

# DHIS2 FHIR interface

Submitted by Scott Russpatrick (University of Oslo) on January 19, 2018 - 9:17am

Last revised by Web Producer on June 21, 2018 - 3:09pm.

**Proposal Status:** Postponing for Future Calls for Proposals

## DHIS2 FHIR interface

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### Executive Summary

University of Oslo (UiO) requests support for the development of a HL7 FHIR interface to make a subset of DHIS2 resources as FHIR resources accessible through a FHIR API. We would like to undertake this project in partnership with other organisations who have experience working with DHIS2 and FHIR (for example Jembi Systems and Intrahealth).

Whereas the historic use of DHIS2 over the past more than 20 years has been primarily confined to aggregate health data, DHIS2 has in recent years developed an individual level data component (tracker) which has seen significant uptake. Our aims with this project are:

- (i) make interoperability with DHIS2 tracker more seamless by exposing an internationally recognized standard interface;
- (ii) apply learnings to strengthen the underlying tracker data model in line with international best practice; and
- (iii) foster a community of practice around the use of DHIS2 tracker within broader health information system architecture environments.

### Background

The DHIS2 has a flexible data model and an API which lends itself to building layered functionality on top of it. What is referred to as "DHIS2-as-a-platform" strategy.

FHIR is a relatively new and exciting HL7 standard which is enjoying substantial uptake. Many health information systems developed in the past few years are either implementing aspects of the FHIR standard or have a strategy to do so. The ability to interact with DHIS2 using FHIR should open new opportunities for interoperability with other systems in the domain.

A challenge is that both DHIS2 and FHIR are open ended systems which can be profiled and extended in an infinite number of ways. The data model of the DHIS2 is highly configurable with few fixed attributes on its resources. For example there is not a pre-defined Patient concept within DHIS2; rather the building blocks with which one can be defined. Similarly FHIR provides base building blocks which need to be further "profiled" to facilitate actual interoperability between systems. There is no prospect, nor any necessary value, of a simple mapping of all of the DHIS2 data model on to all of FHIR. We envisage an incremental process whereby an initial set of base FHIR resources are the immediate focus - such as Patient and a minimal set of related resources such as CarePlan.

There are other FHIR resources and profiles related to health facilities and care providers (such as mCSD) which are not directly patient related but which would also benefit from DHIS2 support. This particular project will maintain the Patient resource as its central focus, but the resulting software artefacts could also be used for supporting additional FHIR based profiles such as mCSD, mACM and emerging FHIR work on aggregate data.

Existing health information architecture projects such as openHIE have defined a number of patient based workflows using FHIR and IHE profiles such as PIXm and PDQm. Exposing DHIS2 tracker entities as Patient FHIR resources will facilitate the participation of DHIS2 in these workflows.

There are a number of existing software projects such as the FHIR HAPI server, the HEARTH FHIR server and the openHIM, which may provide an infrastructural base for the proposed DHIS2 FHIR interface. We will use available software where appropriate rather than reinvent the wheel.

Consortium Team

This project will be coordinated by the UiO DHIS2 management team. Design and development will be driven by the consortium we assemble for this project. The team will consist of DHIS2 tracker experts from the UIO DHIS2 core developer team together with FHIR domain experts. Much of this expertise and experience exists outside of the UIO group so the first task, if the project is approved, will be to engage with other potential partners such as Intrahealth and Jembi systems.

## Project Description

The project will include an early design stage where technology choices will be made and the initial scope of targeted FHIR resources and capabilities finalised. Specific outputs will be:

- (i) a robust and extensible software component which exposes a FHIR API at the front end and communicates with the DHIS2 web api under the hood. This component may be composed of existing software components;
- (ii) an implementation and migration toolkit to assist implementers with configuration (for example a DHIS2 web app and standard metadata packages).;
- (iii) documentation on the approach to extending the interface to support additional FHIR capabilities.

There are a number of design decisions related to the software component which we do not preempt at this stage. For example

- (i) the FHIR REST API service could be assembled from scratch or could make use of the java based HAPI server or the node.js based HEARTH server;
- (ii) the software component could provide a thin facade and pass through requests to the DHIS2 as it's backing store, or it could maintain its own local FHIR repository mirroring the content of the DHIS2;
- (iii) the software component could provide its own authentication and transaction logging functionality or could make use of a third party component such as the openHIM.

It is our intention that important strategic decisions such as these will be taken as part of the community engagement period of project evaluation.

**Supporting Documents:**  [dhis2\\_fhir\\_interface.pdf](#)