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Aarogya Setu- a popular Digital Contact Tracing mobile application to prevent people from COVID19

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Abstract

COVID19 a pandemic identified in December 2019 in Wuhan, China has spread now across the world. In India also it spread geometrically to the level of more than 0.2 million in first week of June 2020. Since there is no identified medicine or vaccine to prevent oneself from COVID19, it is necessary to prevent it by maintaining social distancing and other preventive measures like using face mask, washing hand frequently using soap / sanitizer, boosting immunity level etc. Digital contact tracing has become an important tool for monitoring one's social distancing norms. In India, Aarogya Setu mobile app has been popular and even has contributed significantly in preventing the spread of COVID19. Present study is focused on the features, pros & Cons of Digital Contact tracing applications.

Keywords: COVID19, Pandemic, Social distancing, Digital Contact Tracing, Aarogya Setu etc.

1. Introduction

A pandemic first identified in December 2019 in Wuhan, China has been finally named as corona virus disease (COVID19), It is an infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). It resulted in an ongoing pandemic. The first case may be traced back to 17 November 2019. As of 3 June 2020, more than 6.41 million cases have

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been reported across 188 countries and territories, resulting in more than 380,000 deaths. However, more than 2.75 million people have recovered.

The virus is primarily spread between people during close contact, most often via small droplets produced by coughing, sneezing, and talking. The droplets usually fall to the ground or onto surfaces rather than travelling through air over long distances.

The first case reported in India in January 2020, has infected more than 0.2 million people and caused more than 5800 as of June 03, 2020 despite precautions taken by people & government both.

The preventive measure to stop the spread of COVID19 includes wearing of mask, maintaining social distance, washing hands with soap / sanitizer frequently etc. Digital contact tracing has come out a supportive tool for maintaining social distance in order to prevent the spread of COVID19.

Digital contact tracing is a method of contact tracing relying on tracking systems, most often based on mobile devices, to determine contact between an infected patient and a user. It came to public prominence during the COVID-19 pandemic where it was deployed on a wide scale for the first time through multiple government and private COVID-19 apps. Many countries however saw poor adoption, with Singapore's digital contact tracing app, Aarogya Setu seeing an overwhelming adoption rate. It may use two type of contact tracing.

- **Bluetooth contact tracing**- Currently all major digital contact tracing apps use Bluetooth, more specifically Bluetooth Low Energy, to track encounters. Typically, Bluetooth is used to transmit anonymous, time-shifting identifiers to nearby devices. Receiving devices then commit these identifiers to a locally stored contact history log.
- **Location contact tracing**- No digital contact tracing apps currently make use of GPS, however some implementations do make use of network-based location tracking. This approach has the advantage of eliminating the need to download an app.

Presently all measure countries use Bluetooth contact tracing based application for contact tracing.

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2. Review of Literature

Farrahi K. & others (2014) explored a data-driven avenue for contact tracing in epidemic prevention using social interaction data from mobile phones. His work demonstrated that mobile phone communication history to be a useful data source in disease prevention by obtaining contact information readily for epidemic contact tracing. F. Lusa and others (2020) remarked in their study that the use of a contact tracing app that builds a memory of proximity contacts and immediately notifies contacts of positive cases would be sufficient to stop the epidemic if used by enough people, in particular when combined with other measures such as physical distancing or social distancing. An intervention of this kind raises ethical questions regarding access, transparency, the protection and use of personal data, and the sharing of knowledge with other countries. As no treatment is currently available for the present pandemic, the only tools that we can currently deploy to stop the pandemic are contact tracing, social distancing and quarantine, all of which are slow to implement. However, imperfect the data, the current global emergency requires more timely interventions. Ferretti et al. (2020) explored the feasibility of protecting the population (that is, achieving transmission below the basic reproduction number) using isolation coupled with classical contact tracing by questionnaires versus algorithmic instantaneous contact tracing assisted by a mobile phone application.

3. Aarogya Setu Mobile Application

On 2nd April 2020, India launched Aarogya Setu mobile App for helping augment the efforts of limiting the spread of COVID19, with an objective of enabling Bluetooth based contact tracing, mapping of likely hotspots and dissemination of relevant information about COVID19. The App has over 114 million users as on 26th May, which is more than any other Contact Tracing App in the world. The App is available in 12 languages and on android, iOS and KaiOS platforms. Citizens across the country are using Aarogya Setu to protect themselves, their loved ones and the nation. Many youngsters also call Setu as their Bodyguard. The key pillars of Aarogya Setu have been transparency, privacy and security and in line with India’s policy on Open Source Software, the source code of Aarogya Setu has now been made open source.

Aarogya Setu crossed five million downloads within three days of its launch, making it one of the most popular government apps in India. It became the world's fastest-growing mobile app

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beating Pokémon Go, with more than 50 million installs, 13 days after launching in India on 2 April 2020. It reached 100 million installs by 13 May 2020 that is in 40 days since its launch.

The App offers a comprehensive suite of interventions against COVID-19 and has registered several firsts in the eight weeks since its launch. The App possibly has the most reach and impact when compared to all other COVID-19 contact tracing and self assessment tools combined globally, while pioneering new data driven epidemiological flattening of the curve through syndrome mapping. The App has helped identify about 500,000 Bluetooth contacts. Those who are identified as Bluetooth contacts of COVID19 positive cases or are classified as needing assistance based on their self assessment, are contacted by National Health Authority. So far, the platform has reached out to more than 900,000 users and helped advise them for Quarantine, caution or testing. Amongst those who were recommended for testing for COVID19, it has been found that almost 24% of them have been found COVID19 positive. Compare this to the overall COVID19 positive rate of around 4.65% - 145380 COVID19 positive from a total of 3126119 tests done as on 26th May 2020.

