GENERIC MEDICINE RECOMMENDER SYSTEM

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Abstract-- With the growth of pharmaceutical industries cheaper medicines are now available in the market called Generic Drugs. Generic medicines are those which contain the same active ingredient in the same quantity as that of a brand-name medicine. Generic medicines therefore have the same effect on the body in terms of curing disease as the brand-name medicines.
But doctors normally prescribe the branded medicines so we should have a system from where we could get the names of the generic medicines.
This paper demonstrates a generic Medicine Recommender System for Doctors/patients which basically maps and recommends Generic Medicines having the same constituents as that of branded medicine prescribed by the doctor. Along with this it also builds awareness about Side effects, Dosage and cost of the medicines.

Keywords: Generics, Collaborative Filtering, Scraping.

INTRODUCTION

With the growth of pharmaceutical industries cheaper medicines are now available in the market called Generic drugs. But these medicines are not prescribed by the doctors though they have the same effect as that of the brand medicines. So, patients spend more money on the brand medicines. The proposed project is relevant as it has a socio-economic impact on the society as it recommends the name of the generic medicines having the same constituents as that of the brand medicines.

The proposed solution helps Doctors/patients by basically mapping and recommending Generic Medicines having the same constituents as that of branded medicine prescribed by the doctor. Along with this it also builds awareness about Side effects, Dosage and cost of the medicines.

Drawbacks of Existing Systems:

1.1mg
1mg is an android application which has a list of generic medicines. But this system
does not have any recommender system. The System only lists the names of the generic medicines.

2. Jan Aushadi
Jan Aushadi is a website which is recently hosted by the National Informatics center and is maintained by the pharmaceutical department. This the first website which is hosted after the initiative taken by the prime minister. As this website is hosted recently it has limited data and it does not has a recommender system.

LITERATURE REVIEW

This paper [1] shows that Recommendation algorithms are best known for their use on e-commerce Websites, where they use input about a customer's interests to generate a list of recommended items. Many applications use only the items that customers purchase and explicitly rate to represent their interests, but they can also use other attributes, including items viewed, demographic data, subject interests, and favorite artists. In this paper, recommendation algorithms are shown to personalize the online system for each customer. The system radically changes based on customer interests, showing programming titles to a software engineer.

Another system [2] proposed in this paper focuses on Text detection in images or videos is an important step to achieve multimedia content retrieval. In this paper, an efficient algorithm which can automatically detect, localize and extract horizontally aligned text in images (and digital videos) with complex backgrounds is presented. The proposed approach is based on the application of a color reduction technique, a method for edge detection, and the localization of text regions using projection profile analyzes and geometrical properties. The output of the algorithm are text boxes with a simplified background, ready to be fed into an OCR engine for subsequent character recognition. Our proposal is robust with respect to different font sizes, font colors, languages and background complexities. The performance of the approach is demonstrated by presenting promising experimental results for a set of images taken from different types of video sequences.

[3] A robust algorithm that detects text from natural scene images and extracts them regardless of the orientation is proposed. All existing methods are designed to operate under a certain constraint, like detecting text only in one direction. Maximally Stable Extremal Regions (MSER) detector is chosen to extract binary regions since it has proven to be robust to lighting conditions. An enhancement technique for MSER images is designed to obtain clear letter boundaries. Images are then fed into a Stroke Width Detector and several heuristics are applied to remove non-text pixels. Afterwards, detected text regions are fed into an Optical Character Recognition module and then filtered according to their confidence measure. The recognition of

characters is not part of the algorithm and the results are only about the detection of text. Our algorithm proved to be effective on blurred images and noisy images as well, based on both subjective and objective evaluations.

This system is a little slower than other systems because a lot of object detectors are working on a single image. The performance can increase by allowing more than one object detectors to run in parallel. [3]

ABOUT SYSTEM

The System is an online generic medicine recommender which basically recommends generic medicines having the same constituents as that of brand medicines. Scanning of medicine wrapper can be done to search the name of the medicine.

