

CASE STUDY: OpenEHR

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Work in progress, comments most welcome!

Brief facts about openEHR

Webpage

<http://www.openehr.org>

Organization tagline

OpenEHR is a voluntary based SSO aiming at increasing interoperability of EHR.

Main standardization areas

EHR data information

Best known standards

OpenEHR

Organization classification

Non-formal and academic organization with roots in Australia and the UK. OpenEHR has a very specific scope and employs an open source development approach to standardization.

Does the SSO have any explicit or implicit policy relating to interoperability?

OpenEHR claims as part of its aim “the development of an open, interoperable health computing platform”. The open source licenses function as a guarantee for interoperability. OpenEHR especially promotes semantic interoperability, which is required for a functional relation between technical and medical sides of the standard. OpenEHR is also a baseline to enable interoperability between different forms of data and systems.

Is there an explicit strategy to facilitate or contribute to interoperability?

By using the open source development mode interoperability can easily be controlled and addressed during the development process.

Procedures for testing of a proposed/developed standard with respect to interoperability and backward compatibility?

Being developed as an open source product the testing is that of the open source “eyeballs” method.

What are the procedures (internal or external) for implementation?

OpenEHR provides a reference implementation that is available under open source licenses. The standard is implementation driven and builds upon the lessons learned from implementations.

How is compliance enforced and what are the consequences of defections and deviations from the standard?

OpenEHR does not enforce compliance. The open source licenses give implementers broad choices.

Did the SSO develop competing standards for the same or similar type of technical problem?

Not really, although there are many fragmented proprietary data formats. Organizations with similar activities to OpenEHR include [IHE](#), [Open Health Tools](#) and [Open e-Health Foundation](#).

What is the value of interoperability in the specific area in which the SSO is active?

The value is quite large within the sector since it standardizes the actual data.

What is the value of selection and conformity in the specific area in which the SSO is active?

In the long run selection is of high value to reduce lock-in. In the short run there might be useful with several different solutions before a “best” solution is produced. Conformance will be useful but the diverse needs might mean that it is not completely necessary.

Standardization Process

- OpenEHR has been active as an organization since 2000 but the roots go back to 1989. There are currently 700 members.
- OpenEHR has a holistic approach to standardizing Electronic Health Record data information by supplying both standardized system specifications for data, standardized Archetypes for clinical phenomena, a stable reference implementation and open source software ready for use. Which of these activities that constitute a standard is not clear. OpenEHR consider that they continuously develop one and the same standard in an open source fashion.
- All individuals and organizations are welcome to become members.
- There is just one membership class and it is free of charge.
- Anyone, members as well as non-members, is allowed into technical working groups but the vote for approval is taken by the Architectural Review Board consisting of seven members. The votive requirement is simple majority but before a vote in the ARB there has to be consensus among the members on an issue. There are no official ways to appeal decisions but technical problem issues might be raised by submitting subsequent Problem Reports.
- Standards and working materials are available to the public free of charge. The ARB votes are not public.
- Any party can propose new work, usually by submitting it to a mailing list to ignite discussion. The core project team then decides whether to incorporate it or not, based on if it is compatible with the current set of specifications or not.

Improvement activities

- OpenEHR is currently seeking sponsors to the project. There is also the intention to increase the members of the ARB to twelve, currently there are seven members.
- The very open process of development means that the standard is under constant public review.
- The mission of openEHR is to develop an open and interoperable health computing platform.

- Strategic concerns are that openEHR will work closely with other SDOs such as CEN, ISO and HL7, but openEHR will continue to develop standards by implementation testing rather than through committee work. OpenEHR will also seek closer cooperation with [IHTSDO](#) in order to improve semantic interoperability of terminology.
- Other organizations with activities close to openEHR are [ASTM](#), [CEN](#), [HL7](#), [IHE](#), [ISO](#) and IHTSDO. Of these openEHR cooperates with CEN, HL7, ISO and IHTSDO and have liaisons with CEN, HL7 and ISO.

