Real-Time Medical Help Application: By the People, For the People

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ABSTRACT - Digital technologies are being harnessed to support the public-health response to COVID-19 worldwide, including population surveillance, case identification, contact tracing, and evaluation of interventions based on mobility data and communication with the public. These rapid responses leverage billions of mobile phones, large online datasets, connected devices, relatively low-cost computing resources, and advances in machine learning and natural language processing. The future of public health is likely to become increasingly digital, and we review the need for the alignment of international strategies for the regulation, evaluation, and use of digital technologies to strengthen pandemic management, and future preparedness for COVID-19 and other infectious diseases.

Key Words: Medical Help, Mobile App, Software Development Life Cycle, Waterfall Model, JavaScript, HTML5, PHP, MySQL, Mobile Angular UI, Optimization, Deployment, Applications

I. INTRODUCTION

The COVID-19 forced social distancing and lockdown policies are driving a steady rise in mobile usage. In Q3 of 2020 alone, 33 billion new apps were downloaded globally, according to a recent report. Mobile users worldwide have spent 180 billion collective hours each month of the third quarter, with a whopping spend of $28 billion on technology apps. Undoubtedly, the pandemic would have a lasting impact on mobile app development trends and technologies going forward, just like how it transformed consumer mobile behavior.

The objective of this research is to get full knowledge of the project i.e., "Real – Time Medical Help Application: By the people, for the people". The objective of project is to get up-to-date information of COVID-19 along with the information of areas with high/medium/low epidemiological burden, and deployment in non-mobile platforms. To map the hospitals and check the availability of doctors and medical facilities. Also check the availability of medicines in different medical stores on the basis of area and pin code, booking of online appointments and also free information regarding first aid.

Basic objectives are:
- Provision of up-to-date information on COVID-19.
- Information on areas with high/medium/low epidemiological burden, and deployment in non-mobile platforms.
- To map the hospitals and check the availability of doctors and medical facilities.
- To check the availability of medicines in different medical stores on the basis of area and pin code.
- Booking of online appointments and also free information regarding first aid.

II. WORKFLOW

Following steps have been followed while developing this application understanding the current situation in medical facilities provided to the public and trying to help them by forming a database with the needful data and providing to the one in needs through this application we have come up with. Here are the steps followed in development:

Phase 1: Planning and Requirement Analysis

Phase 2: Defining Requirements
Phase 3: Designing the Product Architecture
Phase 4: Building or Developing the Product
Phase 5: Testing the Product
Phase 6: Deployment in the Market
Phase 7: Maintenance

We have divided our workflow in seven key modules for the above phases to be covered for an effective app development process to make mobile app development initiative for medical help a success and it will serve its objectives. The Modules are:
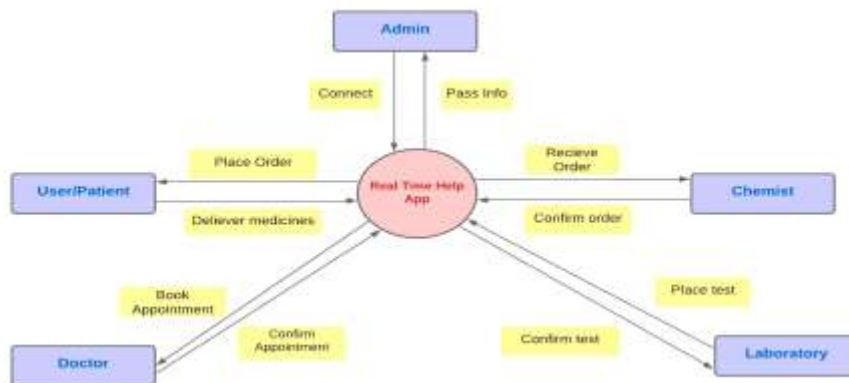
Module 1: Strategy: Designing and Framework
Module 2: Analysis and Planning: Website Designing
Module 3: UI/UX Design: Tabs and Features selection and implementation
Module 4: App Development: Optimization for Mobile Version
Module 5: Testing, Rework or Debugging
Module 6: Deployment and Support
Module 7: Documentation

