

# HOMEDOC- Revolutionising Pharmaceutical Applications through Newer API and Improved User Interface

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**Abstract** - "Given the increasing vacancy and accessibility of smartphones containing mobile applications, there is a gigantic potential to transform how the medical health care system is overseen through the development of mobile phones containing high-performance applications for more competitive medical arrangements.

*This can be proved useful for both patients and medical institutions.*

*However, a large population of people still suppresses their health issue as consultation or diagnosis fee of the doctor becomes a barrier for them.*

*Sometimes for minor health issues such as a headache, stomachache many people take medicines and painkillers without having sufficient or any knowledge regarding the dosage.*

*The Framework of our application is based on providing help to that part of the population who doesn't have the proper knowledge about the dosage and salts of medicines whose consumption is later on proven severely bad for their health.*

*By keenly observing these issues on a regular basis led to the creation of "HOMEDOC", a standard framework for the development of medical conditions."*

**Key Words:** OCR, FDA, Pharmaceuticals, Android, Despeckle

## 1. INTRODUCTION

Medical care is rapidly being transformed by the introduction of new information technology and computer science approaches. New and exciting opportunities exist for improvements for both patients in terms of health and satisfaction, and healthcare systems in terms of effective patient management.

Additionally, there is an increasing availability of the mobile devices nowadays, this includes people of all ages and socioeconomic statuses who are almost always carrying or within range of at least one mobile devices. This increases the chance of usage of medical applications and provides a pocket doctor which can always provide you the best option for your health issue.

HOMEDOC works as an user friendly application where users can easily communicate with the interface and get the solution to their respective health issue. HomeDoc basically serves those people who have very little or no knowledge about the advantages, disadvantages and dosage of the drugs which they take for issues such as a headache or muscle pain. HOMEDOC uses scanning options as well as you can type the name of the drug for which you need the information or else you can scan the credentials of the medicine in the OCR scanner and HOMEDOC will provide you the advantages, disadvantages and dosage information of that particular drug.

In this demonstration, we present our experience in the development of the mobile applications, which aim at helping the population who have no knowledge in the field of medical science and can get good authentic information regarding the drug they are consuming or are going to consume.

## 2. OBJECTIVE

Based on the various working aspects of our Mobile Application, we can list out a number of objectives. Understanding the objectives of the Application at hand will give the users a better understanding and knowledge of the purpose of the Application. Thus it will reduce any sense of doubt or discrepancies that may arise in the average user's mind. The main object of our mobile application, HomeDoc, is to liberate the user from problems arising due to lack of pharmaceutical knowledge. However, we must see some of the key objectives of the application as listed below.

### 2.1 To act as an In-hand thesaurus for the user

In this Application we use the concept of a thesaurus. As we know that a thesaurus is basically a list of words grouped together according to their similarity in meaning. Thus a person can choose from a variety of words whichever he/she finds the most suitable.

Similarly, in the case of the pharmaceutical thesaurus that HomeDoc employs, the user is free to choose from a number of options available to him/her through the dynamic as well as authentic database that this application uses. This would also act as a boon in cases where a medicine of some

particular name may not be available to the user. In such cases the user can provide himself/herself with some alternative drugs of the same composition of salts and chemicals. Thus one of the major objectives of HomeDoc is to group similar medicines so that the user can choose the best alternative.

### 2.2 To save time and cost

Another important objective of HomeDoc is to save time and cost of the user. This application aims at saving time by providing a convenient and resourceful manner in which the user can acquire knowledge and details about a particular medicine. This is accomplished by providing all the details regarding the medicine on the users' screen on the touch of a finger. In this way, HomeDoc also cuts out on a considerable amount of cost as the user does not need to acquire so much of an expert's help or opinion which rarely comes free of cost.

### 2.3 To simplify judgement

This application does a great deal in simplifying or rather sorting out discrepancies that may arise in judgement. Here we refer to the judgement of medicine and their intensities. A particular medicine may have a similar recovery procedure as another medicine.

