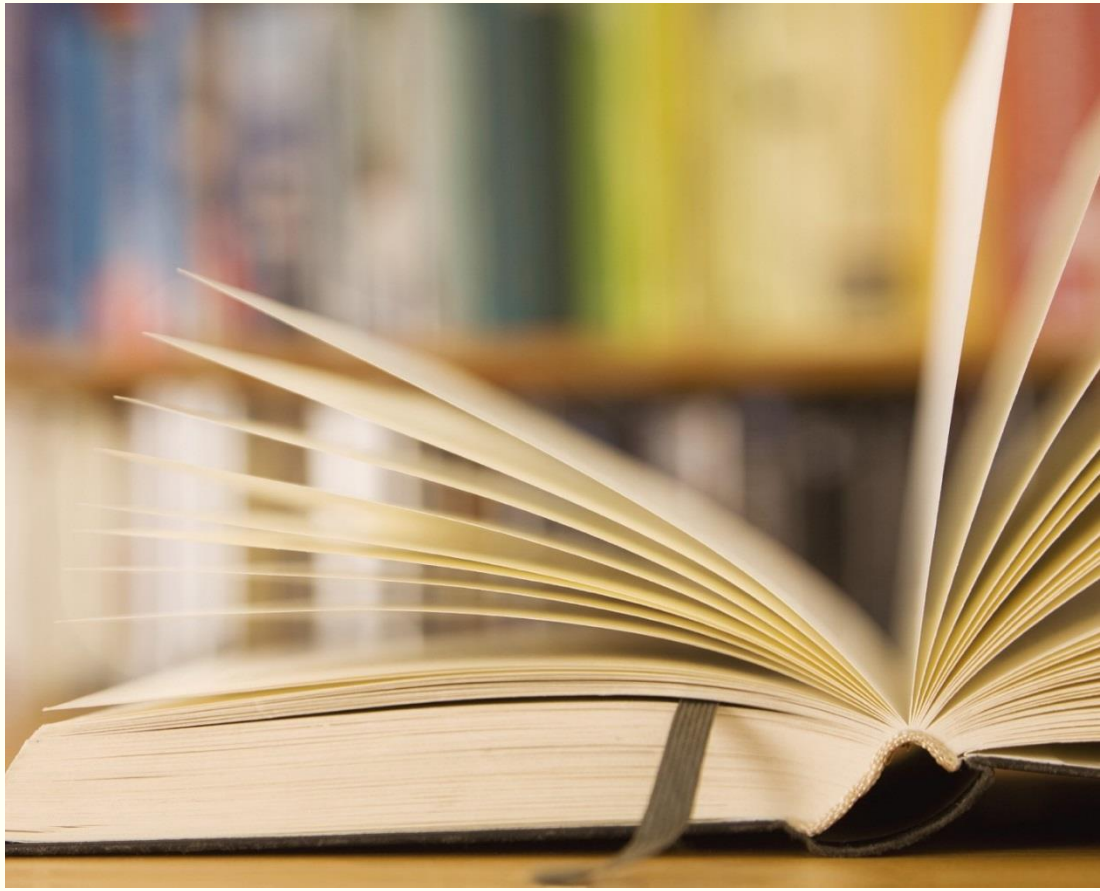
A Semantic Annotation System for Web of Things



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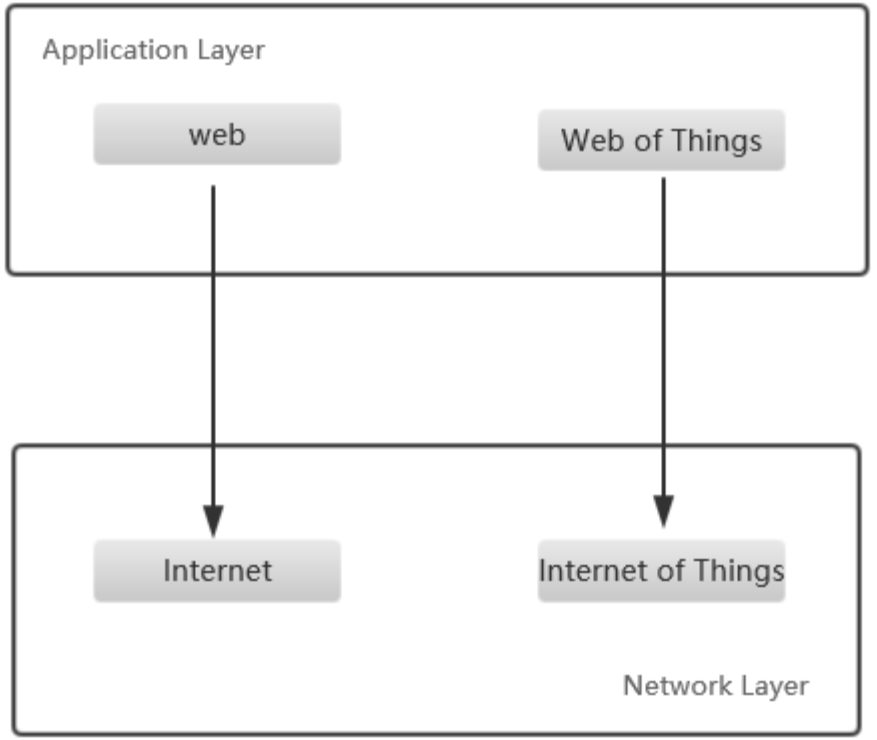
Project No. : RC_3144

