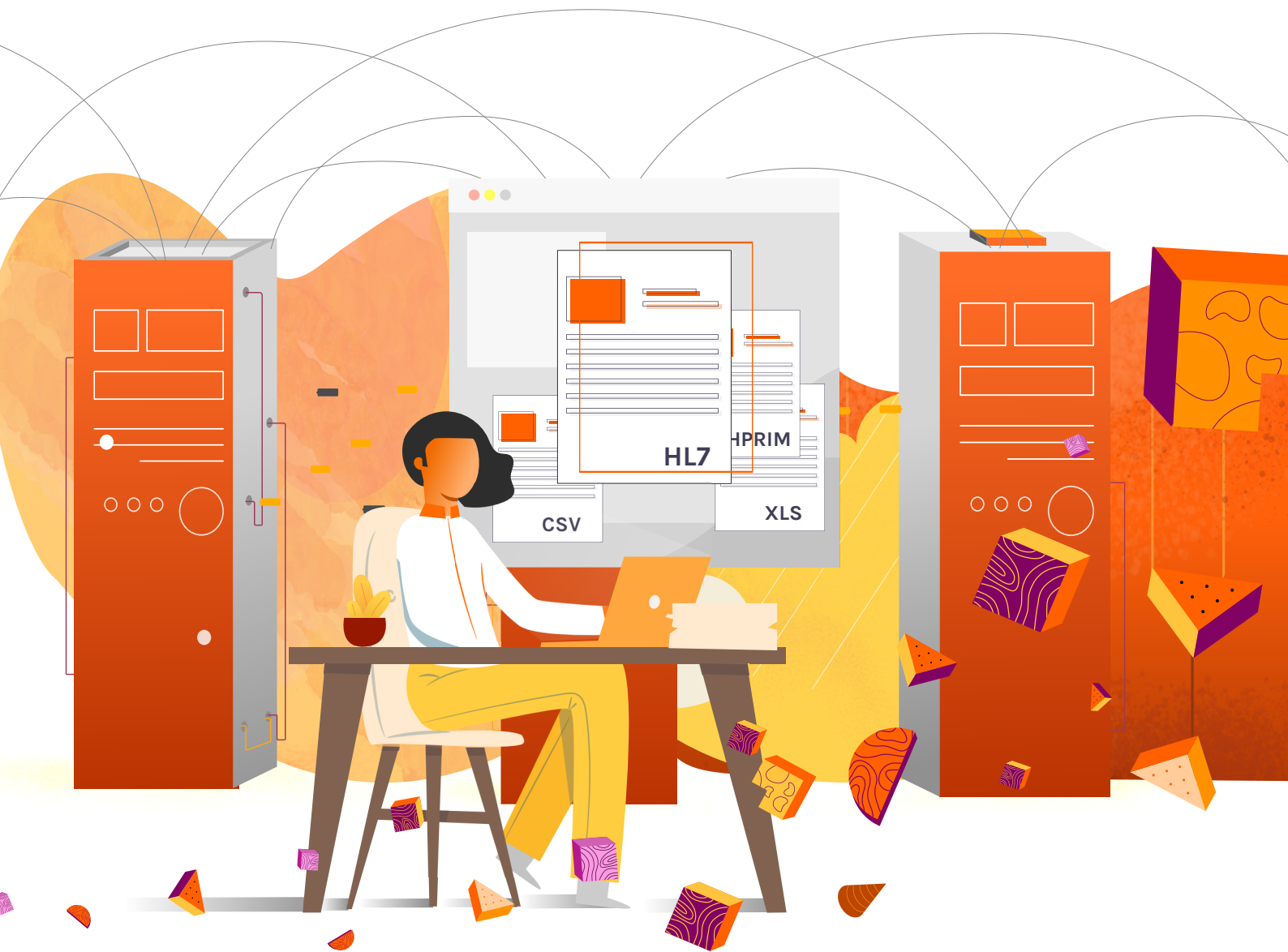


Guide

EVERYTHING YOU NEED TO KNOW ABOUT INTEROPERABILITY STANDARD HL7 FHIR

HL7 FHIR:

A Paradigm Shift to Facilitate the Exchange of Patient Data



Editorial

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The interoperability standard HL7 format has evolved over the years. To democratise its use and implementation, the format has opened up to current web practices (HTML, XML, JSON). The FHIR (Fast Healthcare Interoperability Resources) standard now broadens the field of possibilities with its library of open source resources.

To understand how and why the FHIR standard came into being, Frédéric Laurent, Project Manager at Enovacom, reflects on the origins of this interoperability standard.

