



#### Semantic Versioning Manager: Integrating SemVersion in Protégé

9<sup>th</sup> Protégé International Conference, Stanford, California, USA July 24<sup>th</sup>, 2006

Tudor Groza DERI Galway tudor.groza@deri.org

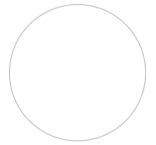
Max Völkel FZI Karlsruhe voelkel@fzi.de Dr. Siegfried Handschuh DERI Galway siegfried.handschuh@deri.org

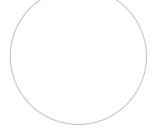
#### **Overview**



Digital Enterprise Research Institute

- Why ontology versioning?
- What is SemVersion?
- Semantic Versioning Manager
- Future directions
- Summary





#### Why ontology versioning?





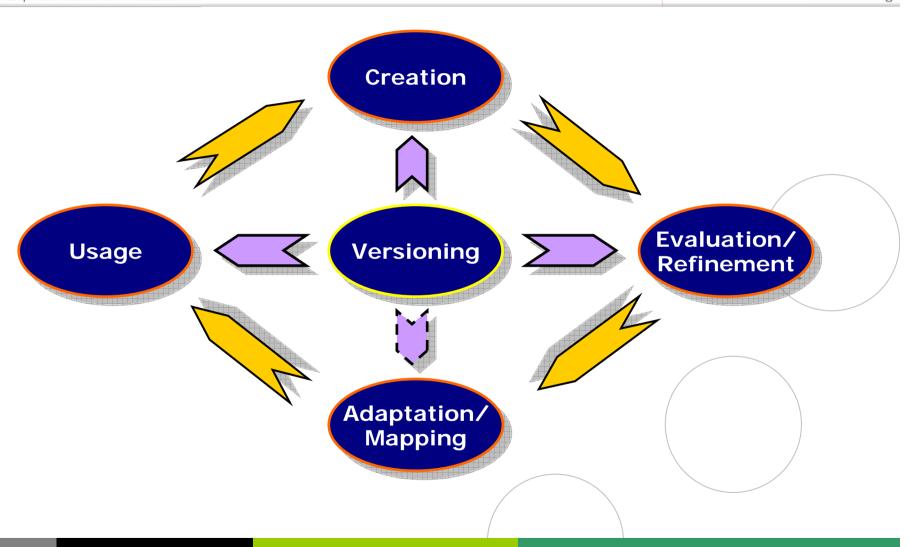
Digital Enterprise Research Institute

- The dynamic status of ontologies
- The distributed settings of ontologies' engineering
- The need for supporting the change management

#### The ontology lifecycle



Digital Enterprise Research Institute

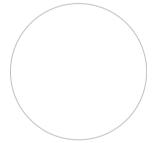


#### What is SemVersion?



Digital Enterprise Research Institute

- RDF-based ontology versioning system
- Data management aspects of versioning
- Functional aspects of versioning



