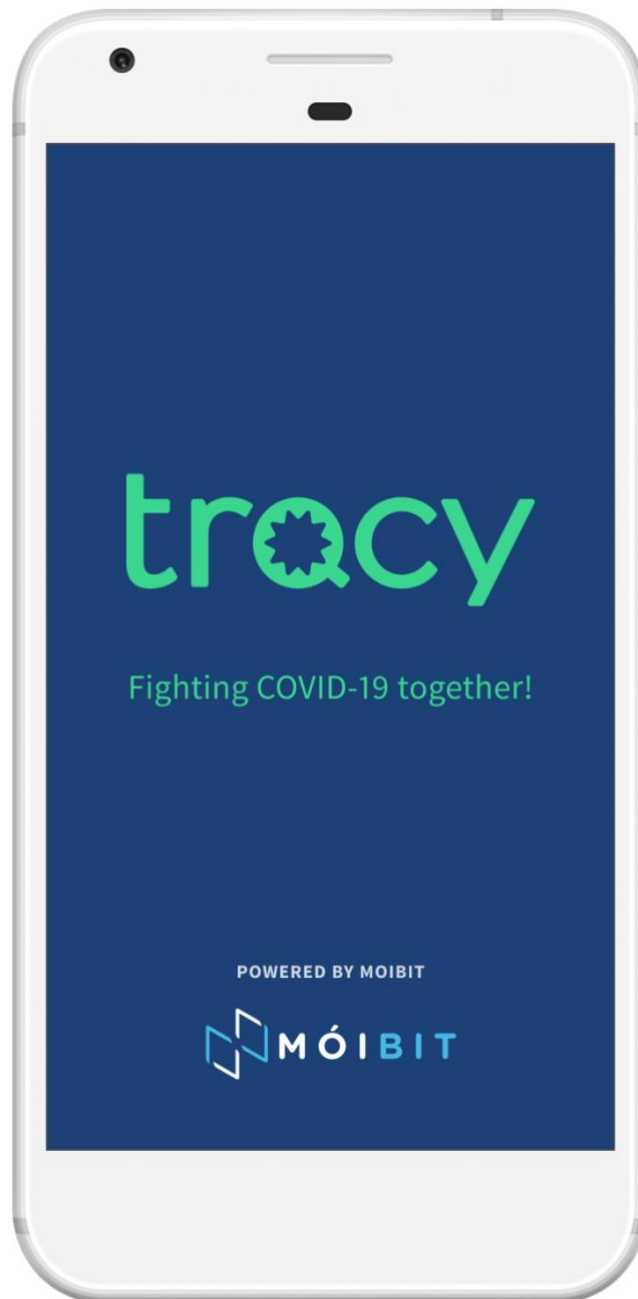


# TRACY App – powered by MoiBit

*Fighting COVID-19 together!*

<https://www.GetTracy.app>

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A privacy-first user-driven socio-technology initiative anchored by [Aicumen Technologies Inc. \(aicumen.com\)](https://www.aicumen.com)

**[WORKING DRAFT]**

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## Abstract

This document proposes a new way of mitigating the coronavirus COVID-19 outbreak with the help of MoiBit™, AI and other decentralized technologies such as Blockchain and Zero-Knowledge interactions.

## Introduction

The COVID-19 disease has rampantly caused an outbreak, infecting over 755,591 people and causing the deaths of more than 36,000 people across the globe. Although more than 158,000 infected people have been reportedly recovered, there could be chances that the virus is looming among others in the society, waiting to lapse the control and measures put by governments and agencies.

We are proposing a privacy-first mobile app that allows governments, agencies and communities alike to prevent, predict and mitigate current COVID-19 risks in their respective areas. This is possible by asking all the citizens to voluntarily participate in a program which records their location history in an anonymous way. If there are any infected people with a travel or location history originating from a particular place, the other users who were present in the close vicinity will be warned of the incident, to put them on close observation as a precaution.

Tracy addresses privacy concerns by allowing people to safely and confidently share information without compromising privacy. The medical teams / task forces get access to location data that is stripped of PII (Personal Identifier Information) and can apply business rules to intervene in specific cases. There is a data broker service that masks personal information and helps target affected users accurately without compromising privacy.

In the following section, we will learn more about the complete solution architecture, and the technologies used to fight the outbreak.