However, there may exist some differences in intensities between them. HomeDoc, by providing a detailed info, makes the judgement of the user simpler and more accurate so that the user knows exactly what he/she is consuming thus also reducing health hazards by reducing the chances of over dosage and accidental poisoning.

### 2.4 To provide assistance to the ordinary user

HomeDoc provides a hands-free and user-friendly interface for users with minimal technical knowledge. Every user is unique with a different understanding of technology.

This application, in order to reach the masses, has employed a user interface that can be understood by the naïve user with a not-so-good understanding of technology. In order to make usage simpler the application employs easy-to-use tools such as OCR. The user can also search for a drug by the click of a button without having to do complex tasks as seen in some common applications nowadays.

## 3. EXISTING SYSTEMS

One's health has now become a matter of higher importance. People are getting more and more conscious. They want to be fit and healthy and thus for doing so they are spending their money in various aspects. Not only the youngsters but even working aged and old people are concerned about their health. As the second largest populated country in the world India's healthcare spending remains low at 1.2% of the GDP. Presently India has just 0.7 doctors and 1.1 beds for every 1000 of its citizens and due to this people don't receive proper medical care.

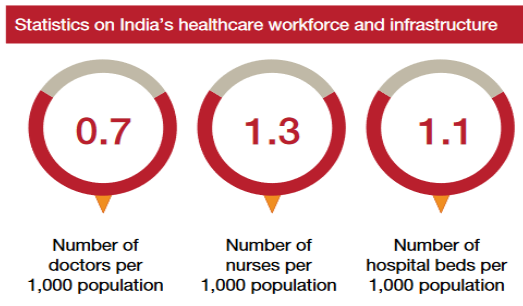


Chart 1: India's Healthcare Statistics

In today's world, where the impact of smart devices in our day to day life is increasing rapidly, common citizen can arrange their medical consultations, facilities and health services through the use of modern information and communication technologies to meet the needs of patients and healthcare providers (ehealth) and the practice of medicine and public health supported by mobile devices (mhealth).

### 3.1 Pertinence of mHealth

India is even lacking in providing primary medical facilities to its population and to fulfill this medical need mHealth is the best, affordable and trending method. India stands among the top five countries search for terms like 'mobile health apps', 'health apps', 'medical apps' and 'mHealth'.

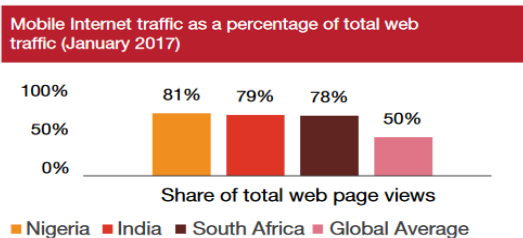


Chart 2: Mobile Internet Traffic

This shows the high interest of Indian population in mHealth. In India, Healthcare market is expected to grow from \$100 billion dollars in 2016 to \$280 billion dollars 2020 creating an ocean full of opportunities for Healthcare companies and startups.

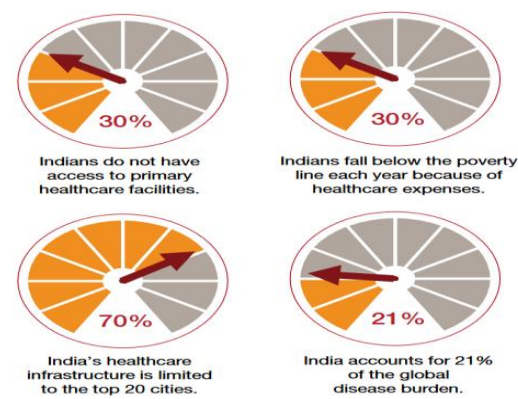


Chart 3: Healthcare Access In India

### 3.2 Popular medical Apps (in India)

With the rising demand of quality and affordable healthcare facilities and fast growing usage of smartphones in all over India, several medical apps have been launched. Some of the popular apps are:

- **Pharmeasy** – It is a healthcare technology application which provides delivery platform, which helps patients connect with local pharmacy store and diagnostics centers in order to fulfill their extensive medical needs.
- **Netmeds** – It is a fully licensed pharmacy online market place that offers authenticated prescriptions and over-the-counter medicine besides health products.
- **1mg** - It's an online medical store which can be access for all health needs. Other than providing medicines it also books appointments with the nearby doctors and provides plenty of options in terms of medical substitutes.
- **MedPlus** -It sales prescriptions and OTC medicines, FMCG products, vitamins, optical and nutrition supplements. It also offers clinical laboratory services and physician consultation services only in few parts of India.

### 3.3 Disadvantages of existing Apps

- Many of the existing systems are not overtly accessible like PharEasy, MedLife and other online medical dictionaries.
- These systems are very specific do not provide multiple features such as OCR scanning, home delivery and some other versatile features.
- These systems have a very high error rate as they derive their info from un-authentic sites and databases. According to Food and Drug Administration (FDA), only 160 apps are approved out of 150,000 approx.
- Several customers have complained about the delivery of wrong medicines or lack of availability of medicines.
- Many of these apps have security issues with the users data.
- According to Avancha (2012), hospitals have strong regulations like the Health Insurance Portability Accountability Act (HIPAA) which is not strictly followed by several medical apps due to which there's a risk of exposure of medical data of the patient.

### 4. PROPOSED SYSTEM

What in an OCR?

OCR (optical character recognition) is the recognition of printed or written texts by a computer. This involves photo scanning of the text per-character, analysis of the scanned-in image, then translation of the character image into character codes like ASCII, commonly used in data processing.

HomeDoc uses an OCR (optical character recognition) scanner to read the process the information of the medicine in hand. This procedure is carried out by placing the strip of the medicine in front of the device's camera and enabling the OCR reader feature on the app. The OCR reader in question uses the technique of feature extraction. In feature extraction, it decomposes characters into certain features like lines, closed loops, line directions and intersections. In order to recognize text efficiently, the software must pre-process the image using techniques given below:

- **De-skew** – Tilting the image few degrees in order to make the lines of text perfectly horizontal or vertical for accuracy.
- **Despeckle** – Removing spots and further smoothing of the edges of the characters
- **Character isolation** – Split touching characters that may have fed into each other
- **Layout analysis** – Identifying text positions, columns and the paragraphs.
- **Line removal** – Removing overlapping lines or boxes.

Once the OCR reader is enabled, it processes the image i.e. the name of the medicine printed on the strip/bottle, the expiry date and the contents of the medicine. It displays all information necessary right from the medicine name, its contents and the recommendations for consumption along with the dosage power, recovery period phase, the price in regular market and the medical category the drug in question falls under. Additionally it also gives the alternatives and comparisons for medicines by giving other brands manufacturing the drug with similar properties and categories.

The algorithms of our apps are designed in a manner that the results returned are specific and accurate enough for the easy understanding of the user. The detailed results provided ease the need of visiting the pharmacist for treatment procedures limited to consumption of medicines. HomeDoc focuses on the requirement of bridging the gap between technology at hand and making it accessible to the public which is not aware to high standards tech-wise through the use of simple technique of OCR reader.

Apart from the Reader, the app provides an option of simply searching the medicine through the search bar returning similar results with sufficient accuracy from our app's database.

#### 4.1 Advantages

- The use of OCR reader easing the work of the user by facilitating the self searching feature from the OCR and displaying the results.
- Using the database of medicines and providing multiple options (comparisons) to the user and if they suit the particular illness the user requires the medicines for.
- Working as an in hand thesaurus for the users by making detailed information available for whichever drug the user searches for.

#### 5. CONCLUSIONS

In this paper, we have introduced our mobile application and explained all the objectives as well as the existing and proposed systems. We have also explained the advantages and disadvantages of the proposed and existing systems respectively.

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