

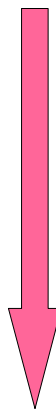
セマンティックWebの過去, 現在, 未来 — オントロジーの視点から —

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知識工学とセマンティックWebにおける オントロジーの研究開発

知識工学

- 90-: 概念化の明示的仕様
(Tom Gruber オントロジーの定義)
オントロジー記述言語
(Ontolingua)
知識交換言語(KIF)
Generic Ontology
CYC, WordNet, EDR...
PSM
Task Ontology
オントロジー構築方法論
...



セマンティックWeb

- 95-97: XML as arbitrary structures
- 97-98: RDF
- 98-99: RDFS
- 00-01: DAML+OIL
- 2004.2.10: OWL
- Rule 仕様検討中

オントロジーの効果

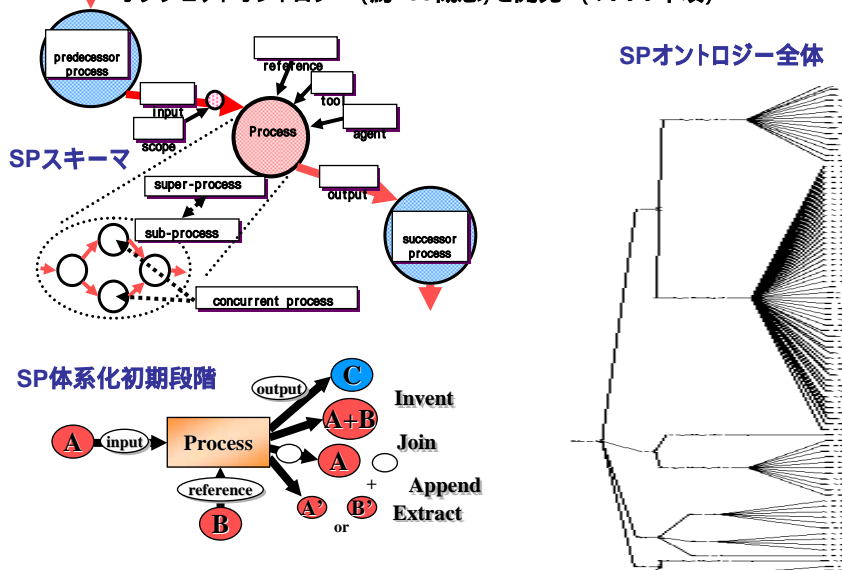
概念の意味の合意形成, 暗黙情報の明示化,
情報統合, 知識再利用, 知識の体系化・標準化,
メタモデル機能, 計算機理解可能

色々言われているけど...

開発プロセスが分からないし, 本当に使える
ツールがあるのか, そもそも**費用対効果**の議
論が見えないし...

ソフトウェア開発プロセスのスキーマ記述と体系化

様々なドキュメントから手作業で約6人月で SPオントロジー(250概念)と
オブジェクトオントロジー(約400概念)を開発 (1998年頃)

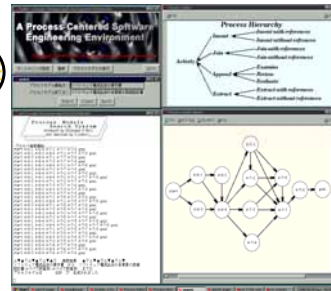
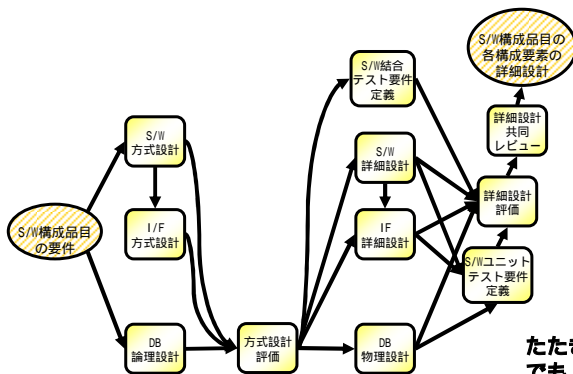


