



Semantic Search Engine for Health Information

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Abstract:

“Prevention is better than cure” is one of the famous proverbs. Taking precautionary measures before getting suffered from dreadful diseases is very important. The medicines are required when you do not follow this famous saying. To solve any disease that may be ranging from common cold to the most dreadful disease like cancer medicines are very much necessary. This application is a web view android application which enables user to get information about symptoms of a disease, medicine recommended for curing the disease and list of medical shops where user can get those medicines near to his/her location. It is a client server application, hence same servlet can be used to serve request from multiple clients.

Key Words: Bootstrap, GPS, API, PHP

1. INTRODUCTION

In today's world, technology has touched every aspect of life but it is sad to hear that millions of people die every year not because of lack of medical facilities but because of lack of knowledge about the available medical facilities. The right to good health is of paramount importance. India has the most inequitable healthcare scenario feasible. On one hand, our country is becoming the hub for medical tourism where people from other countries flock to get good quality medical treatment. On the other hand, most of these facilities seem to be unavailable to the natives. The reason is the poor financial condition of the people. Many government policies and NGOs help such people but knowing about them is still a challenge for the people. One of the ways to make this search easy is by a search system. A search system is a software system that is designed to search information on world wide web. The project aims at providing a search system which can be used to make searches related to medical fields including detailed information about the diseases, medicines with their respective costs and list of medical shops where those medicines are available. People can make use of this search engine to get the medical information either by searching with disease name or with the symptoms in order to know the appropriate disease and medicines to cure that disease. Also the user get two more benefits by this application i.e he/she can follow some health tips to prevent such diseases and also they can follow the natural remedies instead of medicines to cure their diseases which are provided in this application. It is a kind of client server approach where user has to query the search engine, the query will be collected and analyzed, and the engine provides the information to the user. The information related to the query can be retrieved by the user.

2. RELATED WORK

There is an app called as Personal Health Companion- the Medical Service Finder which was designed to provide medical services available to the users nearest location. When user register into the application he can get services such as hospitals, medical centers, ambulance, blood bank and emergency services. By using this application one can search for the specialist doctors and get emergency service by calling police or ambulance. But the disadvantage of this application is that it will not provide

medical information like symptoms, medicines. Generally, new system brings new technology into an organization. The proposed system requires technology and equipment, which is android mobile. Moreover, the maintenance system has a lot of scope being expanded and developed to generate even more better suggestions of places to user. The present technology assures technical guaranty of accuracy, reliability and ease of access. In this proposed system the person need not go to the hospital for getting his problems solved if it is minor. He can get his problems solved by searching solution for his problem which will be provided by this application. In this proposed system we provide solution to existing system by extending its facilities as follows:

- User can search either by disease name or symptoms to get the information related to it.
- The user can get information about symptoms of the disease he searches for and also the medicines to cure that disease.
- User can also get to know that where the medicines will be available near by his location.
- Can suggest a solution for solving the problems in a better way.
- Also the medicine name will be displayed with their respective costs.
- User can also get the extra benefits such as home remedies and general diet.

3. TECHNOLOGY USED

A. JAVASCRIPT

JavaScript is the programming language of HTML and the Web. JavaScript is one of the three core technologies of the world wide web. JavaScript enables interactive web pages and thus is an essential part of web applications.

B. GPS

The **Global Positioning System (GPS)** is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on

or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver. The GPS consists of three parts: the space segment, the control segment, and the user segment. The U.S. Air Force develops, maintains, and operates the space and control segments. GPS satellites broadcast signals from space, which each GPS receiver uses to calculate its three-dimensional location (latitude, longitude, and altitude) plus the current time. The space segment is composed of 24 to 32 satellites in medium Earth orbit and also includes the boosters required to launch them into orbit. The control segment is composed of a master control station, an alternate master control station, and a host of dedicated and shared ground antennas and monitor stations. The user segment is composed of hundreds of thousands of U.S. and allied military users of the secure GPS Precise Positioning Service, and tens of millions of civil, commercial, and scientific users of the Standard Positioning Service (see GPS navigation devices).

