

Securing Access to Sensitive RDF Data

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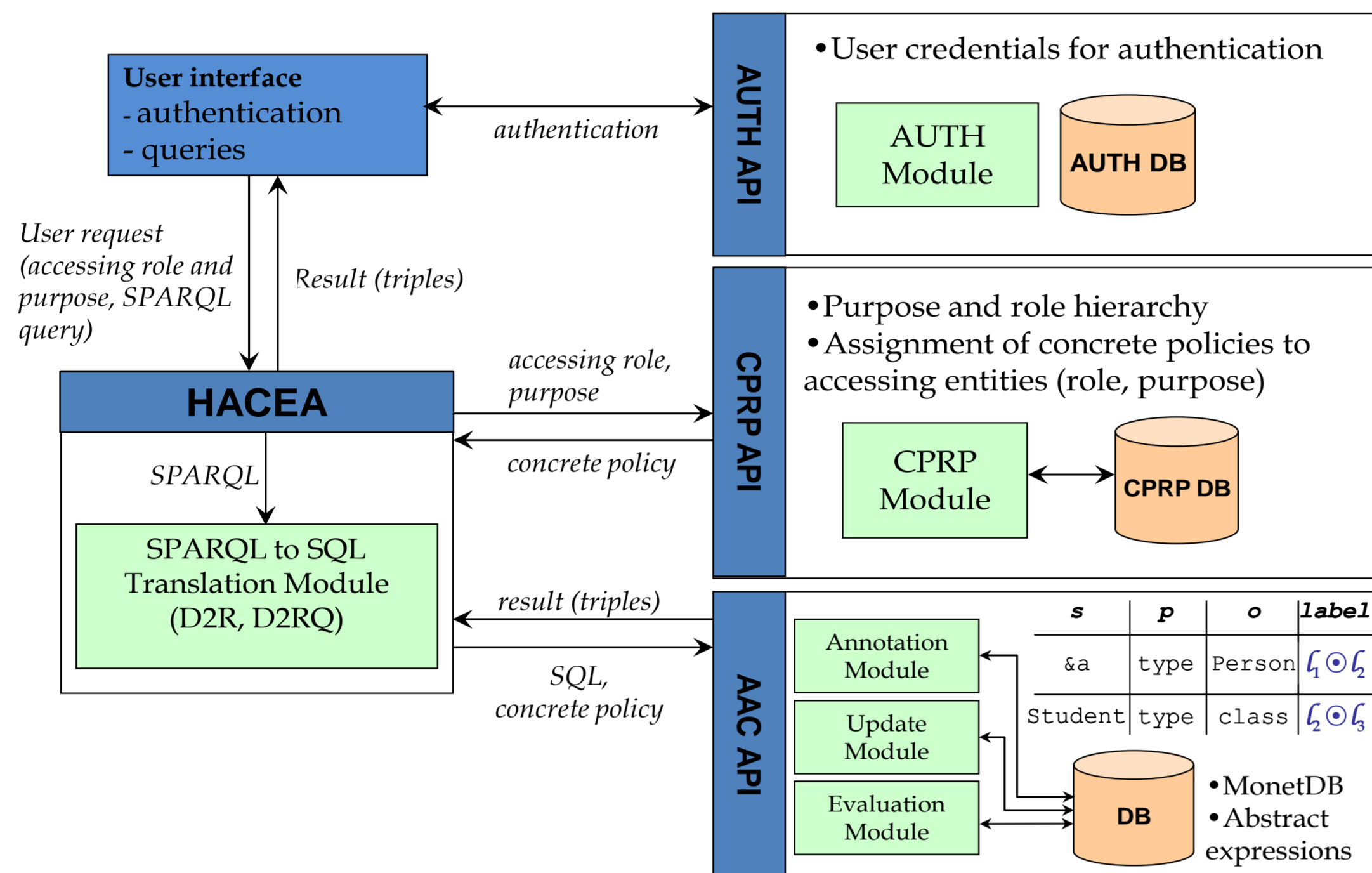
Access Control:

- Refers to the ability to *allow or deny* access to certain information resources for certain entities (selective exposure)
- Crucial for sensitive content (e.g., medical information, personal data)
- Important for the publication of *Linked Open Data*

