The Sparqling system

S. Di Bartolomeo, G. Pepe, V. Santarelli, D.F. Savo

The 4th International Workshop on Visualization and Interaction for Ontologies and Linked Data

October 8, 2018, Monterey, USA

SAPIENZA
UNIVERSITÀ DI ROMA

Ontologies

Recent years have seen a sharp increase in the **popularity of ontologies in modern applications** (biomedicine, e-commerce, Semantic Web, Data Integration and Management)

Ontologies can be formalized in different languages, from **Description Logics** to **RDF(S)** to **OWL 2** (the latter two being W3C standards)

A picture is worth a thousand words

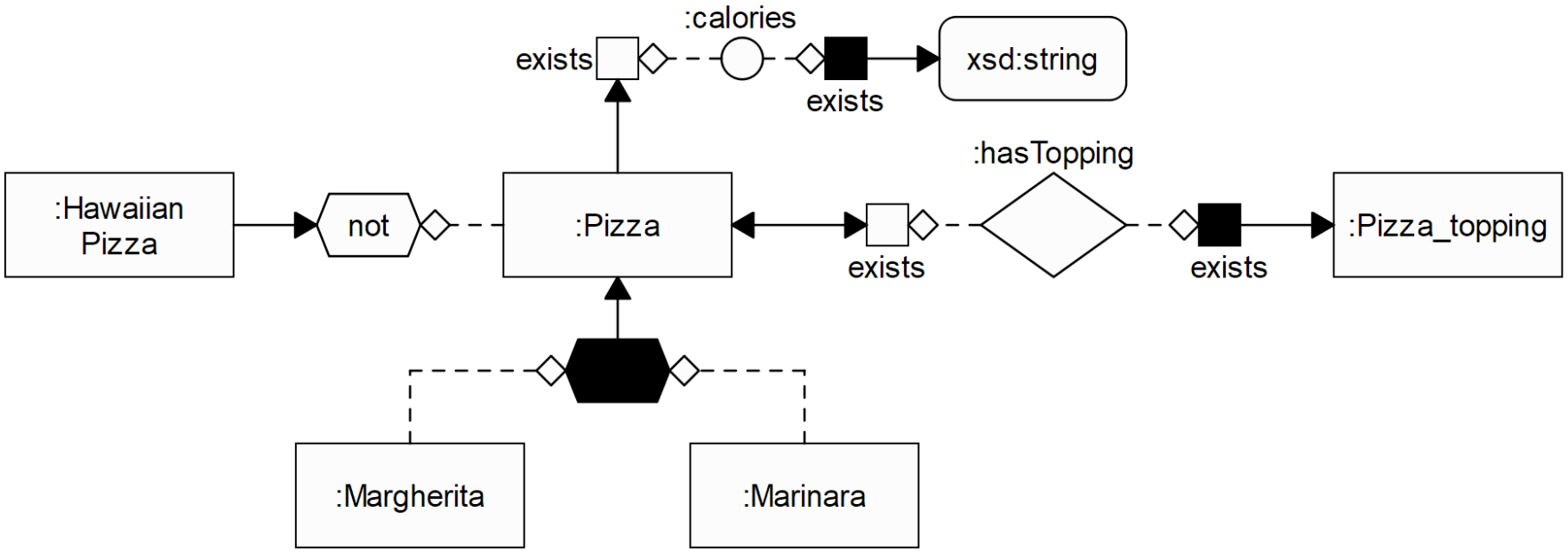
People operating in organizational settings (**domain experts**) typically do not possess the necessary skills to interpret the formulas used to specify the ontology

This introduces a **bottleneck** in the ontology design phase, where **ontology engineers** usually work together with **domain experts**

To alleviate this issue, there have been various efforts to devise **graphical ontology syntaxes** based on standard conceptual modeling languages, e.g., UML class diagrams or ER diagrams

