

An Android Application Approach for the Efficient Distribution and Management of Essential Services during the Pandemic Situations like Covid-19

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ABSTRACT

The following work depicts the problems faced in developing countries like India in the Pandemic situations like Covid-19 where the density of population leads to the failure of the overall country's medical resources and the emergency services could not be distributed to the needy people. The proposed work underlines the fact that the Android application for the above problems could be the best solution and thus proposed a specific mobile application for the efficient management and distribution of the available resources during the future pandemic.

Keywords: Covid-19, Android, Efficient management, Future pandemic

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I. INTRODUCTION

The Covid pandemic was unexpected to the human society and created havoc in the society as a whole. As the pandemic was health related, obviously the Health management systems experienced cumbersome load and sometimes the total failure. To encounter this, Mapping of all existing health facilities (city/ district/ block-wise) in the public, not for profit and private sectors needed to be undertaken. But to do this, massive steps must be taken and the medium shall be the digital revolution in terms of smartphones. The proposed work suggests an application that would identify and designate facilities or separate block within existing facilities to provide COVID -19 related services (Fever clinics, COVID Care Centres (CCC) Dedicated COVID Health Centre (DCHC) and Dedicated COVID Hospital (DCH)) as per guidance issued for appropriate management of suspect/confirmed cases of COVID-19 whereas Remaining facilities/ blocks of facilities will continue to

provide essential non COVID-19 services.

When the solution needs to be implemented nationwide, States could also involve not-for profit/private sector in the provision of non COVID essential services, particularly for secondary and tertiary care, where public sector capacity needs to be supplemented. Utilization of not-for profit/private sector facilities would be based on number and spread of COVID 19 positive cases in the area. States could develop a phased engagement with the not for profit and private sector if existing public health facilities are converted into fever clinic/ CCC/ DCHC and there is a shortfall in government health facilities. States already have PMJAY empanelled hospitals. It should be ensured that they function and continue to provide essential medical services. Dedicated first level 24*7 hospital emergency units, may be set up in suitable CHCs/ SDHsto provide non COVID acute care, including provision of emergency obstetric services. This paper focuses on the development and implementation of the

application that would help to resolve the above mentioned facts and problems.

II. LITERATURE REVIEW

In [1] Smith et al. states that for telehealth to be effective as part of an emergency response it first needs to become a routinely used part of our health system. Hence, it is time to step back and ask why telehealth is not mainstreamed. Also the authors highlight key requirements for this to occur. Strategies to ensure that telehealth is used regularly in acute, post-acute and emergency situations, alongside conventional service delivery methods, include flexible funding arrangements, training and accrediting our health work force. Telehealth uptake also requires a significant change in management effort and the redesign of existing models of care. Implementing telehealth proactively rather than reactively is more likely to generate greater benefits in the long term, and help with the everyday (and emergency) challenges in healthcare.

In [2] Kodali et al. explored the experiences and expectations of Arogya Setu app users by conducting a combined content analysis of their reviews. Five hundred and three most relevant reviews were analyzed using the descriptive statistics and thematic analysis. The reviews are primarily posted in the areas of user acceptance (80%), app usefulness (72.8%), and app features (62.2%). The thematic analysis resulted in four themes: user acceptance, app usefulness, promptness of the Indian Government in bringing the app on time, and concerns and cautions raised by the users. These help in strengthening the app features enabling the real-time data capture and analytics and providing timely information to authorities for better decision-making

In [3] Budd et al. made review that aims to capture the breadth of digital innovations for the public-health response to COVID-19 worldwide and their limitations, and barriers to their implementation, including legal, ethical and privacy barriers, as well as organizational and workforce barriers. 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 disease.

In [4] Timmers et al. carried observational study is to assess people's use of an app to support them with COVID-19 education, self-assessment, and monitoring of their own health for a 7-day period. In addition, they aim to assess the usability of this data for health care providers and policy makers by applying it to an interactive map and combining it with hospital data. The secondary outcomes of the study were user's satisfaction with the information provided in the app, perceived usefulness of the app, health care providers they contacted, and the follow-up actions from this contact.

III. METHODOLOGY

In this methodology section, we are going to discuss block diagrams and flow of the proposed working system.

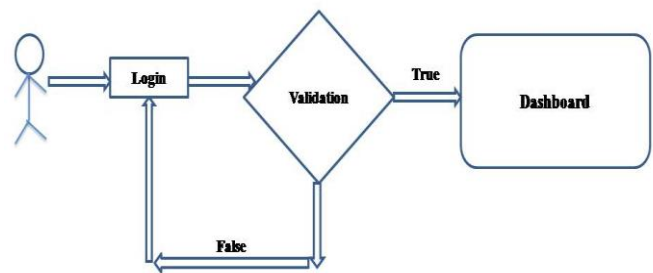


Figure 3.1 Level 0 DFD

In the above diagram, we are showing you basic view of the proposed system. A user will use his credentials to log in to the system. First, credentials will be validated, if they belong to any genuine user or not. Based on validation, he/she will be allowed to access the system functionality.

