A Browser-based Tool for Collaborative Distributed Annotation for the Semantic Web

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Introduction

• Semantically rich, ontology-based metadata is needed in developing the semantic web
• Annotation of web resources should be made possible for the people unfamiliar with the technical side of the Semantic Web
• Annotation systems currently available lack the support of distributed creation of semantic metadata based on rich metadata annotation schemas (ontologies)
• Browser-based annotation tool Saha supports collaborative annotation of web-documents and provides a simple user interface that hides the complexity of ontologies from the annotators
• Saha accepts any annotation schema defined in RDF/OWL and supports the use of external ontology services
Requirements for the annotation tool

- To be easy to use and to support the creation of semantically rich metadata, the system should...
  - hide technical concepts, e.g. URIs and complex class hierarchies, related to ontologies
  - support the use of different kinds of annotation schemas that can be used to define the structure of annotations and thus guide the annotators in their task
  - support collaborative annotation, where annotations can be produced by different annotators at different locations
  - be implemented as a web application, which will make it platform independent from the annotator’s point of view
Architecture of Saha

- Saha is a web application built on Apache Cocoon and Jena frameworks
- Used with an ordinary web browser with Internet connection
- Uses extensively techniques such as Javascript and Ajax to provide an annotator with versatile and simple user interface
Architecture of Saha
Annotations in Saha (1)

- Annotations are based on user-defined metadata annotation schema, defined in RDF/OWL
- Any kind of schema can be used
- Schemas are used in Saha for defining...
  - the structure of annotations
  - types of values that can be used in annotations
  - the layout of the user interface
- Annotations are instantiated classes of an annotation schema, with properties and values defined for instances
- Annotations are linked to the documents either by stating that the document is an instance of the annotation class or using a named property (cf. property “annotates” in Annotea)
Annotations in Saha (2)

- Annotations describe documents as a whole, i.e. they are not associated with any particular section inside the documents.
- Annotations can be used…
  - to find out how the document is related to other documents that have been annotated
  - to serve as a semantically described index that can be used to categorize documents or to search a document
- Classes of an annotation schema used in Saha can be distinguished by their intended use:
  - Classes that describe the documents
  - Classes that describe other resources (e.g. places, people etc.) that are somehow related to the documents
- Classes used to describe other resources form a local knowledge base that can be used and extended when new annotations are created.
Annotation projects

- Collaborative annotation is supported in Saha by *annotation projects*
- Each annotation schema loaded to Saha forms an annotation project that can have multiple members as annotators
- In practice, a project is Jena’s ontology model stored in a database
- Members of an annotation project can edit all the annotations and KB instances stored in the project as well as create new ones
- KB instances can be shared between different project using Onki ontology service framework
Meta-schema

- In addition to describing annotation’s structure in annotation schema, we need a way to describe *how* the schema is used during the annotation process.

- With Saha, a separate *meta-schema* can be used to define e.g.
  - classes which are shown in the class hierarchy of the user interface and which user can choose when new annotation is being created
  - properties of a class whose values are used as rdfs:label of the instance of the class
  - the order of a class’s properties, in which they are shown to the annotator

- Meta-schema improves the usability of the system and enables the use of same annotation schema in different ways in different annotation projects.
Using Saha: KB instances

- Object properties of an annotation schema may have two types of values: KB instances or concepts of an external ontology.
- Annotator can choose existing KB instance or create a new:

Search for existing instances:

Creating a new instance:

Fields to define values for the instance

Pop-up window
Using Saha: ontology services

- Saha can be connected to the Onki ontology service framework developed in the National Semantic Web Ontology Project in Finland.
- Onki provides a web-based browser to search concepts defined in various ontologies and to import them to external applications, such as annotation editors.

**Onki ontology browser**

**Saha annotation editor**

1. Open the Onki browser...
2. Browse the ontology...
3. Fetch a concept to the annotation...
Saha: use-cases and future plans

- Saha is a working prototype
- Currently in trial use in the metadata creation for the Finnish health promotion portal
- Initial feedback from the end-users has been promising, but further experimenting is still needed
- Future plans include…
  - using Saha to provide metadata for additional semantic portal projects
  - implementing automated features to ease the annotation
  - making improvements to the user interface
- A working demo will be available at: http://www.seco.tkk.fi/applications/saha/
Questions?