## Solution Architecture

The solution offers software for 3 targeted audience:

1. [COVID-19 Affected / Suspected citizen](#)

We offer a mobile app with a simple yet elegant design which allows the user to update their location and health status from time to time. It is called as **“TRACY for Citizens”** app.

2. [Personnel from Authorities](#)

We offer a mobile app for designated personnel such as Duty doctors, police, customs, and other registered volunteers an interface to set the quarantine status and also define the geo-fence. It is called as **“TRACY for Authorities”** app.

3. [Personnel from Control Room](#)

We offer a nimble dashboard that produces a statement of all the breached users with the customizable business logics for geo-fencing. It is called **“TRACY Dashboard for Control Room”** app.

In the following diagram, we have attributed all the above mentioned products:

### TRACY Dashboard for Control Room

TRACY QUARANTINE BREACH REPORT								
Unique ID	Citizen wallet	Mobile number	Home quarantine location	Current location	Distance (in metres)	Google maps link	BREACH status	
testBGLR1	0x2854318828b114e698e25410a880ff0378e81e	9845112345	12.91388° N, 77.62003° E	13.913888° N, 76.620038° E	184902	<a href="https://www.google.com/maps/@12.91388,77.62003,13.913888,76.620038">https://www.google.com/maps/@12.91388,77.62003,13.913888,76.620038</a>	BREACHED	
testBGLR2	0x492c03595b9638384827a0299c2299a37a31804	9845112346	12.9748° N, 77.5829° E	12.8688° N, 77.53° E	24217	<a href="https://www.google.com/maps/@12.9748,77.5829,12.8688,77.53">https://www.google.com/maps/@12.9748,77.5829,12.8688,77.53</a>	BREACHED	
testBGLR3	0x12107e9b734f097c94a4d127411809382d7a65d	9845112347	12.8003° N, 77.577° E	12.655° N, 77.2338° E	64906	<a href="https://www.google.com/maps/@12.8003,77.577,12.655,77.2338">https://www.google.com/maps/@12.8003,77.577,12.655,77.2338</a>	BREACHED	
testBGLR4	0xEAA0A38E9E9EC2D7CCDD033188638225aD0D38	9845112348	12.91388° N, 77.62003° E	12.91388° N, 77.62003° E	2	<a href="https://www.google.com/maps/@12.91388,77.62003,12.91388,77.62003">https://www.google.com/maps/@12.91388,77.62003,12.91388,77.62003</a>	OK	
testBGLR5	0x877793217b4a2e7841b1f9695e8303f794e2a	9845112349	12.9817° N, 77.6284° E	12.722° N, 77.6553° E	33704	<a href="https://www.google.com/maps/@12.9817,77.6284,12.722,77.6553">https://www.google.com/maps/@12.9817,77.6284,12.722,77.6553</a>	BREACHED	
testBGLR6	0xF8143cD75318FAC09A96794887A5489C4A0	9845112350	12.9747° N, 77.596° E	12.3051° N, 78.6551° E	144201	<a href="https://www.google.com/maps/@12.9747,77.596,12.3051,78.6551">https://www.google.com/maps/@12.9747,77.596,12.3051,78.6551</a>	BREACHED	
testBGLR7	0x1570c3950969d2a1593299a6eA6a6b853493f	9845112351	12.91229° N, 77.6213° E	13.0088° N, 77.6511° E	15777	<a href="https://www.google.com/maps/@12.91229,77.6213,13.0088,77.6511">https://www.google.com/maps/@12.91229,77.6213,13.0088,77.6511</a>	BREACHED	
testBGLR8	0x292a04EF9027a279068E696290D4624285A42	9845112352	12.9386° N, 77.7717° E	12.0315° N, 77.562° E	23728	<a href="https://www.google.com/maps/@12.9386,77.7717,12.0315,77.562">https://www.google.com/maps/@12.9386,77.7717,12.0315,77.562</a>	BREACHED	
testBGLR9	0x19e68583A4c6e5f7878c32803E3A478795C1	9845112353	12.9842° N, 77.6219° E	12.8084° N, 77.3888° E	31904	<a href="https://www.google.com/maps/@12.9842,77.6219,12.8084,77.3888">https://www.google.com/maps/@12.9842,77.6219,12.8084,77.3888</a>	BREACHED	
testBGLR10	0xb3908ba393a2405810418c29328280a69c442	9845112354	12.9123° N, 77.6203° E	13.4217° N, 76.5728° E	152327	<a href="https://www.google.com/maps/@12.9123,77.6203,13.4217,76.5728">https://www.google.com/maps/@12.9123,77.6203,13.4217,76.5728</a>	BREACHED	

