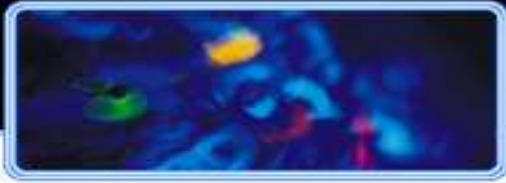




# The NeOn Toolkit

*Andreas Harth (for the NeOn Consortium)  
Karlsruhe Institute of Technology, Germany*

*August 2010*



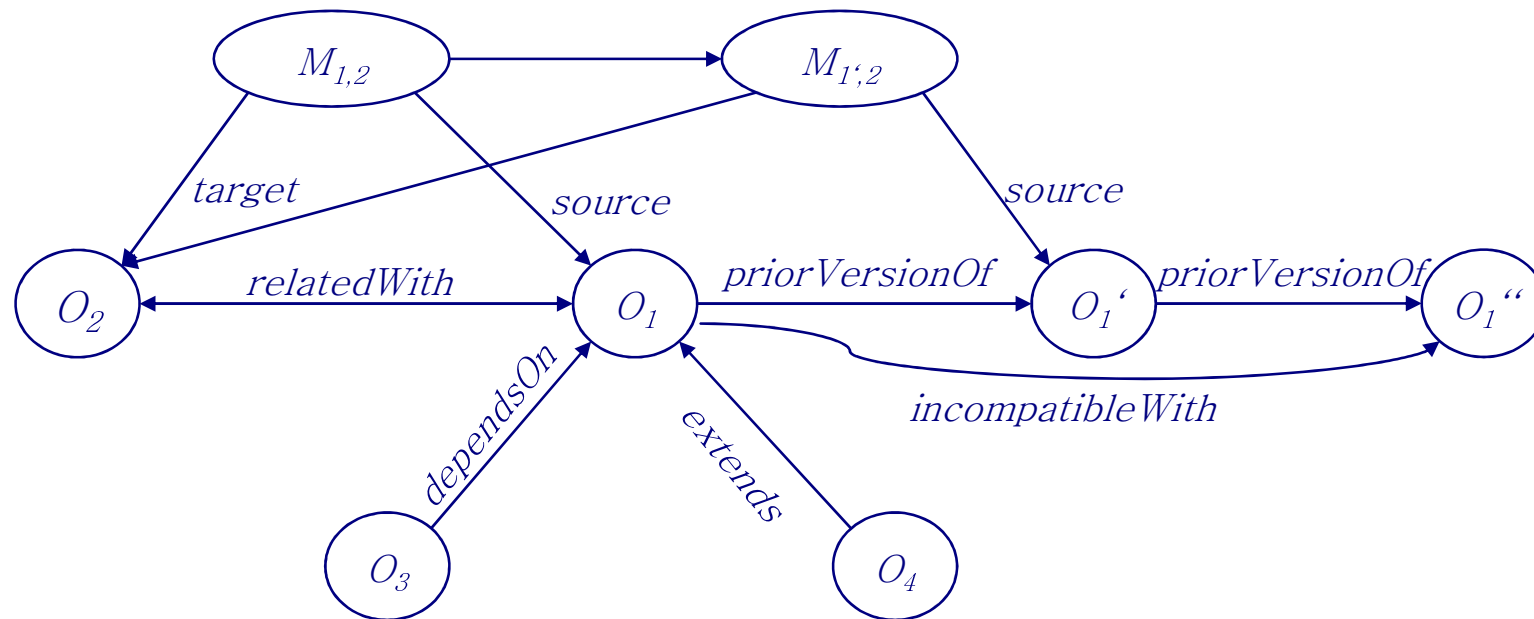
## Overview

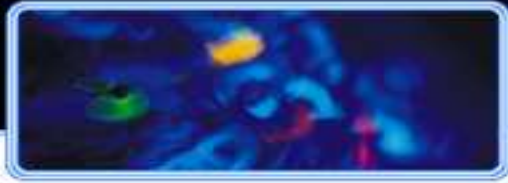
- NeOn Project Introduction
- The NeOn Toolkit (Core and Plugins)
- Supported OWL2 Features
- The NeOn Foundation
- Conclusion



