DARE25-021 - Harmonizing Healthcare Data with HL7 FHIR: An ETL Design and Implementation to participate in the Medical Informatics Initiative

Abstract

This project is concerned with the transformation of data from the research database RDA of the Medical University of Vienna (MedUni Vienna) into a HL7 FHIR (Fast Healthcare Interoperability Resources)-based interoperable data set. This is fully aligned with the German Medical Informatics Initiative (MII) and is compatible with the emerging European Health Data Space (EHDS). The core objective is the design and implementation of a proof-of-concept ETL pipeline that transforms structured clinical data from the RDA's Entity-Attribute-Value (EAV) model into FHIR-compliant resources. The initial scope covers the basic MII modules, providing a foundation for extension to additional domains and future integration with other national and European research infrastructures.

The project combines structural and semantic harmonisation, leveraging FHIR as a standardised interoperability framework. A metadata repository will facilitate the mapping of local data to FHIR resources, thereby ensuring transparency and reproducibility in data transformation. The ETL pipeline's modular design facilitates incremental updates as MII modules evolve or new FHIR versions are released, ensuring a sustainable and extensible infrastructure.

Integration into the MII network facilitates cross-institutional data exchange, enabling MedUni Vienna researchers to participate in multi-centre studies while offering external researchers access to harmonised clinical data via the Portal for Medical Research Data (Forschungsdatenportal Gesundheit). Alignment with the EHDS ensures compatibility with European-wide standards for secure secondary use of health data.

Scientific disciplines:
Medical informatics (100%)

Keywords:
Data harmonizationSemantic interoperabilityHL7 FHIRFAIR principlesETL pipelineMedical Informatics Initiative (MII)Research data warehouseClinical data integrationMulti-centre studies

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Further links to the persons involved and to the project can be found under
https://www.wwtf.at/funding/programmes/ei/DARE25-021/