Android FHIR SDK

The Android FHIR SDK is a set of Kotlin libraries for building offline-capable, mobile-first healthcare applications using the HL7® FHIR® standard on Android.

The Android FHIR SDK makes it easier for developers to build mobile health applications that can leverage the FHIR specification in different ways depending on the type of application they are building. It is made up of three libraries that provide different capabilities that can be leveraged according to the goals. These are:

1. Structured data capture library - Stand-alone library that acts as a FHIR specificationForm Filler . Makes it easy for developers to collect, validate, and process healthcare data on Android based on the FHIR SDC specification. Includes UI widgets for Questoinnaire itemControls, support for many extensions and advanced form behaviours (including FHIRPath expressions), and extraction and population of Questionnaires

2. FHIR Engine - provides secure on-device storage and APIs to allow developers to store and manage FHIR resources locally on Android and synchronize with FHIR server

3. Workflow - Provide decision support and analytics in clinical workflow on Android including implementation of specific FHIR operations ($measure_evaluate and $apply) via CQL. This library provides the essential capabilities for generating a CarePlan from a PlanDefinition (via $apply) which is requirement of the FHIR Clinical Guidelines approach which is being used for the WHO SMART Guidelines L3/4 content.

Central to the vision for the Android FHIR SDK is the ability to easily leverage open standards (i.e FHIR) to build next generation digital health solutions that can run open content (e.g. shared FHIR Questionnaires or more formalised Implementation Guides such as a WHO SMART Guideline). By focussing on the open standards we believe this will lead to more developers able to build new interoperable applications that can live side-by-side platforms provided that also build to the FHIR specification (using the FHIR SDK). All in all this creates a more open ecosystem for health content and applications.

General Details

PRIMARY USERS:

Software developers building mobile health solutions or platforms that want to leverage the open FHIR specification and data model. Today the primary users are development teams that are familiar with building healthcare worker facing applications for data collection that requires on-device storage and syncing capabilities. The SDK has been designed to significantly reduce the barriers to adoption of FHIR and to enable any developer with Android skills to build FHIR compliant applications. As such we think this will enable local developers in countries everywhere to easily pick up the necessary skills and find ways to leverage the FHIR specification for their local needs (i.e they are not locked into any proprietary vendor model)

TYPE:

Software Application

OPEN SOURCE LICENSE:

Apache-2.0

Access Information

SOURCE CODE

https://github.com/google/android-fhir

WEBSITE

https://digitalpublicgoods.net/registry/

CONTACT

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WHO System Classification

PRIMARY

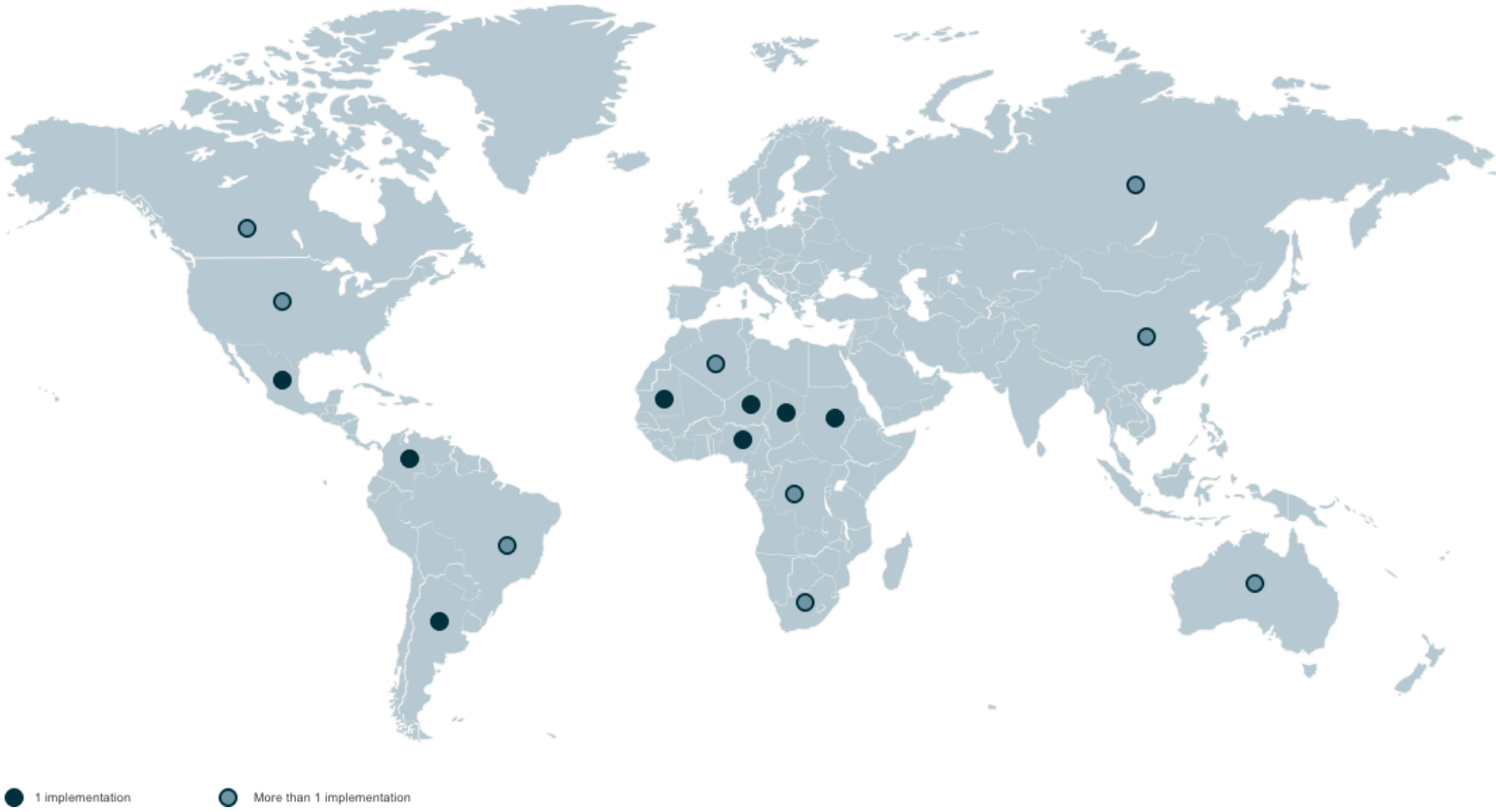
A2 | A2 Community-based information systems