C. BOOTSTRAP

A **Bootstrap** is a free and open-source front-end library for designing websites and web applications. It contains HTML and CSS based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. Unlike many web frameworks, it concerns itself with front-end development only.

D. JSON

Json or **JavaScript Object Notation** is an open-standard file format that uses human-readable text to transmit data objects consisting of attribute-value pairs and array data types. It is a very common data format used for asynchronous browser-server communication, including as a replacement for XML in some AJAX style systems. JSON is a language-independent data format. It was derived from JavaScript.

E. JQUERY

jQuery is a fast, small, cross-platform and feature-rich JavaScript library. It is designed to simplify the client-side scripting of HTML. It makes things like HTML document traversal and manipulation, animation, event handling, and AJAX very simple with an easy-to-use API that works on a lot of different type of browsers. The main purpose of jQuery is to provide an easy way to use JavaScript on your website to make it more interactive and attractive. It is also used to add animation.

F. CakePHP

CakePHP is a free, open-source, rapid development framework for PHP. It's a foundational structure for programmers to create web applications.

➤ MVC framework

Model-view-controller is commonly used for developing software that divides an application into three interconnected parts. The **model** is the central component of the pattern. It expresses the application's behavior in terms of the problem domain, logic and rules of the application. A **view** can be any output representation of information, such as a chart or a diagram. Multiple views of the same information are possible. The third part or section, the **controller**, accepts input and converts it to commands for the model or view.

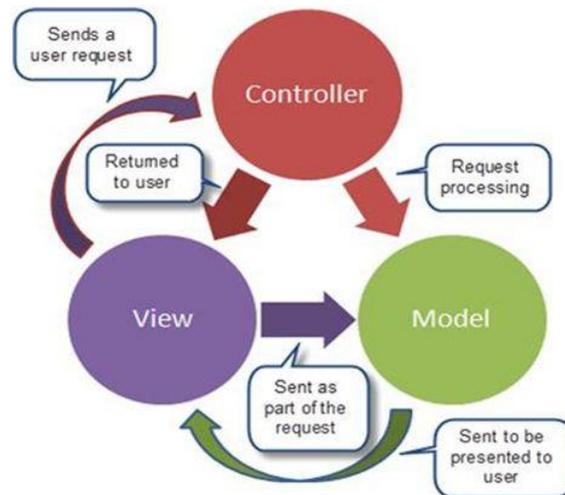


Figure.1. MVC Architecture

G. AJAX

Ajax is a set of web development techniques using many web technologies on the client side to create asynchronous web applications. Ajax is not a single technology, but rather a group of technologies. HTML and CSS can be used in combination to mark up and style information.

4. IMPLEMENTATION

A. SYSTEM DESIGN

The system will be consisting of different things like a database, a server, some web services related to that server, a user interface through which the user can interact with the application. Different modules will be providing different functionalities.

Admin: An authorized person having access to the entire system can manage the chemists and add the diseases, symptoms and update it as and when required. Whenever the chemist registers it's the responsibility of admin to verify and validate his details and give him the access.

Chemist: The Chemist will primarily use the GUI for registering his shop by providing the necessary data. The chemist can login to the applications using his access credentials and update the medicine stocks if it's available in his shop.

User: The user can search either by disease name or symptoms to view the recommended medicines and list of medical shops where those medicines will be available near by his location.