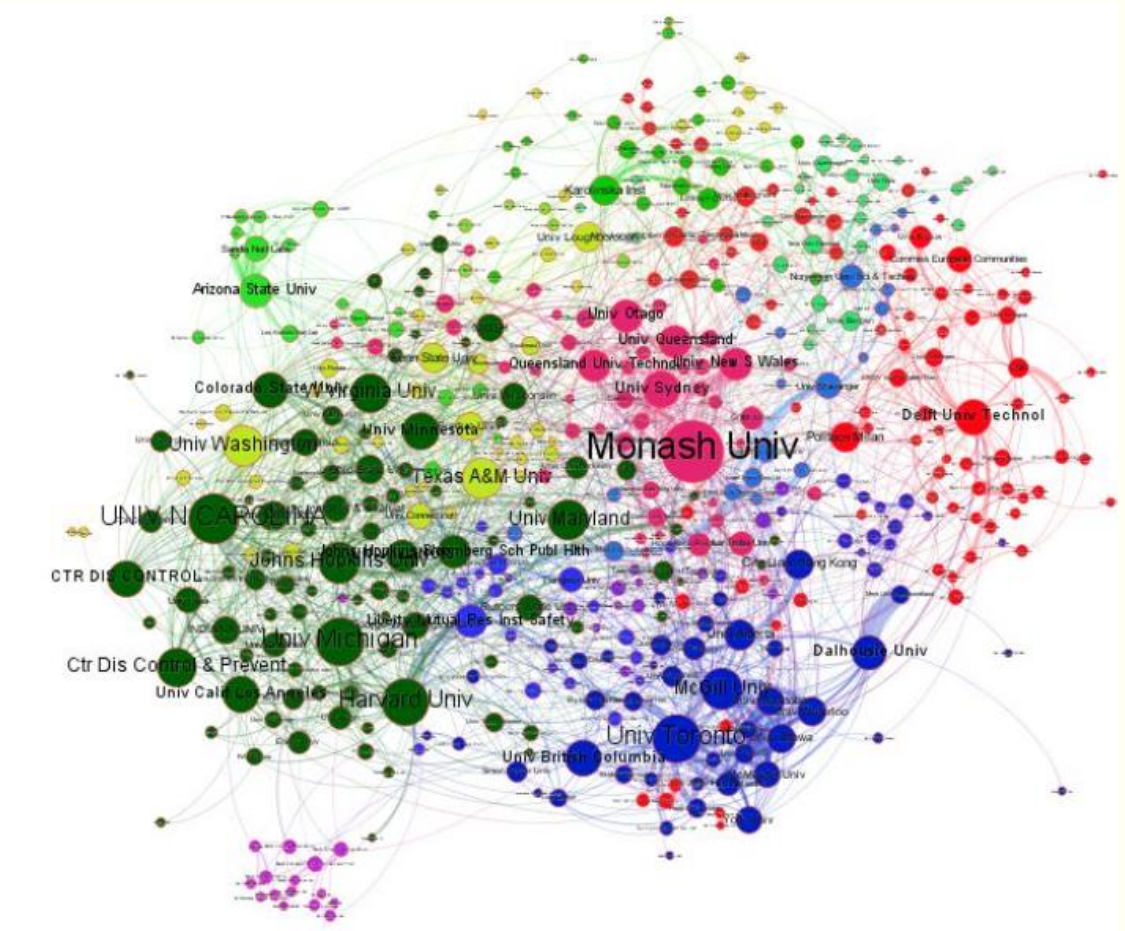
Web of Things

- Reuse web pattern and protocols
- Simplify the application creation
- Make things part of WWW



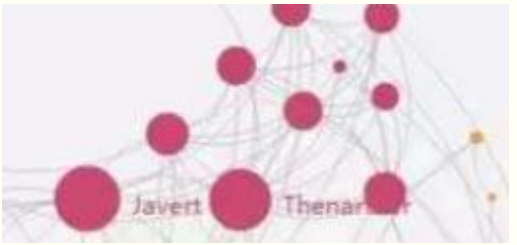
Semantic annotation

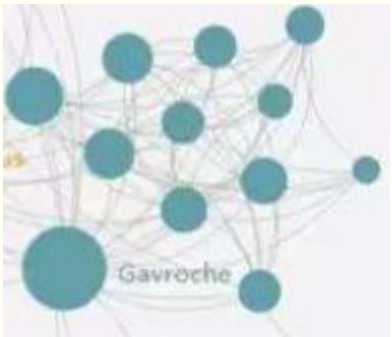
- Metadata
- Construct a knowledge graph
- Machine understandable



Present status

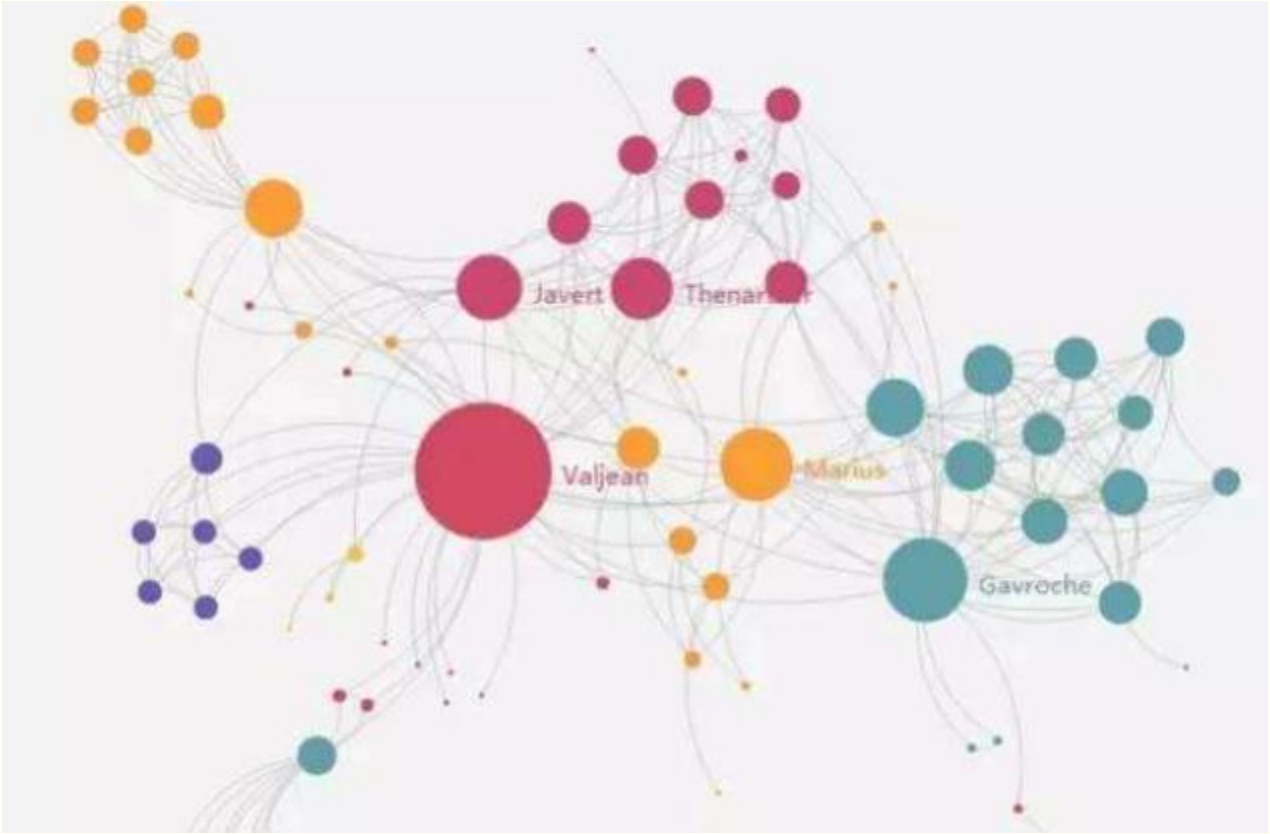
- Domain specific knowledge base
- Isolation among WoT application