- Display BREACHED users
- Direction to visit user
- Users contact info



TRACY App for Authorities

- Home address converted to lat-long
- Set by Doctors/Police/Personnel

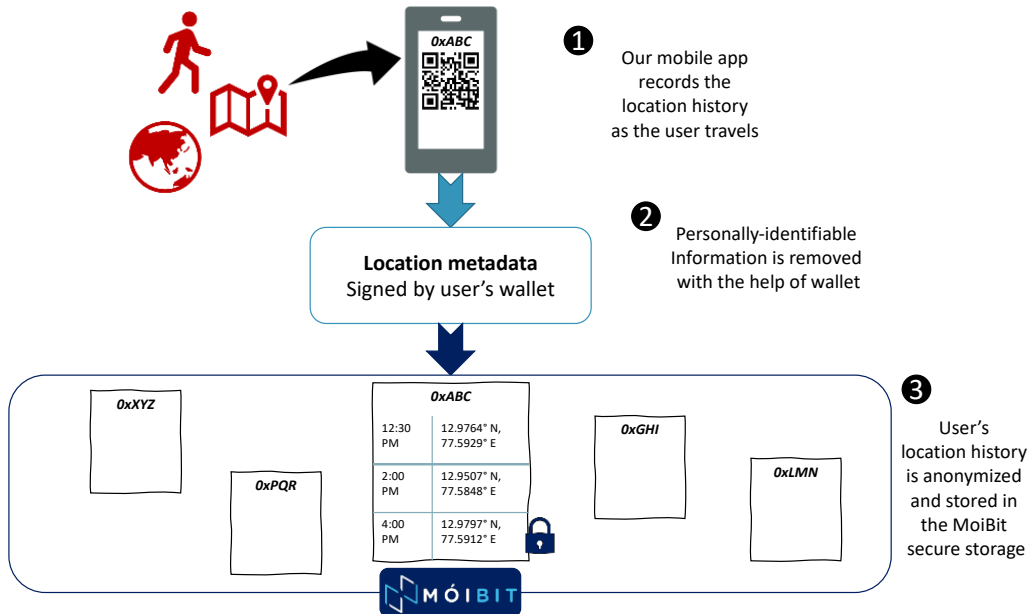
- Current lat-long and selfie sent for every 3 hours
- Frequency can be customized



TRACY App for Citizens

With the key highlights of our solution architecture, let us now look at how data is managed in a privacy preserving manner.

### Information Design



As shown in the figure above, user will be installing the app and travel, as per the recommendations of the local governments. The app records the geo co-ordinates (latitude-longitude co-ordinates) for each minute. The frequency of recording location can be customized, ranging from minutes to hours. Once the location is recorded, the data is signed in the background by the app. The signed data is stored in MoiBit individually for each user.

### About MoiBit

MoiBit is a personal decentralized secure storage network protocol with the power of immutability and provenance of Blockchain systems. We use MoiBit for storing the geo co-ordinates of all the places visited by the user. MoiBit leverages content addressability, cryptography and zero-knowledge proof to create a simple, but highly private and secure storage wallets attached to a decentralized identifier.

It is notable that MoiBit is not a centralized system. Unlike traditional Relational Database and Distributed Databases systems, data in MoiBit cannot be manipulated. If manipulated, the identifier of the data also changes, thus rendering the effort useless.

MoiBit also serves the purpose of storing the user's data in a pseudonymous way. All the inputs are signed by a wallet before changes are made and encrypted before writing it to MoiBit.

### About Ethereum

Ethereum is an open source, public, blockchain-based distributed computing platform and operating system featuring smart contract functionality. The zero-knowledge based wallets used in the Tracy app is an Ethereum wallet.

