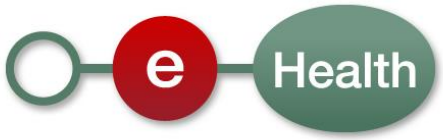

Vision statement HL7 FHIR

Consult

https://www.ehealth.fgov.be/standards/kmehr/en/page/visionstatementhl7fhir

to make sure you are reading the most recent version of this document

Content

1. About this document/context.

In support of the implementation of the cluster 0.5, the program board of the 'actieplan_2019-2021_e-gezondheid/ Plan d'actions e-Santé 2019-2021' decided the future standard is HL7 FHIR.

The program boad also decided any 'careset' initiative by INAMI/RIZIV in support of cluster 4.1 shall start from the FHIR resource in any definition of its caresets.

For cluster 0.5, the program board demanded a vision statement that supports and details this choice.

The goal of this document is to have a document as concise as possible that at this stage can already serve as a directive for stakeholders and implementers.

As such, this document remains mostly high level but identifies guidelines in some key areas concerning various challenges.

2. Document control

Version	Date	Author	Comments
0.01	-	eHealth Platform	Internal – draft
0.02	20190418	eHealth Platform	Internal – draft
0.03	20190429	eHealth Platform	Version for WGSE review
1.0	20190528	eHealth Platform	Version for program board

3. Referenced sources

Document name	Document
actieplan_2019-2021_e-gezondheid/ Plan d'actions e-Santé 2019-2021	 actieplan_2019-2021_ e-gezondheid.pdf
The HL7 FHIR Release 4 standard	https://www.hl7.org/fhir/r4/resourcelist.html

4. HL7 FHIR standard brief

'Fast Healthcare Interoperability Resources' or 'FHIR' is a standards framework created by HL7. HL7 is a non-profit organization of subject matter experts and information experts working together to create frameworks and standards to exchange electronic health information.

> "FHIR is an interoperability standard intended to facilitate the exchange of healthcare information between organizations. It consists of two main parts – a content model in the form of 'resources', and a specification for the exchange of these resources in the form of real-time RESTful interfaces as well as messaging and Documents."[1]

The FHIR resources are modular components that can be assembled to solve real world problems. The FHIR standard contains multiple specific technical representations of these components inter alia a logical view, XML and JSON. A FHIR implementation gives the consumer or the provider of the data a free choice whether to use e.g. XML or JSON.

> "This simple example shows the important parts of a resource: a local extension, the human readable HTML presentation, and the standard defined data content.


```
<Patient xmlns="http://hl7.org/fhir">
  <id value="glossy"/>
  <meta>
    <lastUpdated value="2014-11-13T11:41:00+11:00"/>
  </meta>
  <text>
    <status value="generated"/>
    <div xmlns="http://www.w3.org/1999/xhtml">
      <p>Henry Levin the 7th</p>
      <p>MRN: 123456. Male, 24-Sept 1932</p>
    </div>
  </text>
  <extension url="http://example.org/StructureDefinition/trials">
    <valueCode value="renal"/>
  </extension>
  <identifier>
    <use value="usual"/>
    <type>
      <coding>
        <system value="http://hl7.org/fhir/v2/0203"/>
        <code value="MR"/>
      </coding>
    </type>
    <system value="http://www.goodhealth.org/identifiers/mrn"/>
    <value value="123456"/>
  </identifier>
  <active value="true"/>
  <name>
    <family value="Levin"/>
    <given value="Henry"/>
    <suffix value="The 7th"/>
  </name>
  <gender value="male"/>
  <birthDate value="1932-09-24"/>
  <careProvider>
    <reference value="Organization/2"/>
    <display value="Good Health Clinic"/>
  </careProvider>
</Patient>
```

> FHIR has resources for administrative concepts such as patient, provider, organization and device as well as a wide variety of clinical concepts covering problems, medications, diagnostics, care plans, financial concerns and more."[2]

[1] http://www.hl7.org/implement/standards/product_brief.cfm?product_id=491
[2] https://www.hl7.org/fhir/summary.html#2.17.3 (the example is also on that page)

5. Vision statement

In support of the cluster 0.5 of the actieplan_2019-2021_e-gezondheid/ Plan d'actions e-Santé 2019-2021' the HL7 FHIR standard is the preferred standard to use.

This means any new data flow identified will preferably use the FHIR standard to model its data. Any new interface in a new data flow will also preferably use the FHIR specifications with a preference for REST.[3]

The added value of FHIR is enhanced by sending data both in a structured and a codified way. The guidelines concerning the FHIR narrative shall be followed.[4]

As the FHIR specification is very developer friendly, there will be no public delivery of FHIR validation or visualisation tools by the eHealth Platform. Developers are encouraged to enjoy the speed and abundance of the existing FHIR eco system, which existence is indeed one of the rationales behind the choice for FHIR.[5] Also, as a description of the FHIR standard, the pages published by HL7 are considered to be sufficient.

When needed and mature, eHealth Platform will however publish specific profiles and implementation guidelines for federal initiatives. It will also investigate the use of FHIR registers to publish technical formats of these profiles. These publications will take the form of downloadable technical profiles according to the FHIR specs. The eHealth Platform Standards website will publish the necessary links. The new message guidelines remain active.[6]

As a general guideline, the FHIR standards shall be used as close as possible to the basic HL7 published standard. As a consequence of this, when needed eHealth Platform will only focus on nuances and clarifications between the Belgian initiative and the published standard.

It shall be very clear any transition of current KMEHR flows to FHIR without additional effort on codification and structuring does not provide significant added value. The nature of the data in our systems does not allow for any 'big bang' scenario.

