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Medicine Information Retrieval Application- PharmaGuide

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Abstract - *Most of the time people don't know the purpose and side effects of the medicines. So it is necessary to know their use. In this project we introduce an Android based application for the people. This application will tell their user the use and side effects of medicine. This android application will also allow users to purchase medicines. The Internet and online websites have completely changed our way of shopping completely. As we know that almost everything is going to be online. The web has been a source of medical data; it has just been utilized for online shopping medical products. Now, medicines are also available online. It can be ordered by mobile application. 'Pharma Guide' will help you retrieve information about the use, name and side effects of medicines. You can order medicines which will be delivered at your doorstep. This application is built using Android Studio as platform and SQL as database. A magnificent feature of our application is information retrieval just by scanning medicines which is done by Image to text conversion wherein a text in an image is converted into digital text, and hence information about the text i.e medicine is retrieved. Using this technique, users can take a picture of medicines and retrieve information such as name, use and side effects of a particular medicine.*

Key Words Medicine, android application, information retrieval, scan medicines, medicine delivery

1. INTRODUCTION

Patients may include businessmen, social workers, politicians, teachers, students, etc. Things get really busy for such people. They tend to suffer from lots of diseases or illnesses, so they should take good care of their health. At home family members remind us to take medicines. But when they are out of the city family members would find it difficult to remind them by calling.

For this purpose, there should be some kind of facility for the patients which reminds them to take their medicine on time.

Nowadays everyone uses a smartphone/mobile phone. Variety of applications are available. Mobile phone companies are providing such wonderful applications for their users. Why not use these applications? Using apps like PharmaGuide which is a medicine information retrieval app will help you take medicines after gaining knowledge.

This doesn't mean that any medicine can be sold without prescription to anyone out there. Doing so, can be dangerous. Hence, restrictions should be there on some medicines which cannot be sold in a certain amount without a prescription. Such measures could be taken.

Shopping for medicines and other medical products online is a good deal because it saves time and money. Also, it is difficult to find all medicines at one place. So, we go from one medical to another which wastes lots of time, money, etc. It is environmentally friendly as well.

PharmaGuide will help you know about different medicines by just clicking the picture of medicine having its name. This will save time and effort and is a great use of technology.

2. LITERATURE REVIEW

A. Mobile based campus information retrieval android application [1]:

In general, the information is given to the students in the form of notices, manuals, etc. But, today using cell phone technology for faster and easier communication among the students is feasible. This android application was developed to provide campus information like library books, placement activities present and other notices, to the students. The idea was that the campus information will be accessed inside as well as outside the campus through internet connected devices. The maintenance of application will be easier in later future because of the use of MVC. The information is provided in a cost -effective manner. Different procedures for evaluating the performance of information retrieval systems include precision, recall, fallout,

B. Temple Information Retrieval System using Quick Response Code via Mobile Application [2]:

Purpose was to develop an android application using Quick Response Code (QR code) technology. It was used as main data storage.

Temples can be located within the districts of Dusit and PhraNakorn of the Bangkok Metropolitan Area. The application developer did detailed data collection to ensure that the users can get complete information. Tourists could use smart devices to scan the QR code using an android app to retrieve the information of history and details of temple inquiries. The results of this application could change from one language to another language like Thai to English.

For system analysis and design, diagrams like Use case, Class Diagram were also created. The GUI interface was created by including push buttons and menu lists. Clicking on such buttons will take you to different pages of information or can make you enter or exit the application. This app can create a positive impression on tourists and can enhance tourism.

C. An Android based blood bank information retrieval system [3]:

Records of blood bank used to be manual for years now which is a very slow form of information retrieval and which calls for a lot of human errors. So, using digital means for this will be a great solution. There has been a boom of smartphones with a lot of features and the process of computation is also faster, blood bank search activity is easy to be integrated on the mobile phones for easy search of available blood from blood banks in nearby surroundings in case of any emergency.

D. GeneStoryTeller- A mobile app for quick and comprehensive information retrieval of human genes [4]:

It is an android mobile application where users can retrieve information of any human gene, derived from different available databases. Information of gene drugs interactions, functional annotation and much more for every gene is also given. It gives the latest information of genes in a form of a story which is summarized. Information gets updated from time to time in which the latest data is gathered from gene annotation database.

This android application works offline with no connection to the internet required as long as new updates are available. Titanium Studio was used to develop the entire App and the main code was written in java script, while CSS was used for the graphical design. A great challenge while developing the App was the creation of a robust synchronization mechanism which will help in the continuous curation of the database.

3. RESEARCH METHODOLOGY

A. Data Gathering: Before getting started with this project, we gathered data of different kinds of medicines from millions of them available all around the world. We needed to collect information like name, use and side effects of medicines to construct a database for our application. A study of documents and papers related to our project was done like:

i. Temple IRS used for Quick Response Code using Mobile Application- The project's aim is for the tourists to use smart devices and scanning the QR Code through the android application that process different information of the requested temple.

ii. Mobile based campus information retrieval- The information can be directly communicated through the android devices and is made available for the students, teachers directly for their android devices.

B. Tools preparation:

i. Google Vision API in OCR: This allows developers to create machine learning based applications on OCR without any knowledge associated with machine learning. The Google Vision API enables detection and extraction of text from the images.

ii. Android SDK Manager: It is used for writing the code and also for developing the User Interface.

iii. SQLite Database: It is used for collecting the data for future retrieval and it gets stored in the database.

iv. Camera on Smartphones: Used to click the picture of medicines for image to text conversion.

C. System analysis and design:

The implementation can be divided into Android, MySQL and PHP for communication. Android consists of an inbuilt support for MySQL Database on the device for the storage of the data. For the purpose of storing user registration information, a parse server is used which can be later used for authentication of users and to notify them.

