

SCIO

A mobile phone application that accurately reads rapid diagnostic test (RDT) results. During this phase of the project, the team created a data collection application that captures users' workflows and a machine learning solution that reads RDTs.

Problem

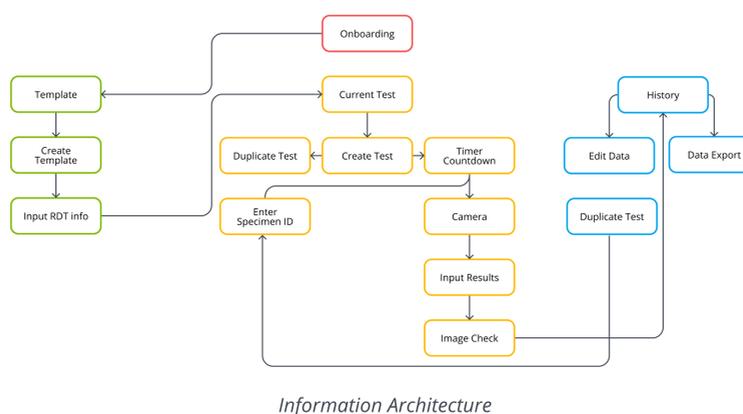
More than a billion rapid diagnostic tests (RDTs) are administered each year to screen for some of the world's most deadly illnesses including Malaria, TB, HIV, and Dengue. RDTs have dramatically expanded access to diagnostic services around the world. However, there are significant opportunities to improve RDT result accuracy and provide that data to decision-makers more quickly. RDTs results are often difficult to read due and require specific testing procedures. Both failure to follow procedure and correctly read a result lead to unnecessary or lack of treatment and often damage healthcare institution credibility with the communities they serve.

Solution

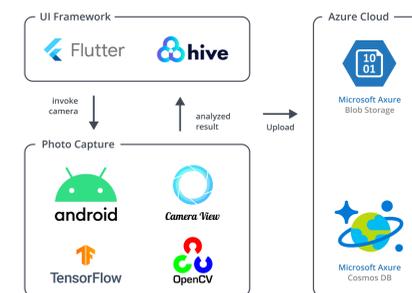
Microsoft and PATH partnered to improve RDT outcomes by creating a universal mobile phone based RDT reader. The GIX SCIO team kicked off work by creating an image collection application based on laboratory technician workflow and a machine learning solution that can read RDT results in a limited number of RDT models.

The team based our image collection application design on insights gathered in interviews with RDT operators (e.g., laboratory technicians), an observational study, and secondary research. We developed several UX elements that closely mimic common workflow activities.

The team built a data collection app to collect images of rapid diagnosis test images. Our solution has two steps; identify the RDT's result window and detect the test's result within that window. We identify the result window using an ML image segmentation algorithm similar to CenterNet.



Information Architecture



Software Architecture Diagram

Process

Secondary Research

- Researched a total of 70 published literature.
- Conducted detailed stakeholder and competitive analyses.

Primary Research

- Interviewed 9 RDT experts from PATH, non-profit organizations, and the UW.
- Observed 13 RDT videos.

Rapid Prototyping

- Created a prioritized list of features
- Wireframed using Figma and prototyped using Android Flutter.

Evaluation & Iterating

- Conducted 2 rounds of usability testings with PATH lab technicians
- Made 5 iterations based on expert feedback

Functional & QA Testing

- Performed both functional testing for ML algorithm and QA testing for all components of the application.