# NeOn Project Overview

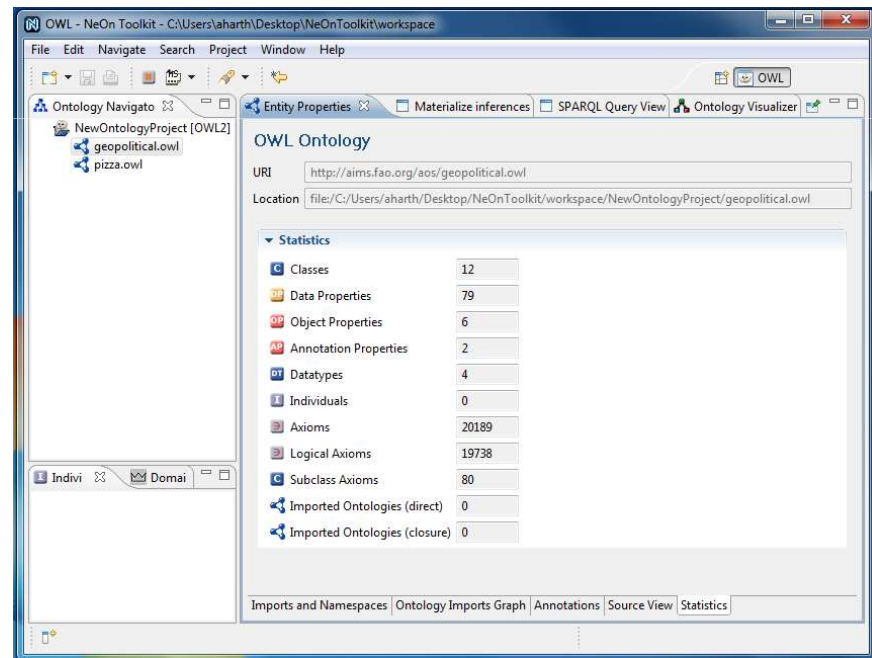
- “Lifecycle Support for Networked Ontologies”
- Methods **and** tools for ontology engineering
- Focus on networked ontologies





# NeOn Toolkit

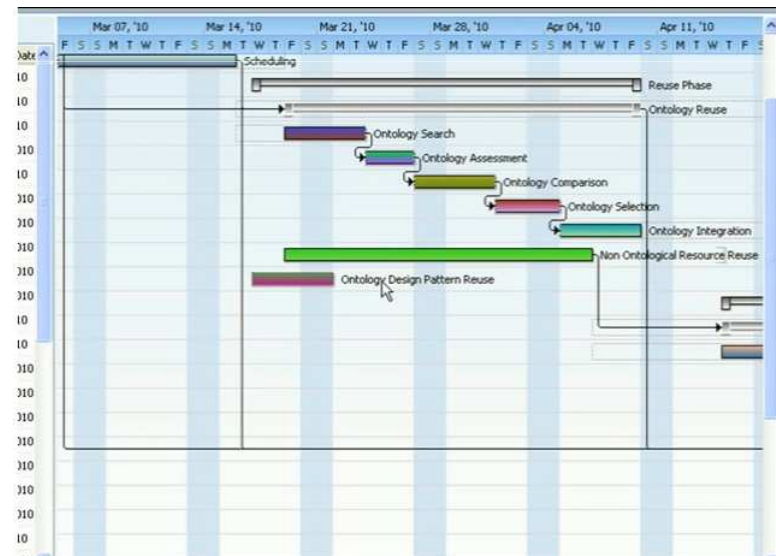
- Built on Eclipse and the OWL API (v3) in Java
- Platform-independent (builds for Windows, MacOS, Linux)
- Complete ontology development functionality
- Extensible via plugins
- Available plugins cover the entire ontology engineering lifecycle
- Business-friendly Eclipse Public License (EPL)

