

# C4H Interoperability Community Board Briefing Paper - FHIR Technical Tools

**Richard Kavanagh, Head of Data Standards, NHS Digital**  
**Dr Amir Mehrkar, INTEROPen, CCIO Orion Health**

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**Information and technology**  
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## Summary

This paper addresses Action #24 from the Code for Health Interoperability Community Board, raised on 11<sup>th</sup> October 2016.

It describes issues discovered in the publishing of FHIR “profiles” for the purposes of both implementation and clinical/professional review.

## Background

In FHIR, profiles are used as a mechanism to constrain the FHIR resources to meet specified use cases. Profiles do this via a process of restriction (by limiting the base resource model) plus extension (by adding to the base resource model).

The profile exist as complex XML files which are then transformed into a visual form so as to make them human readable. There is no one mechanism to apply the transform or any one definition of what the resulting human readable form should be.

To date the following transform mechanisms exist (as a minimum):

- Endeavour has software to undertake the transform mechanism which is used by both the Endeavour and INTEROPen websites
- NHS Digital has software to undertake the transform mechanism and this is used when publishing the national FHIR specifications
- HL7 International has software which is used to publish the base FHIR specifications.

In addition to this there is a commercial product called “Simplifier” available from Furore which provides a shared repository for the publication of FHIR profiles. The “Simplifier” product is based on a “freemium” model and to date we have used the “free” tier.

When creating the “CareConnect” FHIR profiles there was a desire to place the profiles in a GitHub repository that was synchronised with Simplifier and then allow reviewers to use Simplifier to review the profiles.

Unfortunately a number of issues arose, including:

- The Simplifier product had a number of technical “bugs” that prevented the synchronisation working effectively
- The Simplifier product had a number of technical limitations (specifically name length) that prevented the CareConnect profiles from being loaded.
- The visualisation of profiles within Simplifier was markedly different to that used in the England (Endeavour & NHS Digital)

As an interim measure it was decided not to use the Simplifier product but instead use the software created by Endeavour.

## Considerations

Within the FHIR community it is recognised that a single national repository of profiles would be beneficial. At previous board meetings we had agreed that HL7 UK (being the UK affiliate of HL7) was the appropriate place for this.

The display of FHIR profiles is an important concern when developing FHIR specifications. It is important that the profiles are described in a manner that is understandable by the intended audience. From the work undertaken by PRSB to date, it is known that technical and clinical audiences will probably have differing requirements in this area.

FHIR is still a relatively new standard and implementation experience is just beginning to emerge. It is to be expected that learning from implementation will yield changing requirements in how FHIR implementation guides should be created. Flexibility in adapting the presentation of FHIR profiles is unlikely to be achieved via the use of multi-tenanted solutions like Simplifier.

Multi-tenanted applications usually have a single instance of the application deployed that is then used by many different customers. The functionality and user interface tend to be common (as is the case with Simplifier). So any changes made need to be agreeable to all customers.

## Conclusions

The local FHIR community requires a capability to publish FHIR profiles that meets the needs of both the implementation community, the clinical informatics community as well as the clinical community who need a more easily accessible way to understand how clinical data is being modelled and subsequently shared. That capability needs to have the ability to adapt to evolving requirements in a timely manner.

The work already underway from within the FHIR community to explore new ways in visualising FHIR profiles for clinicians using the ClinFHIR (<http://clinfhir.com/>) product will provide useful evidence for future tooling development.

The existence of multiple solutions within England is unhelpful; it consumes resource within the community and provides opportunity for misunderstanding.

The publication of FHIR profiles as “view only” will not be the only functionality required of community tooling. The ability to review, collaboratively interact and suggest modifications to profiles will also be required. Thus tooling will require the ability to store audit trails and logs of activity and discussions amongst participants, with appropriate version control properties.

## Recommendations

In the short term the publication of FHIR profiles for INTEROPen should continue to use the Endeavour capability.

Endeavour and NHS Digital should look to harmonise their display formats (which is already happening).

A project to create a consolidated tooling platform for FHIR should be initiated as a community project, including involvement of the INTEROPen members. As part of the development process the identification and agreement of presentation formats should be agreed and implemented. Appendix 1 shows some early requirements analysis from a clinical informatics perspective between PRSB and INTEROPen.

# Appendix 1 – clinical informatics requirements analysis – an initial review

## Background

Built on learning from FHIRDevDays2016 the Professional Records Standard Body (PRSB) and INTEROPen would like to further develop the clinFHIR tool to be used for the viewing of FHIR profiles and logical models to assist in the curation of UK generic CareConnect profiles.

The current clinFHIR logical model viewer is a reasonable starting point the curation of UK CareConnect profiles.

## High level objective

To provide a way that a non-technical clinicians can view a FHIR profile as a clinically relevant logical model, its associated elements and value sets within the elements, so that they can get an overview of the profile's clinical content and also be able to review and comment on it.

To be able to view this FHIR logical model via a web link (either in a document or email) that opens inside a web browser.

## Requirements.

- import any **FHIR profile** (e.g. CareConnect) in addition to a FHIR base resource (STU2 and STU3) and display as a clinically relevant logical model
- The logical model should display the minimum required properties that are clinically relevant (e.g. hide URL path, actions, model name etc.)
- The mind map view should be able to expand to display the value sets for that element where appropriate
- The mind map should be exportable as a PDF
- The mind map should be exportable in an open standard mind map format (so that further comments can be added by subsequent groups e.g. for educational purposes).
- Reviewers must be able to make comments on the logical model, which can be viewed by any; these comments need to have a chronological date/time
  - A version control feature is desirable but not necessary at this stage

## Future Requirement

- To create a FHIR compliant STU2/STU3 profile from a logical model or an edited logical model