Focus: Linked Open Data

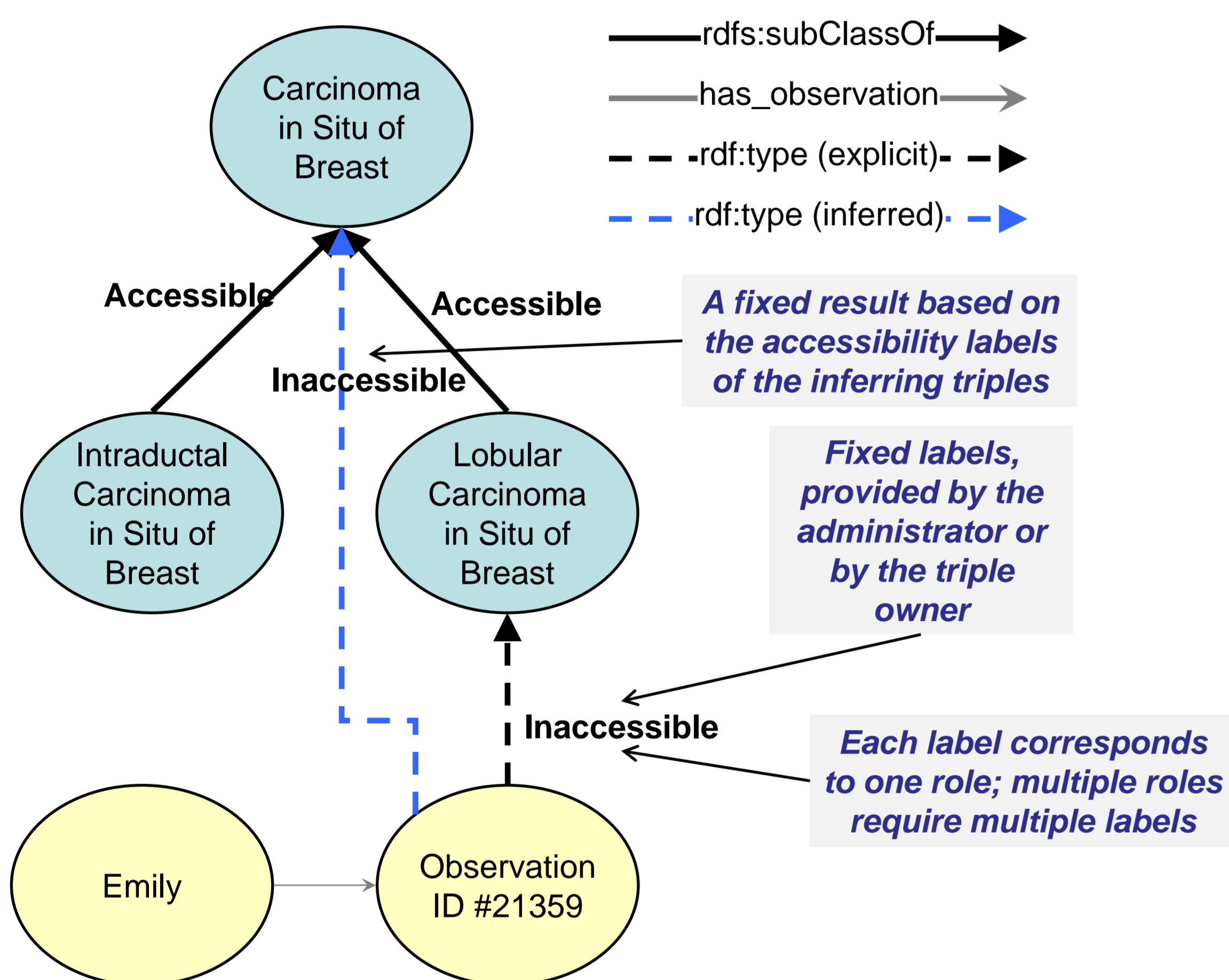
Addressed Challenges:

- RDFS Inference
- Multiple roles, each with its own access control policy
- Data updates
- Dynamic access control policies

