

Table 1. Ontology editor survey results

Tool:	Version:	Release Date:	Source:	Modeling Features/Limitations:	Base Language:	Web Support {Use}:	Import/Export Formats:	Graph View:	Consistency Checks:	Multi-user Support:	Merging:	Lexical Support:	Information Extraction:	Comments:	More Info:	Contact:
<i>The product or other software offering for building ontologies</i>	<i>The latest software release identifier</i>	<i>The date it became available</i>	<i>The company or organization producing or supplying the software tool</i>	<i>The representational and logical qualities that can be expressed in the built ontology</i>	<i>The native or primary language used to encode the ontology</i>	<i>Support for Web-compliant ontologies (e.g., URI's). (Use of the software over the Web (e.g., browser client).)</i>	<i>Languages in which ontology data can be read in, and/or the built ontology can be written out</i>	<i>The extent to which the built ontology can be created, debugged, edited and/or compared directly in graphic form</i>	<i>The degree to which the syntactic, referential and/or logical correctness of the ontology can be verified automatically</i>	<i>Features that allow and facilitate concurrent development of the built ontology</i>	<i>Support for easily comparing and merging independent built ontologies</i>	<i>Capabilities for lexical referencing of ontology elements (e.g., synonyms) and processing lexical content (e.g., searching/filtering ontology terms)</i>	<i>Capabilities for ontology-directed capture of target information from content and possibly subsequent elaboration of the ontology</i>	<i>Pertinent information about methodology, availability and support, additional features, etc.</i>	<i>Product or project Web site</i>	<i>E-mail contact for additional information</i>
Apollo	1.1(1)	29-Sep-2003	Knowledge Media Institute of Open University, UK	Classes with slots plus facets for restrictions and metadata; individuals; inheritance. Extensible functional objects for relations, functions, procedures, axioms and rules.	OKBC model	No. {Server is planned.}	CLOS; OCML; OWL (RDF and XML syntaxes)	No	Yes, strong typing on classes and individuals; manages undefined members.	No	No	No	No		http://apollo.open.ac.uk/index.html	Paul Mulholland <p.mulholland@open.ac.uk>
CIRCA Taxonomy Administrator	1.1	1-Mar-2002	Applied Semantics, Inc. (acquired by Google)	Maps designed taxonomies to a built-in general lexical ontology using weighted concept clusters ("gist"). No definable relations.	proprietary	No	(RDFS planned)	Browsing of ontology.	Yes, limited.	No	Yes, via common mapping.	Yes	Via other CIRCA tools.	Part of CIRCA Auto-Categorizer. Support for relations and RDF import/export was planned. Products may not be available since acquired by Google.	http://www.google.com/	Nathan Tyler <nate@google.com>
CmapTools	3.4	12-May-2004	Institute for Human and Machine Cognition, University of West Florida	Subsumption hierarchy of concepts and relations as labeled nodes and links, plus cross links. Concepts and links in sequence form simple propositions. Complete knowledge models may include URL's and other digitized resources.	Java	URL references. (Searching over the Web)	None	Yes, for creation, editing and comparing.	Various checks for logic, formatting, knowledge structure elements, etc.	Yes, supporting synchronous and asynchronous collaboration, and a variety of server types and locations.	Facilities for comparing ontologies include generating detailed descriptions of concordance.	Syntax, spell check, WordNet, etc	Yes	Project in progress to add OWL import/export capabilities.	http://www.ihmc.us	Technical: Alberto J. Cañas <acanas@ihmc.us> Educational: Joseph D. Novak <jnovak@ihmc.us> Knowledge modeling: Robert Hoffman <rohoffman@ihmc.us>
COBRA	1.0	24-Nov-2003	Artificial Intelligence Applications Institute (AIAI), University of Edinburgh	Ontologies in the Gene Ontology and Open Biological Ontologies formats, with subclass part-of, lineage, and ontology mappings.	GO XML/RDF extended	Load ontologies by URL.	GO flat file; GO RDF/XML; RDFS; OWL	No, but tree view of concepts and relations supports drag and drop.	Possible via user defined procedures in Jena toolkit.	No	Manual ontology mapping between two tree views. Ontologies can be compared per their RDF models.	Synonyms per GO specification; searching term names.	No	This is an AKT project tool. Uses the Jena toolkit.	http://www.xspan.org/applications/cobra/	Stuart Aitken <stuart@aiia.ed.ac.uk>
CoGITaNT	1.0.4	5-Apr-2004	LIRMM - CNRS and LERIA, University of Angers, France	Conceptual graph (CG) modeling with rules; nested typed graphs; projections.	CG model	{Web access is planned}	BCGCT; CGXML; CoGXML; CGIF (export)	Browsing of ontology.	Yes	No	No	No	No	Client and server tools; underlying C++ library (version 5.1.4) also available.	http://cogitant.sourceforge.net/	David Genest <genest@info.univ-angers.fr>
ConceptTool	0.9	23-Sep-2003	Dept. of Computing Science, University of Aberdeen, UK	Concepts by definition or enumeration of individuals for: classes, class instances, class individuals, associations (ala UML or EER), association instances and association individuals. Slots for attributes, associative and partonomic links with types, cardinalities, enumerations, local constraints. Inheritance hierarchies for classes and associations; global axioms for disjointness, coverage. Concepts are classified automatically by their relationships with other concepts.	XML (OWL planned)	No	None; (RDF and OWL under development)	Browsing of concept hierarchies; specialized tree views.	Syntactic correctness enforced by construction. DL style semantic consistency check (class, association, instance and individual validation).	No, (but planned.)	Ontology articulation by creation of shared views through semantic bridges (currently limited to EER-like frame-based model).	Based on WordNet.	No	This is an AKT project tool. Uses DL inference engine (FaCT or RACER) for conceptual deductions and restructuring of statements.	http://www.csd.abdn.ac.uk/research/IKM/ConceptTool/	compatan@csd.abdn.ac.uk
CONE	5.1	1-Apr-2004	VTT Technical Research Centre of Finland, VTT Information Technology.	Multiple models consist of concepts, relations and instances (individuals). Models are linked by "bridge" relations. Concepts have type, referent (concept/instance domain), description and binary properties (attributes). Use of concepts and properties including self-reference is unconstrained. Support for cardinality restrictions and multiple inheritance.	Prolog	URI's	Import/Export: RDF/RDFS, Export: X-CARIN; RuleML.	Yes	Possible via user defined procedures in Prolog.	No	No	Search via CONE Textual Browser.	Yes	CONE (COncceptual NEtwork) supports business process automation using extended Agent-Object Relationship Modeling Language (AORML). Can be licensed with email support.	http://www.vtt.fi/te/ontologies/cone/index.html	Paula Silvenon <paula.silvenon@vtt.fi>; Kuldar Taveter <kuldar.taveter@vtt.fi>
Construct	3.1	1-Jun-2004	Network Inference	Class and property hierarchies; domains and ranges; instances; OWL logical expressions; OWL axioms; comments and meta information. Direct RDB mapping.	OWL	URI namespaces. (Ontology sharing via Visio Viewer browser plug-in).	OWL; XML	Creation, editing and syntactic debugging in graph and tree views.	Immediate syntactic checking; logical correctness via Cerebra Server inference engine.	No, however separate user ontologies may be synchronized using owl:imports.	Not directly, but indexing across multiple ontologies manages object names. Also, using owl:imports allows run-time merging by inference engine.	Synonyms (via OWL sameAs and equivalence); search/filter for terms.	No, except via explicit mappings to external instance data in RDBMS sources with supporting tools.	Visio plug-in runs standalone or with Cerebra Server product for consistency checking, reasoning and querying.	www.networkinference.com	sales@networkinference.com
Contextia	2.1	1-Aug-2002	Modulant	Basic concepts and relations with datatypes are represented in schemas.	Express	Referenced ontologies (URL's); URI's	Entity-relation diagrams; XML Schema	For editing single ontology (using FirstStep XG).	Express model (ISO 10303 validation; cross-ontology consistencies	No	Schema mapping including aggregation/generalization; "context" mapping.	Synonym mappings; term matching	No, except as explicit mappings from structured and semi-structured sources.	Ontology functions are part of an enterprise data integration product. Ontology editing supported by FirstStep XG included with Contextia.	http://www.modulant.com/	Julian Fowler <jfowler@modulant.com>
COPORUM OntoBuilder	1.5	1-Aug-2002	CognIT AS	Basic concepts and relations are represented with single inheritance. Representation of concepts and relations extracted from content may be extended with WordNet information.	RDFS	{Web based repository; (Web services under development.)}	DAML+OIL; RDF(S)	Yes, but not for editing.	RDF consistency via repository	(Under development)	Flat merging via Sesame.	Yes, based on WordNet and RDF Query Language; also in Sesame.	Yes, based on meaning and distribution.	Tool embedded in On-To-Knowledge project (European IST) tool set and requires Sesame RDF repository. Focus on generating editable ontologies automatically from natural language documents.	http://ontoserver.cognit.no	Dieter Hirdes <dieter.hirdes@cognit.no>
