

# OpenFurther: Federating and Generating OMOP Datasets

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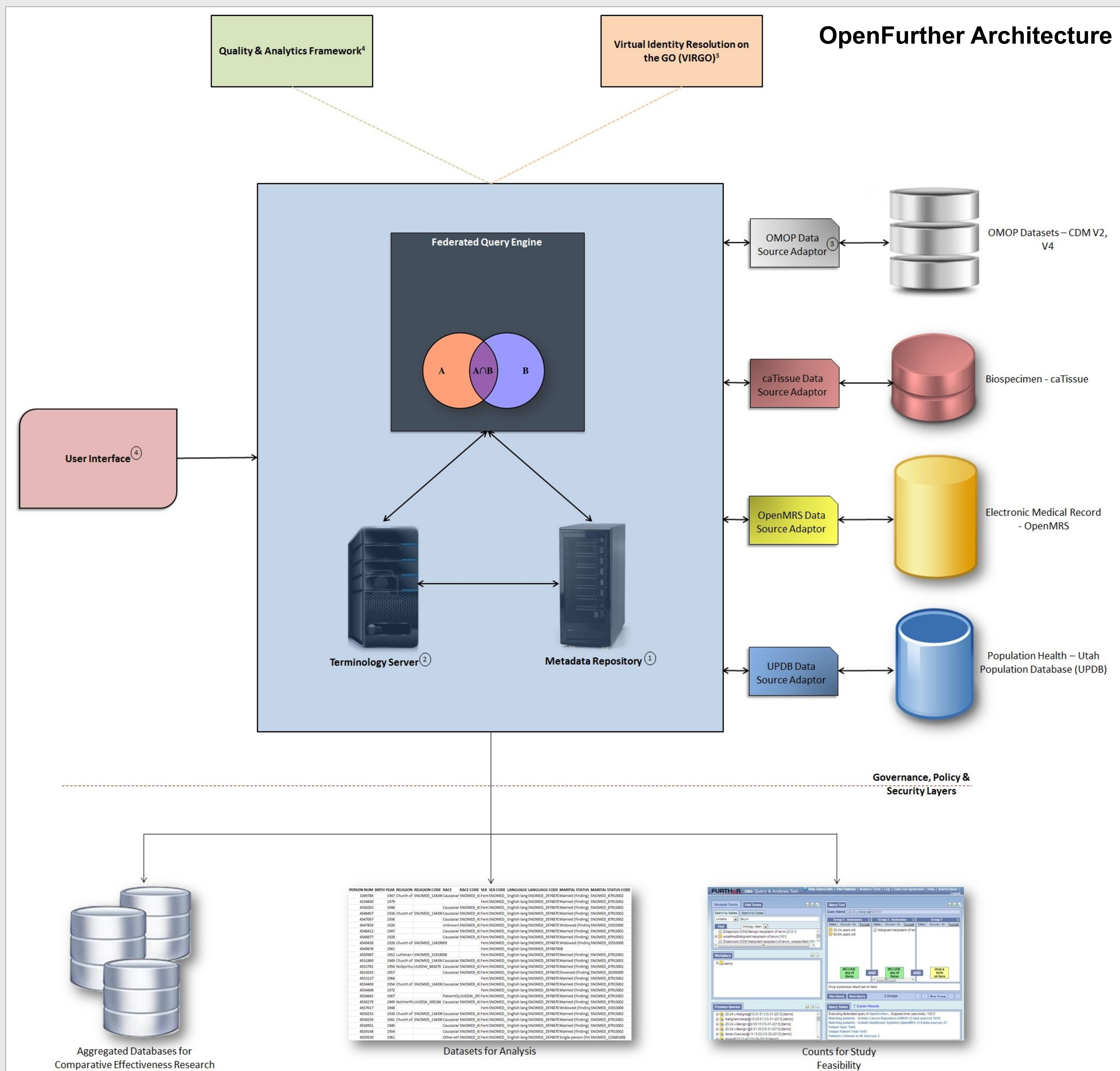
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## Background

- Multiple disparate data sources are using methods provided by the Observational Medical Outcomes Partnership (OMOP) data community to generate datasets in the common data model (CDM).
- These generated datasets often need to be assembled in a centralized repository before they can be used in any comparative effectiveness research (CER) analysis.

## OpenFurther

- OpenFurther<sup>1,2</sup> is an open-source informatics platform that supports federation and integration of data from heterogeneous and disparate data sources.
- By using pre-programmed data source metadata and adaptors, it is able to provide semantic and syntactic interoperability for federating health information on-the-fly and in real-time. It requires neither data extraction nor homogenization by data source partners, facilitating integration by retaining data in their native format and in their originating systems.
- It resolves identities of unique individuals from these sources<sup>3</sup> and assesses the data quality of a data source<sup>4</sup>.
- It supports distributed and centralized governance models and controls access to data based on institutional review board approvals.



## Conclusion

- OpenFurther can federate OMOP datasets in different versions of the CDM with other heterogeneous clinical, public health and biospecimen data from multiple data sources.

## References

- Bradshaw, R. L. et al. Architecture of a Federated Query Engine for Heterogeneous Resources. AMIA Annu Symp Proc 2009, 70-74 (2009).
- Livne, O. E., Schultz, N. D. & Narus, S. P. Federated Querying Architecture with Clinical & Translational Health IT Application. Journal of Medical Systems 35, 1211-1224 (2011).
- Warner PB, Mo P, Schultz ND, Gouripeddi R, Narus SP, Facelli J. On the Fly Linkage of Records Containing Protected Health Information (PHI), AMIA 2013.
- Rajan NS, Gouripeddi R, Facelli J. A Service Oriented Framework to Assess the Quality of Electronic Health Data for Clinical Research, IEEE International Conference on Healthcare Informatics 2013.

## Objective

- To extend the capabilities of OpenFurther to federate OMOP datasets generated from disparate data sources.
- To generate OMOP datasets from multiple disparate data sources.

## Methods

- We mapped OMOP's CDMs to the OpenFurther model and stored them within a metadata repository for consumption by the translation processes<sup>1</sup>.
- OMOP common vocabularies were analyzed, mapped to the standard terminologies used by OpenFurther, and then loaded into a terminology server<sup>2</sup>.
- OMOP data source adaptors were developed to facilitate interoperability among OMOP and other datasets<sup>3</sup>.
- These translational and terminology mappings provide the ability to export non-OMOP data source into any version of the OMOP CDM.
- Finally, we updated OpenFurther's User Query Tool to support querying of OMOP datasets<sup>4</sup>.

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