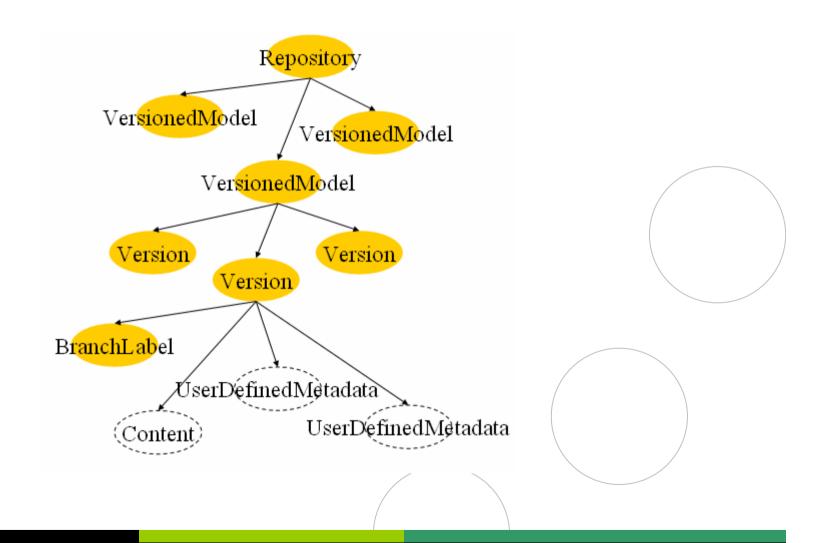


#### Data management aspects





Digital Enterprise Research Institute



# Data management aspects (cont.)

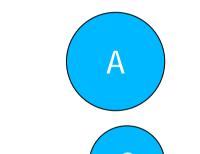


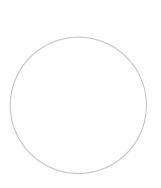
Digital Enterprise Research Institute

www.deri.org

#### Quad Store (Named Graphs or RDF with contexts)

A	S	p	0
Λ			
Α	S	р	0
A	S	p	0
A	S	p	0
В	S	р	0
В	S	р	0
В	S	р	0
C	S	р	0
С	S	р	0
С	S	р	0





#### **Functional aspects**



Digital Enterprise Research Institute

- Structural diff
  - Set theoretic difference of two RDF triple sets
- Semantic diff
  - Language semantics dependent
  - Structural diff between the schema entailment of two RDFS models



## Structural diff vs. semantic di protégé





Digital Ente	rprise Researd	h Institute
--------------	----------------	-------------

www.deri.org

version A:	version B:
a rdfs:type c	a rdfs:type d
b rdfs:type c	b rdfs:type d
c rdfs:subClassOf d	c rdfs:subClassOf d
	e rdfs:type d
added:	removed:
a rdfs:type d	a rdfs:type c
b rdfs:type d	b rdfs:type c
e rdfs:type d	

version A: version B: a rdfs:type d a rdfs:type c b rdfs:type c b rdfs:type d c rdfs:subClassOf d c rdfs:subClassOf d e rdfs:type d added: removed: e rdfs:type d

#### **Structural diff**



Digital Enterprise Research Institute		www.de	eri.org
	<pre>version A:    a rdfs:type c    b rdfs:type c    c rdfs:subClassOf d    added:    a rdfs:type d</pre>	version B: a rdfs:type d b rdfs:type d c rdfs:subClassOf d e rdfs:type d removed: a rdfs:type c	
a ro	sion A: dfs:type c dfs:type c dfs:subClassOf d	version B: a rdfs:type d b rdfs:type d c rdfs:subClassOf d e rdfs:type d	
b ro	ed: ifs:type d ifs:type d ifs:type d	removed: a rdfs:type c b rdfs:type c	

#### **Semantic diff**



Digital Enterprise Research Institute www.deri.org version A: version B: a rdfs:type c a rdfs:type d b rdfs:type c b rdfs:type d c rdfs:subClassOf d c rdfs:subClassOf d e rdfs:type d added: removed: e rdfs:type d version B: version A: a rdfs:type c a rdfs:type d b rdfs:type d b rdfs:type c c rdfs:subClassOf d c rdfs:subClassOf d e rdfs:type d added: removed: , e rdfs:type d

## Structural diff vs. semantic di protégé





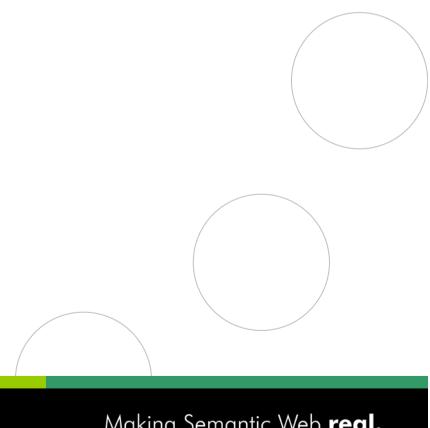
Digital Enterp	ise Research I	Institute
----------------	----------------	-----------

www.deri.org

version A:	version B:
a rdfs:type c	a rdfs:type d
b rdfs:type c	b rdfs:type d
c rdfs:subClassOf d	c rdfs:subClassOf d
	e rdfs:type d
added:	removed:
a rdfs:type d	a rdfs:type c
b rdfs:type d	b rdfs:type c
e rdfs:type d	

version A: version B: a rdfs:type d a rdfs:type c b rdfs:type c b rdfs:type d c rdfs:subClassOf d c rdfs:subClassOf d e rdfs:type d added: removed: e rdfs:type d