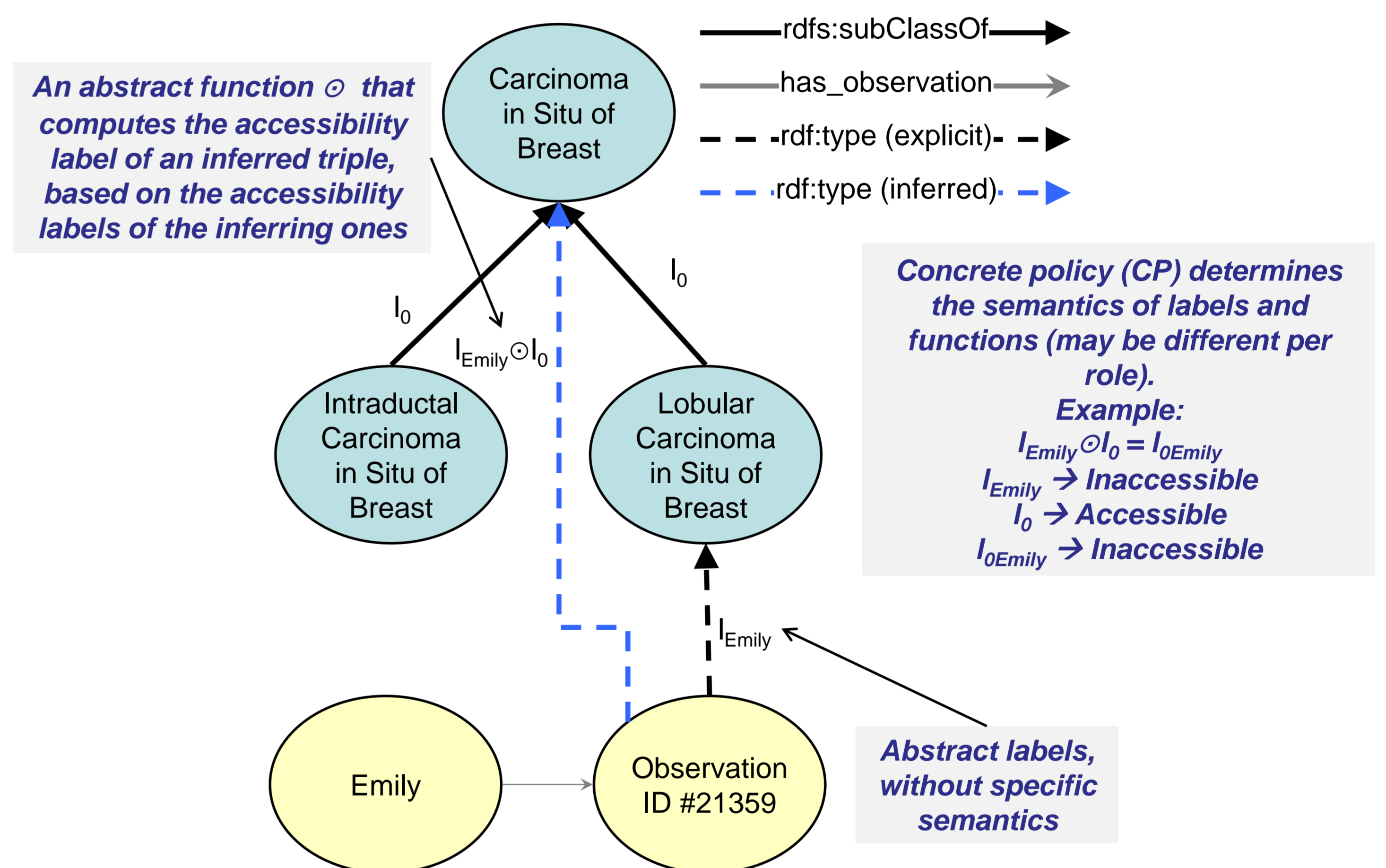


- **AUTH**: user authentication
- **CPRP**: concrete policies management
- **ACC**
 - **Annotation Module**:
 - Assigns abstract tokens to triples
 - Computes the closure of RDF dataset
 - **Update Module**: Updates annotated quadruples
 - **Evaluation Module**: Evaluates translated SQL queries