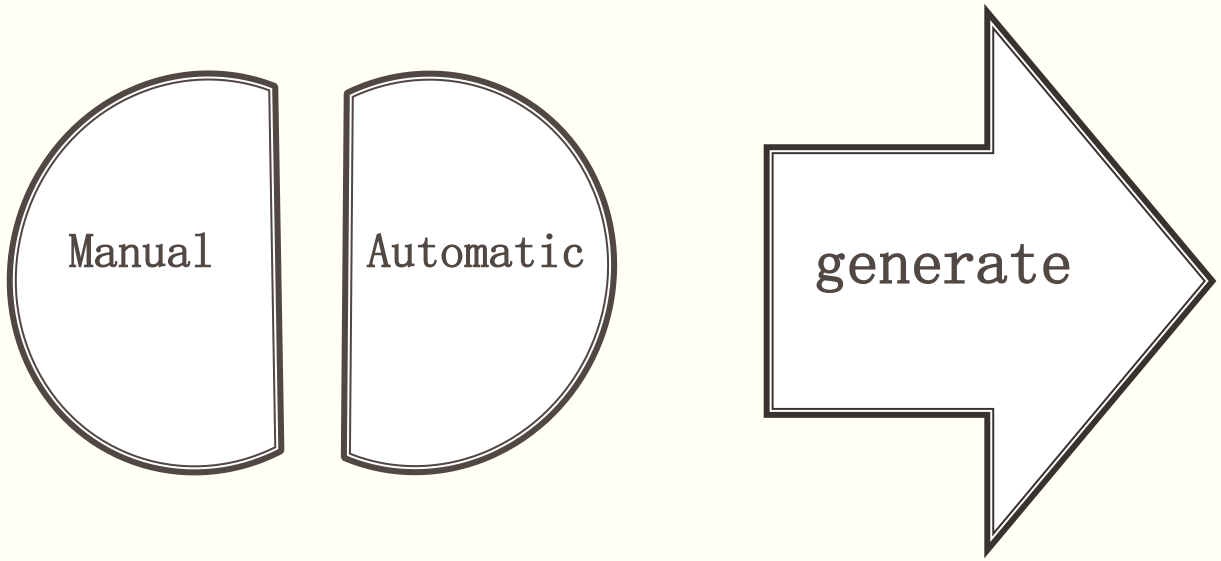


Motivation

- Connect them together
- Growing body
- Ambiguity : different definition but the same meaning
- Take a global domain independent knowledge base as medium