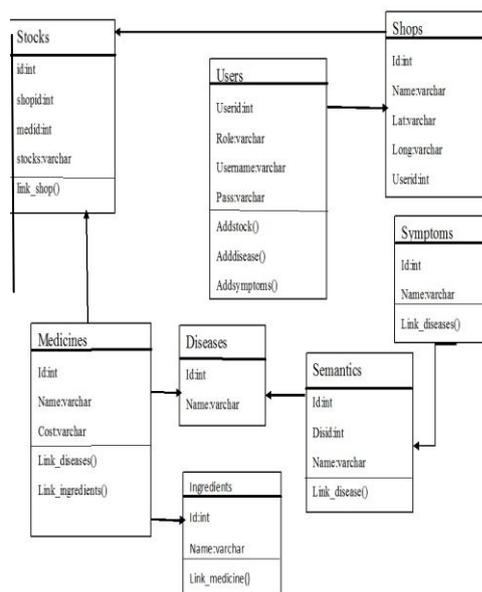


Figure.2. UML Diagram

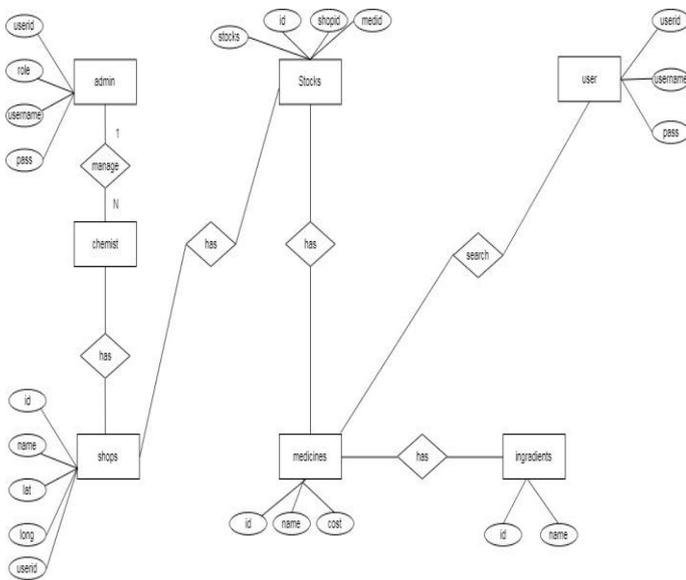


Figure.3. E-R Diagram

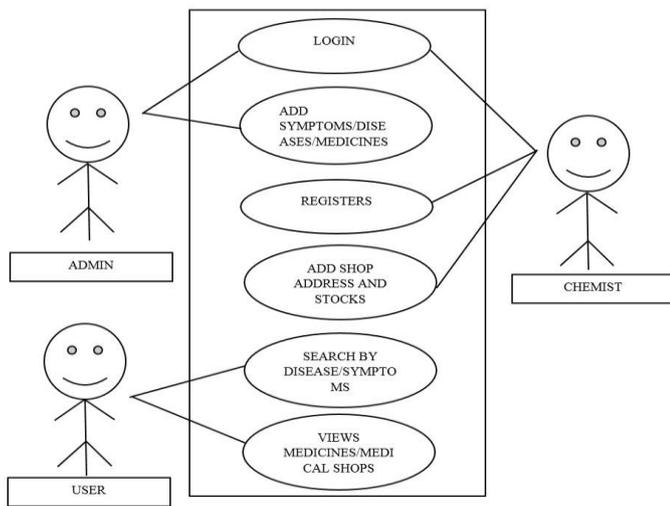


Figure.4. Use case Diagram

Software and Hardware Interfaces:

The application can run on mobile devices having operating systems Android 4.0 and above. It can smoothly function on the devices with RAM capacity of 256MB and above. The app can perform on 2G, 3G, 4G or WI-FI network connections. The processor of the mobile devices should be of 600MHz and above. The GPS of the system must be enabled.

Communication Interfaces:

A Wi-Fi network is used to create our own communication protocol. Software will also support BASE64 encryption logic while sending data to server. Server will support HTTP protocol for web based access.

B. PROPOSED APPLICATION

1) Registration of the chemist: The chemist will be provided with registration page to register his shop by adding appropriate details to get access to the application. The chemist has to enter his shop name, contact number and location. His registration details will be stored in database. Admin will verify the chemist registration and he can Enable or Disable it. If the admin enables the chemist the chemist will have access to the application and he can add stocks and he can view the list of stocks. If the admin disable the chemist then the chemist will not have an access to the application.



