

# Arabic Language and the Semantic Web: Challenges and Opportunities

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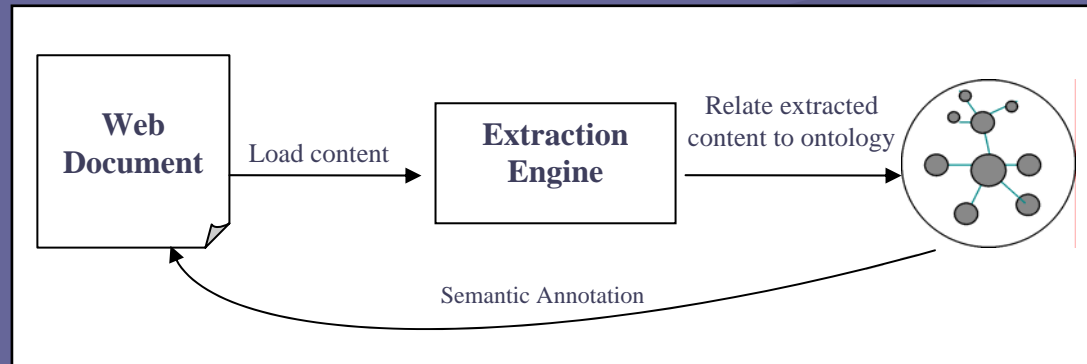
# Outline

- What is The Semantic Web!
- Research Questions
- Pilot Test
- Arabic Research in Semantic Web Technologies
- Challenges
- Opportunities
- Conclusion

# Semantic Web

- What is the Semantic Web?

*“an extension of the current Web in which information is given a well-defined meaning, better enabling computers and people to work in cooperation.”* Tim Berners-Lee , 2001



How it can be done?  
Semantic Annotation Process

# Research Questions!

- Can existing Semantic Web tools facilitate building Semantic Web applications that support the Arabic language?
- What are the challenges faced by users of the Arabic language when trying to embrace Semantic Web technologies?
- What opportunities will this new technology bring to users of the Arabic language?