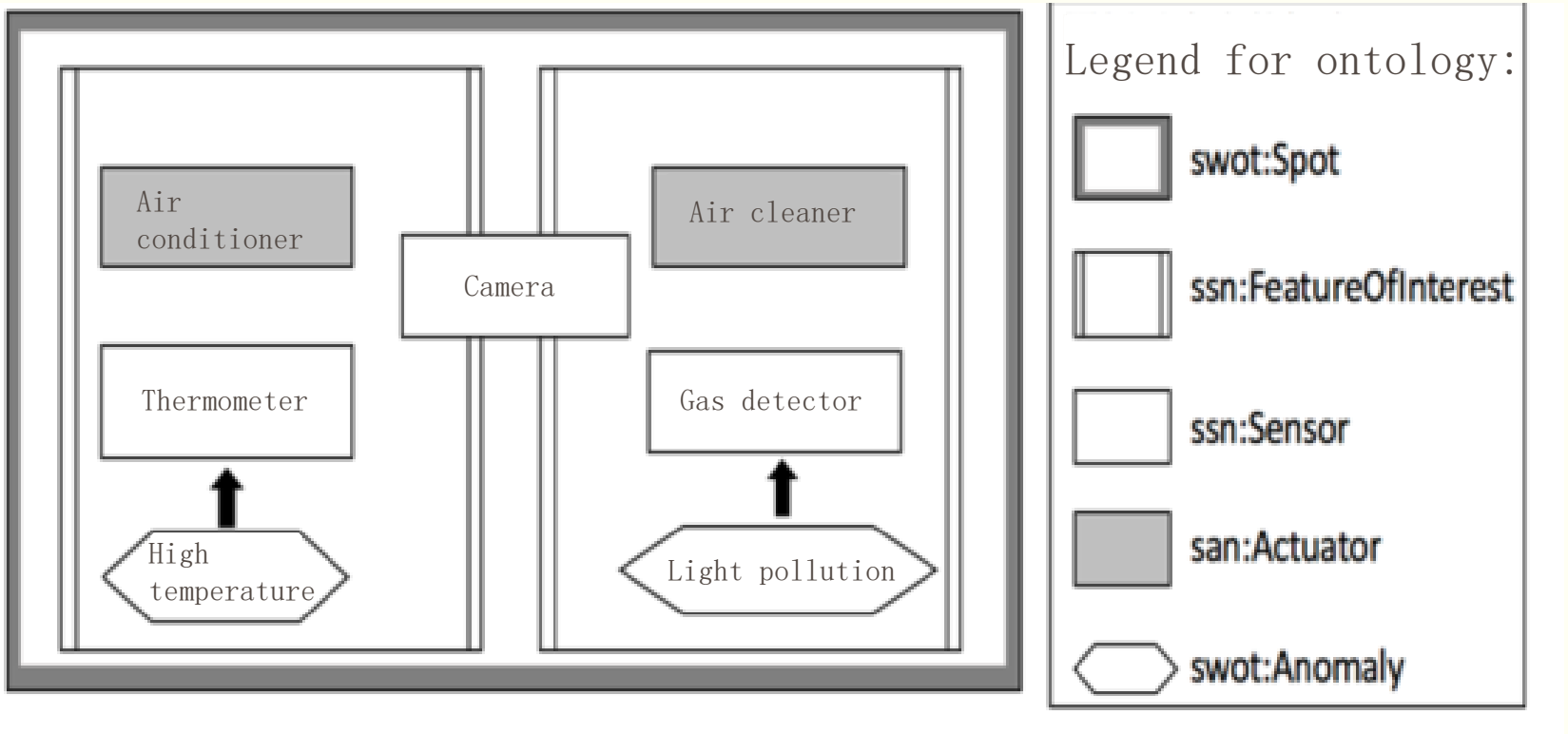
Semantic annotation system



Networked knowledge infrastructure

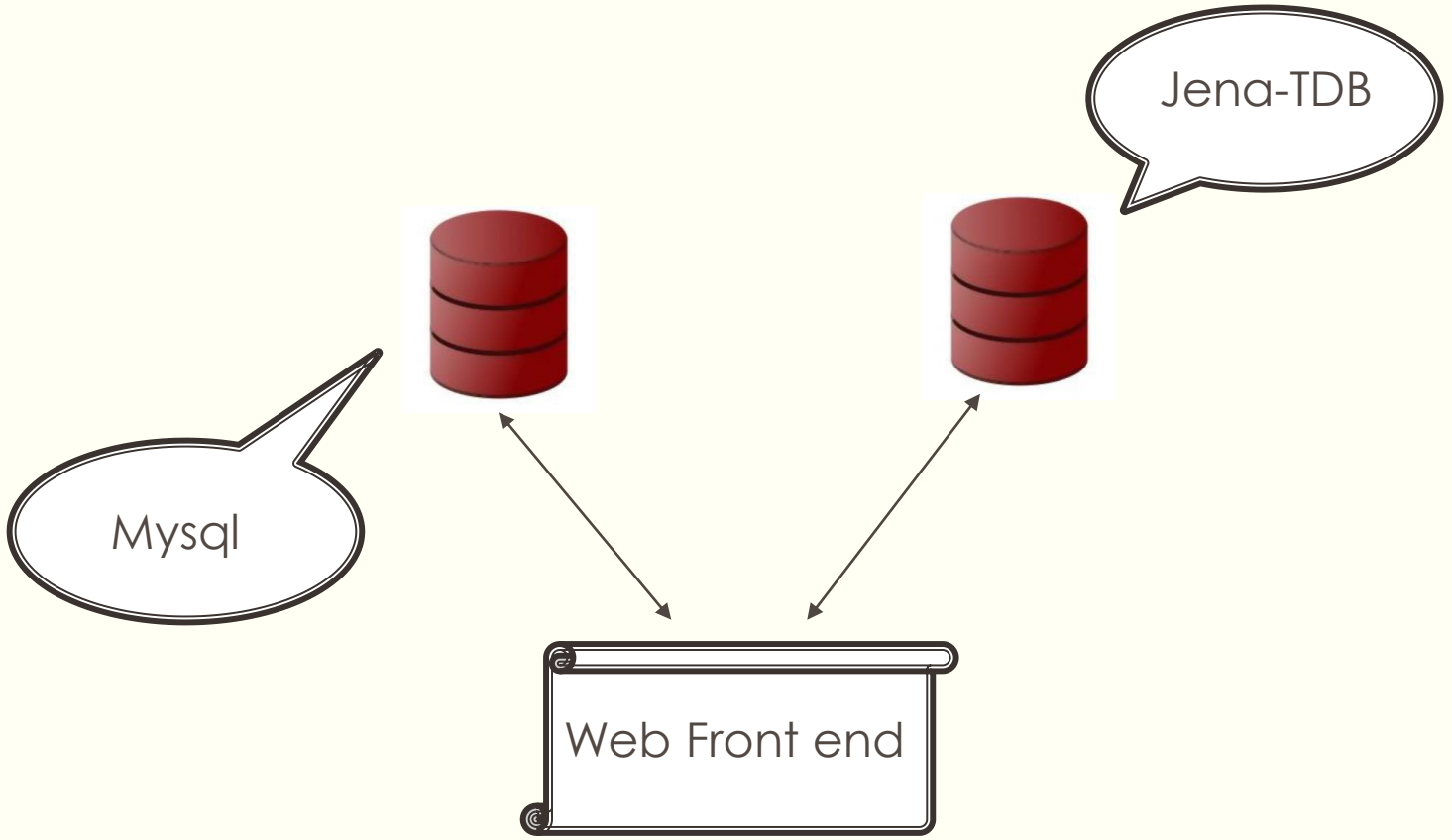
Manual annotation tool

Ontology design



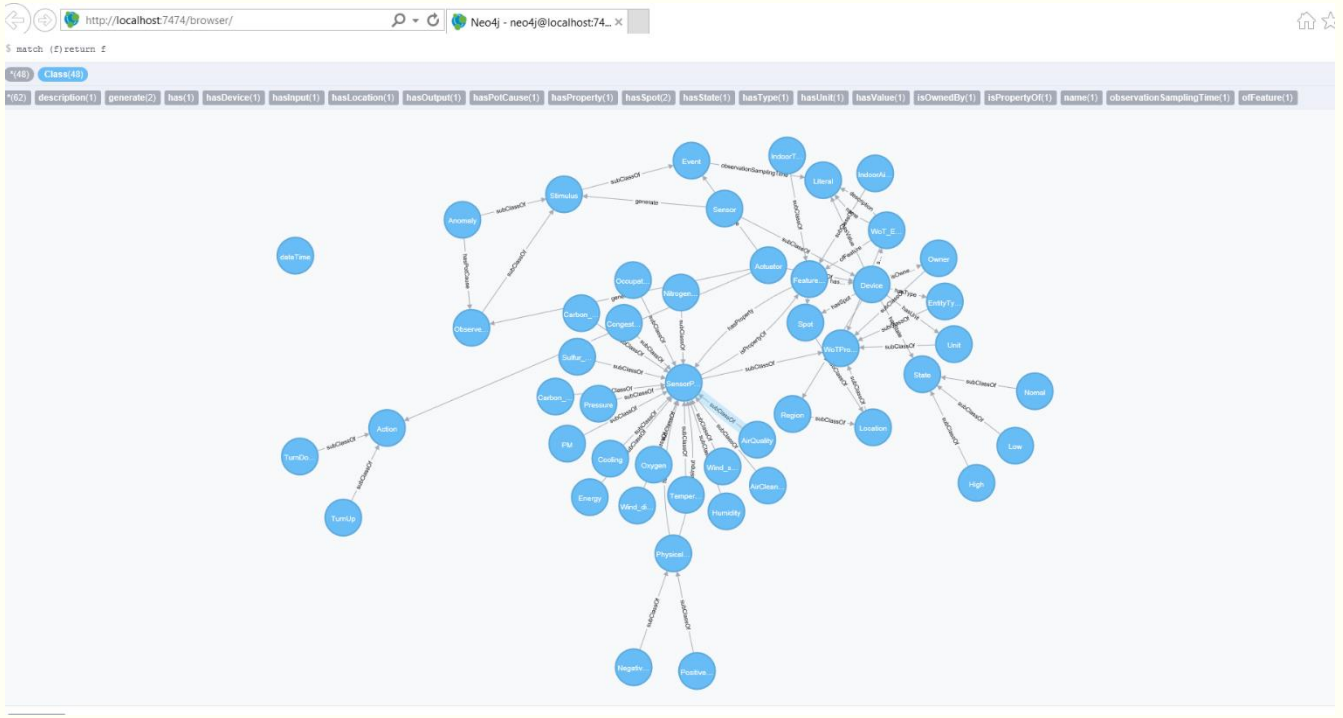
Manual annotation tool

Proof-of-concept Implementation