Corese	1.8	4-Mar-2004	INRIA Sophia, France	Conceptual graphs with binary relations, RDF, RDF graph rules, standard and approximate projection, type inference, introspection. RDF extended with transitive, symmetric and inverse properties as well as disjoint, intersection and union classes.	Conceptual Graphs (CG) and RDF	RDF(S). (Web server; XSLT stylesheets; query by HTML forms)	RDF(S); OWL (partial)	Not yet in the current distribution.	Yes, type checking and type inference.	No	No, except per support of RDF/XML namespaces.	GUI support for multilingual rdfs:label.	Not in distribution	Corese is used primarily as a search engine in corporate knowledge management applications. Java.	http://www.inria.fr/acacia/corese	corese@sophia.inria.fr
DAG-Edit	1.417	14-Apr-2004	Berkeley Drosophila Genome Project (BDGP)	Mixed part-of and isa concept hierarchies are represented along with synonym and search facilities. No properties.	Directed cyclic/acyclic graph	Read input via URL's.	Gene Ontology RDF format; Gene Ontology Postscript schema (experimental); (DAML+OIL in GOET)	No, but tree view of flattened graph.	No	No	Yes, especially at the term level; also change history tracking.	Synonyms; regexp search	No	While intended for gene expression ontologies, it can be used for any taxonomy. Generic alpha version (GOET) is under development.	http://sourceforge.net/projects/geneontology	John Day-Richter <john.richter@aya.yale.edu>
Differential Ontology Editor (DOE)	1.51	4-Nov-2003	National Audiovisual Institute (INA), France	Ontology as a lattice of concepts and a lattice of relationships between concepts, plus a set of instances. Concepts cannot be defined extensionally with constraints. The ontology model is basically RDFS plus terminological information linked to each entity. The arity and the domains of the relationships can be specified. No axiom editor is provided.	Valid XML with respect to a DTD	Load ontology by URL.	RDFS; OWL presentation syntax; OWL exchange syntax; OIL plain text; OIL XML; DAML+OIL; CGXML	No, but tree view.	Arity and type inheritance on relation domains; detects cycles in hierarchies.	No	No	Methodology for differential definitions. Term definitions (encyclopedic); synonyms and preferred terms	No	Supports Differential Semantics methodology of Bruno Bachimon. To be used with other ontology editors.	http://tel.csd.cnrs.fr/documents/archives/0/00/0/52/63/index_fr.html	Raphael Troncy <raphael.troncy@ina.fr>
Disciple Learning Agent Shell	2.8	1-Jul-2003	Learning Agents Laboratory, George Mason University	Semantic network representation with functions, extended to allow partially learned entities. A hierarchy of objects and a hierarchy of features, with their descriptions, are represented as frames. Also, general problem solving rules can be expressed with terms from the ontology.	OKBC-like with extensions	{Ontology summaries output in HTML.}	Import: CYC ontologies	Browse classes, properties and individuals.	Syntactic consistency is always maintained; can commit multiple changes to persistent ontology in single operation.	No	Yes, two ontologies.	Search for terms.	No	The shell is used by subject matter experts etc. to rapidly teach domain problem solving to Disciple agents that learn task reduction rules and extend an object ontology.	http://lalab.gmu.edu/	Gheorge Tecuci <tecuci@gmu.edu>
DL-workbench	1.1	5-Aug-2003	Open CASCADE S.A. & INSA de Rouen, France	SHIQ description logic meta-model as constrained by DAML+OIL representation.	DAML+OIL	URI's. {No}	OWL; DAML+OIL; RDFS	No	Logical pre- & -post conditions and invariants checked on every instance per meta-model. User defined verification is also possible.	(Transaction mechanism is planned.) Project and CVS support via Eclipse platform.	Limited support in API (but not GUI).	Possible via API.	Possible via API.	Built as set of plug-ins to Eclipse Java platform (Ver 3.0). Meta-model approach allows any structural logical formalism to be defined and merged with others. Can be used to add ontology functionality to other tools.	http://projects.opencascade.org/dl-workbench/	Mikhail Kazakov <m-kazakov@opencascade.com>
DOGMAModeler	2.132	1-Jul-2003	STARLab, Vrije University, Brussels	Modeling at two levels (i.e., double-articulation): ontology base takes the form <Context, Term1, Role, Term2>, plus ontological commitments capture application level use of knowledge. An ontological commitment can be specified in any language (e.g. DAML, EER, ORM, UML, if-then, etc.). DogmaModeler presently supports only ORM. Axioms are represented in pseudo natural language sentences.	DOGMA Lexon format; ORM Markup language (serialization of ORM conceptual schemes)	{Web connection to ontology server and ontology commitment libraries.}	(Planned)	Using ORM graphical notation.	(Consistency and implication checking under construction.)	Yes	Supports systematic composition and modularization of ontologies; construction of ontology libraries. (Direct ontology merging is planned.)	(Under construction)	(Planned)		http://www.starlab.vub.ac.be/research/dogma.htm	Mustafa Jarrar <mjarrar@vub.ac.be>
Domain Ontology Management Environment (DOME)	2.0	1-Aug-2002	Btextact Technologies (BT)	Concepts, relations and constraints are mapped to ER-like specifications.	CLASSIC & FaCT	{Web access}	OKBC; XML	ER diagrams	Yes	Yes	(Under development)	(Under development)	Semi-automatic and rule-based extraction from RDB's and web pages	DOME has transitioned to the Semantic Integration Suite under development (http://www.btextact.com/research/researchprojects/currentresearch/). Available externally by individual agreements with limited support.	http://more.btextact.com/projects/bsr/dome/index.htm	Paul D. O'Brien <paul.d.obrien@bt.com>
DUET	0.3.0	17-Jul-2002	AT&T Government Solutions	Represents only UML static constructs available on class diagrams.	UML	URL's and namespaces are preserved in UML package naming.	DAML	Editing using UML class diagrams (via Rational Rose or ArgoUML products).	Valid UML diagrams will produce valid DAML+OIL and conversely.	Supports multi-user capabilities of Rational Rose.	Multiple ontologies may be imported for comparison and merging.	No	No	DARPA DAML project. Additional output: HTML views of UML models.	http://codip.grci.com/Tools/Tools.html	maria@grci.com
e-COSer - e-COGNOS Ontology Server	1.0	15-Oct-2003	CSTB - Centre Technique et Scientifique du Batiment	Concepts, properties and relations are represented in an ontology composed of a taxonomy of concepts and a taxonomy of relations.	DAML+OIL	{Web access; import concept taxonomies via URL.}	Import: DAML+OIL; bcXML (Building and Construction XML)	No, tree view only.	Uniqueness of concept IDs; consistency of taxonomical relations; handling of multiple inheritance.	No	No	Yes	To be released. Ontological indexes of parsed documents are calculated using keywords extracted from the knowledge base and taxonomies.	e-COSer supports the e-COGNOS KM Infrastructure (e-CKMI) for the building construction sector.	www.e-cognos.org	Celson Lima <celson.lima@cstb.fr>

Emacs OWL Mode	beta	23-Jan-2004	BBN Technologies	Supports OWL constructs in a language composition and editing mode.	Emacs	RDF. (Browser access)	No	No	Basic OWL language syntax.	No	No	No	No	Available as source code; requires W3 package.	http://daml.bbn.com/~burstein/owl-mode/ ; http://projects.semwebcentral.org/projects/owl-emacs/	Mark Burstein <burstein@bbn.com>
ExClaim & CommonKADS Workbench	1.0	1-Dec-2001	National Institute for Research and Development in Informatics (ICI), Romania	Description logic modeling plus primitive problem solving actions.	DL model	No	CML	Browsing of ontology	Knowledge verification and model validation (for DL representation).	User roles	No	No	No	Uses the CommonKADS Workbench based on SWI-Prolog and the XPCE GUI.	http://www.ici.ro/ci/portofoliu/exclaim.html	Liviu Badea <badea@ici.ro>
EXPRESS Data Manager VisualExpress	4.7	1-Jan-2004	EPM Technology AS, Norway	Concepts with multiple Inheritance, constraints, rules and functions. Taxonomies implemented directly in ISO 15926, ISO 12006, ISO 13584 and other standards.	ISO 10303-11 Express, supported by XML Schema.	No. {Publish model data and diagrams to Web.}	XML: ISO 10303-21, ISO 10303-28, and others	Yes, in ISO 10303-11 and Express-G graph notations.	Yes, syntactically via a compiler. Model validation via a rule engine (EDMmodelChecker).	Yes, the Express Object Database is generated automatically.	Yes, using ISO 10303-14 and Express-X for mapping.	Yes	Can use ISO 10303-14 and a superset for "cascading views".	A complete system with a major focus on industrial data management. The associated EDMmodelChecker will also validate data against user defined rule schemas.	http://www.epmtech.jotne.com	info@epmtech.jotne.com
ezOWL	1.0	12-Apr-2004	ETRI - Electronics and Telecommunications Research Institute, South Korea	Supports much of the OWL Full ontology model. Enables UML-like diagrammatic definitions.	OWL	URI's	Export: RDF/XML; Notation 3; N-Triple	Full diagram based editing.	Yes	No	No	No	No	Presently available as a plug-in to Protégé that also requires the OWL plug-in. A standalone version is under development.	http://web.etri.re.kr/ezowl/	runto@etri.re.kr