ソフトウェアプロセスプラン(SPP)の生成と評価

入力：S/W構成品目の要件

出力：S/W構成品目の各構成要素の詳細設計

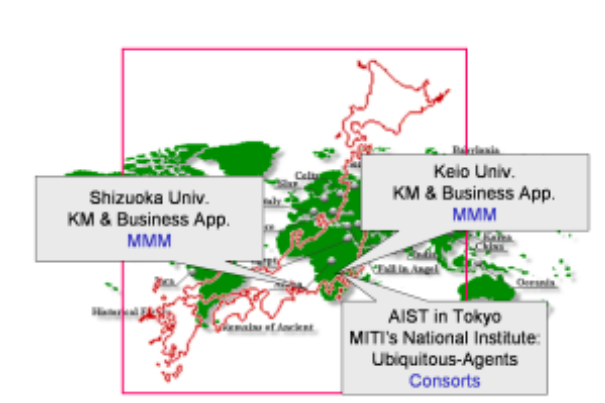
とするSPPIは？



たたき台となるSPP候補の生成に利用でも、人的資源や時間資源に関する概念や開発組織固有概念を追加するコストが大きい。費用対効果は？

What is MMM ?

MMM (Meta-Model Management) Project is a joint research program of Keio University, AIST and Shizuoka University in Japan. We aim to establish a meta-model based knowledge or semantics engineering technology with Semantic Web and Ontologies.

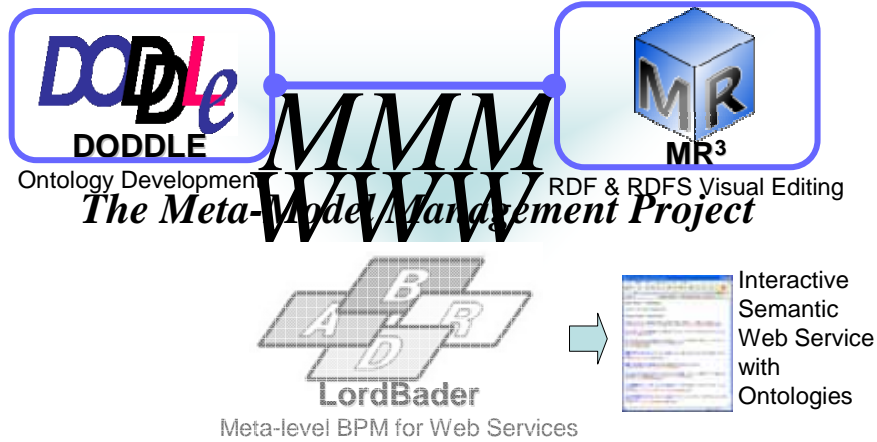


<http://mmm.semanticweb.org/>

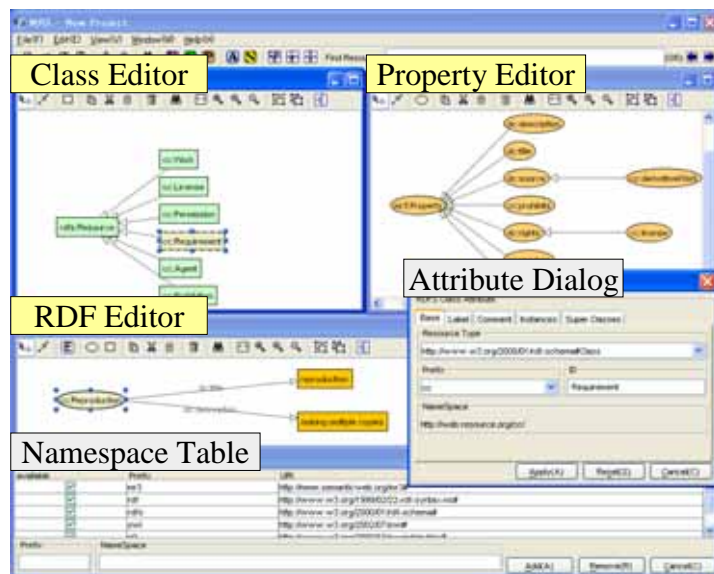
MMM Project

<http://mmm.semanticweb.org/>

- Realizing a total environment of Meta-Model Management (MMM) for the Semantic Web



Graphical Editor: MR³



Editor Windows
 Sub Windows

What's New

2005-12-29: MR3 1.0 RC5 Released.
2005-12-19: MR3 1.0 RC4 Released.
2005-12-04: MR3 1.0 RC3 Released.
2005-10-31: MR3 1.0 RC2 Released.
2004-02-26: MR3 1.0 RC1 Released.
2004-01-24: MR3 Beta3.1 Released



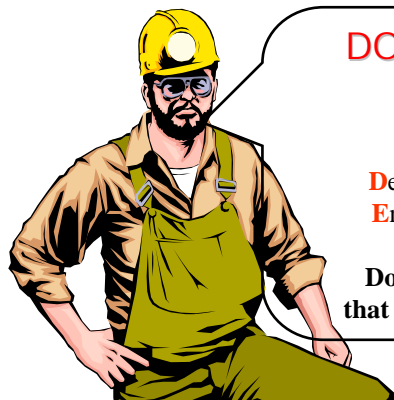
MR3 (Meta-Model Management based on RDFs Revision Reflection) is an editing tool of RDF-based contents developed for managing a relationship between RDF and RDFS contents.