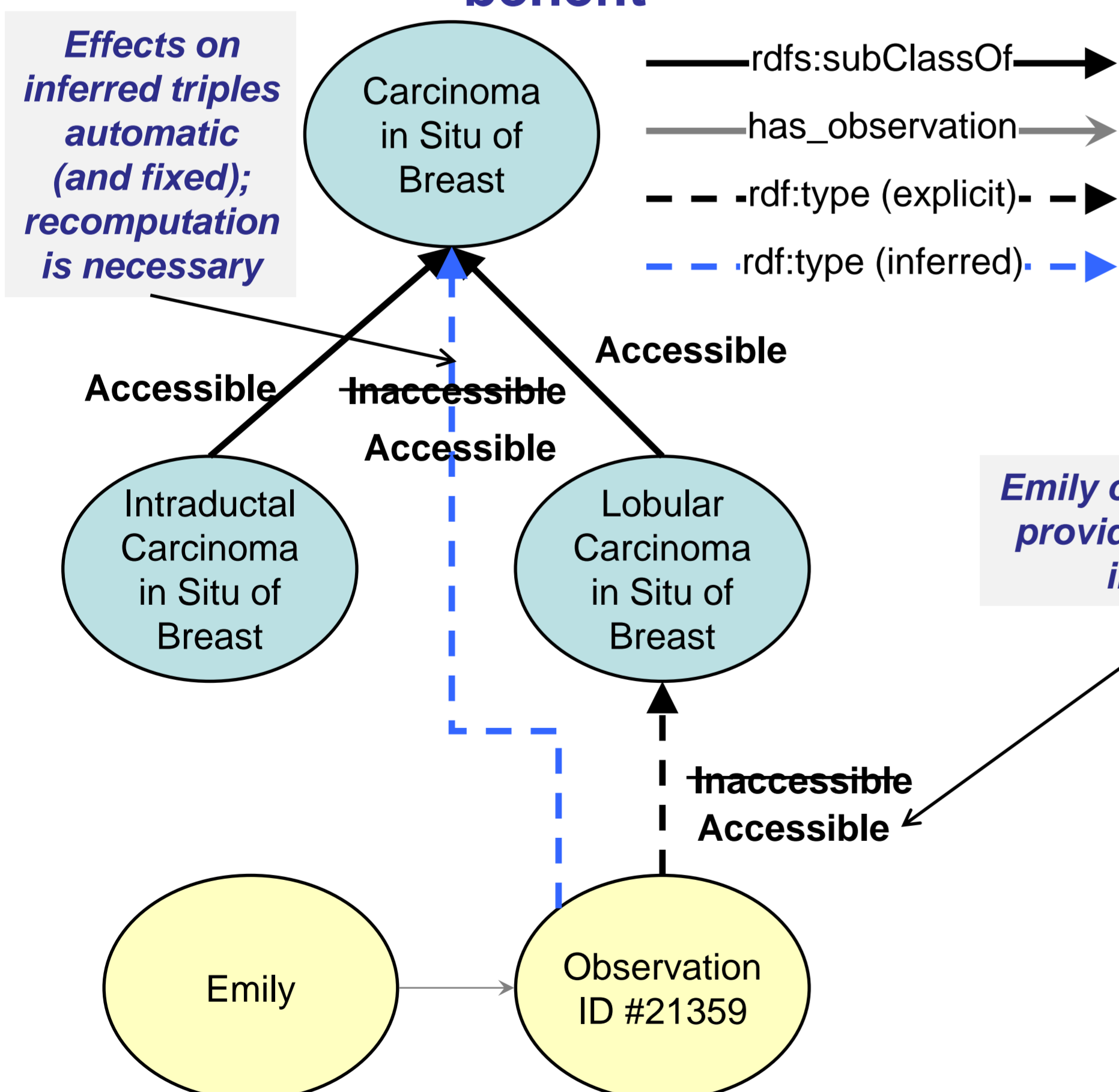
Annotation Models (most common approach)