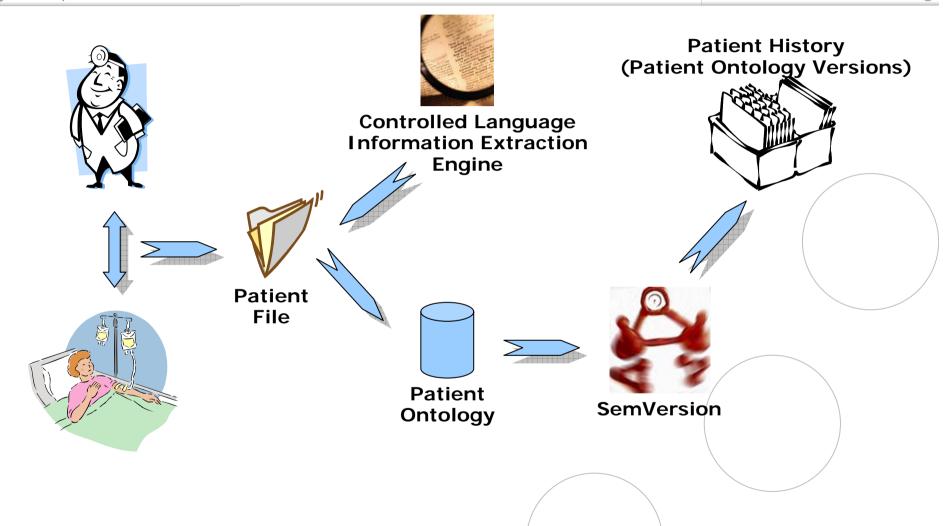
Where can the diff operation help?