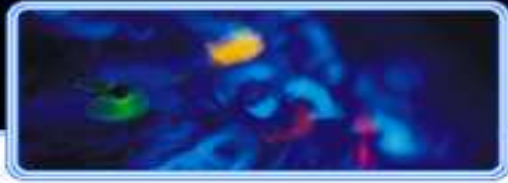




# Ontology Engineering Lifecycle

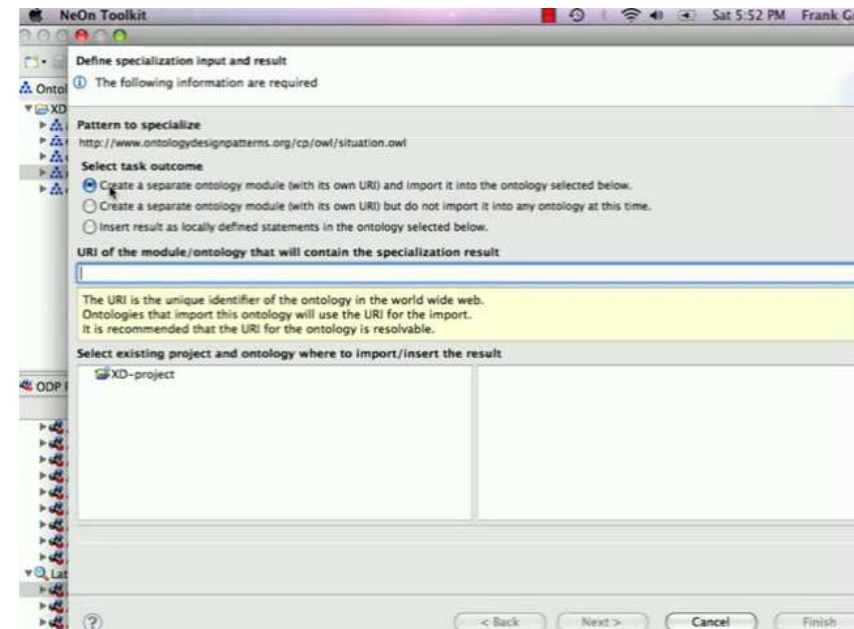
- Project management involved in creating ontologies
- Methodological guidelines for ontology engineering activities
- Implemented in gOntt plugin
- Scheduling ontology projects
- Helping in the execution of ontology projects



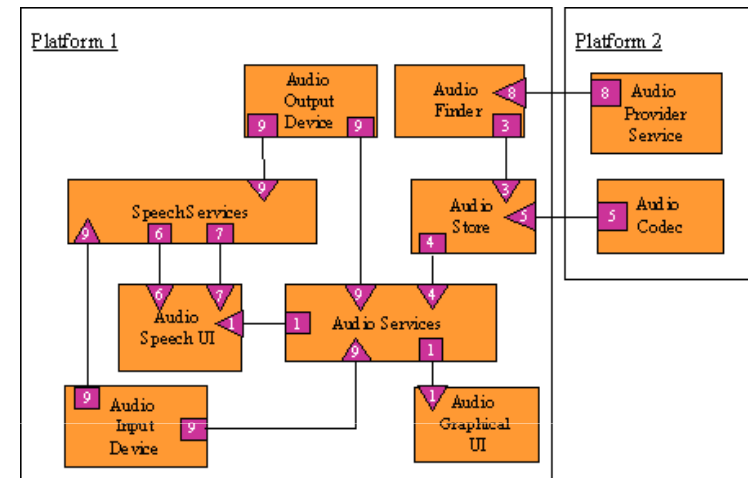
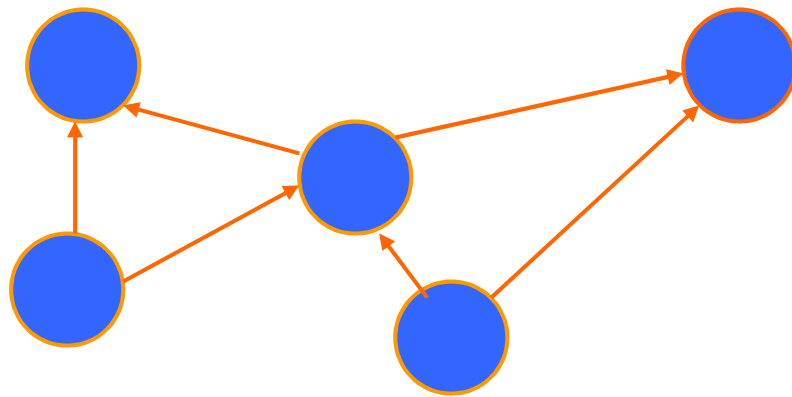


