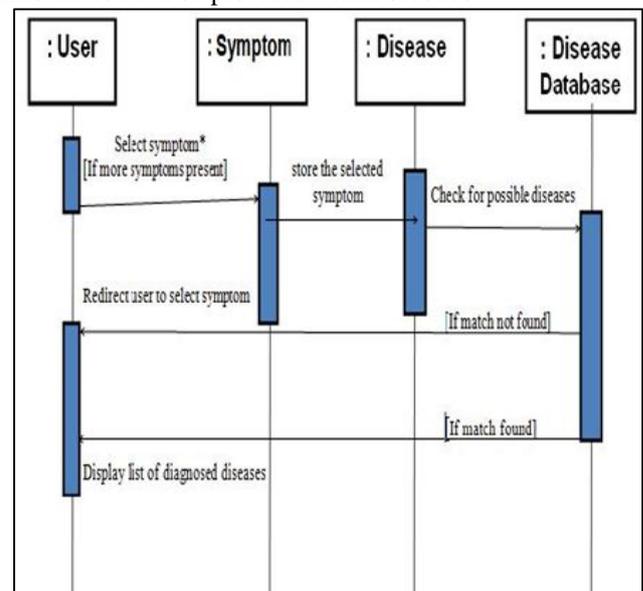

Fig. 4: This Show the MVC Architecture of the Application Flow of Control and its Different Factors i. e., Symptoms, Disease and Disease Database from which Query Fetches the Probable Disease and its Medicines
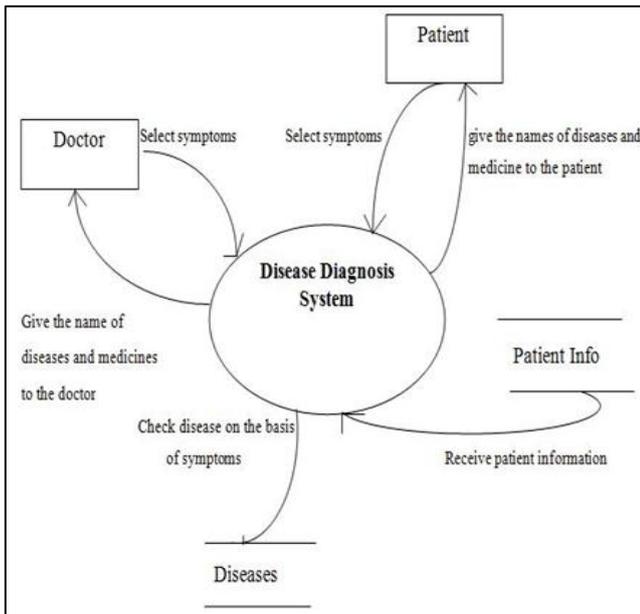
Fig. 5: Diagram Showing the Flow of Application's Functionality from the State when Patient Gives His/Her Symptoms and Takes Back the List of Probable Diseases. Allopathic/Ayurvedic Medicines Can Also be Viewed for the Corresponding Disease

IV. CONCLUSIONS

Thus, we conclude that our Disease Diagnosis System provides solutions for the day to day needs and requirement in this fast moving and busy world. It provides storage and retrieval facilities (In context with diseases and medicines). This system promises very less or no paper work and also provides users the comfort of home. In this system every information stored and retrieved electronically that makes it effective and provides easy retrieval of disease information without searching here and there. The patient can take use of DDS sitting at home on their smartphones and find medicines at the very same level.

Online DDS is very useful for the patients as well as doctors because both are able to receive and provide information about diseases and medicines from a single place on a smartphone.

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