#### Hospital setting scenario



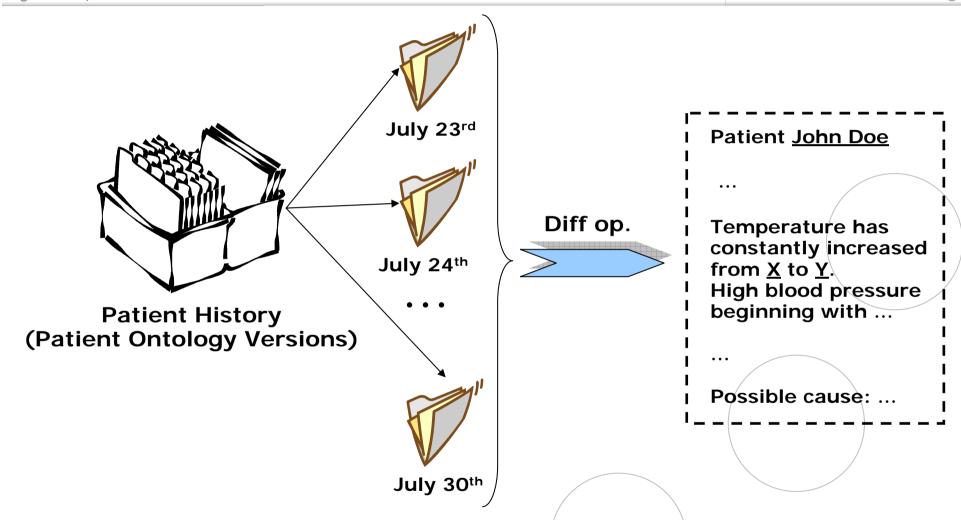
Digital Enterprise Research Institute



#### Hospital setting scenario



Digital Enterprise Research Institute

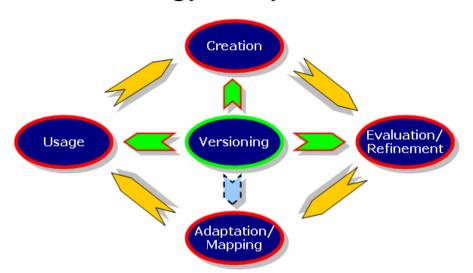






Digital Enterprise Research Institute

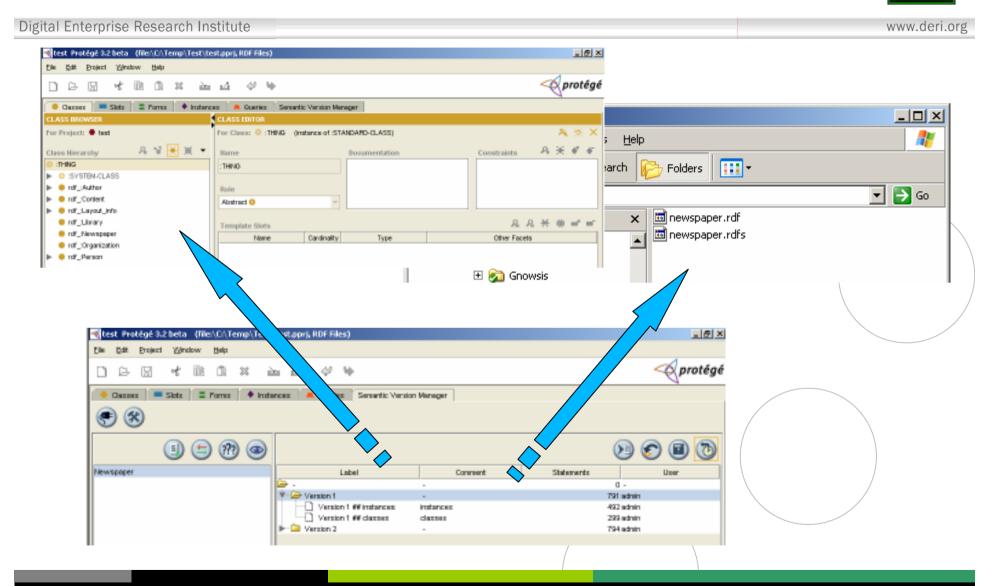
- Integration of SemVersion in Protégé
- Support for the ontology lifecycle



- Re-using as much as possible the functionalities already offered by Protégé
- Deployment as an installation kit