Freedom (formerly Enterprise Semantic Platform)	3.3	31-Oct-2003	Semagix, Inc	Hierarchical entity classes with typed attributes (limited support for XML Schema types) and named relationships; class subsumption inheritance of attributes and relationships; cardinality constraints on relationships, attributes and entity classes. Entity classes can also be modeled to represent the contextual semantic metadata of a domain.	Proprietary	{Web access through browser and API.}	Export: XML; RDF(S)	Browsing of ontology schema and instances using TouchGraph tree viewing.	Cardinality constraints and correctness enforced during construction (instances/assertions).	Limited, concurrency control prevents editing the same instances.	No	Synonym-based term normalization. Searching entity instances on partial match of names (or synonyms) or attribute values.	Ontology-driven extraction from structured and unstructured sources automatically collects, normalizes and inserts information (e.g., semantic metadata) into ontology. Classification of content uses statistical, machine learning and knowledge-based methods.	Platform is focused on enterprise level decision making support through semantic metadata enhancement and tagging with ambiguity resolution. Includes semantic query engine with in-memory indexing; audit trails.	http://www.semagix.com	information@semagix.com
GALEN Case Environment (GCE)	5.10.01	15-Nov-2003	Kermanog	Description logic terminological modeling without support for individuals. Composite concepts are automatically classified according to their criteria (relationships with other concepts). New concepts can be created interactively and according to user-defined rules.	GRAIL	No	GRAIL	No, but filtered tree views allow editing.	Explicit grammatical and sensible sanctions are enforced when combining terms.	No	Compiles differences in concepts, hierarchies and criteria (properties) between two ontologies.	GALEN concept identifiers can be associated with synonyms and word forms.	No	Although, developed primarily as a medical terminology model builder, the tool can serve as a general purpose ontology editor. GCE is part of the Classification Workbench with support to manage domain classification schemes.	www.kermanog.com	Egbert van der Haring <eh@kermanog.com>
GALEN Intermediate Representation Configurator (GirC)	1.00	31-Mar-2004	Kermanog	Categorical structure including links and constraints. Categories contain descriptors to build high-level intermediate representations (called dissections), which can be translated automatically to GRAIL statements. Templates can be defined to ensure consistent sets of dissections.	XML	No	XML	No, editing is in tree view.	Inherent correctness ensured by construction.	No	(Under development)	Synonyms in any language for descriptors and links.	No	GirC, part of the Classification Workbench, is used with other workbench tools to automatically generate GRAIL statements from intermediate representations (dissections). Uses ROIS Knowledge Server over TCP/IP connection.	http://www.kermanog.com/	help@kermanog.com
GKB Editor	3.2	1-Feb-2003	Artificial Intelligence Center, SRI International	Frame-based representation system including classes, slots, and instances.	Ocelot; GFP/OKBC model	No	Ocelot format	Viewing taxonomic structure and semantic-network relationships. Editing classes and properties.	Yes	Multi-user updating supported via Oracle back-end.	Possible across OKBC based ontologies.	No	No	Not intended for initial development of ontologies. Addition to Ontolingua, Loom and other frame language systems.	http://www.ai.sri.com/~gkb/	Peter D. Karp <pkarp@ai.sri.com>
Haystack	Demo	24-May-2004	Massachusetts Institute of Technology	Description logic model as expressible in DAML+OIL.	Adenine (RDFS)	URI's. {Planned Web access}	RDFS	Browsing of ontology.	No	No	No	No	No	Haystack is a personal information manager and a general purpose RDF editor. It can handle ontologies in RDFS but does not focus on ontologies.	http://haystack.lcs.mit.edu/	David R. Karger <karger@lcs.mit.edu>
ICOM	1.1	25-Apr-2001	Free University of Bozen-Bolzano, Italy	EER modeling plus inheritance hierarchies, multidimensional aggregations and multiple schema relations.	Description logic	No	XML; UML (future)	Native editing of ER diagrams (UML diagrams planned).	Verify the specification via DL classifier (FaCT).	No	Supports inter-ontology mappings with graphical interface.	No	No	Graphically editing of native UML class diagrams slated for next release.	http://www.cs.man.ac.uk/~franconi/icom/	Enrico Franconi <franconi@inf.unibz.it>
InferEd	1.0 Beta	20-Jan-2004	Intellidimension	Pure RDF model of classes and instances. Generates, for a model, all inferable statements licensed by RDF/RDFS. Explicitly generates the derivation of a particular inference.	RDF	URI's. {Load/store ontology from/to URL.}	RDF/XML; Notation 3; N-Triples	Graph view of classes only.	Syntactic checks on input ensures valid RDF files.	No, except simple reification mechanism allows comments about ontology statements to be shared.	No, except multiple ontologies can be open simultaneously, and multiple files can be imported into each ontology.	Search/replace (with regular expressions) selectively on predicate, subject, and/or object.	No	Permits queries with rules using the native RDFQL query language. Macro capability for repeatable automatic manipulation of RDF data (inserts, deletes, etc.).	http://www.intellidimension.com	Geoff Chappell <gchappell@intellidimension.com>
Integrated Ontology Development Environment (IODE)	1.7.5	30-Jun-2004	Ontology Works, Inc.	Axiom-based models supporting concepts and relations, primitive datatypes, contexts, default reasoning, temporal model relations, higher-arity relations, metaconcepts and metarelations. Does not perform classification reasoning.	SCL/KIF	URI's; Unicode	XML; XML Schema; UML; OWL Lite/DL; RDF	Taxonomy view including any-arity relations and axiom dependencies. GUI-based editing.	Syntactic and axiom-based semantic consistency checking, with database support for notification and transaction rollback. Supports OntoClean.	Client/server, fully transactional, multi-user Ontology Management System (OMS) with ACID properties. Programmable clients via APIs.	(Planned)	Synonyms; search/replace with regular expressions.	No	Development environment supports enterprise-scale ontologies and ontology-based software components for semantic integration, etc. Enforces built-in formal ontology content and generates APIs, databases and constraints that obey semantics of the domain ontology; uses contexts for optimization, and annotated logic for fact-level security and explanation. Semantic query.	http://www.ontologyworks.com/	info@ontologyworks.com
IsaViz	2.0	8-Aug-2003	W3C - World Wide Web Consortium	Supports RDFS level specifications. Can specify any model based on RDF such as DAML+OIL and OWL.	RDF model; GSS	URI's; XML namespaces	RDF/XML; Notation 3; N-Triples; SVG; PNG	Native creation and editing of resources, literals and properties. Can use GSS stylesheet language to define representations of RDF graphs.	RDF model correctness.	No	Simple merging of graphs.	No	No	Graph Stylesheets (GSS) are used to define schemas for rendering languages based on RDF.	http://www.w3.org/2001/11/IsaViz/	Emmanuel Pietriga <epietriga@nuxeo.com>
JOE	Demo	21-Jul-1999	University of South Carolina Center for IT	Basic concept and relations modeling ala entity-relationship (ER) model.	KIF	No	ER (LDL++)	No	No	No	No	No	No	Development is not currently ongoing. Available as an applet.	http://www.cse.sc.edu/research/cit/demos/java/joe/	Huhns, Michael <huhns@engr.sc.edu>
KAON IO-modeler	1.2.7	6-Apr-2004	FZI Research Center & AIFB Institute, University of Karlsruhe	Extends RDFS with symmetric, transitive and inverse relations, relation cardinality, meta-modeling, etc.	KAON extension of RDFS; (OWL-DL is planned)	Yes. {Java Webstart}	RDFS; Protégé RDFS	Yes, designed for editing large ontologies.	Yes, for evolution of ontology.	Concurrent access control with transaction oriented locking and rollback.	No	Lexical information may be attached to any ontology element as meta-data.	No	OI-modeler is part of KAON tool suite for business applications that uses RDB persistence layer for scalability.	http://kaon.semanticweb.org/	kaon-info@aifb.uni-karlsruhe.de
KBE (Knowledge Base Editor for Zeus Agent Building Toolkit)	1.3	22-Mar-2000	Institute for Software Integrated Systems, Vanderbilt University	Zeus ontology model of concepts, attributes and values; multiple inheritance supported only indirectly; modularization within a closed world model. (Also defines agent interaction protocols.)	GME	No	Zeus ontology file (.edf)	UML-like diagrams for browsing only.	No	No	No	No	No	KBE is layered on top of the Zeus environment (from British Telecommunications) for building agents and extends the ontology editor functions. The underlying GBE model specification system could be used as the basis of other ontology builders.	http://www.isis.vanderbilt.edu/Projects/micants/Tech/Demos/KBE/	Gabor Karsai <gabor@vuse.vanderbilt.edu>
