

QR COVID - AN OUTBREAK TO COVID-19

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Abstract

The recent outbreak of COVID-19 astonished the entire world, forcing lockdowns and straining public health care systems. Since COVID-19 is a highly infectious virus, and infected individuals are not initially showing symptoms, a significant fraction of the population can, at any given time, be a hidden source of transmissions. In response, many governments have shown great interest in smartphone contact tracing applications that help automate the difficult task of tracing all recent contacts of newly identified infected individuals. We discuss a pandemic management framework using symptom-based quick response (QR) codes to contain the spread of COVID-19.

In this approach, symptom - based QR health codes are issued by public health authorities. The codes retrieve the individual's information i.e., name, age, phone number, email ID, visited date, enter, and exit time will be stored in the Public Service Institution's database table and also in the individual's database simultaneously.

Keywords: Covid, QR code, Public Institutions,

Introduction

The World Health Organization (WHO) on March 11, 2020, declared COVID-19 a pandemic, whose effects will probably determine the evolution of our society for many years to come. The direction of this evolution will greatly depend on the capacity of our society to swiftly and jointly converge toward the best mitigation solutions. Until a vaccine will be available or unless the pandemic will spontaneously disappear, the best weapons in the hands of countries will be the prevention and fast diagnosis of infected people.

The traditional manual contact tracing is being greatly improved by leveraging modern techniques like GPS tracking, peer-to-peer wireless beaconing, etc. The major challenges and concerns in this area are privacy, design flexibility, and rapid notification and integration. In addition to these, data protection, data quality, and operability are other key concerns for the effectiveness of such applications. We are introducing an application that helps to keep the visiting details of customers in a public institution using a quick response code. From these records, the responsible authorities can find the cluster of a covid infected person and can send an alert message to their mail.

Implementation

Implementation is the process of bringing a developed system into operational use and turning it over to the user. Implementation includes all those activities that take place to convert from an old system to a new one. The implementation phase of software development involves translating design specifications into source code, and debugging, documenting and unit testing the source code.

At this stage, the theoretical design is turned into a working system. The crucial

stage in achieving a successful new system and giving confidence to the system the users that will work efficiently and effectively. The objective is to put the system into operation while holding costs, risks, and personnel irritation to a minimum. It involves:

- Creating computer compatible files.
- Training the operating staff.
- Installing terminals and hardware.

QR-COVID is an Android-based application system, so it requires some space on a server. To implement the new system, it has to be deployed in the localhost. It is also possible to run the system in the local network. First upbuild the website, then publish the website. After publishing QRCOVID, the files will be integrated into a package. These files and databases will be published on the online server. Then it is possible to access the functionalities just by using the URL.

Only a web browser is required to operate. QRCOVID is developed in a framework, but the client system doesn't require any framework to be installed. This method also offers the greatest security. For the implementation of the system, we want to introduce QRCOVID in society. The admin should log in to the web home page after entering the username and password. Then he/she can manage all details.

Methodology

The methodology implemented here is the Waterfall model. This model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. The waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this waterfall model:

- The phases do not overlap
- Requirements are very well documented, clear and fixed
- Product definition is stable
- Technology is understood and is not dynamic
- There are no ambiguous requirements
- Ample resources with the required expertise are available to support the product.

Proposed System

QRCOVID will be based on the Android platform. Mobile users mainly will be of two kinds, the common public, and public services i.e., shops, restaurants, public transport, hospitals, government offices, etc. The sole admin will be mainly the health department or the concerned authorities working on tracing covid19 infected individuals. Mobile users can download the application and create an account based on their needs i.e., either as a common individual or as a public service institution. After registering, the application will provide the common individual with a unique ID, and automatically the database table will be created for the individual account.

The Public Service Institution can download their QR code and stick it in front of their respective institutions so that the common individuals on arrival at the respective Public Service Institution can scan the QR code with the mobile application before entering and while exiting so that the scanned individual's information will be stored to the Public Service Institution's database table and also to the individual's database simultaneously. This will help the individual to recognize the visited places with date and time if there is a case of a positive result even after some days by simply checking their database.

Hardware Environment

The selection of hardware is very important in the existence and proper working of any software. Then selection of hardware, the size and capacity requirements are also important.

- Processor: Core 2 Duo at 2.0GHz
- RAM: 1GB DDR2 RAM [Minimum]
- Monitor: Any Color
- Keyboard: Standard Keyboard (120 keys)
- Mouse: Any
- Hard disk: 500GB [Minimum]
- Storage: 20 MB
- Network speed: 1 MBPS
- Android device

- Software Environment
- IDE: Visual Studio Code, Android Studio, Xampp
- Front End: Android, xml
- Framework: Bootstrap
- Back End: PHP, MySQL
- Coding Language: HTML, CSS, JavaScript, Java
- Operating System: Windows 10
- Web Server: Localhost

App Features

This project is aimed at improving the process of contact tracing during Pandemic situations like COVID -19. Nowadays, contact tracing is done mainly by manual procedures, for instance, testing and sending to self-quarantine, wherein infected people are interviewed to trace their contacts. Subsequently, the health authority would reach out to each contact traced, check if they show any symptoms and would also give necessary advice if any.

This approach is time-consuming, resource-demanding and prone to errors, since people might not remember all their contacts. Even if they do remember, they might not know them in person or how to contact them. But, with this developed application, cluster of individuals who met the Covid-19 positive patient can be found quickly and marked as quarantined. We are introducing an android based application for contact tracing. In this application, users can register in two ways as an institution or as common people, and databases are created. QRCOVID provides unique ids for users and generates QR-codes for institution wise users. When a common user visits a public institution by scanning QR-code, the required data is entered into a database.

When a registered person is infected, the sole admin i.e., the health department can take the infected person's unique ID and find all the Public Service Institutions visited by an infected individual by fetching the databases from the past any number of days easily and by checking the date and time visited by the positive individual, all other customers visited in the same Public Service Institution can be informed via email notifications faster using the application itself.

Conclusion

The framework of the study is presented in a way that it can be used to substantially control the spread of Covid - 19 in a particular area thereby saving the risks in the surroundings too. The traditional way of tracing the cluster by recording them in books, finding out each person one by one and informing them is rather time consuming. And it turns out to be a hectic task in the critical circumstances of rapid increase in TPR. On the other hand, the process is made much easier using an app. The information obtained can also increase the scientific understanding of the dynamics of Covid - 19 and deliver positive insight for other infected communities, thus proving that the proposed system is a lot better than the existing system.

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