4. Features of Aarogya Setu Application

Aarogya Setu app is based on Bluetooth contact tracing. It has four sections:

- **User Status** – In this section it informs the risk of getting COVID-19 for the user. At the top it is showing user status i.e., safe or at risk. Down to the same status it is showing things to do next. Here it is telling to maintain social distancing, take self assessment test and check app regularly for updates. It also tells how to maintain social distancing, how to stay safe and safety measures against COVID19. Next to this it is showing the number of users having Aarogya Setu app, number of users having taken self assessment test, number of users at risk due to contact of COVID19 positive cases, number of users self assessed as unwell & number of users diagnosed COVID19 positive within a specific radius of 500 Mtrs, 1KM, 2KMs, 5KMs & 10 KMs. This section is further equipped with some trending videos on safety from COVID19, useful resources as FAQs, list of ICMR approved labs for testing COVID19 status, a link of donation to PM care fund & FAQs on privacy. In same section a link for self assessment test has been given. On taking self assessment test, user can know immediately whether he/she is at a risk or safe.

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- **Media**- Second section is having trending videos educating the spread of COVID19 and preventive measures. These includes videos trending of social sites, advice from doctors, immunity boosting techniques, learning centre, spiritual and social videos, celebrity videos etc. These helps user to take preventive measures in fighting against COVID19.
- **COVID-19 Updates** – In this section the statistics of the country, state wise for confirmed COVID19 cases, cases recovered and deceased cases are shown on real time. As per latest information available as on 03.06.2020, morning total 207615 confirmed cases were reported. Out of this 100303 were recovered while 5815 reported deceased.
- **E-pass integration**- This section shows e-pass availability. If any user has applied for e-pass and has been granted, same will be shown in this section. User need not to carry physical pass, instead he / she can use e-pass digitally on Aarogya Setu app. It is also added with FAQs on e-pass.

5. Pros and Cons of Digital Contact Tracing App:-

Digital contact tracing has evolved as an effective tool for preventing the current pandemic across the globe. But it is having some inherent risks as well. Pros and cons of Digital Contact tracing are as follows:-

Pros:-

- It tracks an individual's exposure to COVID19 positive cases.
- Digital tracing provides a more scalable approach to traditional contact tracing, which relies on patients' memories of recent exposure to others.
- The system's opt-in participation, rotating keys and short-term data storage offers more privacy than systems deployed internationally
- It assesses individual contagion risk level and guide individuals to go out in public spaces or not.
- Contact tracing data play a valuable role in informing local and state-level policy-making, and monitoring their effectiveness.

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Cons:-

- This app is not available to a large volume of people who still uses phones supporting voice calls only.
- It is proximity-sensing technologies that preserve personal privacy are still under development by many groups across the country.
- In absence of internet connectivity i.e., mobile data, app gives old updates.
- The collation and use of personally identifiable data may also pose significant risks to children's rights & as well as peoples right.
- Bluetooth protocols are predominately favored over their location based counterparts because of their much stronger privacy protections and lower battery usage. Because a user's location is not logged as part of the protocols, their location cannot be tracked.
- Using a Bluetooth system is the inability to track patients who may have become infected by touching a surface an ill patient has also touched.
- A serious concern is the potential inaccuracy of Bluetooth at detecting contact events

6. List of popular digital contract tracing app in the world

Table-I

Country	Name	Country	Name
Angola	COVID-19 AO	Latvia	Apturi Covid
Australia	COVIDSafe	Malaysia	Gerak Malaysia
Austria	Stopp Corona	Morocco	Wiqaytna (وقايتنا "Our prevention")
Brazil	The Spread Project	Netherlands	PrivateTracer
Canada	COVID Shield	New Zealand	NZ COVID Tracer
China	"Alipay Health Code"	North Macedonia	StopKorona!
Czech Republic	eRouška	Norway	Smittestopp
Finland	Ketju	Poland	ProteGO
France	StopCovid	Russia	Contact Tracer
Georgia	Stop Covid	Saudi Arabia	Corona Map

Germany	Ito	Singapore	TraceTogether
Greece	DOCANDU Covid Checker	South Korea	Corona 100m
Ghana	GH COVID-19 Tracker App	South Africa	Covi-ID
Hong Kong	Stay Home Safe	Sri Lanka	Self Shield (Formerly COVID Shield)
Hungary	VírusRadar	Switzerland	SwissCovid
Iceland	Rakning C-19	United Kingdom	COVID Symptom Study, formerly Covid Symptom Tracker
India	Aarogya Setu	United Kingdom	NHS COVID-19
Israel	Hamagen (Hebrew: המגן "the shield")	United States	COVID-19 Screening Tool
Italy	SM-COVID-19	United States	CovidSafe
Jordan	AMAN (أمان "Safety")	Vietnam	NCOVI
Global	Coalition App	Global	World Health Organization COVID-19 App

Source: Wikipedia

Conclusion

People all over the world are suffering from present pandemic COVID19. There is no known medicine or vaccine to get cure from this pandemic. In this time preventive measures especially social distancing has became a panacea to stop the spread of COVID19. In India, Aarogya Setu app has helped millions of people in taking care of his / her from this pandemic. Using mask, being quarantine, washing hand with soap / sanitizer, maintaining social distance, boosting immunity level etc are the ways to cope up with this COVID19. Updates on COVID19 and different segments of Aarogya Setu suggesting preventive measures are the way for the people to remain safe from this pandemic.

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