KBST-EM	2.0	on request	AIAI, The University of Edinburgh	Generic modeling of entity and process models including enterprise and business models, ontologies, and various UML diagrams. Represents classes with attributes plus relations; functions; hierarchical and graphical views. FOL support of some OWL axioms.	Directed cyclic/acyclic graph; Clips; FBPMML-DL; OWL	{Web publishing of OWL documents.}	FBPMML-DL	Graphical form for creation, editing and some debugging and merging. Relations but not concepts may be entered using graphical form via links.	Graphical & table views are always consistent with ontology characteristics.	No	Yes, limited straight forward ontology merging. Case based reasoning (CBR) shell available to help form and critique business models.	No	No	KBST-EM currently supports 29 different modeling methods and stores some 40 different models. Tool is programmable using CLIPS. Tool is available only by request.	http://www.aiai.ed.ac.uk/%7Ejessica/project2-workflow-tech-profile-sub/details.html	Yun-Heh Chen-Burger <jessicac@inf.ed.ac.uk>
K-Infinity Knowledge Builder	2.0	1-Sep-2003	intelligent views GmbH	Semantic network with multiple inheritance of concepts, typed and transitive relations supporting cardinality and range, and support of individuals.	Proprietary	Load ontology by URL. {Web editing and browsing of ontology on server. Graphical (read only) view of ontology is configurable (filtering, categorizing).}	RDFS and XML (other formats on request); supported with wizards.	Full support for building ontology in graphical form.	Built-in and configurable consistency checking.	Collaborative access to ontology with shared graphical ontology views. Role based user access and rights model.	No	Yes, including full text search.	Yes	The Knowledge Builder tool integrates with the Mediator server via a Java API and Java tag library. Extensive external data source support. Topic Map support.	www.i-views.de	Achim Steinacker <a.steinacker@i-views.de>
LegendBuster Ontology Editor	1.3.6	1-Dec-2002	GeoReference Online Ltd	Semantic network hierarchy of concepts, attributes, attribute values and explicitly represented truth-status flags. Inheritance within hierarchies with lateral links. Full reified relations; inverse relations (partial). Metadata for all entities (at node level). Separate tree list editor.	Proprietary (uses Prolog)	No	No, except across projects (proprietary).	No, except SVG export of instance and query graphs.	Partial, with strict attribute context checks but arites currently unchecked.	No	Yes, if from LegendBuster. (User must check semantic consistency.)	Term search and alphabetical sort.	Semi-automatically capture and import vocabulary present in attribute tables of maps of interest.	While LegendBuster is principally a GIS application, the Ontology Editor is suitable for general purpose ontology development. A standalone editor with instances description and fuzzy query is planned.	http://www.georeferenceline.com/	Clinton Smyth <cpsmyth@georeferenceonline.com>
LinKFactory Workbench	3.3	19-Nov-2003	Language and Computing nv	Description logic T-box (terminological) and A-box (assertional) model. Multiple inheritance over concepts and relationships; identification of necessary and sufficient criteria for concept definition. Manage multiple conflicting ontologies in one T-box. Versioning metadata.	Extended description logic with multilingual support	URI's. {Internet clients; WebInfo spider for document retrieval; JAVA RMI API.}	XML; RDF(S); DAML+OIL/OWL	No, but graphic views possible with available Java Beans.	Checks via inferencing for role restrictions, formal disjoints, sanctioning over subsumers, cycles, etc.	Concurrent editing with object-level-locking. Author privileges can be set by object type.	Components available to compare or merge ontologies via a core ontology; related concepts can be matched using formal relations and lexical information.	Concept/term distinction with separate descriptions; multilingual term entry. Instance attribute for part-of-speech. Search on concepts and terms using lexical and relation/link information.	Components available for semantic indexing, coding, querying and extraction of source information using a built ontology.	Consists of a database server, application server, and clients; designed for very large ontologies. Java beans API and optional Application Generators for extraction and other functions.	http://www.landcglobal.com/pages/products.php	rajesh@landc.be
McCullough Knowledge Explorer (MKE)	6.6	2-Nov-2003	Richard H. McCullough	Generic model including definitions, context, n-ary relations, questions and commands. Support for multiple hierarchical contexts and space-time dependencies. Uses "natural language semantics", not "possible worlds".	Proprietary	XML namespaces	RDF	No	Yes, including undefined and ambiguous concepts.	No	Merge possible with alias and consistency checks.	Form based search.	No, except as user defined procedures.	Interfaces to TAP and OpenCyc knowledge bases. Implemented in Unicorn, KornShell and Java.	http://rhm.cdepot.net/	Richard H. McCullough <rhm@cdepot.net>

Medius Visual Ontology Modeler	1.5	15-Mar-2004	Sandpiper Software, Inc.	UML metamodel and profile for modeling of ontologies; multiple inheritance and slots for classes, relations, and functions; complex semantic networks (e.g., lattices of n-ary relations), functions (like SCL/KIF functions), individuals, and text based axioms (e.g., SCL/KIF expressions). Emulates frame based approach to ontology development.	UML 1.x with extensions for OKBC 2.0.3, RDF (S)OWL, and DAML+OIL constructs. (MOF 2 / UML 2 OMG ODM compliance is planned.)	URI support in DAML+OIL/OWL generators. (Read-only HTML can be generated by Rose.)	XML; RDF(S)OWL; DAML+OIL; (KIF/SCL and SWSL are planned)	Yes, creation and editing of UML diagrams via Rose.	Limited checking for cyclic dependencies; DAML+OIL/OWL ontologies are syntactically correct by construction; (additional checks and deductive closure are planned).	Yes	Native Rose model merging; (ontology comparison, alignment, and interactive merging are under development).	Search for terms and relations; (synonyms, stemming, and pattern matching and comparisons are under development).	No, (but planned in related tools.)	Operates as fully integrated add-in to Rational Rose with version management, collaboration and MOF repository support. Planned port to IBM Rational XDE with full integration including knowledge base reasoning. Currently available in the US only.	http://www.sandsoft.com/products.html	info@sandsoft.com
Metis Enterprise	3.4	10-Dec-2003	Computas AS	Creates layers of knowledge (e.g., ontologies) as interrelated meta-models and models affording different perspectives. Unique knowledge architecture forms logical and logistical knowledge cores which are kept synchronized. Some limitations in current ontology transformation from one domain to another.	Proprietary meta-model and visual language.	XML. (Web and Web portal access for distributed model development and use.)	XML; XML Schema; RDB		Coherence and consistency checks as well as user-defined analyses.	Shared repository.	Manages comparison, merging and splitting of models.	Lexical processing can be built into models. No multi-lingual support.	From models only.		www.computas.com	info@computas.com
MOMIS Ontology Builder	1.0	May-2004 expected	DBgroup, University of Modena and Reggio Emilia	Classes and attributes are expressed within an extended ODMG Object Model. Model descriptions are re-expressed in a description logic in order to infer new relationships. The source descriptions are translated automatically into this logic (OLCD).	ODL-13 (an extension of the ODMG Object Definition Language (ODL) and OLCD)	(Planned Web support)	XML	Creation and browsing of ontology via Si-Designer tool.	Checks by object construction (ODB-Tools) and inference (OLCD inference engine).	No	Yes	Yes, based on WordNet (planned for Euro-WordNet and Multi-WordNet).	Extraction and integration from structured and semi-structured data sources. Relationships derived from schema, lexicon and inferred attributes.	The MOMIS Ontology Builder is an IST SEWASIE project component. It has limited ontology editing capabilities.	http://www.dbgroup.uni.mo.it/Momis/	Sonia Bergamaschi < bergamaschi.sonia@uni.mo.it >
MR3	1.0 RC1	26-Feb-2004	Shizuoka University & AIST (National Institute of Advanced Industrial Science and Technology)	RDF model with RDFS classes and properties; supports label and comment.	RDF(S)	URI's	RDF/XML; N-Triple; PNG	Yes, with concurrent views of classes, properties and RDF model.	Supports correspondence between RDF and RDFS.	No	No	No	No	plug-in API supporting the Jena RDF model API.	http://panda.cs.inf.shizuoka.ac.jp/mmm/mr3/	Takeshi Morita < morita@ks.cs.inf.shizuoka.ac.jp >
NeoClassic	1.0	15-Dec-2000	Bell Labs (Lucent Technologies)	Framework representation of descriptions, concepts, roles, individuals and rules. Concepts can be derived from necessary and sufficient conditions for individual membership. Subsumption and classification are inherent inference.	DL model	No	No	No, command line editor only.	Yes	No	No	No	No	This C++ implementation of the original CLASSIC system is the only currently supported version.	http://www.out.bell-labs.com/project/classic/	Peter F. Patel-Schneider < pfps@research.bell-labs.com >