Model View Controller is used for the development purpose. The model class in android is used for representing all the java classes. which means that it supports all the classes in an application. View is used for representing all the actions in an application which has layouts determined using XML. Controller specifies all the services, API's and interfaces which are running in the backend.

The push notification technology is used as "Logic" to obtain the data from the "Database"and serve using "View" for all the operations in an application. The user has to register by giving some details. Those information are stored in the database. Once it is successful, the user can login to his personal account where he can view information about all the medicines in the all medicines section. Users can scan a particular medicine to get direct information about that particular medicine using MedLens. He can also add medicines to cart as per his choice of medicine and quantity for delivery. He can visit his profile as well.

D. Application design and developing:

The mobile application is developed using Android. It is a user friendly mobile OS which depends on Linux Kernel developed by Google. The aim is to successfully accomplish a real world product which improves the end user's mobile experience. We can write and code using java which uses the java libraries which are developed by Google. It is a platform independent language as it runs on any OS and is also specified as robust and portable in nature.

Back End:

PHP(Hypertext Preprocessor) is used to communicate between android and database. It is a server side scripting language used mostly for the development of the web. PHP is implemented on almost all web servers and on any operating systems and platforms. It is dynamic and interacting. It can encrypt data.

Database:

MySQL is an open source relational database management system. It is also free. There are various advantages of MySQL like:

Open Source and Cost Effective

Portability

Seamless Connectivity

Rapid Development and Continuous Updates

MySQL server databases are extremely secure

OCR:

OCR(Optical Character Recognition) is the process of recognizing from images, characters or symbols that belongs to a specific alphabet.

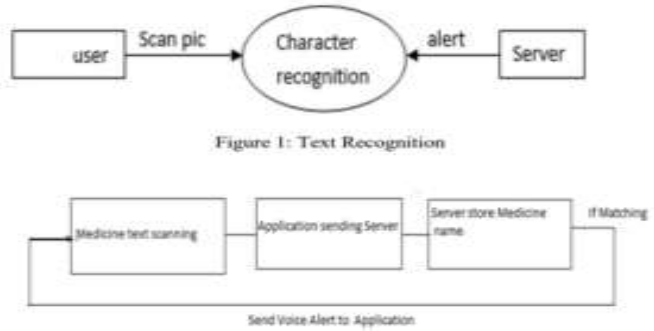

Figure 1: Text Recognition

Fig -1: Text Recognition

4. PROJECT IMPLEMENTATION

Android Studio and Java:

The application is developed in Android, is a mobile OS based on Linux Kernel. The user interface is user friendly and popularly used in touch screen mobiles such as smartphones. The aim of the project is to develop a real world product successfully, improving the mobile experience for the users. Android studio let the developers write the code in java where java libraries are used. It is a platform independent language as it runs on any available Operating System. It was used to build this android application. It makes the life of the person writing the code easier as it contains many libraries and tools.

OCR for Medicine Identification:

Conversion of scanned images to text takes place. Those converted texts are in word format being able to print or save as a word file. Market consists of a variety of OCR apps. Type of bills, warranty cards, important documents or hard copy books can be converted. Hence, OCR technology is a simple way for conversions. Work can be done quite easily and instantly. It also reduces the workload.

Google Vision API in OCR:

In Google Vision API, Developers are allowed to create vision based machine learning applications based on OCR without having any knowledge in machine learning.

The Google Cloud Vision API takes very complex machine learning models having image recognition and formats it in a simple REST API interface. It includes a large selection of tools to extract data on your images with a single API request. It uses a model which is trained on a large dataset of images, which is similar to the models used for Google Photos, so there is no need to develop and train your own custom model.

Text from images can be detected using Vision API. Features Of OCR:

- TEXT DETECTION: Detection and extraction of text from the images is done. For Example, a photograph containing street signs or a traffic sign. The entire extracted text can be included in JSON and individual alphabets and words.

- DOCUMENT TEXT DETECTION: Extracts text from an image for dense text and documents. It is not for a few letters or words. The JSON includes page, block, paragraph, word, and break information.

Hence, Google Vision API was used to convert the text from the images of medicines(name of medicines) to actual text, when clicked will give the information about the particular medicine like name, use and side effects.

5. RESULTS AND DISCUSSIONS

The android application has been trained efficiently with a certain type of writing. The application will retrieve information immediately about the medicines whose font it can detect and which are available in the database. As soon as the name is scanned it gives you information about the name, side effects, usage and price. You can also add those medicines to cart and order them to get those medicines delivered at your doorstep. If the medicine that is scanned is not in the trained list the application shows a message of medicine not found. You can train the system for other font styles as well and can add more medicines as well.

6. CONCLUSIONS

This application particularly gives the user all the information required about the medicines viz medicine's name, use, side-effects and the price. A user can create his own account or just login if he already has one. There is an option to view all the medicines but to make this easier and faster users can directly search for information about any medicines they want by taking a picture of the medicine. After taking the picture, the name which is in the image will be extracted to actual text which will give details about the medicines after you click on it. The benefits of this application is that it makes it easier for users to get all the appropriate details about the medicines. There is also an option of adding them to the cart. The life of patients regularly taking medicines will also become easy.

7. FUTURE SCOPE

Though our application provides users with all the medicine details and allows him/her to order . Medicines of any quantity, there may be a possibility that users might misuse this feature and order medicines in such a quantity that will harm his/her health. So to avoid such possibilities, we can add a security feature by restricting such orders by blacklisting those medicines or by asking for prescriptions of doctors and by verifying it by sending OTP to the respective doctor.

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