The Semantic Web is one of the most promised candidates as the Web tomorrow, whose basis is on RDF and RDF Schema recommended by the World Wide Web Consortium. The purpose of the idea is to make the data on the Web available not only for displaying but also for automation, integration and reuse of data across various applications. At the moment, a number of supporting environment have been developed as the adopted tools of traditional knowledge engineering based ontologies. These products are mostly concentrating on creating ontologies and managing ontology-based semantic markup. From the standpoint of a significance of information lifecycle on the Semantic Web, in this work, an editing tool of RDF-based contents is developed for managing a relationship between RDF and RDFS contents.

MR3 is implemented by JAVA language.

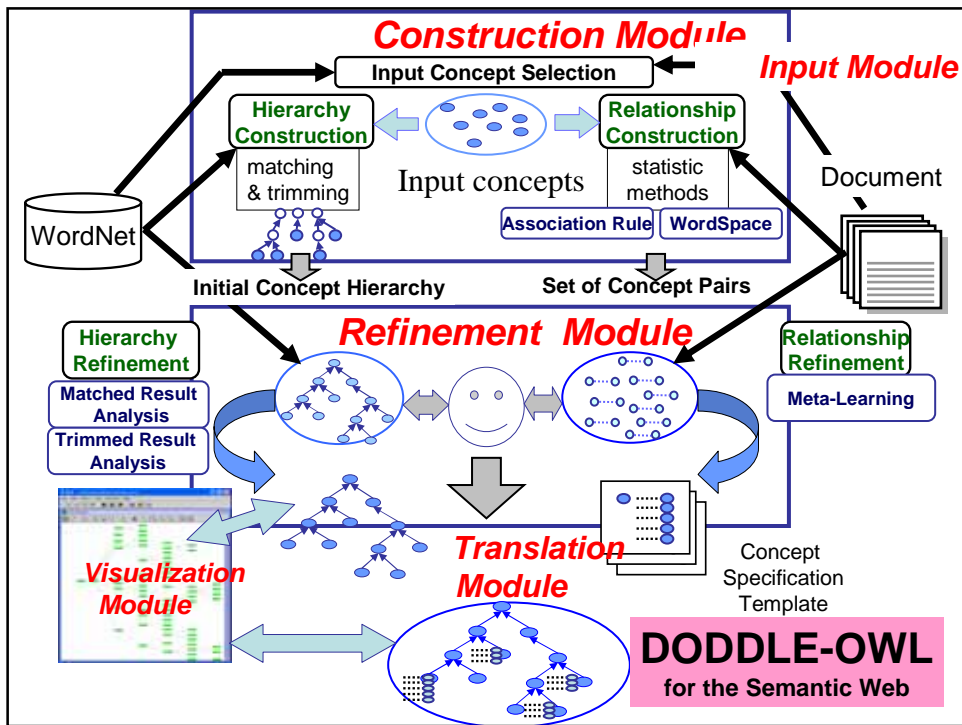
More details available on [this page](#).

DODDLE



DODDLE is a
Domain
Ontology
rapiD
DeveLopment
Environment.

**Doddle means
that Take it easy !**



DODDLE-OWL System Architecture

<i>Visual Representation</i>	<i>Ontology Development</i>	<i>Connection with other tools through Jena Model</i>
MR ³ Graphical Editor	DODDLE-OWL	Plug-ins
Plug-in Interface		
MR ³ : Meta-Model Management Tool		
JGraph	Jena 2 Semantic Web Framework	
Java VM		

