Android application and Django based web application to combat COVID-19 in India

Nilesh Ohol
B.E. Electronics and Telecomm.
Viva Institute of Technology
Virar, India
nileshohol@live.in

Prof. Nutan Malekar
Electronics and Telecomm.
Viva Institute of Technology
Virar, India
nutanmalekar@viva-technology.org

***Abstract*—Amid this COVID-19 pandemic, we expect to have certain services which could be handy and easy to access. Also, as we move along, we observe that the need to improve the Testing Capacity of India is crucial. As of 21st April 2021, India has tested 11,07,43,103 Samples. The figures might amaze you but, It's only about 8% of the total 1,39,08,64,355 Population in India. If each sample is of are considered as testing of an individual. Currently, we are in need of gearing up the testing capacity while also providing services that could facilitate individuals to survive. We have also observed exponential growth in the number of Indians using the Internet in this growing age of technology where India aims to build a Digital India. We require a handy and easy to understand web application and an android application that facilitate such services.**

Keywords—COVID-19, Django, Web Application, Android, Firebase, Testing Centers, Emergency Services.

I. Introduction

Virus Baba is a mobile responsive Web application and also Android applications which facilitates every individual in India with the essential services during this COVID-19 pandemic. In this growing age of technology, India has launched a campaign, "Digital India". With this motivation, "Virus Baba" is also a contribution towards building a Digital India while also improving the infrastructure to facilitate services online.

Both the mobile responsive Web application and Android application facilitates services like Evaluation of Individual health by generating a Susceptibility score and testing of an Individual, Helping Vulnerable Categories, Vocational Online Training, Quarantine Services, Barcode issuing services, Finding Medical stores and Hospitals in a city, Dynamic Visualizations to understand the behaviour of this Virus, Multiple Language support, MSME Products and Services, Volunteering, Weather Report and Links for the Government Services.

II. Ease of Use

A. Mobile responsive web application

Since 1991, Websites have become more popular, easier to access and more sophisticated. The website we will be using is built on top of a framework, "Django". Django is an open-source python based web framework used to develop a high-scale web application. It is quite an easy task to maintain and update. If we ever wish to implement technology like Machine Learning we may implement it without any hassle. Apart from the framework, another backend programming used is JavaScript. Firebase Realtime Database, developed by Google is currently being used for user authentication and data storage. To further evaluate the ease of use we may look at the number of users currently connected to the internet in India. Datareportal published a report called, "Digital 2021: India" on 11th February 2021, Tuesday in which it mentioned that India has 624.0 Million users, which is roughly 48% of the total population. Also, it mentioned, "The number of internet users in India increased by 47 million (+8.2%) between 2020 and 2021"[24]. In such a scenario having a Web application to facilitate essential services could play a critical role.

B. Android Application

As per Statista, India has a whopping 973.89 Million Android users which make up roughly or more than 70% of the total population in India. This report has motivated me to build an Android application that could run on 100% of Android Devices. The Android application is built for minimum Android SDK (Android 4.0 IceCreamSandwich) which should support 100% of the Android devices. Since Android phones in India are fairly priced it becomes an excellent choice for consumers to purchase an Android smartphone. Hence, Android holds 95.77% of the market share in India as per Statcounter, April 2021. We can also infer that most Indians would be notably familiar with the Android OS. document.

III. Objectives

- Enable testing of 1.3 Billion Indian population Possible.
- Provide essential services to individual in this tough times.
- Proper access to testing centres while maintaining social distancing.
- Providing personal Health evaluation, Online training to the youth, Volunteering Services etc to improve oneself in this uncertainty.
- COVID-19 Dashboards to inform users about the situation in states within our country.
- Essential Services include:
    - Helping the Vulnerable Categories.
    - Vocational Online Training.
    - Quarantine Services.
    - Finding Medical stores and Hospitals in a city.
    - Dynamic Visualizations to understand the behaviour of this Virus.
    - Multiple Language support.

- MSME Products and Services.
- Volunteering.
- Weather Report.
- Links for the Government Services.

IV. RESEARCH AND DESIGN METHODOLOGY

Fig. 1. Demographic of Virus Baba

Visualizing the Application with its Layout, font and functionality, Develop Algorithm which will be able to perform the Methodology, Understanding the Programming Language Java, HTML, JavaScript and XML and its Library to be Implemented, Manipulating the functions of the Libraries to Behave in a Desired Way, Running the Application while Overcoming the Errors and Understanding the Reason, add new Features which can make the Application more Happening and Build an APK file, Programming the Frontend, Backend and the Firebase, Deploying the Django Web Application Project to pythonanywhere.com and ready to use the Desired Applications and Web Application.