OCW – Ontology Craft Workbench (formerly Onto-Builder)	3.0	1-May-2002	Ontologos Corp. University of Savoie	Distinguishes "what contributes to the essence of things and what describes them", defining concepts by their "specific difference". Thus, logical and set-oriented semantics are derived a posteriori.	LOK (Language for Ontological Knowledge) written in Smalltalk	(Web access and Web service)	Input: DAML-OIL; XML, LOKOutput: DAML+OIL; XML; KIF; Conceptual Graph	Yes, for browsing.	Yes, based on logic and on the specific-difference theory.	User groups.	Yes, for ontologies based on the OK Model.	Lexicon management including synonyms.	Extraction of lexicons from texts with OK lexical tools (based on Brill's tagger).	OCW is part of the Ontological Knowledge Station that supports a dedicated methodology for building ontologies. Other tools are for lexical support and information extraction (LCW) and terminological knowledge bases (TCW).	http://ontology.univ-savoie.fr	Christophe Roche < roche@univ-savoie.fr >
Oiled	3.5.5	31-Oct-2003	University of Manchester Information Management Group	DAML constraint axioms; same-class-as; limited XML Schema datatypes; creation metadata; allows arbitrary expressions as filters and in constraint axioms; explicit use of quantifiers; one-of lists of individuals; no hierarchical property view.	DAML+OIL	RDF URI's; limited namespaces; limited XML Schema; export HTML. (Load ontologies by URL)	Import/export: DAML+OIL; OWL RDF/XML; SHIQ. Export (only): RDFS; DIG; FaCT Lisp. Import (only): GO.	Browsing Graphviz files of class subsumption only.	Subsumption and satisfiability (via FaCT reasoner).	No	No	Limited synonyms; metadata.	No	Query for classes and instances. Summary of changes in session. Supports DIG interface to DL inference engines.	http://oiled.man.ac.uk/	Sean Bechhofer < seanb@cs.man.ac.uk >
OLR3 Schema Editor	1.0	1-Apr-2002	Institute for Information Systems, University of Hannover	Instantiation and editing of external or custom schemas conforming to RDFS. Concept-specific filtering to present choice of legal properties.	RDFS	RDF URI's; (browser based)	RDF	No	Yes, for property constraints, etc.	No	No	No	No	Part of the Open Learning Repository Version 3 (OLR3) system for course specification.	http://www.kbs.uni-hannover.de/~tkunze	Prof. Dr. Wolfgang Nejdl < nejdl@kbs.uni-hannover.de >
Onto-Builder	1.1	1-Jun-2003	Institute of Medical Informatics, Statistics and Epidemiology (IMISE) and Institute of Computer Science, University of Leipzig	Manages compilation of domain terms, their description, and contexts using natural language.	Natural language; (logical representation language planned)	No. (Web access)	No	No	Not automatically	Yes, with editor, moderator and administrator user group types.	No	Representation of synonyms; search on terms and descriptions; lexical rules for term input	No	Semantic analysis using a formal model based on a top level ontology and a logic-based representation language are planned. Domain focus is on medicine.	www.onto-builder.de	info@onto-builder.de
OntoEdit	2.7	4-Mar-2004	Ontoprise GmbH	F-Logic axioms on classes and relations; algebraic properties of relations; creation of metadata; limited DAML property constraints and datatypes; no class combinations, equivalent instances.	F-Logic	RDF URI's	RDFS; F-Logic; DAML+OIL; RDB schemas	Yes, for navigation and editing.	Yes, constraints and consistency via plug-in analyzer.	(Multi-user functions including transaction locking are planned.)	Simple merging possible.	Synonyms can be defined via DomainLexicon plug-in.	No, but RDB integration via mapping (Professional version).	Free version is restricted to small models. Commercial and professional versions have full support. F-Logic rule creation, debugging and inferring (Professional version).	http://www.ontoprise.com	ontosedit@ontoprise.de
Ontolingua with Chimaera	1.0.650 0.1.45	14-Oct-2002 25-Aug-2003	Stanford Knowledge Systems Lab	OKBC model with full KIF axioms. OWL, DAML and DAML-S are axiomatized as ontologies. Chimaera accepts OWL and DAML ontologies.	Ontolingua	(Web access to service)	Import & Export: KIF; OKBC; Loom; Prolog; Ontolingua; CLIPS. Import only: Classic; Ocelot; Protégé.	No	Elaborate checking via Chimaera; theorem proving via separate Java Theorem Prover (JTP).	Write-only locking; user access levels.	Semi-automated via Chimaera	Search for terms in all loaded ontologies.	No	Online service only (at http://www.ksl-stanford.edu). Chimaera (http://www.ksl-stanford.edu/software/chimaera/) was partially developed under DARPA funding.	http://www.ksl-stanford.edu/software/ontolingua/	ontology-librarian@ksl.stanford.edu
Ontology Editor for Eclipse	1.0	1-Aug-2003	University of Maryland Baltimore County	The tool launches the Protégé ontology editor and adds a text interface for editing the ontology in N3 notation.	see Protégé	see Protégé	N3; see Protégé	see Protégé	see Protégé	see Protégé	see Protégé	see Protégé	see Protégé	All Protégé plug-ins are accessible through the Eclipse platform. A standalone textual ontology creation and editing capability is under development.	http://research.ebiq.umd.edu/v2.1/project/html/id/26/	Anjali Bharat Shah < anjali1@umbc.edu >
Ontology Generator	1.0	23-Dec-2003	Progos	What must be true of an RDF ontology is derived from a collection of (its) instances. The RDF instance documents will produce a valid ontology structure in RDF(S), OWL or DAML+OIL.	RDF	URI's	RDF(S); OWL; DAML+OIL	(Planned)	Generates valid ontologies	(Planned)	(Planned)	No	From RDF instance data.	Not a direct ontology editor, but depends on the data input to automatically generate a valid ontology. Currently available as an online tool.	http://progos.hu/tools/og/	rp@progos.hu
Ontology Graph (OGraph)	0.8.0	23-May-2003	AT&T Government Solutions	Graph representation of DAML+OIL and OWL ontologies. Supports most constructs.	DAML+OIL	URI's	DAML+OIL; OWL; RDF	No	No	Possible	No, but Ontology Manager aids mapping.	No	No	OGraph is a refactored and enhanced version of the DARPA project DAML API. Basic Java library for analysis and manipulation of DAML/OWL ontologies.	http://codip.grci.com/Tools/Components.html	corese@sophia.inria.fr
Ontology Management System (SNOBASE)	1.0	1-Oct-2003	IBM T. J. Watson Research Center	Facility for managing multiple ontology sources. Allows loading, creating, modifying, querying, and storing RDF based ontologies.	Ontology's native language	(Loading ontologies from the Internet)	RDF; RDFS; OWL; DAML+OIL (native only)	No	No	No	No	No	No	A Java library available from IBM alphaWorks.	http://www.alphaworks.ibm.com/tech/snbase	Juhnyoung Lee < jl@us.ibm.com >
OntoMerge	0.1 alpha	15-Apr-2002	Yale University	Predicate calculus for classes, properties, axioms, and their instances. Supports functions and equality substitutions. Forward and backward chaining reasoning.	Web-PDDL (strongly typed FOL)	Load ontologies and data by URL's. (Browser based.)	RDF, DAML+OIL, OWL, WSDL, XML	No, (but planned for release.)	No, (but planned for release.)	No	No, except by adding bridging axioms. Can extract sub-ontologies.	Yes, based on WordNet.	No	Primarily for ontology merging and ontology translation.	http://www.cs.yale.edu/homes/dvm/dam/ontology-translation.html	Drew V. McDermott < drew.mcdermott@yale.edu >
Ontopia Knowledge Suite	2.0.3	15-Mar-2004	Ontopia AS	Constraint modeling specifically and solely for Topic Map representations.	Ontopia Schema Language (OSL)	URI's. (Web access and Web API.)	OSL; XTM; LTM (import only); HyTM	No, but tree view.	Validation against the OSL schema.	Full concurrency and transaction support when running with RDBMS.	For ontologies and instance data, but not (currently) for constraints.	Full-text search	No, but application framework allows extraction.	Although primarily an IDE for Topic Map applications, the framework supports ontologies.	http://www.ontopia.net/solutions/products.html	info@ontopia.net
Ontosaurus	1.9	28-Mar-2002	USC Information Sciences Institute	Rich KB browser with simple editing; contexts; same-class-as; metaclasses.	Loom	No. (HTTP browser)	KIF; Loom; OKBC	Browse class hierarchy	Yes	Global locking	No	No	No	Online access to KB's hosted on CL http server. Versions for Loom and PowerLoom Knowledge Representation System.	http://www.isi.edu/isd/ontosaurus.html	Tom Russ [tar@isi.edu]
OntoTerm	0.9.98	1-Sep-2001	University of Málaga, Spain	Concept and property hierarchies with concept instances; properties distinguished as attributes or relations. Metadata (natural language definitions).	DL-like	(HTML publishing and linking)	Martif (ISO 1220); CLS Framework (ISO 1620)	No, but cross-linked tree views indicate legal element associations or types, and allow editing.	Yes, enforces term and concept correspondence.	No	Simple	Term search	No, but hierarchical metadata system with media linking allows rich information associations.	Although intended to be a terminology management system, OntoTerm can be used for general ontology development. Contact for availability. Ongoing development and support of the software is unknown.	http://www.ontoterm.com/	Antonio Moreno Ortiz < a.m.ortiz@terra.es >