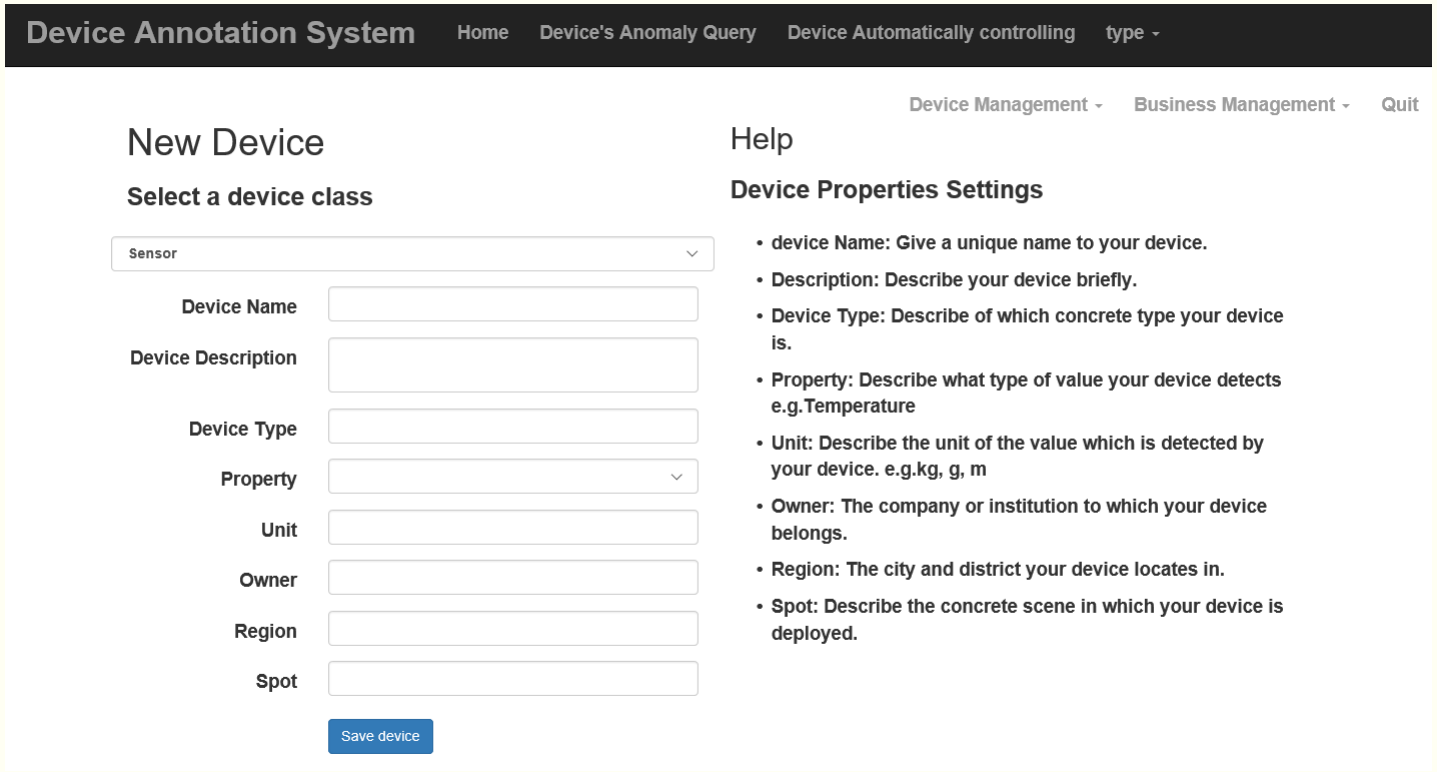
Manual annotation tool

Initial local knowledge base



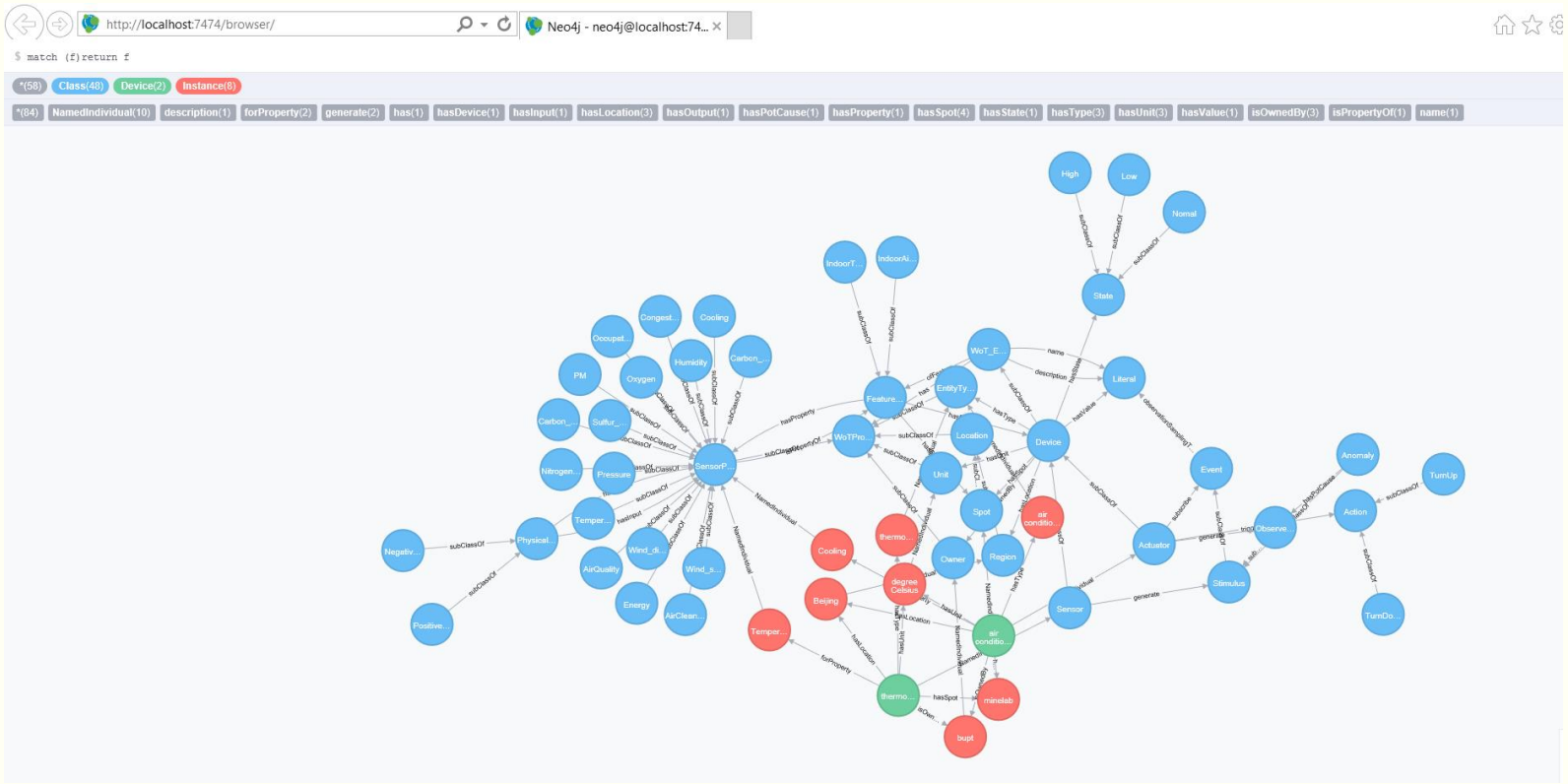
Manual annotation tool

Input UI



Manual annotation tool

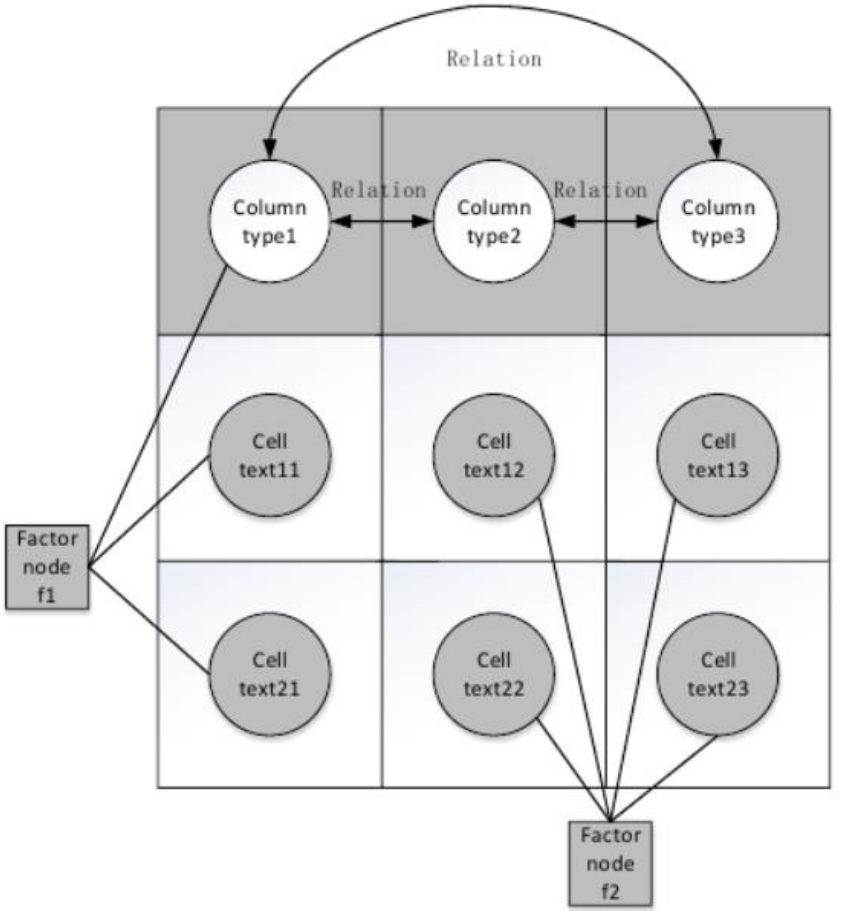
Local knowledge base after manual annotation