V. REQUIREMENTS

V.I. Hardware requirements

For Android Application: Any Smart Mobile phone with 300 MB Free memory Space for Efficiency.
For Web Application: Any Device which has an Internet Connection.

V.II. SOFTWARE REQUIREMENTS:

For Android Application: The Mobile should be Android as an Operating System. For Web Application: Any Operating System which has a Browser.

VI. EXPECTED OUTCOMES

To develop a platform where common people could come and interact with the website and android application that could create more awareness among them about COVID19. A platform which is fast, reliable, easy to understand, accessible, safe and scalable to maximize the benefit. A friendly dashboard which is easily interpretable by any user state wise.
Virus Baba is a Mobile responsive web application and Android applications which provides the following Services:

- Evaluation of Individual health by generating a Susceptibility score and testing of an Individual.
- Helping Vulnerable Categories.
- Vocational Online Training.
- Quarantine Services.
- Finding Medical stores and Hospitals in a city.
- Dynamic Visualizations to understand the behaviour of this Virus.
- Multiple Language support.
- MSME Products and Services.
- Volunteering.
- Weather Report.
- Links for the Government Services.

Let me give you a small glance on the UI(User-Interface) of Android Application and Web Application:

Fig. 2. Android User Interface (Welcome Screen and Login Screen).

Fig. 3. Android User Interface (Login Screen in Hindi, Marathi).

Fig. 4 Android User Interface (Login Screen in Kannada).

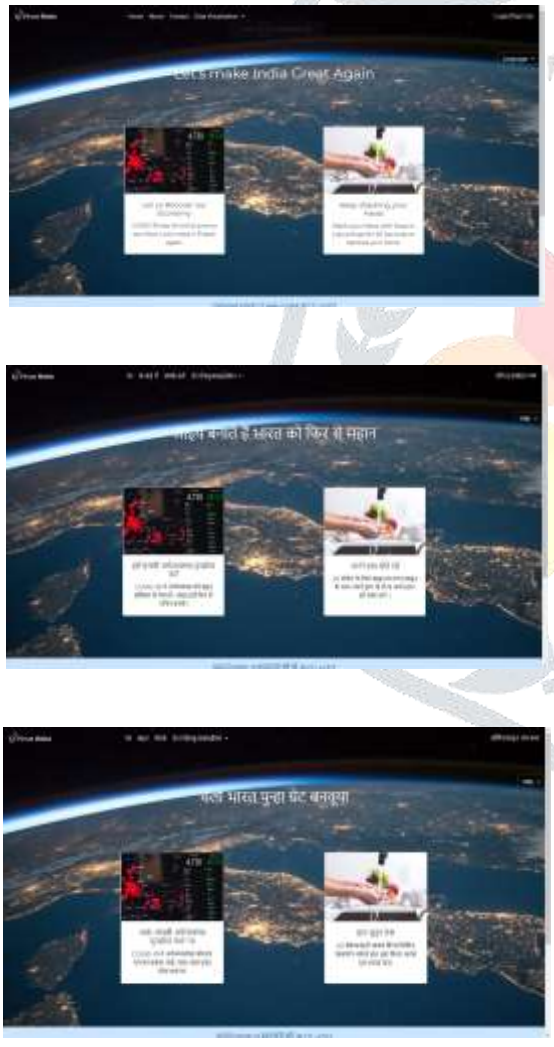

Fig. 5. Web Application User Interface (Welcome Screen in English, Hindi, Marathi).

Fig. 6. Web Application User Interface (Welcome Screen in Kannada).

VII. COMPARISON

Aarogya setu is a mobile application developed under the Health Ministry, as a part of the E-Governance initiative, to track and sensitize the citizens of India in a joint battle against COVID-19 spread. The study aims to understand various useful features of this tool and to present different concepts of data science applied within the application along with its importance in managing the ongoing pandemic. The App uses Bluetooth and GPS technologies to alert a user when they are nearby a COVID-19 infected person. The application uses various Data Science concepts such as Classification, Association Rule Mining, and Clustering to analyze COVID-19 spread in India. The study also shows potential upgradations in the application, which includes usage of Artificial Intelligence and Computer Vision to detect COVID-19 patients.[15] The MyGov is a platform where inclusive planning which includes general public in its formulation. Platform provides different discussion forums on various policy issues.[16] Below Fig.7. shows how Virus Baba Application outperforms the rest of the applications available. Virus Baba has 10 features and 12 features more as compared to Aarogya Setu and MyGov Application.