Fig – 1: Finalized Module Workflow

III. PROPOSED METHODOLOGY

Software Development Life Cycle (SDLC) – Iterative Waterfall Model is used to develop the project. Waterfall Model is a combination of the Iterative and Incremental models of the Software Development Life Cycle. Delivering your system in a big bang release, delivering it in the incremental process over time is the action done in this model. Some initial requirements and architecture envisioning need to be done. The Waterfall Model divides the development cycle into smaller, incremental waterfall models in which users are able to get access to the product at the end of each cycle.
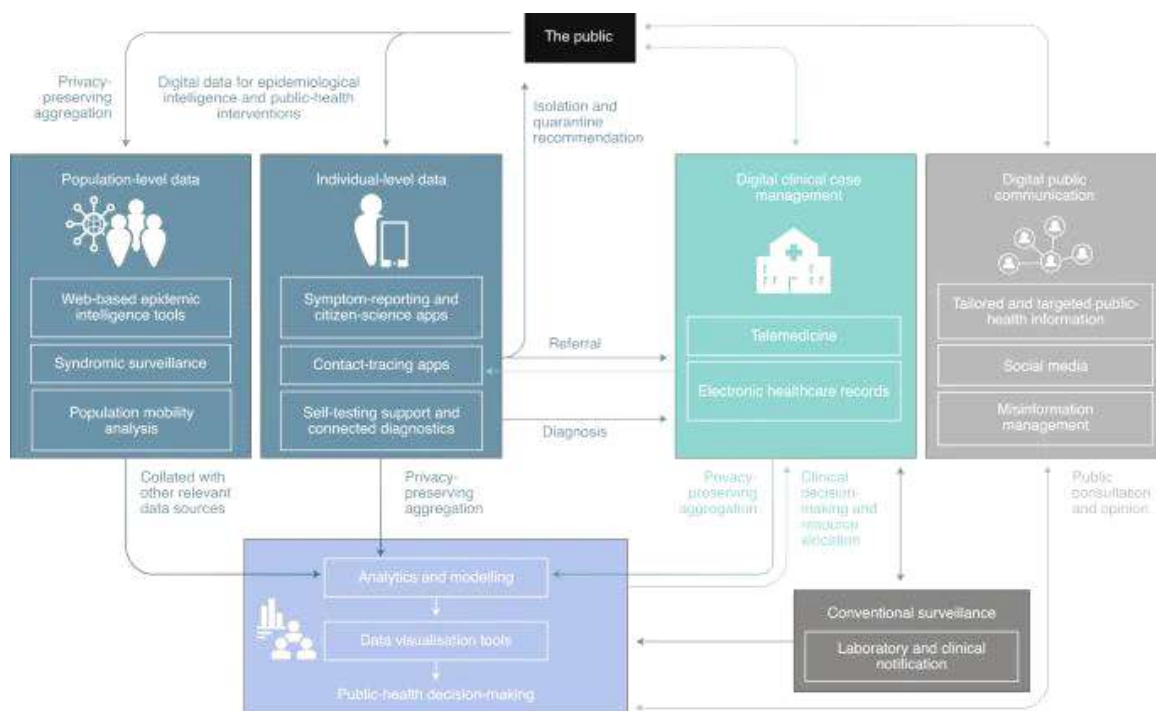
Fig – 2: Overall Proposed System Architecture

IV. TOOLS AND TECHNOLOGY USED (DEVLOPMENT SETUP)

Tools and technology used for the development of this mobile application is one of the most important aspects. **Following are the tools used by us:**

JavaScript: The JavaScript framework provides plenty of continuous influence on mobile app development. The benefits of using JavaScript for Mobile App Development have been started to direct the world as nothing is closer to individuals than smartphones.

HTML5: HTML5 helps us deliver the right functionality and exceptional user experience. The "write-once-run-anywhere" advantage offered by HTML5 accelerates our time to market, improves our app's visibility, makes development affordable, and supports offline browsing.

PHP: PHP frameworks such as Laravel, Lumen, CodeIgniter, and Symfony are being used extensively for building mobile apps that require complex backend and exhaustive data migration like that in ours. Large-scale app projects have preferred this open-source language a lot as it simplifies caching, authentication, and even routing.

MySQL: An open-source, multi-threaded, and easy-to-use SQL database. MYSQL is been used here as a database at the webserver and PHP is used to fetch data from the database.

Mobile Angular UI: It makes use of AngularJS and Bootstrap; it was easy for us to learn the framework and get started. Mobile Angular UI allowed us to build HTML5 hybrid mobile and desktop apps with less effort.