# Ontology Design Patterns (ODPs)

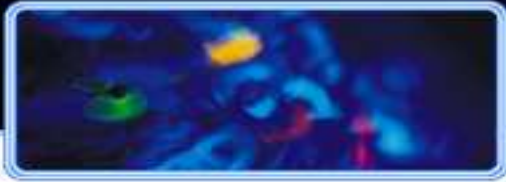
- Patterns are used in many areas as "templates" or abstract descriptions encoding best practices of some field.
- The SemanticMediaWiki ODP portal
  - Various types of patterns
  - Exemplary ontologies
- XD NeOn plugin
  - Access to ODP registry
  - ODP selection, specialisation, and annotation
  - Ontology debugging against design patterns and good practices



# Ontology Modularisation

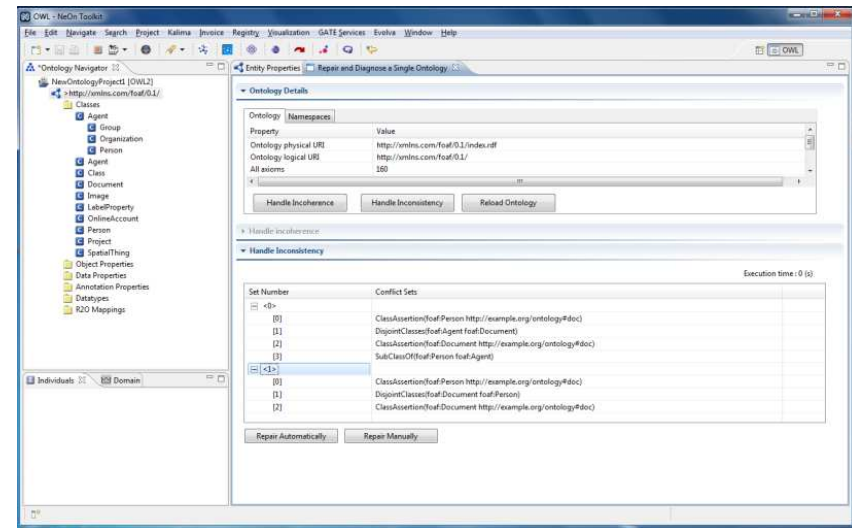


- Inspired from software engineering, ontology modularisation refers to the design of ontologies as sets of components that can be developed and managed independently.
- Module plugins implement methods and algorithms for module extraction, partitioning, and composition



# Reasoning

- NTK allows “pluggable” reasoners via the OWL API (we currently provide HermiT and Pellet)
- Plugins available for materialisation, querying, and resolving inconsistencies
- RaDON – Repair and Diagnosis in Ontology Networks: Implementation of novel scalable methods and algorithms for repair and diagnosis in ontology networks