The Graphol visual ontology language

Graphol[1] is a **visual language for OWL 2** ontologies

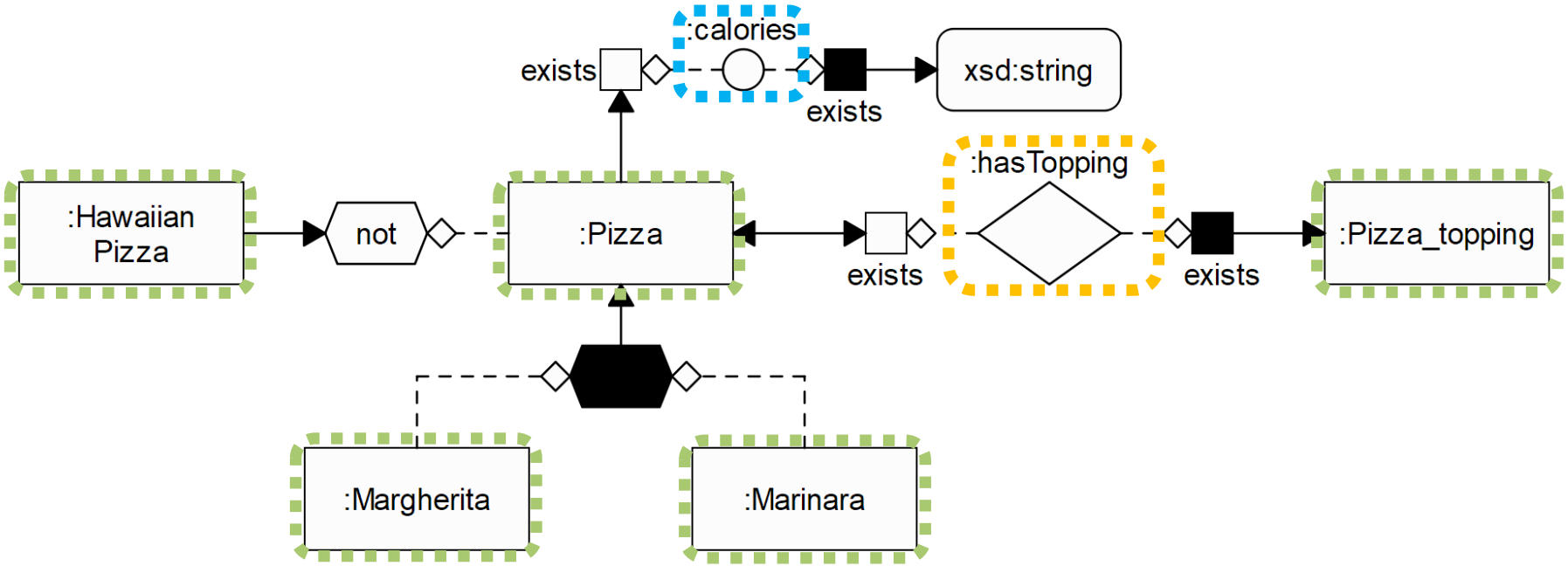


Graphol resembles ER diagrams, but has a formal semantics based on DLs, presents a **entirely graphical syntax**, and is able to fully capture OWL 2

