

Introduction



- In Data Segmentation for Privacy, identifying sensitive data sometimes requires clinical inferences
- We propose:
 - CDS approach can be useful for data segmentation for privacy
 - Use of CDS tools against redacted data could mitigate some of the patient safety risks of data segmentation.
- ILHIE-SHARPS prototype combines these two ideas in an OpenCDS-based automated data segmentation architecture for HIE.

Predicates, Reducers, Safety Checks



- Predicate:
 - Identify if a clinical document has a particular type of sensitive data in it
- Reducer:
 - Redact portions of the clinical document until corresponding predicate is satisfied
- Safety Checker:
 - Check care plan against non-redacted clinical document

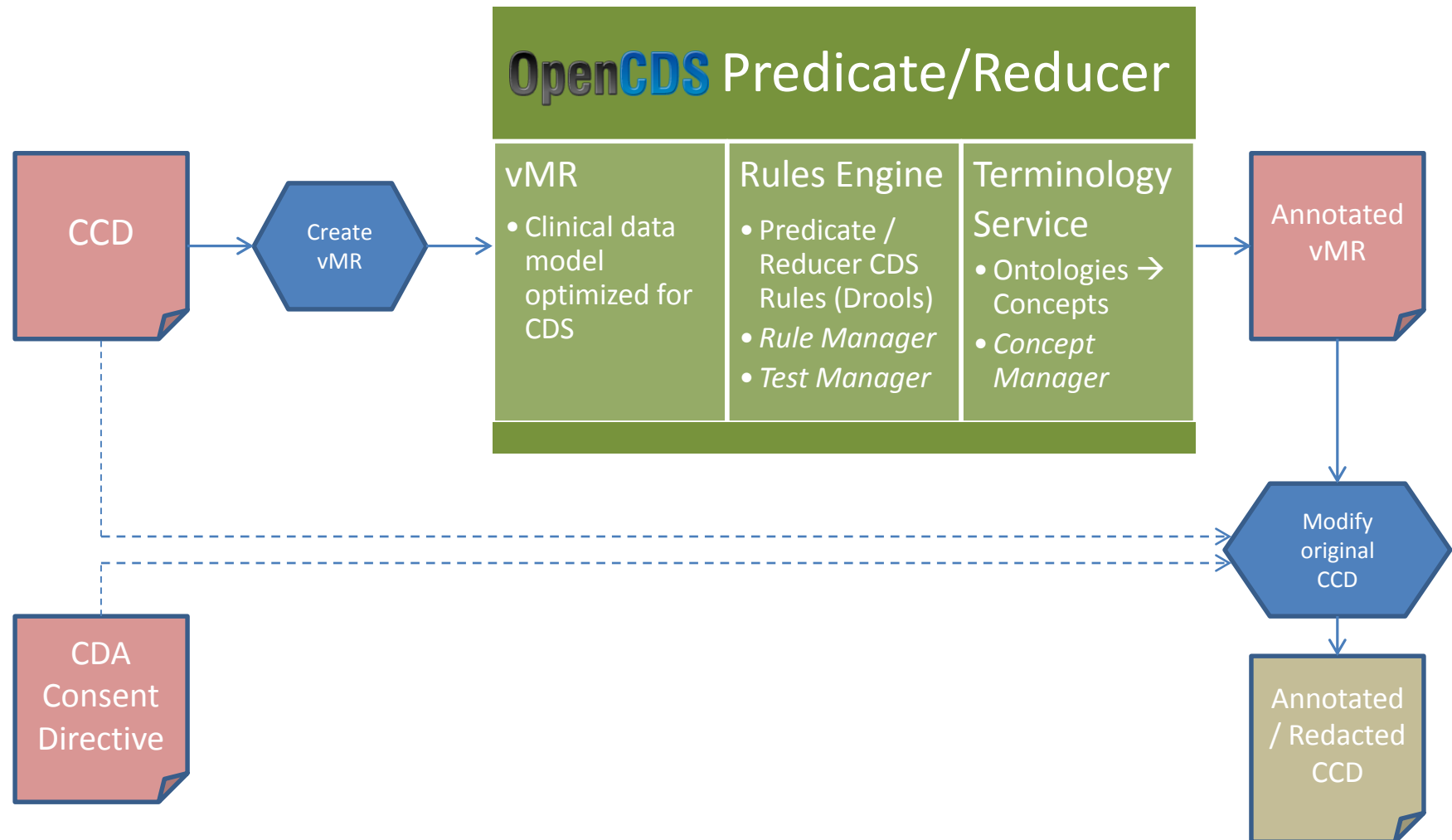
- Open source clinical decision support platform
 - Implements subset of OMG/HL7 Clinical Decision Support Service (CDSS) standard
 - Uses Drools Rules Engine
 - Based on the vMR
- HL7 Virtual Medical Record (vMR)
 - Data model optimized for analysis by clinical decision support engines and used by OpenCDS
 - “Addressing the proliferation of mature but incompatible CDS systems, the HL7 vMR seeks to promote interoperable and scalable CDS efforts by establishing a standard information model for clinical inputs and outputs exchanged between CDS systems and clinical information systems.”

OpenCDS Predicate/Reducer



- ❑ Transform CCD to vMR
- ❑ Execute Predicate Rules and Reducer Rules against:
 - vMR data model
 - Terminology Service (SNOMED CT, LOINC, RxNorm, etc., and custom concepts)
- ❑ Annotate vMR with reducer tags
- ❑ Cross-reference vMR reducer tags to CDA consent directive and original CCD
- ❑ Return redacted CCD

Predicate/Reducer Workflow in ILHIE-SHARPS Prototype



Predicate/Reducer in HIE Architecture



- XDS proxy server installed in front of existing HIE
 - ▣ Intercept inbound XDS Registry/Repository requests
 - ▣ Query for CCD and Consent Directive CDA
 - ▣ Pass CCD and Consent Directive to Predicate/Reducer
 - ▣ Return redacted CCD
- Drug interaction safety checker
 - ▣ Accept proposed medications
 - ▣ Send with unfiltered med list to drug-drug interaction API
 - ▣ Return result
- Consent Manager
 - ▣ Web interface to submit Consent Directive CDA to XDS Registry/Repository

ILHIE-SHARPS Prototype – High Level Architecture

