

Assuring Quality for a Lifesaving App

Helping COVID-19 patients stay safe while isolating at home using the Pandemic intervention and Monitoring System (PiMS) app

AlfredHealth



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Delivered

- Test strategy and planning
- Unit testing
- System integration testing
- Regression testing
- Performance testing
- Load testing
- User acceptance testing
- Security testing
- Compatibility testing

The challenge

Healthcare providers face a challenge – they need to isolate COVID-19 patients in their homes, but they also need to stay on top of their health and symptoms so they can escalate the medical care administered the moment their condition deteriorates.

Recognising this, Alfred Health and Deakin University came together to build the PiMS app that aids healthcare workers and protects COVID-19 patients in Australia, helping them stay safe while at home. Its main function is to notify patients, the specialist nurses and COVID-19 experts responsible for them, when they may need greater medical care and are required to visit the hospital.

Patients are periodically sent reminders to report their symptoms and symptom severity. Furthermore, with the help of the provided oximeter and a thermometer, patients can track and submit their daily heart rate, blood oxygen level, and body temperature. These vital signs and symptoms are then reviewed by specialist nurses and COVID-19 experts in order to provide patients with accurate and timely advice.

The app's intelligent decision-support system, powered by powerful algorithms developed by the Applied Artificial Intelligence Institute (A²I²) at Deakin University, is also able to use the patient's vitals to predict and recommend actions before their health declines. Since it's an AI, it also gets smarter with each patient cared for.

Developing an app of this magnitude and scope is a significant undertaking. Given its role in monitoring people's health as they combat a potentially deadly disease, it was essential the pilot version of the PiMS app be as robust, user-friendly and secure as possible.

For this reason, Planit was approached to provide quality assurance support.



“Partnering with a testing specialist like Planit amplified our velocity, both in technical design and delivery of patient risk to clinicians to clearly inform subsequent clinical actions.”

Dr Leonard Hoon | Senior Research Fellow | Deakin University

The solution

Understanding the immense importance of this app to the community, Planit immediately responded. Our involvement commenced in the initial stages of the PiMS pilot project, where user interface (UI) requirements and business rules were being established.

Like any health crisis, time is of the essence. After consultation with key stakeholders to understand strategic goals, a risk-based test approach was adopted, with risk ratings to assess and test critical components.

We quickly devised a plan of action involving local and remote delivery teams during the lockdown period. One of the key areas where testing would be concentrated was the logic rules for the UI. This was to ensure that the expected content or information is correctly provided to the app user.

Business rules was another area that was prioritised for testing. This would ensure patients were receiving the right condition based on the patient's COVID-19 symptoms and diagnosis.

This then graded the patient mild (green), moderate (yellow), and severe (red), also taking into account age, sex and current medical conditions. This means that patients with mild conditions would receive less frequent notifications from the app, while those with severe symptoms are followed up with by nurses and escalated to paramedics or hospitals when appropriate. The app also has a set of corresponding actions, which includes sending text messages and/or notifications to the clinician monitoring the patient.

The core of the testing was focused on System Integration Testing (SIT) cases. By testing the integrated hardware and software environments, we were able to verify the behaviour of the app and evaluate its compliance with the specified requirements.

Outcome

By the end of the testing, we had identified defects and logged usability enhancements prior to the release of the prototype. This ensured that the app would work as intended for the user, helping them self-diagnose and manage their recovery from the virus.

The testing risk was extremely high for the PiMS app, requiring stringent planning to accommodate the many permutations that may occur as information grows, policies change and infection rates vary.

According to Senior Research Fellow in AI Human Factors at A²I², who led the cross-function design and delivery of the system, Dr Leonard Hoon, “Our collaboration yielded a solution that clinicians could effectively use with less than an hour of training. The system can be easily adapted for use in other contexts – supporting chronic illnesses or to remotely monitor wellbeing.”

We are pleased to have contributed to the successful launch of the prototype of the PiMS App. While testing for the prototype is complete, our offer of support continues. Work on the go-live version will likely include the preparation of a test strategy and test planning across unit, system, SIT, regression, performance, load, UAT, accessibility, security, compatibility, and more.

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About Planit

At Planit, we are experts in quality engineering and assurance. With strong experience in healthcare and life sciences, our specialist consultants can help you ensure quality for even the highest risk applications, deliver a great patient experience, and build a new generation of technologies to gather and exchange health information.

Ask us how we can help you transform your applications!

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