[1] www.obdasystems.com/graphol

The Graphol visual ontology language

Graphol[1] is a **visual language for OWL 2** ontologies

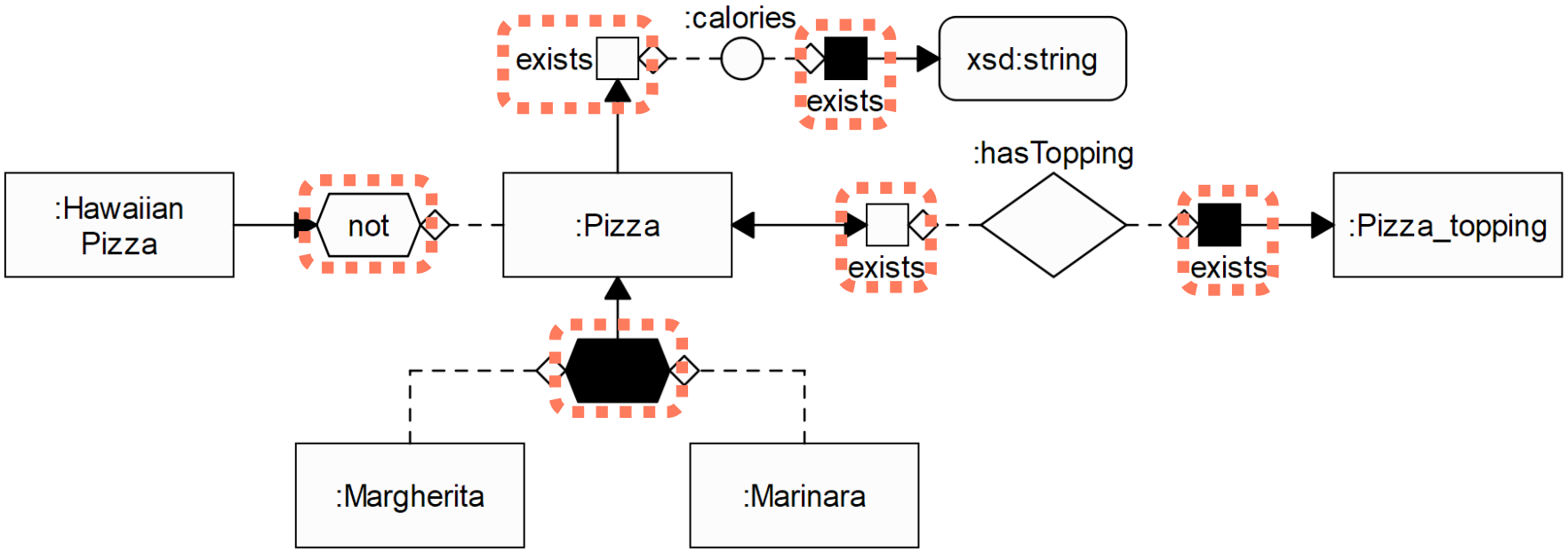


Graphol expressions are either nodes representing atomic predicates (e.g., **named classes**, **object properties**, **data properties**), or ….

[1] www.obdasystems.com/graphol

The Graphol visual ontology language

Graphol[1] is a **visual language for OWL 2** ontologies



….. complex expressions built by using specific **operators**.

Axioms are built using **directed arrows**.

[1] www.obdasystems.com/graphol

Querying ontologies

Queries are the most effective and powerful means for accessing the information in the ontology

SPARQL is the official W3C **query language** for **RDF** and the de facto standard for querying **OWL ontologies**

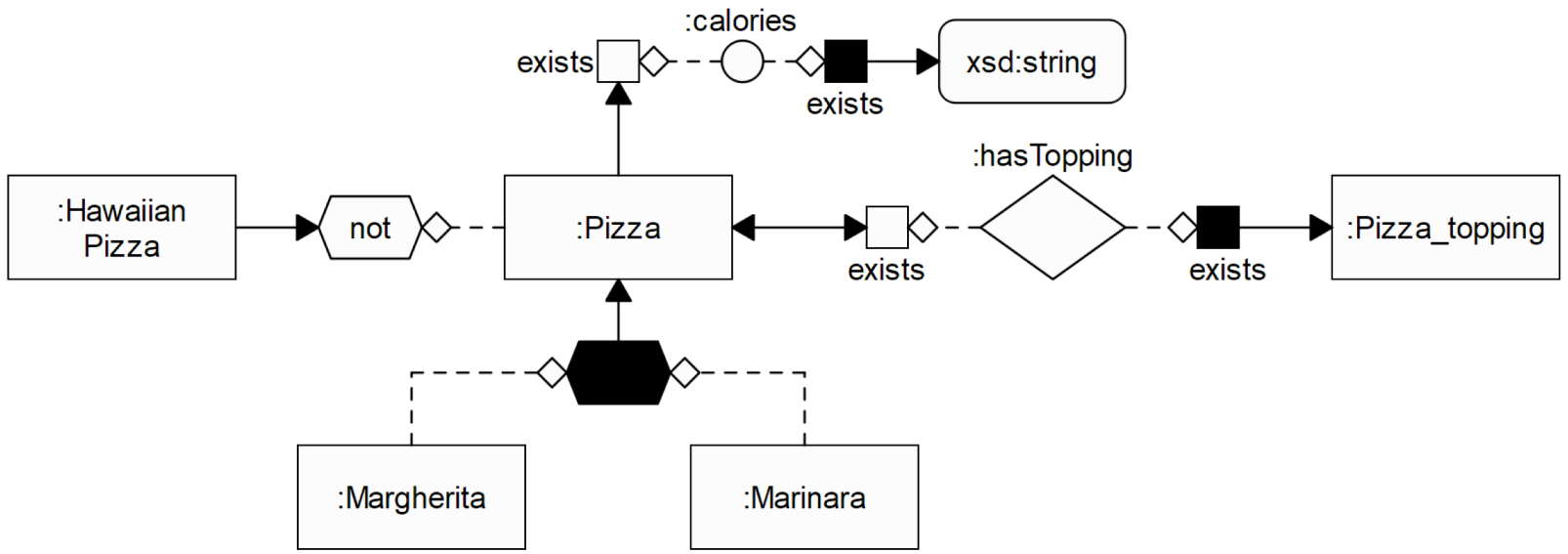
```
Select   ?pizza ?calories
Where {
         ?pizza :calories ?calories.
         ?pizza rdf:type :Margherita.
       }
```

Something is missing…

… a way to **easily write SPARQL queries** without necessarily having to deal with its syntax.

