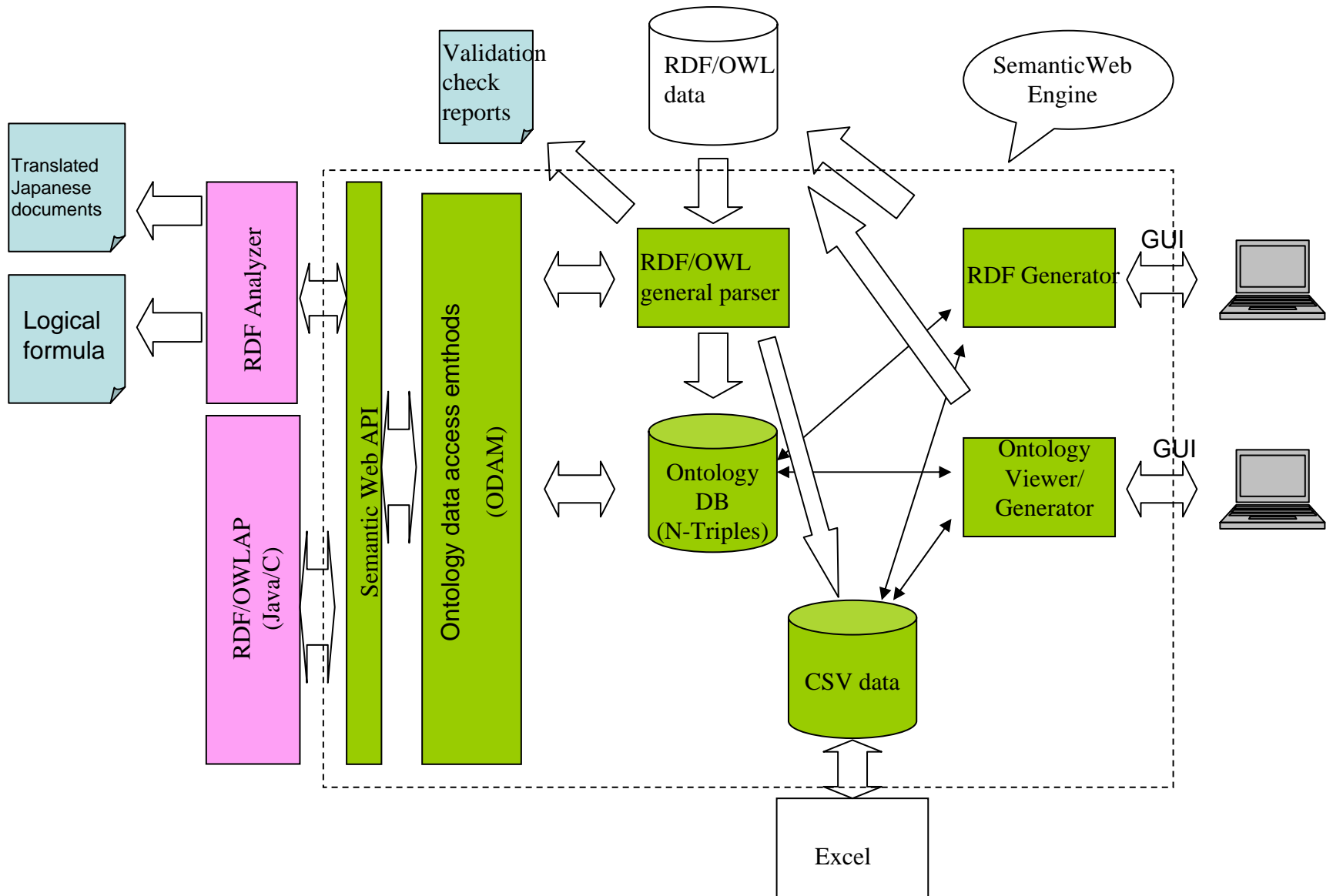# Semantic Web Engine
(A Semantic Web platform package)

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Components of the Semantic Web Engine

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A snapshot of RDF/OWL parser

A snapshot of Ontology Viewer (in case of Galen Ontology)

OWL vocabularies and logical symbols of the Semantic Web Engine (S symbol)

How to grasp and to create a complicated owl description is a big issue.