OntoTrack	0.2	2004 (expected)	University of Ulm Dept. for Artificial Intelligence, Germany	OWL Lite model of subClassOf, equivalentClass, allValuesFrom, someValuesFrom, minCardinality, maxCardinality, cardinality, and intersectionOf. Properties and instances can be imported/exported and used in class definitions but currently cannot be defined or changed.	OWL Lite in RDFS notation	RDF URI's and namespaces. (Java WebStart)	RDF/XML; N-Triple	Graphical editing of classes in UML-style with inference feedback. Orientation managed with: auto-camera movement; continuous zooming and panning; animated (de-)expansion of inheritance levels.	GUI enforces syntactically correct statements. Instant reasoning feedback (via RACER) on each edit. Graphical indication of equivalent classes, direct ancestors and descendants, unsatisfiable classes.	No	No	Search with expansion of matching elements. (Regular expression search planned.)	No	Graphical representation of properties and instances is under development. Support for OWL DL expressiveness is planned.	http://www.informatik.uni-ulm.de/ki/OntoTrack/	Thorsten Liebig < liebig@informatik.uni-ulm.de >
OntoX (of OntoBuilder)	1.0	20-May-2004	Technion – Israel Institute of Technology	Enables manual editing of generated ontologies. These ontologies are taxonomies plus methods represented as XML hierarchies.	XML++ (proprietary)	(Planned Web support)	XML with BizTalk support; (RDF & OWL planned)	Browsing only	No	No	Matching via related OntoM product	A thesaurus is available.	Extracts ontologies from Web sources using form elements and hyperlinks.	OntoX is part of OntoBuilder, a joint product of Technion and Mississippi State University. Aimed at research development and feasibility testing. Support is available.	http://ie.technion.ac.il/OntoBuilder	ontobuilder@ie.technion.ac.il

OntoXpl	1.3	27-May-2004	Computer Science Dept., Concordia University	Browse concept, roles, instances, axioms, and implicit and explicit relations among them. Supports query templates for objects.	OWL	Web application	OWL; XML; DIG; SpaceTree syntax	Browsing of concepts, roles, individuals and their relationships	Server side (RACER) detection of DL inconsistencies are not relayed to client.	No, limited to single ontology file.	No, but owl:imports is supported.	Search; also hyperlinks for objects	Yes, using simple natural language parsers for concepts, roles, and individuals.	Does not have editing functions but reveals underlying structure of ontology from different perspectives, facilitating subsequent editing. Selected and implicit information in the ontology is retrieved and reorganized using RACER inference engine and its query language. Requires Tomcat Java servlet container.	http://www.cs.concordia.ca/yling_lu/	ying_lu@cs.concordia.ca
OPCAT – Object-Process CASE Tool	2.6 beta	16-May-2004	Techion – Israel Institute of Technology	UML-like model of classes and instances of objects and processes; object states and their transitions; transformations of objects by processes; and relations like aggregation-participation, exhibition-characterization, generalization-specialization, classification-instantiation, tagged structural relations, and logical operators. Ontologies represent both the structure and behavior of the domain. Meta-modeling with libraries.	Object-Process Methodology (OPM) language	(Planned Web support) (Web exchange of models; UDDI support available)	XML; UML; (RDF, OWL and OWL-S planned)	Yes, including process animation.	Meta-model validation.	Using OPCATeam extension.	Support for comparing and merging independent built ontologies. Allows white-box/black-box and open reuse.	Lexical referencing (e.g., synonyms) and searching/filtering of ontology terms.	Ontologies captured from text documents using SMART tool.	Full ontology modeling includes support for procedural and behavioral aspects of ontologies. Formerly known as OntoBuilder.	http://www.objectprocess.org	Dov Dori <dori@mit.edu>
Open Ontology Forge	1.0	5-May-2004	National Institute of Informatics, Japan	RDF classes and properties in a simple hierarchy. Features include definition of new property data types and metadata descriptions in natural language. No axioms.	RDFS	{Web browser client; (Web repository planned)}	RDFS; XML (instances only)	Browse nested class hierarchy	Yes, limited. Mainly on instances and class property values; also on instances within a co-reference (identity) pool.	(Under development)	No	Find/replace terms	Mapping from free text to instances using XPointer. Saving instances in inline text format for machine learning.	Focus on annotation of ontology instances in free text for information extraction.	http://research.nii.ac.jp/~collier/	collier@nii.ac.jp
OpenCyc Knowledge Server	0.7.0b	17-Dec-2002	Cycorp, Inc.	FOPC extended with contexts, equality, default reasoning, skolemization, quantification over predicates.	CycL (& SubL)	{HTTP server}	DAML+OIL (native KB only)	No	Directed inferencing and queries; truth maintenance	Yes	No	Yes, via Cyc-NL with KB-linked lexicon for syntactic and semantic disambiguation	English parsing possible with Cyc-NL.	Knowledge base subset and KB Browser Create Term tool provide basic ontology editing only. Future release of ontology building tools: Template-based knowledge entry, Index Overlap, Similarity Tool, Salient Descriptor.	http://www.opencyc.org/	info@cyc.com
OpenKnoMe	5.4d	1-Oct-2002	University of Manchester Medical Informatics	Description logic terminological modeling without support for individuals or type system. Arbitrarily complex structures may be composed from primitive concepts and relations. Role hierarchy with inverses, and reasoning over relationships such as part-of. No formal negation, disjunction or conjunction. Limited support for cardinality. No reasoning over numbers or ranges. Toolset for managing intermediate representations.	GRAIL	Not as configured.	CLIPS; XML	No	Logical coherence ala DL and a meta-model system for declaring inherited semantic constraints and permissions. Also user defined checks using declarative query language (GQL).	User roles and read/write privileges; version control. Users see each others changes only when they check modules back in.	Via explicit mappings (reflections) to GALEN Common Reference Model. Focus is on linking rather than mapping to reference model.	Can use GALEN language module that links its concept identifiers with synonyms and word forms, and provides segment grammar for semantic links.	No	Although, developed primarily as a medical terminology model builder, the tool can serve as a general purpose ontology editor. Currently requires OpenGALEN terminology server and CinCOM VisualWorks runtime environment.	http://www.tophing.com/	Dr. Jeremy Rogers <jeremy@tophing.com>
OWL-S Editor	1.0 beta	1-June-2004	CS/AI Department, University of Malta	Creates OWL-S ontologies with service, profile, (partial) process and grounding models by mapping from WSDL. Web services descriptions can be composed from UML activity diagrams. At present, XSD complex types are not supported.	OWL	Reference ontologies by URL; URI validation checking; {Web accessible version planned}	WSDL	Browse only directed graph	Yes, but limited; (support for reasoner is planned)	No	No	No	No	Java APIs for WSDL conversion and UML activity diagram mapping.	http://staff.um.edu.mt/cabe2/supervising/undergraduate/owledit/FYP/Owledit.html	Charlie Abela <charlie.abela@um.edu.mt>; sci023@um.edu.mt
PC Pack 4 (included in SophX-Pack)	B2.9h	3-Apr-2003	Epistemics Ltd	Knowledge acquisition and modeling. Multiple inheritance; n-ary relations; rules and methods. User definable templates for modeling formalisms like CommonKADS and Moka.	XML	{HTML output via XSLT.}	XML	ER diagrams; class hierarchies; OO views	Only logically consistent models can be created.	Yes	No	No	No	Suite of many integrated KADS inspired tools.	http://www.epistemics.co.uk/	Tim Clarke <tim.clarke@epistemics.co.uk>
Protégé	2.1.1	22-June-2004	Stanford Medical Informatics, Stanford University	Classes, slots (binary relations, properties), facets (ternary relations), and instances. Subslots and subproperties with slot overrides at the class level. Full, extensible metamodel and metaclass support. Multiple inheritance. (Multiple types for instances is under development.)	OKBC + CLOS based metamodel	Reference ontologies by URI; limited namespaces. (Run as applet, Java Webstart; servlet interface; (browser interface under construction)).	RDF; RDFS; DAML+OIL; XML; OWL; Clips; UML	Browsing classes and properties via plug-ins (OntoViz, TGViz); nested graph views with editing via Jambalaya plug-in.	Facets (cardinality, types, etc) checked on input by UI and by API. (Multi-user server and client are under development using a "metaproject" model.)	See Protégé	Semi-automated via PROMPT plug-in.	Query tab allows searching. (General search capabilities and search API under development.) No built-in synonym support. WordNet support via plug-in.	No	Many plug-ins available for extending ontology construction, constraint axioms, inferencing, and integration functions. Support for Common KADS methodology. Full Unicode support. Frequent beta releases are available.	http://protege.stanford.edu/index.html	protege-help@smi.stanford.edu