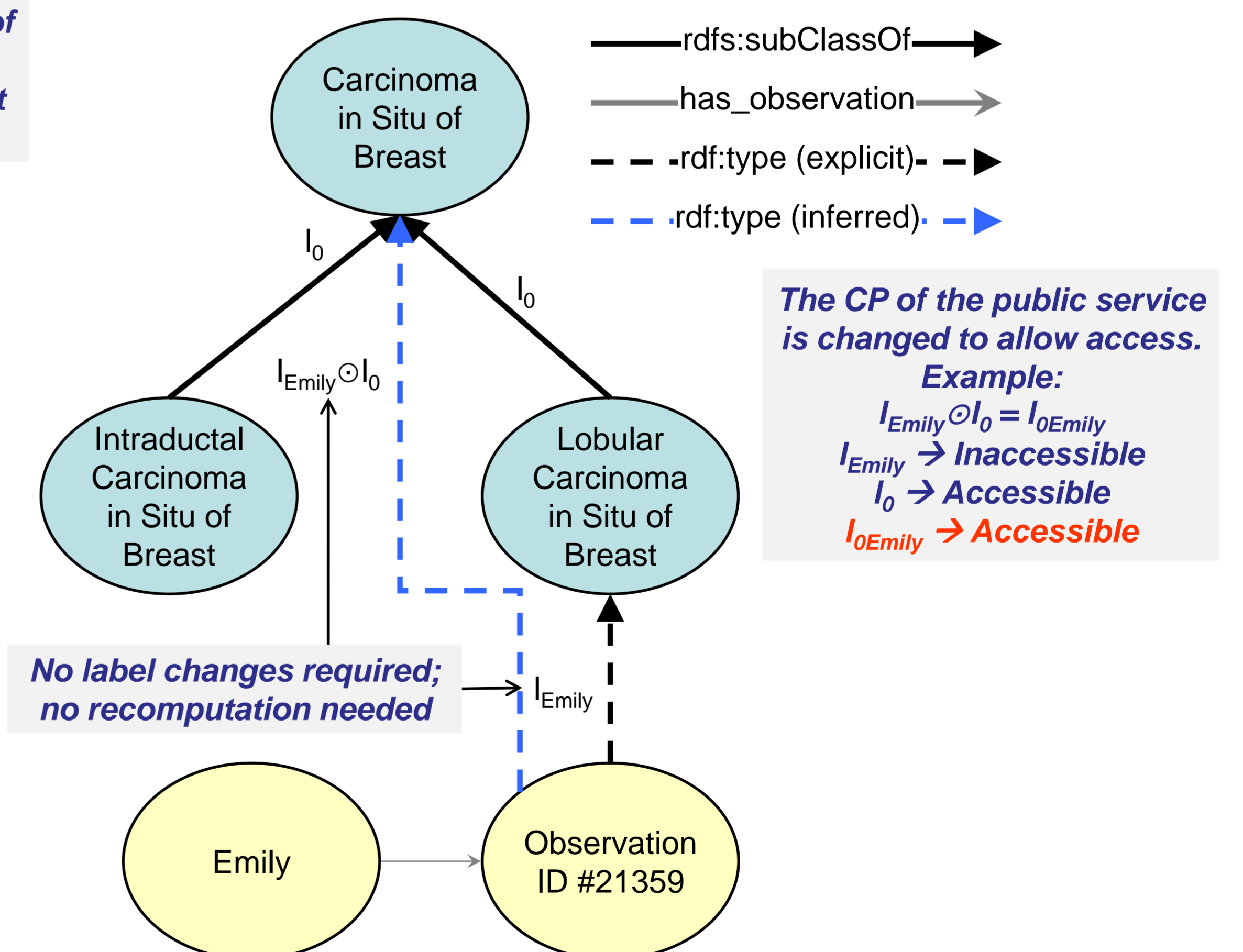
Abstract Models (our proposal)



Scenario: a public service requires evidence that a patient suffers from cancer in order to provide a benefit



No need for Emily to unveil the exact type of cancer; only the inferred triple is required. This can be done with abstract models, but is not possible with annotation models.



Annotation Models:

Suitable for *static* data and access control policies

- Recomputation necessary following every change (including changes in the labels and/or changes in the data itself)
- Fixed and inflexible semantics
- Replication needed to support multiple policies or roles

Abstract Models:

Suitable for *dynamic* data and access control policies

- No recomputation needed during updates
- Better support for dynamic data/access control policies, at a small overhead in evaluation and initialization time (and space)
- Multiple policies or roles, each with its own concrete policy

More details on this work can be found at:

- [1] V. Papakonstantinou, M. Michou, I. Fundulaki, G. Flouris, G. Antoniou. Access Control for RDF Graphs Using Abstract Models. In SACMAT, 2012.
- [2] G. Flouris, I. Fundulaki, V. Papakonstantinou. Abstract Access Control Model for Dynamic RDF Datasets. In EDF, 2012.
- [3] G. Flouris, I. Fundulaki, M. Michou, G. Antoniou. Controlling Access to RDF Graphs. In FIS, 2010.
- [4] G. Flouris, I. Fundulaki, M. Michou, G. Antoniou. Access Control for RDF: Experimental Results. In Poster Session of FIS, 2010.

Acknowledgements

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