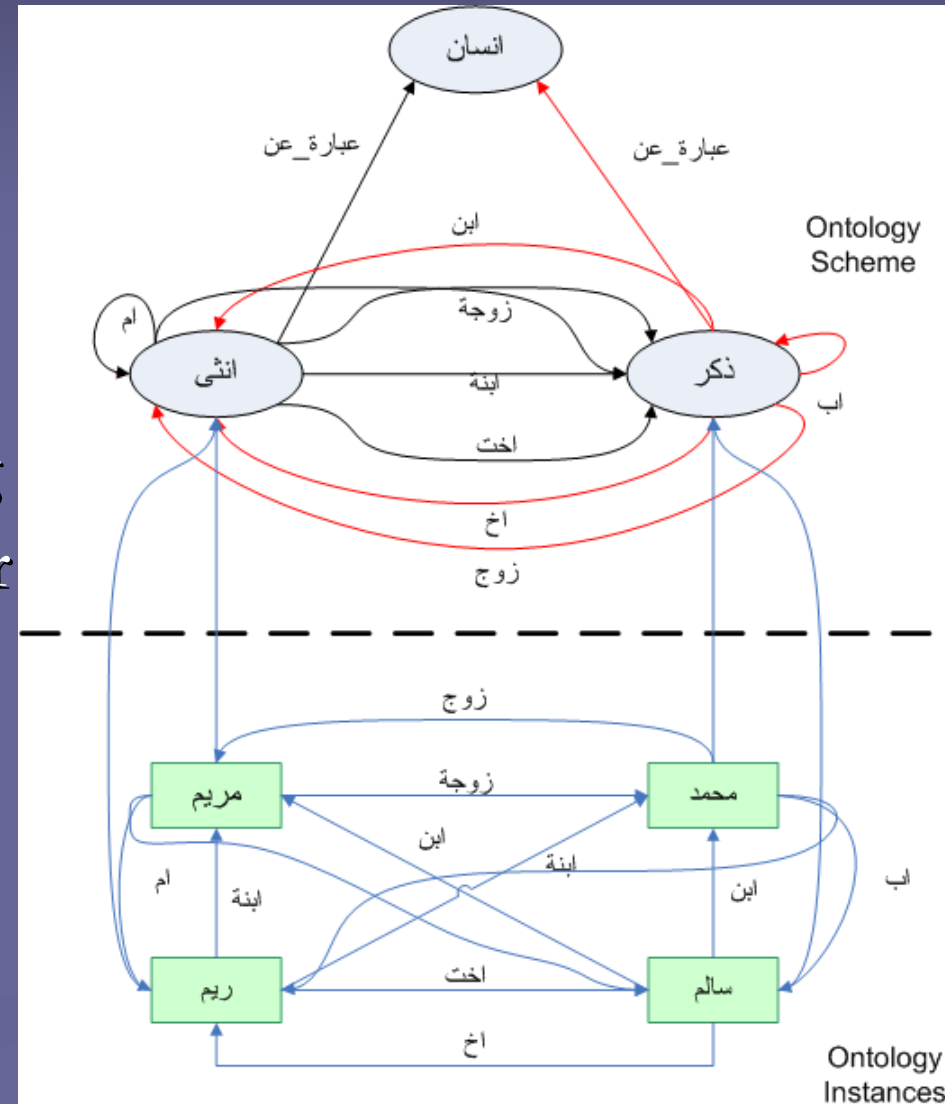
# Semantic Web Application: Pilot Test

## Open Source Tools:

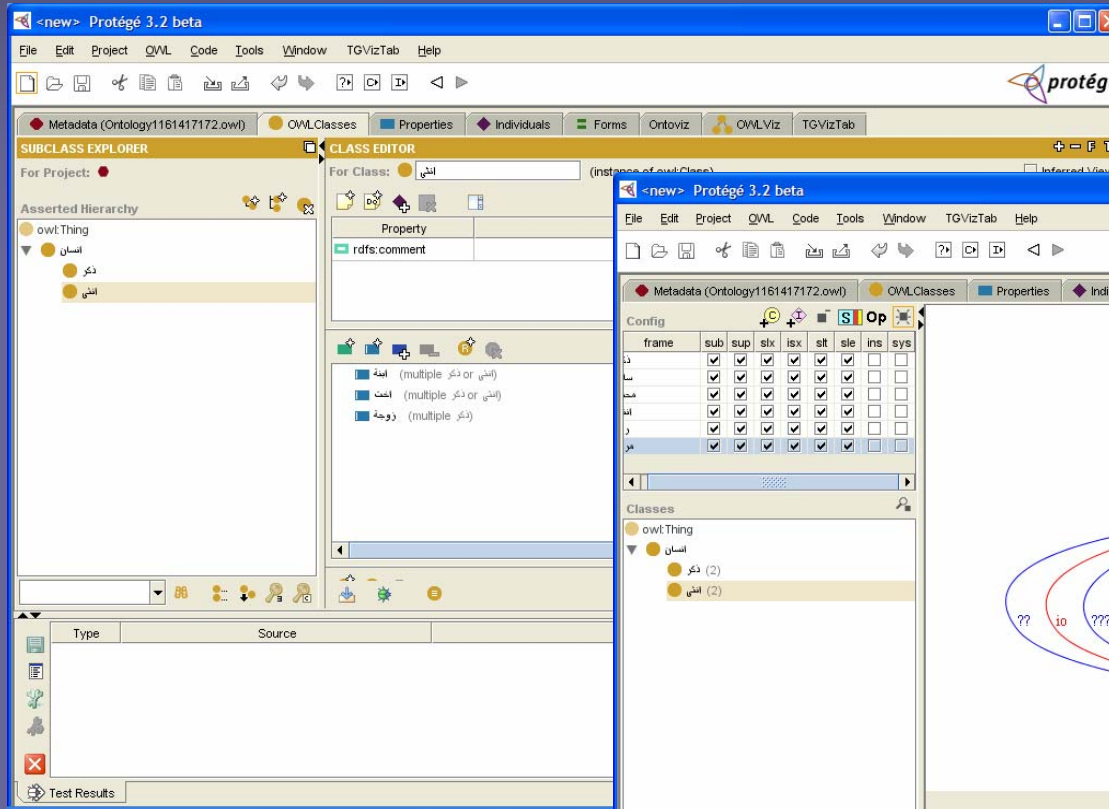
- Protégé
- Jena 2 API

**Scenario:** conceptualizing the parental relationship for a fictional family

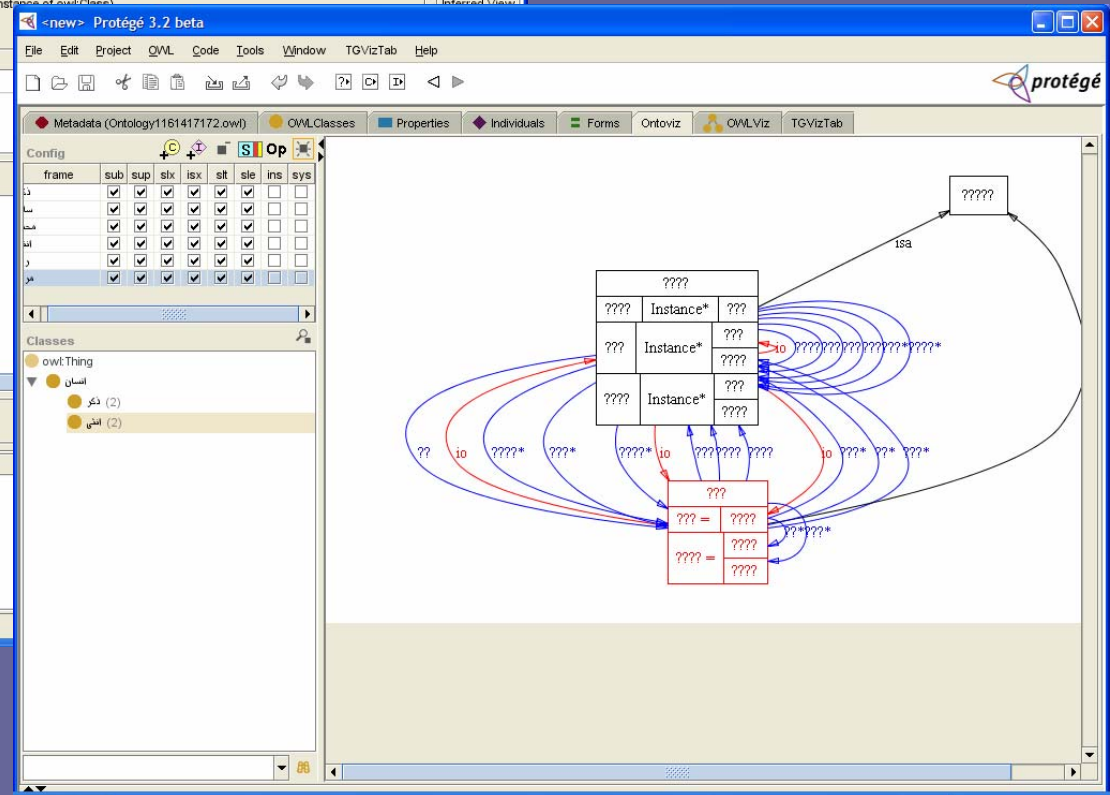
- Ontology scheme
- Ontology instances



# Semantic Web Application: Pilot Test



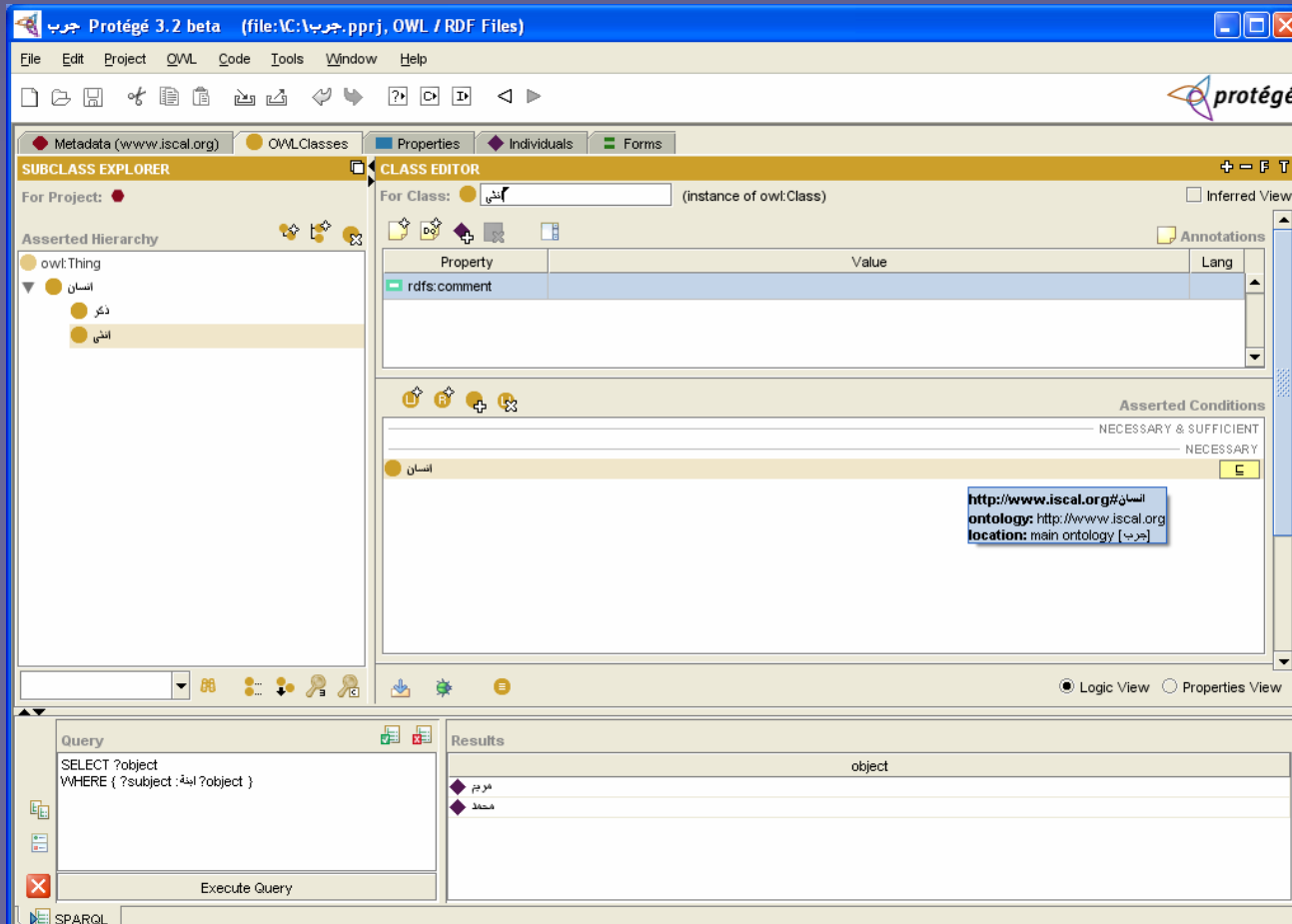
Protégé editor



Ontoviz visualization plug-in

# Semantic Web Application: Pilot Test

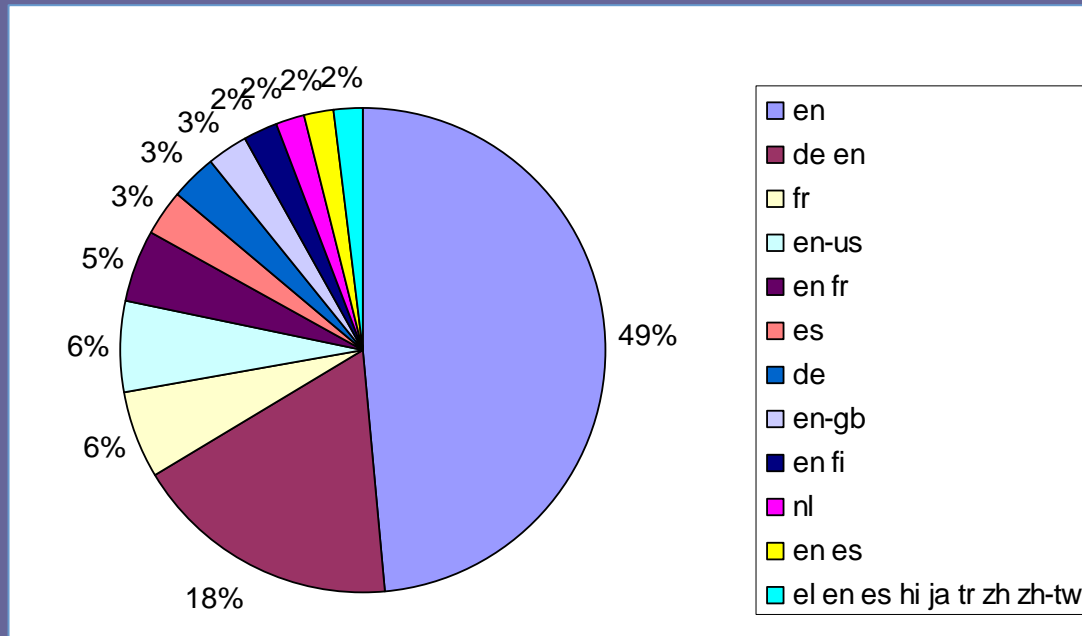
- SPARQL query engine in Protégé



<http://www.w3.org/TR/rdf-sparql-query/>

# Arabic Research in Semantic Web Technologies

- Lack of Arabic support in Semantic Web tools
- Lack of Arabic Semantic Web applications
- Limited resources for Arabic research



OntoSelect Library: Distribution of languages used in creating ontologies

# Arabic Support in the Semantic Web: Challenges

- Development of controlled vocabularies and ontologies to explicitly define machine-processable semantics.
- Information extraction relies extensively on analyzing Web content either morphologically, grammatically or semantically. Thus, more tailored Natural Language Processing tools such as GATE are needed to process Arabic script accordingly.

# Arabic Support in the Semantic Web: Opportunities

- Common framework to integrate and derive new meaning, value and intelligence from existing Arabic repositories in science, business, government documents and communications
- Multilingual Semantic Web supporting Arabic script processing; semantic-enhanced Arabic Web content
- Knowledge management: universal representation for machine-processable data

# Arabic Language and the Semantic Web: Conclusion

- Semantic Web and its underpinning technologies
- Preliminary Investigation: Arabic script processing in Semantic Web applications
  - Experiment with Semantic Web open source tools
  - Results demonstrated limited support for processing Arabic Script
- Overview of Arabic research in the emerging field of Semantic Web technologies.

**Thank you!**

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