

Testing Ireland's contact tracing app

In July 2020, the Health Services Executive (HSE) went live with possibly their most ambitious technology project to date: the COVID Tracker Ireland (CTI) app. Expleo is proud to have played our part.



Introduction

The HSE is responsible for all health-related activities within the Republic of Ireland. With the onset of the global Coronavirus (COVID-19) pandemic, the HSE recognised the need for a contact tracing app that could track and record everyone that an infected person might have been in contact with in the previous 14 days. This is the standard period when the virus is in incubation and the person would be asymptomatic.

Run by the HSE, the app notifies users if they have been in close contact with someone with COVID-19, defining a close contact as someone who was within two-metres of a confirmed case for 15 minutes or more. The app was developed by the HSE and Department of Health, with input from An Garda Síochána, Science Foundation Ireland and private partners from Ireland's technology sector.

Quality brings trust

We were determined to get this right. If the public loses confidence, then the take up will be that much smaller, which has real-life implications.



3,400

individual software tests carried out before launch



26

Expleo employees involved in the project



4,727

man hours contributed by the team



This is the equivalent of

591

working days

Instant impact

The project went live on 6th July, 2020 and became an immediate success with 1.44 million downloads within four weeks, and approximately 300,000 daily check-ins.

How does the app work?

The CTI App is designed to provide updates, health check-ins and then contact tracing. In practical terms, a user might receive prompts to check in their symptoms for that day if they haven't already done so. They can also stay up

to date on the national picture, regarding cases and hospitalisations, as well as how the virus is spreading across community transmission, close contact and travel abroad.

The check-in process reveals the symptom history of the user over the last 14 days, along with advice on protection that is linked to the HSE site. For the contact tracing, the app will display close contact information if you are told you are a close contact of someone with COVID-19.

Our team went through a rigorous, lengthy process; putting the app through its paces to ensure that it was fast, reliable and easy to use in order to maximise uptake. Now, with almost one and a half million downloads, it has been the most successful launch of any COVID-19 contact tracing app in the world. We are delighted to see such high volumes of people downloading it and hope that this will continue so that we can all work together to reduce the risk of COVID-19 infection for everyone.

Phil Codd, Managing Director for Ireland, Expleo

People typically have great difficulty remembering – or may not even know – all of the people they were in close contact with over such a long period. In addition, an app can send the necessary information out rapidly, alerting people to seek a test or self-isolate. In such circumstances, speed and accuracy will save lives.

Oran Newman, Project Manager, Expleo

Ensuring Quality from the outset

Expleo was contacted by the Government of Ireland to deliver all of the quality assurance and software testing on this ground-breaking app. We were responsible for ensuring that the app was user-friendly, fast and reliable, and capable of handling one million downloads and daily check-ins in an hour. This included field testing the CTI app with positive, negative and distance testing scenarios. Performance testing was a critical success factor for the project, given the high volume of potential API calls per hour.

Testing of the app began on Sunday March 29 2020, with an expert Expleo test team and led by a Senior Quality Assurance Manager. We got to work immediately. Test prep started that day with the available InVision mock-up screens. Test execution began the next day, as soon as the first builds were received.

The eight members of our test team each took a different section, such as the log-in screen, registering screen, and so on. Simply, the app needed to work the very same as the mock-up. That meant aligning the texts, colour and screen fit – just by eye – as if they were a member of the public.



Scenario planning

All possible real world scenarios were considered and tested. Senior testers drew up test scenarios for each location, along with:

- Positive scenarios – indoors, direct line of sight, 0 to 2 meters
- Negative scenarios – indoors, direct line of sight, 2.5 to 10 meters
- Other options such as adjacent rooms with wood & plasterboard, or concrete walls, garden walls and vehicles.

We also carried out:

- **Performance testing** – load testing on the app ensured that large volumes of people could download it concurrently.
- **Exposure Notification Distance Testing** – As devices have varying Bluetooth strengths, we tested varying attenuation values that manage Bluetooth strength to maximise compliance with requirements.
- **Graphical user interface (GUI) testing** – Expleo tested the look and feel of the app, ensuring user-friendly navigation; the correct and reliable function of all buttons; and that all content and text matched requirements.

The COVID Tracker app is an essential addition to the HSE's existing contact tracing work. For it to be effective, it needed to be easy to download and use, with highly responsive software that can cope with a very large user base. We chose Expleo due to their extensive experience in software testing and quality assurance. Their knowledge and commitment was invaluable in ensuring that the contact tracing app met all of the stringent targets and requirements we had set.

Fran Thompson, CIO, HSE

Attention to detail

Each of the team had a simulation tool to recreate how users interact with the HSE and upload their details. For example, if a user tests positive for COVID-19, they will receive a code that then activates the app to send details of their recent movements. The HSE can then notify other app users who have been in their two-metre vicinity for more than 15 minutes and advise them to get tested and isolate.

To ensure that a user's surroundings, or large crowds, did not negatively impact the performance of the app – and to avoid putting the Expleo team at risk of contracting COVID-19 – testing was carried out in multiple simulated environments with multiple devices. Quality testing was later carried out on public transport to ensure that it, too, did not negatively impact the effectiveness of the app. Negative testing was just as important as positive testing, given you don't want to be asking people to self-isolate for the wrong reasons.

Navigating the challenges

We were testing in uncharted territory. Requirements were, for the most part, undocumented and ever-changing right up to app release. We had multiple teams with all team members working remotely. This required multiple communication systems for conference calls and instant messaging.

In addition, the Google Apple Exposure Notification Service is essentially a black box, which shares scant detail as to how it works (and therefore how it can be tested). We largely had to work this out for ourselves. Indeed, our test team needed to get up to speed very quickly on the more complex areas of all the relevant technologies.



For further information, or if you have any other questions, please write an email to info@expleogroup.com