Automatic annotation tool

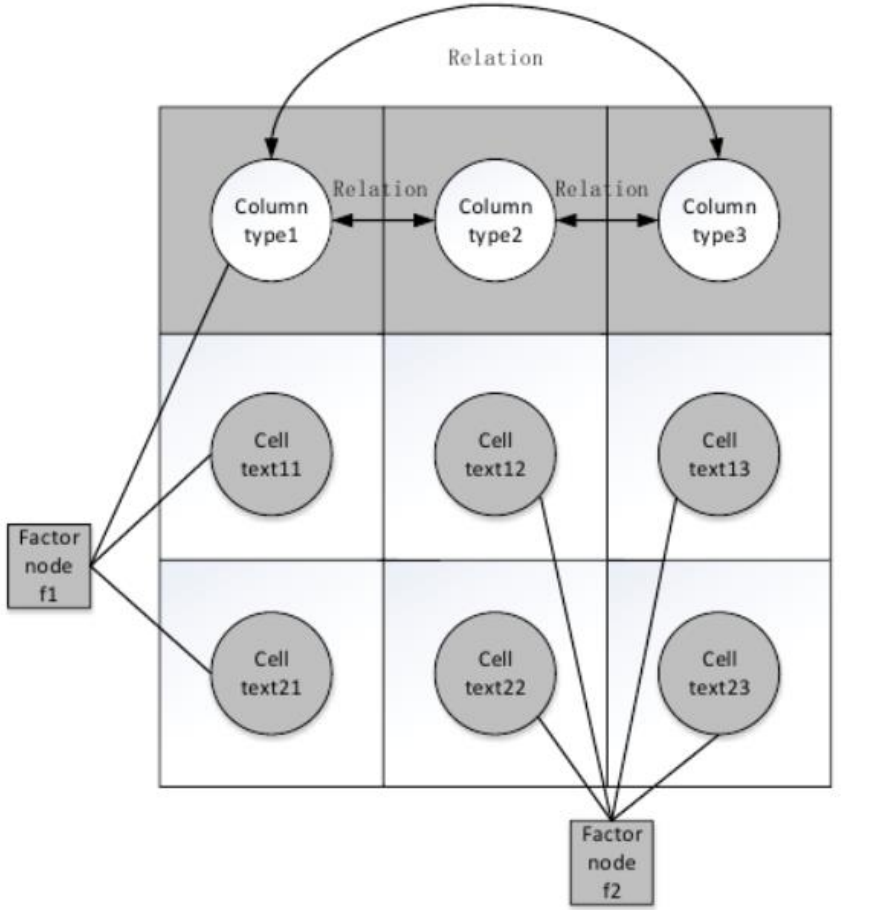
Factor graph model

City	*State*	*Mayor*	*Population*
Baltimore	MD	S.Rawlings-Blake	640,000
Philadelphia	PA	M.Nutter	1,500,000
New York	NY	M.Bloomberg	8,400,000
Boston	MA	T.Menino	610,000



