HL7 EU
GenAI AND HL7 STANDARDS
EVOLUTION AND PERSPECTIVE (SOME ASPECTS)

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“Revolution is not a dinner party”

«… maybe as soon as the first half of next year: **[coding] is done. Soon, we won't bother to check generated code, for the same reasons we don't check compiler output.**»

«I love programming, and it's a little scary to think it might not be a big part of my job. But coding was always the easy part. **The hard part is requirements, goals, feedback** — figuring out what to build and whether it's working.

There's still so much left to do, and plenty the models aren't close to yet: architecture, system design, understanding users, coordinating across teams. It's going to continuing be fun and very interesting for the foreseeable future.»

(Adam Wolff Anthropic Engineer, 24 Nov 2025, on X)

We should remember that facilitating implementation is a reason behind FHIR

Focus: GenAI and HL7 Standard

- Anyway, **beyond the hype, the field of IT is undergoing revolutionary changes**.
- It's critical to understand the reciprocal **relationship between AI technologies and healthcare standards.**
- In particular, IMHO, we need to investigate;

How can GenAI aid in developing standards?

We should consider how AI can be used to improve and accelerate the **development, maintenance, and evolution of FHIR standards**.

How can standards enhance GenAI's accuracy and reliability?

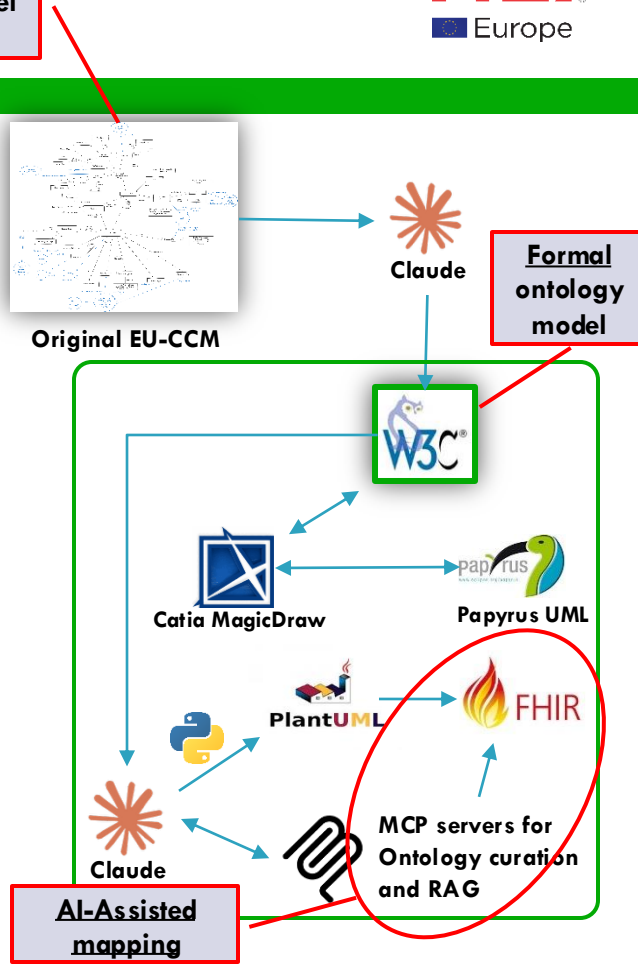
We should consider the **implementation of software systems with the combined use of AI technologies and FHIR Standards**.

Example 1

HL7 EU Common Cancer Model

Common Cancer Model Ontology Development Approach and Tools

- The initial OWL 2 model was generated from the initial European Cancer Common Conceptual Model, developed with Claude 3.7 Sonnet Large Language Model (LLM).
- The Cameo Concept Modeler plugin was then used to import the OWL model into MagicDraw UML 2024x and correct/extend the ontology.
- A Python utility (owl2plantuml_v17.py) has been developed to transform OWL 2 ontologies into PlantUML diagrams, useful for the HL7 Tools chain.
- Subsequent discussions following the Madrid Working Group Meeting led to the current release (version 2.1).
- Ontology is available in multiple serializations: RDF/XML, JSON-LD, OWL Functional syntax, and Turtle format
- The new version has also been exported in Eclipse UML for manipulation with open-source tool as Papyrus UML (after the WGM we'll release the imported Papyrus UML Model).
- The current updated model is aligned with the new version EU Cancer Common Conceptual Model, and has been verified and revised with the assistance of Claude 4.5 Opus LLM.



Example 2

Healthcare Services Reference Architecture (HSRA)

39th Annual Plenary, Working Group Meeting

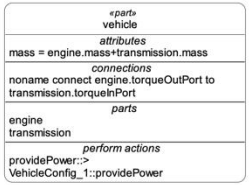
Pittsburgh, PA | September 14 - 19, 2025

Objective: HSRA as a GenAI computable standard

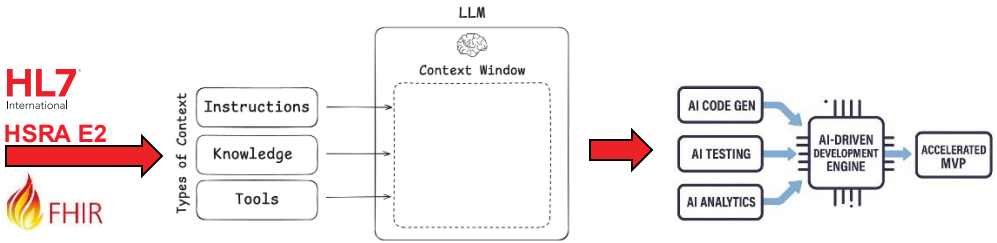
- The use of Large Language Models (LLMs) in IT is increasingly shifting from relying solely on 'prompts' (i.e. V*ibe Coding*) to leveraging comprehensive '*Context*'.
- *Context* refers to supplying an LLM with all relevant information and resources necessary to accomplish tasks, rather than just a cleverly crafted prompt.
- A *context* needs to be precise, and **SysML v2** (System Modeling Language v2) offers ideal features to support this:
  - **It combines a visual modeling language with a corresponding textual representation.**
  - It is based on a robust semantic foundation (moving beyond purely syntactic UML to the newer semantic-founded KerML).
  - **Although relatively new, LLMs effectively manipulate SysML v2,**
  - Moreover, SysML v2 is already supported by several existing tools such as 3DS Magic, SysON, SysIDE, among others, some of which are open source, with a general remarkable interoperability among them.

- The **Health Services Reference Architecture (HSRA)** serves as a comprehensive framework to guide the development of enterprise-scale e-health architectures that leverage HL7 standards and services.
- The HSRA represents an architectural perspective on standards implementation within healthcare information systems, providing structured guidance for enterprise healthcare solutions.

```
part vehicle{
    attribute mass = engine.mass+transmission.mass;
    perform providePower;
    part engine{
        attribute mass;
        port torqueOutPort;
        perform providePower.generateTorque;
    }
    part transmission{
        attribute mass;
        port torqueInPort;
        perform providePower.amplifyTorque;
    }
    connect engine.torqueOutPort to transmission.torqueInPort;
}
action providePower{
    action generateTorque;
    action amplifyTorque;
}
```



Objective: HSRA as a GenAI computable standard



- HSRA continues to serve as a support tool for Architects while also functioning as a computable and standardized artifact suitable for use with AI-assisted engineering.
- In contrast, the full FHIR standard and its Profiles are extensive and lack a complete functional context for resources obvious aspect with the RESTful approach, as FHIR primarily defines Resources and a transport mechanism applicable to them.

This approach, potentially, could be expanded to encompass other aspects of HL7 standards (e.g DAM).