“At the start of the HL7 adventure in the 1980s, an independent format was created to circulate patient data between two systems so as to reduce integration costs. HL7 defines the communication protocol and the structure of the data to be exchanged. The standard is very flexible, facilitating easy implementation. Adoption has grown over the years. At the end of the Nineties, Version 2 was widely used, and it remained flexible in its definition and interpretation. Built on a text format, its structure is difficult to read without tools, and the communication protocol remains sketchy. Therefore, there is a high demand for a more precise standard and formal data model.”

In response, the richer and more complex HL7 V3 standard was created based on XML. However, a period of ten years intervened between the development and distribution of this standard. *“This project had very high ambitions. The designed baseline information model is abstract and requires a lot of work to come up with concrete aspects. Version 3 was finally released, but it suffered from limited industry popularity.”*

To bridge the gap between V2 and V3, the HL7 teams have found themselves at a crossroads; between an ageing V2 and a complex V3. They decided to start from scratch. *“In the early 2010s the HL7 board launched a new working group to bring out a different perspective on its standards. This alternative to V2 and V3 will be based on web technologies.”*

A standard based on web technologies

WITH FHIR, THERE IS NO NEED FOR TEXT FORMATTING AND THE VARIOUS APPLICATIONS TO READ STREAMS THAT COME FROM HTTP, JSON AND XML ELEMENTS. "With this enhancement, entry-level web developers can more quickly appropriate this new standard HL7 FHIR—Fast Healthcare Interoperability Resource."

Simplicity and speed of implementation are key to this new form of interoperability. Based on a set of resources available in open source, FHIR is agile and accessible.

"This format facilitates the exchange of data. The information is easily accessible. They are defined in the form of resources respecting the REST architecture. Since this model is widely used in the web world, the concepts are easy to understand and therefore more quickly adopted."



Frédéric Laurent
Project Manager at Enovacom

Now, all web developers can create and manage these feeds, which creates a welcome opening for players in the sector who can tap into a 'plethora of skilled resources'. FHIR has also harmonised the use of well-known security and connection standards in the context of health records, such as OpenID Connect. This prevents those involved in each project from having to reinvent this layer, which could have design flaws.



Technical and architectural Techniques

BY REMOVING ALL THE TECHNICAL BARRIERS OF HL7 MESSAGES, THIS STANDARD IS IN THE PROCESS OF BEING DEMOCRATISED. As testament, several web giants have already adopted the format. Apple, Google and IBM all use it to support their health services. If today you can collect, share and view your health data on your smartphone, it is in part thanks to FHIR.

"For the web giants, this standard is a real opportunity. The resource model is pre-defined, and the concepts fit ideally into cloud technologies. In addition, these companies have understood that the exchange of health data is a driver of growth. Today, HL7 speaks the same language as the web giants and their devices. These are already massively deployed and are the best tool for using the FHIR standard."

- Frédéric Laurent.

Technically, the HL7 FHIR standard has modified the structures for hosting health data flows. "The paradigm has changed. Information systems will no longer push information to a consumer as defined by HL7 V2. Now, whoever needs the information comes looking for it using standard HTTP requests."

The operation of FHIR is very traditional; **the data is stored in warehouses compatible with the standard.** These warehouses are then queried using web protocols in order to send information from point A to point B.

FHIR is also the focus for several international forums. With just a few clicks, you can interact with developers from around the world who specialise in this format to refine your code. "There are also freely accessible test servers that you can interact with. The development of the code is greatly facilitated," says Laurent.



Enovacom solutions are FHIR-compatible

TO USE SOLUTIONS COMPATIBLE WITH THE FHIR LANGUAGE, DEDICATED SERVERS NEED TO BE SET UP TO BUILD THE TECHNOLOGICAL FOUNDATION. Enovacom, the leader in global medical interoperability, has adapted its solutions so that they can understand this language. *“We have a growing number of projects using FHIR. For example, in the case of the patient journey application, all information is exchanged and stored in an Enovacom data repository (EDR) in FHIR format.”*

This warehouse is able to store and deliver FHIR flows. Having a native FHIR repository ensures the sustainability to the solution.

In addition to this standard, **the solution supports all document formats** that can pass through your information system. Facilitating exchange and interconnection with a FHIR warehouse enables Enovacom to offer a standardised solution. This is compatible with a language that will be used by all healthcare players in the future.

“We are increasingly using FHIR in our solutions to manage patient-related resources, but also repositories, as well as information mappings between different concepts. For example, we can now unify the codifications of different laboratories in order to compare results that are initially generated with local codes. FHIR allows us to have a set of concepts already defined that we can use right away.”