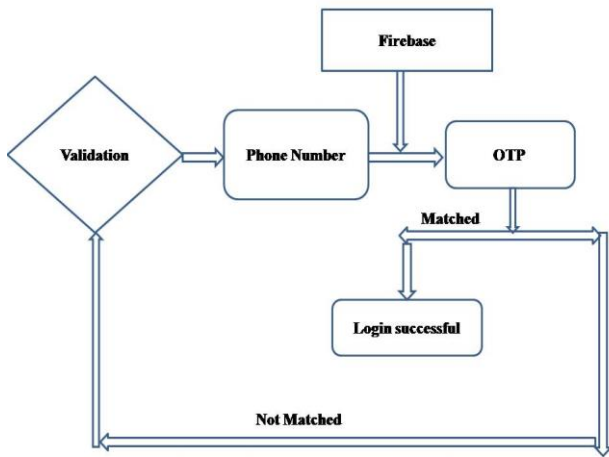


Figure 3.2 Level 1 DFD

Here, we are looking at a more detailed view of the validation procedure we just discussed in the previous diagram. When a user enters his mobile number for login, his number will be verified first using Firebase database. This firebase database is responsible for sending the One Time Password (OTP) to the mobile number. If OTP is verified then only the user can login to his account and do his work/access the system functions. This procedure will be repeated every time a user tries to login to his/her account. If you fail to verify the user by not entering OTP on time, you'll be redirected to the login page.

edit his/her personal details like name, address and contact number. Under the service menu, he will be provided with resource name and resource price.

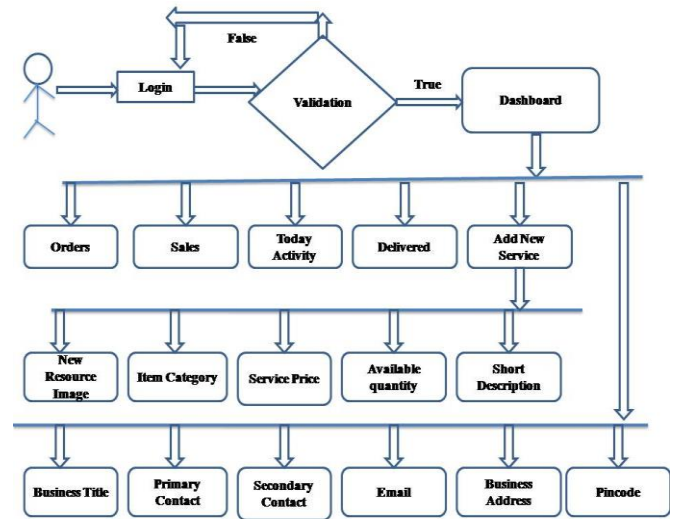


Figure 3.4 Level 3 DFD

User will use his mobile number to login, firebase will generate an OTP to validate the user. As soon as the user is validated, the app will take the user to the dashboard where multiple options will be provided. If he fails to pass the validation then he will be redirected to the login page and asked to perform the validation again. Once he is presented with the dashboard screen, he can track various areas of his business like orders and sales. He can also add new service to his profile like Item category, service price, available quantity, description about his service, etc. He/She can also add personal details about the business and person who is running the business. For example, primary contact, email, business address etc.

IV. IMPLEMENTATION

This section presents the design and implementation of an android application for managing various events. The software is supported to eliminate and in some cases reduce the hardships faced by any event organizer. It is mainly designed to carry out the operations smoothly and efficiently. Users will have to create accounts with their credentials. This software provides a user-friendly interface which allows the clients to contact service providers effectively. It also provides a note-keeping service which gives reminders time to time to the busy organizer. It makes it easy for the user and the clients to

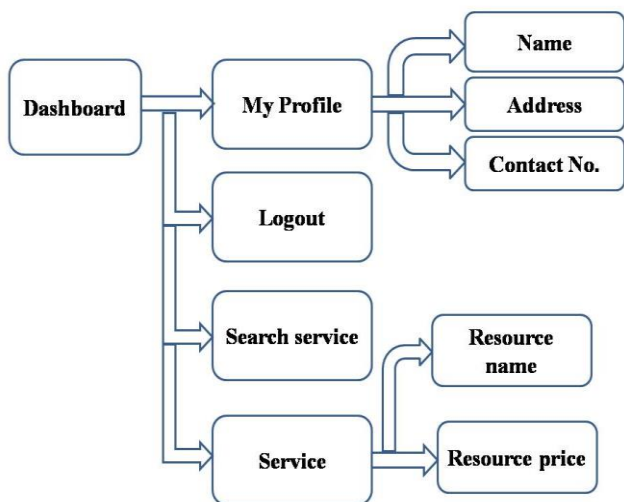


Figure 3.3 Level 2 DFD

Once a user passes his validation, he will be presented with the dashboard of his/her profile. He can view his profile, logout of the system, search for service, and other services.. Under my profile, he/she can see and

store their past expenses and events. This software makes the event organizer plan his event more strategically and provides better services to the clients.