Protégé OWL Plug-in	1.2 beta	28-June-2004	Stanford Medical Informatics, Stanford University	OWL language elements including named classes, properties, restrictions, logical class expressions, enumerations, individuals, metaclasses, ontology metadata and other annotations. Currently does not support direct multiple typing of individuals.	OWL implemented on OKBC metamodel	URI's; currently a single namespace only. (No)	See Protégé; (also OWL Abstract Syntax plug-in under development).	Protégé's GraphWidget for single properties; browsing via OWL/Viz plug-in; visual ontology construction via ezOWL plug-in.	Concept subsumption and satisfiability via a DIG-compliant reasoner such as Racer or FaCT.	See Protégé	Possible using PROMPT.	See Protégé; synonyms possible using owl:sameAs.	No	Co-ODE project at Manchester in collaboration with Stanford. OWL Wizard plug-in streamlines many building tasks. Frequent beta releases are available.	http://protege.stanford.edu/plugins/owl/	http://protege.stanford.edu/community.html
RDFAuthor	alpha	9-May-2002	Damian Steer	Create RDF instance data against RDFS schemas.	RDF	URI's. {Web links; remote RDF query}	XML; RDF	Creating and editing instances as graphs.	RDF errors	No	No	No	No	Currently available for Mac OS X; also as a Java Swing application. Additional output: SVG, PNG, TIFF, PDF.	http://rdfweb.org/people/damian/RDFAuthor/	Damian Steer <pldms@mac.com>
RDFedt	1.02	25-Feb-2001	Jan Winkler	Textual language editor only.	RDF model	RSS	RDFS; DAML; OIL; Shoe	No, but tree view.	Writing mistakes only	No	No	No	No		http://www.jan-winkler.de/dev/e_rdfedit.html	Jan Winkler [Info@jan-winkler.de]
RIC	3.10 alpha	28-May-2003	Maryland Information and Network Dynamics Lab, University of Maryland, College Park	RDF Schema specification of class hierarchy and properties; limited DAML lists; recognition without enforcement of cardinality constraints. Creates instance data for imported ontologies.	RDF	{URL's for ontologies; Java Webstart}	Limited RDF(S), DAML+OIL and OWL (partial)	No	No	No	No	Term searching across ontologies	No	Intended primarily for creating instance data for existing ontologies.	http://www.mindswap.org/~mhgrove/RIC/RIC.shtml	Michael Grove <mhgrove@hotmail.com>
Semantica	3.0.3	13-Apr-2004	Semantic Research	Semantic network of arbitrary concepts and bidirectional relations with instances. Support for file attachments and unstructured comments on some network element types. Basic network analytics.	Proprietary Java-based abstract data model	HTML. ((Collaborative server environment under development.))	Semantica schema XML import/export; HTML export; (RDF(S), OWL, XTM support planned)	Yes, with drag and drop editing.	Basic enforcement of referential integrity.	Supported in Semantica Enterprise Server	Simple merge based on common concept or relation labels.	Synonyms are mapped to concepts; (search planned).	No, except as explicit mappings from structured and semi-structured sources.	Enables multiple modes of information representation.	http://www.semanticsresearch.com/	Jason Wells <jason@semanticsresearch.com>
SemTalk	1.2.5	1-Oct-2003	Semtion GmbH	Subset of RDFS and DAML extended with inverse relations and process modeling. Multiple inheritance.	XML; Visio	URI namespaces. (distributed development)	OWL; DAML+OIL; F-Logic; ARIS models; Bonapart models	Yes, for design and browsing.	Subsumption and name usage across multiple models; meta-model specific checks.	No	Yes, with simple filtering.	Synonyms; homonyms; stop words; some POS; glossaries via Babylon.	No, but interfaces to appropriate Ontoprise and TextTech products.	Microsoft Visio extension and SmartTags. Additional output include: Rational Rose UML class diagrams, RDF annotated HTML, MS Excel, MS Project, SAP IPC, HTML/VML.	http://www.semtalk.com	info@semtalk.com
SMORE	3.0b	4-May-2003	Maryland Information and Network Dynamics Lab, University of Maryland, College Park	Basic DAML+OIL constructs including concepts, properties and limited property restrictions, where these elements are borrowed from existing ontologies, interlinked and possibly expanded.	DAML+OIL (OWL planned)	URI's. {URL's for ontologies}.	RDF/XML; triples	No	No. (Automatic consistency checking via OWL reasoner (Pellet) is under development.)	No	No, but can form one ontology from another. (Compare and map concepts across ontologies using DL expressions is planned.)	Term searching across ontologies by element type.	No	Focus of tool is to mark up documents according to existing and localized ontologies.	http://www.mindswap.org/~aditalk/editor.shtml	Aditya Kalyapur <adityak@wam.umd.edu>
Specware	4.0.6	15-Sep-2003	Kestrel Technology	Models composed of logical and functional axioms.	Metaslang	No	None	No	Proofs via Gandalf and SNARK.	No	Yes, via composition operations (e.g., colimits).	No	No	While primarily a tool for the formal, compositional specification of software, can be used to define domain theories.	http://www.specware.org/	Alessandro Coglio <coglio@kt-llc.com>
SUO-KIF Browser	2.1	12-Jan-2004	Czech Technical University Prague	First order logic plus some higher order logic extensions. Provides read-only access to ontology axioms.	SUO-KIF	No. {Browser}	Import: SUO-KIF; P-WordNet	Yes, for browsing only.	Limited	No	No	No	No	Does not support direct editing, but reveals underlying axioms relating concepts. Online and source code versions. Original C++ version of the tool will be replaced with Java version under development.	http://virtual.cvut.cz/kmsa/resources/index.html	Michal Ševcenko <sevcenko@vc.cvut.cz>
SWOOPed	2.0	26-May-2004	MINDSWAP Research Group, University of Maryland, College Park	Semantic Web Ontology Overview and Perusal (Editor) supports all semantic constructs of OWL. Allows rough structuring using shorthand syntax, and then refinement of ontology (which may be guided in future version). Support for individuals is under development.	RDFS and OWL	URI's. {Java Webstart}	RDFS; DAML+OIL; OWL as RDF/XML	No, (but visualization plug-in is planned).	Pellet Reasoner plug-in allows user to define checks.	No	Provides for staging and comparison of terms based on term descriptions.	(Concept Search plug-in for compound keyword queries is under development.)	No	Uses forms-based, thesaurus-like interface to create, debug and edit the ontology. Supports hyperlinking between associated terms of independent ontologies.	http://www.mindswap.org/2004/SWOOP/	Aditya Kalyapur <swap_adityak@yahoo.com>
SymOntoX	1.0	1-Jul-2003	Institute for the Analysis of Information Systems - CNR, Rome	XML Schema modeling constructs with subsumption of classes and relations; specified relation types of isa, partof, similarity and predicate. Business-oriented predefined classes such as: actor, process, event, message.	XML	{Web browser}	XML; RDF(S)	No	Concept hierarchy validity, range restrictions and graph cycles.	Simple user groups	Possible via XML encoding.	Word lists of synonyms; term query support.	No	Online service; academic level support. (SymOntoX language for process, actor, event and goal is under development.)	http://www.symontox.org	taglino@iasi.rm.ont.it
Taxonomy Builder	3.1	1-Aug-2003	Semansys Technologies	Model allows complex XBRL 2.1 structures. General taxonomy elements assigned data types and substitution groups. Predefined XBRL relation types via links.	XBRL XML Schema	XML namespaces. {Taxonomy browser; Internet client}	Import/export: XML; XBRL 2.X. Import: SQL; XML DB; CSV.	Graph view of hierarchy including cycles, etc.	Yes, relative to XBRL core schema.	No	Merging and de-merging	Search and filter; supports alternative labels but not synonyms.	Automatic creation of taxonomies based on source data structures.	Provides wizards that help abstract low level XBRL Available separately or as part of the Semansys XBRL Composer Professional. Inference engine support also available.	http://www.semansys.com/	Paul.snijders@semansys.com
Taxonomy Management System	4.1 Enterprise Release 1.1.0	4-Oct-2003	Wordmap Ltd.	Arbitrary hierarchical structures with multiple inheritance, typed inheritance relations, multiple taxonomies may be integrated. Class/instance distinction is not a primitive, although it can be represented.	Ontologies are encoded in Oracle database.	No. {Network/Web clients and server.}	Wordmap schema XML; ISO 2788 Thesaurus Format; directory structure; delimited ASCII; Convera Semantic DB	Yes, with drag and drop editing.	No	Yes	Ontologies may be integrated in a hub and spoke architecture.	Language-specific synonym sets for each node, with variants generated from a thesaurus. Search and filtering in the client.	(Semi-automatic ontology construction and document classification is planned.)		http://www.wordmap.com	Will Lowe <Will.Lowe@wordmap.com>
Terminae	2.2	8-Jul-2003	Computer Science Lab, Paris North University - CNSR	Generic and individual concepts and roles are represented with multiple inheritance. Roles may be restricted in value or cardinality.	Description logic implementation in Java	No	XML; DAML+OIL; (OWL planned)	Graphical view for drawing concepts and roles, otherwise tree or frame view.	Yes, via inference.	No	No	Normalization of lexical terms; management of text fragments and lexical structures.	Source texts may be traced to terminological concepts and terms. NLP term and relation extractors use lexical and semantic patterns.	http://www-lipn.univ-paris13.fr/~szulman/TERMINAE.html	Sylvie Szulman <sylvie.szulman@lipn.univ-paris13.fr>	

