



Thymeflow A Personal Knowledge Base with Spatio-temporal Data

thymeflow.com

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1 Problem

- **Personal Information** is **spread** over several devices and services
 - **Loss of functionalities** due to fragmentation
 - **Loss of control** over the data: control of privacy & sharing
- **Vendor lock-in**: Commercial systems often function as data traps, providing **little integration** between each other

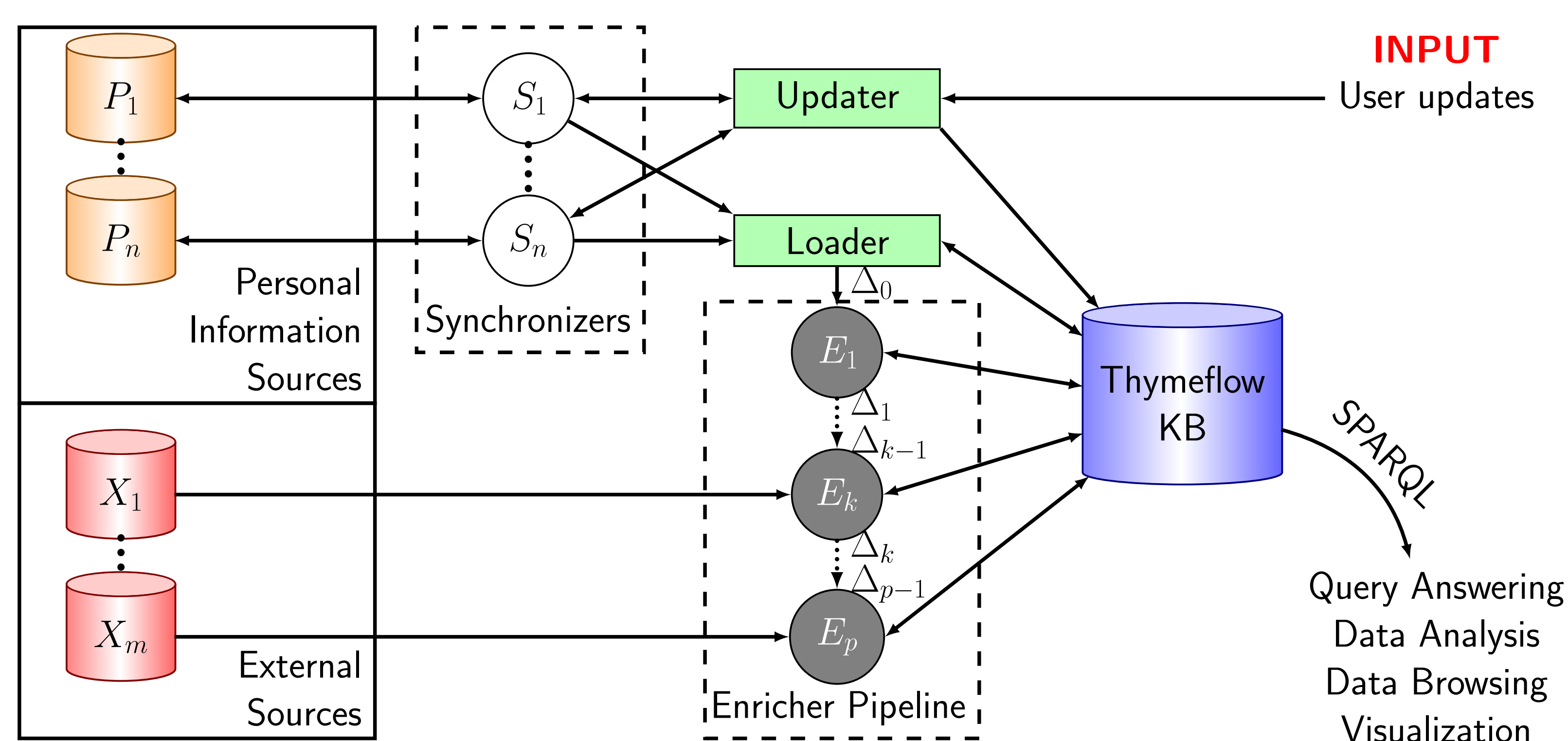
2 Personal Information Management System

Thymeflow is an **open-source** system that **integrates personal data** from **different sources**, allowing **global querying** and **analysis**.

