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A Unified Chart Review Tool Integrating OMOP CDM and Unstructured Data

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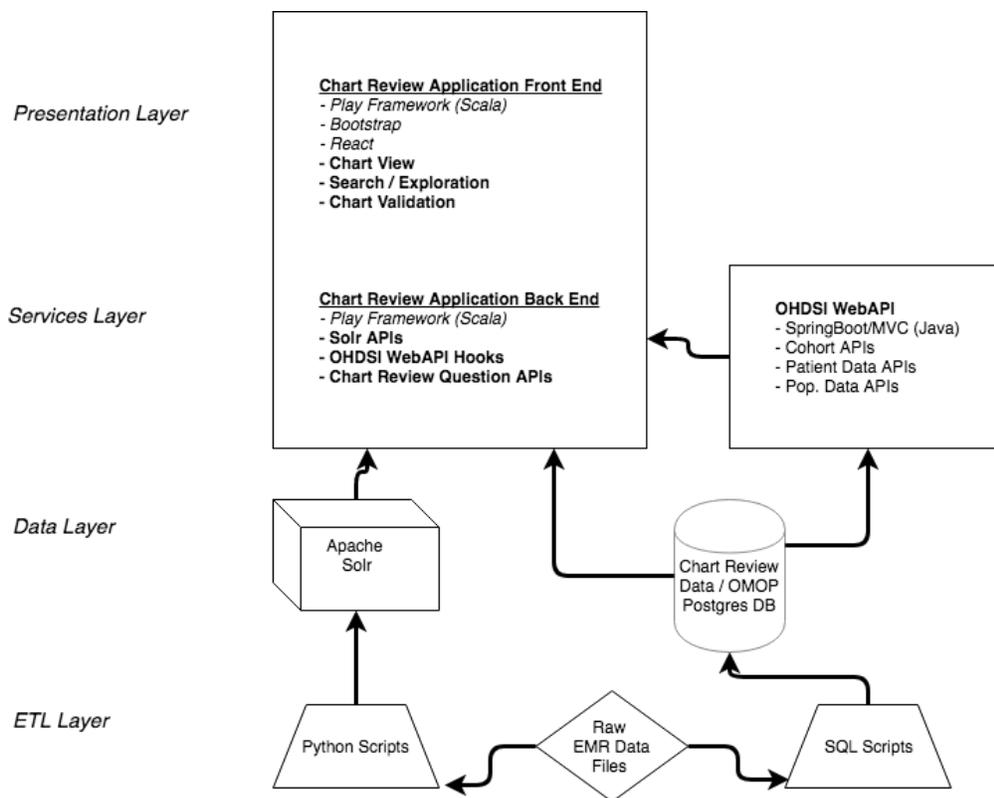
Abstract

Chart review of medical records is a necessary part of clinical research. Validation of clinical outcomes, for example, often requires examination of both structured data (e.g. diagnosis codes) as well as unstructured data (e.g. radiology reports). This software demonstration presents a unified interface for chart review linking the OMOP common data model and unstructured clinical narratives.

Introduction

Chart review of medical records is a necessary part of clinical research. Validation of clinical outcomes, for example, often requires examination of both structured data (e.g., diagnosis codes) as well as unstructured data such as clinical notes and radiology reports. Creating a unified interface to facilitate rapid review of structured and unstructured data is thus an important consideration in chart review and abstraction.[1] Furthermore, to maximize interoperability, chart review tools should support standard data models where they exist.

Methods

We developed an integrated chart reviewing tool to rapidly explore patients with data in the OMOP common data model (CDM) as well as in free text documents. Our review tool uses OHDSI (Observational Health Data Sciences and Informatics) cohorts as the point of entry for chart abstraction. OHDSI cohorts provide a common structure which can be correlated to clinical phenotypes. We used a minimalistic schema to incorporate clinical text narratives, using Apache Solr, an open source text search platform. The application organizes every data point to a cohort index date, supporting the reviewers' ability to review data temporally. We support navigation filters for rapid traversing the chart based on index date (e.g., 365 days after index) as well as limiting content based on text found in structured and unstructured sources (the latter using Solr). The tool's design provides visual clarity for rapidly disambiguating data domains (e.g., drugs, procedures). In addition, the tool provides a customizable list of survey questions to aid in validation studies. This tool has been used effectively in our institution for expert annotation and scanning of cohorts to assess phenotypic accuracy.

Conclusion

Use of the OMOP common data model provides our chart review tool with portability across multiple institutions. Similarly, by allowing a lightweight schema for ingesting documents into Solr, we are able to link unstructured data from multiple sources flexibly. Future additions include features to better support validation of clinical phenotypes, such as structured annotations and comments.

References

1. Allison JJ, Wall TC, Spettell CM, Calhoun J, Fargason Jr CA, Kobylinski RW et al. The Art and Science of Chart Review. The Joint Commission Journal on Quality Improvement. 2000;26(3):115-136.