The Discovery Machine	3.2.2	8-Apr-2004	Discovery Machine, Inc.	Hierarchical task networks for process that combine decomposition, decision trees, and data flow into a single process. Expressions for actions can be encoded into the low-level procedures or drawn from foreign functions.	TMK (Task-Method-Knowledge) and SBF (Structure-Behavior-Function)	No	XML	Yes, graphical language for all specifications and control flow.	GUI enforces syntactic and flow control correctness.	No	Detects element collisions and offers resolutions when importing models.	No	No	Focus is on representation of process (strategy, best practices, etc.) as ontology-like structures. Specification decomposes the process into the tasks and methods used to achieve the stated goal, and defines related object models.	http://www.discoverymachine.com	Todd Griffith <griffith@discoverymachine.com>
TMTab (Protégé)	0.4.3	3-Jan-2004	Techquila	Classes of topics, associations and occurrences. Multiple inheritance for topic classes. Can use Protégé's constraint mechanisms to express more complex constraints including cardinality and constraints on relationships.	OKBC model (ala Protégé)	URI's per ISO 13250:2003. {No}	XTM 1.0	No	Possible to add and check constraint axioms using Protégé plug-ins.	No	No	No	No	TMTab is implemented as a plug-in for the Protégé ontology editor. Converting plug-in to a functional back-end is planned.	http://www.techquila.com/tmtab.html	Kal Ahmed <kal@techquila.com>
TOPKAT	prototype	17-Jun-1995	AIAI, University of Edinburgh	Supports representation of the various models of CommonKADS (circa 1995). Underlying these models are dictionaries of concepts, properties, property values, inferences, and tasks. Production rules can be represented using a combination of these primitives.	HARDY and CLIPS	No	CML	Native graph view for editing	Limited	No	No, except models within a single ontology.	Term equivalence through the data dictionary.	Simple natural language parser can identify possible concepts and property values in a protocol transcript.	The Open Practical Knowledge Acquisition Toolkit (TOPKAT) supports CommonKADS knowledge acquisition techniques including: ladder grid, card sort, repertory grid, protocol analysis. Final diagrams also output in HTML. No support.	http://www.aiai.ed.ac.uk/~jkk/topkat.html	John Kingston <j.kingston@ed.ac.uk>
Triple20	0.3	3-Dec-2003	SWI, University of Amsterdam	Representation of triple constructions as expressed in RDF/XML. Near complete support for RDFS, but incomplete support for OWL constructs.	RDF/XML	URI's. {No}	RDF/XML	Read-only view.	Limited RDFS property domain and range.	No	Multiple ontologies can be edited as one joined ontology, while keeping track of the origin of model fragments.	Search and filter on text elements.	No	Extensible system with Prolog based rule language planned. Uses triple store.	http://www.swi-prolog.org/packages/Trip20	Jan Wielemaker <jan@swi.psy.uva.nl>
Unicorn Workbench (formerly Coherence)	3.0	3-May-2004	Unicorn Solutions	Class and property hierarchies with multiple inheritance; constructs for cardinality, sets, bags, lists, sequences, inverse properties; business rules in the form of look-up tables, enumerated values, property conversions, type restrictions, equivalence constraints, unique value constraints. Mapping to RDB's and MOF metadata.	XML	Support for XML Schema, OWL, RDFS, XML and URI's. (Publishing to web application with role-based permission management.)	XML schema; OWL; RDFS; XML	Can publish graphs with layout control.	Centralized integrity checker and reporter (works across users).	Simultaneous multiple user collaboration using database driven check-in and check-out.	Not directly, but ontologies can be compared to give difference report; ontology importing; ontology versioning.	Synonyms; search/filtering.	No, except explicit mapping of schemas to an ontology allow reverse engineering information into the ontology.	Ontology functions are part the Unicorn System enterprise data integration product. Ontology driven transformations (SQL, XSLT, Java) can be generated automatically. Direct support for Dublin Core and ISO11179 metadata.	www.unicorn.com	info@unicorn.com
Visio for Enterprise Architects	2002 SR-1	2-Apr-2002	Microsoft Corp.	Most object-role modeling (ORM) constructs, but imposes relational logical constraints on specification.	ORM	No	XML (via add-on); DDL	ORM class diagrams	Yes	Yes	Yes	No	No	ORM modeler may be effective for specifying domain ontologies; part of Visual Studio .NET Enterprise Architect	http://www.microsoft.com/downloads/details.aspx?familyid=b92f3350-3c95-4252-b38e-dbd166b89738&displaylang=en	http://customerservice.support.microsoft.com/default.aspx?scid=fn:en-us;CSSCONTACTFIND&style=flat
VisualText Conceptual Grammar KB Editor	1.7	11-Oct-2003	Text Analysis International, Inc.	Each hierarchy of concepts may refer to other concepts via attributes. Explicit optimizations for phrasal and lexical information.	NLP++ (proprietary)	No	Via knowledge base command language.	Yes	Legal operations and values are enforced.	Subtrees may be loaded/unloaded separately.	No	Term search	Separate VisualText analyzers can use ontologies.		http://www.textanalysis.com	info@textanalysis.com
WebKB	2.0	15-Jun-2003	Distributed Systems Technology Centre (DSTC) Griffith University, Australia	KIF-like expressivity plus high-level constructs to represent natural language sentences intuitively. Constraint checking for updates. Statement querying via various graph-matching operators.	FS (FCG + Formalized-English (FE) + For-Taxonomy (FT) + query language + script language)	URI's may be used as category identifiers. All categories in the KB can be accessed from the Web via URI's. (CGI servers, HTML interfaces, internal script/query language).	Export/partial import: RDF+DAML; CGIF	Hyperbolic-like browsing of taxonomies via OntoRama tool.	Syntactic and logical checking including transitive cycles, exclusion link violation, relation signatures. Lexical checking.	Each KB element is prefixed with its associated author. Detected semantic conflicts/redundancies avoided by knowledge sharing protocols. Database-like transactions.	No, but private ontologies can extend the shared ontology (which includes a merge of WordNet and various top-level ontologies).	Category querying on metadata or regular expression on names. Names (instead of identifiers) may also be used within statements.	No	Online service (www.webkb.org). Enquire for source/binary code availability. Cascading menus generated from the KB guide the statement entering.	http://www.webkb.org/doc/generalDoc.html	Philippe A. MARTIN <philippe.martin@gu.edu.au>
WebODE	2.0.9	1-Nov-2003	Ontological Engineering Group, Technical University of Madrid (UPM)	Concepts (class and instance), attributes and relations of taxonomies; disjoint and exhaustive class partitions; part-of and ad-hoc binary relations; properties of relations; constants; axioms; and multiple inheritance. Inference engine for subset of OKBC primitives and axioms.	Internal language; Prolog translation of FOL and frames per OKBC model.	Namespaces and XML Schema datatypes. (Browser client; Java applet).	RDF(S); DAML+OIL; OWL; F-Logic; Prolog; XML; Java; UML	Native graph view with editing of classes, relations, partitions, meta-properties, etc.	Type and cardinality constraints; disjoint and exhaustive knowledge; loops; OntoClean.	Yes, with synchronization; authentication and access restrictions per user groups.	Unsupervised (ODEMerge method) using synonym and hyperonym tables; custom dictionaries and merging rules.	Synonyms and abbreviations; (EuroWordNet support under development).	Possible using WebPicker (for UNSPSC, RosettaNet).	Supports Methontology methodology (Fernandez-Lopez et al, 1999). Online service; front-end for ontology engineering workbench (with ontology storage in any RDBMS); other front-ends (ODESeW, etc.) available.	http://delicias.dia.fi.upm.es/webODE/	webode@delicias.dia.fi.upm.es
WebOnto	2.3	1-May-2002	Knowledge Media Institute of Open University, UK	Multiple inheritance and exact coverings; meta-classes; class level support for prolog-like inference.	OCML	{Web service deployment site}	Import: RDF; Export: RDFS, GXL, Ontolingua, OIL	Native graph view of class relationships.	For OCML code	Global write-only locking with change notification.	No	No	(available from OCML based tool MnM)	Online service only.	http://kmi.open.ac.uk/projects/webonto/	John Domingue <j.b.domingue@open.ac.uk>
Xtractica with Coherent Description Framework (CDF)	1.0	1-Jan-2004	XSB, Inc.	Multiple inheritance subsumption class hierarchies. Support for typed attributes of classes and relations between classes. Supports schema and object information and description logic rules.	XSB Tabled Prolog	No	RDF and RDB	Yes	Basic integrity constraints extensible by description logic rules.	Yes, CVS like check in and check out.	Yes, with limitations.	Yes, tools support lexical processing.	XSB tools use ontologies to guide lexical classification and source extraction.	Tool supports construction of domain ontologies used to guide lexical classification and information extraction.	http://www.xsb.com/technology.html	David Warren <warren@xsb.com>