Requirements for Development of this application was:
Hardware Platform:
Processor- Core i3 or Higher
RAM- 4 GB or Above
GPU- 2 GB or Above
Hard Disk- 500 MB or Above
Software Platform: Visual Studio Code, XAMPP Server
Operating System: Windows 8 or Above

Requirements for Using this application on Client/Doctor/Hospital/Chemist side is:
Hardware Platform:
RAM- 2 GB or Above
Hard Disk- 500 MB or Above
Operating System: Windows 8 or Above & Android 8 or Above

Development Stages of Application and its Features:
Stage 1: The requirement specifications from the first phase are studied in this stage and the system design are conducted. This application provides a registration and login for both doctors and patients. The E-Pharmacy is easy to use and order. The customer selects the required medicines and orders

them by a single click. Before it, the customer needs to create a login account and fill all the details like name, address, phone no…etc. Doctors can register by giving his necessary details. After successful registration, the doctor can log in by giving username and password.

Stage 2: The application also provides login portal for pharmacist and lab assistants. The user can search for the nearest medical shop and order medicine online. Through this application people to consult the Lab officials using Android phone. They can chat with them and get all the details about them through this application.

Stage 3: Analysis of existing system is also carried out in this phase and the limitations of the existing system are analyzed and improved upon. Some new features are also introduced during this stage like Lab Test. Users can connect with respected officials using this application.

Stage 4: This application can be improved in the future by adding the following functionalities: Video calls to discuss the problems with doctors and get online prescriptions. Sharing the medical test reports of patients to doctors through this application.
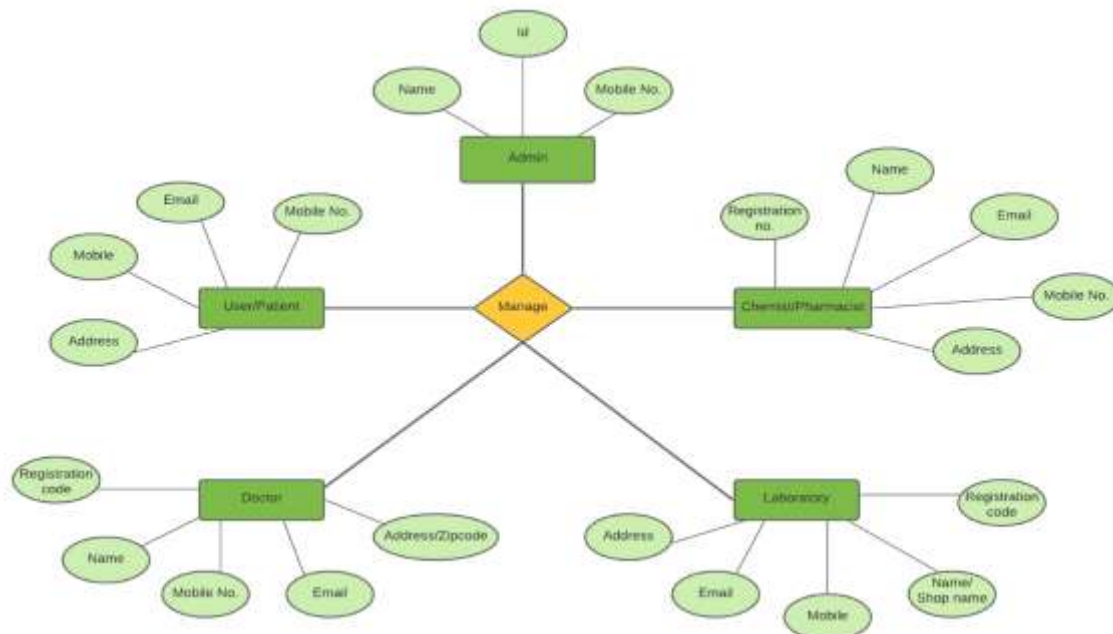