Case Study for Constructing Legal Ontologies

Document

Input Document

This Convention applies to contracts of sale of goods between parties whose places of business are in different States: when the States are Contracting States, or when the rules of private international law lead to the application of the law of a Contracting State. The fact that the parties have their places of business in different States is to be disregarded whenever this fact does not appear either from the contract or from any dealings between, or from information disclosed by, the parties at any time before or at the conclusion of the contract. Neither the nationality of the parties nor the civil or commercial character of the parties or of the contract is to be taken into consideration in determining the application of this Convention. This Convention does not apply to sales: of goods bought for personal, family or household use, unless the seller, at any time before or at the conclusion of the contract, neither knew nor ought to have known that the goods were bought for any such use, by auction, on execution or otherwise by authority of law, of stocks, shares, investment securities, negotiable instruments or money, of ships, vessels, hovercraft or aircraft, of electricity. Contracts for the supply of goods to be manufactured or produced are to be considered sales unless the party who orders the goods undertakes to supply a substantial part of the materials necessary for such manufacture or production. This Convention does not apply to contracts in which the preponderant part of the obligations of the party who furnishes the goods consists in the supply of labour or other services. This Convention governs only the formation of the contract of sale and the rights and obligations of the seller and the buyer arising from such a contract. In particular, except as otherwise expressly provided in this Convention, it is not concerned with: the validity of the contract or of any of its provisions or of any usage, the effect which the contract may have on the property in the goods sold. This Convention does not apply to the liability of the seller for death or personal injury caused by the goods to any person.

Document Input Taxonomy Non-Taxonomy Output

Input Module

List of noun terms from a document

1	goods	138	2965274	articles of commerce
2	contract	136	8713496	A binding agreement between two or more persons that is enforceable by law.
3	party	89	2752627	a group of people gathered together for pleasure, "she joined the party after dinner"
4	time	82	22548	the continuum of experience in which events pass from the future through the present to the past
5	hay	75	11879090	thorny Eurasian shrub of coastal tree having dense clusters of white to scarlet flowers followed by a profusion of seed pods
6	convention	70	4879964	afforded as a consequence of being conventional
7	article	63	2666048	a separate section of a legal document (as a statute or contract or will)
8	state	44	24565	the way something is with respect to its own attributes, "the current state of knowledge"
9	price	39	13155276	sum or amount paid or promised, "a woman's price is no longer in the kitchen"
10	period	39	12547918	cost of taking someone, "they say that every politician has a price"
11	year	35	14257468	an amount of time, "a five year term", "fastened the period of time of his recovery"
12	must	35	8077378	a necessary or essential thing, "seat belts are an absolute must"
13	sex	35	1987379	biological sex of an organism, "she is a female"
14	sex	35	1987379	biological sex of an organism, "she is a female"
15	sex	35	1987379	biological sex of an organism, "she is a female"

WordNet Concepts

---846382--- value: 1
 WordNet:contract, contract_bridg.
 About:
 a variety of bridge in which the bidder receives points toward game only for the number of tricks he bid

---8770975--- value: 1
 WordNet:contract, contract_bridg.
 About:
 a binding agreement between two or more persons that is enforceable by law

Document Input Taxonomy Non-Taxonomy Output

We can see noun terms that come up sorted frequently in an open document

When a noun term has two or more meanings we also see what the noun terms mean using a term definition from WordNet.

Construction & Refinement Modules for Hierarchy

Taxonomy

A user can decide which part should be refined.

Concept Drift Management

indicates some groups of concepts in the taxonomy.

The screenshot shows the DODDLE-GWL interface. On the left is a tree view of a taxonomy with nodes like 'object', 'dog', 'goods', etc. On the right, there are two panels for 'Matched Result Analysis (MRA)' and 'Trimmed Result Analysis (TRA)'. A yellow arrow points from the 'Taxonomy' label to a node in the tree. Another yellow arrow points from the 'Concept Drift Management' label to the MRA/TRA panels. A third yellow arrow points from the text 'indicates some groups of concepts in the taxonomy.' to a specific result in the TRA panel.

Construction & Refinement Modules for Relationships

WordSpace parameter

Association Rule parameter

Significant Related Concept Pairs

Non-taxonomic relationships

Setting parameters used in WordSpace and Association Rule

A user selects correct pairs from the generated candidates and defines non-taxonomic relationships.