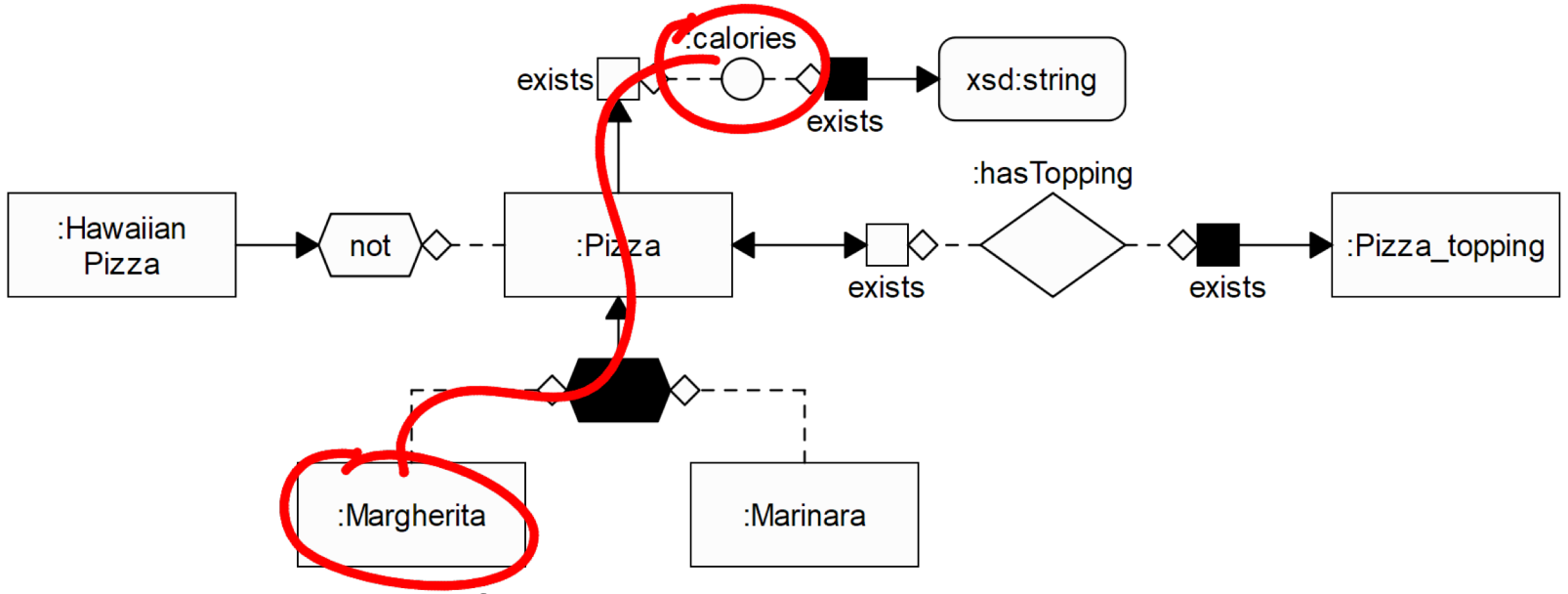
The Idea

The ontology in its **Graphol** form is **helpful in designing queries**.



The Idea

The ontology in its **Graphol** form is **helpful in designing queries**.



The mental process of writing a query is natural when looking at a Graphol diagram, because it recalls the act of tracing a path on it.

The Sparqling system

Sparqling[1] is a web-based application that allows to draw **SPARQL queries** by **exploiting the Graphol representation** of the ontology.

- Navigation of the Graphol ontology

- Construction of the query thought simple point and click

- Double representation of the query: graphical and in SPARQL syntax

[1] www.github.com/picorana/sparqling

The Sparqling system

For a video demo of Sparling, see

https://www.youtube.com/watch?v=FtucgnGDlKA

[1] www.github.com/picorana/sparqling

Next steps

- Currently we cover the **conjunctive query fragment** of SPARQL, tailored for Ontology-based Data Access systems (Sparqling is integrated in the Mastro System[1])

  We will **extend Sparqling to support larger fragments of SPARQL**

- **More powerful tools** to select and add ontology elements in the query graph

- We are also carrying out **user evaluations** with our industrial partners that we are confident will bring new ideas for further improvements.

[1] www.obdasystems.com/mastro

Thank you!

See you at the VOILA 2018 and ISWC 2018 Posters & Demos sessions!