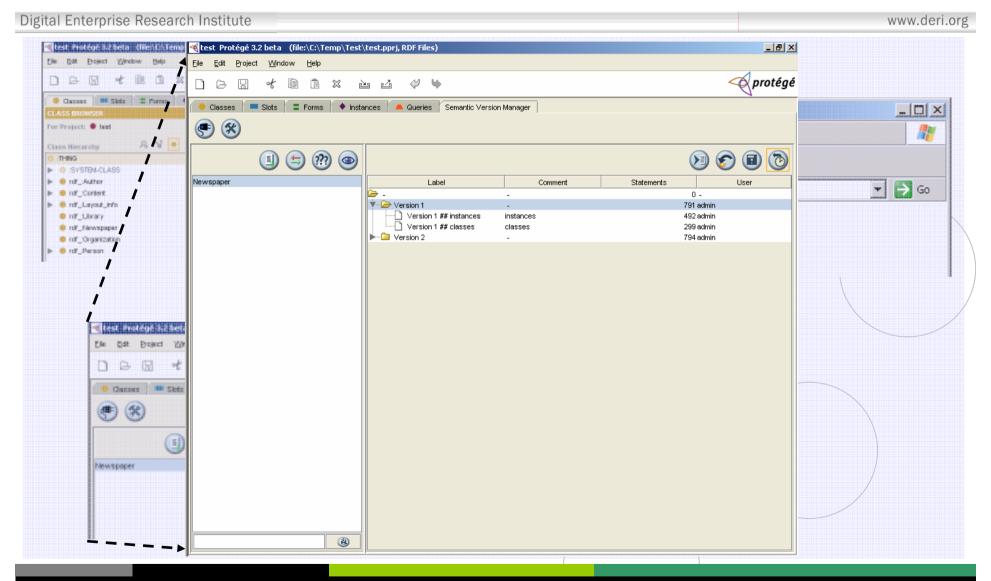






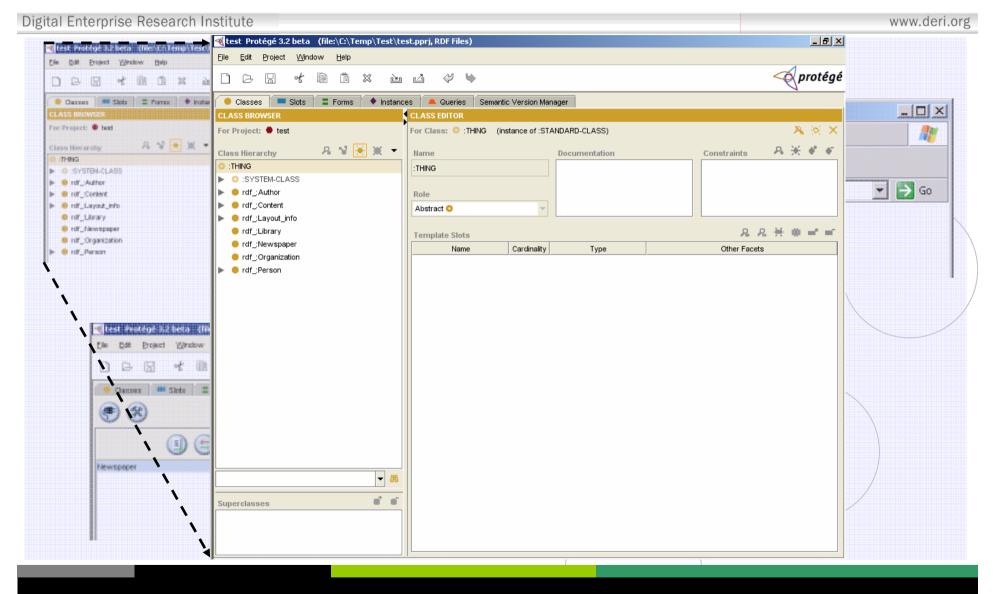






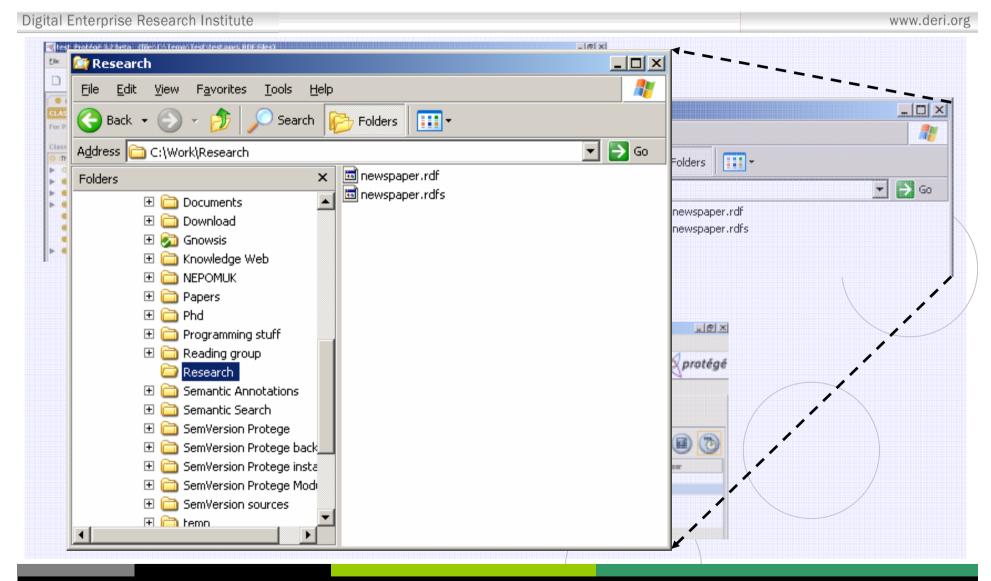






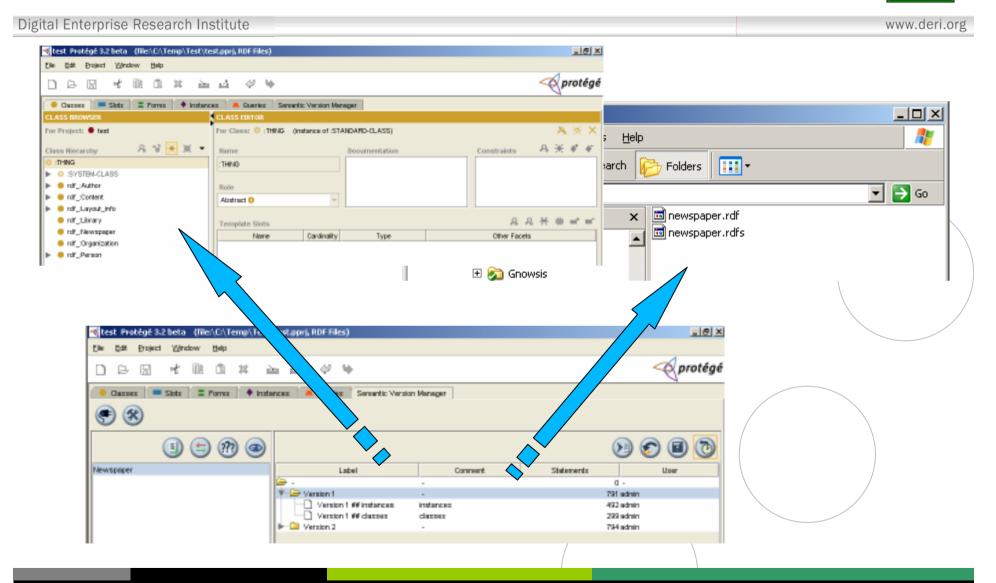






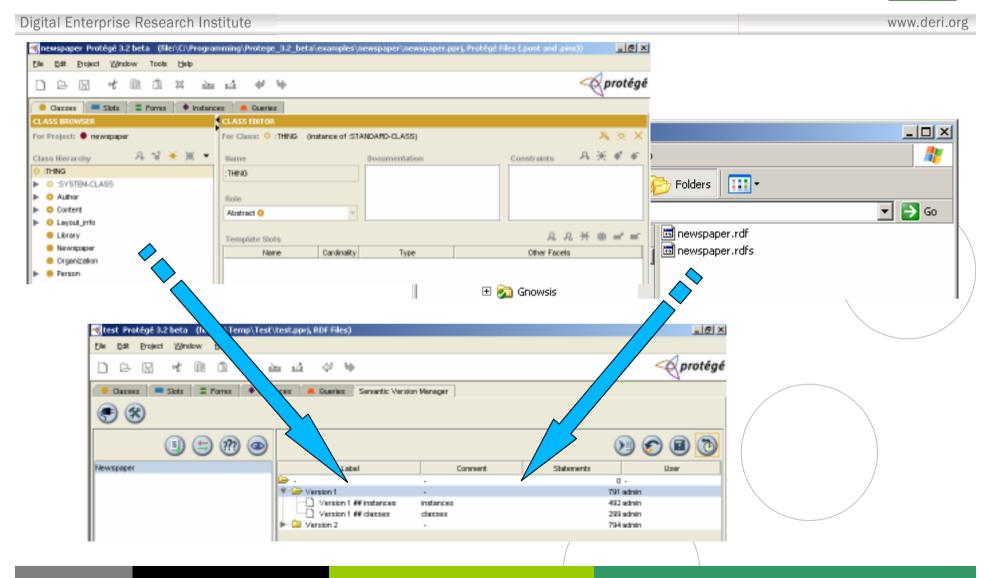






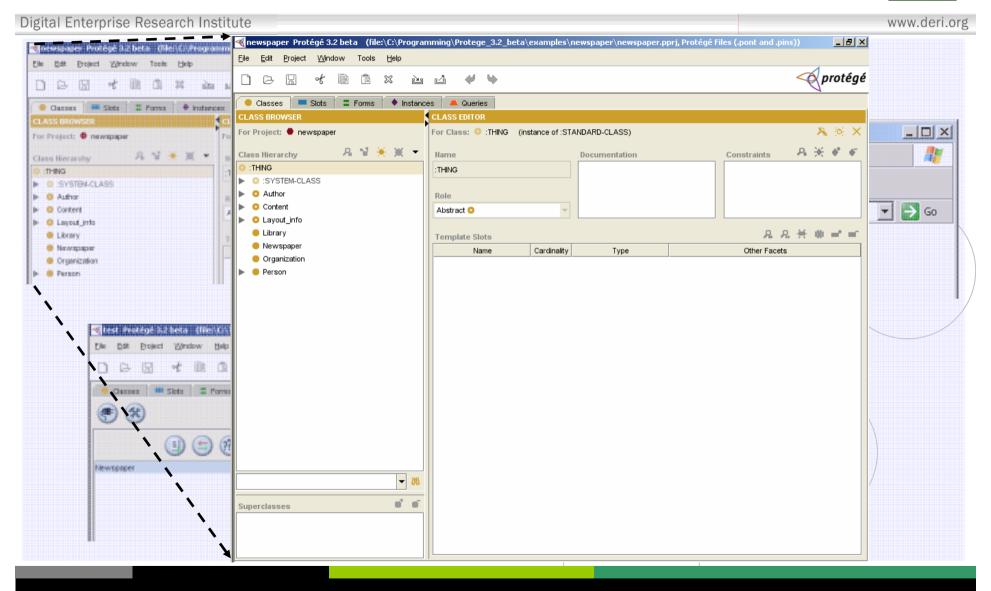






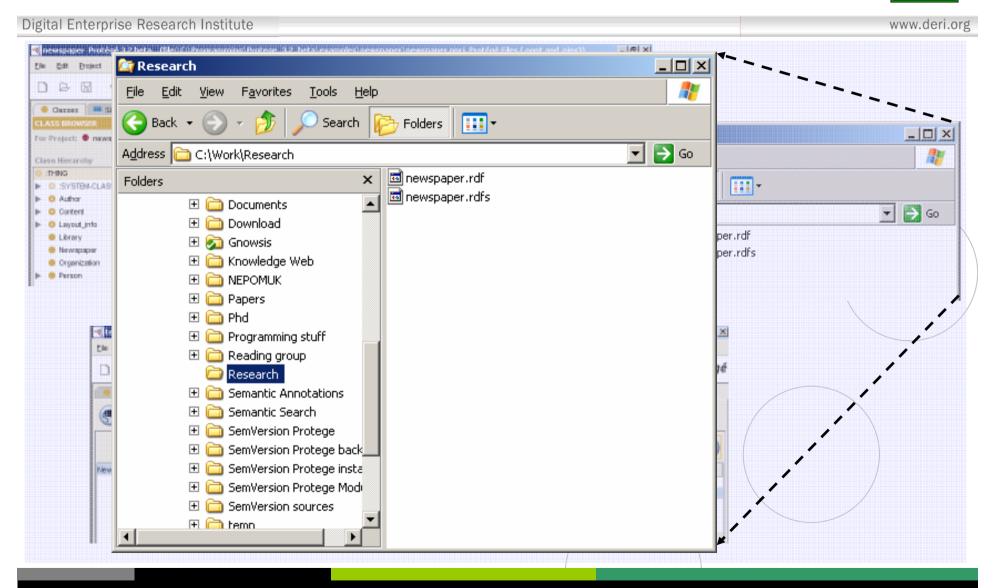






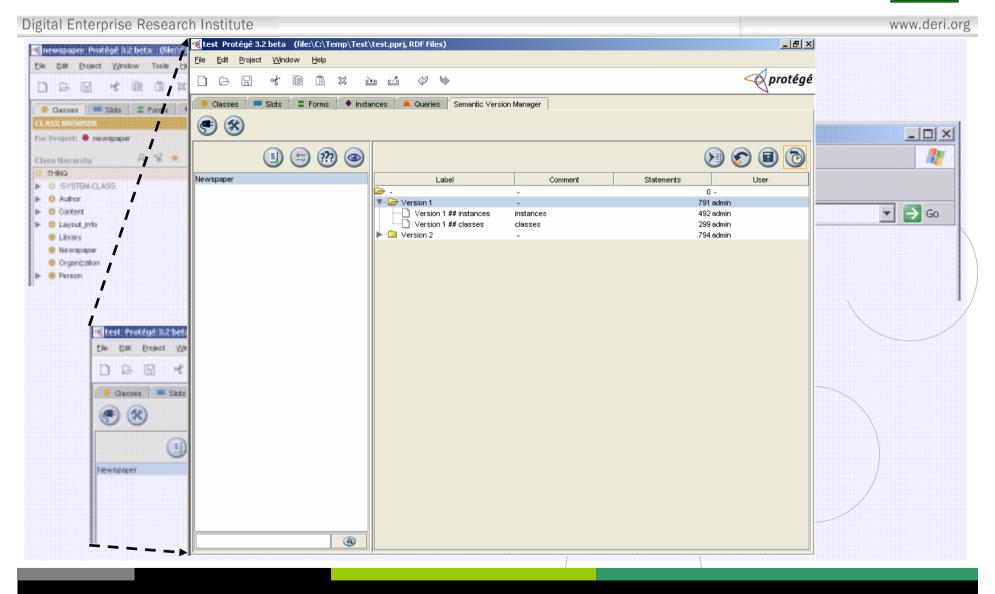






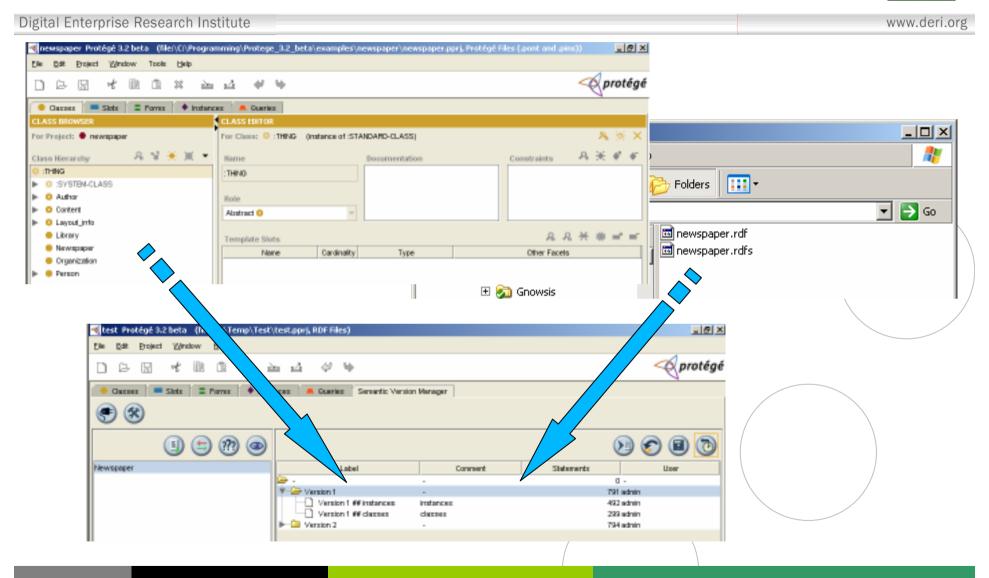








