EHE Medical Records Database

Commercial Description

Version 5.1

ENT

1 Introduction

Electronic Healthcare Exchange (EHE) is a line of products fulfilling a variety of eHealth system needs, ranging from fundamental ones like infrastructure, security, and integration, over exchange and management of clinical documents and discrete medical information, to advanced functionalities like clinical decision support. Solutions made of different EHE products, alone or through integration with the existing infrastructure, support a wide range of processes in a healthcare system.

The EHE Medical Records Database is a product that enables the management of medical data at the level of structured subsets of data that represent certain entities or events in the healthcare system in the form of HL7 FHIR [1] resources. It enables access to these data through an integration interface based on the IHE QEDm integration profile [2][3]. If medical data stored in medical records database is extracted from clinical document sent in the form of a FHIR document this component also enables retrieval of information about exact document from which medical data is extracted.

The product also enables the management of medical data, more precisely - storing, updating, searching, and retrieving medical data.

The medical data that can be managed are:

- data on patient visits

- data on patient health issues and problems.

1.1 Medical Data Management

Services for medical data management described in the following chapters manage different data sets about different health entities, for e.g. doctor's visit, case, allergy, procedures. The solution for informatization of healthcare can be built so that medical data is sent to it in two ways: via individual medical data management services and via documents (e.g. summary after medical examination, findings, etc.), using the product EHE Document Registry and Repository. In this case, the data sent in the documents must be aligned with the data managed through the medical data management service. For example, in the clinical summary that is sent after a visit to the doctor, relevant medical data is sent to the system, either as an integral part of the document or as a reference to already registered data if there are separate services for this.

1.1.1 Visit Data Management

This component provides visit data management (storing, updating, searching, retrieving) using the Encounter FHIR resource (https://www.hl7.org/fhir/R4/encounter.html).

A manageable set of visit data, all of which are not mandatory, are as follows:

- date and time of the start and end of the visit

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- type of visit

- health issues treated during the visit (references to health issues in the medical data repository)

- patient (reference to patient record)

- data on participants (healthcare professionals, organizations, etc.) - references to records on healthcare professionals and organizations.

1.1.2   Health Issues Data Management

This component provides management of data on patient health issues and problems (storing, updating, searching, retrieving) using the Condition FHIR resource (https://www.hl7.org/fhir/R4/condition.html) through the FHIR Messaging Exchange Framework and the IHE QEDm integration profile.

A manageable set of information about a health problem, all of which are not mandatory, is as follows:

- diagnosis according to the International Classification of Diseases 10 revisions (ICD -10)

- clinical status (e.g. active, inactive, remission)

- verification status (e.g. confirmed, unconfirmed, entered by mistake)

- date of onset of the health problem

- date of solving the health problem

- comment.

2   Technical Aspects

Management of data on doctor's visits and health issues is supported by the FHIR Messaging Exchange Framework and the IHE QEDm integration profile [3].

The EHE Medical Records Database implements the Clinical Data Source component of the IHE QEDm integration profile and the Transaction operation:

- Mobile Query Existing Data [PCC-44] – retrieval of clinical and medical data with the following options:

  o *Conditions*

  o *Encounters*

  o *Observation*

- o *AllergyIntolerance*

- o *DiagnosticReport*

- o *MedicationStatement*

- o *MedicationRequest*

- o *Immunization*

- o *Procedure*

- o *Document Provenance.*

The component stores the specified data in the form of the appropriate FHIR resources:

- *Condition* FHIR resource (https://www.hl7.org/fhir/R4/condition.html),

- *Encounter* FHIR resource (https://www.hl7.org/fhir/R4/encounter.html).