The information about external modules used for creating the application are as follows:

A. JSoup

JSoup is a java API which is used for web scraping. Initially dataset of the system was not readily available so database is created by web scraping. The JSoup query is executed in NetBeans IDE.

B. Google Cloud Vision API

Google Cloud Vision API is used for scanning the image and extracting text from it.

C. Collaborative Filtering

Collaborative Filtering is a machine learning technology which is used in recommendation system. It is used to recommend the generic medicines by considering the reviews of doctors.

D. Cloud Computing

To host the website, we need to use some platform from where we get our data. As Web and Android both applications are created a single platform is needed for that. Cloud Computing is the best methodology for that purpose.

IMPLEMENTATION METHODOLOGY

The application mainly uses Android along with many supported libraries. The camera on an Android smartphone will be used to capture an image of the medicine wrapper which will be stored in Android's memory. This image will be processed by using libraries like and Google Cloud Vision API. Google Cloud Vision API uses Google Cloud. The Image is Scanned and text is extracted. The process gets completed and the text is searched in the dataset and recommendation of generic medicines are provided. Another way is to manually search the brand name of the medicine and the generic names of medicines are recommended.

MOTIVATION

On **17th April 2017**, Prime Minister of India, **Shri Narendra Modi** hints at rules for doctors to prescribe Generic Medicines. As generic medicines have the same constituents as that of brand medicine, as generic medicines are cheaper than the brand-medicine. But the name of the generics is not known to patients. To help patients and general public a recommender system is needed. Hence objective is to build an Online Generic Medicine Recommender system.

Design of Proposed System

● Block Diagram

A **block diagram** is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. Block diagrams are typically used for higher level, less detailed descriptions that are intended to clarify overall concepts without concern for the details of implementation. The above diagram consists of 5 blocks -login, registered user, data sets, recommender system, scanning, and forum. Scanning scans the medicine and gives the details of medicine and gives generic name of the medicine. The recommender system gives the detail of medicine like dosage, illness, constituents, cost, etc.
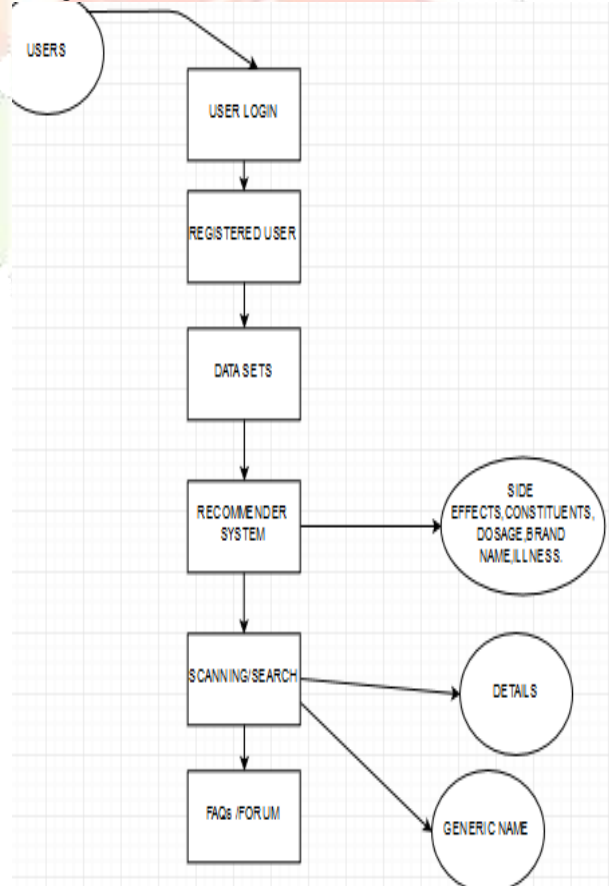

● Modular Diagram:

Modular design, or "modularity in design", is a design approach that subdivides a system into smaller parts called modules or skids, that can be independently created and then used in different systems. A modular system can be characterized by functional partitioning into discrete scalable, reusable modules; rigorous use of well-defined modular interfaces; and making use of industry standards for interfaces.