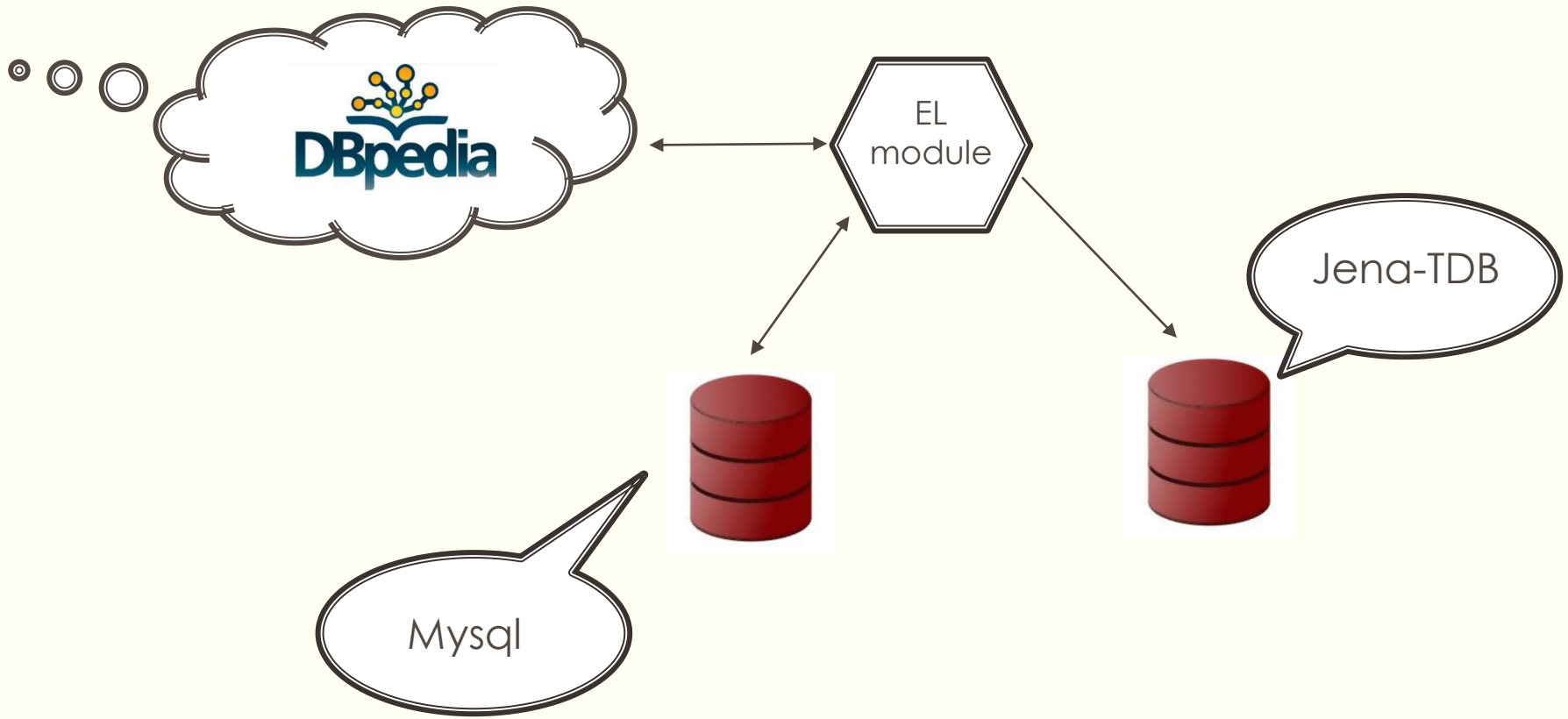
Automatic annotation tool

- Message passing
- Iterative
- Entity linking



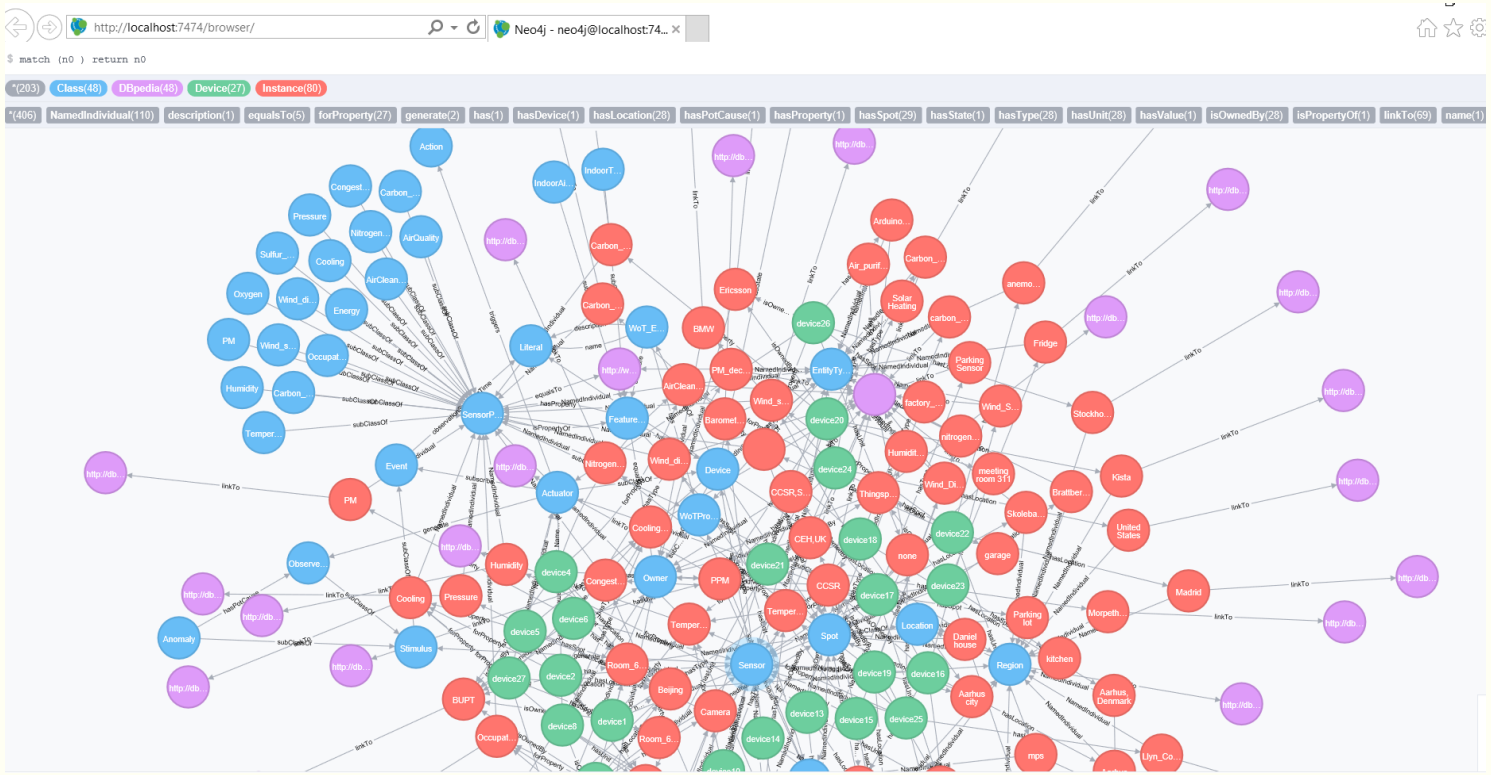
Automatic annotation tool

Proof-of-concept Implementation



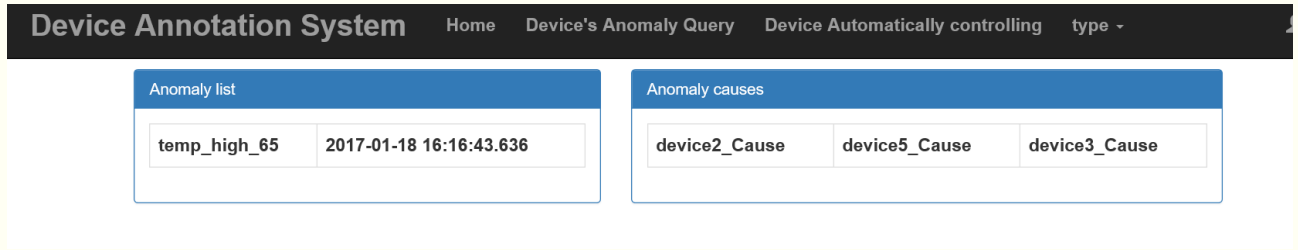
Automatic annotation tool

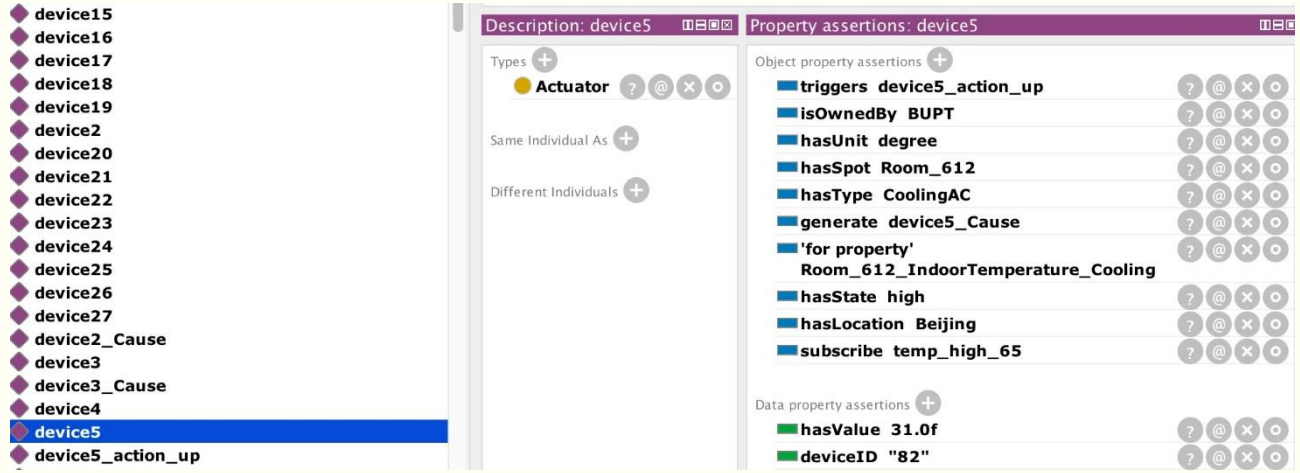
Local knowledge base after automatic annotation



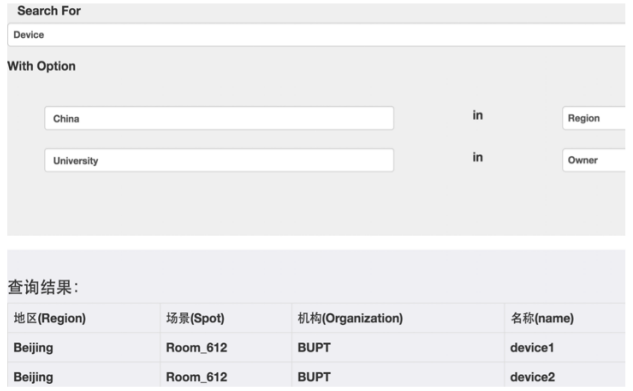
Usage of the knowledge graph

- Anomaly diagnosis
- Automatic controlling
- Semantic searching






```
SELECT DISTINCT ?deviceID
WHERE {
?device swot:deviceID ?deviceID.
?device dul:hasLocation ?loc_local.
?loc_local swot:linkTo ?loc_el.
BIND(URI(?loc_el) as ?loc_el_uri).
?loc_local a swot:Region.
        SERVICE <http://dbpedia.org/sparql> {
                ?loc_el_uri ?rel ?loc_db.
                FILTER regex(str(?loc_db),"China")
        }
}
```



THANK YOU!