- *Observation* FHIR resource (https://www.hl7.org/fhir/R4/observation.html

- *AllergyIntolerance* FHIR resource (https://www.hl7.org/fhir/R4/allergyintolerance.html)

- *DiagnosticReport* FHIR resource (https://www.hl7.org/fhir/R4/diagnosticreport.html)

- *MedicationStatement* FHIR resource (https://www.hl7.org/fhir/R4/medicationstatement.html)

- *MedicationRequest* FHIR resource (https://www.hl7.org/fhir/R4/medicationrequest.html)

- *Immunization* FHIR resource (https://www.hl7.org/fhir/R4/immunization.html)

- *Procedure* FHIR resource (https://www.hl7.org/fhir/R4/procedure.html).

The component also uses all other FHIR resources necessary to store the medical information about the patient received from the incoming clinical documents if they are referenced from the specified resources.

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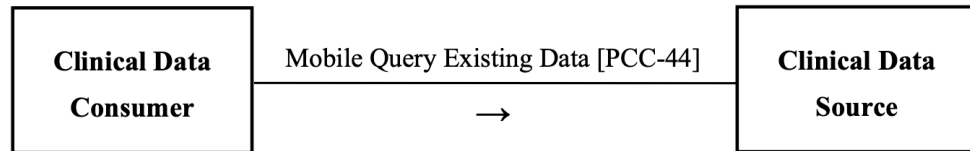| Clinical Data Consumer	Mobile Query Existing Data [PCC-44] $\rightarrow$	Clinical Data Source

Figure 1 - IHE QEDm Integration Profile Components and Transactions

To ensure semantic interoperability, this product uses terminologies via the IHE SVCM profile [4]. To manage terminologies and support integration via the IHE SVCM profile, it is recommended to use the product EHE Terminology Services [6].

3 Interdependencies

The EHE Medical Records Database depends on the following components:

- EHE FHIR Repository [5] – It is also possible to use other providers' data repository compliant with the FHIR R4 standard.

- EHE Terminology Services [6] – It is also possible to use other providers' terminology repository and terminology service compliant with the FHIR R4 standard and the IHE SVCM integration profile.

- EHE Infrastructure [7].

To implement the EHE Medical Records Database, it is necessary to provide a PostgreSQL or Oracle relational database and an Ubuntu Linux operating system.

The components of the EHE Medical Records Database can be installed on physical servers, in virtual machines or containers.

4 Free and Open Source Software

This product uses Free and Open Source Software (FOSS) components with the following licenses:

- Apache Software License 2.0 [8]

- MIT License [9]

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- Mozilla Public License (MPL) [17]

- Elastic license v2 [18].

5 Version

The current product version is 5.1.

6 References

[1] HL7 FHIR (Fast Healthcare Interoperability Resources) - It is a standard describing data formats and elements and the application programming interface for the exchange of electronic health records, created by Health Level Seven, an international health standards organization. The specification is available at https://www.hl7.org/fhir/.

[2] IHE (Integrating Healthcare Enterprise) – This is a joint initiative of healthcare professionals and industry with the aim of improving the way in which information systems and applications in healthcare exchange information by defining integration profiles that determine standards to solve common integration tasks in healthcare (https://ihe.net).

[3] IHE QEDm (Query for Existing Data for Mobile) – It is a profile that defines the search and retrieval of clinical data elements (FHIR resources such as Observation, Condition, Medication...) - specification available at https://wiki.ihe.net/index.php/Query_for_Existing_Data_for_Mobile_(QEDm).

[4] IHE SVCM (Sharing Valuesets, Codes and Maps) – IHE (Integrating the Healthcare Enterprise) profile providing basic transactions associated with terminology services - specification available at https://profiles.ihe.net/ITI/SVCM/.

[5] EHE FHIR Repository – Ericsson Nikola Tesla's standard product which enables data management and storage based on the HL7 FHIR standard.

[6] EHE Terminology Services – Ericsson Nikola Tesla's standard product which enables the use of terminologies, terminological operations, and management of terminologies (code lists, concept

groups, concept maps) based on the HL7 FHIR standard and the IHE SVCM integration profile.

[7] EHE Infrastructure – Ericsson Nikola Tesla's standard product which implements the functions necessary for the operation, internal communication, and monitoring of the components of a solution.

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