- Backend: HTTP Server (Scala) with REST API and SPARQL endpoint (RDF4J)
- Frontend: Web app (Ember.js)
- Mobile App (for location history)

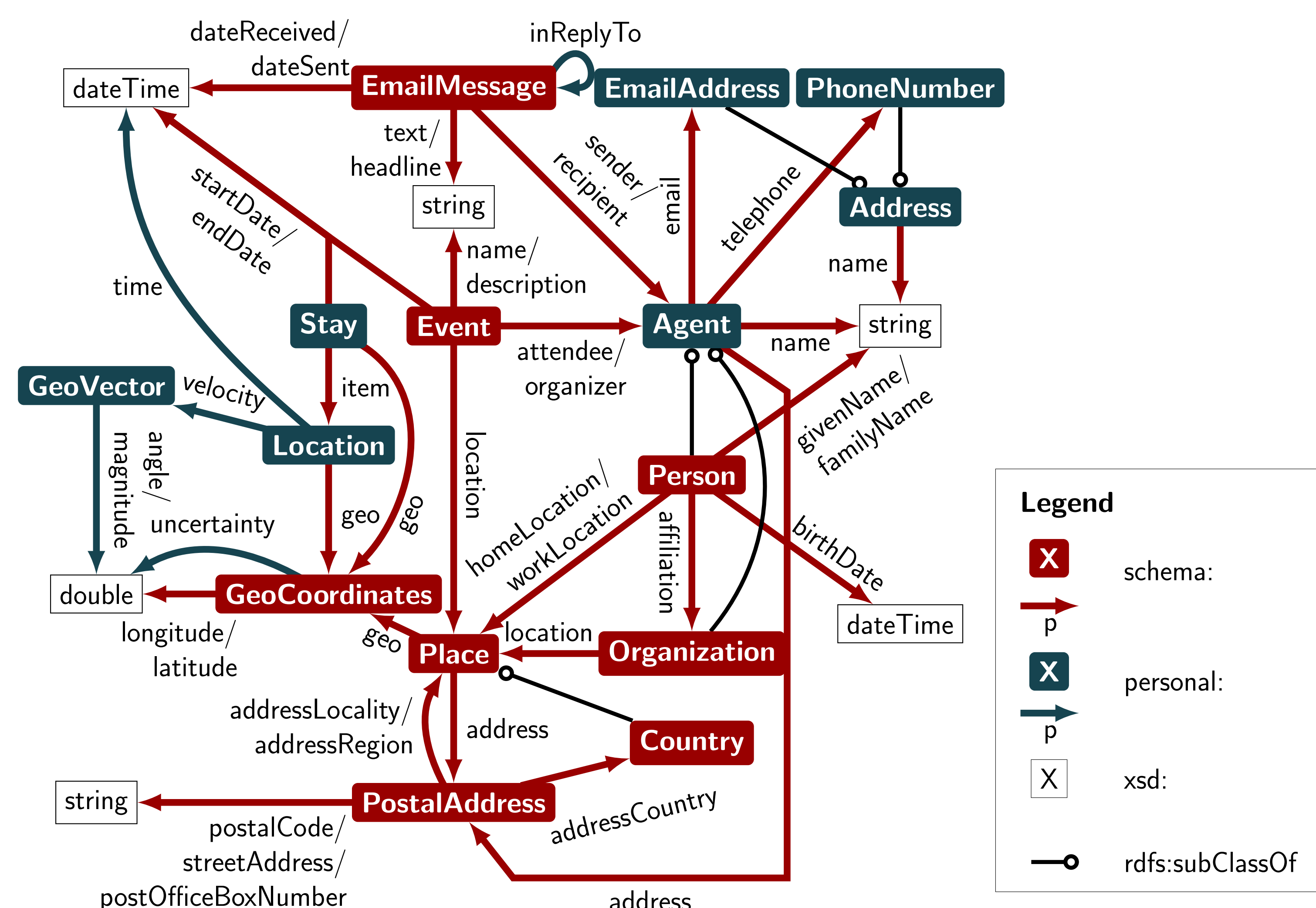
Repositories: <https://github.com/thymeflow>

3 System architecture



4 Model

- **RDF model** using **Named graphs** to track **provenance**
 - schema: `<http://schema.org/>`
 - personal: `<http://thymeflow.com/personal#>`
- Classes: `personal:Agent`, `schema:Event`, `personal:Location`, `schema:EmailMessage`