ADDITIONAL

D2 | D2 Data interchange and interoperability

Geographic Reach & Impact

Multiple vendors are currently adopting and using the technology in applications and platforms that are in the early days of being implemented with NGOs and MoH partners in multiple countries. These include: - Ona FHIRCore platform which replaces the existing OpenSRP tool with a FHIR native version build on the Android FHIR SDK. Projects scheduled for initial deployment in 2022-3 include: Liberia, Uganda, Malawi (with D-Tree), Zambia and Indonesia - D-Tree are leveraging the FHIRCore platform from Ona for an HIV tracking application in Malawi - IPRD deployed a malaria bed net distribution app in 2021 using the FHIR SDK reaching over 700k beneficiaries. They are now deploying Impact Health solution for integrated ANC care in Oyo State, Nigeria which is being rolled out to up to 100 primary care clinics - Argusoft developing the WHO Em Care platform with pilot planned for later this year in Iraq - Intellisoft Kenya has developed a PATH funded application for Newborn Nutrition which is planned for deployment in October/November



Standards & Interoperability

STANDARDS

HL7 FHIR

OPENHIE COMPONENT

Point of service

Maturity

All maturity model assessments are self-reported by the funded organization leading the software development of the global good.

Maturity Matrix: 2023

Global Utility

Country Utilization	Low
Country Strategy	Low
Digital Health Intervention	Medium
Source Code Accessibility	Medium
Funding and Revenue	High

Community Support

Developer and Implementer Community Engagement	Medium
Community Governance	Medium
Software Roadmap	Medium
User Documentation	Medium
Multi-lingual Support	Low

Software Maturity

Technical Documentation	Medium
Software Productization	High
Interoperability and Data Accessibility	High
Security	Medium
Scalability	Low

Resources

Documentation URL
https://github.com/google/android-fhir/wiki

Architectural Documentation URL
https://github.com/google/android-fhir/wiki

Troubleshooting URL
https://github.com/google/android-fhir#feedback-and-getting-help

User Guide URL
https://github.com/google/android-fhir/wiki

Functional Spec URL
https://github.com/google/android-fhir/wiki

Community

The community is made up of regular participants from a number of organizations. These include a mix of developers as well as big NGOs, multi-lateral organizations (e.g WHO) and companies (i.e. Google). These groups span multiple geographies and represent a diverse swathe of the Global Digital Health ecosystem.

COMMUNITY CALLS / FORUMS

The community engages primarily via weekly calls:
- Implementers calls hosted by the WHO as part of the SMART Guidelines efforts
- Google team host a weekly developer call which is open to all developers utilizing the Android FHIR SDK for any project

PLATFORMS / MAILING LISTS

Github
- Issues are openly discussed on the public github repository with decisions shared

Community forums
- The Google team are active on the zulip chat including #android, #smart-guidelines channels

Sustainability

Google is the major contributor in terms of core support for the work both in terms of human resources and funding to external developers to address specific gaps. Other groups have made significant in-kind contributions especially to the early design phases. These include: Ona who have been involved since the beginning of the work and IPRD who specifically contributed to the early SDC Library implementation. The WHO has been a key collaborator and has provided small funding for early demonstration projects (e.g. COVAX app by Ona, DDCC Verifier App by PathCheck)

Linked Registries & Initiatives