In this system, we have 6 main modules:

a) GUI
b) Database
c) FAQs
d) Forum
e) Scanning
f) Datasets
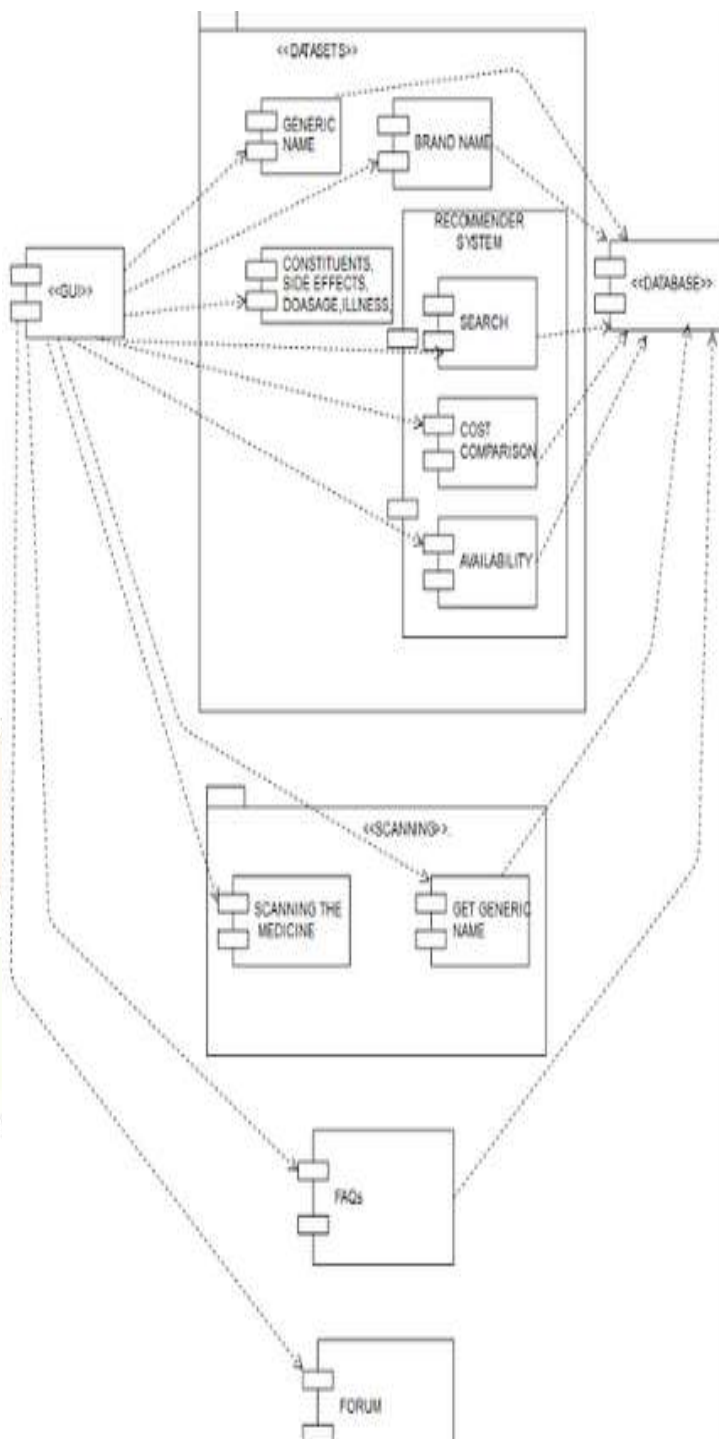
CONCLUSION

We started with the motivation and the idea to solve the problems of patients who wants to take generic medicines. We found many methods to implement the recommendation system but found Collaborative filtering and Cloud Vision API as the best one. Our project is developed on Android and since it is developed by Google, there would be almost no compatibility issues. Also, it helped a lot reviewing literatures from the internet and has helped understand our system, clearer.

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