5.1. Guidelines concerning the trial status of FHIR

HL7 FHIR is a standard in trial use. This implies risk and uncertainty. Currently (since January 2019) FHIR is in version 4. This version contains a limited number of resources that are 'Normative'.

Each FHIR resource has a certain maturity. The status 'Normative' means a resource is stable and there should be backward compatibility in future versions of FHIR. The other maturity levels range from zero to five where zero means draft and five means trial standard used in production in some countries.[7]

[3] FHIR defines various methods for exchanging data between systems: https://www.hl7.org/fhir/exchange-module.html
[4] https://www.hl7.org/fhir/valueset-narrative-status.html
[5] https://www.hl7.org/fhir/implsupport-module.html
[6] https://www.ehealth.fgov.be/standards/kmehr/en/page/new-message-guidelines
[7] https://www.hl7.org/fhir/versions.html#maturity

Please note resources can contain other resources. Their maturity level is not always the same.

An implementation based on a non-normative resource might be incompatible with future versions of FHIR and the implementer might be required to make changes. There is no absolute certainty an implementation based on a non-normative resource will or will not become incompatible with future versions of FHIR. However, it is something the implementer shall consider and plan for.

- When the resources are Normative, it is highly recommended to use FHIR to exchange them.
- Resources in maturity level five or four are recommended to use but the implementer might be required to perform changes in the future when the resource becomes Normative.
- Resources in level three or two might be used but the implementer is expected to follow the evolution of the resource. The implementer shall be aware it is quite likely there will be compatibility issues with future FHIR versions.
- Resources in maturity level zero or one should only be used if the implementer is prepared to do frequent and radical breaking changes in the future.

If a project foresees to use resources that have a maturity level that is lower than recommended in above list, the project must ensure to advance the maturity level of these resources. Roadmap 3.0 cluster projects must obtain the approval of the Enterprise Architect of the Roadmap for the use of these resources.

Recommendation of use by project target/scope:

- Projects with a national use should use resources with maturity 4 to Normative.
- Trial projects may extend this with resources with maturity 2 to 3
- POC projects may extend this with resources with maturity 0 to 1

5.2. Guidelines concerning coding systems and identifiers

A FHIR resource often uses coding systems within a value set to express structured data. Identifiers are used to refer to national registers. When possible or recommended by the FHIR standard, official FHIR codesystems, valuesets and identifiers shall be used.

As codesystems and identifiers are preferably identified by URI in FHIR: the implementer shall contact message-structure@ehealth.fgov.be when there is a need to include table or identifier identifications currently managed by eHealth platform.

5.3. Guidelines concerning extensions

"Note that, unlike in many other specifications, there can be no stigma associated with the use of extensions by any application, project, or standard - regardless of the institution or

> jurisdiction that uses or defines the extensions. The use of extensions is what allows the FHIR specification to retain a core simplicity for everyone."[8]

The FHIR standard has a strict way to define extensions in resources.[9] This is the only way to define extensions. An implementer shall take extra note of the rules concerning Modifier Extension.[10]

When there is a need to have extensions defined on a federal level, the eHealth Platform will act as the source and will publish these. These publications will take the form of downloadable technical extensions according to the FHIR specs. The eHealth Platform Standards website will publish the necessary links.

When possible when needed, an existing extension shall be used.[11]

5.4. Services of the eHealth Platform

Migration to or extension with FHIR framework of the services of the eHealth Platform will be subject to review in future iterations This needs to follow from thorough consulting with the current partners.

In addition, the maturity of FHIR integration with the tooling used (Swagger framework) is not yet sufficiently mature to ensure sufficient quality. Also, the basic services use specific concepts that do not yet have a statisfactory maturity in the corresponding FHIR resources.

In any case, the nature of the data exchanged does not allow for any 'big bang' scenario and any support for FHIR shall be iterative and gradual. Considering also the technical limitations, the migration will be 'best effort'.

5.5. Migration paths of existing data flows

Existing data flows are encouraged to migrate to or extend to the FHIR framework in future iterations.

The mapping between any KMEHR dataflow and FHIR resources is considered to be self-evident.

Any project shall however carefully consult between providers and consumers of its data concerning the path to FHIR and the choice of FHIR interface.

5.6. Guidelines concerning mobile use

As mentioned in the standard brief supra, the FHIR standard does not explicitely favours one exchange architecture or technical message format. It is however understood any project in mHealth will prefer the JSON technical format combined with REST interfaces.

[8] http://www.hl7.org/fhir/extensibility.html
[9] http://hl7.org/fhir/defining-extensions.html
[10] http://www.hl7.org/fhir/extensibility.html
[11] http://www.hl7.org/fhir/extensibility-registry.html

5.7. Areas to elaborate

As HL7 FHIR is an evolving standard, there are subjects that need further study or a possible further evolution of the standard.

Specifically considering the impact of FHIR on both architecture and actual data formats exchanged and the GDPR need for systems that have 'privacy by design'.

This chapter does not aim to be exhaustive but its goal is to raise a few issues that must remain visible in the FHIR context.

5.7.1. Use of encryption

Clinical data should be exchanged encrypted and e.g. the Vitalink vault stores its data encrypted.

A true FHIR exchange however relies very heavily on the various links between its resources. It can be argued adding all these references to the metadata of an evelope containing an encrypted FHIR resource will drift away from any advantage of the power of FHIR.

5.7.2. Access rights

Healthcare practitioners function in different roles and relationships with the patients etc.

To safely determine who is allowed to see what data means an elaborate and detailed system. If all resources are encrypted it would mean there would have to be sufficient metadata available to manage these rights as it would not be possible to filter on the actual data.