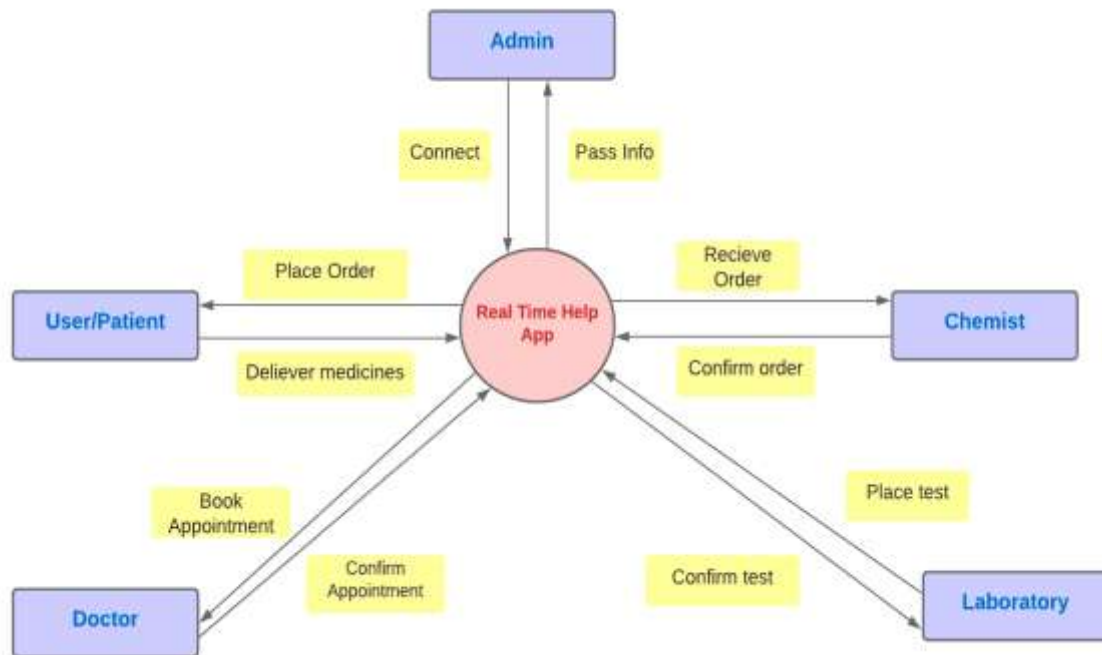**Fig – 3:** DFD Level-0

Fig – 4: ER Diagram

Fig – 5: Data Flow Diagram

V.   EXPERIMENTAL RESULTS AND DISCUSSIONS

Login and sign-up Activity: The application is designed with a simple user interface with the purpose of providing great usability to the users.