Fig. 7. Comparison with Aarogya Setu and MyGov Application.

VIII. BENEFITS TO THE SOCIETY

Many news report and researches claim that India has officially entered into the 2nd wave of coronavirus which will likely be catastrophic since more individuals will be infected as the virus has been mutated to spread more which is explained in a news report published by, "Times of India" on 29th March 2021.

Looking at these reports we are now super motivated to make COVID19 testing more happening and more likely to care about the citizen of India in all aspects. Virus Baba

enables us to provide benefit to the society Economically, Mentally, Physically, Education and Socially.
Since we understand that the Pandemic is worse for the vulnerable categories and MSME (Micro, Small and Medium Enterprises) Companies. This application enables us to help these individuals either by donating the vulnerable categories or purchasing goods and services provided by the MSME (Micro, Small and Medium Enterprises). Physically and Mentally by evaluating your health by answering the questionnaires, providing location of medical stores nearby and also providing medical assistance via consulting with doctor through Video Conferencing. Educating the Youth by providing access to free resources to learn as per their requirements. Socially by encouraging others to volunteer by providing services, food or/and Money.

IX. Privacy Policy

The Developer of Virus Baba assures you that any data being generated in the Web Application as well as the Android Application is being stored in the Firebase Cloud Database and Real-Time database. The Server for storing the data is not situated in India. The Developer assures you that any data generated is not being used for any malicious purpose and used solely to make the experience of using the Application more feasible.

Data we Collect:

- Personal Information (Name, Age, Gender, Email Id and Phone Number).
- The Answers to the Questionnaires and its Susceptibility Score.
- Information of the appointment for test of COVID-19 at the Test centre and Quarantine bed.
- Meet the Doctor Messages and Other Information.

X. Future Scope

Currently it has become our utmost responsibility to minimize loss and maximize benefits to the citizen of India as it indirectly or directly improves the state of out country. As the COVID19 cases are on the rise the using an online platform which is understandable by common people promotes social distancing. Services provided by the Application will be accessible and will improve lives physically, mentally and socially. Educating Youth by providing free resources makes them productive and ready to be a part of service. This platform could be taken advantage of at the level of central, state or district which will improve the management of the Data. The service has a QR code enables service while booking an appointment at the test centre which help us keep the information of the user private and can be only be used on a web application signed in by the authorized user.

XI. SCOW Analysis/Limitations

A. Strength:

- Online Application which promotes Social distancing.
- Services provided by the Virus Baba can be used by common people.
- Application can be accessed through all medium.
- Application is currently available in 4 Different Languages.
- Volunteering section make us feel more secured in the uncertainity.

B. Weaknesses:

- Web Application could be used on a small scale currently.
- User is required to have an Internet connection.
- User doesn't have an after service.
- Data is being collected using Firebase.

C. Opportunities:

- Increase in demand for online platforms that could guide the citizen of India.
- Could be used to advertise any product or services.
- Rising demand for a common platform that could resolve issues and misinformation related to COVID19.
- Ed-tech companies could be promoted in the learning services.

D. Challenges:

- Is to make this application more scalable.
- Make its server stronger to handle the traffic.
- Need to include more content that could make this Application more reliable.
- Need to develop this application in more languages spoken in India.

XII. Conclusion

Due to the large population to combat COVID-19, gearing up the testing capacity, vaccination and provide essential services to the vulnerable category will be necessary. India has the second-highest internet users in the world as recognised by, "Internet World Stats". In such a scenario, having a handy Android application and a web application plays a significant role.
The Application also promotes Social Distancing and Personal Hygiene which could also prevent individuals from being infected by COVID-19.
Some of the individuals who wish to make a difference in society by contributing money, food or volunteering are most welcomed. Finding essential services such as COVID-19 testing centres, Hospitals, or Medical stores are just one tap away on one platform. Amid this pandemic, even students these days are suffering. Being away from your University and learning institutions may lead them to become unemployable graduates, which could be catastrophic and damage our economy. The unpaid learning materials are available for all category of academia could be a good initiative. Python and Java are easy to learn programming language. Python provides many services and helps in implementing technologies like Machine Learning and Cyber Security. Django is a developer-friendly framework as it is straightforward to implement.

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