5 Synchronization

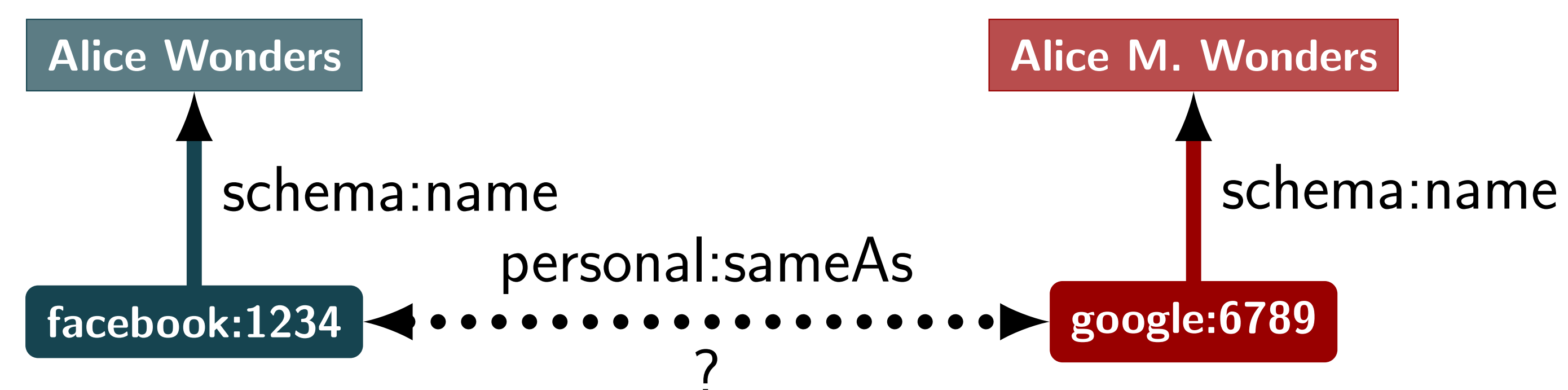
Synchronizers transform data into knowledge and synchronize data sources with the **knowledge base**. Supported protocols:

- Contacts (vCard/CardDav/Facebook Graph API)
- Calendar (iCalendar/CalDav/Facebook Graph API)
- Email (IMAP)
- Location History (Google's JSON format)

Thymeflow can connect to a data source via OAuth (Google, Facebook, Microsoft), with a username/password (IMAP), or import a flat file.

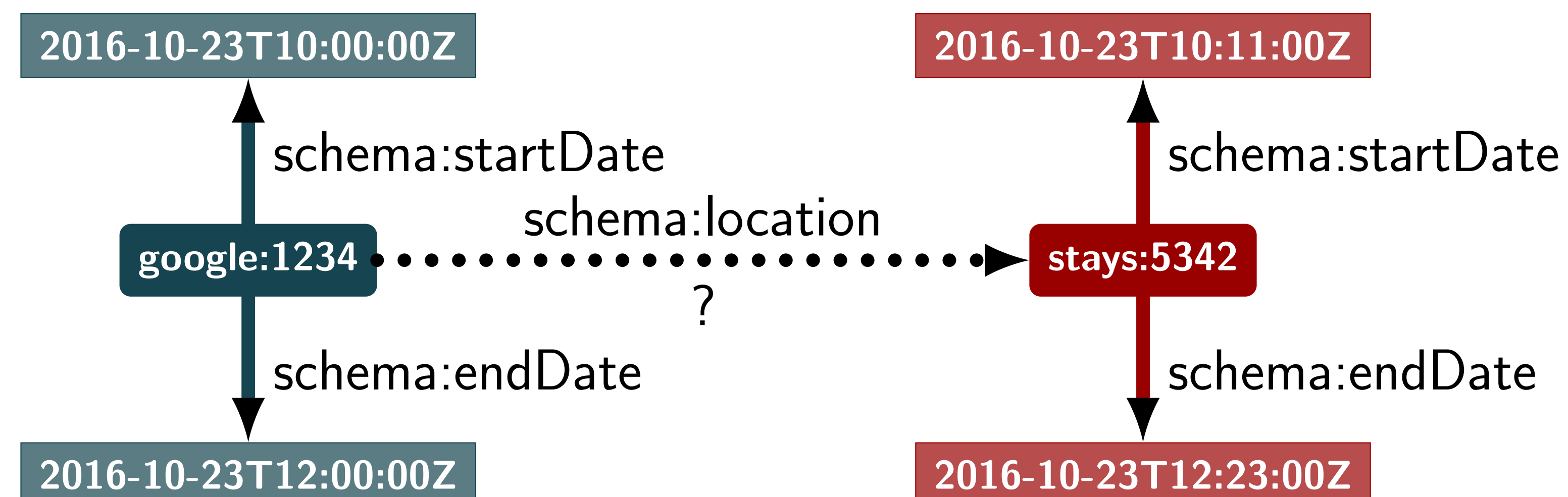
6 Knowledge Enrichment

- **Entity Resolution** (Matching entities with similar attributes)