For example, Enovacom has created an FHIR-compatible patient portal to facilitate the exchange and sharing of inter-establishment data between clinics in Brussels and the La Tour hospital in Geneva.

In addition, **the Enovacom interoperability platform (EAI solution) is also designed to accommodate the HL7 FHIR standard.** It has even received a certificate (Interoperability Toolkit version 3, FHIR) This means that it is

compliant with the technical pre-requisites of the NHS, which has come about through its work with the Oxford Health NHS Foundation Trust.

“In England the National Health Service (NHS) has taken the initiative to define interoperability rules, with particular regard to the exchange of data between the hospital and the primary care.”



Christophe Thibault
Director of International Sales at Enovacom

To comply with this framework, Enovacom’s technical teams have developed a specific connector, certified by the NHS, to allow English healthcare organisations that are equipped with the Enovacom interoperability platform to exchange healthcare data with external parties.

“The NHS is pushing healthcare providers to use FHIR technology to send out letters. We therefore had to adapt to this demand by doing integration tests. The Oxford Health NHS Foundation Trust has asked us to support them in this initiative.”

To be able to develop this connector, Enovacom had to be certified to so it could use this tool with the NHS. *“We went through a series of tests to prove that we complied with NHS demands. The use of FHIR is mandatory, since the NHS requires that the tool allows sending files in FHIR format.”*

This project showed how the Enovacom interoperability platform has the capacity to address health data exchanges in FHIR format in a standardised way.

The expansion of FHIR

THIS NEW PARADIGM HAS NOT YET ACQUIRED REVOLUTIONARY STATUS. ITS USE IS NOT FULLY DEMOCRATISED. As proof, many healthcare organisations still use the HL7 V2 flows, which work correctly and do not require additional investment for healthcare bodies. *“Software publishers are interested, but remain measured in their investments in FHIR. Their current system works; they do not have the immediate need to change the paradigm, which would cost them significant effort in terms of R&D,”* says Thibault.



Germany is also promoting this new standard through an investment programme (Krankenhauszukunftsgesetz), which highlights the need for German health structures to equip themselves with an interoperability platform. This technical base must be able to accept the FHIR format in order to be effective, and therefore benefit from government assistance.

For its part, Switzerland is organising ‘projectathons’ to encourage software publishers to develop connectors to provide solutions capable of feeding its electronic patient record (EPR). A solution has already been designed by the Enovacom teams, since a connector has been created to cover Mobile Access to Health Documents, Patient Identifier Cross-Reference for Mobile, Internet User Authorization and Patient exchanges Master Identity Registry.

Finally, Belgium has launched FHIR-compatible projects with the aim of improving the functionality and accessibility of the Réseau Santé Bruxellois (Brussels Health Network). Current projects include the implementation of an FHIR test server, as well as the improvement of interoperability and standardisation between IT systems. There is also the organisation of working groups between IT systems to produce a common ‘cookbook’ that offers the most common interface possible. While many European countries are pushing their healthcare organisations to use this standard, it is start-ups that can take FHIR to a new dimension.

“We also think that start-ups will boost the democratisation of FHIR. They are more agile, and already know the technical world of the web. In addition, they don’t have to invest to create the code, because a lot of open source components are available. Without a more proactive national strategy, it will be difficult to move quickly on FHIR, as the use of HL7 V3 CDA (Clinical Document Architecture) still remains in the majority.”

Frédéric Laurent.

Despite its rapid maturity, FHIR is dependent on a community working on its development. The British group INTEROPen and the French group Interop ‘Santé are examples of proactive organisations developing the FHIR standard for specific use cases. However, no broader roadmap is in place to address the global challenges of the health sector.

In England, an implementation guide adapted to the NHS has emerged. The HL7 FHIR UK Core Implementation Guide R4 serves as a database compatible with all UK healthcare institutions. Inside there is a pre-established core data set for entering the data of a patient.

Much of FHIR is being developed in England. For example, the first national FHIR project was launched in 2014: the Female Genital Mutilation Risk Indication System 3. At the local level, investments in IT infrastructure, more open supplier/integration engine interfaces and the search for open data solutions allow for greater interoperability. This suggests a move toward further adoption of FHIR.





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Enovacom can help with IT issues across your digital transformation journey, whether your organisation is well underway or it is just getting off the mark.

Our offer is now even more comprehensive since our integration with Orange Healthcare, the B2B healthcare operation of **our parent company Orange Business Services.** This took place on October 1st 2020 and created **our 'Digital & Data' healthcare division,** which **offers digital health software and service packages that target four major areas:**

- Protecting healthcare data
- Exchanging and sharing information between healthcare stakeholders
- Digitising patient pathways
- Getting the most out of healthcare data



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