OWL vocabularies	meaning	Logical symbols
owl:unionOf	union	∪
owl:intersectionOf	intersection	∩
owl:complementOf	compliment	¬
owl:cardinality	number	=
owl:minCardinality	minimum	≧
owl:maxCardinality	maximum	≦
owl:allValuesFrom	universal quantifier	∀
owl:someValuesFrom	existential quantifier	∃
rdfs:subClassOf	Sub class of	∈
owl:equivalentClass	equivalent	=
owl:hasValue	value	≡
owl:Restriction	Property restriction	[Property name] symbol Property value

OWL vocabularies and logical symbols of the Semantic Web Engine (S symbol)

OWL vocabularies	meaning	Logical symbols
owl:disjointWith	disjoint	∨
owl:distinctMembers	All deferent	≠
owl:oneOf	One of	(….|…|….|….)

Logical formula and OWL description

SemillonOrSauvignonBlanc = #Wine ∩ ([#madeFromGrape] ∀ (#SemillonGrape|#SauvignonBlancGrape))

```
<owl:Class rdf:ID="SemillonOrSauvignonBlanc">
  <owl:intersectionOf rdf:parseType="Collection">
   <owl:Class rdf:about="#Wine" />
   <owl:Restriction>
    <owl:onProperty rdf:resource="#madeFromGrape" />
    <owl:allValuesFrom>
     <owl:Class>
      <owl:oneOf rdf:parseType="Collection">
       <owl:Thing rdf:about="#SemillonGrape" />
       <owl:Thing rdf:about="#SauvignonBlancGrape" />
      </owl:oneOf>
     </owl:Class>
    </owl:allValuesFrom>
   </owl:Restriction>
  </owl:intersectionOf>
</owl:Class>
```

RDF Analyzer (the paerser's GUI)

```
<rdf:RDF
  <owl:Class>
    <owl:intersectionOf rdf:parseType="Collection">
      <owl:Class>
        <owl:complementOf rdf:resource="premises006#A"/>
      </owl:Class>
      <owl:Class>
        <owl:complementOf rdf:resource="premises006#B"/>
      </owl:Class>
    </owl:intersectionOf>
  </owl:Class>
  <owl:Class rdf:about="premises006#A"/>
  <owl:Class rdf:about="premises006#B"/>
</rdf:RDF>
```

CSV data

```
owl:Class
,_:RE1
,premises006#A
,premises006#B
_:RE1 = (¬premises006#A)∩(¬premises006#B)
```

RDF/OWL

N-Triples

N-Triples（RDF,RDFS,OWL）
<Subject> <predicate> <object>

CSV data

RDF Analyzer

Logical formula

```
 **Intermediate logical formula**
_:RE1 = (_:RE3 ∩ _:RE5 )
_:RE3 = ¬premises006#A
_:RE5 = ¬premises006#B


 |
 ↓

 **final logical formula**
_:RE1 = (¬premises006#A)∩(¬premises006#B)
```

Local formula

N-Triples data

```
_:RE1 rdf:type owl:Class .
_:RE1 owl:intersectionOf _:RE2 .
_:RE2 rdf:first _:RE3 .
_:RE2 rdf:#rest _:RE4 .
_:RE3 rdf:type owl:Class .
_:RE3 owl:complementOf premises006#A .
_:RE4 rdf:first _:RE5 .
_:RE4 rdf:rest rdf:nil .
_:RE5 rdf:type owl:Class .
_:RE5 owl:complementOf premises006#B .
<premises006#A> rdf:type owl:Class .
<premises006#B> rdf:type owl:Class .
```

De Morgan's law
(¬A)∩(¬B) = ¬(A ∪B)
(note、meaning of symbols）
¬:=NOT（否定）
∩:=AND（積）
∪:=OR（和）