After opening the application, the user has to register with the application using his identification information including username, phone number and password shown in figure.
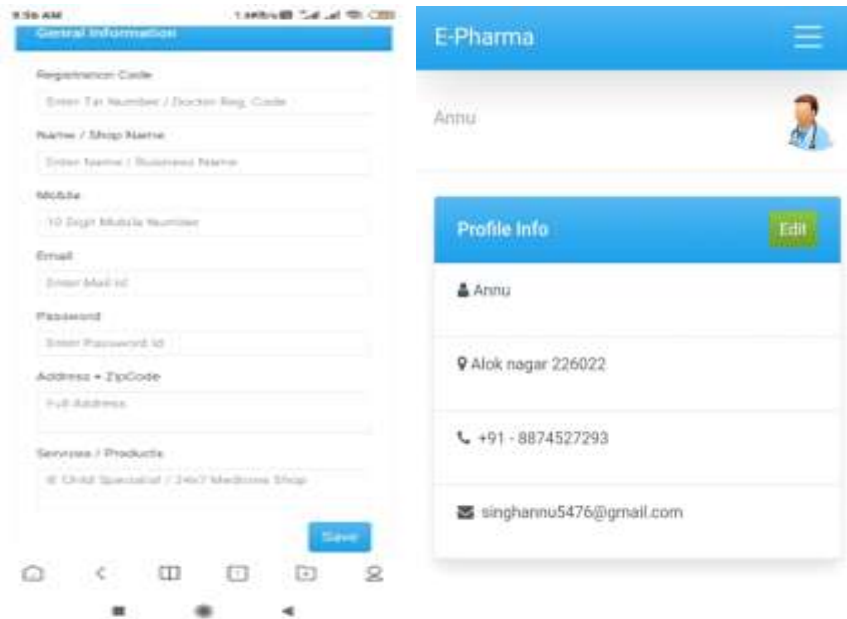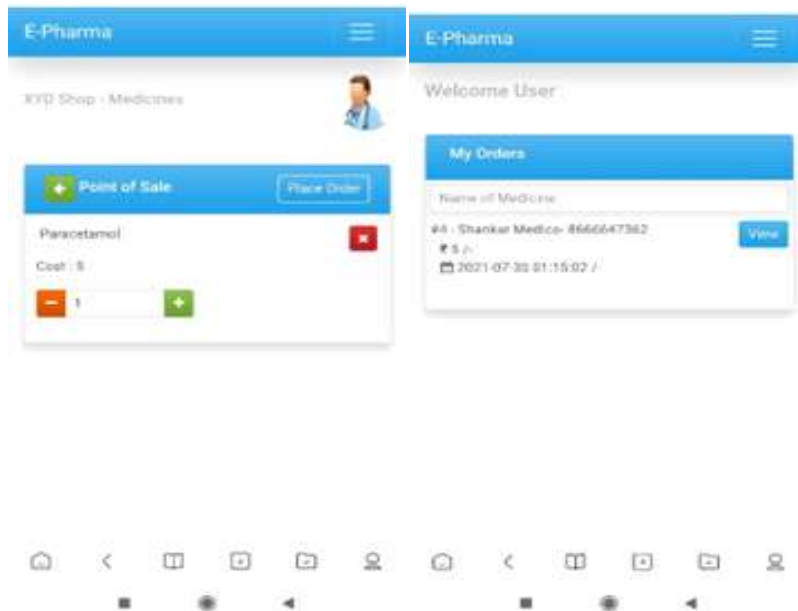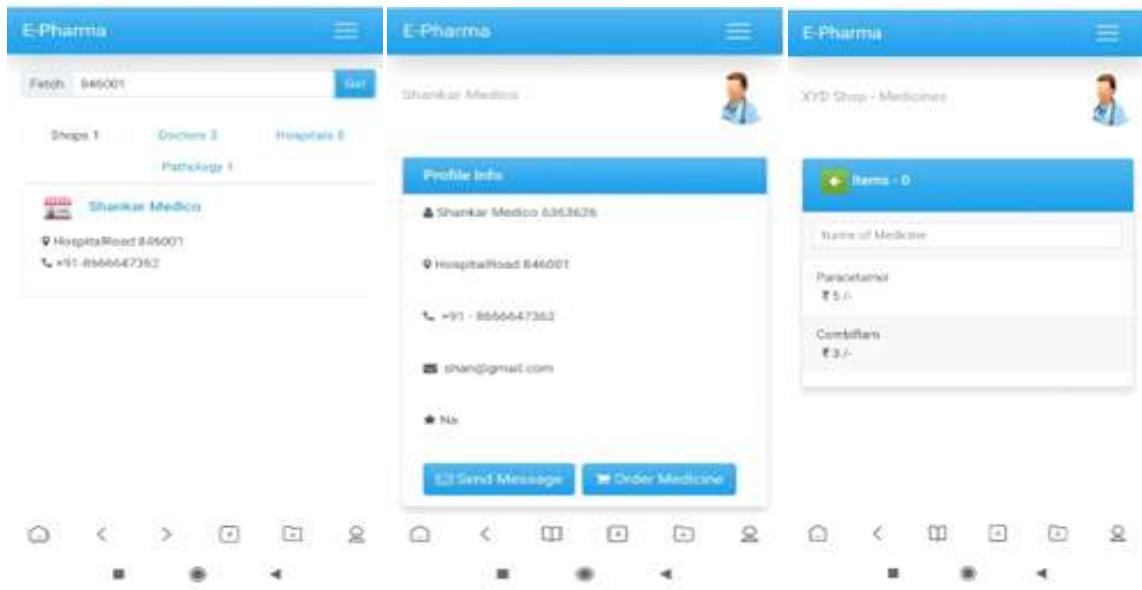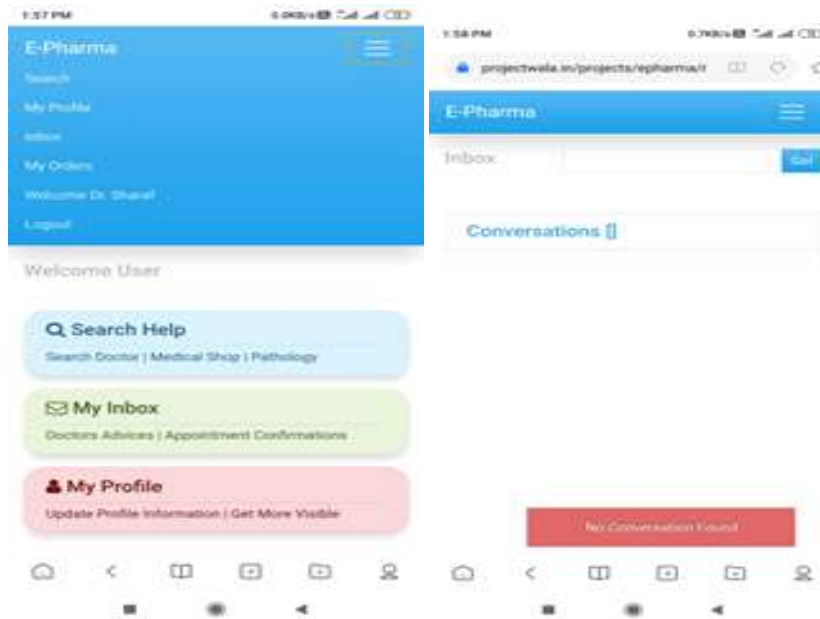
Home Page for User:

Actions Performed by User: User can search for available doctor, medical shop, pathology using name or zip code. One can start conversation with any of these and get their problems solved. Booking of appointments, ordering medicine can be done by the user.
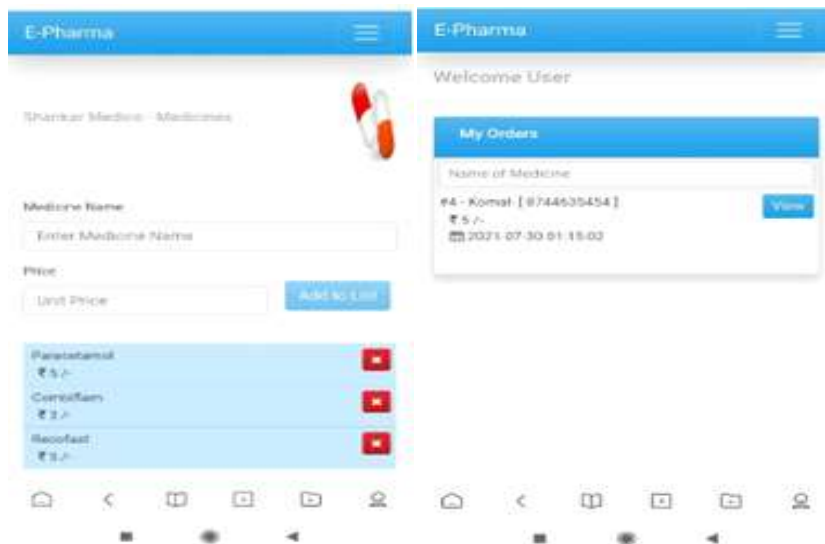
Actions of Doctor: Doctors can create account and connect to the patients through chat.

Shopkeepers Profile: A chemist can create an account and provide the details of available medicine for which order can be placed and connect to user through chat.
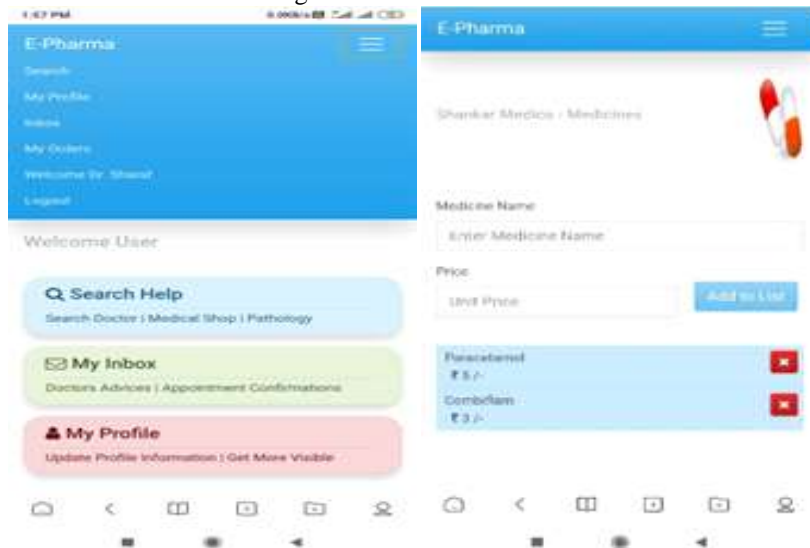
VI. CONCLUSION

Mobile apps are considered to be a valuable tool for citizens, health professionals, and decision makers in facing critical challenges imposed by the pandemic. The integration of digital technology into pandemic policy has been proved beneficial for the pandemic. In the race to contain the spread of a highly transmissible virus, countries that have quickly deployed digital technologies to facilitate planning, surveillance, testing, contact tracing, quarantine, and clinical management have remained front-runners in managing disease burden.