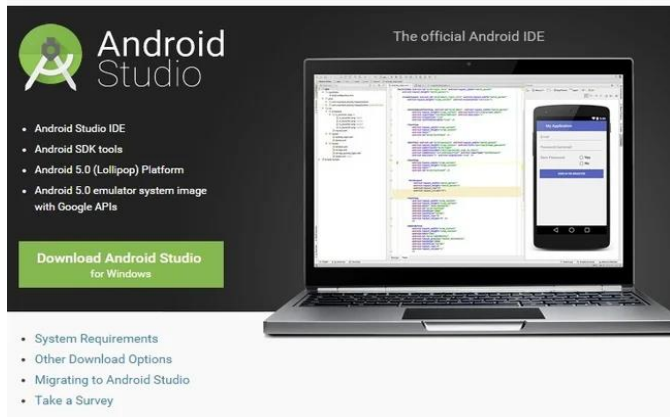


Figure 4.1 Android Studio

Features of Proposed Android Applications:

A) Multiple Language Support:

Android supports multiple languages in its operating system and one can change the language very easily based on one's requirement, the International languages supported are English, Germany, Chinese, Dutch, French, German, Japanese, Korean, Russian, and many more also some native language of India is also Supported Like Hindi, Marathi, Gujrati, Punjabi and many more.

B) User Interface:

The user interface of the Android operating system is straight forward, and these features make it very user friendly.

C) Extensive Application Support:

Android have Play store which is used as the major tool to download and update applications on the operating system, however, one can download the installer(often called as APK file) and install it manually, but it is not much recommended as third party applications could be prone to some security breach in the smartphones.

D) Smart Replies:

Automatic Suggestion to reply to texting app, like if a message contains a phone number then we can click on it and save/call the contact number. In this feature, you not only get some suggested responses but also get recommended actions related to the message. For Example, if someone sends a message regarding a meeting schedule then it pops to set a reminder for the

meeting in the calendar, If one get a location in the message then it pops to open maps for it, If someone asks to join for a meeting then it prompts us to reply with yes or no. The smart reply feature was initially started by Gmail and is later on carried to android also. These features not only work for system apps but also work on some third party applications like Signal.

E) Web browser:

The web browser available in Android is based on the open-source Blink (previously WebKit) layout engine, coupled with Chromium's V8 JavaScript engine. Then the WebKit-using Android Browser scored 100/100 on the Acid3 test on Android 4.0 ICS; the Blink-based browser currently has better standards support. The old web browser is variably known as 'Android Browser', 'AOSP browser', 'stock browser', 'native browser', and 'default browser' (from the time it was always the default). Starting with Android 4.4 KitKat, Google has begun licensing Google Chrome proprietary software) separately from Android, but usually bundled with (what most device vendors did). Since Android 5.0 Lollipop, the WebView browser that apps can use to display web content without leaving the app has been separated from the rest of the Android firmware in order to facilitate separate security updates by Google.

F) Multi-touch:

Android has native support for multi-touch which was initially made available in handsets such as the HTC Hero. The feature was originally disabled at the kernel level (possibly to avoid infringing Apple's patents on touch-screen technology at the time).[8] Google has since released an update for the Nexus One and the Motorola Droid which enables multi-touch natively.

G) Accessibility:

Built-in text-to-speech is provided by TalkBack for people with low or no vision. Enhancements for people with hearing difficulties are available, as are other aids.

H) Java support:

While most Android applications are written in Java, there is no Java virtual machine in the platform and Java byte code is not executed. Java classes are compiled into Dalvik executables and run on using Android Runtime or in Dalvik in older versions, a specialized virtual machine designed specifically for Android and optimized for battery-powered mobile devices with

limited memory and CPU. J2ME support can be provided via third-party applications.

V. TESTING SUMMARY

Android application automation can be clubbed with manual as per the need. However, if Android Automation testing is added to the strategy, selecting the correct tool is a big task. While selecting the automation tool factors like Multi-platform support, Test workflow, Price of the tool, service/support etc. should be taken into account.

There are several challenges involved in Android application testing. There are different factors to be taken into account before the Android testing process can really be implemented but once done this becomes a very interesting task.

VI. CONCLUSION

The India is developing country and the number of smartphone users, especially the Android phone users is increasing day by day. Also as the population density is also at peak and hence the pandemic flow becomes easy from person to person. The proposed application has been towards the efforts to make India ready for any future pandemic where the distribution of the essential services and significantly the health services will be efficient which in turn will lead to fewer death rates. The future scope for this application will be but not limited to the other spectrums of society and the contemporary issues faced by the people from time to time.

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