### Installation

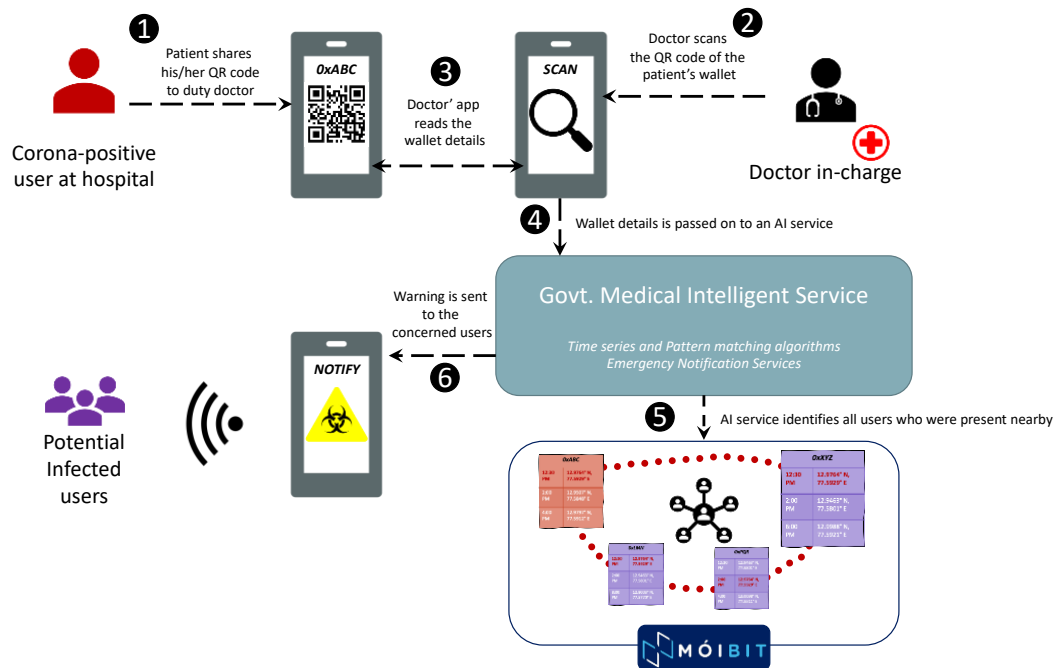
We are planning to launch the App on the Google Play store. Subsequently, there may be a release on the Apple App Store.

1. App is installed. Users are requested to login either through Facebook, Twitter or LinkedIn. Once done, a new decentralized Zero-Knowledge Proof (ZKP) based MoiBit wallet is created. The wallet is pseudonymous. Personal Information of the user shall NOT be revealed to the public.
2. Now, the user allows the location access and background refresh access to the App.
3. App can now detect the location co-ordinates for each minute and ready for sign.
4. The geo co-ordinates and metadata are sanitized to remove PI.
5. User's wallet is used in the background to sign the co-ordinates.
6. The anonymized geo co-ordinates are stored in MoiBit.
7. Analytics shall be run by the medical agencies to identify any affected people.
8. If detected, all the users who had a travel history pertaining to the affected areas shall be notified via app.
9. If the user is tested positive in the later stages, they can notify the suitable agencies. The medical agencies can further backtrack other users who were present in the same area at the time of the victim.

The citizen app is under private beta test. The authorities app development is work in progress. Please refer to the Resources section to know more about the progress.

## Mitigation and response

Our app shall be ready to address the positive cases and effectively communicate the issue with other community members.



Following are the steps taken by the app to address any infections:

1. Patient confirmed as a COVID-19 positive reports to the isolation ward at the hospital
2. Duty doctor checks if patient is user of the app
3. If patient is user of the app, doctor scans the QR code of the patient's wallet
4. Patient's wallet is searched in Moibit to get his/her travel history (recorded through Google Maps API)
5. An AI-based model using pattern recognition identifies any other users with overlapping location history at the specified timeframe.
6. If any users are matched, the respective users are identified in an anonymous way and notification is sent out to the users to report to the nearest testing center.

## Resources

- **TRACY Website:** <https://www.gettracy.app/>
- **TRACY Whitepaper:** [https://gettracyapp.netlify.com/assets/files/TRACY-Whitepaper\\_NoCopy.pdf](https://gettracyapp.netlify.com/assets/files/TRACY-Whitepaper_NoCopy.pdf)
- **TRACY Deck:** [https://gettracyapp.netlify.com/assets/files/TRACY-Deck\\_NoCopy.pdf](https://gettracyapp.netlify.com/assets/files/TRACY-Deck_NoCopy.pdf)
- **TRACY mobile app repository:** <https://github.com/moibit/tracy-mobile-app>
- **TRACY on twitter:** <https://twitter.com/GetTracyApp>
- **TRACY community on telegram:** <https://telegram.me/ProjectTracy>