As the internet continues to grow in popularity, immense new opportunities arise, when it comes to immediate access to expert advice and information from health professionals. In this matter, online pharmacies are extremely beneficial. Patients who need to seek advice about their symptoms or discuss possible side-effects of treatments, can receive help in a timely and discreet manner. The online doctor and pharmacist can offer professional advice, resolve problems, diagnose and help with new and repeat prescriptions. Patients with long-term illnesses can also benefit from an online pharmaceutical service, as those who require multiple medications can get advice about dosage and timing requirements for their treatment.

Here is a list with five reasons why one can count on us:

- **Efficient delivery and a simple ordering process:** Our website provides quick delivery and a simple ordering procedure, helping to avoid the hassle of a long waiting period.
- **Quick treatment with just one click:** We intend to use technology in the best way, in order to improve the health and wellbeing of the patients. Our health professionals evaluate the condition with a series of questions and they approve a suitable prescription for the patient. Even more, one can benefit from quick access to a pharmacist via phone, e-mail or chat.
- **Expert advice and guidance:** We offer instant access to expert services, professional doctors and pharmacy staff.
- **Completely convenient:** Our website offers some of the very best prices on medicines with a fantastic service. We stock a great range of branded and non-branded products.
- **Discreet services.**

Some people may feel more comfortable purchasing their treatment online, or simply want to discuss with a professional about prescriptions and health online or over the phone, rather than in person.

VII. FUTURE SCOPE

Information and Time Management - One of the HCPs' most frequent uses for mobile devices are information and time management. Popular information management apps, such as Evernote and Notability, enable users to write or dictate notes, record audio, store photographs, and organize material into categories within a searchable electronic database.

Health Record Maintenance and Access - Apps are also available that aid in data collection and retrieval, such as entering information into a patient's EHR or EMR. Hospital information systems often include features that allow HCP management of EHRs and PACSs, permitting secure access to patient information (medical history, vitals, prescriptions, lab results, x-rays, scans, consultations, and discharge notes) either on site or remotely.

Communication and Consulting - Mobile devices have been proven to improve contact between HCPs and their colleagues. In one study, mobile devices were shown to improve communication between doctors and nurses on inpatient wards. In a survey of medical school HCPs and students, more than 80% of respondents described using mobile devices to communicate with colleagues about patient care via e-mail, telephone, and text messages. They described texting as a more efficient means of communication than telephone conversations or in-person meetings. Mobile devices also allow rapid response to an e-mail, allowing users to keep up with communication. Texting or calling colleagues directly on their mobile devices, rather than paging them, has also been shown to save critical time in emergency cases. Mobile devices can also be used by HCPs to aid long-distance patients by allowing them to text or send pictures regarding problems or questions.

Reference and Information Gathering - Mobile devices are invaluable tools for HCPs to use to search or access medical literature, as well as other information sources. The survey of medical school HCPs and students found that mobile devices were often used to access medical journal websites (60%) or medical news online (74%). Several medical journals, such as the New England Journal of Medicine, The Lancet, and BMJ (formerly the British Medical Journal), provide apps that allow articles to be viewed on mobile devices. However, journals rarely provide free access to articles without the purchase of a subscription.

Patient Management - The use of mobile devices to remotely monitor the health or location of patients with chronic diseases or conditions has already become a viable option. Mobile device apps can provide public health surveillance, aid in community data collection, or assist disabled persons with independent living. In one study, a single-lead electrocardiograph (ECG) was connected to a smart phone to diagnose and follow the treatment of patients with sleep apnea, providing a possible alternative to costly and labor-intensive polysomnography. Sensors attached to garments that communicate with mobile devices have also been used to remotely monitor and collect medical data regarding chronically ill elderly patients.

VIII. ACKNOWLEDGEMENT

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