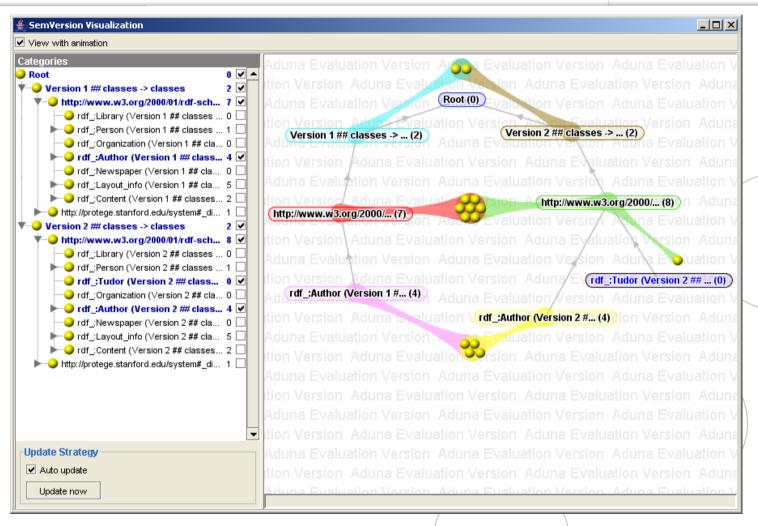




## Structural diff at class-subclass level



Digital Enterprise Research Institute

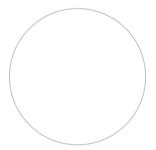


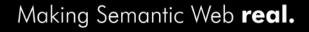
#### **Future directions**



Digital Enterprise Research Institute

- SemVersion
  - Partial re-design
  - Client-Server architecture
  - Storage: Full versions vs. Diffs
  - Support for temporal queries
- Semantic Versioning Manager
  - 100% Protégé integration as a back-end



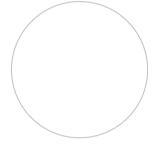


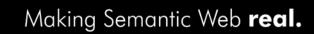




Digital Enterprise Research Institute

- SemVersion
  - RDF-based ontology versioning system
  - Separation between data management and functional aspects
- Semantic Versioning Manager
  - Integration of SemVersion in Protégé





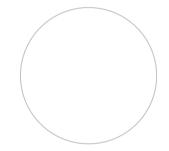
#### Acknowledgements



Digital Enterprise Research Institute

- York Sure, AIFB Karlsruhe
- Tania Tudorache, Protégé
- Brian Davis, DERI Galway
- Part of this work has been funded by the European Commission 6th Framework Programme in the context of the Knowledge Web - Network of Excellence project, FP6-507482 and the EU IST NEPOMUK IP – The Social Semantic Desktop, FP6-027705

## Thank you!



http://semversion.ontoware.org/