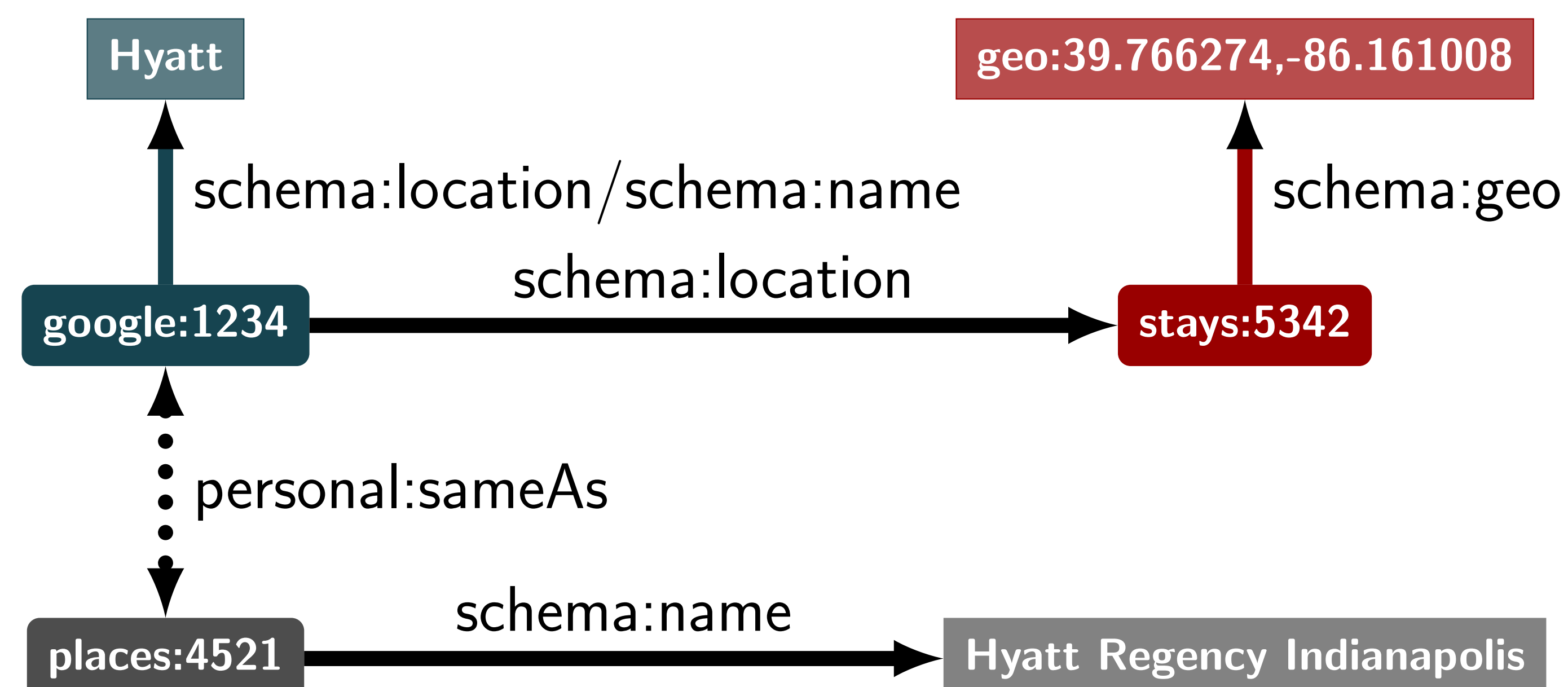


- Location History **Stay Extraction** (time-based clustering)

- **Matching Events with Stays**



- **Geocoding Event locations** using **Stays**



7 Use-cases

- Get me the list of telephone numbers of my birthday party guests
- Show me the places I visited during my previous trip to Paris
- Tell me who I most frequently communicate with
- Show me clusters of my friends and the events they attended