Interoperability

- The IPR rights are transferred to the foundation and deliverables are provided under royalty-free licenses. The software is provided under a tri-licensing schema including GPL, LGPL and MPL. Copyright can be transferred to the foundation, be owned co-jointly or be retained by the contributor. For reference specifications and implementations the copyright must be owned solely or jointly by the foundation.
- There are no disclosure requirements of IPR.
- OpenEHR supply testing suites and the reference implementation can be used as a basis and showcase for implementation of the standard. Implementation in itself is the main goal of openEHR standards development. OpenEHR also allows for testing of conformance to openEHR specifications and Archetypes for products not developed by openEHR themselves.
- Interoperability is central to the organization. The whole process of open development is geared towards making interoperability possible.

Case study

The openEHR Foundation is an international not-for-profit foundation founded in 2000, with the ambition to make interoperable and lifelong electronic health records a reality and improve medical care in the information society through the open standard specification openEHR. The foundation is dedicated to the development of specifications, open source software and tools for the creation of adaptable health computing systems and patient-centric electronic health records. The focus in openEHR is not on how different systems exchange data with each other, but on architecture, reference models and especially archetype models for standardization of data, irrespective of the application of such data. The term openEHR is used both for the foundation and its published work. The first version, openEHR 1.0, was released in February 2006, and the latest version, openEHR 1.0.2 was published on New Year's Eve in 2008.

OpenEHR was founded by [University College London](#) and [Ocean Informatics Pty Ltd](#) from Australia and the board of the foundation is composed of four members from these two organizations. Membership in the foundation is open to anyone, and by now openEHR has more than 700 members from more than 70 countries. Membership is free of charge although the foundation is actively searching for sponsors.

Standardization is considered necessary by openEHR, however the openEHR view is that traditional standards setting processes with committees do not have a future. Instead, a development process

aligned to the open source model is needed, with continual and open review where anyone can request changes. Therefore, openEHR is published in official versions which the users continually review, but with defined rules for how changes in the specifications are to be made. OpenEHR can be considered to consist of three types of content: specification documents, Archetypes and software. The latter two builds on the specifications. Thus a new version of openEHR implies the revision of the set of specifications. All the specifications are developed and managed by a project group within the foundation. However, each specification typically is the work of a specific working group. Anyone in the foundation may suggest changes to a specification, and when such a proposal is made it is discussed and developed until a consensus has been reached among the members of the foundation. Any such changes are then reviewed and documented by the Architecture Review Board consisting of 7 members before the revision of the specification is implemented by the project group.

All IPR to the contributions to openEHR is owned by the foundation and all material is made publicly available for free under licenses where the only terms are that the user may not use the material out of context or modify it in such a way that it may damage the openEHR foundation. The stance of the foundation on IPR is that all components and specifications have to be in open source format; otherwise complete interoperability among all the complex systems in the area will never be achieved.

OpenEHR continually cooperate with other organizations such as CEN and ISO. The openEHR specifications build upon various definitions and specifications in standards from CEN and ISO – while CEN in turn have adopted standards based on openEHR. A large international project of harmonization is also underway within ISO to develop specifications for how data following the openEHR standard should be exchanged in messages following the HL7 version 3 standard.

OpenEHR is also cooperating with other organizations, for example openEHR is participating in the development of terminology by the IHTSDO (International Health Terminology Standards Development Organisation).

As rather new, the openEHR open standard has not yet been widely implemented. Various evaluations of openEHR are however ongoing in one or many regions within about ten countries. A number of Swedish companies, universities and other organizations are members of the openEHR foundation. The most active Swedish company is [Cambio Healthcare System](#), which is also represented by one of the seven members in the Architecture Review Board.

Key success factors

- Free membership of openEHR creates incentives for wide participation, especially from motivated individuals.
- The set leadership of the foundations, although somewhat undemocratic, provides a coherent leadership vision.
- The open development of standards provides swift reactions to technological progress and ensures that standards will meet the market demands.

- Focus on interoperability. This enhances the ability of openEHR to respond and adapt to technological developments.