Figure.5. Chemist Registration

2) **Processing the query:** When the user searches either by disease name or symptoms the perfect match will be found from the database by linking the disease with the appropriate symptoms, and that will be linked with medicines and medicines will be linked with the medical shops. All these information will be stored in the database. Server fetches these information from the database and displays it to the user. User can retrieve this information.

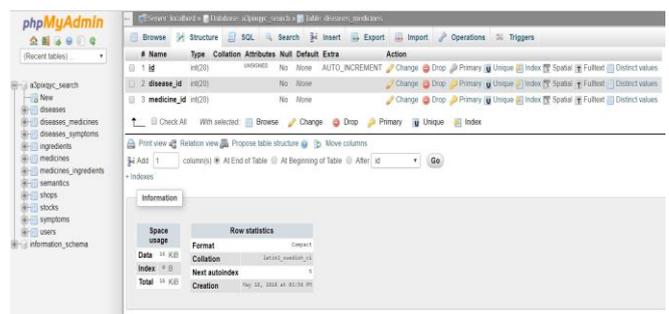
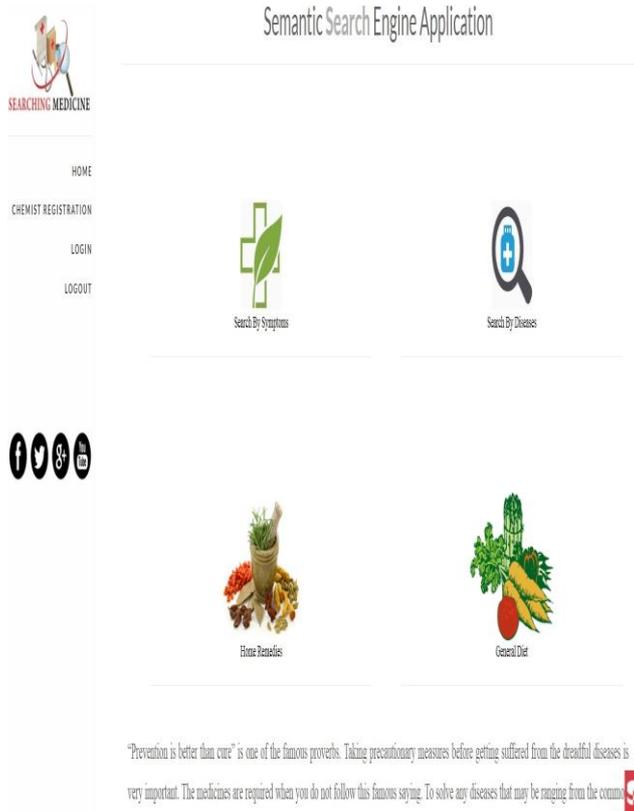


Figure.6. Processing the query

The home page can be viewed as:

- (a) **Search by symptoms:** The user can search by symptoms to get the related information such as disease name, medicines and list of medical shops.
- (b) **Search by disease:** The user can search by disease name to get the related information such as symptoms, medicines and list of medical shops.
- (c) **Home Remedies:** User can get some of the home remedies which can be followed to get cure from the disease.
- (d) **General Diet:** User can follow some general diets to prevent the disease. They also helps to maintain the health and hygiene properly.



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Figure.7. Home Page

5. ADVANTAGES

- It acts as a dual analyzer which provides both symptoms and disease name.
- Saves valuable time of user(No need to visit Hospitals).
- It provides high quality medical information.
- This application can be used in both the ways, as web view or as an android view.

6. CONCLUSION

Along with the advancement in the field of medical science, increase in rate of diseases and health issues cannot go unnoticed. We know that the knowledge and identification of various diseases has never been quite common and easy for everyone. The basic problem that any individual faces is to realize the symptoms regarding the disease he is suffering from and the solutions to cure that disease. The proposed application provides the possible symptoms, recommends medicines to cure that disease and the list of medical shops where user can get those medicines near to his location.

7. ACKNOWLEDGEMENT

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