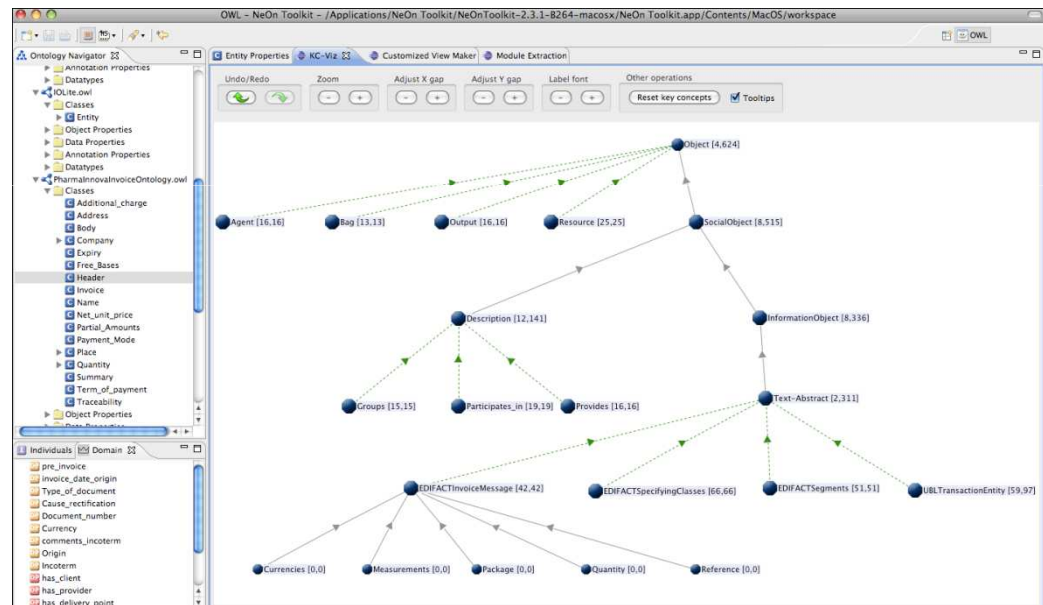






## Visualisation: KC-Viz

- Investigate the value of ontology summarisation techniques based on key concepts to provide better visualisation and navigation of ontologies
- Key concept extraction: Integration of cognitive criteria with lexical statistics, formal and topological criteria
- Implemented in the KC-Viz plugin





# NeOn Toolkit 2.3 Features

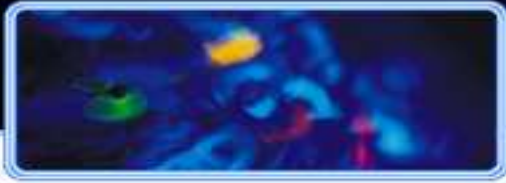
- **New OWL2 features**
  - Creation of new datatypes
  - AnnotationProperty taxonomy: creation and presentation in Navigator
  - Domain and range of AnnotationProperties
  - New ObjectProperty characteristics
  - Sub-property chains
- **Lots of usability enhancements**
  - Improved navigation/operation of toolkit with the keyboard
  - Indicate progress while restoring workspace after restart
  - Organization of views
  - Organization of plug-ins on update-site
  - Accessibility of plug-ins
  - Appearance of Preferences for NeOn Toolkit and plug-ins
- **Lots of improvements for the MAC**
- **Additional ontology tabs**
  - Source view for ontologies (Functional Syntax, Manchester Syntax, OWL/RDF, OWL/XML)
  - Ontology statistics panel
  - Graphical view of Import statements
- **Template for populating the properties of individuals**
- **Source view for entities**
  - Manchester Syntax
- **Import/export of ontologies to different formats**
  - Functional Syntax, Manchester Syntax, OWL/RDF, OWL/XML, Turtle
- **Domain view displaying applicable properties for a class**
- **Display number of direct/indirect individuals per class**
- **Improved search facility**
  - Incl. “Find References” for entities



# OWL2 Features

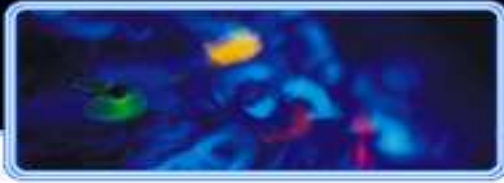
- Complete support of OWL 2 ontologies
  - Loading
  - Representation
  - Serialising
  - To the extent the OWL API v3.0.0 does
- Partial GUI-level coverage of OWL 2, some features are not implemented
  - N-ary data ranges (also not yet supported by OWL API v3.0.0)
  - Inverse object property expressions
  - Anonymous individuals
  - Complex data ranges
  - Disjoint union
  - Disjoint properties
  - Negative property assertions
  - HasKey axioms
  - Axiom annotations
- All other 88\* OWL 2 features are supported by the NeOn Toolkit GUI

\* According to <http://www.w3.org/TR/2009/REC-owl2-quick-reference-20091027/>



# The NeOn Technologies Foundation Ltd.

- Incorporated July 2010
- Objectives
  - To develop and promote the uptake of advanced semantic technologies.
  - To promote high standards in ontology engineering and semantic application design and development through the development and release of robust methods and tools and examples of best practices.
  - To educate students, users and practitioners in semantic technologies through the publication of research outputs, learning resources and training events.
- The foundation offers partnerships with organisations which use the NTK or would like to contribute in its development
- Training and sponsoring opportunities available



## Conclusion

- Stable version NTK 2.3.2 available for download
- 30+ plugins available
- Enhanced version (with focus on usability) planned for Q4 2010
- Work underway on ontology design patterns for OWL2
- Business-friendly Eclipse Public License (EPL)
- NeOn Foundation up and running, partnerships possible
- Download the NTK at <http://neon-toolkit.org/>