The screenshot shows the DODDLE-GWL interface for relationship refinement. It features several input fields for parameters: 'WordSpace parameter' (set to 0.5), 'Association Rule parameter' (set to 0.5), and 'Minimum Support' (set to 0.5). Below these are buttons for 'EXE WordSpace' and 'EXE Apriori'. A table titled 'Significant Related Concept Pairs' is shown, with columns for 'Concept', 'WordSpace/Min', and 'Apriori'. The first row is highlighted in red and shows 'price_12547516' as a concept. Below the table is a section for 'Non-taxonomic relationships' with a table containing 'price_12547516' and 'goods_2965274'. A yellow arrow points from the 'WordSpace parameter' label to the 0.5 input field. Another yellow arrow points from the 'Association Rule parameter' label to the 0.5 input field. A yellow arrow points from the 'Significant Related Concept Pairs' label to the table. A yellow arrow points from the 'Non-taxonomic relationships' label to the table below. A yellow arrow points from the text 'Setting parameters used in WordSpace and Association Rule' to the parameter input fields. A yellow arrow points from the text 'A user selects correct pairs from the generated candidates and defines non-taxonomic relationships.' to the 'Non-taxonomic relationships' table.

Visualization Module

The image shows a screenshot of the DODDLE-OWL software interface. The top window, titled "DODDLE-OWL", displays a hierarchical tree structure of concepts. A yellow box highlights a specific node in this tree. A yellow arrow points from this box to a larger window below, titled "Visualization Module". This window displays a detailed graph visualization of the ontology, with nodes and edges representing relationships between concepts. A text box on the right side of the screenshot contains the text: "The display of concept drift management in Visualization Module."

Translation Module

The image shows a screenshot of the DODDLE-OWL software interface. The main window displays a text editor with OWL (Web Ontology Language) code. A red box highlights the code, which defines several classes and their relationships. The code includes the following elements:

```
owl:subClassOf
  owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_3228/"
  rdfs:subClassOf()
  rdfs:label "ddee" rdfs:label()
owl:Class
owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_3777374/"
  rdfs:subClassOf()
  rdfs:label "dmet" rdfs:label()
owl:Class
owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_4464/"
  rdfs:label "dmeta" rdfs:label()
  rdfs:subClassOf()
  owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_5000/"
  owl:Class
owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_5008117/"
  rdfs:label "dobj" rdfs:label()
  rdfs:subClassOf() rdfs:resource "http://www.semanticweb.org/dodde/ontology_4464/"
owl:Class
owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_5187889/"
  rdfs:subClassOf()
  owl:Class rdfs:about "http://www.semanticweb.org/dodde/ontology_3228/"
  rdfs:subClassOf()
  rdfs:label "dmet" rdfs:label()
```

The bottom of the interface shows a navigation bar with buttons for "Document", "Input", "Taxonomy", "Non-Taxonomy", and "Output".

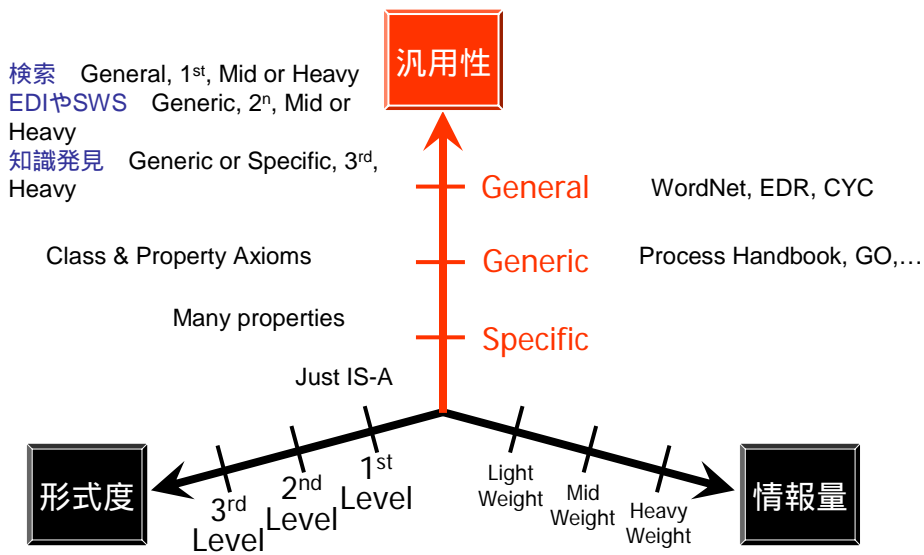
What's New

2005-04-26: DODDLE-OWL version 0.2 released.

2004-07-30: DODDLE-OWL alpha version released.



オントロジーの分化





タスク(ユーザ)と
費用対効果を考慮して、
様々なオントロジーを
使いこなそう！