Enhanced social distancing monitoring through augmented contact-tracing

Safeguarding public health by augmenting contact-tracing measures in Singapore with Bluetooth low-energy (BLE) enabled TraceTogether Tokens

INTRODUCTION

The world was unprepared for COVID-19. Little was known of the virus and social distancing was the only way to combat its spread. When Singapore went into its first lockdown in April 2020, the authorities knew a better contact-tracing measure must be put in place—one that enables a more robust process of identifying persons who may have been exposed to confirmed COVID-19 cases.

THE CHALLENGE: ENHANCING CONTACT-TRACING

Contact-tracing is by no means an easy feat. To successfully ascertain the contact-points of a confirmed COVID-19 case, relevant authorities must thoroughly interview the COVID-19 patient and trace back to the places he has visited and the people whom he has come into contact with. This is an arduous process as it's near impossible to ascertain the unidentified persons who were exposed to the COVID-19 patient. Furthermore, the investigation officers would have to conduct grueling interviews with the patient whose priority should be on receiving medical attention and recovery.

KEY CHALLENGES

- **TraceTogether mobile app does not cover the digitally excluded population e.g. elderly and young children**
- **Arduous process of interviewing and tracing back to past contact-points of the COVID-19 patient**
- **Near impossible to ascertain the unidentified persons who were exposed to confirmed COVID-19 cases**

To ensure that patients focus on recovery without having to partake in laborious interview processes and to enhance current contact-tracing measures, the Government Technology Agency (GovTech) of Singapore needed a more efficient solution in identifying people who may have been exposed to confirmed COVID-19 cases—one that can augment the existing TraceTogether mobile app and provide data on the patient's past contact-points while maintaining a high degree of anonymity without infringing on personal privacy.

THE SOLUTION: BLUETOOTH LOW-ENERGY ENABLED PORTABLE TOKENS

8 weeks to design and put together the Bluetooth low-energy (BLE) enabled TraceTogether Token

Stores encrypted data exchanged with other tokens which can only be accessed by authorized public officers

Together with GovTech Singapore and using our expertise in Bluetooth low-energy (BLE), we put together the highly portable TraceTogether (TT) Token in just eight weeks—from ideation to production, a process which could have taken six to nine months. The token is designed to exchange short-distance Bluetooth signals with other tokens or TT mobile apps that are in close proximity. These data records are encrypted and stored locally in the token for no more than 25 days and are automatically erased after. The token does not capture geo-location data as it does not have internet or cellular connectivity which minimizes unauthorized remote access to the encrypted data that is stored only on the token. Its battery life is between six to nine months and does not require charging.

> **GovTech and PCI worked closely on the initial design of the TraceTogether Token. PCI has demonstrated its engineering capability and was flexible to respond to changes in product requirements when we rolled out the first tranche of tokens in June 2020.**
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> *– Quek Yang Boon, Director of Sensors and Internet of Things, GovTech Singapore*

THE RESULT: AUGMENTED CONTACT-TRACING

The contact-tracing measure in Singapore is enhanced with the tokens that were distributed. Vulnerable seniors who have no access to smart phones and/or contact-tracing mobile apps were prioritized to receive the tokens, and collection intervals for the general public were subsequently rolled out.

The token is only surrendered to authorized public officers for data extraction in an event one is found to be a confirmed COVID-19 case. For the authorities, this **significantly increases the effectiveness in contact-tracing with improved accuracy in identifying the patient's past contact-points**. More importantly, the patient is left to receive medical attention and to recover without having to go through grueling interview processes.

ABOUT THE TRACETOGETHER TOKEN

- Uses Bluetooth low-energy (BLE) to exchange signals with other tokens nearby
- Stores encrypted data which is automatically erased after 25 days
- Has no internet or cellular connectivity to prevent unauthorized remote access
- Doesn't require charging; battery life of up to nine months
- Drop protection of up to 1 meter (3.28ft); has ratings of IPX1 or IP54 and can be IPX7 with supplementary armband
- Interoperable with the TraceTogether mobile app (Android and iOS)

Visit us at www.pciltd.com or email us to find out more: sales@pciltd.com.sg